STUDER A812

Operating and Service Instructions



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SICHERHEIT UND ERSTE HILFE

SICHERHEIT

Durch Entfernen von Gehäuseteilen, Abschirmungen etc. werden stromführende Teile freigelegt Aus diesem Grunde müssen die folgenden Sicherheitsvorschriften unbedingt beachtet werden:

- Eingriffe in ein Gerät dürfen nur von Fachpersonal vorgenommen werden.
- 2. Vor Entfernen von Gehäuseteilen: Gerät ausschalten und vom Netz trennen.
- 3. Bei geöffnetem Gerät: Netzteil- oder Motorkondensatoren mit einem passenden Widerstand entladen.
- Bauteile grosser Leistung, wie Leistungstransistoren und -widerstände sowie Magnetspulen und Wickelmotoren erst nach dem Abkühlen berühren.
- Servicearbeiten bei geöffnetem, unter Spannung stehendem Gerät:
- Keine blanken Schaltungsteile berühren
- Isolierte Werkzeuge verwenden
- Metallene Halbleitergehäuse nicht berühren, da sie hohe Spannungen aufweisen können.

ERSTE HILFE (bei Stromunfällen)

- 1. Bei einem Stromunfall die betroffene Person raschmöglichst vom Strom trennen:
- Durch Ausschalten des Gerätes
- Ausziehen oder Unterbrechen der Netzzuleitung
- Betroffene Personen mit isoliertem Material (Holz, Kunstoff) von der Gefahrenquelle wegstossen
- Nach einem Stromunfall sollte immer ein Arzt aufgesucht werden.

ACHTUNG

EINE UNTER SPANNUNG STE-HENDE PERSON DARF NICHT BERÜHRT WERDEN, SIE KÖNNEN DABEI SELBST ELEKTRISIERT WERDEN!

- 2. Bei Bewusstlosigkeit des Verunfallten:
- Puls kontrollieren,
- bei ausgesetzter Atmung künstlich beatmen,
- Seitenlagerung des Verunfallten und Arzt verständigen.

SAFETY AND FIRST AID

SAFETY

There are no user serviceable components inside the equipment, live parts are laid open when removing protective covers and shieldings. It is essential therefore to ensure that the subsequent safety rules are strictly observed when performing service work or repairs.

- 1. Servicing of electronic equipment must be performed by qualified personnel only.
- 2. Before removing covers: Switch off the equipment and unplug the mains cable.

3. When the equipment is open:

- Discharge power supply- and motor capacitors through a suitable resistor.
- Components, that carry heavy electrical loads, such as power transistors and resistors as well as solenoid coils and motors should not be touched before a cooling off interval, as a precaution to avoid burns.

4. Servicing unprotected and operating equipment:

- Never touch bare wires or circuitry
- Use insulated tools only
- Never touch metal semiconductor cases because they may carry high voltages.

FIRST AID (in case of electric shock)

- 1. Separate the person as quickly as possible from the electric power source:
- by switching off the equipment,
- unplugging or disconnecting the mains cable,
- pushing the person away from the power source by using dry insulating material (such as wood or plastic).
- After having sustained an electric shock, always consult a doctor.

WARNING:

DO NOT TOUCH THE PERSON OR HIS CLOTHING BEFORE POWER IS TURNED OFF, OTHERWISE YOU STAND THE RISK OF SUSTAINING AN ELECTRIC SHOCK AS WELL!

If the person is unconscious Check the pulse,

- reanimate the person if respiration is poor,
- lay the body down and turn it to one side, call for a doctor immediately.

SÉCURITÉ ET PREMIERS SECOURS

SÉCURITÉ

Si les couvercles de protection sont enlevés, les parties de l'appareil qui sont sous tension ne sont plus protégées. Il est donc d'une nécessitée absolue de suivre les instructions suivantes:

- 1. Les interventions dans les appareils électriques doivent être faites uniquement que par du personnel qualifié
- 2. Avant d'enlever les couvercles de protection:

Couper l'interrupteur principal et débrancher le câble secteur.

- Après avoir enlevé les couvercles de protection:
 - Les condensateurs de l'alimentation et des moteurs doivent être déchargés à l'aide d'une résistance appropriée.
- Il est prudent de laisser refroidir les composants de haute puissance, par ex.: transistors de puissance, résistances de puissances de même que des électroaimants et les moteurs de bobinage.
- S'il faut que l'appareil soit sous tension pendent les réglages internes:
 - Ne jamais toucher les circuits non isolés
 - Travailler seulement avec des outils isolés

PREMIERS SECOURS (en cas d'électrocution)

- Si la personne est dans l'impossibilité de se libérer:
 Couper l'interrupteur principal
- Couper Interrupteur prin Couper le courant
- Repousser la personne de l'appareil à l'aide d'un objet en matière non conductrice (matière plastique ou boîs)
- Après une électrocution, consulter un médecin.

ATTENTION

NE JAMAIS TOUCHER UNE PER-SONNE QUI EST SOUS TENSION, SOUS PEINE DE SUBIR ÉGALE-MENT UNE ÉLECTROCUTION

- En cas de perte de connaissance de la personne électrocutée:
 Controller le pouls
 - Si nécessaire, pratiquer la respiration artificielle
 - Mettre l'accidenté sur le coté latérale et consulter un médecin.

1. GENERAL INFORMATION

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1.1 Quick Reference Description

With its compact and rugged design, its system flexibility, and the high operating convenience afforded by its multiple microprocessors, the STUDER A812 tape recorder satisfies all requirements of a universal studio machine, be it in radio, television, or recording studios, theater or film productions, auditoriums, or scientific institutes.

Its salient features are:

- Highly stable die-cast aluminum alloy chassis for the tape deck, the headblock, and other assemblies.
- Hall-commutated brushless DC capstan motor with capacitative tacho sensor for highly accurate tape speed, and outstanding acceleration and deceleration rates.
- Fast tape deck with high spooling speeds and gentle processing of the tapes through electronically controlled tape tension, 2 controlled AC spooling motors, and noncontacting tape tension sensor.
- Precision electronic tape counter with real-time indication. Photoelectric scanning of the guide roller rotation.
- Easy editing: motor-assisted with variable spooling speed (SHUTTLE mode).
 For cueing in spooling mode, the high end of the frequency response can be lowered (switch selectable).
- Monitor speaker below the tape deck cover or in the penthouse.
- Manually operable shield above the reproduce heads; can remain closed in spooling mode.

Due to the enormous system flexibility, a suitable A812 version is available for any type of application:

- The basic version is available as a mono, 2-channel (optionally with embedded time code track) or stereo machine with or without external instrument panel.
- Can be operated in horizontal, inclined, or vertical position.
- Four tape speeds can be selected: 3.75 / 7.5 / 15 / 30 ips (programmable).
- The inputs and outputs are balanced and floating and can be ordered with or without input/output transformers.
- Selector switch for two tape types with different calibration data, and changeover switch for NAB/CCIR equalization.
- Zero locator and transfer locator for up to 3 addresses as standard features.
- Equipped with varispeed control (variable tape speed).
- Output selector keys on models equipped with VU meters: INPUT, REPRO and SYNC (playback via record head).
- VU-meter panel with safe/ready changeover, record level potentiometers.
- Line voltage selectable from 100 to 140 V / 200 to 240 VAC, ±10%, 50...60 Hz.
- Can be remote controlled from a terminal or personal computer via an RS232 interface (option).
- Connection facilities for fader start circuit, parallel and serial remote control.

	 High operating convenience afforded by a control system comprising several microprocessors: The last operating state is saved when the machine is switched off: tape counter, locator addresses, tape speed, settings of the input and output selectors. STOP mode is automatically activated when the machine is powered on again. Drop in by pressing only the REC key in play mode (internally programmable) Drop out by pressing PLAY during a recording. Reduced spooling speed (LIBRARY WIND): A lower spooling speed can be selected for producing pancakes to be saved in the library. TAPE DUMP (waste basket mode with disabled take-up motor). LAP TIME (second time level for measuring individual tape segments without influencing the main tape counter). Alignment of the audio parameters via the microprocessor. Programmable keys (softkeys): any function selected from a list of about 100 functions can be assigned to any key, for example: 	
Fader	Local keyboard inhibited, only fader start possible.	
Rehearse	Simulation of an electronic cut.	
Auto mute	Automatic muting of the audio channels in spooling mode, etc.	
	These keys feature special recesses for self-adhesive labels.	

- Internal self-test system for the main functions, supported by error diagnosis: Automatic power-on test, some of the functions are periodically repeated.

1.2 Standard Versions

Model		Order Number
A812-1	 Machine for 1/4" tape with full-track erase head Without channel selector Monitor speaker built into tape deck cover Input and output equipped with transformers Maximum reel diameter 317.5 mm (12.5") Tape speeds 3.75 / 7.5 / 15 ips 	60.118.12011
A812-1 VU	 Machine for 1/4" tape. Penthouse equipped with: VU-meter with channel selector Monitor speaker Input and output without transformer Maximum reel diameter 317.5 mm (12.5") Tape speeds 3.75 / 7.5 / 15 ips 	60.118.12012
A812-0.75	 Machine for 1/4" tape, stereo, with 0.75 mm track separation and full-track erase head No channel selector Monitor speaker built into tape deck cover Inputs and outputs equipped with transformers Maximum reel diameter 317.5 mm (12.5") Tape speeds 3.75 / 7.5 / 15 ips 	60.118.12021
A812-0.75 VU	 Machine for 1/4" tape, stereo, with 0.75 mm track separation and overlapping erase head Penthouse equipped with: VU-meters with channel selector Monitor speaker Inputs and outputs without transformers Maximum reel diameter 317.5 mm (12.5") Tape speeds 3.75 / 7.5 / 15 / 30 ips 	60.118.12022
A812-2 F	 Machine for 1/4" tape, stereo, with 2 mm track separation and full-track erase head No channel selector Monitor speaker built into tape deck cover Inputs and outputs equipped with transformers Maximum reel diameter 317.5 mm (12.5") Tape speeds 3.75 / 7.5 / 15 ips 	60.118.12030

STUDER A812

Model		Order Number
A812-2/2	 Machine for 1/4" tape, stereo/2-channel, with 2 mm track separation and overlapping erase head Penthouse equipped with: Channel selectors Monitor speaker Inputs and outputs without transformers Maximum reel diameter 317.5 mm (12.5") Tape speeds 3.75 / 7.5 / 15 ips 	60.118.12031
A812-2/2 VU	 Machine for 1/4" tape, stereo/2-channel, with 2 mm track separation and overlapping erase head Penthouse equipped with: VU-meters with channel selector Monitor speaker Inputs and outputs without transformers Maximum reel diameter 317.5 mm (12.5") Tape speeds 3.75 / 7.5 / 15 / 30 ips 	60.118.12032
A812-2	 Machine for 1/4" tape, stereo/2-channel, with 2 mm track separation and 2-track erase head (no time code erasure) No channel selectors Monitor speaker built into tape deck cover Inputs and outputs equipped with transformers Maximum reel diameter 317.5 mm (12.5") Tape speeds 3.75 / 7.5 / 15 ips 	60.118.12033
A812-2 VU	 Machine for 1/4" tape, stereo/2-channel, with 2 mm track separation and 2-track erase head (no time code erasure) Penthouse equipped with: VU-meters with channel selector Monitor speaker Inputs and outputs without transformers Maximum reel diameter 317.5 mm (12.5") Tape speeds 3.75 / 7.5 / 15 / 30 ips 	60.118.12034
A812-2 TC	 Machine for 1/4" tape, stereo/2-channel, with 2 mm track separation, with embedded time code track and 2-track erase head Penthouse equipped with: Channel selectors Time code chanel selector Monitor speaker Inputs and outputs equipped with transformers Maximum reel diameter 317.5 mm (12.5") Tape speeds 7.5 / 15 / 30 ips 	60.118.12041

Model		Order Number
A812-2 TC VU	 Machine for 1/4" tape, stereo/2-channel, with 2 mm track separation, embedded time code track, and 2-track erase head Penthouse equipped with: VU-meters with channel selector Time code channel selector Monitor speaker Inputs and outputs without transformers Maximum reel diameter 317.5 mm (12.5") Tape speeds 7.5 / 15 / 30 ips 	60.118.12042
Additional Manuals	Operating and service instruction manual (German) Operating and service instruction manual(English)	10.27.0331 10.27.0341

1.3 Options

	Mono/stereo switch Mono/stereo switch with test generator	20.812.902.00 20.812.903.00
	Serial interface RS232 (for operation with TLS4000)	20.812.885.00
	Serial interface SMPTE/EBU (RS422 and RS232)	20.812.886.00
	Interface for noise reduction system for 2 channels	20.812.945.00
	Interface for parallel channel remote control up to S/N 1999	20.812.938.00
	Interface for serial remote control and remote counter	20.812.888.00
	Mechanical operating hours meter	20.812.865.00
	Tape scissors for installation in the headblock	20.812.891.00
	Tape marker for installation in the headblock	20.812.892.00
	Tape scissors and tape marker for installation in the	20.812.893.00
	headblock	
1.3.1 Connectors for C		Order Number
1.3.1 Connectors for C	headblock	
1.3.1 Connectors for C	headblock	
1.3.1 Connectors for C	headblock ptions and Remote Control Sockets (Not required for connecting STUDER remote controls) Connector for serial remote control (options 20.812.885.00 + 20.812.886.00), 9-pin, D-type, connector	Order Number
1.3.1 Connectors for O	headblock ptions and Remote Control Sockets (Not required for connecting STUDER remote controls) Connector for serial remote control (options 20.812.885.00 + 20.812.886.00), 9-pin, D-type, connector with screw lock Connector for noise reduction system (option	Order Number 20.020.303.07
1.3.1 Connectors for C	headblock ptions and Remote Control Sockets (Not required for connecting STUDER remote controls) Connector for serial remote control (options 20.812.885.00 + 20.812.886.00), 9-pin, D-type, connector with screw lock Connector for noise reduction system (option 20.812.945.00), 15-pin, D-type connector with screw lock Connector for synchronizer 25-pin, D-type with screw	Order Number 20.020.303.07 20.020.303.08

1.3.2 General Information

- All models are chassis versions for installation into A812 consoles or standard 19" rack cabinets. Consoles must be ordered separately (see accessories)
- Operating position: any position between horizontal and vertical
- SYNC reproduction as standard feature, except models without channel selector
- CCIR/NAB equalizations switch-selectable
- Time code channel not active at 3.75 ips
- Electronic tape counter with real time indication at all tape speeds, positive and negative time indication. ZERO LOCATOR and ADDRESS LOCATOR, WATCH/LAP display capability, numerous additional functions.
- Splicing rail near the headblock
- Standard input and output connector configuration: INPUT XLR FEMALE / OUTPUT XLR MALE
- Built-in speaker for monitoring the source/tape signal
- Three-pronged adapter included with machine. Additional reel adapters must be ordered separately (refer to: Tape reels)
- Required XLR audio connectors included with machine
- 25-Pin connector for parallel tape deck control as standard equipment. Matching connectors must be ordered separately (refer to: Connectors for options ...)
- Size of the STUDER standard modules:
 H = 190 mm x W = 40.6 mm
- Line voltage: 100 V to 120 VAC OR 200 V to 240 VAC (selectable), ±10%, 50 to 60 Hz.
- Operating and service instruction manual included with machine.
- **IMPORTANT** The input and output configuration with or without transformers is as specified in the Section: Standard versions. Other configurations available on request.

1.4. Accessories

-

1.4.1 Studio Consoles		Order Number
	(overall width 635 mm) A812 consoles are supplied assembled with wooden side pane nism can be locked in the following positions:	els, The tilt mecha-
	 horizontal 7.5° or 15° forward tilt 7.5° or 15° or 60° backward tilt. (If reels with a diameter of 317.5 mm (12.5") are used, protrude laterally from the console.) 	, the reels do not
Consoles with TRAVERSE	for machines with penthouse Height 780 mm, with gliding pads Height 840 mm, with gliding pads Height 900 mm, with gliding pads Height 840 mm, with casters Height 900 mm, with casters Height 960 mm, with casters	20.020.204.20 20.020.204.21 20.020.204.22 20.020.204.25 20.020.204.26 20.020.204.27
Consoles with RACK BASE (19", 3 U)	 for machines with penthouse Height 780 mm, with gliding pads Height 840 mm, with gliding pads Height 900 mm, with gliding pads Height 840 mm, with casters Height 900 mm, with casters Height 960 mm, with casters 	20.020.204.30 20.020.204.31 20.020.204.32 20.020.204.35 20.020.204.36 20.020.204.37
Consoles with TRAVERSE	for machines without penthouse Height 780 mm, with gliding pads Height 840 mm, with gliding pads Height 900 mm, with gliding pads Height 840 mm, with casters Height 900 mm, with casters Height 960 mm, with casters	20.020.204.40 20.020.204.41 20.020.204.42 20.020.204.45 20.020.204.46 20.020.204.47
Consoles with RACK BASE (19", 3 U)	for machines without penthouse Height 780 mm, with gliding pads Height 840 mm, with gliding pads Height 900 mm, with gliding pads Height 840 mm, with casters Height 900 mm, with casters Height 960 mm, with casters	20.020.204.50 20.020.204.51 20.020.204.52 20.020.204.55 20.020.204.56 20.020.204.57

LOW-COST STUDIO CONSOLES	A812 consoles complete with wooden side panels and casters. Integrated tilting mechanism. Operating height 840 mm.	
Console with TRAVERSE	for machines with console penthouse	20.020.204.65
Console with RACK BASE (19", 3 U)	for machines with console penthouse	20.020.204.75
Console with TRAVERSE	for machines without console penthouse	20.020.204.85
Console with RACK BASE (19", 3 U)	for machines without console penthouse	20.020.204.95

1.4.2 Console Accessories

Order Number

Console panel with storage shelf	for 635 mm studio consoles, for installation of models: A812-1, A812-0.75, A812-2 F, A812-2	21.811.560.00
Console penthouse with storage shelf	and monitor speaker, for 635 mm studio consoles, for in- stallation of models: A812-1, A812-0.75, A812-2F, A812-2	20.811.563.00
Housing for TLS4000	LOCAL CONTROL UNIT (only for models with penthouse with VU-meter or channel selector)	1.058.058.00
Blanking panels for 19" rack base:	 1 Unit high, colorless anodization 2 Units high, colorless anodization 3 Units high, colorless anodization 1 Unit high, grey lacquer 2 Units high, grey lacquer 3 Units high, grey lacquer Screws for rack mounting M6 x 12 Screws for rack mounting M6 x 16 Washers for rack mounting, M6 	$\begin{array}{c} 1.918.001.00\\ 1.918.002.00\\ 1.918.003.00\\ 1.918.011.00\\ 1.918.012.00\\ 1.918.013.00\\ 21.99.0164\\ 21.99.0167\\ 23.99.0121\end{array}$

1.4.3	Remote Controls		Order Number
		Parallel tape deck remote control in desktop housing, with 15 m cable (spare space for VARISPEED control 21.328.253.00 available).	20.820.366.00
		VARISPEED control for installation in desktop housing 20.820.366.00	21.328.253.00
		25-Pin connector, type D, for installation in desktop hou- sing of the parallel remote control 20.820.366.00 (for through-connection of the remote control signals).	21.328.254.00
		Parallel tape deck control in STUDER STANDARD MO- DULE size, 1 unit wide, with 15 m connection cable.	20.820.367.00
		VARISPEED control in STUDER STANDARD MODULE size, 1 unit wide, without connection cable.	21.328.290.00
		Flat cable 0.3 m for connecting the VARISPEED control to the parallel tape deck remote control 20.820.367.00	1.023.102.03
		Connection cable 15 m for direct connection of the VARI- SPEED control to the A812 tape recorder (25-pin D-type connector)	1.328.292.00
		VARISPEED control, deluxe version, with digital indication of the speed deviation in semitones, STUDER STAN- DARD MODULE size, 1 unit wide (without connection cable)	1.328.280.00
		Flat cable 0.3 m for connecting the VARISPEED control (deluxe version) to the parallel tape deck remote control 20.820.367.00	1.023.730.00
		Connection cable 15 m for direct connection of the VARI- SPEED control (deluxe version) to the A812 tape recorder (9- and 25-pin D-type connector)	1.023.731.00
		Serial remote tape timer with main and auxiliary timer indication (only available in conjunction with option 20.812.888.00), for stand-alone operation or for installation in mounting frame $1.328.270.31/32/33$, with 15 m connection cable (H = $50.8 \times W = 202.6 \times D = 130 \text{ mm}$)	20.820.368.00
		Mounting frame for installing one serial remote counter 20.820.368.00	1.328.270.31
		Mounting frame for installing two serial remote counters 20.820.368.00	1.328.270.32
		Mounting frame for installing three serial remote counters 20.820.368.00	1.328.270.33

Serial remote tape timer with 5-position display for con- nection to RS232 interface (only available in conjunction with option 20.812.885.00) for stand-alone operation or for installation in mounting frame $1.328.275.31/32/33$, with 15 m connection cable (H = $50.8 \times W = 157 \times D = 130$ mm)	21.328.275.00
Mounting frame for installing one serial remote counter 21.328.275.00	1.328.275.31
Mounting frame for installing two serial remote counters 21.328.275.00	1.328.275.32
Mounting frame for installing three serial remote counters 21.328.275.00	1.328.275.33
Serial remote control with main and auxiliary tape timer indication (only available in conjunction with option 20.812.888.00), desktop housing, with 15 m connection cable	20.820.369.00
Serial remote control with main and auxiliary tape timer indication (only available in conjunction with option 20.812.888.00), desktop housing, with 15 m connection cable	20.820.370.00
Parallel channel remote control for audio and code channels (only available in conjunction with option 20.812.938.00) STUDER STANDARD MODULE size, 1 unit wide, with 15 m connection cable	21.328.260.00

1.4.4 Reel Adapters

	Professional NAB adapter with aluminum grip section	1.013.344.00
	Low-cost NAB adapter for use with standard 3-pronged adapter	89.01.0354
	DIN adapter	1.013.343.00
	Reel flange for DIN adapter	1.013.328.00
	Reel flange with integrated DIN adapter, for use with stan- dard 3-pronged adapter	1.013.046.00
	AEG hub 1/4", metal	10.200.003.01
	Empty NAB reel, 1/4", (diam. 26 cm), metal	10.213.001.01
1.4.5 Supplementary A	ccessories	Order Number
Plastic dust cover	for machines in 635 mm studio console with penthouse	1.058.100.30
Plastic dust cover	for machines in 635 mm console without penthouse	1.058.100.31
1.4.6 Conversion Kits		Order Number
Rack base (19", 3 U)	for TLS 4000 synchronizer (1 U) and additional space for 2 x 19" modules (2 U). For swapping with the traverse; fits 635 mm studio and low-cost studio consoles.	1.058.057.00
1.4.7 Service Aids		Order Number
Service Aids	Tool case (basic kit) with soldering iron and demag- netizing choke for 110 V.	20.020.001.20
	Tool case (basic kit) with soldering iron and demag- netizing choke for 220 V.	20.020.001.21
	Supplementary tool kit A812 including extender boards.	20.020.001.39
	Extender board for audio and logic modules, 39-pin	1.820.799.00
	Extender board for logic modules, 64-pin	1.228.324.81
	Additional service aids can be found in the price "Accessories"	price list.

1.5 Technical Data

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Tape speeds:				
	76,2 38,1 19,05 9,5 cm/s (30 ips - 15 ips - 7.5 ips - 3.75 ips)			
	All tape speeds selectable on the front panel (depend the keys either one, two, three or four of the available s	ding on the p speeds can b	programming of be selected).	
Nominal tape speed	adjustable within in steps of		±0.2% 0.025%.	
Variable tape speed	Nominal speed variableby (with indication programmable in %, semitones or ips)		s (+54 to -35%)	
Tape speed deviation	Max.		±0.2%	
Tape slip	Max.		0.1%	
Tape reels	NAB, 3-pronged, DIN Max. diameter Min. hub diameter		318 mm (12.5") 45 mm (1.77")	
Tape width			6.3 mm (1/4")	
Wow and flutter	Peak value weighted, according to DIN 45507 or publ. 386.	IEC		
	Ambient air temperature		0 to 40°C	
	76 cm/s, 30 ips 38 cm/s, 15 ips 19 cm/s, 7,5 ips 9,5 cm/s, 3,75 ips	max. max. max. max.	0,03% 0,04% 0,06% 0,1 %	
Starting time	At 30 ips tape speed, 1000 m tape with DIN hub or 76 (2500 ft) tape with NAB reel (for reaching 200% of nominal wow-and-flutter rating):		approx. 0.4 s	

Tape counter:	6-Position LED indication in hours, minutes, seconds a tape speeds. In reverse direction incrementing past zero	
	Range: -9 h 59 min 59.9 s	to 23 h 59 min 59.9 s
Spooling speed:	Programmable 0	.1 to 12 m/s (4 to 470 ips)
Winding time:	For 1000 m tape For 762 m (2500 ft) tape	approx. 90 s approx. 70 s
Braking time from full winding speed:	With full 1000 m pancake (1/4" tape)	approx. 4 s
Tape tension	Play and record mode:Spooling mode:	nominal 0.7 N (70 p) nominal 0.8 N (80 p)
Line inputs:	 Balanced and floating, with input transformers. Impedance, 30 Hz to 20 kHz 	≥ 10 kΩ
	or	
	 Electronically balanced, without input transformer. Impedance, 30 Hz to 20 kHz (balanced wiring) Impedance, 30 Hz to 20 kHz 	≥ 20 kΩ ≥ 10 kΩ
	(unbalanced wiring)	- 10 Kaa
Input level:	 Nominal input level relative to reference flux, internally programmable: 	/ +6, +10, +14, +16 dBm;
	 Nominal input level relative to operation level (according to NAB), internally programmable: 	0, +4, +8, +10 dBm;
	 (Adjustment range of the magnetic flux with above input levels: 	100 to 1000 nWb/m)
	 Uncalibrated mode, models with VU meter panel and input/output level potentiometers. 	d
	Max. adjustable increase in the input sensitivity:	
Maximum input level:	 With input transformer: Without input transformer: (+26 dBm if the nominal input level, relative to open ating level, is set to 0/6 dBm) 	+ 24 dBm + 28 dBm r-
Outputs:	 With transformer Impedance 30 Hz20 kHz: Load 	balanced and floating ≤50 Ω ≥200 Ω
	or	
	 Without transformer Impedance, 30 Hz20 kHz Load 	electronically balanced ≤30 Ω ≥200 Ω

Output level:	 Nominal output level relative to reference flux, inter- nally programmable: +6 	s, +10, +14, +16 dBm;			
	 Nominal output level relative to operating level (according to NAB), internally programmable: 	0, +4, +8, +10 dBm			
	(Adjustment range of the reproduce gain for operating fluxes of 100 to 1000 nWb/m)				
	Uncalibrated mode, models with VU-meter panel and input/output level potentiometers.				
	Max. adjustable increase in the output gain:	10 dB			
Max. output level:	 With output transformer: (Load ≥200 Ω) Without output transformer. 	+24 dBu			
	 Without output transformer: (Load ≥200 Ω) 	+28 dBu			
	- Balanced load≥200 Ω:- Unbalanced load≥200 Ω:- Balanced load≥600 Ω:	+ 26 dBu + 24 dBu + 30 dBu			

(+26 dBu if the nominal output level, relative to operating level, is set to 0/6 dBm)

Unbalance load \geq 600 Ω :

+24 dBu

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Equalization standards:

Switch selectable NAB and CCIR

Equalization time constants:

	76 cm/s 30 ips	38 cm/s 15 ips	19 cm/s 7.5 ips	9,5 cm/s 3.75 ips
CCIR	17,5/∞µs	35/∞µs	70/∞μs	90/3180 µs
NAB	17,5/∞µs	50/3180µs	50/3180µs	90/3180µs

Frequency response, record/reproduce:

	76 cm/s	38 cm/s	19 cm/s	9,5 cm/s
	30 ips	15 ips	7.5 ips	3.75 ips
±2 dB	40 Hz	30 Hz	30 Hz	30 Hz
	22 kHz	20 kHz	16 kHz	10 kHz
±1 dB	60 Hz	40 Hz	30 Hz	30 Hz
	20 kHz	18 kHz	12 kHz	8 kHz

Frequency response SYNC reproduction:

Amplifier programming,"narrow band":

	76 cm/s	38 cm/s	19 cm/s	9,5 cm/s
	30 ips	15 ips	7.5 ips	3.75 ips
±2 dB	60 Hz 12 kHz	30 Hz 12 kHz	30 Hz 8 kHz	

Amplifier programming, "wideband":

	76 cm/s	38 cm/s	19 cm/s	9,5 cm/s
	30 ips	15 ips	7.5 ips	3.75 ips
±2 dB	60 Hz 20 kHz	30 Hz 18 kHz	30 Hz 12 kHz	

Signal-to-noise ratio

Record/reproduce:

CCIR (Equalization according to CCIR, or AES at 76 cm/s (30 ips), measured with tape type AGFA PER 528, BASF LGR 50 or equivalent).

Full-track, 6.3 mm track width, (320 nWb/m; 9,5 cm/s = 250 nWb/m)

	76 cm/s 30 ips	38 cm/s 15 ips	19 cm/s 7.5 ips	9,5cm/s 3.75ips
Linear according to CCIR 468-2	64 dB	62 dB	61 dB	57 dB
Weighted according to CCIR 468-2	54 dB	52 dB	51 dB	48 dB
Weighted, ASA-A (IEC 179)	68 dB	66 dB	64 dB	62 dB

Stereo, 2,75 mm track width (510 nWb/m; 9,5 cm/s = 400 nWb/m),

	76 cm/s 30 ips	38 cm/s 15 ips	19 cm/s 7.5 ips	9,5cm/s 3.75ips
Linear according to CCIR 468-2	65 dB	63 dB	62 dB	58 dB
Weighted according to CCIR 468-2	56 dB	54 dB	52 dB	49 dB
Weighted, ASA-A (IEC 179)	69 dB	67 dB	65 dB	63 dB

2-Track, 2,0 mm track width (510 nWb/m; 9,5 cm/s = 400 nWb/m)

	76 cm/s 30 ips	38 cm/s 15 ips	19 cm/s 7.5 ips	9,5cm/s 3.75ips
Linear according to CCIR 468-2	64 dB	62 dB	61 dB	57 dB
Weighted according to CCIR 468-2	54 dB	52 dB	51 dB	48 dB
Weighted, ASA-A (IEC 179)	68 dB	66 dB	64 dB	61 dB

NAB [Equalization according to NAB or AES at 30 ips, measured with tape type SCOTCH 3M 226 or equivalent]

	30 ips 76 cm/s	15 ips 38 cm/s	7.5 ips 19 cm/s	3.75ips 9,5cm/s
linear, RMS, 30 Hz20 kHz	75 dB	72 dB	74 dB	64 dB
RMS value,, ASA-A-weighted, according to DIN 45633/ IEC Publ. 179	78 dB	75 dB	77 dB	68 dB

Full-track, 6,3 mm track width (1040 nWb/m; 3.75 ips = 510 nWb/m)

Stereo, 2,75 mm track width (1040 nWb/m; 9,5 cm/s = 510 nWb/m)

	30 ips 76 cm/s	15 ips 38 cm/s	7.5 ips 19 cm/s	3.75ips 9,5cm/s
linear, RMS, 30 Hz20 kHz	71 dB	68 dB	70 dB	59 dB
RMS value, ASA-A-weighted, according to DIN 45633/ IEC Publ. 179	75 dB	71 dB	73 dB	63 dB

2-Track, 2,0 mm track width (1040 nWb/m; 9,5 cm/s = 510 nWb/m)

	30 ips 76 cm/s	15 ips 38 cm/s	7.5 ips 19 cm/s	3.75ips 9,5cm/s
linear, RMS, 30 Hz20 kHz	70 dB	67 dB	69 dB	59 dB
RMS value, ASA-A-weighted, according to DIN 45633/ IEC Publ. 179	74 dB	70 dB	72 dB	63 dB

Signal-to-noise ratio Record/SYNC reproduction:

Amplifier programming "narrow band":

CCIR [Equalization according to CCIR or AES at 76cm/s (30 ips),measured with tape AGFA PER 528, BASF LGR 50 or equivalent]

Full-track, 6,3 mm track width (320 nWb/m)

	76 cm/s 30 ips	38 cm/s 15 ips	19 cm/s 7,5 ips	9,5cm/s 3,75ips
Linear according to CCIR 468-2	63 dB	62 dB	61 dB	
Weighted according to CCIR 468-2	54 dB	52 dB	51 dB	

Stereo, 2,75 mm track width(510 nWb/m)

	76 cm/s 30 ips	38 cm/s 15 ips	19 cm/s 7.5 ips	9,5cm/s 3.75ips
Linear according to CCIR 468-2	62 dB	61 dB	60 dB	
Weighted according to CCIR 468-2	55 dB	53 dB	52 dB	

2-Track, 2,0 mm track width (510 nWb/m)

	76 cm/s 30 ips	38 cm/s 15 ips	19 cm/s 7.5 ips	9,5cm/s 3.75ips
Linear according to CCIR 468-2	61 dB	60 dB	59 dB	
Weighted according to CCIR 468-2	54 dB	52 dB	51 dB	

Harmonic distortion:

(Record-reproduce 1 kHz, measured with tape type AGFA PER 528)

	76 cm/s 30 ips	38 cm/s 15 ips	19 cm/s 7.5 ips	9,5cm/s 3.75ips
CCIR, full-track 320 nWb/m	≤ 1,0 %	≤ 1,0 %	≤ 1,5 %	≤ 2,0 %
CCIR, stereo and 2-track 510nWb/m	≤ 1,0 %	≤ 1,0 %	≤ 1,5 %	≤ 2,0 %

Harmonic distortion:

(Record reproduce, 1kHz, measured with tape type SCOTCH 3M 226)

	(
		30ips 76 cm/s	15ips 38 cm/s	7.5ips 19 cm/s	3.75ips 9,5cm/s
		510 nWb/m	510 nWb/m	510 nWb/m	400 nWb/m
	NAB, full-track	≤ 0,5%	≤0,5%	≤0,5%	≤0,5%
	NAB, stereo/2-track	≤0,5%	≤0,5%	≤0,5%	≤0,5%
Cross talk	(at 1 kHz, according 45521) 2-Track models: ≥65 d				
Erase depth:	at 1 kHz and 510 nWb/m			38	3 cm/s 15 ips
	With full-track erase head: With overlapping 2-track erase	e head:			≥80 dB ≥75 dB
Erase and bias frequency:	At all tape speeds:				153.6 kHz
VU-meters:	Characteristic switchable from VU (according to IEC recommendation 268, part 10, section 4) to PPM (peak program meter) (according to IEC recommendation 268, part 10, section 3, except 24.1 concerning scale division)				
Power input:	(switch selectable)	100 V to 140	V or 200 V to	240 V; ±10%	; 50 or 60 Hz
Power consumption	(at nominal voltage):				
	Idle:90 WRecording, 2-channel:150n WSpooling:190 WMax. power consumption:280 W				150n W 190 W
Admissible power outage:	Operating state unaffected by	power outage	es of		up to 100 ms
Ambient air temperature:	(+32°F to +104°F)			0	°C to +40°C
Relative humidity:	Noncondensing: 20% to 90°				20% to 90%
Safety standard:	According to IEC recommendation, publication 65, pro- tection category I (power filter, power switch, power fuse, power transformer and voltage selector conform to pro- tection categories I and II)				
Weight:	(without console), depending on configuration: Net. appro				ipprox. 43 kg ipprox. 70 kg

1.5.1 Technical Data of the Timecode Channel

	The time code channel corresponds to the IEC publication 461, DIN 45511, part 7.	
Track width/track location:	In center of tape	0.38 mm
Code format:	80-Bit address code (switch selectable 24/25/29.97/30 frames/second)	SMPTE/EBU
Tape speeds:		
		38,1 19,05 9,5 cm/s ips - 7.5 ips - 3.75 ips)
Magnetic flux of the time code track:	729 nWb/mpp ±3 dB	
Time code channel input:	With transformer Input impedance	balanced and floating ≥10 kΩ
Input level:	Nominal: Minimum: Maximum:	2 Vpp 0.25 Vpp 4 Vpp
Time code channel output:	With transformer Output impedance	balanced and floating ≤40 Ω
Output level:	Load ≥200 Ω	2 Vpp
Crosstalk from code channel to audio channel to	Relative to 510 nWb/m tape flux of the audio track, for all components of the time code signal	≥90 dB
Time code delay unit:	 (TIME CODE DELAY UNIT) Selectable time code delay for: Coincident time code and audio track recording or reproduction at 24/25/29.97/30 frames/sec Telefunken M15A-TC compatible time code and audio track recording or reproduction at 24/25/29.97/30 frames/sec. Coincidence error between code track and audio track: [With TIME CODE DELAY UNIT in coincident mode] 	
		+4 ma
	at 38,1 cm/s (15 ips)	±4 ms
	The technical data apply to any operating position between	
	We reserve the right to make changes as technical progres	s may warrant.

1.5.2 Type of Packing

Machines with VU-meter panel:
Cardboard box
(depending on console height).82 x 84 x 120/126/132 cmMachines without VU-meter panel:
Cardboard box
(depending on console height)82 x 84 x 93/99/105 cmGross weight:
Depending on configuration:73 kg to 119 kg

1.5.3 Dimensions



Fig. 1.5.1 max. depth 402 mm

1.6 Instructions for the Service Personnel

1.6.1 Abbreviations

А Assembly ANT Antenna В Bulb ΒA Battery, rechargeable battery BR Optocoupler (bulb --> LDR) С Capacitor D Diode, DIAC DI. 1 FD Optocoupler (LED --> phototransistor) Optocoupler (LED --> LDR) LED array, 7-segment display DLQ DLR DLZ DP Photodiode Rectifier DZ F Electronic component EF Headphones F Fuse FL Filter Н Head (audio, erase) HC Hybrid circuit (thick/thin film) Hall element HE IC Integrated circuit Socket (female) J Jumper J Κ Relay, contactor L Inductor LS Loudspeaker Motor М ME Meter MIC Microphone MP Mechanical part Ρ Connector (male) PU Phono cartridge Q Transistor, FET, Thyristor, TRIAC QР Phototransistor **OPZ** Phototransistor array Resistor R RP Light-sensitive resistor, $\ensuremath{\mathsf{LDR}}$ RT Temperature-dependent resistor RZ Resistor network S Switch Т Transformer TL Delay line ΤP Test point, test socket Wire, stranded wire Base, holder Ψ Х XB Lamp base XF Fuse holder XIC IC socket Y Crystal, piezo element Ζ Network, array

1.6.2 Powers of Ten

Designation	Abreviation	Value
Tera-	T	1012
Giga-	G	109
Mega-	M	106
Kilo-	k	103
Milli-	m	10-3
Mikro-	μ	10-6
Nano-	n (mμ)	10-9
Pico-	ρ (μμ)	10-12
Femto-	f	10-15

() = Abbreviation commonly used in the USA $\,$

1.6.3 Letter and Color Codes

Resistors

				-	
Standard- series:					
E6 E12 E24 - 1st digit	I 2nd digit 	t Mult.	To1	 	
	2nd dig.				ĸ

Color	Digit	Multi- plier	Tole- rance	ТК
gold silver black braun red orange yellow green blue violet grey white	- 0 1 2 3 4 5 6 7 8 9	0,01 0,1 1 10 100 1 k 100 k 10 k 1 M 10 M - -	5 % 10 % - 2 % - 0,5 % 0,25 % 0,1 % -	- - 50•10-6/K 15•10-6/K 25•10-6/K - - - - -

No TK designation = $50 \cdot 10-6/K$ Only 1 black ring = 0Ω (jumper)

Capacitors:

Frequently, the tolerance is specified by a letter behind the printed capacitance rating:

D	= 0,5 %
F	= 1 %
G	= 2 %
J	= 5 %
K	= 10 %
M	= 20 %

Molded RF coils:

Examples:

A wide silver ring and four narrow rings of different colors are used to identify molded RF coils. The wide silver ring marks the start of the counting direction. The second, third, and fourth ring specify the inductance in Microhenry (μ H). The second and the third ring designate the numeric value and the fourth ring is either a multiplier, or if its color is gold, the decimal point. The fifth ring designates the tole-rance in percent (±).

Color	Digit	Multiplier	Tolerance
gold silver black braun red orange yellow green blue violet grey white without	- 0 1 2 3 4 5 6 7 8 9 -	- 1 10 100 103 104 105 106 107 108 109 -	5 % 10 % 2 % - 0,5 % - - 20 %



** Multiplier

Inductors and transformers on ferrite cores:

Inductors and transformers on ferrite cores are marked with three colored dots (color coding same as in the two left-hand columns of the Section "Resistors"). These dots designate the last three digits of the STUDER standard number. The large dot marks the start. The first digits of the standard number (1.022.--- are always the same.

Example:

- Driver transformer, 150 kHz.
- Standard number: 1.022.211
- Color code: red (large dot), brown, brown

Terminal 1 of the winding form is usually identified with a lobe; if not, the winding form is marked with a yellow dot near terminal 1.

1.6.4 Electrostatically Sensitive Components



MOS (metal oxide semiconductor) devices are highly sensitive to electrostatic charges. The following precautions should be followed:

- Electrostatically sensitive components and assemblies ("ESE" are stored and transported in protective packing material. The label illustrated above is affixed to this protective packing.
- It is important to avoid any contact of the terminals with plastic bags, plastic foils and other statically chargeable material.
- Only touch the terminals when your wrist is connected to ground.
- Use a special conductive plastic mat as a work surface.
- Never install or unplug printed circuit boards when the tape recorder is under power! The tape recorder should be switched off for at least 5 seconds before any circuit boards are installed or removed!

2. Start up, Procedure, Operating

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	-	, .

2.1 Unpacking and Checking

The A812 tape recorder is shipped in a special packing that protects the machine from damage in transit. Care should be exercised when unpacking the machine so that its surfaces do not become marred.

Check that you have received all the material by comparing the packing content with the shipping list. Save the original packing material because it provides the best protection in case your tape recorder needs to be transported again.

Check all items for possible shipping damage. If you discover any damage, immediately notify the forwarding agent as well as the nearest STUDER dealer.

2.2 Installation Site

The A812 should be installed in a dust-free and an adequately ventilated environment. The performance data of the tape recorder are guaranteed for an ambient temperature range of 0° C to $+40^{\circ}$ C with a relative humidity of 20% to 90% (noncondensing).

Install the tape recorder in such a way that sufficient space is available all around the machine for unobstructed cooling. Particularly in recessed locations there is a possibility of heat accumulation. The air circulation zone should neither be misused as a storage area nor be obstructed with manuals etc.

The tape recorder should not be installed in the vicinity of strong electromagnetic fields. General sources of interference are: strong load fluctuations on adjacent power circuits, high-power transformers, elevator motors, electrical welding plants, as well as nearby radio and television transmitters.

The rear of the unit should remain readily accessible for service work. When the recorder is installed in a niche, sufficient space should be available for shifting the machine even when the cables are attached.

2.3 Setting up the Tape Recorder

The technical data are guaranteed for operating the tape recorder in any position between horizontal and $\pm 15\%$ inclination.

2.3.1 Assembling the Console

The console is shipped in disassembled condition.

- First fasten the side panels of the console to the traverse (or the rack base) by means of a 5 mm heaxagon-socket-screw key. Subsequently fasten the wooden side panels with 4 screws each (4 mm hexagon socket).
- The rear console panel is mounted after the tape recorder has been installed.
- In order to install the tape recorder it is necessary to remove the two long aluminum strips (3 screws each, hexagon-socket 2.5 mm, as well as 2 screws M6, screwdriver No. 6).
- Position the console horizontally (the lever for releasing the tilting mechanism is located on the left front below the console). Slide the tape recorder into the console from the back, mount the aluminum strips and fasten the screws.

Tape recorders without VU-meter penthouse:

Install the rear panel (6 hexagon socket 2.5 mm)

Tape recorders with VU-meter penthouse:

- Slide the cable harness and the flat cable through the panel neck (on the rear panel), connect the panel housing to the panel neck (2 screws, hexagon socket 5 mm).
- Engage the rear panel with mounted penthouse on the back of the console and fasten the screws (6 x hexagon socket 2.5 mm).

Important !!

DO NOT ACTUATE THE TILTING MECHANISM IN TAPE SPOOLING MODE BECAUSE THE HIGH CENTRIFUGAL FORCES COULD DAMAGE THE TAPE, THE REELS, THE ADAPTER AND THE TAPE DECK COVER !!

STUDER A812

2.4 Connectors, Fuses



Fig. 2.4.1

[1]	Line input CH1
[2]	Line output CH1
[3]	Line input CH2
[4]	Line output CH2
[5]	Line input time code channel (TC versions only)
[6]	Line output time code channel (TC versions only)

[7]	Connector for VU-meter panel (audio)
[8]	Connector for VU-meter panel (control)
[9]	Connector for noise reduction system (option) *
[10]	Connector for serial remote control, remote counter, and autolocator (option) *
[11]	Connector for synchronizer (TC versions only) *
[12]	Connector for parallel remote control *
[13], [14]	Parallel wired connectors for SMPTE/EBU bus, RS232 interface, or data dump to external memory (option)
[15]	Line voltage selector *
[16]	Ground socket *
[17]	Power inlet with primary fuse, diam. 5 x 20 mm

100 to 140 V: 6.3 A SLOW 200 to 240 V: 3.15 A SLOW

The connectors identified with * are located below the hinged cover.



Fig. 2.4.2

All secondary fuses: diam. 5 x 20 mm !

[1]	Fuse for capstan motor and auxiliary voltages 4 A SLOW
[2]	Fuse for STABILIZER 8 A SLOW
[3]	Fuse for STABILIZER 1.6 A SLOW
[4]	Fuse for positive spooling motor voltage (+) 2.5 A SLOW
[5]	Fuse for negative spooling motor voltage (-) 2.5 A SLOW
[6]	Headphones socket (on models with monitor speaker built into the tape deck cover)

2.4.1 Power Connection, Voltage Selection



Fig. 2.4.3

No. 1 = No. 2 =	Phase Ground	
No. 3 =	Neutral	

Important !! Before you connect the recorder to the AC power source for the first time, check that the setting of the line voltage selector agrees with the local line voltage. The following voltage can be set:

> 100, 120, 140, 200, 220, 240 VAC, \pm 10%; 50 to 60 Hz. Disconnect the recorder from the AC outlet before you change the line voltage!

> After the line voltage selector has been adjusted, the power fuse in the power inlet may possibly have to be replaced with a correctly rated fuse (diam. 5 x 20 mm)

100 V ... 140 VAC: 6.3 A (SLOW) 200 V ... 240 VAC: 3.15 A (SLOW)



2.4.2 Line Inputs and Outputs





The balanced inputs and outputs are terminated on XLR sockets or connectors (pin assignment according to IEC recommendation 268-14).

No. 1 No. 2	Audio ground A-line (hot) *	
No. 3	B-line (cold)	

* Line A is "hot" with unbalanced connection of the tape recorder.

2.4.3 Remote Control Socket

Parallel remote control connector	A parallel remote control with the following capabili 25-pin connector (female, type D):	ities can be connected to this
	 Remote control of the tape transport functions STOP, REC). RESET TIMER (resets the tape timer) ZERO LOC (automatically searches the tape time LOC START (automatically searches the tape au command was entered). LIFTER (defeats the tape lifter in spooling mode). FADER (enables the fader start circuit). VARISPEED (variable tape speed). 	r address 00.00.00.0). ddress at which the last PLAY
	Connector set	Part No. 20.020.303.16

Connector housing, 25-pin

Connector, 25-pin, coded

Part No. 54.13.7022 Part No. 10.217.001.06
Pin	Signal name		Designation
01	+0.0		Ground (GND, 0 V)
02	BR-REW	2 ¹ C	Status indicator lamp REWIND
03	BR-FORW	*	Status indicator lamp FORWARD
04	BR-VRSPD	2/4	Status indicator lamp VARISPEED
			(alternatingly LOW and HIGH, when active)
05	SR-VRSPD	+	Switch for VARISPEED command
06	SR-FADRY	+	Switch for FADER START READY command
07	BR-LOCST	*	Status indicator lamp LOC START
08	BR-FADRY	*	Status indicator lamp FADER START READY
09	BR-REC	*	Status indicator lamp RECORD
10	ST-RESET	+	Switch for RESET TIMER command
11	FAD1		Input FADER START command, line A
12	FAD2		Input FADER START command, line B
			(FADER START is active when 5 to 24 VDC or
			AC are available across pins 11 and 12).
13	IR-REFEX		Input for external capstan PLL reference
			(nominal: 9.6 kHz, TTL level recommended;
			max. input voltage +10 V).
14	SR-OLOC	+	Switch for ZERO LOC command
15	BR-PLAY	*	Status indicator lamp PLAY
16	BR-STOP	*	Status indicator lamp STOP
17	SR-LIFT	+	Switch for LIFTER command
18	SR-LOCST	+	Switch for LOC START command
19	SR-REC	+	Switch for RECORD command
20	SR-REW	+	Switch for REWIND command
21	SR-FORW	+	Switch for FORWARD command
22	SR-PLAY	+	Switch for PLAY command
23	SR-STOP	+	Switch for STOP command
24	KEY		Connector coding
25	+24.0		+24 V supply (max. 300 mA)

Pin assignment of the PARALLEL REMOTE CONTROL:

- * Open collector output, active LOW. No internal pull-up resistor. Maximum HIGH level +30 V, maximum current 200 mA (built-in current limiting resistor 22 Ω).
- + Switch input. LOW level activates the command. Internal pull-up resistor, $4.7 \text{ k}\Omega$ to +24 V. Maximum HIGH level = +30 V. Logical levels: LOW = 0 V to +4 V; HIGH = +7.5 V to +30 V.













Important !! If incandescent bulbs are used for feedback, their inrush current may not exceed 0.3 A !

Connector for external synchronizer

A 25-pin connector (female, type D) is available for connecting an external synchronizer (time code versions only).

Connector set	Part No. 20.020.303.15
Connector housing, 25-pin	Part No. 54.13.7022
Connector 25-pin, coded	Part No. 10.217.001.05

Pin	Signal name		Designation
01	+ 0.0		Ground (GND, 0 V)
02	BR-REW	*	Status indicator lamp REWIND
03	BR-FORW	*	Status indicator lamp FORWARD
04	BR-VRSPD	2/4	Status indicator lamp VARISPEED
			(alternatingly LOW and HIGH when active)
05	SR-VRSPD	+	Switch for VARISPEED command
06	SR-REHSL	+	Switch for REHEARSAL command
07	OR-MVCLK	2/4	Output for TAPE MOVE CLOCK signal
			(128 pulses/15 ips, pulse duty factor 50%).
08	KEY	*	Connector coding
09	BR-REC	*	Status indicator lamp RECORD
10	OR-MVDIR	*	Output for TAPE MOVE DIRECTION signal
			(REWIND = LOW, FORWARD = HIGH).
11	OR-CMCLK	*	Output for CAPSTAN MOTOR MOVE CLOCK signal
			(1200 pulses/s at 7.5 ips)
12	OR-SYENB	*	Output for SYNCHRONIZER ENABLE signal (LOW
			when tape is tensioned and the recorder is
			operational, HIGH when the tape is not
			tensioned).
13	IR-REFEX		Input for external capstan PLL reference
			(nominal: 9.6 kHz, TTL level recommended;
			max. input voltage +30 V).
14	+ 0.0		Ground
15	BR-PLAY	*	Status indicator lamp PLAY
16	BR-STOP	*	Status indicator lamp STOP
17	SR-LIFT	+	Switch for LIFTER command
18	SR-MUTE	+	Switch for MUTE command (no influence on
			time code channel)
19	SR-REC	+	Switch for RECORD command
20	SR-REW	+	Switch for REWIND command
21	SR-FORW	+	Switch for FORWARD command
22	SR-PLAY	+	Switch for PLAY command
23	SR-STOP	+	Switch for STOP command
24	KEY		Connector coding
25	+24.0		+24V supply (max. 300 mA)

Pin assignment of the SYNCHRONIZER connector:

- * Open collector output, active LOW. No internal pull-up resistor. Maximum HIGH level +30 V, maximum current 200 mA (built-in current limiting resistor 22 Ω).
- + Switch input. LOW level activates the command. Internal pull-up resistor, 4.7 k Ω to +24 V. Maximum HIGH level = +30 V. Logical levels: LOW = 0 V to +4 V; HIGH = +7.5 V to +30 V.

Connector for the RS232 serial interface

and SMPTE/EBU bus or RS232 interface and data backup facility

A terminal with RS232 interface and ASCII protocol or a tape recorder for data backup (option 1.810.751.00) or a terminal with RS 232 interface and binary protocol or the SMPTE/EBU bus (RS422) (option 1.820.751.20) can be interfaced to this connector.

Pin assignment of the RS232 or SMPTE/EBU bus (RS422) connector (option 1.820.751.20);

RS232			RS422
Pin	Signal name	Pin Signal name	
01 02 03 04 05 06 07 08 09	SHIELD RX 0,0V 0,0V TX SHIELD	01 02 03 04 05 06 07 08 09	SHIELD TRANSMIT A RECEIVEB REC.COMMON TRSMT.COM.0 TRANSMIT B RECEIVE A SHIELD

Pin assignment of the RS232 connector or the connector for data backup (option 1.810.751.00:

Pin	Signal name
01 02 03 04 05 06 07	FRMGND TRANSA RECEIVB RECEIVCM SPARE TRANSCM TRANSB
08	RECEIVA
09	FRAMGND

Connection of the AUTOLOCATOR/REMOTE TIMER A serial remote control, a remote timer or an autolocator can be connected via this 9-pin connector (female, D-type). The keys of the serial remote control are freely programmable. All functions programmable on the local keyboard can also be executed from the remote control. The functions programmed on the serial remote control do not necessarily have to be the same as those on the local keyboard. Pin assignment of the AUTOLOCATOR/REMOTE TIMER connector

Pin	Signal name
01	SHIELD
02	N.C.
03	TR-A
04	KEY
05	+0.0
06	N.C.
07	TR-B
08	SIGN.GND
09	+ REMSUP

Connection of the NOISE REDUCTION SYSTEM

A 2-channel noise reduction system (either DOLBY <R> or TELCOM <R>) can be remote controlled via this 15-pin connector.

Connector set

Part No.20.020.303.08

Pin assignment of the NOISE REDUCTION SYSTEM connector

Pin	Signal name		Designation
01	B-BDY-01	*	Control signal for DOLBY system channel 1
02	B-BDY-02	*	Control signal for DOLBY system channel 2
03	N.C.		
04	KEY		
05	N.C.		
06	N.C.		
07	N.C.		
08	N.C		
09	N.C.		
10	N.C.		
11	B-TLC-01	+	Control signal for TELCOM
			system channel 1
12			
13	B-TLC-02	+	Control signal for TELCOM
			system channel 2
14	+24.0		
15	+0.0		

- * Open collector output, active LOW. No internal pull-up resistor. Max. HIGH level 30 V, max. current 200 mA.
- + Open collector output, same as above, but active HIGH.





TIP	=	Left-hand channel
RING	=	Right-hand channel
SLEEVE	=	Ground

2.5 Operating Instructions



Three standard versions exist with differently programmed (and labelled) keypads. These versions are subsequently identified with the letters A to C.

Version A



Models: A812-0.75, A812-2, A812-1 A812-2F

Fig. 2.5.2

Models: A812-VU, A812-2/2 VU, A812-2 VU, A812-1 VU, A812-2/2



Fig. 2.5.3

Models: A812-2 TC, A812-2 TC VU



A self-adhesive status indication label set with complete lettering is included in the supplied accessories. It can be used if the desired key assignment differs from the standard version.

After the existing status indication label has been peeled off, the unused lamp sockets can be fitted with the supplied LEDs. The new status label is then glued on and the tape recorder programmed as desired.

	~	~		-			
() 15 IPS	30 IPS	SAFE	STEREO	○ CCIR	TAPE A	SPOT ERASE	○ REMOTE
🔿 7.5 IPS) 3.75 IPS				🔘 ТАРЕ В	O REHEARSE) FADER

Fig. 2.5.5

2.5.1 Operator Controls

		Main Keypad
[1]		Power switch
[2]		Tape lift slide
[3]		Marking device (option)
[4]		Splicing rail
[5]		Scissors (option) Main keypad
[6]	<	Rewind key
[7]	>	Forward wind key
[8]	PLAY:	key
[9]	STOP:	This key has priority over all tape transport keys and cancels any active synchronizer LOOP. If STOP and LOC START 15 are pressed simultaneously, the stored locator addresses are displayed. Certain function keys (such as STEREO/MONO, CCIR/NAB, TAPE A/TAPE B, FRAMES/S SELECT, OFFSET ON/OFF) are only accessible if the STOP key is pressed simultaneously.
[10]	REC:	Record key, only active together with PLAY (provided the recording channel is not switched to SAFE mode). Depending on the programming, it is possible to switch either directly to record by pressing the REC key (RECORD B), or PLAY + REC must be pressed (RECORD A).
[12]	SHUTTLE wheel:	For positioning the tape with continuously variable tape speed. Center position = STOP, left-hand limit position = max. SHUTTLE rewind speed, right-hand limit position = max. SHUTTLE forward wind speed.
[13]	SHUTTLE BAR:	Bar above the SHUTTLE wheel [12]. When the SHUTTLE BAR is pressed the spooling speed selected with the SHUTTLE wheel will be stored.
		Secondary keypad
[15]		Display field for keys [34] to [42]
[16]	LED- tape timer	Real-time indication for all tape speeds in hours, minutes, seconds, and tenths of seconds, switchable to a second tape timer with user-selectable reference.
[17]	RESET TIMER:	Reset key for the tape timer [16].
[18]	LAP:	Switches the (main) tape timer to a second timer with user-selectable reference. An "L" is shown as long as the reading of the second timer is displayed.

[19]	TRANS (TRANSFER):	Preselection key for storing the current tape timer reading (functions also when the second timer has been activated with LAP). In order to store the timer reading in one of the 5 LOC memories, press one of the keys LOC1LOC5; the tape timer continues to count. If the timer reading is not to be transferred into a LOC memory, the tape timer can be reenabled by pressing TRANS a second time.			
[20]	LOC1:	Automatically searches the tape address stored with [19]. The LOCATE address is displayed as long as this key is pressed.			
[21]	LOC2:	Analogous to LOC1 [20].			
[22]	LOC ZERO:	Searches the tape address that corresponds to the timer reading 0.00.00.0 Relates to the corresponding zero position of the tape timer in normal mode or in LAP mode.			
[23]	LOC START:	Automatically searches the tape address at which the last PLAY command (or PLAY + REC, but only from STOP) has been entered. This is followed by a STOP (function LOC START STOP), PLAY (function LOC START PLAY, default programming) or RECORD (LOC START REC).			
[24]	ROLLBACK:	Rewinds the tape by the programmed amount between 1 and 59 seconds. Defauvalue: 15 seconds. There are three programming possibilities: Rollback-Plate (default), Rollback-Stop, Rollback-Rec.			
[25]	LIBRARY WIND:	Reduced spooling speed for producing library quality pancakes. Preselection key, initiates the reduced speed in conjunction with one of the spooling speeds [6] or [7]. This function can be cancelled by pressing LIBRARY WIND a second time. Speed programmable from 0.1 to 15 m/s in increments of 0.1 m/s; default value 5 m/s.			
[26]	TAPE DUMP:	Dump edit mode. Four programming possibilities: TAPE DUMP-A, tape timer enabled; TAPE DUMP-B, tape timer disabled; TAPE DUMP-C, dump edit preselection by pressing TAPE DUMP and initiated with PLAY, interrupted with STOP, tape timer enabled; TAPE DUMP-D, same as TAPE DUMP-C but tape timer disabled.			
		Function and programming key pad below the hinged cover			
[27]	LC display:	Alphanumeric display for indicating the software status, speed deviation in varispeed mode, error messages, programming of audio and tape deck parameters, etc.			
[28]	PROG. ENB	PROGRAMMING ENABLE): Switch for enabling the STORE key [33] (to protect certain functions and parameters, this key must be operated with a hexagon-socket-screw key size 2.5).			
		 Screw turned to the counterclockwise limit position: programming enabled. Screw turned to the clockwise limit position: programming disabled. Two different disabling possibilities can be programmed: Program disable A, all functions are protected against inadvertent modification. Program disable B, programming disabled but the first three tape deck parameters (LIBRARY WIND), max. wind, rollback time) can be modified and stored. 			

		[30]CURSOR/<Keys for paging in the menue and for moving[31]CURSOR/>the cursor on the LC display[32]^/LAST
[33]	STORE:	Key for storing a modified audio or tape deck parameter, for changing over a function that has not been assigned to a key, for reprogramming a key function (if pressed together with the corresponding key), or for acknowledging an error message.
[34]		 STEREO MONO (for versions A, B): stereo/mono se- lector (only in conjunction with STOP!).
		FRAMES/S SELECT (for version C): Selection of the time code type (24 / 25 / 29.97 / 30 frames/sec); only on conjunction with STOP!
[35]		 MASTER SAFE (for version A): Record inhibition for machines without SAFE/READY switch.
		 CCIR-NAB (for versions B, C): Selector switch for the equalization standard (only in conjunction with STOP!).
[36]	TYPE A-TAPE B:	Selector switch for two tape types (only in conjunction with STOP!).
[37]	VARISP. ON/OFF:	On/off switch for variable tape speed.
[38]	SET VARISP .:	Activates the VARISPEED input with the aid of the UP [39] and DOWN [42] keys.
[39]	UP,[42] DOWN:	 multifunction keys: In conjunction with the keys [29-32]: For paging through the menu and for the audio and tape deck parameters. In conjunction with the VARISPEED function: For selecting the desired tape speed: In conjunction with the functions SET ADDRESS and SET TIMER: For entering the locator addresses and setting the tape timer.
[40]	SPEED SELECT:	"Wraparound" key for selecting the speed. Each time this key is pressed the next higher or next lower speed is selected.
		Version A: 3.75/7.5/15 ips Version B: 3.75/7.5/15/30 ips Version C: 7.5/15/30 ips

V/NEXT

[29]

[41] FADER: Disables the local keypad, fader start is given priority. Four programming possibilities: FADER A: FADER START without enable key. After the FADER START the local keypad is disabled and the built-in monitor speaker (but not the headphones) is muted. When the fader is pulled back (= no voltage), the tape recorder switches to STOP but muting of the monitor speaker is only cancelled when the tape has come to a standstill. FADER B: FADER START with enable key (FADER START READY), the local keyboard is also active when FADER START is enabled. After the FADER START the local keypad is disabled; default programming. FADER C Same as FADER START B, except that the local keypad is inhibited when FADER START is enabled. FADER D: FADER START with enable key (FADER START READY), the local keypad is also active when FADER START is enabled. After the FADER START the built-in monitor speaker (but not the headphones) is muted. If after a FADER START a key of the local keypad is activated in PLAY mode, muting of the monitor speaker is cancelled. If FADER START is not enabled, actuation of the FADER

In the event that the tape tears during a FADER START, the tape deck must be reactivated with the FADER switch.

[42]

DOWN: Multifunction key, analogous to [39] UP.

Operator controls in the penthouse (if configured)

switch does not influence the operating state of the tape recorder.

[50]	REC:	Record pilot lamp; is light when the channel is switched to record mode.
[51]	READY:	Channel is enabled for recording.
[52]	SAFE:	Channel is disabled for recording.
[53]	INP:	The input signal is connected to the output.
[54]	SYNC:	The sync signal is connected to the output.
[55]	REP:	The reproduce signal is connected to the output.
[56]	CODE LEVEL	(only on code channel control): This time code pilot light is light when the time code is reproduced from tape or when the time code level at the input is large enough (depending on the setting of the input selector INP/SYNC/REP).
[57]	Output meter:	VU-meter or peak program meter (PPM), internally switchable.
[58]	RECORD LEVEL:	Level potentiometer for record mode.

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[59]	REPRO/SYNC LEVEL:	Level potentiometer for play mode or sync reproduction.
[60]	UNCAL:	Enables the level potentiometer. Switched off: Calibrated line level. Operator controls for the monitor speaker (in the console penthouse or the tape deck cover):
[61]	INPUT:	The input signal of the machine is heard via the monitor speaker.
[62]	TAPE:	The output signal of the machine is heard via the monitor speaker.
[63]	CH1.	Channel 1 is connected to the monitor speaker.
[64]	1+2/CUE:	The sum of both channels or the CUE channel (only for TC versions) is connected to the monitor speaker. This function is programmable with jumpers.
[65]	CH2:	Channel 2 is connected to the monitor speaker.
[66]	VOLUME:	Volume control for the monitor speaker.
[67]	PHONES:	Phones socket (on models with console penthouse this socket is located at the monitor speaker, on models without console penthouse it is located above the hinged cover of the amplifier bay.

2.5.2 Power Switch

CAUTION: Before you switch on the tape recorder for the first time, check that the setting of the line voltage selector agrees with the local mains voltage. The fuse rating must be checked whenever the setting of the line voltage selector is changed.

The power switch is located at the top edge of the tape deck cover. The tape recorder can be switched on after it has been connected to the mains.

When the tape recorder is switched on, the previously active operating state is automatically reestablished and displayed. Exceptions: the machine always switches to STOP (the STOP lamp flashes if the tape is missing or threaded loosely). On machines with a SAFE/READY switch the channels are switched to SAFE. When the machine is switched on the main functions are automatically tested by the microprocessor. Any errors are shown on the LC display.

2.5.3 Indications at Power on Time

After the machine has been switched on, some of the pilot lamps may light up briefly, including READY or REC. However, the record function is electronically inhibited during this phase.

The following LEDs subsequently light up and indicate the current operating state of the tape recorder:

- STOP: The stop function is active. If the LED flashes this means that both tape tension sensors are in their home position (no tape mounted or tape loosely inserted). slack.
- CCIR or NAB: Selected equalization standard
- STEREO or MONO (if configured).
- TAPE A or TAPE B: Selected tape type.
- Tape speed: for example 15 or 7.5 ips.
- Output selector: The selected output is indicated with INPUT

Depending on the configuration of the tape recorder the following may also be light:

Output meters

(DIN 45514, 45517)

- On the track selector: SAFE
- On the output selector: Selected output (INP, SYNC or REC)
- UNCAL (if the key is pressed)

On the LC display the software status of the tape recorder (creation date of the master software, calendar week/year) is briefly displayed, followed by a list of the options with which the machine is equipped, possible error messages in plain text or the message "no errors detected", and subsequently the current status of the machine (line level, for TC versions also the offset and the selected time code type).

2.5.4 Inserting the Tape

Adapter for 3-pronged (CINE) reels and for DIN hubs are engaged in the spindles; adapters for NAB reels or hubs are inserted into the spindles and fixed by pressing the red button in the middle of the adapter. The adapters are released by lightly pressing against the edge of the spindles.

Three-pronged reel with flange



Install the adapters for 3-pronged reels. Mount the full reel on the left-hand spindle, the empty reel on the right-hand spindle. Pull out the three-pronged guide and lock the adapter with a 60° turn.

NAB reel:





NAB adapter

Install the NAB adapter. Mount the NAB reel on the adapter or, if a self-supporting pancake is used, mount an NAB hub on the adapter and turn the top of the adapter clockwise until it engages.

Self-supporting pancake

(Hub according to DIN 45515)



Fig. 2.5.8 1 DIN adapter 3 center of pancake, unlocked

2 DIN platter 4 center of pancake, locked,

Install the DIN adapter, mount the spindle on the adapter and engage the driving pin of the reel flange in the holes of the spindle.

Mount the full pancake on the left-hand side. Lift the clip and twist it by 90° until it rests on the guide pins. Mount an empty reel flange and an empty hub on the right-hand side.

Threading the tape

Before you thread the tape raise the head shield in front of the soundheads.



Fig. 2.5.9

Thread the tape as illustrated. Wrap the leading end of the tape around the righthand reel and secure it by giving the reel a few counterclockwise turns. The STOP lamp flashes. When one of the spooling keys is pressed, the tape is slowly tensioned (even if it is inserted only loosely) and the STOP key changes to steady light. The A812 is now ready for operation.

Set the tape timer to zero by pressing the RESET TIMER key. Move the head shield over the soundheads, if necessary.

2.5.5 Tape Speeds

Up to four tape speeds are available; various models are programmed for the three most commonly used tape speeds (e.g. in time code versions the slowest speed is not programmed because operation with time code is not advisable at 3.75 ips). When you press the SPEED SELECT key (below the hinged cover) the tape speed is increased by one step or it is changed back from the highest to thelowest speed; the corresponding pilot LED lights up

2.5.6 Play

When the local PLAY key, a corresponding remote control key, or a fader start device is actuated, the tape recorder switches to play mode. The PLAY LED lights up.

Play mode can be cancelled by pressing the STOP key.

If the PLAY key is pressed while a recording is in progress, the machine switches to play without interruption.

If the PLAY key is pressed in spooling mode, the tape is immediately decelerated and the PLAY function preselected. As soon as the magnetic tape has come to a standstill or been decelerated to the nominal speed in the play direction, the machine switches to play mode, the PLAY lamp is continuously light.

From the PLAY function you can switch directly to spooling mode or an autolocator function.

2.5.7 Varispeed Control

The deviation relative to the nominal speed can be selected with the built-in varispeed control within the range of \pm 7.5 semitones.

With the keys SET VARISP and UP or DOWN you can preselect the tape speed without changing the current nominal speed. The speed is indicated on the LC display either in semitones, in percent of the nominal speed, or as the actual tape speed in inches per second (ips).

Pressing the VARISPEED key switches from the nominal speed to the changed speed - the VARISPEED pilot lamp above the tape timer flashes. When the function VARISPEED INDICATION ENHANCED is active, the two LEDs of the spooling keys < and > also flash.

If the functions SET VARISP and VARISPEED are simultaneously active, the speed change is performed directly (with the UP and DOWN keys). The result is directly audible during playback.

The delay correction for the drop-in and drop-out (see Section 2.5.9) is set for the nominal speed; when recordings in varispeed mode a corresponding offset will result.

2.5.8 Record

When the REC and the PLAY keys are pressed simultaneously, the machine switches to record mode and the PLAY and REC keys light up.

If PLAY and REC are pressed in spooling mode, the tape is decelerated, the record function preselected, and the REC and PLAY lamps flash. As soon as the tape has been decelerated to the nominal speed, the record mode is automatically initiated and the two lamps change to steady light.

From record mode it is possible to switch directly to fast wind, play or a locator function by pressing the corresponding key.

Models with MASTER SAFE key:	The MASTER SAFE function is used for record inhibition on machines without SAFE/READY key. However, this function can also be programmed on machines equipped with a SAFE/READY key in which case the MASTER SAFE function is a higher ranking record inhibition. As long as MASTER SAFE is active, the machine cannot be prepared for recording with the READY key.
Models with SAFE/READY keys:	 With the SAFE key you can inhibit recording on the corresponding channel. The yellow SAFE lamp lights up; when PLAY and REC are pressed the tape deck is started; the old recording on the audio track of the channel protected with SAFE is preserved and can be monitored (REP or SYNC). To prepare a channel for recording the corresponding READY key must be pressed. The green READY pilot lamp lights up. When the recording is started with PLAY and REC, the red REC pilot lamp lights up to signal that the record mode is active. While a recording is in progress you can inhibit the channels directly with SAFE. In order to reenable them for recording you must first press the READY keys. After the READY lamp lights up you must press either PLAY and REC or only REC, depending on the internal programming. On 2-channel machines the two channels are operated either in parallel or individually, depending on the programming (function CH CONTR PAR/INDIV).
Drop-in:	Click-free changeover from play or SYNC reproduction to record mode is possible. Depending on the jumper setting, this is achieved by either pressing REC together with PLAY (RECORD A) or only the REC key (RECORD B). Depending on the programming the record erase head and the soundhead are activated either simultaneously, or the record head is activated with a speed-dependent delay in such a way that the erase head and the record head are switched on at exactly the same tape location (function IN-OUT DEL. Y/N).
Drop-out:	Click-free changeover from record mode to play or SYNC reproduce mode is possible by pressing the PLAY key. Depending on the programming the erase head and the record head are either switched off simultaneously or the record head is deactivated with a speed-dependent delay in such a way that the erase head and the record head are switched off at exactly the same tape location (function IN-OUT DEL. Y/N). A drop-out with SAFE always deactivates both heads simultaneously. A drop-out with STOP first completes the drop-out before the tape is stopped.
Overlapping drop-in:	Mechanical (fade-IN/fade-OUT) If e.g. an applause is to be faded in with overlap at the end of a recording, the magnetic tape can be lifted off the record and the erase head by means of the tape lifter [4]. The machine is then restarted in record mode. When the tape lifter is slowly released, the tape first contacts the record head and the applause is added to the existing modulation (e.g. the end of a music selection). When the tape lifter is released completely, the tape also contacts the erase head. The existing modulation is erased and only the applause is recorded.

2.5.9 SYNC Reproduction

The SYNC key switches the corresponding channel to SYNC reproduction. In this
mode the tape induces an audio signal in the record head. This signal is amplified
and equalized in the reproduce amplifier. Since there is no time offset between the
record and the reproduce head in this mode, accurate drop-in is possible.
Sync reproduction is not intended to be used at 3.75 ips (quality generally not
adequate!). All sync audio parameters at this speed are normally set to 00.

However, it is feasible to calibrate the tape recorder also for 3.75 ips sync reproduction if quality degradation is acceptable. The reproduce bandwidth in sync mode is limited to approx. 12 kHz. For special mixdowns the bandwidth can be increased to 20 kHz with the aid of a jumper (see

Section 4.9.2). However, strong cross talk from the record channel to the sync channel must be expected at frequencies above 12 kHz.

SYNC preselection: SYNC reproduction can be preselected for a channel that has been readied for record mode. When the SYNC key is pressed during a recording, the corresponding channel is connected to the input (INP). This channel is automatically switched to SYNC reproduction when the drop-out occurs (PLAY, SAFE, STOP).

2.5.10 Spooling Mode

	The < key activates the fast wind in the forward direction, the > key in the rewind direction. The tape will be wound at the programmed spooling speed. Spooling is automatically cancelled by STOP, PLAY, REC+PLAY, SHUTTLE, TAPE DUMP, LOC functions, and by spooling in the opposite direction. It is admissible to switch from fast forward directly to rewind and vice versa, or directly from play or record to rewind. During spooling it is possible to switch directly to play or record. The LED of the preselected function flashes; the magnetic tape is decelerated, and the preselected function is activated when the tape has come to a stop or reached the nominal speed.
Tape lifting	In spooling mode the tape is automatically lifted off the soundheads in order to minimize wear on the tape and the audio heads. The tape lift pin can be engaged by actuating the programmable momentary action LIFTER key.
Important !!	
	DO NOT ACTUATE THE CONSOLE TILTING MECHANISM IN SPOOLING MODE - THE TAPE, THE REELS, THE ADAPTERS, AND THE TAPE DECK COVER CAN BE DAMAGED BY THE STRONG CENTRIFUGAL FORCE !!

2.5.11 Producing Pancakes at Reduced Spooling Speeds, (LIBRARY WIND)

The reduced spooling speed LIBRARY WIND is intended for pancakes that are to be saved in a library. The speed can be programmed between 0.1 and 15 m/s in increments of 0.1 m/s (default: 5 m/s). The library wind function is activated by pressing the LIBRARY WIND key and followed by the spooling key < or >. The library wind function is cancelled by pressing LIBRARY WIND a second time.

2.5.12 Stop

The STOP key has the highest priority and cancels all functions such as play, record, spooling, and autolocator. After this key is pressed the tape is decelerated and the stop lamp flashes until the tape has come to a standstill. The STOP lamp subsequently changes to continuous light.

The tape tension sensors are automatically disabled when the tape stands still so that the tape can be shuttled manually for editing.

Any new operating mode entered during the deceleration of the tape is stored and activated as soon as the nominal speed has been attained. If STOP is pressed concurrently with one of the LOC1...LOC5 keys, the corresponding locator address is displayed on the tape timer.

Various function keys can only be operated in conjunction with STOP (e.g. tape type selection (TAPE A/TAPE B), equalization standard (CCIR/NAB), mono/stereo changeover (STEREO/MONO), changeover of the time code standard (FRAME/S and OFFSET ON/OFF).

2.5.13 Autolocator

The autolocator supports the following operating modes:

- ZERO LOC: Zerolocator. When this key is pressed a fast forward or rewind is initiated until the tape address corresponding to the counter reading 0.00.00.0 is found, regardless of whether the zero position of the main timer or the auxiliary timer is to be searched.
- LOC START (programmable): When this key is pressed a fast forward or rewind is initiated until the tape address is reached at which the last play or record command was entered from STOP or spooling mode. Depending on the programming, either the stop (function LOC START STOP), play (function LOC START PLAY) or record (function LOC START REC) is subsequently activated.
- LOC1...LOC5 (prorammable): Transfer locator. Up to five tape addresses can be stored and automatically searched in spooling mode by pressing the corresponding key.

Programming:	 With the programmable TRANS key: Search the desired tape address and press the TRANS key when the tape is close to the desired address. The address can be stored as long as the TRANS LED is light. When the exact position has been found, press the LOC key. When the address has been stored the TRANS LED switches off. To program a new entry the TRANS key must be pressed again. With the programmable HOLD key: At the desired tape address press the HOLD key. The corresponding timer reading will be "frozen" on the display (however the tape timer continues to run). When one of the LOC keys is pressed, the content of the display is transferred to the corresponding memory and the current timer reading reappears on the display. 			
Reading out a LOC address:	During a LOC process: Press the corresponding LOC key a second time.			
auuress.	In STOP condition: Press the STOP key plus the corresponding LOC key.			
PLAY or REC preselection:	If PLAY or PLAY + REC is pressed during a locate function (ZERO LOC, LOC START, LOC15), the tape recorder automatically switches to play or record when the corresponding tape address is reached. The stored locator addresses are not lost when the tape recorder is switched off.			
Important !!	Because the locator addresses are not relative to the tape addresses, unwanted offsets will occur if the RESET TIMER key is inadvertently pressed.			

2.5.14 Tape Timer

The electronic tape timer always displays the real tape time in hours, minutes, seconds, and tenths of seconds, relative to the selected nominal tape speed. The timer has a display range -9 h 59

min 59.9 s to 23 h 59 min 59.9s. Numbers that are outside the display range are identified by a subscripted "u" (underflow) or a superscripted "o" (overflow) in the tens position of the hours, for example: o4.00.00.0 or u3.03.35.7 Fractional tenths of seconds are rounded. The timer can be set to 0.00.00.0 by pressing the RESET TIMER key.

When the end of the tape or a torn tape is detected, the timer stops automatically. In dump edit mode (TAPE DUMP) the timer either stops or continues to run, depending on which of the four TAPE DUMP modes has been programmed (default: TAPE DUMP A).

2.5.15 Auxiliary Timer LAP

The LAP key activates a second (auxiliary) tape timer with a user-selectable reference. An "L" appears in the first position of the display.

The auxiliary timer can be set to zero (RESET TIMER key) at any tape address and can for example be used for determining the exact playing time of a selection without having to compute the difference between the start and the end time.

When the LAP key is pressed a second time, the display switches back to the main timer, and the "L" in the first display position disappears.

2.5.16 Remote Controls

The following functions can be activated from the parallel remote control unit: play, record, fast wind, stop, RESET TIMER, ZERO LOC, LOC START, RECAP (rewind for as long as this key is pressed, and subsequent activation of play), or LIFTER (defeating the tape lift during fast wind), and FADER (FADER START ready).

With the serial rémote control it is possible to operate all functions that can be programmed on the local keypad, regardless of how the local keys are programmed. In addition the serial remote control features a tape timer display and a SHUTTLE wheel. The keys are programmed in the same manner as those on the local keypad.

- Operation with the programmable function REMOTE A: When the REMOTE key is pressed the corresponding pilot lamp lights up and the local keypad is disabled. When the REMOTE key is pressed a second time, the local keypad is reenabled and the pilot light switches off. In this condition the keys of the remote control are dead.
- Operation with the programmable function REMOTE B: When the REMOTE key is pressed, the corresponding pilot lamp lights up, the keys of the remote control unit and the keys of the local keypad are equivalent. When the REMOTE key is pressed a second time the remote control is deactivated and only the local keypad is active. The pilot light switches off.
- Operation without REMOTE A or REMOTE B function: The REMOTE LED is continuously light, the keys of the local keypad and the remote control units are equivalent.

With the fader start circuit the tape recorder can be remotely switched to play mode. The FADER START operation can be set up by a switch that interconnects contact 6 (signal SR-FADRY) and contact 1 (ground) of the parallel remote control socket (FADER START READY). A voltage of 5 to 24 V AC or DC can now be connected to the contacts 11 and 12. The tape recorder is switched to play mode. This setup is also possible with the programmable FADER key on the local keypad or the serial remote control, or with the FADER KEY of the parallel remote control (initiates the same function FADER A, B, C or D that is assigned to the local FADER key.

- Operation with the programmable function FADER A: FADER START without setup key. After the FADER START the local keypad and the remote control keys are inhibited, the built-in monitor speaker (but not the headphones) is muted. When the fader is pulled back (fader switch opens), the tape recorder is switched to STOP, however muting of the monitor speaker is not cancelled until the tape has come to a full stop.
- Operation with the programmable function FADER B: FADER START with enable key (FADER START READY), local and remote keypads are active, FADER START enabled. After the FADER START the local keypad is disabled; default programming.
- Operation with the programmable function FADER C: Same as FADER START B, except that both the local and the remote keypads are inhibited when FADER START is enabled.
- Operation with the programmable function FADER D: FADER START with enable key (FADER START READY), both the local and the remote keypads remain active even when FADER START is enabled After the FADER START the built-in monitor speaker (but not the headphones) is muted. If any key of the local or remote keypad is operated when the machine is in PLAY mode after FADER START, the muting of the monitor speaker is cancelled. If FADER START is not enabled, the actuation of the fader switch does not cause any change in the operating state of the tape recorder.

2.5.17 VU-Meter Panel

By means of a jumper the level indication can be changed over from PPM to VU characteristic.

UNCAL: When this key is pressed the corresponding level potentiometers are enabled; this status is signalled by a pilot light. When the UNCAL key is released, the corresponding potentiometer is disabled and the input or output level is set to line level.

Output selector:

- INP: connects the input signal to the output and to the output meter of the tape recorder.
- SYNC: connects the reproduce signal from the record head to the output and to the output meter of the tape recorder. This operating mode can be preselected for recording. (As long as the corresponding channel is enabled for recording, it is switched to INPUT because playback with the record head is not possible during a recording. As soon as the channel is switched to READY or SAFE, SYNC reproduction is automatically activated).
- REP: Connects the reproduce signal to the output and to the output meter of the tape recorder.

In record mode, convenient tape/source monitoring is possible with the INP and REP keys.

INP, SYNC, and REP are mutually self-cancelling. On 2-channel machines both channels are operated either in parallel or individually (function CH CONTR PAR/INDIV).

2.5.18 Monitor

On models without penthouse the monitor speaker is built into the tape deck cover; on machines with console penthouse it is built into the monitor panel. On models with penthouse the headphones socket is located on the monitor panel, on models without penthouse it is located on the left above the amplifier bay.

With the mutually self-cancelling switches INPUT and TAPE the signal can be switched between input and output (tapped before the corresponding level potentiometers).

Channel 1 (CH 1) or channel 2 (CH 2) can be monitored. In addition either the sum of both channels or the CUE channel (time code) can be monitored, depending on the position of the jumpers on the monitor amplifier, see Section 4.9.6. If the jumpers on the monitor amplifier are in the CUE position, the sum of both channels can still be monitored by simultaneously pressing the keys CH1 and CH2.

I he volume can be adjusted with the VOLUME control knob.

2.5.19 Mono-Stereo Switch (Option)

Stereo machines can be equipped or retrofitted with a mono/stereo switch. When the machine is switched on, the last operating state prior to switch-off is automatically reestablished and displayed.

To switch from stereo to mono and vice versa, the STOP and STEREO-MONO switch must be pressed simultaneously.

If the machine is not fitted with a mono-stereo module, the two pilot lamps STEREO and MONO remain dark.

2.5.20 Test Generator (Option)

The controls of the test generator are located on the front edge of the test generator module. To operate these controls the amplifier bay must be opened! When the upper key is pressed, the test generator is switched on (REF lamp is light, i.e. the reference frequency, normally 1 kHz, is selected). Subsequent pressing of this key changes the reference frequency as follows: - 60 Hz - 125 Hz - REF - 10 kHz - 16 kHz - OFF - (REF - 60 Hz - etc.).

With the lower key the generator level can be switched from nominal level to a level that is down by 10 dB. If "-10 dB" is selected, the gain in the reproduce path of the mono-stereo switch is automatically increased by 10 dB; this means that the VU-meter reading of measurements with tape is the same as with nominal level.

The lower key is only enabled if the test generator has previously been switched on with the upper key. After the test generator has been switched on and off with the upper key, nominal level is always available at the output of the test generator.

2.5.21 Time Code Channel (TC-Versions only)

Time code recording	Press the READY key on the time code channel control unit; the READY lamp lights up. Then start the machine in record mode by pressing REC + PLAY; the REC lamp is light. Or while a recording is in progress, press READY and, depending on the programming, REC + PLAY or only REC.
Time code reproduction	Press REP or SYNC and start the machine in PLAY mode. Depending on the setting of the output selector, the green CODE LEVEL lamp is light if a time code signal exists on the TC line input (INPUT position = or on the tape (REP or SYNC position).

2.5.22 Editing, Cutting the Tape

Searching a tape address with fast wind	If the tape position to be searched is approximately known (e.g. start or end of a selection), the tape can be spooled to an address near this point. Press the programmable LIFTER key so that the tape lift pin is pushed behind the soundheads and the modulation becomes audible. As soon as the desired tape location becomes audible, the tape can be fine-positioned with the < and > keys or by actuating the SHUTTLE wheel. Press the STOP key and manually move the tape to the edit position by carefully rotating the two reel flanges.
Searching a tape location with PLAY:	If individual segments with unknown addresses are to be eliminated from a production, they can be searched in normal PLAY mode. When a position has been found, press the STOP key and move the tape to the exact editing position by carefully turning the two reel flanges by hand.
Searching a tape position with the autolocator	The tape address 00.00.00.0 can be searched automatically at spooling speed. The start of a production is automatically stored and can be searched automatically with the LOC START key if the recording has not been interrupted. While a production is in progress, up to 5 tape positions can be stored directly, depending on the programming of the recorder, by pressing TRANS and LOC1 (5) at the desired position. When the corresponding LOC key is pressed, the desired tape address is automatically searched. The tape can subsequently be fine-positioned by hand.
Cutting with the built-in scissors (option):	Mark the cutting position (position of the reproduce head gap) with a grease marker or a soft pencil on the back of the tape. Move the marked position to the scissors by turning the two reel flanges. The tape is cut by pressing the key. When the TAPE DUMP key is pressed, the unwanted tape segment can be played into the waste basket (see dump edit mode).
Cutting at the reproduce head:	With magnetically neutral scissors the tape can be lifted lightly off the reproduce head and cut exactly in front of the head gap (center of head face) at an angle of 45°.

Marking the tape, cutting in the splicing block:	With the optional marker, a grease pen or a soft pencil, mark the center of the headface on the tape.
	Insert the marked position into the splicing block and cut it with a razor blade.
Splicing the tape	Insert the two tape ends with the marked side facing upward into the splicing block. Butt the ends together (without overlap!) and join them with an approx. 20 mm long, 1/4" wide adhesive tape.

2.5.23 Dump Edit Mode

In dump edit mode the right-hand spooling motor is disabled so that unwanted tape segments can be played into the "waste basket".

When the (programmable) TAPE DUMP key is pressed, the recorder switches to play but the right-hand take-up motor is switched off. Four modes are available:

- TAPE DUMP A (default programming for all four standard versions): Tape timer active, cancellation of this function with STOP or by pressing TAPE DUMP a second time.
- TAPE DUMP B: Tape timer disabled, cancellation of this function with STOP or by pressing TAPE DUMP a second time.
- TAPE DUMP C: Pressing TAPE DUMP preselects dump edit mode, activation by pressing PLAY, interruption with STOP. The tape timer remains active. Cancellation of this function only in STOP mode by pressing TAPE DUMP a second time.
- TAPE DUMP D: Same as TAPE DUMP C but the tape timer is disabled.

2.6 Soft Keys

Each control key of the A812 tape recorder (except the four blue and red keys and the UP and DOWN keys of the function and programming keypad below the hinged cover) can be assigned to any of the approx. 100 possible functions or operating modes. It is also possible to directly enter or change over certain modes (subsequently designated as KEYS/MODE) without requiring corresponding programming of the control keys.

In order to simplify the assignment of the keys, the LC display (alphanumeric liquid crystal display on the right front of the tape deck) as well as the opposite downward branching status tree diagram is used.

This diagram consists of

blocks

and

settings

After the tape recorder has been powered on, the first three (possibly four) blocks appear consecutively on the display for a few seconds:

A812M SOFTWARE VERS MASTER: WW/YY

Creation date of the MASTER MPU software, calendar week/year,

A812 OPTION

Indication of the SMPTE/EBU option if installed.

DEFAULT AUDIO PARAMETERS LOADED

If this message appears, the default audio parameters have been loaded after a RAM error. These parameters can deviate slightly from the machinedependent parameters. The tape recorder can be operated, but deviations from the optimum calibration data are inevitable. If the machine-dependent parameters have been written down or saved on tape, they can be reentered or reloaded.

ERR:xxxxxxxxx

Plain-text error message (if any) resulting from the automatic self-test (see Section 2.7), or the message "no errors detected", and

L RANGE 0/6 dBm OFS: NONE FPS:

Line level with which the tape recorder operates. The second line appears only if the machine is equipped with a time code headblock; OFS = offset between time code channel and audio channel in inches, FPS = number of full frames per second.

The start-up process stops here. The above four (or five) blocks can be recalled in normal operation by pressing the keys |^/LAST.

When the programming lock, switch [28], is closed (hexagon-socket screw key size 2.5; clockwise limit position) the STORE key is inhibited.

Two different program locks are possible:

- **Program lock A:** All functions are protected against inadvertent modification.

- **Program lock B:** All programming is inhibited except for the first three tape deck parameters.

The following tape deck parameters can be modified and stored: reduced and maximum spooling speed, and ROLLBACK time. Error messages can be still acknowledged with STORE when the programming lock is closed. It is not possible to reprogram any key functions when the lock is closed. Any attempt will be signalled on the LC display with the message "program mode not enabled".

To open the programming lock, switch [28]: starting from the clockwise limit position give the screw approx. 1 - 2 counterclockwise turns.

The keys v/NEXT, </CURSOR, >/CURSOR, and ^/LAST are used for navigating up and down within the tree diagram. In order to branch off, position the cursor under the desired menu. In the bottom half of the tree diagram you can page forward with the "up" key and backward with the "down" key.

2.6.1 Key Numbering

The keypad is designed as a matrix comprising 5 rows with up to 10 keys each.

Numbering:



Fig. 2.6.1

2.6.2 Available Functions (A812) Software Release 6/89

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			Key No.		
				in version:	
Nr.	Function	Туре	A	В	С
009	L RANGE O/ 6 dBm Y/N	к/м			
010	L RANGE 4/10 dBm Y/N	K/M			
011	L RANGE 8/14 dBm Y/N	K/M			
012	L RANGE 10/16 dBmY/N	K/M			
021	MASTER SAFE Y/N	K/M	3.5		
022	TAPE A	K/M			
023	ΤΑΡΕ Β	K/M			
024	TAPE A/B	K/M	3.6	3.6	3.6
031	MONO/STEREO	К/М	3.4	3.4	
032	CCIR/NAB	K/M		3.5	3.5
033	CCIR/NAB SAME/INDIV	K/M			
034	REP/SYN SAME/INDIV	K/M			
041	AUTO MUTE ON/OFF	K/M			
042	AUTO INP A Y/N	K/M			
043	AUTO INP B Y/N	K/M			
044	IN-OUT DEL. Y/N	K/M			
046	AUTO LOW PASS Y/N	K/M			
051	CH CONTR PAR/INDIV	K/M			
101	REHEARSE	к			
211	3.75 IPS Y/N	к/м			
212	7.5 IPS Y/N	K/M			
213	15 IPS Y/N	K/M			
214	30 IPS Y/N	K/M			
215	3.75/7.5 IPS	K/M			
216	7.5/15 IPS	K/M			
217	15/30 IPS	K/M			
218	3.75/7.5/15 IPS	К/М	2.3		
219	7.5/15/30 IPS	K/M			2.3
220	3.75/7.5/15/30 IPS	K/M		2.3	
230	FADER MASTER ENABLE	K/M			
231	FADER A Y/N	K/M			
232	FADER B Y/N	K/M	2.4	2.4	2.4
233	FADER C Y/N	к/м			
234	FADER D Y/N	K/M			
241	VARISPEED %	K/M			
242	VARISPEED HT	K/M			
243	VARISPEED IPS	K/M			
244	VARISPEED IPS/HT/%	K/M			
245	VARISPEED IND. ENH.	K/M			
246	SAVE KEY SETTING Y/N	K/M			
247	PROGRAM DISABLE A/B	K/M			
252	CAPSTAN MODE A/B	K/M			
255	REC INDIC MODE A/B	K/M			

			Key No. in version:		
Nr.	Function	Туре	A	В	С
301	REWIND (<)	К	0.7	0.7	0.7
302	FORWARD (>)	К	0.6	0.6	0.6
303	LIBRARY WIND	К	1.1	1.1	1.1
304	PLAY	K	0.5	0.5	0.5
306	STOP	K	0.4	0.4	0.4
307	RECORD A	K	0.3	0.3	0.3
308	RECORD B	К			
311	TRANSFER	K	1.7	1.7	1.7
312	HOLD	K			
313	LOC1	К	1.6	1.6	1.6
314	LOC2	K	1.5	1.5	1.5
315	LOC3	K			
316	LOC4	K			
317	LOC5	К			
318	LOC ZERO	К	1.4	1.4	1.4
319	LOC START PLAY	K	1.3	1.3	1.3
320	LOC START STOP	К			
321	LOC START REC	К			
322	ROLLBACK PLAY	К	1.2	1.2	1.2
323	ROLLBACK STOP	K			
324	ROLLBACK REC	K			
325	BACKSPACE STOP	K			
327	TAPE DUMP A	K	1.0	1.0	1.0
328	TAPE DUMP B	К			
329	TAPE DUMP C	K			
330	TAPE DUMP D	K			
332	LIFTER	K			
334	LAP/WATCH DISPLAY	К	4.0	4.0	4.0
335	RESET TIMER	K	4.1	4.1	4.1
336	SET TIMER	К			
337	SET ADDRESS	К			
338	SET VARISPEED	К	2.7	2.7	2.7
339	VARISPEED ON/OFF	K	3.3	3.3	3.3
345	REMOTE A R.CTL ONLY	К			
346	REMOTE B REM+LOCAL	К			
347	SHUTTLE BAR	K	0.0	0.0	0.0
351	NO FUNCTION	К			
401	24 FRAMES/SEC Y/N	K/M			
402	25 FRAMES/SEC Y/N	K/M			
403	29.97 FRAMES/SEC Y/N	K/M			
404	30 FRAMES/SEC Y/N	K/M			
406	25/29.97 FRAMES/SEC	K/M			
407	29.97/30 FRAMES/SEC	K/M			
408	24/25/29/30 F/SEC	K/M			3.4
409	OFFSET 1.2" Y/N	K/M			
410	TC MODE NORM/SPEC	K/M			

2.6.3 Description of the Functions

L RANGE L RANGE L RANGE	0/6 dBm Y/N 4/10 dBm Y/N 8/14 dBm Y/N 10/16 dBm Y/N	(Nr. 009) KEYS/MODE (Nr. 010) KEYS/MODE (Nr. 011) KEYS/MODE	
L RANGE	10/16 dBm Y/N	(Nr. 012) KEYS/MODE	

Definition of the line level with which the tape recorder operates.

The first of the two level specifications is used if the VU-meter is programmed for VU characteristic, the second is used for PPM characteristic.

If the line level used in the studio differs from the four existing parameters, select the value that comes closest to the studio level and adjust the internal record and reproduce levels in such a way that the tape recorder operates with the desired flux.

MASTER SAFE Y/N

(Nr. 021) KEYS/MODE

Record inhibition for machines without SAFE/READY switch or higher ranking SAFE key for machines with SAFE/READY switch. On/off key.

TAPE A Y/N	(Nr. 022) KEYS/MODE
TAPE B Y/N	(Nr. 023) KEYS/MODE
TAPE A/B	(Nr. 024) KEYS/MODE
TAPE A/B	(Nr. 024) KEYS/MODE

Tape type selector; either two individual keys with mutual self-cancellation (functions 022 and 023) or one changeover key.

When the machine is switched on, the last selected tape type will automatically be selected.

Operation: Press the STOP key; the tape type can be selected as long as the STOP key is pressed.

MONO/STEREO	(Nr. 031)
KEYS/MODE	

Mono/stereo changeover (option)

When a stereo machine is switched on, the last selected status will automatically be selected.

CCIR,	/NAB	((Nr
00117	IN/ LD	1	1.41

Nr. 032) KEYS/MODE

Equalization selector. When the machine is switched on, the last selected equalization standard will automatically be selected.

CCIR/NAB SAME/INDIV

(Nr. 033) KEYS/MODE

Changeover to identical audio parameters for both equalization standards. If identical audio parameters are desired for both equalization standards, first press to the desired parameter and press STORE; the parameter is automatically accepted for the second equalization standard.

Exception:

Record and reproduce time constants (EQU REC and EQU REP).

Accepting the reproduce audio parameters for sync mode. Same procedure as for function 033. The output selector must be in the REP position.

AUTO MUTE ON/OFF (Nr. 041) KEYS/MODE

Automatic muting in spooling mode (exception: when the tape LIFTER is engaged!) and during the acceleration phase (until the nominal speed is attained). On/off key. Default: OFF.

AUTO INP A	(Nr. 042) KEYS/MODE
AUTO INP B	(Nr. 043) KEYS/MODE

Selection of the AUTO INPUT function. All channels switched to SYNC (AUTO INP A) or only the channels switched to SYNC and READY (AUTO INP B) are switched to INPUT in the operating modes STOP, REWIND, FORWARD, LOC, AND ROLLBACK.

On/off key.

Default: AUTO INP B.

IN-OUT	DEL.	Y/N
--------	------	-----

(Nr. 044) KEYS/MODE

Delay correction. The record head is switched on/off with a delay during drop-in and drop-out. On/off key.

For the REHEARSE function IN-OUT DEL = ON (i.e. YES) is a prerequisite! Default: YES.

AUTO LOW PASS	(Nr. 046) KEYS/MODE

Automatic treble de-emphasis in spooling mode.

CH CONTR PAR/INVIV (Nr. 051) KEYS/MODE
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For stereo machines: Either both channels can be operated simultaneously with either channel control module or the channels are controlled individually. On/off key.

Default: INDIV:

REHEARSE	(Nr. 101) KEYS ONLY

Simulation of an electronic cut. Preselection key. The PLAY LED flashes in play mode when this function is active. When REC + PLAY are selected the machine switches at the right time from SYNC to INPUT, however, without activating record mode. The PLAY and REC LEDs flash. When PLAY is pressed the machines switches back to SYNC.

Precondition for REHEARSE: The corresponding channel must be switched to SYNC and READY, and the IN-OUT DEL function (044) must be ON. Cancellation of this function: by pressing REHEARSE a second time.

3.75 IPS	(Nr. 211) KEYS MODE
7.5 IPS	(Nr. 212) KEYS MODE
15 IPS	(Nr. 213) KEYS MODE
30 IPS	(Nr. 214) KEYS MODE
3.75/7.5 IPS	(Nr. 215) KEYS MODE
7.5/15 IPS	(Nr. 216) KEYS MODE
15/30 IPS	(Nr. 217) KEYS MODE
3.75/7.5/15 IPS	(Nr. 218) KEYS MODE
7.5/15/30 IPS	(Nr. 219) KEYS MODE
3.75/7.5/15/30 IPS	(Nr. 220) KEYS MODE

Speed selection keys. It is possible to program either one key for each speed (functions 211...214), or combination keys (changeover with each key depression, functions 215...217) or "wraparound keys" (the next speed is selected whenever this key is pressed, functions 218...220).

FADER	MASTER ENABLE	(Nr. 230) KEYS/MODE

Higher ranking enabling of all FADER functions (No. 231 to 234).

FADER A	Y/N	(Nr. 231) KEYS/MODE
FADER B	Y/N	(Nr. 232) KEYS/MODE
FADER C	Y/N	(Nr. 233) KEYS/MODE
FADER D	Y/N	(Nr. 234) KEYS/MODE

With the fader start circuit it is possible to switch the tape recorder to play by means of the fader start circuit. The FADER START mode can be prepared by a switch that interconnects contact 6 (signal SR-FADRY) with contact 1 (ground) of the parallel remote socket (FADER START READY). A voltage from 5 V to 24 V AC or DC can now be applied to contacts 11 and 12 in order to switch the machine to play mode. This setup can also be prepared with the programmable FADER key on the local keypad or the serial remote control, or with the FADER key on the parallel remote control.

There are four programming possibilities:

- **FADER A:** Without the preparation key (FADER START READY). The local keypad is disabled, except for the speed keys. The FADER switch must be reactuated after the tape has unthreaded.
- **FADER B:** FADER START with enable key. The enable function for FADER B, C, and D must be program assigned to a key (FADER START READY). The local keypad is also active when FADER START is enabled. The local keypad is disabled after the FADER START has been initiated; this is the default programming.

- **FADER C:** Same as FADER START B, except that the local keypad is disabled when FADER START is enabled. FADER START READY.
- FADER D: FADER START with enable key. The enable function for FADER B, C, and D must be program assigned to a key (FADER START READY); the local keypad is also active when FADER START is enabled.
 After the FADER START has been initiated, the built-in monitor speaker (but not the headphones) is muted. If a key of the local keypad is actuated in PLAY mode after the FADER START, the muting of the monitor speaker is cancelled. If FADER START is not enabled, actuation of the FADER switch does not change the operating state of the tape recorder.
 While a recording is in progress neither the FADER START nor the FADER switch

While a recording is in progress neither the FADER START nor the FADER switch have any influence on the tape deck.

Keys for defining the VARISPEED display format. The deviation from the nominal speed is indicated in percent, in semitones, or in ips. For each desired format a separate key (functions 241...243) or a "wraparound key" (the next function is selected with each key depression, function 244) can be programmed.

VARISPEED IND. ENH. Y/N

(Nr. 245) KEYS/MODE

If selected, this on/off function causes the spooling keys < and > to flash in VARISPEED mode in addition to the VARISPEED LED.

SAVE KEY SETTING Y/N

(Nr. 246) KEYS/MODE

When the machine is converted (e.g. from mono to 2-channel) the machine type must be changed over in the TYPE SETTING position of the ALIGNMENT DECK block. In this case the keypad programming is automatically adapted when function No. 246 is switched off (=NO). If the custom programming of the keypad is to be protected, this function is to be switched to YES.

Programm DISABLE A/B

(Nr. 247) KEYS/MODE

With this function the program lock [28] can be programmed in two different ways:

- Program lock A: all functions are protected against inadvertent modification.
- Program lock B: reprogramming is disabled but the first three tape deck parameters (lib. wind, max. wind, rollback, time) can still be modified.

SHUTTLE A/B

(Nr. 251) KEYS/MODE

Selection key. When SHUTTLE A is selected, the tape contacts the head when it is moved with the SHUTTLE wheel so that the modulation becomes audible. If SHUTTLE B is selected the tape does not make contact with the soundhead. Default: SHUTTLE A.

CAPSTAN MODE A/B

(Nr. 252) KEYS/MODE

Selection key. If CAPSTAN MODE A is selected the capstan motor rotates only if the pinch rollers are engaged (prolongs the bearing life). If CAPSTAN MODE B is selected the capstan motor rotates continuously except when no tape is threaded or the tape is not tensioned (shortens the acceleration time).

Default: CAPSTAN MODE A.

REC INDIC MODE A/B

(Nr. 255) KEYS/MODE

Changeover of the REC indication mode.

- REC INDIC MODE A; the red LED of the tape deck is dark when REC + PLAY are pressed (all rec preselection keys on save). Default setting.
- REC INDIC MODE B; the REC LED of the tape transport is light when REC+PLAY are pressed, even though REC preselection is on save. Mode B is required in conjunction with the Studer TLS 4000 synchronizer.

REWIND (<)

(Nr. 301) KEYS ONLY

Rewind with maximum (programmed) spooling speed.

This function can be selected from: FORWARD, STOP, PLAY/REC, SHUTTLE stored, any LOC function, CUE.

Cancellation: by pressing FORWARD, STOP, PLAY, SHUTTLE, SHUTTLE BAR, any LOC function; in synchronizer mode by pressing LOCK.

The spooling speed can be defined in the ALIGNMENT DECK block; default: 15 m/s.
ORWARD	(>)
--------	-----

(Nr. 302) KEYS ONLY

Fast forward with maximum (programmed) spooling speed. Activation/cancellation conditions: same as REWIND.

	LIBRARY WIND	(Nr. 303) KEYS	
ONLY			

In conjunction with FORWARD or REWIND, the preselection of this function causes the tape to be wound with defined, reduced, speed (programmable from 0.1 to 15 m/s in increments of 0.1 m/s).

Cancellation: press LIBRARY WIND key a second time.

The reduced spooling speed can be defined in the ALIGNMENT DECK block; default: 5 m/s.

```
PLAY
```

(Nr. 304) KEYS ONLY

Playback with the selected tape speed.

Cancellation: by pressing REC/PLAY, FORWARD, REWIND, STOP, any LOC function. If the shuttle wheel is actuated in play mode, the selected spooling speed and direction are accepted immediately, however the PLAY function is saved (play LED flashes) and playback resumes as soon as the shuttle wheel is released.

STOP

(Nr. 306) KEYS ONLY

All tape deck commands are cancelled by this function.

RECORD A

(Nr. 307) KEYS ONLY

Record mode, only possible in conjunction with PLAY.

Activation: simultaneously press REC and PLAY.

Cancellation: by forward, rewind, stop, all locate functions, tape dump, rollback, backspace, speed change; dropout is also possible by pressing PLAY (machine changes to play mode without interruption).

The RECORD LED is disabled when:

- MASTER SAFE is switched on,
- No RF driver is installed,

If on machines with VU-meters none of the channels is switched to READY.
 Default programming.

RECORD B

(Nr. 308) KEYS ONLY

Record mode, only possible in conjunction with PLAY; analogous to RECORD A. Difference: If the recorder operates in play

mode, record mode can be activated by pressing only the REC key.

Saves the current tape timer address in a buffer. When one of the keys LOC1...LOC5 is pressed, the buffered address is transferred to the corresponding LOC memory.

Activation of this function: possible at any time.

Cancellation: by pressing TRANSFER a second time.

HOLD

```
(Nr. 312) KEYS ONLY
```

"Freezes" the current tape timer reading in any operating state (also functions when the tape timer is switched to LAP mode). The frozen timer reading can be transferred to one of the LOC memories:

- Either by pressing one of the keys LOC1...LOC5. The tape timer continues to run. When the corresponding LOC key is pressed again, the tape will be positioned at the stored address.
- By pressing TRANS and one of the keys LOC1...LOC5. The tape timer display remains "frozen". The timer is reenabled by pressing the same LOC key a second time, and the search is started by pressing the LOC key a third time.

1		
	LOC1	(Nr. 313) KEYS ONLY
	LOC2	(Nr. 314) KEYS ONLY
	LOC3	(Nr. 315) KEYS ONLY
	LOC4	(Nr. 316) KEYS ONLY
	LOC5	(Nr. 317) KEYS ONLY
I		

Automatic searching of the stored address in spooling mode; preselection of PLAY or PLAY + REC is possible (the keys of the preselected function flash while the LOC process is still active). ROLLBACK can be preselected during the LOC process. The tape is locked at the selected address minus the preroll time. During the locking operation the programmed rollback time is added each time the ROLLBACK key is pressed.

Indication of the target address: in STOP mode by simultaneously pressing STOP and the corresponding LOC key; while the LOC process is running: by continuously holding down the corresponding LOC key.

If the LIBR WIND function is active, the locking point is searched with reduced spooling speed.

All LOC addresses remain stored when the tape recorder is switched off! Activation: from PLAY/REC, REWIND, FORWARD, LOC, SHUTTLE mode. Cancellation: by pressing STOP, LOC, REWIND, FORWARD, SHUTTLE, SHUTTLE BAR, TAPE DUMP.

3) KEYS ONLY

Automatic search of the address 0.00.00.0 in spooling mode; preselection of PLAY, PLAY + REC or ROLLBACK is possible. Activation/cancellation: see LOC1...LOC5.

LOC START-PLAY	(Nr. 319) KEYS ONLY
LOC START-STOP	(Nr. 320) KEYS ONLY
LOC START-REC	(Nr. 321) KEYS ONLY

Analogous to LOC1...LOC5. The LOC START address is stored automatically whenever a PLAY or PLAY + REC command is entered.

Depending on the programming, PLAY, STOP or RECORD is automatically initiated when the target address is reached.

Activation/cancellation: see LOC1...LOC5.

ROLLBACK-PLAY	(Nr. 322) KEYS ONLY
ROLLBACK-STOP	(Nr. 323) KEYS ONLY
ROLLBACK-REC	(Nr. 324) KEYS ONLY

The tape recorder spools automatically backward by a preselectable amount. ROLLBACK always relates to the current tape timer reading.

When the target address is reached, the PLAY, STOP or RECORD command is automatically initiated.

Activation: from STOP, PLAY, RECORD mode.

Cancellation: by pressing STOP, REWIND, FORWARD, PLAY, PLAY + REC, SHUTTLE, SHUTTLE BAR, any LOC function.

Multiple actuation of the rollback key increments the preroll time by the programmed amount.

Example: Rollback time 15 sec. Press rollback time 4 times Preroll time = 4 x 15 sec. = 1 minute.

Cancellation: By pressing STOP, REWIND, FORWARD, PLAY, PLAY+REC, SHUTTLE SHUTTLE BAR, any LOC function.

The ROLLBACK TIME can be defined in the ALIGNMENT DECK block.

BACKSPACE-STOP

(Nr. 325) KEYS ONLY

This function initiates rewinding at four times the play speed for as long as this key is pressed. During this process the tape contacts the reproduce head. When this key is released the tape is automatically decelerated and STOP is activated.

TAPE DUMP A	(Nr. 327) KEYS ONLY
TAPE DUMP B	(Nr. 328) KEYS ONLY

Dump edit mode. The take-up motor is disabled. The tape timer is active and the required information is supplied by the capstan motor tacho (TAPE DUMP A), or the timer is disabled (TAPE DUMP B).

Activation: only possible in STOP or EDIT mode.

If tape dump is pressed while another tape transport function is active, the machine switches to STOP mode.

Cancellation: by pressing TAPE DUMP a second time or any tape transport function.

TAPE DUMP D (Nr. 330) KEYS ONLY		ONLY ONLY
---------------------------------	--	--------------

Dump edit mode with preparation, take-up motor disabled. The tape timer is active and the required information is supplied by the capstan motor tacho (TAPE DUMP C), or the timer is disabled (TAPE DUMP D).

Activation: only possible in STOP or EDIT mode. Preparation by means of TAPE DUMP, start of the dump edit mode with PLAY, interruption with STOP. Cancellation: by pressing TAPE DUMP a second time (only possible on STOP condition).

The spooling functions < and > can also be initiated after the tape dump key has been pressed.

LIFTER

(Nr. 332) KEYS ONLY

In spooling mode, this function causes the tape lift pin to be retracted so that the tape contacts the reproduce head and the modulation becomes audible. Momentary-action key. If AUTO MUTE is selected, muting will be defeated for as long as the tape makes contact with the head.

Activation: in REWIND, FORWARD, LOC AND ROLLBACK mode. Cancellation: by releasing the LIFTER key.

LAP/WATCH DISPLAY

(Nr. 334) KEYS ONLY

Changeover of the tape timer display to a second timer which, like the main tape timer, is supplied with pulses from the tacho roller. When LAP/WATCH is active, an "L" is shown in the first position of the tape timer display.

This timer can be set to zero by pressing the RESET TIMER key. In LAP/WATCH mode, LOC ZERO relates to the zero position of the LAP/WATCH timer. LOC addresses can also be entered directly in LAP mode, however, the LOC addresses of the tape timer will be overwritten.

Cancellation: by pressing LAP/WATCH a second time.

Setting the locator addresses:

RESET TIMER	(Nr. 335) KEYS ONLY
Only the timer reading shown	indication or the LAP/WATCH timer ind on the display is set to zero. If this sponding timer remains at zero until the
SET TIMER	(Nr. 336) KEYS ONLY
second timer, see LAP/WATCH display position can be selected v value increased or decreased a modified reading can be transfer key.	urrent tape timer content (or the content function 334) is transferred into a buffe with the CURSOR keys (h, min. s, 1/10s) a s desired with the UP and DOWN key red into the tape timer by pressing the s MER a second time or by pressing SET
SET ADDRESS	(Nr. 337) KEYS ONLY
the second timer, see LAP/WA buffer. The display position cal 1/10s) and the value increas DOWN keys. The entered add pressing the TRANSFER key operation is completed, the co It is also possible to transfer a pressing SET ADDRESS follow	momentary tape timer reading (or the rea TCH DISPLAY, function 334) is transferred in be accessed with the CURSOR keys (h, sed or decreased as desired with the L dress can be transferred into a LOC regis and one of the LOC keys. key. When the ntent of the tape timer is again displayed. a locator address into the tape timer disp wed by STOP and one of the LOC keys. above and stored again with TRANS and
the LOC keys.	
the LOC keys. Cancellation (only if the store or	peration has not been completed): by pr by selecting a LOC or ROLLBACK functio

varispeed input. Switches the LC display to VARISPEED indication. The deviation from the nominal speed is displayed in the programmed format, the displayed value can be modified with the UP and DOWN keys. The format is defined with the VARISPEED DISPLAY FORMAT functions 241...244.

SET VARISPEED is not feasible during audio calibration (because the UP and DOWN keys are used for the calibration).

Cancellation: by pressing the SET VARISPEED key a second time or with SET TIMER.

STUDER A812

VARISPEED ON/OFF	(Nr. 339) KEYS ONLY
Activates the variable tape speed. The	e selected value is shown on the LC display

As soon as varispeed is active, the VARISPEED pilot lamp flashes. If SET VARISPEED is also selected, the tape speed can be varied with UP or DOWN also in play mode.

VARISPEED ON/OFF is not possible during the calibration process. Cancellation: by pressing the VARISPEED key a second time.

REMOTE A REM CTL ONLY (Nr. 345) KEYS ONLY

Activates the parallel and/or serial remote control; the local keypad is disabled. Activation: only in STOP mode.

REMOTE B REM + LOCAL (Nr. 346) KEYS ONLY

Activates the parallel and/or serial remote control; the local keypad remains enabled.

Activation: only in STOP mode. Default programming.

SHUTTLE BAR

(Nr. 347) KEYS ONLY

Key for storing a SHUTTLE spooling speed selected with the SHUTTLE wheel. Activation: during the actuation of the SHUTTLE wheel.

Cancellation: by all tape transport functions, LOC and ROLLBACK functions, backspace, and tape dump.

NO FUNCTION

(Nr. 351) KEYS ONLY

"Function" for programming a dummy key without function.

24 FRAMES/SEC 25 FRAMES/SEC 29.97 FRAMES/SEC 30 FRAMES/SEC 25/29.97FRAMES/SEC 29.97/30 FRAMES/SEC	(Nr. 401) KEYS/MCDE (Nr. 402) KEYS/MODE (Nr. 403) KEYS/MODE (Nr. 404) KEYS/MODE (Nr. 405) KEYS/MODE (Nr. 406) KEYS/MODE	
29.97/30 FRAMES/SEC 24/25/29.97/30 F/SEC	(Nr. 406) KEYS/MODE (Nr. 407) KEYS/MODE	

Changeover of the time code standard (only for TC versions). It is possible to program either one key for each utilized standard (functions 401...404), or a combination key (changeover with each key depression, functions 406, 407), or a "wraparound" key (advances one step each time the key is pressed, function 408).

OFFSET 1.2" Y/N

(Nr. 409) KEYS/MODE

On/off key for adapting the internal time code offset to a different standard (only for TC versions).

Normal condition: no offset, i.e. OFFSET 1.2" = N.

TC MODE NORM/SPEC

(Nr. 410) KEYS/MODE

Changeover of the TIME CODE MODE

- NORM: At 3.75 ips no TC recording is possible, the output selector is set to INPUT and REC preselection is switched to SAVE. Input and save remain fixed in this position. If the speed is changed (e.g. to 7.5 ips), the output selector changes from input back to repro, REC preselection remains in save but is no longer inhibited.
- SPEC: Time code recording is also possible at 3.75 ips. The output selector and REC preselection are not changed.



345 RENOTE A R. CTL ONLY 346 RENOTE B REM-LICOL 347 SNUTTLE BAR 351 NO FUNCTION

SET VARISPEED VARISPEED ON/OFF

52

336 SET TIMER 337 SET ADDRESS 338 SET VARISPEED

2.6.4 Programming Examples

Example 1:

Setting the audio parameters: reproduce level, tape speed 7.5 ips, CCIR equalization, tape type A, channel 2:

	Step	Information on LC display
	Turn the programming lock [28] counterclockwise by 1 to 2 turns (hexagon-socket screw key No. 2.5)	
	Switch machine to STOP	L RANGE/ dBm
1	√/NEXT	USER SET UP ALIGNMENT MODE
2	√/NEXT	ALIGNMENT AUDIO DECK AUX
5	√/NEXT	LINE OUT CALIBRATION AUDIO CHANNELS INPUT
	v/NEXT	LVL REP 15.0 CCIR A CH1 72 CH2 72
	Press the speed selection key 7.5 ips	LVL REP 7.50 CCIR A CH1 <u>66</u> CH2 66
	>/CURSOR (changeover to CH 2)	LVL REP 7.50 CCIR A CH1 66 CH2 <u>66</u>
	Set the desired level with the UP/DOWN key (indication in HEX)	LVL REP 7.50 CCIR A CH1 66 CH2 <u>F9</u>
	Save the setting with STORE; press LAST 4 times proceed to the next setting with NEXT.	L RANGE/ dBm or: TRB REP 7.50 CCIR A CH1 39 CH2 <u>39</u>

Example 2:

Activating the functions AUTO MUTE (function No. 041) without assigning this function to a key:

	Step	Information on the LC display
	Turn the programming lock [28] counterclockwise by 1 to 2 turns (hexagon-socket screw key No. 2.5)	
	Switch the machine to STOP	L RANGE/ dBm
1	√/NEXT	USER SET UP ALI <u>GN</u> MENT MODE
3	∨/CURSOR	USER SET UP ALIGNMENT <u>MO</u> DE
4	√/NEXT	KEY / MODE SETTING AU <u>DI</u> O DECK TC
8	√/NEXT	AUDIO KEY <u>S/M</u> ODE KEYS ONLY
(14)	v/NEXT	F009 1/0 NO KEY L RANGE 0/6dBm Y/N
	Page to the function with the UP key	041 0/1 NO KEY AUTO MUTE ON/OFF
	Changeover with STORE	F041 1/0 NO KEY AUTO MUTE ON/OFF
	Press LAST 4 times	L RANGE/ dBm

Example 3:

Reprogramming the FADER START key (key 2.4, function No. 232) to the function AUTO MUTE ON/OFF (function No. 041):

	Step	Information on LC display
	Turn the programming lock [28] counterclockwise by 1 to 2 turns (hexagon-socket screw key No. 2.5)	
	Switch machine to STOP	L RANGE/ dBm
1	v/NEXT	USER SET UP ALI <u>GN</u> MENT MODE
3	>/CURSOR	USER SET UP ALIGNMENT M <u>OD</u> E
4	v/NEXT	KEY / MODE SETTING AU <u>DI</u> O DECK TC
8	v/NEXT	AUDIO KEY <u>S/M</u> ODE KEYS ONLY
(14)	∨/NEXT	F009 1/0 NO KEY L RANGE 0/6 dBm Y/N
	Page to the function with the UP key	F041 0/1 NO KEY AUTO MUTE ON/OFF
	Press STORE	F041 PRESS 2nd KEY AUTO MUTE ON/OFF
	While holding STORE down also press FADER START	F41 key assigned AUTO MUTE ON/OFF drücken
	Change the key label	
	Press ^ 4 times	L RANGE/ dBm

Example 4:

Reprogramming the RESET TIMER key (key 4.1, function No. 335) to the function SET ADDRESS (function No. 337):

	Step	Information on LC display
	Turn the programming lock [28] counterclockwise by 1 to 2 turns (hexagon-socket screw key No. 2.5)	
	Switch the machine to STOP	L RANGE/ dBm
1	v/NEXT	USER SET UP ALI <u>GN</u> MENT MODE
3	>/CURSOR	USER SET UP ALIGNMENT M <u>OD</u> E
4	√/NEXT	KEY / MODE SETTING AU <u>DI</u> O DECK TC
9	>/CURSOR	KEY / MODE SETTING AUDIO D <u>EC</u> K TC
10	v/NEXT	TAPE DECK KEYS/MODE KEYS ONLY
(18)	>/CURSOR	TAPE DECK KEYS/MODE KEYS ONLY
(19)	√/NEXT	F301L07, R27 REWIND
	Page to the function with the UP key	F337 NO KEY SET ADDRESS
	Press STORE	F337 PRESS 2nd KEY SET ADDRESS
	While holding STORE down, also press RESET TIMER	F337 key assigned SET ADDRESS
	Change the key label	
	Press ^ 4 times	L RANGE/ dBm

* L07, R27 means: this function is assigned to key No. 0.7 of the local keyboard (local, "L"), and to the key No. 2.7 of the serial remote control (remote, "R").

2.7 Degraded Operation

This Section describes the capabilities of the A812 tape recorder in the event of a fault within an individual module.

"Degraded operation" is not possible if:

- one or more supply voltages are missing
- or:
- the spooling motor and capstan motor control is defective.
- Important !! If any error messages are displayed, the machine should always be switched off for approximately 10 seconds and then powered on again. If the same error messages reoccurs, one of the remedies described in 2.7.1 will have to be taken. If any faults occur, the tape recorder should be operated only if absolutely necessary and be repaired or forwarded to the nearest service center as soon as possible.

2.7.1 Error Messages of the LC Display

There are three error categories:

- Errors of the category 1 are faults that make it impossible to operate the equipment (e.g. hardware malfunctions). Such an error message can only be reset by switching the machine off and switching it on again after approx. 10 seconds. If the error reappears, it must be remedied, else the tape recorder can be operated as usual.
- Errors of the category 2 adversely affect the operation of the machine, however degraded operation is still possible. Error messages of this category remain on the display for information purposes even if the cause of the malfunction has disappeared. The error message can be cancelled by pressing the STORE key. If the malfunction persists, the message will reappear and can be cancelled again (if necessary), as described above. The machine can still be operated.
- Errors of the category 3 also influence the function of the machine, but degraded operation is possible. The error message is automatically cancelled when the cause of the error disappears. If the LC display is needed for other purposes (e.g. varispeed indication), the error message can be cancelled by pressing STORE even though the error may possibly persist.

Error messages of the category 1:

	ERR.	SUPPLY VOLTAGE
--	------	-------------------

- Recorder: swith Cause: One
 - switches to STOP, does not respond to keys

One (or several) supply voltages are missing.

Remedy:

Switch off the tape recorder

- Check the secondary fuses and replace them, if necessary.
- Repair or replace the SWITCHING STABILIZER PCB.

EDD	P75. A 7577 A	
ERR.	DATA	
	LOST	

- CAUSE: Audio and reference data lost.
- **REMEDY:** Switch the recorder off and on again. The standard parameters are now loaded and the error message disappears.
 - Check the buffer battery on the MASTER MPU, replace it, if necessary (see 2.7.3).
 - Continue to operate with the standard data (minor deviations from the optimum frequency response are unavoidable), or
 - Load the parameters stored on tape or diskette via the RS 232 interface, or
 - Load the parameters noted in the log book, or
 - Recalibrate the machine.

ERR. EPROM 1

ERR. EPROM 2

ERR. EPROM 3

CAUSE:
Fault in one of the three EPROMs on the MASTER MPU.

- **REMEDY:** Switch the tape recorder off and on. If this message does not reappear, continue to work with the machine.
 - Replace the software

ERR.	MOVE-SENSOR HARDWARE	

MACHINE: Switches to STOP.

CAUSE: MOVE SENSOR PCB defective or too frequent direction changes detected.

REMEDY: Exchange, repair, or realign.

Error messages of the category 2:

5 ,		
	ERR. POWER DROP OUT	
MACHINE:	 Switches to STOP. 	
CAUSE:	Transient line voltage failure 100 ms	
REMEDY:	 Acknowledge with STORE. 	
	ERR. AUDIO CHANNEL 1	
	ERR. AUDIO CHANNEL 2	
CAUSE:	Error in one of the audio channels, HF driver defective, erase current too high because wrong erase head installed. Playback with the affected channel is still possible !!	
REMEDY:	Exchange the audio modules (machine disconnected from AC power source!).Check the erase head.	
Error messages of the category 3:		
	ERR. MOTOR SUPPLY VOLTAGE LOW	
CAUSE:	 Spooling motor supply voltage failure 	
REMEDY:	 Wait 10 seconds. If the error persists: Switch the tape recorder off. Check both primary fuses and replace them, if necessary. Repair or replace the SPOOLING MOTOR SUPPLY or SPOOLING MOTOR DRIVE AMPLIFIER. 	

	ERR. NO COMMUNICAT. MASTER-TAPE DECK	
CAUSE:	 No feedback to status request. Software of the MASTER MPU and TAPE DECK MPU not compatible. 	
REMEDY:	 Replace the MASTER SERIAL INTERFACE and/or the TAPE DECK SERIAL INTERFACE. Replace the software. 	
	ERR: TACHO SENSOR	
MACHINE:	 Switches to STOP 	
CAUSE:	 No output signal from the move sensors, the direction of rotation does not agree. 	
REMEDY:	 Check the flat cable connectors to the sensor. Check the sensor and replace it, if necessary Check that the spindles and the tacho roller rotate without binding. 	
	ERR: NO COMMUNICAT CAPSTAN-TAPE DECK	
MACHINE:	 Switches to STOP. 	
CAUSE:	 No data exchange via the parallel port of the CAPSTAN INTERFACE. Capstan processor does not start. 	
REMEDY:	Replace the CAPSTAN INTERFACE or the CAPSTAN CONTROL UNIT.	
	ERR: SHUTTLE VALUE INVALID	
CAUSE:	 Incorrect values have been supplied by the SHUTTLE potentiometers during the initialization phase. 	
REMEDY:	 The SHUTTLE wheel should not be actuated during the initialization phase of the machine. Readjust the SHUTTLE potentiometer. 	

	ERR: NOT IDENTIFIED
CAUSE:	 Unknown fault.
REMEDY:	 Switch the recorder off and on again. The machine can be used normally if the error message does not reappear. Unplug and reinsert the RAM of the MASTER MPU.
Important !!	 The audio data and the tape tension data are lost and the default parameters are loaded in their place! Either continue to operate with the default data (minor deviations from the optimum frequency response are unavoidable), or Load the parameters stored on tape or diskette via the RS 232 interface, or Load the parameters specified in the log book, or Recalibrate the machine.

THE FOREGOING LIST IS NOT COMPLETE AND CAN BE CHANGED OR EXPANDED AS REQUIRED.

2.7.2 Additional Messages on the LC Display

After the tape recorder has been converted (e.g. from full-track mono to 2-track), the machine type must be changed in the parameter block TYPE SETTING". The key programming will automatically be adapted. The display shows:

WA	DEFAULT KEYS LOADED

If the keyboard programming should be retained, activate the function No. 246 "SAVE KEY SETTING".

After a loss of data (message: "ERR: DATA LOST", see above) and the subsequent off/on-switching of the machine, the following message is displayed:

WARN:	DEFAULT KEYS
	& PARAMETER LOADED

The machine can be operated with the default parameters or it must be recalibrated, as described above.

WARN:	DEFAULT
	PARAMETER LOADED

After one of the key function has been reprogrammed, the above message changes as follows:

WARN: DEFAULT KEYS LOADED

2.7.3 Procedure for Handling the Error Message DATA LOST

	 Follow the instructions according to the Section (ERR: DATA LOST), 2.7.2. Replace the battery on the MP UNIT MASTER 1.811.786.
	Early failure of the lithium battery type SONNENSCHEIN (size 1/2 AA, diam. 14.3 mm x 25.7 mm, part No. 89.01.0275) is possible due to manufacturing defects. The life of such batteries is limited to approx. 2 years. In the event of a battery failure, the tape recorder loses the audio and tape deck parameters (error message: DATA LOST) and continues to operate with the default values. The batteries affected by this defect are marked with the production date 84 02 to 84 29 (embossed at the edge near the negative pole). For safety reasons we recommend to replace all batteries marked with the production date 84 xx (worldwide approx. 300 units). Affected are the tape recorders A812 and A820 that have been delivered prior to the end of 1986.
Exchanging the buffer battery	of the A812 and A820:
	 Write down the audio and tape deck parameters (including tape tensions A/B, equalization data and TYPE SETTING in the ALIGNMENT DECK block) or save them via the RS 232 interface on tape or a personal computer. Replace the battery and label it with the date on which it should be replaced (= production date + 7 years). Switch on the tape recorder. After a short time the error message DATA LOST may appear on the LC display. If this is the case, press the RESET key on the MPU MASTER. The processor will be reinitialized and the tape recorder is ready. Reenter or load the audio and tape deck parameters, incl. TYPE SETTING, see Section 2.7.4. Check the programming of the keyboard and reprogram any key so that the error message DEFAULT KEYS LOADED will be cleared.
Packing and transportation of the MPU boards	in black, antistatic plastic bags.
	To prevent discharge of the battery, the battery terminals should not touch the antistatic plastic foil. As an insulator, a piece of pasteboard, format approx. 100 x 130 mm, is placed between the board and the plastic foil.
Ordering replacement batteries	Please contact the nearest STUDER dealer.
Technical data of the new batteries:	 Open-circuit voltage: 3.66 V Nominal voltage (loaded with 3.4 kΩ, measured after 2 - 3 minutes): 3.4 V The maximum current consumption of the RAM is 13 µA, the corresponding voltage drop across diode D3 on the MPU MASTER board should be less than 300 mV.

2.7.4 Programming the machine type (TYPE SETTING)

The machine type (e.g. A812-0.75, A812-2 VU, etc.) is set with the TYPE SETTING function in the ALIGNMENT DECK parameter block. This is necessary for selecting the correct default programming as well as the erase current of the HF driver (also refer to Section 2.5).

An incorrect TYPE SETTING can damage the output stage of the HF DRIVER.

Step	Information on LC display
Turn the programming lock [28] counterclockwise by 1 to 2 turns (hexagon-socket screw key No. 2.5)	
Switch machine to STOP	L RANGE ./. dBm
∨/NEXT ALI <u>GN</u> MENT MODE	USER SET UP
√/NEXT AU <u>DI</u> O DECK AUX	ALIGNMENT
>/CURSOR AUDIO D <u>EC</u> K AUX	ALIGNMENT
Press v/NEXT 11 times until the LC display shows:	TYPE SETTING TYPE: A812-0.75
Select the desired type with the UP/DOWN keys	TYPE SETTING TYPE: A812-xxxx
Save the setting with STORE	
Press ^/LAST 13 times	

Machine version	Erase head	Type setting
A812-0.75	Full-track	A812-0.75
A812-0.75 VU	Overlapping e.	A812-0.75 VU
A812-1	Full-track	A812-1
A812-1	VU Full-track	A812-1 VU
A812-2/2	Overlapping e.	A812-2/2
A812-2/2	VU Overlapping e.	A812-2/2 VU
A812-2F	Full-track	A812-2 (F)
A812-2	2-Track	A812-2 (F)
	(no TC erasure)	
A812-2 VU	2-Track	A812-2 VU
	(no TC erasure)	
A812-2 TC	2-Track	A812-2 TC
	(with TC erasure)	
A812-2 TC VU	2-Track	A812-2 TC VU
	(with TC erasure)	

Parameter table for TYPE SETTING

2.8 Operation with the Serial Interface

Two versions of the serial interface are available:

The version 1.810.751 supports the operation with a terminal (RS 232, ASCII format), and the audio parameters can be saved on an external medium such as tape.

The version 1.820.751 supports the operation with a terminal (RS 232, binary format). In addition it is suited for connection to an SMPTE/EBU bus in accordance with the SMPTE standard.

2.8.1 SMPTE/EBU Bus

The SMPTE/EBU bus is a data transfer medium with which several individual units can be combined into a flexible and powerful system (e.g. remote control of several tape recorders).

2.8.2 Data Dump

The audio parameters stored in RAM can be copied to audio tape or cassette via the 9-pin connector of the serial interface 1.810.751, or new audio parameters can be read into the machine from an external storage medium (refer to Section 4.8).

2.8.3 RS 232 Interface

The term "RS 232" defines a connection between a terminal and a modem. This standard also defines:

- Electrical characteristics (levels, lines),
- Mechanical characteristics (connectors),
- Signal descriptions, and
- Standard connections.

The interface supports data rates up to 19.2 kbaud (for A810 / A812 / A820: 9.6 kbaud) and cable lengths up to 15 m.

The signal levels are defined as follows:



Various interface structures are possible with the 25-pin connector. In practice, however, the full complement of pins is rarely used. Modern systems frequently use the minimum structures illustrated in Fig. 2.8.1 for establishing terminal-modem or terminal-terminal connections.



Fig. 2.8.1

All extensions (e.g. baud rate, code, synchronous/asynchronous connection, number of start/stop bits, parity, hardware/software handshake) are defined by the equipment manufacturer.

2.8.4 Serial ASCII Interface of the A812 1.810.751.00

The serial interface of the A812 tape recorder employs a 9-pin connector according to SMPTE rather than the 25-pin connector. By means of an adapter cable the user can thus define whether the unit is to function as a terminal or as a modem.

Recorder 9-Pole		Terminal 25-Pole		Modem 25-Pole	
Signal	Pin	Signal	Pin	Signal	Pin
SNDATA	2	Trans.Data	2	Trans.Data	3
RCVDATA	8	REC. DATA	3	REC. DATA	2
GROUND	9	Sig.Ground	7	Sig.Ground	7

No additional handshake lines are used. A software handshake (X ON/ X OFF protocol) is implemented for all baud rates, but only necessary at 9.6 kbaud.

X ON = 0001 0001 (ASCII DC1)	continue
X OFF = 0001 0011 (ASCII DC3)	interrupt

After an X OFF has been received, the tape recorder still transmits up to two characters. After it has transmitted its own X OFF, it can still receive five characters without losing a command.

The number of start and stop bits, even/odd/no parity, and the following baud rates can be set: 300, 1200 or 9600.

Only ASCII characters are accepted as data.

2.8.5 Installation of the Serial Interface 1.810.751

- Set up your computer or terminal as follows: 1 start bit, 8 data bits, 1 stop bit (no parity), baud rate 300, 1200, or 9600. No echo mode. Set the handshake lines CTS and RTS to LOW.
- SERIAL REMOTE CONTROLLER 1.810.751: This board contains a receiver and a driver for the Studer interface for recording data on audio tape, and the RS 232 interface. Changeover between these two is possible manually by means of a jumper (position X; changeover with DIL switch 2, OFF = RS 232) or automatically (position H). Since the automatic changeover is implemented, position H should be used.

Insert the PCB, enable the pilot LED with the DIL switch 1: the RX and TX LEDs light up.

- Connect the computer or the terminal via the adapter cable to one of the two 9pin RS 232 sockets. If the connection is correct, the RX and the TX LEDs switch off.
- Program the baud rate to match the computer or terminal.
 After a RESET (switching the A812 MCH off and on again) the display shows:

The device commands (see command list below) can now be entered via the terminal keyboard. The commands are executed when the ENTER KEY is pressed.

Command list

	TAPE DECK COMMANDS	
Command (_ = blank, < ^J = CR, * = blank or CR)	Response of the tape recorder-	Description
(SW 6/89)		
STP*	<cr><lf></lf></cr>	STOP
RWD*	<cr><lf></lf></cr>	Rewind
FWD*	<cr><lf></lf></cr>	Fast forward
PLY*	<cr><lf></lf></cr>	Play
REC*	<cr><lf></lf></cr>	Record (directly,
		without preceding PLAY command)
LFT*	<cr><lf></lf></cr>	Tape lift pin extended
EDT*	<cr><lf></lf></cr>	Tape lift pin retracted
SSA*	<cr><lf></lf></cr>	Select tape speed 3.75 ips (9,5 cm/s)
SSB*	<cr><lf></lf></cr>	Select tape speed 7,5 ips (19 cm/s)
SSC*	<cr><lf></lf></cr>	Select tape speed 15 ips (38 cm/s)
SSD*	<cr><lf></lf></cr>	Select tape speed 30 ips (76 cm/s)
WNR_ <xxxx></xxxx>	<cr><lf></lf></cr>	Rewind with selec- table speed (0000 ≤ XXXX ≤ 5FFF)
WNF_ <xxx></xxx>	<cr><lf></lf></cr>	Spool forward with selectable speed (0000 ≤ XXXX ≤ 5FFF)
NS?*	3.75 IPS <cr> <lf> 7.5 IPS <cr> <lf>, or 15 IPS<cr><lf> or</lf></cr></lf></cr></lf></cr>	Read out the nominal speed
	30 IPS <cr><lf></lf></cr>	
VEN*	<cr><lf></lf></cr>	Vari-Speed external on
VEF*	<cr><lf></lf></cr>	Vari-Speed external off

TAPE DECK COMMANDS			
FEN*	<cr><lf></lf></cr>	FADER START enable (higher	
FEF*	<cr><lf></lf></cr>	ranking) FADER START	
LOC <address></address>	<cr><lf></lf></cr>	inhibited (higher ranking) Spool to <(-)	
		hh(:)()mm(:)()ss (:)()n> (n = 1/10 seconds) e.g. LOC_01:20:15:0 LOC00_35_25_1	
LMV_ <t.reading></t.reading>	<cr> <lf></lf></cr>	Spool according to the timer reading produced by the tacho roller <xxxxxx>, 4 Bytes HEX z.B. LMV 00AE4F00</xxxxxx>	
MV?*	XX XX XX XX	Read out the timer reading of the tacho	
STM_ <address></address>	<cr><lf> <cr><lf></lf></cr></lf></cr>	roller 4 Bytes HEX Set timer to <(-)hh (:)()mm(:)()ss (:)()n> (n = 1/10 seconds) (-9:59:59:9 ≤address ≤ 23:59:59:9) z. B. STM_01_20_15_0 STM -00:35:25:1	
TM?*	_hh:mm:ss:n <cr><lf>, or hh:mm:ss:n <cr><lf> n = 1/10 sec</lf></cr></lf></cr>	Read out the tape timer	
DST*	<cr><lf><_hh:m m:ss:n_Y_XXXX XXXXXXXXXXXXX n = 1/10 Sek. Y = Status,</lf></cr>	Display the equipment status, repetitive (cancel with	
	1 Byte HEX X = Status inquiry, e.g PLAY	CRTL X)	

X <cr><lf> X = 1 Byte HEX X = 01 X = 81 X = 02 X = 82 X = 03 X = 83 X = 04</lf></cr>	Status inquiry e.g.: TAPE OUT TAPE OUT ACHIEVED STOP NOT ACHIEVED STOP ACHIEVED REWIND NOT ACHIEVED REWIND ACHIEVED
X = 01 X = 81 X = 02 X = 82 X = 03 X = 83	TAPE OUT TAPE OUT ACHIEVED STOP NOT ACHIEVED STOP ACHIEVED REWIND NOT ACHIEVED
X = 81 X = 02 X = 82 X = 03 X = 83	TAPE OUT ACHIEVED STOP NOT ACHIEVED STOP ACHIEVED REWIND NOT ACHIEVED
X = 02 X = 82 X = 03 X = 83	STOP NOT ACHIEVED STOP ACHIEVED REWIND NOT ACHIEVED
X = 82 X = 03 X = 83	STOP ACHIEVED REWIND NOT ACHIEVED
X = 03 X = 83	REWIND NOT ACHIEVED
X = 83	ACHIEVED
	REWIND ACHIEVED
X = 04	ACTING ACTILICE
	FORWARD NOT
	ACHIEVED
X = 84	FORWARD ACHIEVED
X = 05	PLAY NOT ACHIEVED
X = 85	PLAY ACHIEVED
X = 06	PLAY VARISPEED
	NOT ACHIEVED
X = 86	PLAY VARISPEED
	ACHIEVED
X - 07	PLAY INT. REF. NOT
× = 07	ACHIEVED
V _ 07	PLAY INT. REF.
~ = 07	
Y 00	ACHIEVED
X = 08	PLAY EXT. REF. NOT
¥ 00	ACHIEVED
X = 88	PLAY EXT. REF.
	ACHIEVED
	RECORD ACHIEVED
X = CO	SHUTTLE REVERSE
	ACHIEVED
X = C1	SHUTTLE FORWARD
	ACHIEVED
X = 42	LOCATE WIND
	REVERSE
X = C2	LOCATE WIND
	REVERSE ACHIEVED
X = 43	LOCATE WIND
	FORWARD
X = C3	LOCATE WIND
	FORWARD ACHIEVED
X = C7	CUEING FORWARD
	ACHIEVED
X = C9	POSITION PLAY
	FORWARD ACHIEVED
Y _ 50	
	TAPE DUMP
Y = NA	TAPE DUMP ACHIEVED
	$X = 84 \\ X = 05 \\ X = 85 \\ X = 06 \\ X = 86 \\ X = 07 \\ X = 87 \\ X = 08 \\ X = 88 \\ X = 88 \\ X = 88 \\ X = 89 \\ X = C0 \\ X = C1 \\ X = 42 \\ X = C2 \\ X = 43 \\ X = C3$

AUDIO-COMMANDS			
Command (_ = blank, $\prec^{J} = CR, * =$ blank or CR)	Response of the tape recorder-	Description	
SMN*	<cr><lf></lf></cr>	Switch to mono (only if equipped with MONO/STEREO switch)	
SST*	<cr><lf></lf></cr>	Switch to stereo (only if equipped with MONO/STEREO switch)	
SNB*	<cr><lf></lf></cr>	NAB-equalization	
SCR*	<cr><lf></lf></cr>	CCIR-equalization	
STA*	<cr><lf></lf></cr>	Switch to tape type A	
STB*	<cr><lf></lf></cr>	Switch to tape type B	
MSN*	<cr><lf></lf></cr>	MASTER SAFE on	
MSF*	<cr><lf></lf></cr>	MASTER SAFE off	
SRH*	<cr><lf></lf></cr>	REHEARSAL on	
CRH*	<cr><lf></lf></cr>	REHEARSAL off	
DDN*	<cr><lf></lf></cr>	Drop in/out- out delay on	
DDF*	<cr><lf></lf></cr>	Drop in/out- out delay off	
REA_i< ^J	<cr><lf></lf></cr>	Channel i READY (i = 1, 2, 3 or F)	
SAF_i<	<cr><lf></lf></cr>	Channel i SAFE (i = 1, 2, 3 or F)	
INP_i< ^J	<cr><lf></lf></cr>	Channel i INPUT (i = 1, 2, 3 or F)	
SYN_i< ^J	<cr><lf></lf></cr>	Channel i SYNC (i = 1, 2, 3 or F)	
REP_i< ^J	<cr><lf></lf></cr>	Channel i REPRO (i = 1,2, 3 or F)	
MTN_i< ^J	<cr><lf></lf></cr>	Channel i MUTE (i = 1,2 or F)	
MTF_i< ^J	<cr><lf></lf></cr>	Channel i cancel mute (i =1,2 or F) (F = all channels)	
SAP_i_j_k*	<cr><lf></lf></cr>	D/A-converter j channel i to k (i =1 or 2; j = 0: LEVEL REPRO	

	AUDIO-COMMANDS		
		1: TREBLE REPRO 2: BASS REPRO 3: EQUALIZATION REPRO 4: LEVEL RECORD 5: TREBLE RECORD 6: BIAS 7: EQUALIZATION RECORD; k = 2 digits HEX, correspond to the number that appears on the LC display in conjunction with the	
AP?_i,j*	XX <cr><lf></lf></cr>	audio settings (e.s. SAP_1_0_FF Read out audio para- meters channel i,	
	XX=1 Byte HEX	D/A converter j i = 1 or 2;	
		<pre>j = O: LEVEL REPRO 1: TREBLE REPRO 2: BASS REPRO 3: EQUALIZATION REPRO 4: LEVEL RECORD 5: TREBLE RECORD 6: BIAS 7: EQUALIZATION RECORD</pre>	
PAP <i,j,xx></i,j,xx>	[] <i,j,xx> [,CR]</i,j,xx>	i=channel(1,2), j=D/A-converter	
		<pre>xx=hex-number 0≤xx≤FF j: 0=level repro/sync 1=treble repro/sync 2=bass repro/sync 3=equalization repro/sync 4=level record 5=treble record 6=bias record 7=equalization record</pre>	

MACHINE AND TIME CODE COMMANDS							
Command (_ = blank, < ^J = CR, * = blank or CR)	Response of the tape recorder-	Description					
TP?	TP?[,CR]	Tape tension					
LCE*	<cr><lf></lf></cr>	parameter? built-in keypad enabled					
LCD*	<cr><lf></lf></cr>	built-in keypad disabled					
RME*	<cr><lf></lf></cr>	Remote control keypad enabled					
RMD*	<cr><lf></lf></cr>	Remote control keypad disabled					
TDN*	<cr><lf></lf></cr>	Time-Code-delay on					
TDF*	<cr><lf></lf></cr>	Time-Code-delay off (bypassed)					
TH?*	00 <cr><lf>,od.</lf></cr>	Readout time code source (00 = 1.h. head;					
	01 <cr><lf>,od.</lf></cr>	01 = r.h.ch. wideband					
	02 <cr><lf>,od.</lf></cr>	02 = r.h.ch. narrow band					
	03 <cr><lf></lf></cr>	03 = line input					
SBA_ <address></address>	<cr><lf></lf></cr>	Set bus address to <xxxx> (4 HEX, 82FF ≤ digits XXXX ≤ FFFF)</xxxx>					
BA?*	<xxxx><cr><lf></lf></cr></xxxx>	Read out bus address					

THE FOREGOING LIST IS NOT COMPLETE AND CAN BE CHANGED OR EXPANDED AS REQUIRED.

Examples:

FWD*	= Fast forward
LOC01:43:00:8	= Autolocator to address 1.43.00.8
SAF_3<	= TC channel SAFE (recording inhibited)
AP?_1_4*	 Read out the audio parameters of channel 1, D/A converter 4 (LEVEL RECORD); response of the tape recorder e.g. A9 HEX
SAP_1_4_A3*	 Modify the audio parameters channel 1, D/A converter 4 (LEVEL RECORD), new value A3 (old value A9 from the preceding example will be overwritten!)
Important !!	All other parameters such as SYNC or REPRO, tape speed, tape type, equalization must be selected on the tape recorder.
D_108_227	 All audio and reference parameters are displayed in hexadecimal format, e.g.:
	0 1 2 3 4 5 6 7 8 9 A B C D E F 0100 xx xx xx xx xx xx xx xx 82 70 90 95 26 B0 30 BB'&00; 0110 00 00 00 66 39 80 87 30 A0 3E 75 62 50 96 8790 >P 0120 66 39 80 61
RADR	subsequently be converted to a hexadecimal value!): = ARAM-12 + IDAC + ISYNC*8 + CCAB*12 + SPEED*24 + CHNL*72 + TAPE*144
where:	 RADR = Address of the parameter (decimal value) ARAM = 264 (108 hex), starting address of the parameter area in RAM
IDAC	= 0 forLEVEL REPRO= 1 forTREBLE REPRO= 2 forBASS REPRO= 3 forEQUALIZATION REPRO= 4 forLEVEL RECORD= 5 forTREBLE RECORD= 6 forBIAS RECORD= 7 forEQUALIZATION RECORD
ISYNC	= 0 for REPRO MODE

= 1 for

SYNC MODE

CCAB	P	
0070	= 0 for	equalization according to CCIR (at 30 ips automatcally $= 0$)
	= 1 for	equalization according to NAB (at 3.75 ips automatically = 1)
	L	
SPEED	[
	= 0 for	9,5 cm/s (3.75 ips)
	= 1 for	19 cm/s (7.5 ips)
	= 2 for	38 cm/s (15 ips)
	= 3 for	76 cm/s (30 ips)
CHNL	[
	= 0 for	channel 1
	= 1 for	channel 2
TAPE		
TAPE	= 0 for	tape type A
	= 1 for	tape type B
	The address c	f TREBLE, REPRO, SYNC, NAB, 15 ips, channel 1, tape type B is:
	264-12 +	1 + 1*8 + 1*12 + 2*24 + 0*72 + 1*144 = 465 = 01D1 (hex)
UAP_01D1_5C		
	= Change	the above parameters to 5C

2.8.6 Installation of the Serial Interface 1.820.751



Hardware definitions:

- Electrical standards according to RS 232C or RS422A (selectable with jumpers)
- Full-duplex
- Asynchronous data transmission, bit-serial and word-serial, according to the following diagram:



Odd or even parity and the number of stop bits (1 or 2) can be programmed.

- Baud rates for RS 232 and RS 422 programmable as 9600 or 1200 baud, for operation in conjunction with an SMPTE bus it is preset to 38400 baud.
 Standard factory settings:
- RS 232C = 1 start bit
 - 8 data bits
 - even parity
 - 1 stop bit
 - 9600 baud.

Pin assignment:

Pin	RS232	RS422
1 2 3 4	SHIELD RX 0,0 V	SHIELD TRANSMIT A RECEIVE B RECEIVE
5		COMMON
6	0,0 V	TRANSMIT COMMON
7 8 9	TX SHIELD	TRANSMIT B RECEIVE A SHIELD

Jumpers:



Fig. 2.8.2

	J8	J7	J6	J5	J4	J3	J2	J1
SMPTE BUS	вс	BC	вс	вс	BC		вС	вС
SERIAL RS232	AB	AB	AB	AB	AB		AB	AB
SERIAL RS422	AB	вС	вС	вС	AB		BC	BC

Changeover of the operating mode and the electrical configuration:

Changeover of the baud rates:

		J3
SMPTE BUS	38,4 kBd	BC
RS232/RS422	9600 Bd	BC
	1200 Bd	AB

Standard settings

	J8	J7	J6	J5	J4	J3	J2	J1
SMPTE BUS	вс	BC	вс	BC	BC	вс	вс	вС
SERIAL RS232 9600 Baud	AB	AB	AB	AB	AB	вС	AB	AB

STUDER A812

Pilot lamps	indicating different states, de interface (RS 232/RS 422)	The four pilot LEDs on the front bracket of the module 1.820.751 are used for indicating different states, depending on whether the module is used as a serial interface (RS 232/RS 422) or as an SMPTE/EBU bus interface (programmable with jumpers as described above).					
	SMPTE/EBU-Bus:	PCB	RS232/RS422:				
	INTERFACE SELECTED Glows when the inter- face receives an SEL ADDR and as long as- it remains in the SELECT STATUS	ο	RX ACTIVE Glows as soon as the interface receives STX (control byte) and as long as it receives a message.				
	INTERFACE POLLED Glows when the inter- face receives a POLL ADDR and as long as it remains in the POLL state.	0	TX ACTIVE Glows as long as the interface transmits a message.				
	INTERFACE IDLE/ACTIVE Glows as long as the interface waits for a BREAK-SIGNAL or its own address	0	INTERFACE ACTIVE Glows as long as the interface waits for STX (control byte).				
	FIFO TX/RX ACTIVE Glows as long as the interface receives data from the FIFO or transmits datato the FIFO	0	FIFO TX/RX ACTIVE Glows when the inter- face receives data from the FIFO or trans- mits data to the FIFO				
Software protocol:	The host control system can transmit commands (function commands) or status requests to the A812. The A812 acknowledges the commands and supplies status request.						
	Commands from the cont	rol syste	m to the A820 MCH:				
		00.					

STX	BC	СВ	CC	CPs	CS	

- **STX:** aBis a control character that is transmitted as a start character (according to SMPTE recommendation: STX = 02H).
 - BC (byte count): contains the number of bytes that follow (excluding checksum).

CB (control byte):



- CC (command code): function or parameter command; refer to corresponding instruction set.
- **CP** (parameter bytes): only for parameter commands; if more than one parameter byte exists, the MSB is transmitted first.
- **CS** (checksum): Two's complement of the sum of all data transmitted before the checksum, excluding STX.
 - Status request from the control system to the A812:

|--|

- **STX** is a control character and is transmitted as the start character (according to SMPTE recommendation: STX = 02H).
- BC (byte count): = 3 (fixed).
- CB (control byte):



SBA, SBC

(status request byte): SBA contains the base address, SBC the number of bytes of the requested status.

CS

(checksum): two's complement of the sum of all data transmitted before the checksum, excluding STX.

Acknowledgment and status messages of the A812 MCH to the control system: After the control system has transmitted a command block, it must wait for an acknowledgment from the A812 before a new command block may be transmitted. This acknowledgment can consist of a control

character or a status message. If no acknowlegment arrives within the time-out period (10 ms), the control system considers the transmission as faulty. Possible acknowledgments:

Acknowledgment after error-free transmission of commands or status change request with unchanged status:

(= 04_H according to SMPTE-proposal)

Acknowledgment after the following errors:

- Transmission error (framing, parity overrun)
- Wrong command codes
- Time-out (2 sec) during the command transmission)



Status message as an acknowledgment to:

- Unconditional status request
- Status change request with changed status

	STX	вС	СВ	SBA	SBC	STATUS	CS	
--	-----	----	----	-----	-----	--------	----	--

- **STX** is a control character that is transmitted as the start character (according to SMPTE recommendation: STX = 02H).
- BC (byte count): contains the number of bytes that follow (without checksum).

CB (control byte):



- **SBA, SBC** (status request byte): SBA contains the base address, SBC the number of bytes of the requested status. STATUS: Table with the desired status bytes.
 - **CS** (checksum): two's complement of the sum of all data transmitted before the checksum, excluding STX.

Command list:

APPLICABLE TO MODULES NO. 1.820.751.21 or higher TOGETHER WITH MASTER SOFTWARE <u>17/87</u> or higher

Tape deck commands from the control system to the A812 according to the following pattern (see also above):



where CB = 02H
Important !! The following commands do not correspond to the normal SMPTE convention. They have provisionally been defined in this manner and released for use. They will be changed as soon as the final SMPTE code is available.

Command	Code(CC)	Parameter(CP)
STOP	02 _H	
REWIND	03 _H	
FAST FORWARD	04 _H	
PLAY	05 _H	
ZERO LOC	06 ^{''}	
LOC START	07 ^{''} H	
BACKSPACE	08	
RECORD	09 _H	
RESET TIMER	OEH	
SET PLAY SPEED	51 _H	Länge: 1 Byte
3.75 ips	н	00 _H
7.5 ips		01 _H
15 ips		02 _H
30 ips		03 ^H

Status messages

APPLICABLE TO MODULES NO. 1.820.751.21 or higher TOGETHER WITH MASTER SOFTWARE 17/87 or higher

Status of the A812 as an acknowledgment in conjunction with unconditional status request, according to the following pattern:

STX BC CB SBA SBC STATUS	CS
--------------------------	----

where: $STX = 02_{H}$ and $CB = 82_{H}$.

Important !!	The following commands do not correspond to the normal SMPTE convention.
	They have provisionally been defined in this manner and released for use. They
	will be changed as soon as the final SMPTE code is available

Meldung	Status-An- forderungs- Bytes: SBA SBC		Parameter (STATUS)	
TAPE DECK STATUS NEW TAPE DECK *STATUS OLD	03 _H 02 _H	01 _H 01 _H	NOT ACHIEVED	ACHIEVED
TAPE OUT STOP REWIND FAST FORWARD PLAY RECORD BACKSPACE ZERO LOC/ LOC START PLAY, REWIND ZERO LOC/ LOC START PLAY, FAST FORWARD			01 _H 02 _H 03 _H 04 _H 05 _H 09 _H 40 _H 42 _H 42 _H	81 _H 82 _H 83 _H 84 _H 85 _H 89 _H C0 _H C2 _H
TAPE TIME	01 _H	04 _H	Codierung: BCD Format: HH MM SS FRAMES (024/25)	

Message Status request bytes SBA SBC Parameter (STATUS).

- * The last machine status remains stored and can be recalled if this is required by a special application.
- Notes:

The following error message

STX	вс	FF	FF	FF	FF	CS
-----	----	----	----	----	----	----

informs the control system that the last command from the controlled tape recorder has not been understood.

 The control system must transmit BREAK if the controlled tape recorder does not answer.

2.9 Daily Care

Daily care is limited to cleaning the soundheads, the capstan shaft, and the tape guidance elements.

Dust and oxide particles of the magnetic coating tend to accumulate on the soundheads and tape guides and can lead to gaps in the recording, so-called drop-outs.

Cleaning should be performed daily, or more frequently if contamination is visible. For cleaning work we recommend the STUDER cleaning set (part No. 10.496.010.00). It contains all utensils necessary for cleaning a tape recorder, a soundhead cleaning fluid, and aluminite cleaner.

- **Procedure:** Moisten the yellow piece of cloth with soundhead cleaning fluid and clean all guidance elements that come in contact with the tape. Then wipe the cleaned parts with a dry section of the yellow piece of cloth. Coarse accumulations in the grooves of the right-hand time code head can be removed with a hard brush, the bristles of which have been shortened to approx. 5 mm.
- Important !! When you clean the capstan, make sure that no cleaning fluid penetrates into the bearing! Dulling of the transparent VU-meter covers is possible if they come in contact with the cleaning fluid!

3 Power Supply Electronics

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3.1 Circuit Descriptions

General:

Section 3.1 is subdivided as follows: At the beginning (3.1.1) a circuit description of the general modules (power supply, supply voltage monitoring) is given, followed by a discussion on the control and tape deck modules. The latter has been broken down into two function blocks (3.1.2 and 3.1.3) so that the interaction of the individual modules can be presented. The criterion for this subdivision is the common data bus. Following the block diagram which explains the functions of each block, a circuit description of the individual modules is provided.

	Abbreviations			
ACIA ADC CMOS DAC FIFO IRQ LSB MPU MSB NMOS NMI PIA PIO PROM RAM ROM SSDA	Asynchronous communication interface adapter Analog-to-digital converter Complementary metal oxide semiconductor Digital-to-analog converter First in, first out Interrupt request Least significant bit Microprocessor unit Most significant bit N-channel metal oxide semiconductor Non-maskable interrupt Peripheral interface adapter Parallel input/output Programmable read-only memory Random access memory Read-only memory Synchronous serial data adapter			
VMOS	Vertical metal oxide semiconductor			

3.1.1 Power Supply

3.1.1.1 Power Supply Electronics GRP01 - GRP12

	Supply electronics 1.811.51
Function:	 Supply of the GRP30 (SWITCHING STABILIZER PCB 1.820.790) with a filtered DC voltage (approx. 50 to 60 V), and the GRP8 (POWER SUPPL CONNECTION BOARD 1.811.770) with two filtered DC voltages (approx. ±7 to ±90 V).
Circuit description:	The line voltage is applied to a 3-pin power inlet (GRP01/ELM1). The insulation of the power supply corresponds to IEC65, protection category 1; the protective ground terminal is connected to chassis (GRP5/ELM1). The interference suppression of the machine conforms to VDE 871, category B. From the power inlet the AC voltage is taken via the power switch (GRP2/ELM1), the primary fus (GRP01(ELM2), the power line filter (GRP3/ELM1), and the 100V/120V/140V/200V/220V 240V line voltage selector (GRP04/ELM1) to the power transformer GRP6. The primary windings (ELM1 and ELM2) consist of a 10 V and an 18 V winding that are connected in series or in parallel, depending on the switch getting of the line voltage selector. The secondary windings (ELM3/4) ar distributed as follows:
	For transformer 1.811.520: Two 50 V windings connected in series and four 20 windings per coil.
	For transformer 1.811.525: two 35 V windings connected in series, three 20 windings and one 40 V winding per coil.
	The secondary windings are combined into the following groups:
	 The first comprises two 40 V windings (20 V + 20 V) and supplies via the fus (GRP7ELM2), the rectifier D3 (GRP7/ELM5) and the filter capacitors C8, C (GRP7/ELM5) the positive section of the SWITCHING STABILIZER (+STABIN)
	The second comprises two 40 V windings, connected in parallel (on th transformer 1.811.520 two 20 V windings connected in series) and supplies vi the bridge rectifier (GRP7/ELM6) and the filter capacitor C10/GRP /ELM10 the negative section of the switching stabilizer (-STABIN). The AC voltage ACPWEB1/D1 are tapped on the AC side of the rectifier (GRP7/ELM6) an also connected to the SWITCHING STABILIZER (line voltage monitoring).
	 The third comprises two 20 V windings connected in series that supply th capstan motor control (+CAPMOT) via the bridge rectifier (GRP7/ELM7) and the charging capacitor C11 (GRP7/ELM11).
	The fourth comprises the remaining windings: two 35 V windings (in series connected in parallel (for the transformer 1.811.520 two 50 V winding connected in series) supply via the fuses (GRP9/ELM5,6) the bridge rectifier D4, D5 (GRP9/ELM1,2) the charging capacitors C3, C4 (GRP9/ELM3,4) and the spooling motors (± PSVTMOT).

Order No.

Order No.

On the power supply connection board 1.811.770, filtering of the supply voltage for the spooling motors is implemented with the current compensated chokes L1 and L2 and the X- and Y-capacitors C3 to C14. R7 to R10 are used for balancing the charge of the capacitors C3, C4 (GRP9/ELM3,4). With the voltage dividers R1 to R6 the "high" voltage is stepped down and taken via J1 to the tape deck periphery driver 1.811.779 for monitoring the motor supply voltage.

Module identifications

Index .81:	Transformer 1.811.520 + ventilator (controlled via fan connection board 1.811.799 = 15 VDC).
Index .82:	Transformer 1.811.525 + ventilator (controlled via fan connection board 1.811.799 = 15 VDC).
Index .83:	Transformer 1.811.525 + ventilator (controlled via fan connection board 1.811.798 = 7.5 VDC; software controlled only in PLAY/REC 1.811.997.23 (SW 17/87 or newer).

3.1.1.2 Switching Stabilizer PCB GRP32

	Switching stabilizer PCB	1.820.790
Function:	 incl. STABILIZER/LIMITER PCB Generates all controlled voltages required by the tape recorder: +5.6 V for the logic circuits +15 V and -15 V for the audio section + 24 V for the solenoid control Supply voltage (+REMSUP) of a serial remote control (approx. solenoid approx. solenoid control) 	1.820.792 50 V, current
	The +24 supply voltage of the connectors for parallel remote synchronizer is generated by a linear voltage regulator (IC15) with a from +REMSUP.	
	Circuit description	
SWITCHING STABILIZER	GRP32 Po	CB 1.820.790
	By means of switching regulators this circuit produces from the in +STABIN and -STABIN the +5.6 V and \pm 15 V. The three switching reponents (IC1, 2, 3) are supplied by one of the two linear voltage regular V (IC103) and +24 V (IC8). IC103 and IC8 are mutually decoupled D15. The three switching regulators operate synchronously with a clo of 76 kHz (TD-C76K) which is generated by the MP UNIT TAPE DEC 1.820.785 GRP20/ELM46. This clock pulse is checked for correct f IC7.1/7.2, the parallel resonant circuit L4/C37, and the DUAL ONE Shany noise is filtered out.	egulator com- ators for +26 by D101 and ck frequency CK CONTROL frequency by

- +5.6 V control: From +STABIN the switching regulator produces the +5.6 V supply voltage. The clock pulse of IC6/pin5 is taken to IC1 (REGULATING PULSE WIDTH MODULATOR). IC1 contains the reference voltage source, an oscillator (not used in this application), an error amplifier, and a current limiting circuit.
- The output of IC1 (CA/CB) controls the driver transistor Q1, and via driver transformer T1 also the switching transistor Q4.
- From the pulsating voltage produced with Q4 and the free-wheeling diode D22, a new mean value is formed with L5 and C28.
- This DC voltage is refiltered with L1 and C26. The voltage fluctuations across L1 increase with rising output current and are used as information for the current limitation in IC5.2. The attack point of the limiter is approx. 7 A.
- The output voltage of the switching regulator can be adjusted with trimmer potentiometer R21.
- The ±15 V control functions analogously; the two switching regulators produce the +15 V and the -15 V from +STABIN and +STABIN respectively. The +15 V regulator comprises the following components: IC3, Q2, T2, Q5, D23, L6, C35, L3, C30, AND IC5.1. The -15 V regulator comprises the following components: IC2, Q3, T3, Q6, D24, L7, C36, L2, C31, and IC4.1. The -15 V regulator is wired in such a way that its output voltage is of the same magnitude as the one of the +15 V regulator (TRACKING MODE) which means that no -15 V can be present when the +15 V are missing. The reference value of the output voltage is adjusted in common with trimmer potentiometer R6.
- +24 V control: The +24 V are produced from +STABIN with a preset linear voltage regulator (IC8).

STABILIZER/LIMITER Order No.

PCB 1.820.792

- The +26 V and the -26 V are produced by a preset linear voltage regulators (IC103, 104) from +STABIN and -STABIN.
- The supply voltage for a serial remote control unit (approx. +50 V, uncontrolled) is produced from + CAPMOT.
- Two linear voltage regulators are used for limiting the current. IC101 is wired as a current source, the max. current is approx. 1 A. In the event of a short circuit, IC102 limits the input voltage of IC101 to approx. 35 V
- The comparator IC100 monitors the secondary voltage (ACPWE-D1, ACPWE-B1) of the power transformer; in the event of a power failure it signals T-PWRON = LOW to both CPUs. The machine is switched to STOP and SAFE after 120 ms. If the power failure is shorter than 120 ms, the logic state of the equipment does not change.
- The crowbar circuits comprising Q101 and Q100 respectively monitor the +5.6 V and the ±15 V switching regulator. If one of these voltages is exceeded by approximately 3 V, the corresponding triac fires and short-circuits the +5.6 V to ground and the +15 V to -15 V.

3.1.2 First Block - MASTER SECTION

3.1.2.1 Machine Control	· 	Order No.
MPU MASTER CONTROL	GRP20/EL44	1.811.786
MASTER SERIAL IF	GRP20/EL43	1.820.753
MASTER PERIPHERY CONTROL	GRP20/EL46	1.820.728
3.1.2.2 Interfaces		
PARALLEL REMOTE INTERFACE	GRP35	1.820.738
SERIAL REMOTE INTERFACE	GRP33	1.820.729
SMPTE/EBU INTERFACE	GRP20/EL45	1.820.751
RS232/DATASAVE IF	GRP20/EL45	1.810.751
3.1.2.3 Keyboard & Disp	blay	
TAPE DECK DISPLAY DRIVER	GRP52	1.811.776
TD PUSH BUTTON BOARD	GRP50	1.811.777
SUB PANEL PUSH BUTTON BOARD	GRP53	1.811.778
SHUTTLE PCB	GRP51	1.328.214
OPERATING ASSEMBLY		1.811.230
LCD UNIT	GRP54	1.811.233

3.1.2.4 VU-Meter + Time Code

Order No.

CHANNEL CONTROL	1.820.732
TC CHANNEL CONTROL	1.810.735
	Functional description according to block diagram Fig. 3.1.1:
	The 8-bit data bus of the MP UNIT MASTER is directly connected to the PARALLEL REMOTE INTERFACE, the TAPE DECK DISPLAY DRIVER, the MASTER PERIPHERY CONTROLLER, and the MASTER SERIAL INTERFACE. However, the 4-bit address is only connected directly to three modules. The system clock (TM-ENB), the write/read signal (TM-RW), and three of the five SEI SECT signals (TM-SI) and the set of the statement of the set of the s

SELECT signals (TM-SL2, TM-SL3, TM-SL6). For the other two modules these output signals are buffered via the MASTER SERIAL INTERFACE. This also applies to the required SELECT signals TM-SL4 and TM-SL5.

The MP UNIT MASTER consequently has direct access to these five modules. The SELECT signals are assigned as follows:

■ TM-SL2 ->	MASTER SERIAL INTERFACE
TM-SL3 ->	SMPTE/EBU BUS INTERFACE
TM-SL4 ->	TAPE DECK DISPLAY DRIVER
TM-SL5 ->	PARALLEL REMOTE INTERFACE
TM-SL6 ->	MASTER PERIPHERY CONTROLLER

To ensure that the MP UNIT MASTER serves an interface request as quickly as possible, an interrupt processing scheme is used. For this purpose an interrupt decoder is integrated in the MASTER SERIAL INTERFACE. All external interrupt requests (TM-SEIR, TM-REMIR, RM-SHIR, TM-KBIR, and TA-AUIR) are taken to this module which on request supplies an interrupt (TM-IRQ) to the MP UNIT MASTER. Via the decoder the MP UNIT MASTER can more quickly recognize the unit to be served than this would be possible in polling mode.

The POWER ON RESET of the MP UNIT MASTER (TM-RESMP) is passed on via the MASTER SERIAL INTERFACE. From here a reset (TM-RESET) is also triggered if the MP UNIT MASTER does not execute the program correctly due to a fault.

The two serial lines (TM-RX and TM-TX) of the MP UNIT MASTER are not used by the SMPTE/EBU BUS INTERFACE.

They are intended for the traffic via the RS 232 ASCII interface, e.g. for communication with a terminal.



Fig. 3.1.1

3.1.2.1 Machine Control

3.1.2.1.1 MP Unit Master GRP20/EL44

Functions:		MP UNIT MASTER1.811.786Central control unit for the entire A812Storing of all parameters (audio data, tape tensions, etc.)
Circuit description:		IC17 is an 8-bit NMOS processor type MC6803-1. The control program comprising 48 K-bytes is stored in three ROMs (IC15, IC16, and IC18). The RAM consists of IC8, a CMOS-RAM with a capacity of 8 K-bytes. This RAM is buffered by a lithium battery which means that the data are not lost when the A812 is switched off.
	Note:	The life of the lithium battery is marked on the battery itself. In order to prevent loss of RAM data after a power off, the battery should be replaced before this expiration date.
		With the 8-bit D-latch IC13 the addresses A0A7 from the multiplexed data/address bus are assigned to the address bus. The system clock E (ENABLE PULSE) is generated internally with quartz-accuracy by IC17. After the clock pulses have been inverted (IC9), eight reference frequencies are generated with the binary counter IC7. The frequency of IC7, pin 6 is output via the 8-bit bus driver (IC2) as the clock frequency (TM-C76K), but this frequency is not used in this application (spare).
		With a jumper, one of three frequencies (JS7, JS8, JS9) can be selected as the clock signal TM-C307K (after buffering by IC2). This signal is not used (spare).
		To reduce the power consumption the system clock E is also output to the OE inputs (OUTPUT ENABLE) of ROM and RAM (IC8, IC15, IC16, and IC18).
		IC12 inhibits the RAMSL signal if the RESET signal is present which means that access to the RAM is prevented during the reset phase.
		With IC4 and IC6 the R/W signal is combined with the system clock E for correct timing during the read/write access.
		IC14 monitors the 5 V supply and generates a defined reset pulse when the machine is switched on, or if transient power failures occur when the machine is in operation. The system can be reset manually by pressing the S1 key.
		With the TM-RESET signal a reset of the MP UNIT MASTER can also be initiated by the MASTER SERIAL INTERFACE.
		Jumpers JS12JS17 set the operating mode of the MP UNIT MASTER IC17.

Order No.

These jumper settings are fixed.

The address decoder IC11 (two 2-bit binary decoders) generate the CHIP SELECT signals from the addresses A13, A14, and A15 for the ROMs, the RAM, as well as the enable signal for IC3. IC3 is a bidirectional data bus buffer. The direction is determined by the read/write signal R/W.

An additional address decoder IC5 (3-bit binary decoder) generates the SELECT signals TM-SL2...SL7 as a function of the addresses A10...A15. The SELECT signals TM-SL2...5 are used for the interface modules. The interface modules are accessed through memory mapping (see Fig. 3.1.2).

The control bus is buffered with an 8-bit bus driver (IC1) and a gate of IC6.

JS3, JS4, JS5, and JS6 are set and connect the signals TM-BUSSW and TM-DRENB to the serial interface.

IC12 buffers the serial inputs/outputs for a terminal.

IC2 buffers the address and clock signals as well as the reset for the peripheral devices.

Memory-mapping



Fig. 3.1.2

3.1.2.1.2 Master Serial Interface GRP20/ELM43

Order No.

Functions:	 Master serial interface PCB 1.820.753 Interface to the TAPE DECK SERIAL INTERFACE and to a spare serial interface. Buffering of the address bus and the control bus to the PARALLEL REMOTE INTERFACE as well as the TAPE DECK DISPLAY DRIVER. IRQ initiation at the MP UNIT MASTER 1.820.786, as well as decoding of the interface that requests an IRQ.
Circuit description:	IC5, a PIA (PERIPHERAL INTERFACE ADAPTER) and the two SSDAs (SYNCHRONOUS SERIAL DATA ADAPTER) IC6 and IC9 are integrated in the MP UNIT MASTER and permit direct access by the processor.
	The required address decoding is performed by IC11 (two 2-bit binary decoder).
	The communication with the INTERNAL SYNCHRONIZER and the TAPE DECK SERIAL INTERFACE is implemented with serial data transmission. The two SSDAs (IC6 and IC9) perform the required parallel/serial or serial/parallel conversion. The data transmission is performed with hardware handshake. The required data clock is derived from the system clock "E" by frequency division with a dual 4-bit binary counter (IC12), and is output buffered to both units by IC3 (8-bit bus driver). The serial signals are buffered by IC4 (8-bit bus driver).
	With the two RS422 line drivers (IC1 and IC2) the control and address bus are connected with symmetrical voltage to the PARALLEL REMOTE INTERFACE and the TAPE DECK DISPLAY DRIVER.
	Like IC5, IC6, and IC9 they also fulfill an output function.
	Two retriggerable monoflops (IC13 must be retriggered by the MP UNIT MASTER in regular intervals. This is the case as long as the processor correctly executes its program. If a fault occurs and the program "hangs up", IC13 outputs a LOW pulse that reinitializes the processor (RESET).
	IC8, IC7, IC10 and part of IC5 constitute a priority decoder for IRQ requests. Here, the five IRQ sources TM-SEIR, TM-REMIR, TA-AUIR, TM-SHIR, TM-KBIR as well as those of the two SSDAs IC6 and IC9 are combined by IC7 and IC10 with an 8-bit word of port PA (IC5) and supplied to the 8-to-3 priority encoder IC8. The 3-bit word at the output of IC8 (A0, A1, A2) is read via the port PB (IC5) after IC8 has initiated an IRQ.
	If several IRQs are requested simultaneously, the 3-bit word at the output of IC8 contains three bits that correspond to the most significant input of IC8.
	Like Q1, IC3 (8-bit bus driver) serves as a buffer.

3.1.2.1.3 Master Periphery Controller GRP20/ELM46

Functions:	 Master periphery controller PCB 1.820.728 Interface to the AUDIO section, including the required TTL/CMOS level conversion. Connection to the channel control units CHANNEL MODE SELECTOR CH1, CH2 and CODE.
Circuit description:	The two PIAs (CI1 and IC2) are connected to the address data and control bus of the MP UNIT MASTER and consequently in their direct access path.
	IC1 establishes the connection to the three CHANNEL MODE SELECTORS (CH1, CH2, CODE) via the AUDIO COMMAND BUS. With IC10 the bidirectional data bus is buffered, port PB (IC1) is the interface. IC11 (8-bit bus driver) buffers the control bus as well as the two 1-bit data signals to the three modules CHANNEL MODE



Via the audio channel bus and the PIA (IC1) the MP UNIT MASTER receives the status information of the channel selectors (SAFE/READY) as well as the output selectors (INP, SYNC, REC).

These switches are connected to the audio command bus via an 8-to-1 multiplexer.

The feedbacks for the pilot lamps are transmitted by the MP UNIT MASTER via the PIA and the audio command bus to the lamp drivers (binary 3-to-8 decoder).

(See Fig. 3.1.3)

With the second PIA (IC2) the connection to the AUDIO section is established. Also here the port PB is used for the data bus, however, it is only unidirectional in the output direction. With port PA the address bus (PA4...PA7) and control bus is output. IC7, IC5, and IC6 function not only as buffers but also perform the required level conversion from TTL to CMOS.

The audio parameters are written into the audio amplifiers by the MP UNIT MASTER via the PIA (IC2) and the BUS converter (Fig. 3.1.4).

- With 8-way D-flip-flop Input and output level 0, 4, 8 or 10 dBm Changeover INP, SYNC, REP Muting MUTE Equalization 3180 s Erase current Drop-in or drop-out
- With 8-bit digital/analog converter (256-step attenuator): Reproduce level Reproduce frequency response (treble, bass) Reproduce equalization Record level Record frequency response (treble) Record equalization Bias current

The signals from the AUDIO section TA-ACT01, TA-ACT02, and TA-ACTTC are combined with the PIA outputs CA2 and CB2 by three 3-way AND gates (IC4) and returned as the control signals CA-CHS01, CA-CHS02, and CA-SHSTC to the AUDIO section for address decoding.

Via the port PA3 the desired mode, MONO or STEREO, is output via the D-flip-flop IC9 and to the buffer IC7 as CA-MONO. It is subsequently read in again via port PA3 as the feedback TA-ACTM0.

IC8, a retriggerable monoflop, is continually retriggered by the program via CA2. The output signal CA-SAFE is therefore only active (LOW) if this retriggering is not interrupted.

STUDER A812



Fig. 3.1.4.

3.1.2.2 Interfaces

3.1.2.2.1 Parallel Re	mote Interface GRP35	Order No.
Function:	Parallel remote interface Interface between MP UNIT MASTER and Parallel remote control SERIAL REMOTE INTERFACE PCB Synchronizer socket	1.820.738
Circuit description	IC3, a KEYBOARD DISPLAY INTERFACE, establishes the SERIAL REMOTE INTERFACE, the parallel remote contr feedback lines), and the synchronizer port to the MP UNIT M	ol (control lines and
	The bidirectional data bus is connected directly to the However, the control signals for IC3 (CHIP SELECT, read/w 0 and RESET) arrive via the MASTER SERIAL INTERFAC brought to TTL level by the two RS422 line receivers IC4 a are subsequently prepared for IC3 by IC7, IC8, IC1B (2-bit IC2.	vrite, CLOCK, address E. These signals are nd IC2. These signals
	The eight inputs RL0RL7 if IC3 are connected to the INTERFACE, so that the data from the serial remote port can signals ROW0ROW5 (OE) of IC5 are active. But also the in REMOTE or SYNCHRONIZER port are connected to the in after buffering by the comparators via IC10 or IC6 respective enabled by the signals ROW6 or ROW7 of IC5. Scanning of remote control port as well as the synchronizer is conseque outputs SL0SL3 of IC3, via the binary decoder IC5.	n be read in when the puts of the PARALLEL puts RL0RL7 of IC3 ly, when IC10/IC6 are the serial and parallel
	The outputs B0B3 and A0A3 if IC3 are connected to a 6-backar an 8-bit D-register (IC14), and stored by the latter after transferred.	
	For this purpose the data transfer signals L6 and L7 are deadecoder).	coded by IC1A (binary
	After buffering the outputs of IC9/IC14 are connected to the and SYNCHRONIZER ports.	PARALLEL REMOTE

3.1.2.2.2 Serial Remote Interface GRP33

Order No.

Function:	Fu	nction:	
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Serial remote interface

- 1.820.729 Serial/parallel and parallel/serial conversion from/to the SERIAL REMOTE port.
- Transfer of data from/to the PARALLEL REMOTE INTERFACE.

The SERIAL REMOTE INTERFACE is connected directly to the PARALLEL Circuit description REMOTE INTERFACE and establishes the link to the serial port.

> With IC9, an RS422 transceiver, the connection between the serial port and the MPU IC8 is established.

> The latter performs the serial/parallel conversion. The data transmission to the PARALLEL REMOTE INTERFACE is handled by IC4 and IC1. Both 8-bit D-registers are used as 1-byte memories in order to support asynchronous transmission. For this purpose the byte is written into IC4 by the MPU (IC8) and connected by the address decoder IC2 to the output (IC4). The pulse shaper (EXOR IC3) produces a clock pulse from the T-SL0 signal. IC1 now accepts the data from IC4. With the T-OE signal these data are connected to the output of IC1 and accepted by the PARALLEL REMOTE INTERFACE (IC3). Since the T-SL0 signal is also read by the MPU (IC8) via the input P10, the MPU knows when the last data have been accepted. It can now output the next byte from the internal RAM. In this way the data transfer is controlled by the MP UNIT MASTER.

> The data to be transmitted are already buffered in the PARALLEL REMOTE INTERFACE and are read in by the MPU (IC8) via IC5. IC7 is a ROM whose addresses are controlled by IC6. The parallel/serial conversion is again performed by IC8, and the output via IC9.

3.1.2.2.3 SMPTE/EBU BUS Interface 1.820.751 GR20/ELM45	Order No.
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Function: SMPTE/EBU BUS interface 1.820.751 Interface between the MP UNIT MASTER and the external port for the SMPTE/EBU bus. **Circuit description** IC17 is an 8-bit NMOS microprocessor with a clock frequency of 4 MHz; the required control program is stored in ROM IC16. The addresses A0...A7 are assigned to the address bus by IC15 (8-bit D-latch). IC5 (binary decoder) is the address decoder. IC18 is an ACIA (ASYNCHRONOUS COMMUNICATION INTERFACE ADAPTER) for serial communication. This adapter is designed for RS232 as well as RS422. IC3 is the driver for the RS232 output, and IC11 for RS422. The corresponding operating mode is selected with the jumpers JS2. IC7 is the serial receiver. Selection between RS232 and RS422 is possible with the jumpers JS5, JS6, and JS7.

	RS232	RS422
JS2	B-A	B-C
JS5	B-A	B-C
JS6	B-A	B-C
JS7	B-A	B-C

The clock pulse for serial output is derived from the system clock TM-ENDE of the MP UNIT MASTER via IC19 (4-bit counter); the baud rate is selected with jumper JS3.

JS3 A-B	=	1200 baud
JS3 C-B	=	38400 baud for SMPTE/EBU bus, or
	=	9600 baud for RS232/RS422 interface

IC10 is a 14-bit counter that is used for detecting the BREAK character on the SMPTE bus. The counter is reset by each transmitted or received signal via pin 11. If no signals are available for a predetermined interval (468.75 s or 576 E-signal pulses), L level is output by IC6. If jumper JS8 is set to B-C, the DCD signal for IC18 is produced. As a result an interrupt is signalled for IC17 via the IRQ1 line. In the interrupt program the status register IC18 is then read by the CPU (IC17) and a BREAK character is detected. By means of corresponding software the bus interface is set to the active state.

IC4 is a DUAL PORTED FIFO chip with a capacity of 128 bytes. It is used as a bidirectional data buffer for the information exchange between the two MPUs.

The MPU IC17 writes the data into IC4 via IC9 (8-bit D-flip-flop) and reads them out of IC4 via IC13 (8-bit bus driver). The second port of IC4 is connected to the data bus of the MP UNIT MASTER via IC2 (8-bit D-flip-flop) and IC1 (8-bit bus driver).

3.1.2.2.4 RS232/Datasave Interface GRP20/EL45

	Interface for serial remote control Connection to a terminal Data backup on tape Expanded test system	1.810.751
Data backup on tape	The audio parameters stored in RAM can be saved on tape via the 9- remote connector. For this purpose pins 4 and 6 of the 9-pin connector interconnected with the RECORD INPUT of the tape recorder (or an cassette recorder). Also refer to Section 4.7.	must be
	When the 9-pin connector for the serial remote control is connecter REPRODUCE output of the tape recorder (or the cassette recorder), the audio parameters can be compared with the RAM content and read bac RAM. Also refer to Section 4.8.	he stored
RS 232 connections	Pins 2, 3, 7, 8, and 9 are required for connecting an external terminal with an RS 232 interface. SNDATA is the transmit line, RCVDATA is the line.	
	The two pilot lamps SEND and RECEIVE indicate whether data are trans the microprocessor to the serial interface or vice versa.	mitted by
DEBUG display	The LEDs of the DEBUG display indicate the status of the data bus, the bus, and the three select lines.	1.810.757 e address
	Whether the WRITE or the READ signals of the MPU bus is to be represe be selected with a program switch.	ented can

Order No.

3.1.2.3 Keyboard & Display

3.1.2.3.1 Tape Deck Display Driver GRP50		Order No.
	Tape deck display driver with:	1.811.776
TD PUSH BUTTON BOARD	GRP50	1.811.777
SUB PANEL PUSH BUTTON BOARD	GRP53	1.811.778
SHUTTLE PCB	GRP51	1.328.214
OPERATING ASSEMBLY		1.811.230
LCD UNIT	GRP54	1.811.233
Functions:	 Interface for display and keyboard. Analog/digital conversion of the analog signal from the SHUTT potentiometer. 	ILE CONTROL
Circuit description:	The analog signal ANM-SH2 from the wiper of the SHUTTI POTENTIOMETER is converted by IC7/IC9 (AC) to an 8-bit data we on the data bus of the MP UNIT MASTER.	
	IC21, an RS422 line receiver, transfer the SELECT signal TM-SL4 addresses A0A2 of the MP UNIT MASTER 1.820.786 to the ad (IC18).	
	With the second RS422 line receiver (IC22) the read/write signals (pulse (RES), and the clock (ENB) are accepted by the MP UNIT made available to IC9, IC8, and IC13 after they have been logically c	MASTER and
	The TAPE DECK DISPLAY DRIVER is connected to the LC DISP means of connector P4.	PLAY UNIT by
	The keyboard/display interface IC13 establishes the connection be UNIT MASTER and the following modules:	etween the MP
	a) PUSHBUTTON/DISPLAY PCB 1.820.767	
	The ten 7-segment display positions (with common and PUSHBUTTON/DISPLAY PCB are controlled in multiplex mode matrix (DL1.01.7, DL4.04.7, DL5.05.7).	
	All segments, the decimal points, and all cathodes of the LED matrix by a LED segment driver (IC11).	are controlled

The common anodes of the corresponding 7-segment display position (DLZ1...DLZ10) are controlled by the signals TM-D0...TM-D9, the anodes of the LED matrix are controlled by the signals TM-L1, TM-L4 and TM-L5. These signals are produced in the two binary demultiplexers IC19 and IC20 based on the information supplied by IC13. They are buffered by the transistors Q1...Q15.

b) TAPE DECK PUSHBUTTON PCB 1.820.769

The Hall-effect keys on the PUSHBUTTON/DISPLAY PCB are wired in a matrix. After a key has been pressed they are scanned via IC14, an addressable 8-bit latch, in four rows (TM-EN1...TM-EN4). The TM-EN0 signal is responsible for the keys on the TAPE DECK PUSHBUTTON PCB.

The keyboard/display driver IC13 periodically outputs the five signals TM-EN0...EN4 and each time reads the corresponding column of the keyboard via its inputs RL0...RL7 in order to determine whether or not a key has been actuated. If this is the case the IRQ TM-KBIR is initiated.

3.1.2.4 VU METER + TIMECODE

3.1.2.4.1 Channel Control		Order No.
	Channel control	1.820.732
3.1.2.4.2 TC Channel (Control	Order No.
	TC Channel control	1.810.735
Function:	 Scanning the five keys (READY/SAFE, INPUT/REP transmitting the information to the MPU MASTER CONTROL. Control of the six feedback LEDs (REC/READY/SAFE, INPUT or the seven feedback LEDs (REC/READY/SAFE, INPUT CODE LEVEL). 	T/REPRO/SYNC)
Circuit description:	The control signals T-SADA, T-SADB, T-SADC, T-READSL, T-WR signal T-DT-XY are connected to the MP UNIT MASTER PERIPHERY CONTROLLER. The five keys are scanned by the 8- (IC2).	via the MASTER
	The feedbacks from the MP UNIT MASTER are supplied via decoder (IC1) by through-connecting the corresponding six/seventiates and the corresponding six/seventiates are supplied with the corresponding six/seventiates are supplicit.	
	The 5V supply voltage is derived from the +15 V supply by mea regulator (IC3).	ns of an in-phase

Order No.

3.1.3 Second Block

3.1.3.1	Tape deck control	
3.1.3.1.1	Tape deck controller 2x GRP 27	1.811.774
3.1.3.1.2	Tape deck periphery interface GRP26	1.811.773
3.1.3.1.3	Tape deck periphery driver GRP25	1.811.779
3.1.3.2	Spooling motors	
3.1.3.2.1	Spooling motor controller PCB GRP24	1.811.772
3.1.3.2.2	Slew rate limiter board	1.811.780
3.1.3.2.3	Spooling motor drive amplifier PCB GRP31 (left-hand motor) Spooling motor drive amplifier PCB GRP32 (right-hand motor)	1.811.771.00 1.811.771.81
3.1.3.3	Tape tension sensors	
3.1.3.3.1	Tape tension sensor PCB GRP82 left GRP83 right	1.811.730 1.811.728
3.1.3.3.2	Move sensor PCB GRP82/(ELM3	1.811.732
3.1.3.3.3	Tape end switch PCB GRP82/ELM2 (left) Tape end switch PCB GRP83/ELM2 (right)	1.810.729 1.810.729
3.1.3.4	Capstan motor	
3.1.3.4.1	Capstan control unit GRP20/ELM42	1.820.764
3.1.3.4.2	Capstan motor interface GRP20/ELM41	1.811.775
3.1.4.3	Tacho sensor electronics PCB GRP38	1.021.695
3.1.3.4.4	Capstan motor drive amplifier PCB GRP39	1.820.774



Fig. 3.1.5

3.1.3.1.1 Tape Deck Controller GRP27

Order No.

	Tape deck controller 1.81	1.774
Functions:	 Slave processor of the MP UNIT MASTER for controlling the two spon motor and the capstan motor. The tape deck controller accepts parame macro commands of the master processor and subsequently control tape transport mechanism of the machine by means of its peripheral der The status field of the tape deck is buffered in RAM and on retransmitted to the MP UNIT MASTER 1.811.786 (GRP 20/EL44). Serial communication to the MP UNIT MASTER with an SSDA (synchrosserial data adapter). Parallel communication with the CAPSTAN CONTROL UNIT 1.820.764 20/EL42). Interface to the tape deck periphery 	trized ls the vices. quest
Circuit description	IC5 is an 8-bit NMOS processor MC 6803-1. The control program comprisin K-bytes (27128 for 1.811.774.2x) and 32 K-bytes (27256 for 1.811.77 changeover with JP13, 14, 15 starting with PCB index -12 is stored in an EF (IC8). IC12 is a CMOS-RAM with a capacity of 2 K-bytes.	4.3x),
	With the 8-bit D-latch IC7 the addresses A0A7 from the multip data/address bus of IC5 are assigned to the address bus. From the system E (ENABLE PULSE, 1.2288 MHz) internally generated with quartz accuracy by the 76.8 kHz reference frequency for pulse width modulation is produced with binary counter on the tape deck periphery IF (1.811.773 or 1.811.783). Wit and IC4 the R/W signal is combined with the system clock E for correct t during the read/write cycle. IC1 monitors the 5 V supply and generates a dereset pulse when the machine is switched on, as well as after transient p failures when the machine is in operation. The system can be reset manually key S1. The jumpers JP7JP12 define the operating mode of the processo These jumper settings are fixed.	clock y IC5, th the h IC3 iming efined power y with
	The address decoder IC11 (two 2-bit binary decoders) generates the SELECT signals from the addresses A13, A14, and A15 for the EPROM, the and the periphery chips, as well as the enable signal (PERENB) for IC9. The is a bidirectional data bus buffer the direction of which is determined b write/read signal R/W. An additional address decoder IC14 (3-bit binary dec generates the select signals TD-SL0, TD-SL1, TD-SL2. The interface module addressed with memory mapping.	RAM, latter y the oder)
	All signals for the local tape deck bus are buffered.	

Memory map



Fig. 3.1.6

The serial TTL bus (TPS-RX, TDS-TX, TDS-DTR, TDS-CTS, TDS-CLK) from/to the MASTER SERIAL INTERFACE 1.811.775 (GRP20/EL43) is buffered by an 8-bit bus driver IC18, and connected to the tape deck controller IC5 by IC16 (SSDA). IC16 performs the serial/parallel or parallel/serial conversion (send or receive) in synchronous mode. For this purpose TDS-CLK is supplied to the MASTER SERIAL INTERFACE of the receive clock. When a byte is received, IC16 triggers an interrupted (TD-IRQ) at the processor of the tape deck controller.

The communication with the lower ranking capstan processor is performed in parallel via PIA (parallel interface adapter) IC15, 17 via P5 to the CAPSTAN INTERFACE 1.811.775 (GRP20/EL41) and to the (future) internal synchronizer. This module is connected to the data, address and control bus of the tape deck controller (signals TD-...) and the capstan control unit (signals TC-...). With CS-PIA the tape deck controller selects the PIA chip IC15. IC17 is selected by the capstan control unit via TC-SL1. The communication of the two MPUs is per formed in interrupt mode. The interrupt is always initiated on the opposite PIA.

In addition to the supply voltage P1 supplies the AC monitoring signal T-PWRON (power failure message). The DC supply monitoring signal T-SUPVON (all DC voltages available) is generated by the fuse failure detector 1.820.732; this assembly is not implemented in the A812 as a standard feature.

This module also contains a status LED DLQ1 which is activated by the tape deck controller when the initialization has been correctly completed.

3.1.3.1.2 Tape Deck Periphery Interface GRP26

Tape deck periphery interface

1.811.773

Function:

Based on the parameters supplied by the tape deck controller 1.811.774 (GRP27) and the analog output signals, the tape deck periphery interface produces analog control signals for the spooling motor controller 1.811.772 (GRP24) for each operating mode (STOP, PLAY, spooling, shuttle, tape dump, etc.).

The move signals (MVCLK, MVDIR) are evaluated in an 8-bit up/down counter. Optimum torque utilization of the asynchronous spooling motors is ensured by the frequency control with VCO (voltage controlled oscillator). This reduces the power dissipation in PLAY mode.

The processor clock is divided down to 76.8 kHz for the pulse width modulation of the output stages.

The voltage is monitored locally. A reference voltage of ±10 V is generated.

The following rules apply:

- The tape tensions of the supply and take-up reel are controlled when the tape speed is controlled by the capstan motor (e.g. PLAY).
- Only the back tension is controlled if the pinch roller is not engaged (e.g. FWD, RWD, shuttle). The torque of the take-up motor is also preset. However in this case the reference value is not a tape tension but the spooling speed of the tape.

Circuit description

GRP 26	1.811.773
Functions only with tape deck software 2x)	1.811.997

The tape deck controller 1.811.774 (GRP27) has direct access to the tape deck periphery via the data, address and control bus (connector P2). An 8-bit bus transceiver (IC14) bidirectionally buffers the tape deck data bus that leads to the tape deck controller. The peripherals are decoded via the two 3-to-8 demultiplexers (IC11 and 12). The base address of the board is 1000 hex. IC17 is an 8-bit output port, IC19 and 8-bit input.port.

The D/A converters (IC25 for left, IC22 for right) fulfill different functions: setting the tape tension reference values and setting the torque/speed for the spooling motor controller 1.811.772 (GRP 24).

The tape tension reference values are generated by IC25 (left) and IC22 (right); the opamps IC24 and IC21 convert the signals to unipolar voltages (0 to +10 V, TP11 for left, TP10 for right). IC 20/2 and 9/2 form the difference between the reference and the actual tape tension. The low passes R50, C16 and R34, C8 are used for suppressing high-frequency noise (TP7, TP6). PD controllers with switch-controlled I-content (Q3 and Q1 via IEN signal) are implemented with IC 20/1 and 9/1. From the bipolar voltages IC1 creates the unipolar control signals ANVML/R (0...10V) for the SPOOLING MOTOR CONTROLLER 1.811.772. With the TTL signal V/TTML/R the analog switch IC4 changes over between tape tension control (L) and torque and speed control (H).

- **PLAY mode** The tape speed is determined by the capstan motor; the tape tension is controlled by booth spooling motors.
- **Spooling mode "FWD"** (Rewind "RWD" analogous) The speed of the take-up motor is determined by the spooling control loop (reference value set by the tape deck controller 1.811.774 via IC25, analog switch IC4 in position HD; the actual speed value is measured with the tape move sensor 1.811.731, the four-edge evaluation and direction detection are performed on the tape deck periphery driver 1.811.779, the clock and direction signal are evaluated by two 4-bit up/down counters on the tape deck periphery interface 1.811.779 and subsequently processed by the tape deck controller 1.811.774 for determining the speed.
 - **STOP** The tape stands still. Both spooling motors are inactive. However both holding solenoids of the tape tension sensors (GRP 82/5 left, GRP 83/5 right) are energized.
 - **TAPE OUT** The tape is unthreaded. The spooling motors are inactive. The holding solenoids of the tape tension sensors are de-energized.

Via the opamp IC13, the D/A converter IC 15 controls the VCO (IC 10, control voltage 0...5 V). The motor control frequency is visible on test point 5 (effective motor control frequency = VCO frequency/512). IC2 and IC6 are switches controlled by the signal FML/R for changing over between a fixed frequency of 25.6 kHz (corresponds to a motor frequency of 50 Hz) and the variable VCO frequency. These signals are supplied via P1 to the spooling motor controller 1.811.772.

The 8-bit up/down counter (IC28 and 29) is supplied by the signals MVCLK and MVDIR. The 8-bit counter reading is connected to the 8-bit bus transceiver IC14 if the enable signal is available. This counter reading is processed by the tape deck controller 1.811.774 for computing the momentary tape address and tape speed. Two retriggerable monoflops IC27 are continually retriggered by the select signal (SLMVCK). If this retriggering fails, a RESET of the tape deck controller is initiated. At the same the periphery are reset via TD-RESET.

From the system clock E (enable pulse, 1.2288 MHz) the reference frequency of 76.8 kHz (TP2) is generated by the binary counter (IC3). This signal in turn is divided by three to obtain the motor reference frequency of 25.6 kHz (TP4).

The temperature compensated reference voltage source IC10 generates the tape deck reference voltage +10 VREF. The reference voltages -10 VREF and +5 VREF are derived by IC8.

A local supply voltage monitoring is implemented with the comparator IC5 (\pm 15 V). The output signals of the comparators are logically combined by Q2 (PENB) with a WIRED-OR circuit and the TD-PENB signal is supplied via P1 to the spooling motor controller 1.811.774.

Test points:

TP1	END	
TP2	76.8 kHz	(TTL)
TP3	+ 10 V reference	
TP4	25.6 kHz	(TTL)
TP5	VCO-OUT	(TTL)
TP6	Reference tape tension R - actual tape tension R	
TP7	MVCLK (MOVE CLOCK)	ΠL
TP8	Reference tape tension L - actual tape tension L	
TP9	MVDIR (move direction)	(TTL)
TP10	Reference tape tension, torque control motor right	(analog 010 V)
TP11	Reference tape tension, torque control motor left	(analog 010 V)
TP12	GND	

3.1.3.1.3 Tape Deck Periphery Driver

Order No.

1.811.779

Functions:

Tape deck periphery driver

- A/D converter for conditioning analog signals for the tape deck controller
- Evaluation of the output signals of the spooling motor tacho and the move sensor
- Spooling motor voltage monitoring
- Control of the tape deck solenoids
- Signal conditioning for user port (not externally accessible)

Circuit description Via the data, address, and control bus (connector P2) the tape deck controller 1.811.774 has direct access to the tape deck periphery. An 8-bit bus transceiver (IC12) bidirectionally buffers the TD data bus that leads to the tape deck controller 1.811.774 GRP27. The periphery is decoded via the 3-to-8 demultiplexer (IC14). The base address of the board is 1100 hex. IC9 is an 8-bit output port, IC7 and 8bit input port. The analog voltages of the two tape tension sensors left/right (AN-TTL and AN-TTR) as well as the motor supply voltage (SUPV) are taken via an active low pass filter IC1 and via an 8-to-1 multiplexer (IC11, controlled by the output port IC9) to the A/D converter, where they are converted to a digital value. The A/D converter works in interrupt mode via Q1 with the tape deck controller (control via IRQEN, IC9). The two 90° phase shifted TTL signals T-CLK1 and T-CLK2 (from the MOVE SENSOR 1.811.731 GRP 82/3) are buffered by IC13 (Schmitt trigger) and input to one D-register (IC4) each. The signals are transferred with the positive edge of the processor clock (TD-E). IC8 (4 EXOR gates) is a 4-edge evaluation circuit. The transfer value of T-CLK2 (7Q) is shifted with two clocks to the output 5Q, combined by an EXOR with the momentary level of T-CLK1, and output as the data signal to IC10 (D-flip-flop).

The D-flip-flop IC10 contains the move direction (TP8: L = forward, H = reverse) TD-MV-DIR. The input signals T-CLK1 and T-CLK2 are also EXORed and shifted through to 1Q via 4D in four cycles or to 2Q in three cycles. This logical combination produces the counting pulses (TD-MVCLK) which are supplied to the up/down counters 74LS 699 on the tape deck periphery interface. The signal TD-MVCLK is a pulse with a width of 0.8 s which is delayed relative to the direction signal (TP-MVDIR) by an additional 0.8 s. Only if 4D and 4Q have different levels will the NAND gate (IC2) be enabled for through-connecting the processor clock (TD-E) so that the data signal is received by IC10.

The D-flip-flop IC10/1 divides the TD-MVCLK signal by two to produce the TD-MVCLKS signal.

Move Sign.	T-CLK1/2	TD-MVCLK (4-slope- evaluation)	TD-MVCLKS (divided by 2)
3,75 IPS	16 Hz	64 Hz	32 Hz
7,5 IPS	32 Hz	128 Hz	64 Hz
15 IPS	64 Hz	256 Hz	128 Hz
30 IPS	128 Hz	512 Hz	256 Hz

Fig. 3.1.7

The signals of the two spooling motor tachos (WCLK1/2 L/R) are also processed via a 4-slope evaluation (IC 17, 19, 21). A PROGRAMMABLE COUNTER TIMER 68A40 on the tape deck controller 1.811.774 (GRP27) is used as a counter. The sense of rotation is supplied via two D-flip-flops (IC18) to an input port of the tape deck periphery interface 1.811.773 GRP26.

Via P5 the already divided positive and negative spooling motor supply voltage (+Ucomp, -Ucomp) is tapped differentially with IC6 and converted to a unipolar signal (TP2, 0...5V) which is supplied to the A/D converter IC3. R25 and D11 monitor the 24 V solenoid supply by means of the TD-24VSC signal, which is taken to an input port of the tape deck periphery interface 1.811.773.

The following signals are supplied to connector P6 (USER PORT) by the drivers IC23/24: TD-MVCLKS, TD-MVDIR, TD-YTRSP, TD-TRSP (the latter two are not used because the OPTO SENSOR module 1.820.793 is not implemented. All tape deck solenoids are controlled via IC8 (3-to-8 demultiplexer driver).

Test points:

TP1	GND	
TP2	SUPV Motor supply voltage	(analog 05 V)
TP3	MVCLK Move clock	(TTL)
TP4	WDIRL Wind direction left	(TTL)
TP5	WCLKL Wind clock left	(TTL)
TP6	WDIRR Wind direction right	(TTL)
TP7	WCLKR Wind clock right	(TTL)
TP8	MVDIR Move direction	(TTL)
TP9	MVCLKS Move clock symmetric	(TTL)
TP10	END	

3.1.3.2.1 Spooling Motor Controller PCB GRP24

Order No.

Spooling motor controller PCB

1.811.772

The spooling motors are 3-phase 4-pole asynchronous motors with hollow rotor in delta wiring. These are 3-phase controlled (for switching principle see SPOOLING MOTOR DRIVE AMPLIFIER 1.811.771 GRP31/32). An artificial 3-phase network with pulsed static power converter that employs the undershooting principle is used.

For each motor two 60°C shifted sine wave signals of identical amplitude, constant phase relation, and variable frequency are generated. The sine waves are generated digitally with counters, PROMs and DA converters. One PROM (512 x 8 bit) contains the discrete values of two 60°C phase shifted sine wave signals of one period. A counter switches the PROM from address to address as a function of the counter clock frequency. The corresponding data are processed by DA converters at whose outputs the analog sine wave signals appear. The amplitude can be adjusted with a DC voltage at the VREF input, while the applied counter frequency influences the frequency of the sine wave voltage, and the counter direction signal influences the sense or rotation. These analog signals are taken to comparators which in turn are supplied by a 76.8 kHz delta signal. This results in a PWM signal which is supplied to the SPOOLING MOTOR DRIVE AMPLIFIER 1.811.771 (GRP31/32).



Fig. 3.1.8



Function:

Preparation of the required signals for controlling the two 3-phase motors.

Amplitude: AN-VML/R (0...10 V)

Frequency: MFL/R (TTL) 12.8 kHz (= 25 Hz) to 51.2 kHz (= 100 Hz)

Sense of rotation: DIRL/R (TTL)
Circuit description (board index 20) This circuit description relates to the control of the left-hand motor (right-hand motor analogous). The 9-bit up/down counter (IC 9, 16, 23) switches the PROM (IC8) as a function of the counter clock frequency from address to address (even addresses SIN1 phase-shifted by 0°, odd addresses SIN2 phase-shifted by 60°). The DA converters IC6 (SIN1) and IC7 (SIN2) convert the data to an analog signal. The opamps IC14, 15 produce from this signal a bipolar analog signal (+10 Vmax.), whose amplitude depends on the applied reference voltage.

Any DC components are eliminated by means of the high pass C24, R36 and C25, R35. The base points relate to ground. The signals are subsequently taken to an active low pass filter of the 2nd order (IC 25). With the negative input a regulator (integrator R32/C49 and R53/C50) with infinite DC amplification is connected for compensating DC voltage components on the power side (signal DCPHR/T-R/L). The low-level signal FETs short-circuit the capacitors when the output stage is inactive (i.e. PENB-H).

IC1 is a temperature-compensated reference voltage source; the integrator is supplied via the voltage divider R5, R11, clocked with Q1 (76.8 kHz). A balanced delta signal (\pm 12 V) appears at the output (TP3). This signal supplies all comparators via 100 Ω decoupling resistors. The pulse width modulated signals are visible after the comparators (IC22, 28) on test points 6 and 11. The signals SIN1 and SIN2 are taken to the SPOOLING MOTOR DRIVER 1.811.771 via the Schmitt trigger (IC26). The retriggerable monoflop (IC4) monitors the availability of the clock frequency (TD-SCK signal).

Test points:

- **TP1** 12.0 V ±0.2 V
- TP2 GND
- TP3 Delta ± 12 V
- TP4 SIN1-L (analog ±10 Vmax)
- TP5 SIN2-L (analog ±10 Vmax)
- TP6 PWM SIN1-L (15 V)
- TP7 PWM SIN2-R (15 V)
- TP8 SIN2-R (analog ±10 Vmax)
- TP9 SIN1-R (analog ± 10 Vmax)
- TP10 GND)
- TP11 SIN2-L (15 V)
- **TP12** SIN1-R (15 V)

STUDER A812

Order No.

3.1.3.2.2 Slew Rate Limiter Board

Function:

	1.811.780
ha control signals	(ANI \/ML /D) for the

 Limiting the rise and decay speed of the control signals (AN-VML/R) for the two spooling motors. Local supply voltage monitoring for the spooling motor controller 1.811.772 GRP24

Circuit description The reference voltage source (IC2, UREF = 2.55 V) is supplied via R8, R9 with 5.6 V as well as +15 V. IC1 and Q1 monitor the supply voltages 5.6 V, ±15 V in combination with the RESET signal, and control the self-conducting FET Q2. The POWER ENABLE signal (PENB) exists only if all supply voltages are available (AND gate IC12). The timing elements R34, R35, C8, IC6 and IC10 are responsible for the ON delay, IC13 latches the signal, provided the two control voltages AN-VML/R are below 1 V (signal PIN 1, IC12). The flip-flop IC 13/1 synchronizes the PENB signal with the 76.8 kHz delta signal (maximum value of the delta voltage), and this signal is output via the level shifter IC7 to IC5 which takes the signal to the spooling motor controller 1.811.772.

Slew rate limiter board

IC3 and 9 together with R17 and R36 form a positive (IC8 and 14 with R23 and R38 a negative) current source which charge or discharge the electrolytic capacitors C7 and C6 via the bridge rectifiers D13...D16 and D22...D25 (max. rise time approx. 120 ms, max. decay time approx. 70 ms).

The now limited output voltages AN-VML/R are compared by the comparator IC4 (the reference voltage is supplied by the voltage divider R13, R15, approx. 1 V) and produce a logic signal (5 V) if AN-VML and AN-VMR are less than 1 V. These two signals are combined at IC 12/3 and enable the PENB signal with IC 12/1. D4, D5, D9, D10, D19, D20, D26 and D27 are not used.

3.1.3.2.3 Spooling Motor Driver Amplifier PCB GRP31/GRP32

Order No.

Spooling motor drive amplifier PCB left-hand motor	1.811.771.00
Spooling motor drive amplifier PCB right-hand motor	1.811.771.81

Function:

- Controlling a 3-phase motor (in delta connection) by means of DC-AC converters in both rotation directions based on two pulse width modulated control signals SIN1-L/R, SIN2-L/R supplied by the SPOOLING MOTOR CONTROLLER 1.811.772 (GRP24/ELM1 (left), LEM2 (right)).
- Supply voltage DC = 180 V
- **Control frequency** 25 Hz...100 Hz AC = 0...63 V
 - **Circuit layout** The reference point of a "star" connected motor is the star point (neutral terminal). If the three phase-shifted voltages are produced artificially, the reference point can be defined as desired because the motor does not require a connection to the star point. If the reference point is placed at one of the corners (one winding phase) and if the 60° shifted, in magnitude identical voltages U1 and U2 are combined, their difference yields a voltage U3 of identical magnitude which is connected to the 3rd motor winding in correct phase relationship.



r ig. 0. i.

Circuit description

The pulse length modulated signals at the inputs SIN1 and SIN2 of 1.811.772 (GRP24, ELM1 or 2) are taken via the Schmitt trigger (IC1) to XOR elements (IC2, IC5) which split the signal into an inverted and a non-inverted signal which are taken to the driver stages (Q4-Q15). The latter are only operative when this is allowed by the externally supplied power enable signal (PENB). Two switch pairs (Q20, Q212 and Q22, Q23) are controlled via the two pulse transformers (T1, T2) with a constant frequency of 76.8 kHz and a variable pulse duty factor. For creating the moment only the current flow is of significance. The energy stored in the filter chokes (L2, L3) maintains the current flow during off periods. If the pulse duty factor of all pulses is 50%, the mean current flow is zero. If the carrier is modulated, the mean value changes sinusoidally according to the degree of modulation between a positive and a negative maximum value. The two resulting voltages (AN-R, AN-T) with identical amplitudes must be 60° phase shifted relative to each other.

Order No.

Module identification:		
Index .81:	Introduction of chokes (L4-L7) in the load circuit	
Index .82:	Push-pull control of the pulse transformers, idle time in the gate control circuit shifted, supply voltage monitoring combined with PENB signal (Q3).	

3.1.3.3.1 Tape Tension Sensor	PCB	
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Tape tension sensor:			.811.730 .811.728
Function:		 Measuring the tape tension; the angle by which the sensor lever is of is converted to an analog voltage (AN-TTL or AN-TTR respectiv supplied to the TYPE DECK PERIPHERY DRIVER 1.811.779 (GRP2 (left)/ELM6 (right). 	ely) and
Circuit description:		IC4 together with R15/R16 and C9 forms an oscillator which oscillate frequency of approx. 833 kHz. The oscillator signal is amplified and induce a magnetic pulsating field. The degree to which the decoupling coil L2 is by the screen plate coupled with the sensor arm, depends on the deflect tape tension sensor. D2, D3 are full-wave rectifiers. The signal is amplified The signal AN-TTL/R is aligned with R27 to 0 \pm 50 mV (no deflection) and to 4 V \pm 50 mV (full deflection).	ces in L1 damped on of the d by IC3.
Test points:			
	TP1:	Signal AN-TTL/R (04 V)	
	TP2:	Signal TAPE END (TTL)	
	TP3:	GND	

3.1.3.3.2 Move Sensor PCB GRP82/ELM3

Order No.

1.811.732

Move sensor PCB

Function:

- Scanning and transmitting the tape speed and the move direction (actual value) of the tape to the TAPE DECK PERIPHERY DRIVER 1.811.779 (GRP25/ELM25) in the form of two TTL square-wave signals with 90° phase shift.
- **Circuit description:** The 20 teeth of the toothed ring interrupt the two light barriers DLQ1 and DLQ2 when the left-hand guide roller turns. The light barriers are arranged in such a way that the output signals (TTL) T-CLK1 and T-CLK2 are phase shifted by 90° relative to each other.

Admissible tolerance range of the phase shift ±30°



Fig. 3.1.11

Circuit with Index		00/.81/.82 The output signals of the light barriers are converted to TTL signals by IC1 (dual differential line receiver with Schmitt trigger characteristic). The reference voltage is defined by R9/R10. R4 and R7 prevent any oscillation tendency.		
Test points:				
	TP1:	GND;		
	TP2:	T-CLK2 (TTL),		
	TP3:	T-CLK1 (TTL)		
Module modifications	:			
Index .81		Introduction of light barriers with defined aperture H 22A1		
Index .82		Increase in the reference voltage		
Index .83		New circuit with automatic pulse duty adjust		

Circuit with index .83: The collector currents of the photo transistors produce a voltage signal on the load resistors R1/R12. Because the collector currents can vary extremely, The difference between the signal and its mean value is amplified by the subsequent opamp (IC1). To ensure that this circuit functions correctly when the tape stands still, the working range for forming the mean value is slightly narrowed (by R9, R2) relative to the signal range. Any oscillation tendency of the circuit is suppressed by regenerative feedback at the positive input of the opamp (by means of R6, R8). The output signals are converted to TTL level by Q1 and Q2. In PLAY mode the scanner operates with the following frequencies:

A812	T-CLK1/2 (TTL)	
3,75 IPS	16 Hz	
7,5 IPS	32 Hz	
15,0 IPS	64 Hz	
30,0 IPS	128 Hz	

3.1.3.3.3 Tape End Switch PCB GRP 82/ELM2, GRP 83/ELM2		
	Tape end switch PCB, left Tape end switch PCB, right	1.810.729 1.810.729
Function:	 Detection of the tape end. Signals TEND L/R (TTL). Transmission to deck periphery driver 1.811.779. 	
Circuit description: When the tape tension sensor is in its neutral position (i.e. AN-TLL/R = 0 light barrier DL Q1 is enabled (hole in the linkage of the dashpot of th tension sensor). The signal is evaluated on the tape tension sensor 1.811.730 GRP 82 (left); 1.811.728 GRP 83 (right).		shpot of the tape

3.1.3.4.1 Capstan Control Unit 1.820.764 GRP20/ELM42

	Capstan control unit	1.820.764
Function:	 Autonomous control of the capstan motor 	
Circuit description:	IC16 is an 8-bit NMOS processor type MC 6803-1. The contro comprising 16 K-bytes is stored in ROM (IC17). IC15 is a CMOS F capacity of 2 K-bytes.	
	With the 8-bit D-latch IC14 the addresses A0A7 from the de data/address bus are assigned by IC16 to the address bus. The syst (ENABLE PULSE) is generated internally with quartz accuracy, and or retriggerable monoflop (IC8) after it has been inverted (IC11). After inverted again, the clock is output as TC-ENB to the CAPSTAN INTERF the (future) synchronizer.	em clock E utput to the it has been
	To ensure correct timing the system clock E is also output to the (OUTPUT ENABLE of the ROM and RAM (IC17 and IC15).	e OE input

Order No.

IC18 monitors the 5 V supply and generates a defined reset pulse when the machine is powered on as well as after transient line voltage interruptions when the machine is in operation. The CAPSTAN MOTOR CONTROL UNIT can be reset manually with the key S1.

The TD-CRES signal can also initiate a reset of the TAPE DECK PERIPHERY CONTROLLER.

Jumpers JS1...JS3 define the operating mode of the MPU IC16. These jumper settings are fixed.

The address decoder IC12 (two 2-bit binary decoders) generates the CHIP SELECT signals from the addresses A13, A14 and A15 for the ROM, the RAM, as well as the enable signal for IC3 and IC2, and the signals TC-SL1...TC-SL4. IC3 is a bidirectional data buffer; the direction is determined by the read/write signal R/W.

The control bus is buffered by an 8-bit bus driver (IC2).

3.1.3.4.2 Capstan Motor Interface GRP20/ELM41

Capstan motor interface

Functions:

- Changeover and processing of the signals of the internal or external varispeed control.
- Digital/analog conversion for controlling the CAPSTAN MOTOR DRIVE AMPLIFIERs.

Circuit description: Eight bits are transferred via IC3 (8-bit D-register) from the DAC (IC4). The reference voltage for the D/A converter is set with IC6 (TP1: 10 V). The analog voltage is output to the CAPSTAN MOTOR DRIVE AMPLIFIER 1.820.774 via IC5 (AN-CSPDC).

The tacho signals TD-TCM1/TD-TCM2 generated by the TACHO SENSOR PCB GRP 84 are 90° shifted pulses from which the rotation direction signal TC-TCDIR (for the synchronizer) and TC-CDIRI for the CAPSTAN CONTROL UNIT 1.820.764 (GRP 20/42) are generated.

The two tacho signals TD-TCM1 and TD-TCM2 are converted by IC13 and one of the two AND/OR/INVERT gates with 2x2 inputs (IC14) to a signal with double the frequency (TC-TCMV, TC-TCTNI). With TC-TCMVI the CAPSTAN CONTROL UNIT determines the actual tape speed. By contrast, TC-TCMV is intended for a synchronizer.

The changeover between the internal or external varispeed control is performed by the signal TC-INEX. The two signals T-REFINT (from the internal) and T-REFEXT (from an possible external varispeed control) are buffered in IC12, and with the TC-INEX signal (from the CAPSTAN CONTROL UNIT) they are logically combined to the RC-REF signal by the second AND/OR/INVERT gate in IC14. This output signal is processed in the CAPSTAN CONTROL UNIT and is returned as TC-REFP.

The D-flip-flop IC9 divides the TC-REFP signal by 2 and supplies the result to the programmable timer IC2. The MPU of the CAPSTAN CONTROL UNIT can now determine the speed based on the selected nominal tape speed and the reference frequency from the varispeed control.

Order No.

1.811.775

3.1.3.4.3 Tacho Sensor Electronics PCB GRP 38

Order No.

Tacho sensor electronics PCB	1.021.695
 Generating the capstan motor tacho signals TD-TCM1 and TCM2 shifted square-wave signals with TTL level) and transmission of the via the CAPSTAN MOTOR DRIVE AMPLIFIER 1.820.774 (GRP CAPSTAN INTERFACE 1.811.775 (GRP20/ELM41) Processing of the output signals of the three Hall effect sensors of SENSOR PCB 1.021.697 (built into the capstan motor, not acc service purposes) and transmission of these signals to the MOTOR DRIVE AMPLIFIER 1.820.774 (GRP85). 	ese signals 85) to the In the HALL ressible for
The capstan motor tacho consists of two insulating plastic rings, th which is equipped with teeth made of conductive plastic, and the toothed brass rotating mass (90 teeth) which are rigidly connected to t shaft.	externally
Of the conductive teeth on the plastic rings, 14 are electrically inter This results in 6 tooth segments per ring. Three of these segments, e 120° offset, are also conductively interconnected.	
These two groups of three, with the toothed rotating mass in betwe considered as a variable capacitor whose capacitance varies when t mass rotates (see Fig. 3.1.6). The frequency of this capacitance vari times greater than the rotational frequency of the capstan shaft. These are mutually offset by one half tooth so that they can be used no detecting the rotational speed but also the sense of rotation.	he rotating iation is 90 e two rings
The main oscillator (approx. 5.5 MHz) is implemented with Q1, L1, a output signal is connected to the input of IC6 and IC amplifiers/demodulators).	
The variable capacitances inside the capstan motors together with the t L2 (of IC6) and L3 (of IC7) constitute two parallel resonant circuits whi tuned to the frequency of the main oscillator. When the capstan motor tuning of the two parallel resonant circuits changes. The output signals FM demodulators are AF signals with the same frequency as the o change of the capstan motor tacho, but with a phase shift of 90°.	ch are also rotates, the s of the two
These two signals are first amplified by IC2/1 and IC5/1 respectively converted to square-wave signals by the Schmitt triggers IC5/2 respectively.	
The edge steepness is subsequently increased with two comparators open collector outputs of the comparators (signals TD-TCM1 and TD- looped via the CAPSTAN MOTOR DRIVE AMPLIFIER 1.820.774 (GRI CAPSTAN INTERFACE 1.811.775 (GRP20/ELM41); the two pull-up re also located there.	-TCM2) are P85) to the
	 Generating the capstan motor tacho signals TD-TCM1 and TCM2 shifted square-wave signals with TTL level) and transmission of th via the CAPSTAN MOTOR DRIVE AMPLIFIER 1.820.774 (GRP CAPSTAN INTERFACE 1.811.775 (GRP20/ELM41) Processing of the output signals of the three Hall effect sensors on SENSOR PCB 1.021.697 (built into the capstan motor, not acc service purposes) and transmission of these signals to the MOTOR DRIVE AMPLIFIER 1.820.774 (GRP65). The capstan motor tacho consists of two insulating plastic rings, the which is equipped with teeth made of conductive plastic, and the toothed brass rotating mass (90 teeth) which are rigidly connected to t shaft. Of the conductive teeth on the plastic rings, 14 are electrically inter This results in 6 tooth segments per ring. Three of these segments, et 120° offset, are also conductively interconnected. These two groups of three, with the toothed rotating mass in betwe considered as a variable capacitor whose capacitance varies when t mass rotates (see Fig. 3.1.6). The frequency of this capacitance variatings greater than the rotational frequency of the capstan shaft. These are mutually offset by one half tooth so that they can be used in detecting the rotational speed but also the sense of rotation. The wariable capacitances inside the capstan motors together with the field (CG) and L3 (of IC7) constitute two parallel resonant circuits whit tuned to the frequency of the main oscillator. When the capstan motor turing of the capstan motor tacho, but with a phase shift of 90°. These two signals are first amplified by IC2/1 and IC5/1 respersubsequently converted to square-wave signals by the Schmitt triggers IC5/2 respectively. The edge steepness is subsequently increased with two comparators open collector outputs of the comparators (signals TD-TCM1 and TD looped via the CAPSTAN MOTOR DRIVE AMPLIFIER 1.820.774 (GRI CAPSTAN INTERFACE 1.811.775 (GRP20/ELM41); the two pu

The output signals of the three Hall effect sensors on the HALL SENSOR PCB 1.021.697 are taken via connector P2 to the TACHO SENSOR ELECTRONICS PCB 1.021.695 (GRP84). The comparators IC3 and IC4/1 evaluate the signals. The open-collector outputs of the comparators (signals TC-HALL1, TC-HALL2, and TC-HALL3) are connected to the inputs pin 10, 11 or 12 of the LOGIC CONTROL ICs on the CAPSTAN MOTOR DRIVE AMPLIFIER PCB 1.820.774 (GRP85). The three pull-up resistors are also located there.

Alignments and test points: see 3.3.10



Fig. 3.1.12

3.1.3.4.4 Capstan Motor Drive Amplifier PCB GRP85

Order No.

Capstan motor drive amplifier PCB

1.820.774

The capstan motor is a 3-phase motor with a multipole permanent magnet rotor and a stator with 24 windings. The commutation is performed by Hall effect sensors in the motor and by logical combination of the output signals of the Hall elements. The motor speed is determined exclusively by the operating voltage. The nominal operating voltage is 40 V DC.

Functions:

- Low-loss control of the motor speed via the operating voltage by means of switching regulators (76 kHz) based on the analog input signal AN-CSPDC from the CAPSTAN INTERFACE 1.811.775 (GRP20/ELM41).
- Controlling the three stator windings with three-stage (+, high-impedance, ground) sinusoidal square-wave signals as a function of the output signals TC-HALL1...3 from the TACHOSENSOR ELECTRONICS PCB 1.021.695 (GRP84) and the "rotation direction bit" TC-CAPDC from the CAPSTAN CONTROL UNIT PCB 1.820.764 (GRP20/ELM42).

Circuit description:

The switching regulator is implemented with IC4. It receives its clock frequency (TM-C7CK, 76 kHz) from the MP UNIT 1.811.786 (GRP20/ELM44). The clock frequency is monitored in the band-pass filter around IC6/2, shaped into a square-wave signal by the Schmitt trigger IC6/1, and subsequently shaped by IC3 (ONE SHOT) into needle pulses of the same frequency. These pulses control the internal oscillator of IC4. If these pulses fail, IC4 generates its on clock.

The reference value is supplied as the signal AN-CSPDC (0 to 10 V) by the CAPSTAN INTERFACE 1.811.775 (GRP20/ELM41), buffered with IC1/1, and compared to the actual value with IC1/2. The voltage divider R14, 38/R44 determines the factor by which the operating voltage of the motor is greater than AN-CSPDC (approx. 4). The correcting variable is taken via IC2/2 to the switching regulator chip IC4.

The output of IC4 is connected to a fast switching stage with MOSFETs (Q1...8) which together with L3 and C10 produces the supply voltage + CAPMOT (about 43 - 63 V) for the capstan motor (approx. 5 to 40 V, depending on the speed).

The 6 outputs of the LOGIC CONTROL ICs, IC5, each control one Darlington transistor (Q10, Q12, Q14, Q16, Q18, Q20). Each pair of these six Darling circuits can be considered as a 3-position switch. Position 1: supply voltage; position 2: open; position 3: ground. These three switches produce the previously mentioned, 120° phase shifted sinusoidal signals C-PHASE-R, -S, and -T.

The timing of the three phases is determined by the TC-CAPDC. This permits fast deceleration as well as reversal of the capstan motor.

The supply voltage of the LOGIC CONTROL IC (IC5) is monitored with IC2/1. If it drops below approx. 4 V, the correct function of IC5 is no longer assured (switching transistors can become damaged). For this reason the output of IC2/1 inhibits the pulse width modulator, and its output voltage drops to 0 V.

3.2 Removing the Assemblies

- Open the flap on the amplifier bay: unfasten the stop screw (hexagon-socketscrew key No. 3). Open the flap with a sharp pull.
- Folding down the amplifier bay: unfasten the two stop screws (hexagonsocket screw key No. 3). Lightly lift the amplifier bay and press the button in the middle to release the catch. We recommend that you manually cushion the amplifier bay as it swings out. To close the bay it should be engaged with moderate momentum.

FOR MEASURING THE WEIGHTED AND LINEAR SIGNAL-TO-NOISE RATIO AND THE RF RATIOS, THE AMPLIFIER BAY MUST BE CLOSED AND THE THREE STOP SCREWS TIGHTENED!!

WARNING DISCONNECT THE POWER PLUG BEFORE YOU REMOVE ANY HOUSING PANELS!

3.2.1 Covers

Headblock cover



Fig. 3.1.13

- Unscrew the pinch roller cover (without tool) and remove the pinch roller.
- Unfasten 4 screws M4 (hexagon-socket screw key 2.5 mm)

Head cover

For aligning the azimuth of the audio heads, only the head cover needs to be removed.

- Unfasten 1 screw each (hexagon-socket-screw key 2.5 mm) on the left and right of the head cover.
- When reassembling make sure that the head feeder lines do not get pinched (applies particularly to time code machines).

Tape deck cover, top



Fig. 3.1.14

- Unfasten 8 screws M4 (hexagon-socket-screw key 2.5 mm)
- Unfasten the two guide rollers (without tool) and remove the roller.
- Lift off the tape deck cover (the head block cover must be removed).



Fig. 3.1.15

- Unfasten 6 screws (hexagon-socket-screw key No. 2.5)
- Remove the cover.

Tape deck cover, bottom

Rear panel

- Unfasten 4 screws (hexagon-socket-screw key No. 2.5).
- Fold down the rear panel.





Wooden side panels

Unfasten four screws on each panel (hexagon-socket-screw key No. 4).

3.2.2 Headblock Assembly

- Remove the headblock cover (3.2.1)
- Important !! To prevent unwanted magnetization of the soundheads, the tape recorder must be switched on when you remove or install the headblock assembly.





- Unfasten three screws M4 (hexagon-socket-screw key 3 mm).
- Carefully slide out the head block so that the capstan shaft does not become damaged.
- Do not turn the headblock upside down, otherwise the three screws drop out.

3.2.3 Tape Tension Sensors

- Remove the headblock cover and the tape deck cover (3.2.1).
- Tape tension sensor, left
- Separate the flat cable marked TAPE TENSION LEFT from its connector.
 Unplug two stranded connecting wires (blu, vio) from the EDIT solenoid.

- Loosen 1 screw M3 (hexagon-socket-screw key 2 mm) so that the spacer can be shifted.
- Unfasten 3 screws (hexagon-socket-screw key 2.5 mm).
- Remove the tape tension sensor.
- Do not turn the tape tension sensor upside down, otherwise the 3 screws drop out.

When reassembling make sure that the:

- Polarity of the EDIT solenoid is correct (vio = +),
- Flat cable (tape tension left) is plugged in

Fig. 3.1.18

Tape tension sensor, right

Separate the flat cable marked TAPE TENSION RIGHT from its connector.
 Unplug two stranded connecting wires (grn, vio) from the EDIT solenoid.



Fig. 3.1.19

- Loosen 1 screw M3 (hexagon-socket-screw key 2 mm) so that the spacer can be shifted.
- Unfasten 3 screws (hexagon-socket-screw key 2.5 mm).
- Remove the tape tension sensor.
- Do not turn the tape tension sensor upside down, otherwise the 3 screws drop out.

When reassembling make sure that the:

Polarity of the EDIT solenoid is correct (vio = +),

3.2.4 Tape Lifter

12

Tape lift pin

Remove the tape deck cover (3.2.1) and the head block (3.2.2). Unhook the return spring on the pinch arm.



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Fig. 3.1.20
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- Unhook one return spring each on the left and the right.
- Remove one circlip each from the left-hand and the right-hand tape lift pin.
 - Remove the circlip above the black plastic clip and remove the clip toward the top.
 - Remove the left-hand and right-hand tape lift pin.
 - When reassembling make sure that the coupling pin (A) is located on the left of the roller (B).

Tape lift solenoid

Remove the monitor module (3.2.11), if configured.



Fig. 3.1.21

- Remove the circlip (C).
- Remove the lever (A).
- Unfasten 2 screws M4 (hexagon-socket-screw key 3 mm), remove the solenoid toward the front. Do not tilt the solenoid, otherwise the armature drops out.
- Unplug two stranded connecting wires (yel, vio).
- When reassembling make sure that the polarity of the connections is correct (vio = +)

3.2.5 Pinch Roller Assembly

- Remove the head block cover, the headblock, and the lower tape deck cover (3.2.1).
- With a forceful jerk pull the circuit board frame on the bottom of the unit out of the snap closures on the left and right. Tilt down the circuit board frame.
- Remove the tape lift pin (3.2.4).
- Unplug the two stranded connecting wires (or, vio) of the pinch roller solenoid.



Fig. 3.1.22

- Unfasten 3 screws M4 (hexagon-socket-screw key 3 mm).
- Carefully remove the pinch roller assembly toward the front.

When reassembling make sure that the:

- Pin at the pinch roller arm is engaged in the plastic lips.
- The polarity of the pinch roller solenoid connections is correct (vio = +).
- Return spring on the pinch roller arm is engaged.

3.2.6 Spindle (incl. Brake Roller)

- Remove the upper tape deck cover.
- Release the adapter by pressing against the ring at the edge of the spindle and remove it.
- Unfasten the screw in the center of the spindle ((hexagon-socket-screw key 2.5 mm).
- Gently press against the two brake levers to lift the brakes so that the spindles can be removed without twisting the brake band.

CAUTION! THE HEIGHT OF THE BRAKE DRUM IS SET WITH SHIMS. MAKE SURE THAT THESE SHIMS ARE NOT LOST OR CONFUSED!

NEITHER THE INSIDE OF THE BRAKE BAND NOR THE BRAKE LINING (REDDISH FABRIC) MAY BE TOUCHED WITH UNGLOVED HANDS !!

When reinstalling make sure that the brake band is not twisted. - Release the band by pressing against the two brake levers !

3.2.7 Tape Brakes

- Remove the tape deck cover (3.2.1)
- Remove the spindle (including brake roller).



Fig. 3.1.23

- Unfasten 3 screws M3 (hexagon-socket-screw key 2.5 mm).
- Carefully remove the brake chassis toward the top.
- Important !! The brake bands should be neither kinked nor the inside be touched with ungloved hands!

Kinked brake bands must be replaced, contaminated brake bands should be cleaned with alcohol!

- Unplug the connections of the EDIT solenoid (white, vio) and the brake solenoid (brn, vio).
- When reassembling make sure that the polarity is correct (vio = +).
- Important !! The brakes must be readjusted after the brake chassis has been installed.

3.2.8 Spooling Motors

- Remove the tape deck cover (3.2.1)
- Remove the spindle, including brake roller (3.2.6)
- Remove the brake chassis (3.2.7).
- Unplug the connection cable spooling motor left/right from the socket (Molex) above the brake chassis).



Fig. 3.1.24

- Unfasten 3 screws each M4 (hexagon-socket-screw key 3 mm).
- Carefully lift out the motor toward the top.

3.2.9 Capstan Motor

- Remove the upper and lower tape deck covers.
- Tilt down the tape deck circuit board holder.
- Unplug the multipin connector (MOLEX) on the CAPSTAN MOTOR DRIVE.
- Unfasten three special screws (hexagon-socket-screw key 3 mm) from the top. While unfastening the screws, support the motor from the bottom so that it cannot drop out of the machine.



Fig. 3.1.25

3.2.10 Power Supply

- Remove the lower tape deck cover.
- Tilt down the amplifier bay (2 (hexagon-socket-head screws No. 3) and remove the power supply cover (7 hexagon-socket-head screws No. 2.5).
- Remove the plastic cover above the power supply.
- Unfasten 3 hexagon-socket-head screws No. 3 on the side of the power supply and one hexagon-socket-head screw No. 2.5.
- Carefully lift out the power supply and secure it with one hand.
- Unplug the 2 multipin connectors (Molex), one Cis connector, and the yellow stranded ground conductor on the power supply.
- Unscrew the power line filter on the right-hand side of the power supply (2 hexagon-socket-head screws No. 2.5).

3.2.11 Spooling Motor Drive Amplifier (2 X) and Switching Stabilizer Boards

- Unfasten the rear panel at the 4 screws (hexagon-socket-screw key No. 2.5) in the corners and swing it down.
- SPOOLING MOTOR DRIVE AMPLIFIER: Unfasten two multipin connectors (Molex) and one flat cable.
- Switching stabilizer: Unplug two multipin connectors (Molex).
- Each of the three modules is secured by two screws (hexagon-socket-screw key No. 2.5) on the rear of the unit.

3.3 Checks, Adjustments

3.3.1 Power Supply

Checking the supply voltages:

Switch off the machine.

- Remove the CODE READ/WRITE UNIT 1.820.721 and reinstall it via the extender board (1.820.799.00). If the machine is not equipped with a CODE READ/WRITE UNIT, the extender board must nevertheless be installed in the corresponding position.
- Switch on the machine.
- Measure the following voltages on the extender board, relative to ground (TP21):
- TP24: +5.6 V ±0.1 V (adjustable with R21 on the SWITCHING STABILIZER PCB 1.820.790)
- TP 22: +15 V ±0.1 V (adjustable with R6 on the SWITCHING STABILIZER
- TP 23: -15 v ±0.1 V PCB 1.820.790)

To measure the non-adjustable voltages, swing down the rear panel of the machine and measure directly on the SWITCHING STABILIZER PCB 1.820.790, refer to the circuit diagram.

- +24 V ±1 V
- +26 V ±1 V
- - 26 V ±1 V
- STABIN+
- STABIN -
- CAPMOT

uncontrolled voltages which range between 30 V, and 63 V, depending on the load of the configuration of the machine.



Note: The voltages specified above are also available on the 16-pin flat cable connector P11 (ELM12) on the BASIS PCB 1.811.700. For easy tapping, an adapter cable with test points should be used.

Pin assignment of the connector P11 (ELM12):

	Pin 1, 2:		C	APM	OT
	Pin 4:		+	24 V	
	Pin 5:		S	TABI	N-
	Pin 7, 8:		S	TABI	N+
	Pin 9, 10:		+	5.6 \	/
	Pin 11, 12:		0	V 0.	
	Pin 13:		-1	15 V	
	Pin 14:		+	15 V	
	Pin 15:		+	26 V	
	Pin 16:		-2	26 V	
Tho	connector	P11	ie	nin	con

The connector P11 is pin compatible with the FUSE/SUPPLY FAILURE DETECTOR PCB 1.820.737 of the STUDER A820. For this reason it is possible to use this board for measuring purposes.

Pin assignment ...



Fig. 3.1.27 (A820 Fuse/Supply Failure Detector 1.820.737)

3.3.2 Move Sensor (Tape Move Sensor)

Checking the TTL signals:

SIGNAL- NAME	CLOCKWISE- ROTATION	COUNTERCLOCK-: WISE ROTATION	MOVE SENSOR PCB
T-CLK1L			TP3 or pin 7 on the connector (GND=TP1)
T-CLK2L			TP2 or pin 8 on the connector (GND=TP2)

Fig. 3.1.28

64 Pulses per second at 15 ips (t = 15.6 ms)

Checking the tape timer:

The tape timer should increment and decrement correctly at all tape speeds.

Brake the left-hand guide roller by hand. The tape timer should not advance, the machine should switch to STOP.

The error message TACHO ERROR appears on the LC display.





Exchanging the light barriers DLQ1 and DLQ2

After one of these two light barriers has been replaced, the signals T-CLK1L and T-CLK2L must be checked according to the above diagram. If the required phase relation between the two signals is not achieved, one of the two light barriers must be adjusted (unsoldering, lightly rotating and resoldering) until the desired phasing is achieved. The location of the entire TAPE MOVE SENSOR also influences the phasing, however to a lesser degree. This may also have to be taken into consideration.

3.3.3 Mechanical Brakes

Improperly serviced or unprofessionally adjusted brakes can cause the tape to tangle or to tear. Check in regular intervals that the brakes act smoothly and that no loops are formed even when the difference in the tape pancake diameters is very large. Brake bands should be checked for wear and contamination.

The tape brakes are self-regulating: even if the friction coefficient changes, the braking force remains constant across wide ranges.

Preparatory steps: Remove the tape deck cover; unplug the 3-pin tape end sensor connector on the left-hand tape tension sensor.

The brake bands and brake linings must be absolutely clean and free of grease. Contaminated brake bands and brake linings can be cleaned with alcohol. Make sure that they are no longer touched with ungloved hands after they have been cleaned.

The brake bands should not have any kinks and contact the full width of the brake lining.

When replacing the brake drum make sure that there is no residual adhesive on the brake drum.

If the braking force is too weak after the brake bands have been replaced, they can be lightly roughened with a SCOTCH "pot cleaner".

To adjust the brake delay, the brake springs can be fastened in three different positions each. Refer to the illustration below with the springs [A] in the maximum setting, springs [B] in the medium setting.



Fig. 3.1.30

Basic adjustment of the brake chassis	 Switch off the tape recorder. Shift the brake chassis [1] in such a way that the distance between the two brake levers [2] and the tape lift pin [3] is approx. 1 mm. Secure the adjustment with three hexagon-socket-head screws [4] (2.5 mm). Make sure that the brake chassis is only shifted in parallel. Switch on the tape recorder. Check that the two brake systems are released simultaneously by the lifting pins. If this is not the case, check that the spooling motors are positioned correctly. If minor differences still occur, this can be corrected by lightly bending the levers [2].
Adjusting the EDIT solenoid	 In order to adjust the EDIT solenoid [5] it must be energized: connect the machine to the AC outlet and switch it on. Shift the two mounting screws [6] (hexagon-socket-screw key No. 2.5) of the magnet [5] in such a way that a gap of approx. 1 mm is created between the tape lift pin [7] and the brake lever [8]. The lever [2] should contact the pin [3]. Retighten both fixing screws [6].
Adjusting the brake solenoid	 On the right-hand tape tension sensor also unplug the 3-pin connector. Select TAPE DUMP or TAPE DUMP and PLAY, depending on which of the four TAPE DUMP functions A, B, C or D is programmed. Unfasten the two fixing screws [10] (hexagon-socket-screw key No. 2.5) of the brake solenoid [9] and shift it in such a way that the end of the lever [2] has a travel of 2-3 mm between the neutral position and the released brake. Retighten the two fixing screws. When the brake system is released, the two spooling motors should rotate without binding. Both brake levers should lift in parallel. The correct functioning of the brakes can be checked by briefly turning the spindles forward and backward (power switch off).
Measurement the braking torques	 Switch on the recorder (the 3-pin connectors of the left-hand and right-hand tape tension sensors are still disconnected). Mount an empty reel with a core diameter of approx. 100 mm and with 2 to 3 m of tape in the take-up direction. Hook a spring dynamometer into the leading end of the tape and pull it smoothly forward (direction of arrow). The EDIT braking torque in the take-up and supply direction should be 0.8 to 1.1 N (80 to 110 p). The torque can be corrected with spring [A]. To measure the braking torque the 3-pin connectors of the tape-end sensor must be reinserted. The tape tension sensors should be in their neutral position. The braking torque in the take-up direction should be 2.6 to 3.2 N (260 to 320 p). The braking torque difference between the left-hand and right-hand side should not exceed 0.5 N (50 p). Correction: with spring [B].



3.3.4 Tape Tension Sensor

NOTE:

The illustrations relate to the left-hand tape tension sensor.





Mechanical function check	 Mobility of bearings and dashpot: Move the tape tension sensor manually from the neutral position to the maximum deflection point. No grinding or rattling noises should be audible. The screening plate should not scrape against any parts; the tape tension and the stop spring should not touch any other parts.
Damping: Important !!	 Check the smooth and immediately effective damping in the winding direction, also the function of the nonreturn valve in the pump piston. After the dashpot has been replaced, the damping requires no adjustment because this element has been adjusted by the factory. When installing the dashpot make sure that the cylinder bottom is not twisted!
Checking the tape transport:	With installed tape tension sensor and threaded tape in PLAY mode, visually check the tape transport (height adjustment) at the idler roller and the small guide roller.
Adjusting the EDIT solenoid	

Fig. 3.1.33

- With the EDIT solenoid in the neutral position, the toothed section must be adjusted in such a way that the teeth mesh completely and parallel with those of the toothed disk (slot cover).
- The distance of the tip of the teeth on the toothed section should be 1 mm ±0.5 mm throughout the entire deflection range of the tape tension sensor.



Important !! The solenoid should always be shifted parallel to the base plate!



- Push the armature with your finger in the direction of the arrow.
- Unfasten the two screws (hexagon-socket-screw key No. 2.5) of the solenoid holder and shift the magnet in parallel so that the brass disc is still freely movable (corresponds approx. to the play specified in Fig. 3.3.9).
- Tighten the two screws and secure them laterally with locking paint.



Fig. 3.1.35

Adjusting the tape tension spring:

- Switch off the tape recorder. Remove the tape deck cover.
- Mount the guide rollers (without cover). Hook the spring dynamometer to the shaft and pull parallel to the lateral edge of the tape recorder.
- The force of the tape tension spring is adjusted with the tensioner [A]. It should be noted that the value for the left-hand tape tension sensor is to be set to $0.9 \text{ N} \pm 0.1 \text{ N}$ (90 p $\pm 10 \text{ p}$) and for the right-hand tape tension sensor to $1.1 \text{ N} \pm 0.1 \text{ N}$ (110 p $\pm 10 \text{ p}$) with a tape tension sensor deflection of -15°, or a distance of 45 mm between the top edge of the front panel and the bottom edge of the guide roller.
- A ruler or the B67 tape tension alignment gauge, part No. 10.044.001.00 can be used.





- **Important !!** Due to the hysteresis of the spring dynamometer, the measurement should only be made in the tensioning direction.
 - After the adjustment has been completed, tighten the adjustment screw of the tensioner [A] and secure it with locking paint.

Tape tension sensor PCB

Adjusting the offset and the gain of the TAPE TENSION SENSOR PCB

- Connect the digital voltmeter to the two test points TP1 (AN-TTL/R) and TP3 龖 (ground).
- Neutral position (without tape): Align the offset with R27 on both TAPE TEN-8 SION SENSOR PCBs to 0.000 V ±0.005 V.
- Deflect the tape tension sensor to +20° or a distance of 64 mm between the top edge of the front panel and the bottom edge of the guide roller; align the gain with R26 on the two TAPE TENSION SENSOR PCBs to 4.000 V \pm 0.005 V.

1.811.728



- After this alignment secure each potentiometer with a drop of locking paint, 88 diam. approx. 2 mm.
- Important !! Leave the slots of the trimmer potentiometers open!



Fig. 3.1.38

Adjusting the dashpot The dashpot cannot be adjusted "in the field" due to the lack of alignment gauges. Suitable gauges are in development. If the dashpot does not provide smooth and immediately acting damping, it should be replaced. Replacement dashpots require no adjustment because they are factory-adjusted to the correct value.

3.3.5 Tape end Sensor

(PCB at the dash pot)

Mechanical adjustment:

- Switch on the tape recorder.
- Deflect the arm of the tape tension sensor by approx. 2 to 2.5 mm from the stop position, and adjust the TAPE END SENSOR PCB in such a way that the T-TENDL signal (left-hand tape tension sensor, TP2) and the T-TENDR signal (right-hand tape tension sensor) just switch to logical 1 (HIGH); TP3 = ground).



- Pretension the arm with the spring dynamometer (10 N ±1 N or 1 kp ± 100 p). The T-TENDL/R signal should always remain logical 0 (LOW).
- Tighten the adjustment screw and secure the locking paint.
- Reinstall the guide rollers.



Fig. 3.1.40

Function check:

- Switch on the tape recorder, tape deck in STOP mode, both tape tension sensors in neutral position. The EDIT solenoid of the brake chassis should drop out, the STOP control lamp should flash for approx. 10 seconds.
- Deflect the tape tension sensor from the neutral position. The EDIT solenoid of the brake chassis and the EDIT solenoid of the left-hand tape tension sensor should pick up.
- Restore the tape tension sensor to the neutral position and repeat the same check with the right-hand tape tension sensor.

3.3.6 Pinch Roller Assembly

The pinch roller arm is actuated by an electromagnet. The pinching force is determined by the built-in spring.

Adjusting the pinching force:

- Switch off the tape recorder.
- Remove the tape transport cover.
- Reinstall the pinch roller (without cover)
- Separate the 3-pin connectors at the two TAPE TENSION SENSOR PCBs.
- Hook the spring dynamometer 0...20 N (0...2 kp) to the thread of the pinch roller shaft.
- Switch on the tape recorder.

- Select TAPE DUMP or TAPE DUMP and PLAY (depending on which of the four TAPE DUMP functions, A, B, C or D, is programmed.
- Pull the spring dynamometer at a right angle to the pinch roller arm so that the pinch roller lifts off the capstan shaft.
- The spring dynamometer should give a reading of 8...10 N (800.... 1000 p).
- If the reading is higher or lower than the desired value, unfasten the two fixing screws of the pinch roller solenoid (hexagon-socket-screw key No. 3) and shift the pinch roller solenoid in such a way that the nominal value is achieved.,
- Retighten the fixing screws.
- Make sure that the arm returns smoothly to the neutral position, otherwise the solenoid is twisted.





Checks:

 With your index finger lightly push the pinch roller toward the capstan shaft so that the pinch roller just makes contact with the capstan shaft.

- Press TAPE DUMP or TAPE DUMP and PLAY (depending on which of the four TAPE DUMP functions, A, B, C or D, is programmed). The pinch roller arm should again visibly move toward the capstan shaft. This ensures that the pinch roller solenoid deflects completely and that only the tension spring in the solenoid armature establishes the coupling between the pinch roller arm and the armature (no mechanical contact).
- Check this visible travel by actuating STOP and PLAY (or STOP and TAPE DUMP, depending on which of the four TAPE DUMP functions A, B, C, or D, is programmed). If no play can be felt, the pinching force must be increased.
3.3.7 Tape Lifter

In spooling mode the two tape lift pins are moved by the tape lift solenoids in such a way that the tape is lifted off the soundhead face. This prevents unnecessary wear on the soundheads.

Preparatory steps:

Switch off the tape recorder.

103

Remove the tape deck cover.



Fig. 3.1.42

Adjusting the tape lift solenoid

- Mount a tape, switch on the tape recorder.
- Adjust the tape lift solenoid in such a way that the tape is lifted off the record head by approx. 1 to 1.5 mm in spooling mode.
- Press STOP and manually check that the armature moves without binding; if necessary unfasten one of the fixing screws of the tape lift solenoid and lightly rotate the solenoid until the armature moves without binding.
- Retighten the fixing screw.

3.3.8 Tape Tension

Control measurement:	 10.300.001.01) which must actual type used. The me performed between the reel center and at a right angle a access to the tape, the ta depending on the type of the Switch on the tape recorresponding tape ty when the tape type is characteristical context. 	neasured with a spring dynamometer (part No. be calibrated to 1.0 N (100 p) with 1/4" tape of the asurement with the spring dynamometer is to be and the tape tension sensor. The tape must run in the cross the spring dynamometer. To permit unhindered pe deck cover may possibly have to be removed, e spring dynamometer available. corder, select the 15 ips tape speed as well as the pe (the tape tension values are also switched over hanged!). pool forward until the pancake diameter of both reels is	
PLAY tape tension:		able below must be achieved. If the pinch roller is lifted should come to a standstill within one full rotation, and the following information:	
	ERR: TACHO SENSOF	3	
	(After the pinch roller has be	en released, this message disappears again).	
	PLAY tape tensions:	left: 0.60.7 N (6070 p) right: 0.80.9 N (8090 p)	
	IMPORTANT:The difference between the left and the r tension should be 0.2 N (20 p).		
I			

- Adjusting the PLAY tape tension:
- Switch on the recorder, select the 15 ips tape speed as well as the corresponding tape type (the tape tension values are also changed over when the tape type is changed!).
- Mount the tape and spool it forward until the diameter of the tape pancake of both reels is identical.
- Open the programming lock [28] (hexagon-socket-screw key No. 2.5, approx. 1 counterclockwise turn).

Starting with the display "L RANGE ./. dBm", press V/NEXT twice and >/CURSOR once, then V/NEXT four times in order to set the PLAY tape tension. The LC display shows:

T TENS PLAY LEFT 8A	1/4" A RIGHT 8A	

- Changeover right/left with >/CURSOR and </CURSOR (indication on LC display).
- The selected tape type is also displayed (upper right corner of the LC display), the changeover is initiated by simultaneously pressing STOP and TAPE A/TAPE B.
- Select PLAY.
- With the UP and DOWN keys adjust the two tape tension sensors to a deflection of -15° (or a distance of 45 mm between the top edge of the front panel and the bottom edge of the guide roller.
- Press STORE after each adjustment.
- Repetitively press ^/LAST until "L RANGE./. dBm" appears on the LC display.
- Measure the tape tension. If the tape tension values specified above are not attained, readjust the tape tension spring (see Section 3.3.4). If the tape tension spring is adjusted correctly but the specified tape tension values are not attained, these values must be achieved by lightly adjusting the tape tension spring with the tensioner [A].
- After these adjustments have been made, tighten the fixing screws of the tensioner [A] and secure it with a drop of locking paint.
- **Note:** TAPE TENSION WIND remains at 70 hex (default hex value).

3.3.9 Shuttle Wheel

Checking the neutral position:	
Prerequisite:	The SHUTTLE wheel returns mechanically correctly to the neutral position for both directions!
	 Remove the front panel (5 x hexagon-socket-head screws 2 mm). Thread the tape, and switch on the recorder. Check that the "dead" play of the SHUTTLE wheel is symmetrical relative to the neutral position. For this purpose connect a digital multimeter (range 10 VDC, display accuracy at least 2 positions after the decimal point!) to the SHUTTLE potentiometer (+ = red stranded wire, ground = brown stranded wire). Deflect the SHUTTLE wheel to the right. As soon as the tape starts to move, write down the voltage reading. Deflect the SHUTTLE wheel to the left. As soon as the tape starts to move, write down the voltage reading. Compute the average of the two measured values. Measure the voltage in the neutral position of the SHUTTLE wheel. The measured value should agree with the computed average value. If this is not the case, the module must be removed for adjustment, and reconnected.
Adjusting the neutral position:	 Lightly loosen the headless screw (on the potentiometer shaft). Hold the SHUTTLE wheel in the neutral position and turn the potentiometer with a screwdriver until the correct value is attained. Tighten the headless screw and check the setting. Reinstall the assembly.

3.3.10 LC Display Unit 1.820.233

The contrast of the LC display can be optimized for various viewing angles.

- On machines with serial numbers up to 1000: Remove the front panel.
- Adjust the contrast for the preferred viewing angle by means of the trimmer potentiometer R1 on the CONNECTOR PCB 1.820.797.
- On machines with serial numbers greater than 1000: The trimmer potentiometer R1 is accessible through a hole in the front panel near the upper right corner of the LC display (CONTRAST).

3.3.11 Replacing and Aligning the Soundheads

Important!!	To prevent unwanted magnetization of the soundheads, the machine must be
	disconnected from the power source before the headblock is removed or installed!

Replacing the soundheads:

- Remove the headblock cover (4 x hexagon-socket-head screws 2.5 mm)
- Remove the headblock (3 x hexagon-socket-head screws 3 mm)
- The soundhead can be removed after the screws [A] (hexagon-socket-screw key No. 3) accessible from the bottom has been removed.



Fig. 3.1.43

Important !! Do not shift the black wobble plate when changing a soundhead! The distance between the soundhead support and the headface is milled exactly to the same dimension for all soundheads which means that no height adjustment of the soundheads is required.

After the soundhead has been replaced, check with the alignment gauge A80, A812, A820 1/4" (part No. 10.010.001.02) on the reference base A80, A812, A820 (part No. 10.010.001.01) that the head is positioned perpendicularly so that the height is correct. For this check the headblock and gauges must be placed on a precision levelling block (or as an expedient on a flat glass plate).

The azimuth alignment is described in Section 4.3.3.





Tape guide:

Check the tape guide [B] with the aid of the scrape flutter roller gauge A812/A820 1/4" (part No. 10.010.001.32).

The height of the ceramic parts can be adjusted with a blade screwdriver No. 3).





Scrape flutter roller:

The scrape flutter roller can be removed after the hexagon-socket-head screw (3 mm), accessible from the bottom, has been unfastened.

After this roller has been removed, its height does not have to be checked because it has been precision aligned by the factory.

The mounting of the scrape flutter roller must be parallel to the record head, otherwise there will be insufficient space for the left-hand tape lift pin.

With the scrape flutter roller gauge A812/A820 1/4" (part No. 10.010.001.32) check that the scrape flutter roller is positioned perpendicularly on all sides.

3.3.12 Capstan Motor

Capstan motor tacho:	The capacitative adjusted at the fac		as wel	as	the 1	three	Hall	effect	sensors	can	only	be
3.3.12.1 Tacho Sensor E	lectronics PCB	}								0	der N	10.

Tacho Sensor Electronics PCB	1.021.695
Tacho Sensor Electronics PCB	1.021.69

- Remove the capstan motor but leave it connected.
- Disconnect the TACHO SENSOR ELECTRONICS PCB 1.021.695 from the capstan motor /2 x (hexagon-socket-head screws 2.5 mm).
- Switch on the tape recorder, without tape, tape speed 15 ips.
- Put the capstan motor into operation by pressing PLAY.
- Connect a frequency counter to TP2 (ground to TP1).
- Adjust the oscillator frequency with L1 to 5.500 MHz ±500 kHz.
- Connect an oscilloscope (or AF millivoltmeter as an expedient) to TP4 (ground to TP1).
- With L3 adjust for maximum amplitude.
- Connect the oscilloscope (or AF millivoltmeter) to TP3 (ground to TP1).
- With L2 adjust for maximum amplitude.
- Connect the oscilloscope to the TD-TCM2 signal (IC1/pin2) and with R41 adjust to a pulse duty factor of 50%.

The following adjustments can or must be made with the capstan motor removed or installed (when the motor is installed, the trimmer potentiometer R41 is accessible from the bottom when the lower tape deck cover is removed and the tape deck electronics rack is tilted down):

- If a wow-and-flutter meter is available: Install the capstan motor. The linear wow and flutter can be adjusted to the minimum with R41.
- As an expedient this adjustment can also be made in one of the following two ways:
- Connect the oscilloscope (only when the motor is removed) to TP3 (ground to TP1). With R41 adjust for minimal signal jitter.

By ear (also possible with installed motor): Press the blade of a large screwdriver (approx. No. 6) against the housing of the capstan motor and listen at the screw driver handle while adjusting the volume with R41 to the minimum.



Fig. 3.1.46

3.3.13 Alignments and Test Points on the Circuit Boards of the Tape Deck Controller

Reference voltage for D/A converter:	These alignments are normally only required after repairs have been made on the corresponding board. The circuit diagrams of these boards can be found in the diagram section of this manual (in preparation).		
	 CAPSTAN INTERFACE PCB 1.820.727: With R12 on TP1 align to +10.00 V ±0.01 V (relative to TP2). 		
Test points:	CAPSTAN MOTOR DRIVE AMPLIFIER 1.811.775:		
TP1:	Ground		
TP2:	Needle pulses, TTL level, 76 kHz		
ТР3:	Pulse width modulated signal, amplitude 0 to 50 V (relative to ground), the voltage depends on the capstan motor speed, 76 kHz.		
TP4:	DC voltage, mean value of the voltage on TP3, 0 to 50 V.		
TP5, TP6, TP7:	120° phase shifted AC voltage, trapezoidally approximated sine shape		
TP8:	Square-wave signal, TTL level, combination of the output signals of the three Hall effect sensors (triple frequency).		

4 Audio

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4.1 Circuit Descriptions



Fig. 4.1.1 Block Diagram

The audio section comprises:

- Line amplifier
- Reproduce amplifier
- Mono/stereo switch (option)
- Record amplifier
- RF driver

The following assemblies are also included (depending on version):

- Headblock
- Output meters
- Monitor amplifier
- Level controller for reproduction
- and recording
- Time code channel (CODE READ/WRITE
- UNIT and CODE DELAY UNIT)

4.1.1 Input and Output Sockets Line Amplifier

(GRP22/GR23/GRP24) (GRP21 ELM45/ELM50

Order Number

Imput and output sockets (GRP22/GRP23/GRP24) and Line Amplifier (GRP21 ELM45/ELM50)

1.820.749

(with input/output transformer) (without input/output transformer)

1.820.714 1.820.715 (+ 1.820.862)





Line Amplifier

(with input/output transformer)

1.820.714

The input signal is taken from the input socket via an interference suppression filter to the line amplifier. The interference supression filter prevents radiofrequency voltages from nearby transmission equipment from entering the tape recorder.

The microprocessor establishes the following settings via an 8-way D-type flip-flop (IC1):

CA-DATA0...3 (internal signals): CA-LLODB, CA-LL4DB, CA-LL8DB, CA-LLADB) switch the line level of the input and output to 0, 4, 8, or 10 dBm.

CA-DATA4	(CA-INPXY) Switches from REPRO/SYNC to INPUT	
CA-DATA5	(CA-MUTXY) Mutes the line output.	
CA-DATA6	(CA-SYNXY) Switches the reproduce amplifier from REPRO to SYNC.	
CA-DATA7	(CA-EQLXY) Switches on the NAB equalization (3180 μ s) With the rising clock edge the flip-flop transfers the data available at the D-inputs to the Q-outputs.	
	A low-pass filter before the input transformer eliminates noise frequencies.	
	The input amplifier with IC3/2 is followed by the trimmer potentiometer R52 for compensating the manufacturing tolerances of the input transformer. The gain of IC3/1 is switched to the desired line level by the flip-flop outputs Q1, Q2, and Q3.	
	With DIL switch S1 the line amplifier can be matched to the applicable recorder configuration: with or without VU-meter panel or mono/stereo switch.	
	IC4, IC5, and IC7 switch the output of the line amplifier from INP to REP/SYNC; IC2 IC6, and IC8 mute the output.	
	The input change-over/muting switch is followed by a low-pass filter with IC10/2. With trimmer C25 the filter is aligned for maximum damping of the 153.6 kHz erase frequency. The gain of IC10/1 is switched to the desired line level by the flip-flop outputs and Q6, Q7 and Q8.	
	The output level is fine-adjusted with R81. IC9/2 drives the complementary output transistors. The signal is taken to the output socket via the line balancing transformer and an additional interference filter.	
	The signal for the headphones socket and the internal monitor amplifier is tapped before the transformer. The output meter is supplied with the balanced output signal.	
	With JS0 and JS1 of DIL switch S1 the Headphones/monitor signal can be tapped at the output of IC9/1 (before muting; JS0 ON, JS1 OFF; monitor level independent of the selected output level and the muting of the output level), or at the line output (after muting; JS0 OFF, JS1 ON).	
Line Amplifier + Line Output Amplifier	(without input/output transformer) 1.820.715/1.820.862	
	The input signal is taken from the input connector via an interference filter to the line amplifier. The interference filter prevents high-frequency voltages produced by nearby transmission equipment from getting into the tape recorder.	

nearby transmission equipment from getting into the tape recorder.

The following settings are established via an 8-way D-flip-flop (IC1):

- CA-DATA0...3 (internal signals): CA-LLODB, CA-LL4DB, CA-LL8DB, CA-LLADB) switch the line level of the input and output to 0, 4, 8, or 10 dBm. At the same time the monitor level is stabilized independently of the line level.
- CA-DATA4 (CA-INPXY) Switches from REPRO/SYNC to INPUT
- CA-DATA5 (CA2-MUTXY) Mutes the line output.
- CA-DATA6 (CA-SYNXY) Switches the reproduce amplifier from REPRO to SYNC.
- CA-DATA7 (CA-EQLXY) Switches on the NAB equalization (3180 µs) With the rising clock edge the flip-flop transfers the data available at the D-inputs to the Q-outputs.

An RC low-pass filter before the input transformer eliminates noise frequencies. The common-mode input impedance can be decreased with jumper JS1 (position "N"). The common mode rejection ratio is set with the trimmer potentiometer R78 for low frequencies and with the trimmer capacitor C18 for high frequencies.

The gain of IC10/1 is changed over to the desired line level by the flip-flop outputs Q1, Q2, and Q3.

With DIL switch S1 the line amplifier can be matched to the applicable recorder configuration: with or without VU-meter panel; with or without stereo switch; monitor connection before muting or to line level.

IC4, IC5, and IC8 switch the output of the line amplifier from REPRO/SYNC to INPUT; IC3 IC6, and IC9 mute the output.

The input change-over/muting switch is followed by a low-pass filter with IC12/2. The gain of IC12/1 is switched to the desired line level by the flip-flop outputs Q4, Q5, and Q6.

The output level is fine-adjusted with R93.

The signal is taken to the LINE OUTPUT AMPLIFIER PCB where it is inverted (IC203/1). The inverted and the non-inverted signal is taken to a complementary output stage (IC202/1, Q203, 206, 207, 219, 220 or IC202/2, Q201, 202, 205, 213, 214).

From the two balanced output signals IC204/2 produces an unbalanced signal that is taken to the monitor path on the LINE AMPLIFIER board.

The AF output currents of the two output stages flow through two of the three windings of L201 which have an identical sense of winding. The magnitude of the currents are normally identical, but they flow in the opposite direction. As soon as the magnitude of the output currents differs (e.g. short circuit of one of the two output lines), an AF signal is induced in the third winding of L201. This signal is amplified in IC204/1 and fed via the analog switch IC201 to the two output stages as an additional AF input signal. This signal has the effect that the gain of the output stage whose output is connected to ground, is reduced in such a way that no current can flow. In addition the gain of the second output stage is increased to the point where an AF differential signal is available on the two output lines. The magnitude of this unbalanced signal is identical as without ground short. The large gain in the control loop has the effect that a negligible voltage is available on L201 (-> no magnetic flux and consequently no distortion contribution by L201).

One voltage magnification circuit each (Q215, D201, C220, D203, C221, and Q217, D202, C222, Q218, D204, C223 respectively) is controlled by the output stage outputs. When a large positive output voltage is available at the output stage comprising Q213, 214, the Darlington Q215 becomes conductive and connects a positive supply voltage to the negative pole of C220. The positive pole of the latter is already charged to approx. +15 V via D201, and is now boosted to approx. 25 V. A high positive supply voltage is thus briefly available to the output stage. If a high negative voltage is needed, the reverse process takes place.

The heat sink of the output transistors is in thermal contact with R252 (NTC). If the output stage transistors overheat, IC7/2 on the LINE AMPLIFIER board switches. The input signal is muted with IC3, 6, and 9 until the temperature has dropped to an admissible value.

At power on the generation of an AF control signal for the output stage is suppressed for a few seconds by the delay around IC7/1 and IC201. Uncontrolled alignment processes on the line output are thus prevented as long as the quiescent output voltage of IC204/1 is not yet at a defined potential.

The signal is taken to the output connector via an interference filter. The output meter is supplied with the balanced output signal.

With JS0 and JS1 of DIL switch S1 the headphones/monitor signal can be switched from the output of IC11/1 (before muting; JS0 ON, JS1 OFF) to the output of IC11/2 (corresponds to line output, after muting; JS0 OFF, JS1 ON).

4.1.2 Preamplifier in Headblock Reproduce Amplifier

(GRP60 ELM02) (GRP21 ELM44/ELM49)

Order Number

Reproduce Preamplifier PCB 1 channel Reproduce Preamplifier PCB 2 channel Reproduce Preamplifier PCB

1.810.710 1.810.711/.712 1.820.710



A reproduce preamplifier 1.810.710/.711/.712 (GRP60 ELM2) is arranged between the reproduce head and the reproduce amplifier. This preamplifier which is arranged directly on the headblock (GRP60) produces a gain of approximately 28 dB. Q1 and Q4 are low-noise transistors; IC1 is a low-noise, internally compensated dual opamp. The preamplifier is linear up to approximately 25 kHz. Only when both supply voltages are present (\pm 15 V) is the preamplifier switched on (D1, Q2). This prevents current from flowing through the head winding when one of the supply voltages is missing and thus avoids magnetization of the reproduce head.

In two-channel and stereo recorders, cross talk between the two channels is minimized with the trimmer potentiometer R14.

The reproduce signal REPRE-XY is taken via screened conductors to the reproduce amplifier.

The reproduce amplifier is laid out in such a way that the reproduce signal or the SYNC signal can be processed.

The input signal is changed over from normal reproduction to SYNC with the signal CA-SYN01 (02) via IC10 and the FET switches IC5 and IC6. The SYNC signal (SYNHH-XY/SYNHL-XY) is taken via the input transformer T1 and the SYNC amplifier comprising Q2 and IC7/2. The bandwidth of the SYNC amplifier can be switched from 12 kHz (NARROW) to approximately 20 kHz (WIDE) by means of a jumper in which case strong cross talk between the record and the SYNC reproduce channel is to be expected on 2-channel recorders.

The reproduce signal is taken via a low-pass filter comprising IC14/2. This filter is aligned with trimmer potentiometer C31 to achieve maximum attenuation of the 153.6 kHz erase frequency.

The CA-EQL01 (02) signal connects the 3180 μs time constant (IC14/1) via IC9 and FET switch IC4.

A signal of the auxiliary path (inverting two-fold differentiating circuit) is added to the signal of the auxiliary path (integrator with IC14/1) for phase-linear correction of the air gap loss in the reproduce head.

The equalization time constant is set with IC16, IC15/1; the frequency response is set with IC13, IC15/2 (treble) and IC8, IC7/1 (bass). The data stored in RAM are transmitted from the MPU to the corresponding 256-step attenuators.

The reproduce level is set with IC11, IC12/2 (resolution 256 steps).

IC2 (DUAL BINARY TO 1-OF-4 DECODER/DEMULTIPLEXER) decodes the address of the corresponding digital/analog converter IC8, 11, 13 or 16 from the address lines of the CMOS bus (CA-ADR-R, -S, -T, -U), and activates this address for data transmission.

4.1.3 Mono/Stereo Switch with Test Generator (GRP21 ELM46) Mono/Stereo Switch without Test Generator

Order Number



Fig. 4.1.4

The mono/stereo switch processes the two input signals and the two reproduce signals in two separate branches.

The input signals INPAD-01, 02 are taken from the outputs of the two line input amplifiers with internal reference level of 0 dBm to the mono/stereo switch. In stereo mode the signals buffered by the voltage followers IC3/1, 3/2 are taken directly to IC6/1, 6/2, or in mono mode they are added via the resistors R42 and R37 and amplified in IC25/1. The level of the mono signal is adapted with potentiometer R205. Mono/stereo changeover is performed via IC 19 (PROM) and the comparators IC13/1, 16/2 by means of the FET switches IC17, 21, 24, and 26.

The operating mode is selected with the jumper JS2: mono signal from INPAD-01 + INPAD-02 or only from INPAD-01.

The output signals from IC6/1 and IC6/2 (RECIN-01, -02) are taken with internal reference level to the record amplifiers and the line output amplifiers.

The reproduce signals TAPDI-01, 02 are taken from the reproduce amplifiers to the inputs of the voltage followers IC10/1, 10/2; they are decoupled and added by R81 and R80 to a monosignal. The monosignal is amplified in IC31/1, the level can be adjusted with R206. The mono/stereo changeover is achieved with FET switches. The operating mode can be selected with jumper JS3: the monosignal can either be connected to channels 1 + 2 (TAPMS-01, 02) or to channel 1 only (TAPMS-01.

The signals TAPMS-01, 02 are transmitted to the line output amplifiers.

Test generator

(only 1.820.724)

The test frequencies are produced by the function generator IC2. The balance is set with R8, the sine shape with R20. The frequencies are changed over with IC20 (PROM) and Q1 \dots Q5.

When the upper key (FREQ) is pressed, the test generator is switched on (REF pilot lamp [DL205] is light, i.e. the reference frequency, normally 1 kHz, is selected). If this button is pressed repetitively, the frequency changes as follows:

60 Hz - 125 Hz - REF - 10 kHz - 16 kHz - OFF - REF - etc.

With the lower key (LEVEL) the generator level can be switched to a level that is 10 dB lower than the nominal level. When "-10 dB" is selected, the gain in the reproduce branch of the mono/stereo switch is automatically boosted by 10 dB; this means that the reference value of the VU-meter display is the same as for nominal level when measurements are made with tape present.

The lower key (LEVEL) is only active when the test generator has previously been enabled with the upper key. After the test generator has been switched OFF and ON again with the upper key (FREQ), nominal level is always available on the test generator output.

The output signal of the function generator is taken via IC31/2 and IC25/2 to the mono branch. The output signals of IC7/1 23/2 decide whether the input signals (INPAD-01, -02) or the test signal are connected to the record amplifiers (RECIN-01, -02). This changeover is achieved with FET switches.

The generator level can be adjusted with potentiometer R208.

Order Number

4.1.4 RF Driver (GRP21 ELM42/ELM47)





The erase and bias currents are prepared on the RF driver.

The 307.2 kHz quartz reference of the microprocessor TA-CLK is divided in IC3 (DUAL JK NEGATIVE EDGE-TRIGGERED FLIP-FLOP) to 153.6 kHz. The outputs are connected to the RF driver IC11.

The erase and bias output stages are controlled by the windings of the transformer T2.

The DC voltage reference for the erase current is defined (in 16 steps) by IC1 (OCTAL D-TYPE FLIP-FLOP) IC6/2 through the data lines

CA-DATA-0 ... 3. The DC voltage reference for the bias current is defined by the MASTER MPU, via the 256 step attenuator IC2.

IC1 also decodes the commands for switching on the erase and bias current. CA-SAFE = 0 activates IC1.

The DC voltage values defined by the microprocessor are switched on or off by Q1 (erase current) and Q2 (bias current). IC9/1 or IC10/1 respectively shapes the ON- and OFF-switching edge in such a way that click-free drop-in and drop-out is achieved. The DC currents supplied by IC9/2, Q13, and IC10/2 to the corresponding power amplifier stages are proportional to the required output currents. Q11 and Q10 respectively control these currents and in the event of an overload switch off the RF driver IC11 via D12 and the comparator IC8/1.

The clock signal (IC3, PIN 9) is checked; the RF driver is also switched off via IC8/1 if the clock is missing or corrupted.

The standby signal TA-ACT-01 (-02) is connected via IC8/2 in order to signal to the microprocessor that channel 1 or 2 is ready. The TA-ACT signal checks whether or not the corresponding record amplifier is plugged in.

The erase current is connected by Q5 and Q8 at CLOCK frequency to the primary windings of T1. The erase current receives its sine shape through the parallel resonant circuit comprising the inductor of the secondary winding and C3. A second resonant circuit comprising the inductor of the erase head and a capacitor (built into the headblock) is coupled loosely via R4 to a portion of the secondary winding of T1.

IC7, IC4 and relay K1 switch the erase current on or off.

The bias current is generated by Q3 and Q4 in the same manner as the erase current, and taken to the output transformer on the record amplifier board.

4.1.5 Record Amplifier (GRP21 ELM42/ELM48)



Fig. 4.1.6

The audio signal (RECIN-01 (-02) from the line amplifier is taken via a low-pass filter comprising IC7/1. The low-pass filter is designed for maximum attenuation of the 153.6 kHz erase frequency.

The treble losses of the record head air gap are compensated with phase-linear correction elements. The inverting two-fold differentiating circuit (IC10) is followed by the treble control element IC8, IC9/1 (record frequency response). A portion of the audio signal is mixed into the input of IC 10/2 via the plug-in ADAPTATION BOARD in order to improve the steepness of the height correction. The summed components of the corrected record signal are amplified by IC9/2.

Order Number

The equalization time constant is set with IC5, IC6/1, the record level is set with IC3, IC6/2. The audio parameters stored in RAM are transmitted from the MPU to the corresponding 256-step attenuators.

The 3180 μs time constant is connected by EQUAL-01 (-02) via the FET switch IC2.

The record signal is taken to opamp IC4/2 which is wired as a current source.

The signal AFCSW-01 (-02) (AUDIO FREQUENCY CURRENT SWITCH) controls the record current via Q1. The record and bias current are added via T1. The two RF filters comprising L3 and L4 prevent stray pickup of the bias frequency by the other circuit elements. The bias current is discharged via the series resonant circuit comprising L2; a closed bias current loop is thus formed with the two windings of T1 and the winding of the record head.



4.1.6 Time Code Channel

General

Two-channel recorders can be equipped with a time code channel. The 0.38 mm wide code track is located between the two audio tracks. The time code signal (80 bits per full frame according to SMPTE) is recorded with biphase modulation.

The tape flux is 729 nWb/m peak-to-peak ±3 dB.

A reproduce (read) head is integrated in the audio erase head {A}. This head "reads" during audio reproductions/recordings and slow forward editing. A second time code head is arranged on the far right of the headblock {B}. This is a combined erase/reproduce/record head (read/write head).

This head "reads" during spooling and slow reverse editing and is able to record the time code signal.

Time code heads:



Fig. 4.1.8



Fig. 4.1.9

CODE READ/WRITE UNIT (GRP21 ELM40)

1.820.721

Time code reproduction: The signal of the left-hand head REPHH-TC, REPHL-TC (active for audio reproduction or recording) is taken via a low-pass filter/amplifier comprising IC15/1. The low-pass filter suppresses the 153.6 kHz erase frequency (cross talk audio-erase frequency -> time code reproduction). The signal of the right-hand code head RECHH-TC is taken to a low-pass filter/amplifier IC12, IC16. The bandwidth of the filter is automatically switched over with Q7. The bandwidth is large during spooling and small during slow reverse editing.

	The outputs of the two filters/amplifiers (signal of the left-hand or right-hand code head) are connected with FET switches Q10, Q11 to the limiter (IC13, changeover switch IC4/2, IC11, IC14, Q9). Even for variable speeds this limiter supplies a constant output signal which is reshaped into a square-wave signal by a Schmitt trigger (IC6/1, IC10, IC7). The time code reproduce signal is taken either directly or via the CODE DELAY UNIT (jumper JS2 or changeover switch IC4/1) to the line output amplifier IC2, (IC18 on the time code read write unit 1.820.721.85) the line balancing transformer T2, and as the signal LOUFA-TC, LOUFB-TC to the balanced and floating output socket.
Time code recording:	 The recording signal LINFA-TC, LINFB-TC is taken via the balanced and floating input connector, the input transformer T1, and the changeover switch IC4/2 to the Schmitt trigger (IC6/1, IC10, IC7) and to the CODE DELAY UNIT. The output signal of the CODE DELAY UNIT is connected by the changeover switch IC4/3 to the input of the record amplifier. With Q5, IC9 the signal edges are shaped in such a way that a trapezoidal recording signal is attained. The signal TA-CLK from the MPU is divided in IC8 from 307.2 kHz down to 153.6 kHz and converted in the RF driver IC5 to an erase and bias signal. The erase current is decoupled via T3 and taken via screened lines as the ERAHH-TC/ERAHL-TC signal to the erase head. The bias current is added by the secondary winding of T3 via the trimmer capacitor C9 to the trapezoidal recording signal. The changeover relay K1 determines whether the combination head operates as a reproduce or record head. The output signal RECHH-TC, RECHL-TC is taken via screened lines to the combination head. The MASTER MPU established the following settings via the CMOS bus (by means of the 8-way flip-flop IC1, address decoder IC3): Record level (4 bits, of which 3 are used), adjustable with:
	R2 (7.5 ips), R8 (15 ips), and R10 (30 ips).
	 Record function (CA-WRTTC = 1) Slow reverse editing, right-hand code channel, narrow-band (CA-RS2TC = 1) Spooling, right-hand code head, wide-band (CA-RS1TC = 1) Bypassing the DELAY UNIT (CA-BPDTC = 1) INPUT, input signal to output (CA.RS1TC = 1 and CA-RS2TC = 1 and CA-BPDTC = 1).
	For bias and record level alignment refer to Section 4.7.
CODE DELAY UNIT	(GRP21 ELM41) 1.820.722
	The time code signal is delayed in the CODE DELAY UNIT in such a way that the audio and time code signals on the tape coincide, i.e. the distance between the heads is automatically compensated.

An additional microprocessor IC2 (6803) is used for this purpose.

A PLL (PHASE LOCKED LOOP) with clock regeneration is implemented by programming (software).

The external microprocessor memories comprise 2K PROM (IC18) and 8K RAM (IC14). The RAM can hold 8192 half-bits = 51 full frames.

Information from the MASTER MPU (1.820.786) is transmitted via the TTL bus, the bus converter and the CMOS bus to the two 8-bit latches IC8, IC9 of the DELAY UNIT and comprises:

- required delay
- direction of tape travel
- bypass command

4.2 Calibration

The audio parameters are loaded from RAM into the registers of the audio amplifier whenever the machine is switched on, or the tape speed, the tape type, or the equalization standard is changed.

When new parameters are set with the UP/DOWN keys or via the serial interface, the parameters stored in the RAM and in the registers of the audio amplifiers are overwritten.

If the data in the RAM are lost, the default data stored in the PROM are automatically loaded.

4.2.1 Introduction

General	The assumption is that the tape recorder to be calibrated has been mechanically adjusted to specifications (particularly with respect to the tape tensions and the tape transport). Before you start with the calibration of the tape recorder, clean and demagnetize the soundheads and the tape guidance elements.
	The calibration of the tape recorder should always be performed in the following order:
Reproduce alignments	Preferred studio tape speed: Level Azimuth alignment of the reproduce head gap (see note 1) Frequency response (see note 2)
	All other tape speeds: Level Frequency response (see note 2)
Note 1	Depending on the reference tape, minor deviations can occur between the different speeds. In this case the final azimuth alignment should be made with the preferred studio speed.

Note 2	Normally the studio tape recorders are calibrated with full-track reference tapes. Due to fringing, frequency response errors occur in stereo and 2-channel machines at low frequencies. For this reason you should align the reproduce frequency response for low frequencies with tape. This means that if no calibration tapes with the correct guard track width are available, the alignment of the reproduce frequency response is to be repeated after the record frequency response has been made with tape.
Record alignments	 Preferred studio tape speed: Record level preadjustment Azimuth alignment of the record head gap (bias parameter at approximately the same value for both channels!) Bias Record level Frequency response
	All other tape speeds: Record level preadjustment Bias Record level Frequency response
SYNC reproduction	All tape speeds (except 3.75 ips): Level Frequency response

4.2.2 Level Definitions Voltage Level 0 dBu = 0.775 V

- h reference flux is reproduced, or
- when fed to the input of a tape recorder, produces reference flux on the tape.

Line level

Voltage reference level CCIR designation for line level; this level produces a 0 dB indication on a quasi peak program meter (PPM).

Standard reference level(operating level):
Designation commonly used in the USA for the level required to produce a tape
flux of 250 nWb/m (for recording on high-quality tapes) or 200 nWb/m (for
recording on standard tapes); this level gives a reading of 0 VU on a VU-meter.

Peak level Designation commonly used in the USA for a level that is 8 to 10 dB higher than the operating level. For reasons of simplicity, a peak level of +6 dB relative to the operating level (double the voltage value) is used for calibrating a tape recorder.

CCIR/IEC setting

Definition	Line level (dBm)	VU-meter reading, jumper in "PEAK" position (dB)
Reference Level	+ 6	0

NAB setting

Definition	Line level (dBm)	VU-meter reading, jumper in "VU" position (VU)
OPERATING LEVEL "PEAK LEVEL"	+ 4 + 10	0 + 6

Reproduce level = operating level

4.2.3 Equalization Networks

Equalization networks that correct the frequency response are installed in the record and reproduce path.

The attack points of the correction are referred to as the transition frequencies or transition time constants (1 / 2) f) and have been standardized by various organizations (IEC, NAB, AES, CCIR).

r					
TAPE	TRANSITION FREQUENCIES, LOW AND HIGH (TRANSITION TIME CONSTANTS)				
SPEED	IEC-1968	NAB-1965	NAB-1975		
9,53 cm/s 3,75 ips	50; 1800 Hz (3180; 90µs)	50; 1800 Hz (3180; 90µs)	- (-)		
19,05 cm/s 7,5 ips	0; 2240 Hz (∞ ; 70 µs)	50; 3150 Hz (3180; 50µs)			
38,10 cm/s 15 ips	0; 4500 Hz (∞; 35 µs)	50; 3150 Hz (3180; 50µs)	(-)		
76,20 cm/s 30 ips	0; 9000 Hz (∾; 17,5 µs)	AES 1971 O; 9000 Hz (∾; 17,5 µs)	- (-)		

4.2.4 Magnetic Reference Flux, Standard Calibration Data

When a recording with reference flux is reproduced, line level is available on the output of the tape recorder.

The following standard settings are made by the factory:

CCIR setting

 Line voltage: Line frequency: Line level: VU-meter reading at line level: Load impedance: Tape type: Tape flux at line level: 	220 V 50 Hz + 6 dBm + 6 VU 600 ohm AGFA PER 528
3 3/4 ips,	stereo: 400 nWb/m
3 3/4 ips,	mono: 250 nWb/m
7½ ips,	stereo 510 nWb/m
7½ ips,	mono: 320 nWb/m

15 ips,	stereo: 510 nWb/m
15 ips,	mono 320 nWb/m
30 ips,	stereo: 510 nWb/m
30 ips,	mono: 320 nWb/m

NAB setting

 Line voltage: Line frequency: Line level: Reading of the VU-meter at line level: Load impedance: Tape type: Tape flux with at level: 	220 V 50 Hz + 4 dBm + 0 VU 600 ohm Scotch 3M 226
3 3/4 ips,	200 nWb/m
7½ ips,	250 nWb/m
15 ips,	250 nWb/m
30 ips,	250 nWb/m

Until further notice the machines leaving the factory will be calibrated to one of these two standards.

4.2.5 Calibration Tapes

	Calibration tapes are used for aligning the reproduce path of tape recorders. They are generally magnetized across their full width. A separate tape is used for each tape speed.
Important!!	In order to prevent unintentional erasure of these costly tapes, all channels should be switched to SAFE during playback. On machines without SAFE key the MASTER SAFE key should be actuated.
	The reference tapes contain the following sections:
Level tone section	(Reference flux = 320 nWb/m for 7½, 15, and 30 ips; 257 nWb/m for 3 3/4 ips) produces line level in play mode on the output of the tape recorder. The output level should be adjusted to the specified line level, while the approx. 60 to 180 sec. level tone section is being played. NAB calibration tapes with a reference flux of 200 nWb/m produce an output level of -4 dB relative to 320 nWb/m.
	Reference frequency: 333 Hz or 500 Hz at 3 $3/4$ ips; 1 kHz at 7½ to 30 ips (there are also NAB calibration tapes with 700 Hz reference frequency).

Level adjustment		 If the tape recorder is to be calibrated with a different (usually higher) re level, the reference flux difference is computed according to the for formula: 				
Example		00lo <i>g</i>	Reference flux on the tape			
		20log ₁₀	Reference flux on tape			
	Example		on the calibration ce flux, e.g. for a	tape high-dynamic ta	ре	= 200 nWb/m = 510 nWb/m
		Difference = 20	log ₁₀	510 nWb/m 200 nWb/m	- = 8 dB	

Also refer to Fig. 4.2.1



Fig. 4.2.1

Azimuth alignment section

Used for correcting the perpendicularity (azimuth) of the reproduce head gap. This section comprises a shorter section with reference frequency (for coarse adjustment) and a longer section with 10 kHz for fine-adjustment. NAB calibration tapes can be sectioned differently. The level of this section is normally 10 dB below the reference level.

The alignment is made by means of the azimuth adjustment screw until the normal output voltage is achieved. On two-channel and stereo recorders, alignment to minimum phase difference between the two channels is possible with the aid of a 2-channel oscilloscope or an AF millivoltmeter with two inputs and summation.

Important !! If major adjustments on the reproduce head are made, additional voltage peaks occur, however with lower level!

If the reproduce amplifier operates with correct equalization, there is no difference between the reproduce levels of the reference frequency and the 10 (8; 16) kHz recording.

Frequency responseUsed for determining and adjusting the reproduce frequency response. NABsectioncalibration tapes exist on which the frequencies differ from the following table.

REFERENCE TAPE	CCIR				NA	В		
TAPE SPEED [m/s];[ips]	9,5	19	38	76	3,75	7,5	15	30 (AES)
REV.LEV.SEC.: REF.FREQ. REF.FLUX.DENS.	333 Hz 257nWb/m	1 kHz 320nWt	o/m		500 Hz 200nWb/m	1 kHz 200 nk	(700 H; Nb∕m	z)
AZYMUTH ALIGNMENT SECT.(-10 dB)	333Hz 10 kHz	1 kHz 10 kHz	ſ		250 Hz 4 kHz 8 kHz	500 (7 8 kHz 16 kHz	700) Hz <u>z</u>	
FREQUENCY RESP. SECTION: (CCIR: -20 dB) (NAB : -10 dB)	333 Hz 31,5 40 63 125 250 500 1 kHz 2 4 6,3 8 10 12,5 14 16 333 Hz	1 kHz 31,5 H 40 63 125 250 500 1 kHz 4 6,3 8 10 12,5 14 16 18 1 kHz	Iz		31,5 Hz 63 125 250 500 1 kHz 2 4 5 6,3 8 10 500 1	31,5 H 63 125 250 500 1 kHz 2 4 8 10 12,5 16 Hz 2 kHz	łz 20	

4.2.6 Preparatory Steps

Before you start with the calibration, the parameters of the tape recorders must be programmed for the desired application. Also refer to section 2.6 "SOFT KEYS".

Line level

Set the required line level:

OPERATING LEVEL (NAB)	REFERENCE LEVEL (CCIR)	FUNCTION No.
O dBm	6 dBm	009
4 dBm	10 dBm	010
8 dBm	14 dBm	011
10 dBm	16 dBm	012

The four functions 009...012 are used to adapt the tape recorder to the line level used in the studio. The operating level as well as the reference level are shown on the LC display. The first (smaller) of the two level indications relates to NAB, the second to CCIR.

If the line level used in the studio does not correspond to any of the available gradations, use the value that comes closest to the studio level, and adjust the internal record and reproduce levels in such a way that the tape recorder corresponds to the desired studio level.

Examples Function 011, CCIR equalization, reference level = 14 dBm, VU-meter amplifier switched to PPM characteristic (jumper on VU-meter amplifier), PPM reading at reference level = 0 dB.

Information on the LC display when the machine is ready:

L RANGE: 8 /14 dBm

Function 010, NAB equalization, operation level = 4 dBm, VU-meter amplifier switched to VU characteristic (jumper of VU-meter amplifier), VU-meter reading at operating level = 0 VU.

Information on the LC display when the machine is ready:

L RANGE: 4/10 dBm

Function 011, CCIR equalization, selected reference level = 16 dBm, desired line level 15 dBm, VU-meter amplifier switched to PPM characteristic (jumper of VU-meter amplifier), PPM reading at reference level = 0 VU. Information on the LC display when the machine is ready:

L RANGE: 10/16 dBm

Checking the output level and the VU-meter reading:

 Connect the AF generator to the line inputs (CH1 and 2) and feed 1 kHz with line level.

1	Connect the AF millivoltmeter to one of the line outputs and load the output
	with 600 ohm (standard) or with 200 ohm (minimum) (if the usual termination
	impedance in the studio is considerably higher, the output should be
	terminated with this impedance).

- Switch on the tape recorder and press the INP key of channels 1 and 2.
- Release all UNCAL keys (calibrated level).
- Or, also for machines without VU-meter or channel control module: The top position of the AUDIO ALIGNMENT block (see 2.6, SOFT KEYS) is used to switch all audio channels of the machine to INPUT; press v/NEXT three times. The following information appears on the LC display:

LINE OUT CALIBRATION AUDIO CHANNELS INPUT

As long as this information is displayed the audio section of the machine is switched to INPUT (if VU-meters or channel control modules are installed, the INPUT LEDs are light).

 With the LINE AMPLIFIER trimmer potentiometers accessible from the front, adjust the output level to the line level (fine-adjustment for compensating the load impedance).

Checking the VU-meter reading:

- U-characteristic: 0 VU should be indicated when line level is available.
- PPM characteristic: -6 dB (NAB) or 0 dB (CCIR) should be indicated when line level is available.

The VU-meter reading can be corrected with the trimmer potentiometer on the rear of the VU-meter amplifier.

CCIR/NAB equalizations Select the required equalizations on the function and programming keypad: CCIR or NAB (press the changeover key together with STOP).

If identical calibration data (level, frequency response, bias) are desired for both equalizations, proceed as follows:

- Select the preferred equalization (master panel)
- Adjust and check all audio parameters according to the alignment instructions.
- Activate function 033 (CCIR/NAB SAME; same parameters for both equalizations, see 2.6 SOFT KEYS).
- Recall all previously set parameters and store them again.

The same parameters are now programmed for both equalizations.

For special cases the equalization time constants can be corrected individually. In this case it is important that the function CCIR/NAB SAME is switched off!

- Tape type A/BSet the tape type selector to the desired position (press this key together with
STOP!).
 - **Important !!** The reproduce and record settings must be repeated step by sep for the second tape type!

4.2.7 Input Procedure

For easier orientation the status tree diagram in Section 2.6 can be folded out.

Example Setting the audio parameters reproduce level, 15 ips tape speed, CCIR equalization, tape type A, channel 2:

Step	Information on LC-Display
Give the programming lock [28] 1-2 counter- clockwise turns (hexagon-socket-screw key No. 2.5)	
Switch machine to STOP	L RANGE ./. dBm
v/NEXT	USER SET UP ALIG <u>N</u> MENT MODE
√/NEXT	ALIGNMENT AU <u>D</u> IO DECK AUX
√/NEXT	LVL REP 15.0 CCIR A CH1 <u>7</u> 2 CH2 72
>/CURSOR (changeover to CH 2)	LVL REP 15.0 CCIR A CH1 66 CH2 <u>6</u> 6
Set the desired output level with the UP/DOWN keys (indication in HEX)	LVL REP 15.0 CCIR A CH1 66 CH2 <u>F</u> 9
Save with STORE; press ^ 3 times, or: proceed to next with	L RANGE ./. dBm oder: TRB REP 15.0 CCIR A setting CH1 39 CH2 <u>3</u> 9

Indication of the set value The gain of the individual amplifiers can be set within the range of 0 and the maximum in 255 steps (corresponds to 256 discrete values). These 256 values correspond to the range between the two limit positions of a potentiometer. The set value is shown as a hexadecimal value on the LC display (00 for 0 and FF for 255).

Examples of hexadecimal numbers

DECIMAL	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
HEXADECIMAL	0 1 2 3 4 5 6 7 8 9 A B C D E F

HEXADECIMAL	DECIMAL	% of FF res. 255
1A	26	10
33	51	20
4D	77	30
66	102	40
80	128	50
99	153	60
B3	179	70
CC	204	80
E6	230	90

Important !! The hexadecimal number gives the user an indication of the range in which the amplifier operates. No conclusions can be drawn concerning the voltage values!

Altering the parameters Pressing the UP/DOWN keys has the same effect as turning a potentiometer clockwise or counterclockwise. One key depressing corresponds to one step (within the range of 0 to 256). If this key is pressed continually, the range will be traversed in the corresponding direction.

In contrast to conventional potentiometer settings, the original value stored in RAM can be reproduced accurately at any time (e.g. by pressing the STOP key).
Storing the parameters

When the desired value has been found (for example line level 10 dBm = 2.5 V), it can be stored in RAM: press the STORE key. For comparison purposes the hexadecimal amplifier settings can be recorded in a

For comparison purposes the hexadecimal amplifier settings can be recorded in a log.

Example

A812 Nr.	30ips	1998 - 1997 - 2006 - 20	15ips	SPEED	7.5ips	\$	3.75ip	os	COM- MENTS-
NAB/CCIR TAPE A/B	CH1	CH2	CH1	CH2	CH1	CH2	CH1	CH2	
REPRO LEVEL TREBLE BASS EQUAL.									
RECORD LEVEL TREBLE BIAS EQUAL.									
SYNC LEVEL TREBLE BASS EQUAL									

4.3 Reproduce Alignments

4.3.1 Preparatory Steps



Fig. 4.3.1

- Connect the audio millivoltmeter to the line output channel 1. The lines outputs are to be loaded with 10 kohm (600 ohm or 200 ohm) for all measurements.
- Switch on the tape recorder.
- Select the preferred studio tape speed.
- Press SAFE and REPRO of channels 1 and 2. Release all UNCAL keys (calibrated level). On machines without VU-meter panel press MASTER SAFE.
- Mount the calibration tape for the corresponding equalization and spool forward to the LEVEL TONE section.

4.3.2 Reproduce Level Alignment ...



Page to the LVL REP position by pressing v/Next, >/CURSOR, </CURSOR and ^/LOAD (possibly with the aid of the status tree diagram, Section 2.6, where also a step-by-step programming example can be found).



Fig. 4.3.2

- Initially the cursor is located below the parameter for channel 1.
- Start the recorder in PLAY mode.
- By pressing the UP or DOWN key you can adjust the reproduce level to the desired line level.
- Press STORE.

- On stereo machines, switch the millivoltmeter to the line output channel 2. Position the cursor below the parameter for channel 2 by pressing >/CURSOR. The desired line level can now be set by pressing the UP or DOWN key.
- Press STORE.

4.3.3 Azimuth Alignment of the Reproduce Head.

- Spool the calibration tape forward do the AZIMUTH ALIGNMENT section. The level of this section is approx. 10 dB below the one of the level tone section. Switch the millivoltmeter to the line output channel 1.
- Start the tape recorder in play mode.



Fig. 4.3.3

Coarse adjustment

Fine-adjustment

- While the recording with reference frequency is being played, adjust the azimuth of the reproduce head until the highest voltage is achieved.
- Connect the line outputs of the two channels either to the inputs of a 2-channel oscilloscope. While the recording with 8, 10 or 16 kHz is being played, adjust for minimal phase difference of the output signals on the audio channels by means of azimuth alignment screw.

or

the inputs of an AF millivoltmeter with summing facility. While playing the recording with 8,10 or 16 kHz adjust for maximum sum level of the audio channels by means of the azimuth alignment screw.

Important !!	Always align first to the maximum level and then to minimum phase difference! If major corrections to the reproduce head azimuth are made, additional maxima but with lower level can occur.
Checking the level	 Rewind the calibration tape to the LEVEL TONE section and switch to PLAY mode.

Check the level of channels 1 and 2. Correct, if necessary.

4.3.4 Reproduce Frequency Alignment

Treble adjustment TREBLE REPRO

TRB REP 15.0 NAB B CH1 31 CH2 31

- Spool the calibration tape forward to the FREQUENCY RESPONSE section 16 kHz (applies to 30 ips, 14 KHz for 15 ips, 12.5 kHz for 7.5 ips). The level of this section is approx. 20 dB (CCIR) lower than the one of the level tone section.
- Connect the millivoltmeter to the line output channel 1.
- Page to the TRB REP position by pressing the V/NEXT key.



- Initially the cursor is located below the parameter for CH 1.
- Start the recorder in PLAY mode.
- By pressing the UP or DOWN key you can adjust the reproduce level to the desired line level.
- Press STORE.
- On stereo machines switch the millivoltmeter to the line output channel 2. Position the cursor below the parameter for channel 2 by pressing >/CURSOR. The desired line level can now be set by pressing the UP or DOWN key.
- Press STORE.

Modifying the standard reproduce equalization EQU REPRO: ...

EQU REP 15.0 NAB B CH1 61 CH2 61

For special applications the reproduce frequency response can be changed by slightly shifting the time constants of the standard reproduce equalization.

As a rule the standard equalization should not be modified

To change the standard reproduce equalization proceed as follows:

- Press LAST/NEXT to page to the TREBLE REPRO setting:
- Repetitively press > /Cursors until EQU REP appears on the LC display.



The equalization time constant is set in common for both channels.

- Start the tape recorder in PLAY mode.
- Pressing the UP key increases the time constant, i.e. the transition frequency is shifted toward the lower frequency (and vice versa).
- Press STORE when the optimum frequency response has been found.

THEORETICAL STANDARD REPRODUCE EQUALIZATION SETTINGS				
STANDARD TIME	CUT-OFF	STANDARD		
CONSTANT	FREQUENCY	EQUALIZATION		
[µs]	[kHz]	VALUES [HEX]		
120	1,326	E5		
90	1,768	A3		
70	2,273	87		
50	3,150	61		
35	4,547	44		
17,5	9,094	26		

Bass alignment BASS REPRO ...

BAS REP 15.0 NAB B CH 1 <u>6</u>A CH2 6A

- Spool the calibration tape forward to the FREQUENCY RESPONSE 63 Hz section.
- Connect the millivoltmeter to the line output channel 1.
- With the LAST/NEXT key page to the BAS REP position.
- Initially the cursor is located below the parameter for CH 1.
- Start the recorder in PLAY mode.
- By pressing the UP or DOWN key you can align to the optimum frequency response.
- Press STORE.
- On stereo machines switch the millivoltmeter to the line output channel 2. Position the cursor below the parameter for channel 2 by pressing >/CURSOR. The desired frequency response can now be set by pressing the UP or DOWN key.
- Press STORE.



Important !! If mono reference tapes are used for the reproduce alignment of stereo machines, strong fringing can occur at low frequencies. In order to achieve a linear frequency response, the reproduce alignment of the bass frequencies must either be repeated with tape (after the record alignment), or, if no record adjustments are planned, a calibration tape with the correct guard track width must be used!

4.3.5 Alignments for other Tape Speeds

The alignments for other tape speeds are basically performed in the same manner as outlined in Sections 4.3.2 through 4.3.4:

- Select desired speed
- Change over the equalization and tape type if necessary
- Mount the corresponding calibration tape.

Exceptions The reproduce frequency response is aligned with different frequencies, depending on the tape speed:

	SETTING FOR			
r · 1	TREBLE REPRO			
[ips]	[kHz]	[Hz]		
3,75	8	63		
7,5	12,5	63		
15	14	63		
30	16	63		

4.4 RECORD ALIGNMENTS

4.4.1 Preparatory Steps

Mount unrecorded tape of new quality.



Fig. 4.4.1

- Connect the AF generator with 1 kHz and operating level to the line input channel 1 (channels 1 + 2 on stereo models). A reference frequency of 700 Hz can be fed when aligning to NAB standards.
- Switch on the recorder and press the READY and REP keys of channels 1 and 2.
- Release all UNCAL buttons (calibrated level).
- Select the preferred studio tape speed.

4.4.2 Record Level Prealignment ...

LVL REC 15.0 NAB B CH1 30 CH2 30

Page to the LVL REC position by pressing the V/NEXT, ->/CURSOR, </CURSOR and V/LAST keys (possibly with the aid of a status tree diagram, Section 2.6, where also a step-by-step programming example can be found).





- Initially the cursor is positioned below the parameter for channel 1.
- Start the recorder in PLAY mode.
- The record level for the second channel can be set to the desired line level by pressing the UP or DOWN key.
- Press STORE.
- On stereo recorders switch the millivoltmeter to the line output channel 2. With ->/CURSOR position the cursor below the parameter for channel 2. The record level can now be set to the desired line level by pressing the UP or DOWN key.
- Press STORE.

4.4.3 Azimuth Alignment of the Record Head

If the bias has not been aligned yet, the parameters of two-channel or stereo recorders should be set to the same or similar values for both channels, refer to Section 4.4.4 (reason: the mechanical and the "magnetic" head gap of the record head are not in the same position; their distance depends on the magnitude of the bias current. For this reason an azimuth correction must be made after the final bias alignment).

- Set the AF generator to 10 kHz and decrease the level by 20 dB.
- Connect the millivoltmeter to the line output channel 1.
 - Start the recorder in PLAY mode.



Fig. 4.4.2

 Correct the azimuth of the record head by means of the azimuth alignment screw so that the highest output voltage and simultaneously the lowest level fluctuations are attained.

If major corrections of the azimuth alignment have been made, the record level prealignment (Section 4.4.2) should be repeated!

4.4.4 Bias Adjustment ...

BIA REC 15.0 NAB B CH1 <u>4</u>6 CH2 46

- Set the AF generator to 10 kHz and the level 20 dB below line level.
- Connect the millivoltmeter to the line output channel 1.
- Page to the BIA REC position by pressing V/NEXT.



- Initially the cursor is positioned below the parameter for CH 1.
- Start the machine in RECORD mode.
- The bias current is set to zero by repetitively (or continually) pressing the DOWN key.
- For searching the maximum output voltage, press the UP key, write down the value. Continue to press UP until the output voltage drops by approximately Delta U. Delta U depends on the tape speed and the tape type and can be determined from the BIAS table at the end of this Section.
- Press STORE.





- On stereo recorders, switch the millivoltmeter to the line output channel 2. Position the cursor below the parameter for channel 2 by pressing ->/CURSOR.
- Adjust the bias in the same manner as for channel 1.
- Press STORE.

4.4.5 Azimuth Correction (for two-Channel Models)

On stereo models align to minimum phase difference between the output signals of channels 1 and 2 with the aid of an oscilloscope and by carefully turning the azimuth alignment screw of the record head.

4.4.6 Record Level Adjustment ...



- Set the AF generator to 1 kHz (700 Hz) and line level.
- Connect the millivoltmeter to the line output channel 1.
- Page to the LVL REC position by pressing NEXT/LAST.



- Initially the cursor is positioned below the parameter for channel 1.
- Start the machine in RECORD mode.
- Set the record level to the desired line level by pressing the UP or DOWN key.
- Press STORE.
- On stereo recorders, connect the millivoltmeter to the line output channel 2.
 Position the cursor below the parameter for channel 2 with >/CURSOR.
- The record level can be adjusted to the desired line level by pressing the UP or DOWN key.
- Press STORE.

4.4.7 Record Frequency Alignment

- Set the AF generator to line level -20 dB.
- Connect the millivoltmeter to the line output channel 1.

Treble adjustment TREBLE RECORD ...

- TRB REC 15.0 NAB B CH1 54 CH2 54
- Page to the TRB REC position by pressing LAST/NEXT.



- Initially the cursor is positioned below the parameter for CH1.
- Start the recorder in PLAY mode.
- Align for optimum treble frequency response by pressing the UP or DOWN key: the recommended, non-binding treble linearization settings for the corresponding tape speeds are listed in the following table:

Tape s	speed	Frequency setting	
[cm/s] [ips]		[kHz]	
9,5	3,75	8	
19	7,5	10	
38	15	12,5	
76	30	16	

Press STORE.

- On stereo recorders switch the millivoltmeter to the line output channel 2. Position the cursor below the parameter for channel 2 by pressing ->/CURSOR.
- Align for optimum treble frequency response by pressing the UP or DOWN key.
- Press STORE.

Changing the standard record equalization

EQU RECORD ...

EQU REC 15.0 NAB B CH1 99 CH2 99

For special cases it is possible to correct the record frequency response by slightly shifting the time constants of the standard record equalization.

As a rule the standard equalization should not be modified!

To change the record equalization proceed as follows:

- Page to the TREBLE REPRO position by pressing LAST/NEXT.
- Repetitively press >/CURSOR until the following information appears on the LC display:



- The equalization time constant is in common set for both channels (only 1 parameter).
- Start the machine in RECORD mode.
- Pressing the UP key decreases the time constant, i.e. the transition frequency is shifted toward the higher frequencies (and vice versa).
- Press STORE when the optimum frequency response has been found.

THEORET. STANDARD RECORD EQUALIZATION SETTINGS				
STAND.TIME CONST.	CUT-OFF FREQUENCY	STANDARD EQUALIZATION		
[µs]	[kHz]	VALUES		
120	1,326	OE		
90	1,768	4C		
70	2,273	75		
50	3,150	82		
35	4,547	BA		
17,5	9,094	DE		

Bass alignment BASS REPRO (with Tape):

BAS REP 15.0 NAB B CH1 6A CH2 6A

For explanations refer to Section 4.2.1, note 2.)

- Connect the millivoltmeter to the line output channel 1.
- Page to the BAS REP position with LAST/NEXT.



- Initially the cursor is positioned below the parameter for CH1.
- Start recorder in PLAY mode.
- Align for optimum frequency response (below approximately 200 Hz) by pressing the UP or DOWN key.
- Press STORE.
- On stereo recorders, connect the millivoltmeter to the line output channel 2. Position the cursor below the parameter for channel 2 by pressing >/CURSOR.
- Align for optimum frequency response (below approximately 200 Hz) by pressing the UP or DOWN key.
- Press STORE.

4.4.8 Cross Talk Adjustment (only for 2-Channel and Stereo Models)

- Connect the AF generator (line level, 1 kHz) to the line input channel 1, and connect the millivoltmeter to the line output channel 2.
- Switch both channels to READY
- Start the machine in RECORD mode.
- Align for minimum output voltage with the aid of the CROSSTALK potentiometer (preamplifier in headblock, R14, Fig. 4.4.4).
- Repeat the same measurement with swapped channels.
- If pronounced differences occur, an optimum value has to be found for both channels.



Fig. 4.4.4.

4.5 SYNC Reproduce Alignments

Sync reproduction is not intended for 3.75 ips. However, it is feasible if degraded reproduce quality is acceptable. The factory sets all SYNC parameters to 00 for this tape speed.

(The same parameters as for the reproduce alignment can be used in one of two ways: Select function F034. Switch REPRO/SYNC PARAM. SAME/INDIVIDUAL to SAME:

- Directly when calibrating the reproduce settings: The REPRO value is read simultaneously into the sync amplifiers when the STORE key is pressed.
- Or after the reproduce settings have already been calibrated: Recall all reproduce parameters (select) and write the corresponding parameter into the synch amplifiers by pressing the STORE key.

- Switch off the tape recorder and wait 5 seconds.
- Set the jumper on the REPRODUCE AMPLIFIER to NARROW (or WIDE if a wider frequency response is desired in this case, however, strong cross talk from the record channel to the SYNC reproduce channel must be expected).

The settings for SYNC reproduction are analogous to the reproduce settings, with the following exceptions:

- On the VU-meter or channel selector select SYNC rather than REP (the LC display shows e.g. LVL SYN instead of LVL REP), the channel controllers are in all cases connected in parallel, even if they can normally be operated individually (function CH CONTR PAR/INDIV set to INDIV).
- The audio heads do not need to be realigned. However, the record and reproduce alignment must have already been completed.

Sync reproduce level alignment: ...

LVL SYN 15.0 NAB B CH1 <u>6</u>2 CH2 62

Treble alignment: ...

TRB SYN 15.0 NAB B CH1 50 CH2 50

 Alignment frequencies with jumper in NARROW position: 8 kHz for for 7½ ips, 10 kHz for higher tape speeds.

Altering the reproduce equalization

EQU SYNC ...

EQU SYN 15.0 NAB B CH1 61 CH2 61

The following table shows the theoretic standard equalization values:

THEORET. STANDARD RECORD EQUALIZATION SETTINGS				
STANDARD TIME .	CUT-OFF	STANDARD		
CONST.	FREQUENCY	EQUALIZATION		
[µs]	[kHz]	VALUES		
120	1,326	E5		
90	1,768	A3		
70	2,273	87		
50	3,150	61		
35	4,547	44		
17,5	9,094	26		

Bass alignment BASS SYNC: ...

EQU SYN 15.0 NAB B CH1 <u>8</u>8 CH2 88

Studer tape recorders are normally calibrated with full-track reference tapes. However, frequency response errors are caused by fringing effects in stereo and two-channel models at low frequencies.

For this reason it is recommended to align the SYNC reproduce frequency response for low frequencies with tape, i.e. after the record alignment the sync reproduce frequency response should be repeated with a test tape prepared on the machine itself if no calibration tapes with correct track separation are available (approximately 3 minutes each: 1 kHz (NAB 700 Hz), 10 kHz (8 kHz for 7½ ips), 50 Hz).

4.6. Time code Reproduction

Basically no electrical adjustments are necessary for the time code reproduction. The adjustments are limited to the mechanical alignment of the left-hand and righthand soundheads and are only necessary after the code heads have been replaced.

An alignment gauge should be available (part No. 10.010.001.28). Because the width of the code track is very small (0.38 mm), accurate alignment of the heads is absolutely essential.

4.6.1 Preparatory Steps

Check the heads for contamination and clean them, if necessary. The height of the head can be aligned to maximum reproduce level by means of a time code standard tape. The CODE READ/WRITE UNIT must be mounted on the extender board (No. 1.820.799.00) for this purpose.

CAUTION Switch off the recorder and wait at least 5 seconds before inserting or unplugging any circuit board!

Time code reproduction in spooling is not feasible as long as the CODE READ/WRITE UNIT is mounted on the extender board!

The reproduce level is measured (preferably with an oscilloscope) before the limiter on the test point TP; the ground terminal of the oscilloscope probe must be interconnected with terminal 21 of the extender board.



- Mount the time code reference tape, recording inhibited (SAFE).
- Start the recorder in PLAY mode.

4.6.2 Checking the Soundheads

THIS PROCEDURE IS ONLY NECESSARY AFTER THE SOUNDHEADS HAVE BEEN REPLACED!

- Visually check the height of the soundhead, then measure the voltage on the test point TP.
- With your finger alternately press from the top and the bottom lightly against the tape edge (to the left of the left-hand code head). The height is correct if the voltage becomes smaller while the tape is being pressed in either direction.
- Program the spooling speed for producing library pancakes (LIBRARY WIND), depending on the selected nominal speed, to 0.2 m/s, 0.4 m/s, or 0.8 m/s (in the ALIGNMENT DECK block, see status tree diagram, Section 2.6); press LIBRARY WIND and spooling key </>, measure the voltage on the test point TP.
- With your finger alternately press from the top and the bottom lightly against the tape edge (to the right of the right-hand code head). The height is correct if the voltage becomes smaller while the tape is being pressed in either direction.

Should the measured voltage rise when the tape edge is pressed, the height of the heads must be corrected:

- On the left-hand code head with the aid of shims (0.1 mm, Part No. 1.062.210.08),
- On the right-hand code head by adjusting the swivel plate. Refer to Section 4.6.3!

4.6.3 Tape Guidance

The right-hand time code head (combination head) must be aligned perpendicularly to the plane of the tape path. Lateral or forward/backward tilt detected after the height alignment has been performed must be corrected by adjusting the swivel plate with the aid of the TC head alignment gauge set No. 10.010.001.28. Recheck the height alignment, if necessary!



Fig. 4.6.2

4.7 Time code Recording

4.7.1 Preparatory Steps

The record alignment can be performed either with a time code signal or a squarewave signal. The advantage of the square-wave signal is that the image is visible on the oscilloscope. In this case, however, the CODE DELAY UNIT must be removed and the jumper JS2 on the CODE READ/WRITE unit must be changed to the BYPASS position.

• Mount the CODE READ/WRITE PCB on the extender board (part No. 1.820.799.00).

CAUTION:

Switch the recorder off and wait at least 5 seconds before you unplug or insert any PCBs! Time code reproduction in spooling mode is not feasible as long as the CODE READ/WRITE UNIT is mounted on the extender board!

- Switch on the recorder.
- Set the trigger level for the time code line input:

connect the square-wave generator (frequency 1 kHz) to the time code line input. The output voltage of the generator should be at the lowest value at which the line level input and the CODE LEVEL indicator lamp should still respond (factory setting: 0.5 Vpp, nominal input voltage approx. 150 mVpp). Adjust the trimmer potentiometer R15 on the TIME CODE READ/WRITE AMPLIFIER in such a way that the CODE LEVEL lamp just turns on.



Fig. 4.7.1

Check the soundheads for contamination and clean them, if necessary.

4.7.2 Adjusting the Head Height of the right-hand Code Head (Combination Head)

THIS PROCEDURE IS ONLY NECESSARY AFTER THE TIME CODE HEADS HAVE BEEN REPLACED!

- Mount an unrecorded tape of new quality
- Set the bias trimmer C9 to the middle position
- Turn the record level trimmers R2 (7½ ips), R8 (15 ips) and R10 (30 ips) counterclockwise from the limit position by 1/3 of the maximum angle of rotation (approximately 90°).
- Remove the CODE DELAY UNIT, set the jumper JS2 to the BYPASS position (if not already there, see Fig. 4.7.1).
- Select 7.5 ips tape speed.
- Connect the square-wave generator, 2 Vpp, 1 kHz, to all three line inputs and make a recording with a duration of approximately 10 to 20 seconds.
- Apply iron oxide spray: (MAGNETIC IRON OXIDE by AERSOLS INTERNATIONAL LTD., STUDER No. 10.555.001.00),

to a few centimeters of the recorded tape, coated side facing upward.

 After the suspension has dried, measure the track symmetry with the aid of a measuring magnifier (STUDER No. 10.258.006.00).

Correct the head height if the deviation is greater than \pm 0.05 mm. Repeat the recording and measurement process until track symmetry is achieved.



Fig. 4.7.2

It is necessary to check the tape guidance after the head height has been corrected (4.6.3).

4.7.3 Preparatory Steps

Press time code SAFE button (audio recording inhibited = SAFE)

- Connect the oscilloscope to the test point TP, connect the ground terminal of the oscilloscope probe to terminal 21 of the extender board.
- Mount the time code reference tape, spool forward to the second test section (time code, 729 nWb/m), start the recorder in PLAY mode, and measure the signal amplitude (amplitude, peak-to-peak) with an oscilloscope on the test point TP. Write down the measured value. (Approximate value: 180 - 300 mVpp at 15 ips)

If no time code reference tape is available, this measurement can be made on a make-shift basis with the aid of a full-track audio tape. Procedure:

 Connect the oscilloscope to the test point TP via an RC element as illustrated in Fig. 4.7.3.



Fig. 4.7.3

- Play the level tone section, 1 kHz, measure and write down the measured value.
- Multiply the measured value by the factor
 - k = 1.3 if a reference tape with a flux of 200 nWb/m is used,

or

k 0.81 if a reference tape with a flux of 320 nWb/m is used, to maintain the time code reproduce level (peak-to-peak) for a tape flux of 729 nWb/m pp.

Write down the computed value.

4.7.4 Bias Adjustment

- Mount an unrecorded tape of new quality;
- Adjust the bias timer C9 to minimum capacitance.
- Turn the record level trimmers R2 (7½ ips), R8 (15 ips) and R10 (30 ips) counterclockwise from their CCW limit position by 1/3 of the maximum angle of rotation (approximately 90°).
- Press the time code READY key.



Fig. 4.7.4

- Connect the square-wave generator (frequency 1 kHz; remove the CODE DELAY UNIT, set JS2 on the CODE READ/WRITE UNIT to the BYPASS position) or connect the time code generator with approximately 2 Vpp to the time code line input.
- Start the machine in RECORD mode. During the recording increase the capacitance of C9 step by step in intervals of 10 seconds until the rotor has travelled approximately 90°. A recording with different bias values is produced in this manner.





Rewind to the start of the recording.

- Connect the oscilloscope to the test point TP, connect the ground terminal of the oscilloscope probe to terminal 21 of the extender board.
- Switch the machine to PLAY mode.
- During the playback write down the position in which the output amplitude is the highest.
- Restore C9 to this position.
- Restart the machine in record mode. Adjust C9 in small increments to the previously noted position.
- Determine the optimum position of C9 through several experiments, i.e. maximum amplitude and steep signal edges.



Fig. 4.7.6

4.7.5 Record Level Alignment

	With the trimmer potentiometers R2 (for 7.5 ips and also for 3.75 ips if the function F410 (time code special) has been selected (see status tree diagram, Section 2.6). If necessary optimize the level to the preferred tape speed (3.75 or 7.5 ips. With R8 (for 15 ips) and R10 (for 30 ips) the record level is aligned in such a way that the reproduce level determined according to 4.7.3 is available on the test point TP.
Procedure (for each tape speed)	 Mount an unrecorded, new quality tape.
	 Connect the oscilloscope to test point TP (ground: to terminal 21 of the extender board).
	 Start the machine in RECORD mode and record a square-wave signal for time code for 20 seconds, approx. 2 Vpp, 1 kHz (CODE DELAY UNIT removed, JS2 on the CODE READ/WRITE UNIT in the BYPASS position).
	 Rewind to the start of the recording, switch the recorder to PLAY mode. The voltage on test point TP should be the same as the value determined according to 4.7.3.
	 Repeat this procedure several times until this value is attained.



at this procedure several times until this value is attained.



4.7.6 Checking the Head Gap Position, Reproduce

(05) (06

020

C

- Install the CODE DELAY UNIT.
- Connect the time code line output and the line output of one of the two audio channels to the MASTER or the SLAVE input of a STUDER TLS 4000 synchronizer (or a time code reader with offset display facility).

Ó

 $\left(\begin{array}{c} 2 \\ 2 \end{array} \right)$ (014) CS3 C 8 13

- Mount the time code reference tape, spool to the first section (full-track time code) and start the recorder in PLAY mode, tape speed 15 ips.
- Measure the offset between the audio channel and the time code channel.

: •

IC 17

10

0 R 47 0 R 46

• (0 3) • − • (2 5) • − • 47] • − • 47] • − • 873 • − • 873 • − • 873 • − • 873 • − • 873 • −

°. .

- The offset should not exceed 2 ms (for 30 ips), 4 ms (for 15 ips) or 8 ms (for 7.5 ips). If the offset is greater, it can be decreased by turning the left-hand combination head.
- After this adjustment has been made it is necessary to check the erase depth of the audio channels! A compromise between maximum erase efficiency and minimum time code offset may have to be made.

If the head wrap is correctly adjusted and if the erase efficiency of the audio channels is adequate, the offset values are usually within the above tolerances. Verification with the above mentioned equipment is, therefore, not absolutely necessary.

4.7.7 Checking the Head Gap Position, with Tape

- Connect the time code generator in parallel to an audio channel and to the time code channel. Make a recording with a duration of approximately one minute.
- Rewind to the start of the recording and measure the offset between the audio channel and the time code channel with the same equipment as in 4.7.6.
- The offset should not exceed 2 ms. If the offset is larger, it can be decreased by turning the right-hand combination head.
- **Important !!** After the right-hand combination head has been aligned (time code record head) a new recording must be made for checking the head gap position!

The tape should pass approximately symmetrically across the head face, it should not be drawn across one of the edges!

4.7.8 Checking the Time Code Reproduction in Spooling Mode

- Install the CODE DELAY UNIT, or if none is available, set the jumpers JS2 on the CODE READ/WRITE UNIT to the BYPASS position.
- Install the CODE READ/WRITE UNIT without extender board.
- Connect the time code generator to the TC line input.
- Select 7.5 ips tape speed.
- Make a recording with a duration of approx. 10 minutes.
- Connect the time code reader to the TC line output.
- Switch the recorder to spooling mode. The recorded time code should be read accurately even at maximum spooling speed in either direction.

If the time code is not read correctly (too many drop-outs), the right-hand time code head should be cleaned or possibly be repositioned. (Also realign the lifter).

Cleaning the right-hand code head:	 With a hard brush remove the deposits in the grooves and clean the head with soundhead cleaner.
Checking the headface	Of the right-hand time code head
	 Color the right-hand side of the right-hand time code head with a grease pen (part No. 10.401.001.01). Actuate the tape lifter manually and press one of the spooling keys. Check the headface after approx. 1 to 2 minutes of spooling time. The headgap should be within the section wiped by the tape. If this is not the case, check the lifter alignment according to 3.3.7 or adjust the time code head at the expense of the delay time (lightly correct the offset measurement).
Important !!	During the spooling process the CODE DELAY UNIT is automatically bypassed, i.e. the offset in spooling mode is always much greater than in play mode.

4.8 External Storage of the Audio Parameters

For copying the audio and tape tension parameters of the RAMS to an external storage medium, the tape recorder must be equipped with the serial interface 1.810.751. Two copying methods are feasible: either by means of a suitable personal computer directly on a diskette, or on audio tape (preferably with the tape recorder whose parameters are to be stored).

With a special command the data stored in RAM can be compared with the saved data in order to verify that they have been correctly transmitted.

The terms SAVE (data backup) for external storage of the data from the tape recorder RAM, and VERIFY for comparing the externally stored data with those in the tape recorder RAM, and LOAD for transferring the data from the external storage medium into the tape recorder RAM are used in the following description.

4.8.1 SAVING the Data on Tape

When the SAVE command is initiated on the tape recorder, the microprocessor serially transmits the stored audio and tape tension data to terminals 4 and 6 of the SMPTE/EBU BUS/RS232 connector.

These terminals are balanced and floating, the level is approx. 9 Vpp. In order to match the output level to the current source, a load impedance (approx. 47 ohm) must be connected between pins 4 and 6 (results in a voltage of approx. 2.5 Vpp). For safety reasons the complete set of data is transmitted three times. The entire SAVE process takes approx. 65 seconds.

Procedure

Connect the input of the tape recorder to the SMPTE/EBU BUS / RS232 connector:



Fig. 4.8.1

- Select the tape speed (7.5 ips)
- Mount a tape of corresponding length (at least 65 seconds).
- Press the READY key of the desired recording channel.
- With the aid of a hexagon-socket-screw key No. 2.5, give the programming lock [28] approx. 1 - 2 counterclockwise turns
- Repetitively press V/NEXT until the LC display contains the following information:

PARAM BACKUP ON TAPE V_^ VERIFY SAVE LOAD

The cursor is located between the two arrows (in a protected position).

- Press >/CURSOR twice, the cursor is now positioned below SAVE.
 - Start the recorder in play mode with PLAY + REC.
- Press STORE, the LC display contains the following information:

DATA TRANSMISSION IN PROGRESS PLS WAIT

The data are recorded on tape.

- Measure the reproduce level with tape on the audio line output. If necessary change the impedance so that approx. 2.5 Vpp are available at the output. Or, if available, adjust the record level with the RECORD LEVEL potentiometer.
- Make the final recording.

Upon completion of the data transmission the following message is displayed:

DATA TRANSMISSION COMPLETED

If an error has occurred during the data transmission (e.g. due to a transient line voltage failure), the following message is displayed:

DATA TRANSMISSION FAILED

In this case press V/NEXT or ^/LAST to retrieve the following menu:

PARAM BACKUP ON TAPE ^ v VERIFY SAVE LOAD

The process can be repeated, if desired, or you can return to the starting position by pressing ^/LAST.

4.8.2 VERIFYING the Data Stored on Tape

When the VERIFY (verify the RAM data with the data on the external storage medium) command is entered on the tape recorder, the microprocessor serially receives all stored audio data (pins 4 and 6 of the SMPTE/EBU BUS/RS232 connector).

These terminals are balanced and floating. The level should be approx. 2.5 Vpp.

Procedure = Connect the output of the tape recorder to the socket SMPTE/EBU BUS/RS232:



Fig. 4.8.2

- Select the same tape speed that has been used for recording the data.
- Mount the tape containing the stored parameters.
- Adjust the reproduce level: The reproduce level should be not much less than 2 Vpp. If necessary adjust the level.
- With the aid of a hexagon-socket-screw key No. 2.5, give the programming lock [28] 1 to 2 counterclockwise turns.

Repetitively press V/NEXT until the LC display shows the following menu:

PARAM BACKUP ON TAPE ^ v VERIFY SAVE LOAD

The cursor is now located between the two arrows (in a protected position).

- Press >/CURSOR once, the cursor is now positioned below VERIFY.
- Press STORE, the LC display contains the following information:

WAITING FOR DATA INP PLS SEND DATA

Press PLAY to start the recorder in play mode. The LC display shows the following information as soon as valid data are decoded:

VERIFYING DATA PLEASE WAIT

After the data comparison has been successfully completed, the following message is displayed:

VERIFICATION SUCCES-FULLY COMPLETED

If the data do not agree, the following message is displayed:

VERIFICATION FAILED PLEASE REPEAT

The following message is displayed if:

Play has not been started within approx. 15 seconds, and No valid data have been detected within approx. 30 seconds:

NO DATA FOUND

In all cases the key ^/LAST switches back to the following menu:

PARAM BACKUP ON TAPE ^ v VERIFY SAVE LOAD

This procedure can be repeated, if necessary, or with ^/LAST you can page back to the starting position.

4.8.3 LOADING the Data from Tape

When the LOAD command (loading data from the external storage medium) is entered on the tape recorder, the microprocessor serially receives all stored audio data and loads them into RAM. The same connection cable can be used as for VERIFY. Normally the first of the three identical data blocks on the external storage medium suffices for loading the data. However, if errors occur during the loading operation, the processor accesses the second or the third data block. Procedure

Same as in 4.8.2 until the following menu is displayed:

PARAM BACKUP ON TAPE ^_v VERIFY SAVE LOAD

Press >/CURSOR three times, the cursor is now positioned below LOAD.
 Press STORE, the LC display contains the following information:

WAITING FOR DATA PLS SEND DATA

Press PLAY to start the machine in play mode. The LC display contains the following information as soon as valid data are detected:

DATA LOADING IN PROGRESS - PLS WAIT

Upon successful completion of the load operation the following message is displayed:

DATA LOADING COMPLETED

If read errors have occurred (e.g. transient line voltage failure, contaminated soundheads) the following message is displayed:

DATA LOADING FAILED DEFAULT PARAM LOADED

Repeat the process, or if desired, continue to work with the default parameters.

The following message is displayed if:

Play has not be started within approx. 15 seconds,

and

No valid data have been detected within approx. 30 seconds:

NO DATA FOUND

The old audio and tape tension reference data are still available in the RAM.

In all cases the key ^/LAST switches back to the following menu:

PARAM BACKUP ON TAPE ^_v VERIFY SAVE LOAD

This procedure can be repeated, if necessary, or with ^/LAST you can page back to the starting position.

4.8.4 SAVING the Data by Means of a Personal Computer

When the SAVE command is entered on the tape recorder, the microprocessor serially transmits the stored audio and tape tension data to the SMPTE/EBU BUS/RS232 connector. For safety reasons the complete set of data is transmitted three times.

Procedure

- Connect the personal computer to the SMPTE/EBU BUS / RS232 connector: Same as described in 2.8.5. In addition the software handshake mode (X ON/X OFF protocol) must be activated.
- With the aid of a hexagon-socket-screw key No. 2.5, give the programming lock [28] approx. 1 - 2 counterclockwise turns
- Repetitively press V/NEXT until the LC display contains the following information:

PARAM BACKUP RS 232 ^_v VERIFY SAVE LOAD

The cursor is located between the two arrows (in a protected position).

- Press >/CURSOR twice, the cursor is now positioned below SAVE.
- Press STORE, the LC display contains the following information:

DATA TRANSMISSION IN PROGRESS - PLS WAIT

The data are transmitted to the personal computer. Upon completion of the data transmission the following message is displayed:

DATA TRANSMISSION COMPLETED

The received ASCII data can be recorded on diskette.

If an error has occurred during the data transmission (e.g. due to a transient line voltage failure), the following message is displayed:

DATA TRANSMISSION FAILED

In either case press V/NEXT or ^/LAST to retrieve the following menu:

PARAM BACKUP RS 232 ^ v VERIFY SAVE LOAD

The process can be repeated, if desired, or you can return to the starting position by pressing ^/LAST.

4.8.5 VERIFYING the Data in the Personal Computer.

When the VERIFY (verify the RAM data with the data on the external storage medium) command is entered on the tape recorder, the microprocessor serially receives all stored audio data (pins 4 and 6 of the SMPTE/EBU BUS/RS232 connector).

Procedure

Start up and connect the personal computer to the SMPTE/EBU BUS/RS232 connector:

Same as described in 2.8.5 In addition the software handshake mode X ON/X OFF protocol) must be activated.

- With the aid of a hexagon-socket-screw key No. 2.5, give the programming lock [28] 1 to 2 counterclockwise turns.
- Repetitively press V/NEXT until the LC display shows the following menu:

PARAM BACKUP RS 232 ^ v VERIFY SAVE LOAD

The cursor is now located between the two arrows (in a protected position).

- Press >/CURSOR once, the cursor is now positioned below VERIFY.
- Press STORE, the LC display contains the following information:

WAITING FOR DATA INP PLS SEND DATA

 Activate the data transmission from the personal computer to the tape recorder. The LC display shows the following information as soon as valid data are decoded:

> VERIFYING DATA PLEASE WAIT

After the data comparison has been successfully completed, the following message is displayed:

VERIFICATION SUCCES-FULLY COMPLETED

If the data do not agree, the following message is displayed:

VERIFICAITON FAILED PLEASE REPEAT

The following message is displayed if:

No transmission has been started within approx. 15 seconds, and

No valid data have been detected within approx. 30 seconds:

NO DATA FOUND

In all cases the key ^/LAST switches back to the following menu:

PARAM BACKUP RS 232 ^_v VERIFY SAVE LOAD

This procedure can be repeated, if necessary, or with ^/LAST you can page back to the starting position.

4.8.6 LOADING the Data from the Personal Computer

When the LOAD command (loading data from the external storage medium) is entered on the tape recorder, the microprocessor serially receives all stored audio data and tape tension and loads them into RAM. Normally the first of the three identical data block on the external storage medium suffices for loading the data. However, if errors occur during the loading operation, the processor can access the second or the third data block.

Procedure

Same as in 4.8.5 until the following menu is displayed:

PARAM BACKUP RS 232 ^_v VERIFY SAVE LOAD

- Press >/CURSOR three times, the cursor is now positioned below LOAD.
- Press STORE, the LC display contains the following information:

WAITING FOR DATA PLS SEND DATA

 Start the data transmission from the personal computer to the tape recorder. The LC display contains the following information as soon as valid data are detected:

DATA	LOA	DIN	g in
PROGR	ES -	PLS	WAIT

Upon successful completion of the load operation the following message is displayed:

DATA LOADING COMPLETED

If read errors have occurred (e.g. transient line voltage failure, contaminated soundheads) the following message is displayed:

DATA LOADING FAILED DEFAULT PARAM LOADED

Repeat the process, or if desired, continue to work with the default parameters. The following message is displayed if:

Transmission has not been started within approx. 15 seconds, and

No valid data have been detected within approx. 30 seconds:

NO DATA FOUND
The old audio and tape tension parameters are still available in the RAM.

In all cases the key ^/LAST switches back to the following menu:

PARAM BACKUP RS 232
^_v VERIFY SAVE LOAD

This procedure can be repeated, if necessary, or with ^/LAST you can page back to the starting position.

4.9 Programming the Operation Parameters

4.9.1 Program Switch LINE AMPLIFIER





JS0, JS1

Connection of internal monitor and headphones output:

Connection on output amplifier

JS0 = 0 JS1 = 1

Connection before muting

= 1 = 0

Monitor speaker and headphones switched off

JS0 = 0
JS1 = 0

JS2...JS9: VU-meter panel, mono/stereo switch:

Configuration	JS2	JS3	JS4	JS5	JS6	JS7	JS8	JS9
without VU-Panel, without M/S- Switch	1**	1	1	1	0	1	0	1
with VU-Panel, without M/S- Switch	1	0	1	1	1	0	1	1
without VU-Panel, with M/S- Switch	1**	1	0*	1*	0	1	1	0
with VU-Panel, with M/S- Switch	1	0	0*	1*	1	0	0	0

* The indicated switch position means that when the output selector is in the INP position, the RECIN output signal of the mono/stereo switch will be heard. If the input signal is to be tapped before the mono/stereo switch, it is necessary to set JS4 to 1 and JS5 to 0.

** On machines without VU-meter panel and without monitors speaker the jumper setting JS2 = 0 is required.



Fig. 4.9.2

4.9.2 Jumper REPRODUCE AMPLIFIER

The SYNC reproduce frequency response can be switched from 12 kHz ("N = narrow) to 20 kHz ("W" = wide) by means of a jumper.

Note Strong cross talk from the record to the sync reproduce channel must be expected above 12 kHz!



Fig. 4.9.3

4.9.3 Jumper VU-Meter Amplifier

The display characteristic of each VU-meter or peak program meter (PPM) can be selected by means of a jumper on the back of the VU-meter panel. VU indication according to IEC recommendation 268, part 10, Section 4; peak program indication (PPM) according to IEC recommendation 268, part 10, Section 3 (except 24, 1, scale division).

Remove the VU-meters by unfastening the 4 mounting screws.



Fig. 4.9.4

4.9.4 Jumper and Potentiometer MONO/STEREO SWITCH and/or TEST GENERATOR

Jumper

- If the mono/stereo switch is retrofitted, the setting of the program switch on the LINE AMPLIFIER must be altered correspondingly (refer to 4.9.1). In addition the
- Function 031 "STEREO/MONO" is to be program assigned to a key selected by the user (as shown in example 4, Section 2.6.4)
- Key label is to be changed, and the

• Status indication plate is to be replaced by the one with the complete labeling. Identification plates and plug-in LEDs are bypacked in the accessories of the recorder.

In machines for which a test generator is desired but the mono/stereo switch is not desired or applicable (e.g. full-track versions), the electronics of the mono/stereo switch is nevertheless required.

In this case the TA-ACTMD signal must be pulled to ground with jumper IC1 (jumper in position "TEST GENERATOR ONLY"); the microprocessor then assumes that there is no mono/stereo switch so that this switch will not be operated by the software.

The record operating mode can be selected with jumper JS2:

- Mono signal either only from the input channel 1, or
- The aggregate signal of channels 1+2.

The reproduce operating mode can be selected with jumper JS3:

- The aggregate signal of channels 1 + 2 can either be connected only to the output channel 1 or,
- To both channels 1 and 2.



Fig. 4.9.5

Potentiometers

(Prerequisite: the tape recorder has been calibrated as specified in Section 4.2).

- LEVEL MONO alignment, reproduce:
- Mount a tape
- Select the MONO mode (simultaneously press STOP and STEREO MONO).
- Set the level for the desired flux with the "LEVEL MONO REPROD" potentiometer.

- Select a setting that is 1.1 dB below the MONO level in order to compensate the guard track loss (not taken into consideration in the factory setting!).
- LEVEL MONO alignment, record: Feed nominal level 1 kHz.
- Select MONO mode (simultaneously press STOP and STEREO-MONO).
- Set the output to nominal level by means of "LEVEL MONO RECORD" potentiometer.
- TEST GENERATOR alignment:
- Switch the recorder to INPUT.
- Press the "REF" button on MONO/STEREO SWITCH circuit board; set the "REF LEVEL" potentiometer to a reference level of 0 dB/VU.

4.9.5 Jumper TIME CODE READ/WRITE UNIT

With the jumper JS1 the LED can be programmed not to indicate whether a signal is recorded on the time code track (CODE LEVEL LED).

When the time code channel is operated without the CODE DELAY UNIT 1.820.722, the delay input and output must be interconnected. The serial interface can be used for this purpose, if available, or the jumper JS2 can be moved to the corresponding position on the CODE READ/WRITE amplifier. In the second case no CODE DELAY UNIT may be installed!



Fig. 4.9.6

4.9.6 Jumper MONITOR AMPLIFIER

- MONITOR AMPLIFIER (refer to Fig. 4.9.7):
- Jumper JS1 in position "S": both channels are connected to the headphones socket.
- Jumper JS1 in position "M": only channel 1 is connected to the headphones socket.





- SOURCE SELECTOR BOARD (refer to Fig. 4.9.8): Jumpers JS1 and JS2 must either be both in position "A" or "C"!
- Jumpers JS1 and JS2 in position "A": When the switch "1+2/CUE" is pressed, the aggregate signal of both audio channels is connected to the monitor speaker or the headphones socket.
- Jumpers JS1 and JS2 in position "C": If switch "1+2/CUE" is pressed, the time code signal is connected to the monitor speaker or to the headphones socket respectively.



Fig. 4.9.8

4.10 Bias Adjustment Parameters

Таре Туре		U(dB)		
Tape Speed	9,5 cm/s 3,75 ips		38cm/s 15 ips	76cm/s 30 ips
Agfa PEM 468	6	6	3.5	1.5
Agfa PEM 469	7	7	5	2
Agfa PER 525	6	5	3	1
Agfa PER 528	6	6	3.5	1.5
Ampex 406	6	5	3	1.5
Ampex 456 MASTER	5	6.5	3.5	1.5
BASF LGR 30P	6	6	4	1.5
BASF LGR 50P	6	6	4	1.5
BASF SPR 50LH/LHL	6	5.5	3.5	1.5
BASF Studio Master 910	5	6	4.5	1.5
EMI 816/817	6	6.5	4	1.5
PYRAL CJ90	6	6.5	3.5	1.5
SCOTCH (3M)206	5.5	5.5	3	1.5
SCOTCH (3M)226	6	6	3.5	1.5
SCOTCH (3M)250	5	6	3.5	1
SCOTCH (3M)256	6	6.5	3,5	1
SCOTCH (3M)263	6	6	3	1

5. Master Section

-

ESE = Electrostatically sensitive assembly

Contents		GRP/ELM	
Block diagram of the groups and elements Wiring Principal connection types Cable designations, color scheme Explanation to the LOCATION PIN LIST Explanation to the SIGNAL WIRE LIST Explanation to SIGNAL NAME Signal names Wiring lists Location pin list Signal wire list Tape transport section Block diagram tape transport			5/1 5/4 5/5 5/5 5/6 5/7 5/8 5/9 5/25 5/27 5/25 5/27 5/51 5/85
Tape deck control master section Block diagram MP Unit Tape Deck Control MPU master control Block diagram master serial interface Master serial interface Block diagram master periphery control Block diagram channel control Block diagram C-MOS bus (audio)	1.820.785.00ESI1.811.786.25ESI1.820.753.00ESI1.820.753.00ESI1.820.753.81ESI1.820.728.00ESI	E GRP20/ELM44 E GRP20/ELM43 E GRP20/ELM43 E GRP20/ELM43 E GRP20/ELM43	5/87 5/88 5/89 5/91 5/93 5/95 5/95 5/97 5/98
Master periphery controller Block diagram serial remote controller Block diagram SMPTE/EBU interface Serial remote controller SMPTE/EBU bus interface Block diagram parallel remote interface Parallel remote interface Block diagram serial remote interface Serial remote interface Block diagram informations GRP50-54	1.820.728.81ESI1.810.751.00ESI1.820.751.00ESI1.820.751.21ESI1.820.751.21ESI1.820.738.00ESI1.820.738.00ESI1.820.738.81ESI1.820.729.00ESI1.820.729.00ESI	E GRP20/ELM45 E GRP20/ELM45 E GRP20/ELM45 E GRP20/ELM45 E GRP35 E GRP35 E GRP35 E GRP35 E GRP35	5/99 5/101 5/103 5/104 5/105 5/107 5/109 5/111 5/113 5/115 5/117 5/119
Block diagram display driver board Tape deck display driver Tape deck display driver Push button board/display board Subpanel push button board Shuttle board LC display unit LC display unit TC channel control board TC channel control board	1.811.776.00ESI1.811.776.82ESI1.811.777.001.811.778.001.328.214.001.811.233.811.811.233.821.820.732.001.820.735.001.820.735.00		5/120 5/121 5/123 5/125 5/127 5/129 5/131 5/132 5/133 5/135







STUDER A812

SURVEY OF GROUPS (PART 4, POWER SUPPLY & AUDIO SECTION)

GRP/ELM DESIGNATION OF ASSEMBLIES

5.1 Wiring

For equipment with complex electronics, wiring diagrams are difficult to follow and can cause misinterpretations. For this reason we have chosen a more reliable method based on automatically generated computer wiring lists. These provide comprehensive information on all electrical connections within the equipment.

For the sake of clarity, the power supply, the tape transport control system, and the audio section have been subdivided into groups (GRP) which in turn comprise elements (ELM) and connecting points (PNT).

The signal names are constructed from various abbreviations which identify their function.

5.1.1 Groups

The electrical part of the A&12 tape recorder has been subdivided into groups (GRP01...GRP30). These Groups are linked by cables and connectors that are identified by the corresponding group number. The group summary (foldout page on the left) and the block diagram (at the beginning of the diagram Section) identify the group allocation and the principal connections.

5.1.2 Elements, points

Groups that comprise several plug-in circuit boards or other assemblies are subdivided into elements (ELM). The elements contain the connecting points (PNT).

5.1.3 Principal connection types

Туре	Designation	STUDER No.
	Connector type D,crimp:	
A	Contact pin, for thin stranded wires	54.02.0451
AA	Contact pin, for thick stranded wires	54.02.0455
В	Contact sleeve, for thin stranded wires	54.02.0450
BB	Contact sleeve, for thick stranded wires	(54.02.0454)
	CIS connector:	
С	Contact sleeve	54.01.0402
D	Contact pin 54.01.0401	
	MOLEX connector:	
F	Contact sleeve, for thin stranded wires or contact	54.02.0412
	sleeve for solder mounting on circuit board	54.02.0407
FF	contact sleeve, for thick stranded wires	54.02.0413
G	Soldering pin	29.21.6002
н	Stranded/solid wire, tinned (6 mm)	
I	Connector, type D, crimp, contact pin	54.02.1112
	Blade terminal AMP FASTON, crimp 0.8 x 6.3 mm;	
JM	Connector sleeve, for thin stranded wires	54.02.0337
J	Connector sleeve, for thick stranded wires	54.02.0332
ĴĴ	Connector sleeve, for very thick stranded wires	54.02.0338
к	Stranded/solid wire, skinned (8), tinned (1 mm)	
L	Stranded/solid wire, tinned (4 mm)	
М	MOLEX contact pin, for thin stranded wires or MOLEX contact pin for solder mounting	54.02.0411
	on circuit board	54.02.0406
MM	MOLEX contact pin, for thick stranded wires	54.02.0410
MY	AMP blade terminal (blade)	54.02.0344
N	CIS connector, contact pin	54.01.0225
0	Contact spring, for EU card edge connector	54.01.0376
	Female multipoint connector:	
Р	Contact spring, for thin stranded wires	54.06.4512
r PP	Contact spring, for thick stranded wires	54.06.4512
	Contact spring, for thick standed wires	54.00.4510
Q	Socket terminal strip, contact sleeve	54.01.0451
R	Connector, type D, crimp, contact sleeve	54.02.1111

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S	Stranded/solid wire, skinned (4 mm) and tinned	
Т	TERMI-POINT plug contact on WIRE WRAP pin	,
U UU	Detent spring solder contact, crimp Detent spring solder contact, crimp	54.03.0201 54.34.6002
V VV	Connector sleeve for thick stranded wires Connector sleeve for thin stranded wires	54.02.0432 54.02.0474
W	Wrapped	
x xx	Blade connector AMP FASTON, crimp 0.5 x 2.8 mm: Connector sleeve, for thin stranded wires Connector sleeve, for thick stranded wires	54.02.0325 54.02.0329
Y YY	Blade connector AMP FASTON, crimp 0.8 x 2.8 mm: Connector sleeve, for thin stranded wires Connector sleeve, for thick stranded wires	54.02.0326 54.02.0327
z	Not tinned	

Fig. 5.1

5.1.4 Cable designations, conductor color scheme

The most important connecting lines of the cabling are labelled. The conductor ends are marked with three numbers which identify the group, the element, and the corresponding connection point.

Flat-cable connectors have labels that specify the:

- Group and element numbers where the connector itself is plugged in, and either the
- Name of the module into which the opposite end of the cable is plugged in,

or:

- the Name of the module into which the connector itself is plugged in.
- Examples: Labelling of individual conductors in connectors:

The tape deck controller PCB 1.811.774.XX (GRP 27) features a 12-pin Molex socket (ELM 4) which is identified on the component arrangement diagram with P1. One of the 8 connecting wires on the matching connector (GRP 27, ELM 4) is green and is labelled as 20-66-6. This combination of numbers identifies a connection point (PNT) of a specific ELEMENT (ELM) of a group (GRP), in this example GRP 20, ELM 66, connection point 6. In other words: the green wire is the connection 6 of the 12-pin Molex socket P1.

The opposite end of the green conductor is imprinted with the designation 20-20-3, i.e. it is connected to terminal 3 of the wire field ELM 20 on the BASIS BOARD GRP 20.

Labelling of flat cables:

Both cable ends are fitted with labels that identify the GROUP and the ELEMENT of the corresponding connection socket.

Cables that originate from a distributor are usually identified with TO and the name of the corresponding assembly, for example:

The flat cable connector P3 (ELM 3, on the BASIS BOARD (GRP 20) is labelled as follows:



i.e. this flat cable connects the BASIS BOARD 1.811.700.XX to the TAPE DECK CONTROLLER 1.811.774.XX (GRP 27).

The label on the TAPE DECK CONTROLLER end of the flat cable is labelled as follows:

GRP27 ELM01 TAPE DECK CONTROLLER

Basis Board 1.811.700.XX (GRP 20)



Color scheme:

0	black	(blk)							
1	brown	(brn)							
2	red								
3	orange	(org)							
4	yellow	(yel)							
5	green	(grn)							
6	blue	(blu)							
7	violet	(vio)							
8	grey	(gry)							
9	white	(wht)							
-	uncolored	(unc)							
Fig	Fig. 5.3								

5.1.5 Explanations to the LOCATION PIN LIST

The LOCATION PIN LIST provides information on all connecting points and their signal names as well as the type of connection and, if applicable, also the color of the connecting wire.

This list is arranged by groups and contains all connecting points of a group, sorted by element number. However, it does not provide any information on the connections of an individual point. But it may contain information on the cable harness routing (see example below).

To trace the cable connection of a known signal name (on a certain group and the corresponding element), the SIGNAL WIRE LIST must be used.

This SIGNAL WIRE LIST must also be used if only the signal name is known (Section 5.1.6).

If the GROUP (e.g. a circuit board) and the corresponding ELEMENT (e.g. a connector on this PCB) are known, all available signals and their names, the color and connection type of the conductor wires, as well as the pin location on the connector can be determined from the LOCATION

Example: LOCATION PIN LIST PAGE 29

101

GRP 27 1.811.774.00 <-- <-- CONTINUATION

SUPPLY (FROM GRP20, ELM20)

PNT SIGNAL NAME COLOR LV TYPE

ELM 4

+15.0 + 0.0 -15.0 + 5.6 + 0.0

T-PWRON

+ 0.0 T-SUPVON

10 11 + 0.0 12

 *
 WILLI STUDER AG *
 L O C A T I O N P I N L I S T
 *
 89/09/18 * 12:22 * P A G E 27

 *
 1.811.000.00 *
 STUDER A 812 * TAFE DECK & AUDIO
 *
 86/05/19 - 00

- Group 27 is the TAPE DECK CONTROLLER 1.811.774.00
- ELEMENT 4 of GROUP 27 is the 12-pin connector P1 for GROUP 20, ELEMENT 20.
- CONNECTION POINT 1 of ELEMENT 4 of the GROUP 27 carries the signal name + 15V (i.e. the + 15 V supply).
- The connection type is M.

As can be seen from Table 5.1 in Section 5.1.3, code M is a MOLEX contact pin for PCB mounting (54.02.0406). See below.



- No wire color is specified because this connector is solder mounted directly to the tape deck controller board.
- Neither are any colors specified if the connection cable is a flat cable.

As the above example demonstrates, the LOCATION PIN LIST can also supply information on the origin of the cable to the connector (or in our example: to the socket).

ELEMENT 4 GROUP 27 is labelled as SUPPLY (FROM GRP 20, ELM 20).

The origin of the connection to the 12-pin Molex socket (GRP 20, ELM 20) can be found on page 15 of the LOCATION PIN LIST.

STUDER A812

*	1.811.09	0.00 * STUDER	A 812 * TAPE DE	CK & AUDID • 88/05/19 - 00
	1.811.70	00.00 < CONTINUATIO	DN 🔳	Group 20 is the BASIS BOARD 1.811.700.XX
		IN. GRP20, ELM657	66 F	ELM 20 of GRP 20 is the WIRE FIELD (connection field) TO CONN. GRP 20 ELM 65/66 (to connector GRP 20, ELM 65 and ELM 66). The part number for the connection cable is 1.811.898.00.
1 + 5.6 2 + 5.6 3 T-PWRJN + + 0.0	3 3 5	บ บ บ บ		The signal on connection point 3 (GRP 20, ELM 20, PNT 3) is named T-PWRON.
5 + 0.0 6 + 0.0 7 + 0.0	0	U U U		The connection wire is green (color $5 = \text{green}$), see Table 5.3.
8 + 0.0 9 -15.0 10 -15.0 11 T-SUPVON	0 6 9	U U U U	-	The connection type is $U =$ detent spring solder contact, crimp (54.03.0201)
12 + 0.0 13 + 0.0 14 +15.0	0 2	U		
15 +15.0 16 +24.0 17 -26.0 18 +26.0	2 7	U U		



This information already gives precise information on the arrangement of the cable connection.

EL 9 P9

GRP 20

BASIS BOARD 1.811.700.XX

Representation on diagram:





0000

0000

0000



5.1.6 Explanations to the SIGNAL WIRE LIST

This list is arranged alphabetically by signal name. The alphabetic section is preceded by the signal names of the zero Volt points as well as the supply voltages. If the signal name is known, additional information can be extracted from this list. If only the group designation or the group number is known, the LOCATION PIN LIST (see 5.1.5) should be used.

The signal name can be found in the first column (SIGNAL NAME). The second column specifies the conductor COLOR. The fourth column specifies the groups (GRP), elements (ELM), and connecting points at which the corresponding signal appears. This column is arranged by assembly number and does not provide any information on the signal path through the equipment.

Examples:

The signal T-PWRON can be found by means of an alphabetic search on page 91 of the SIGNAL WIRE LIST

T-PWRON	5	19	1	7	F	FROM GRP30, ELMO2 JOI	
	5	19	2	7	м	TO GRP20, ELM10 P01	
			10	7	F	FROM STABILIZER GRP30, ELMO2 J01	
			11	6	F	SYNCHRONIZER (SUPPLY) P10	
	5		20	3	U	WIRE FIELD, TO CONN. GRP20, ELM65/66	1.811.898.00
		20	44	14		MP-UNIT MASTER JOB	1.811.786.00

Continuation of T-PWRON on page 92 of the SIGNAL WIRE LIST.

****	******	****	****	****	****	****	****	****	h de skale i	****		****	***	****			****	****		***	all the second	****	~ ~ ~								****	
* WILLI ST	UDER A	G *		S	I G	N	Α	L	ы	I	R I	E	L	I S	т				*	8	9/0	9/18			12:2	2	*	PA	GI		92 🔹	
* ***********	1.811	.090.	00	* S1	UDER	A	812	*	ΤΑΡΕ	DECM	(8	AUDIC							*	8	8/0	5/19	-	00								
*****	******		****		****	****	****					*****		*****			****	****		***	***	****	***	***	****	***	***:	****	***	****	****	
SIGNAL NAME	COLOR	МI	ASY	GRF	ELM	PNT	S	LV	TY	ΡE			D	E SCR I	PTIO	N OF	ELE	MEN	r					RE	MARK			ELEM	ENT	NR.		
							-																-			-						
<< CONT.OF	5			20	66	6			F						TOR 1							P1	6									
T-PWRON				27	4	6			M				S	JPPL Y	(FRC	DM G	RP 20	 FI 	M20			10	÷ .									
				30	ż	7			м						(TO							PO										
							-																-									

Information from the SIGNAL WIRE LIST

Signal name (SIGNAL NAME)	: T-PWRON
Color of the conducting wires (COLOR)	: 5 = green, or none in the case of a flat cable or PCB conductor.

Connection types (TYPE)

(TYPE) F, M, or U

- F = Molex contact socket for this stranded wires or Molex contact socket for direct solder mounting to the circuit board.
- M = Molex contact pin for thin stranded wires or Molex contact pin for
- direct solder mounting to the circuit board.
- U = Detent spring solder contact, crimp

List extract relating to the signal path T-PWRON

GRP	ELM	PNT	Signal path
30	2	7	From the 24-pin Molex PCB coupling P1 pin 7 on the stabilizer board 1.820.790.XX a
19	1	7	Cable harness with Molex connector routes the green conductor from Pin 7
19	2	7	to Pin 7 of the Molex connector at the opposite end of the cable harness.
*20	10	7	This connector is plugged into the Molex socket J1 of the Basis Board 1.811.700.XX. From here the signal branches off via printed conductors.
20	11	6	This signal is taken to Pin 6 of the synchronizer board socket and ends here (the pin is not assigned).
20	44	14	The signal is also taken via a printed conductor to Pin 14 of the Master MPU 1.811.786.XX (multipin connector J8) and also to
20	20	3	pin 3 of the wiring field ELEMENT 20.
20	66	6	The green wire of the soldered Cable harness with Molex connector (1.811.898.XX) is taken to the
27	04	6	Tape deck controller 1.811.774.XX.

* From there the signal branches off. This is the reason why the GRP number appears more than twice in the SIGNAL WIRE LIST.

5.1.7 Signal name

The signal name is generally an abbreviation for the function or task of the corresponding signal. From the table below, arranged in alphabetic order, the following information can be retrieved:

- Explanation of the signal name
- Specification of the level for static signals (5 V or 15 V level)
- Signal status

Example: (Extract from the signal name list)

 T-POS1
 0 Position sensor 1

 T-POS2
 0 Position sensor 2

 T-PWRON
 0 Power on (AC detection)
 1 @ on

 T-READSL
 0 Select read mode, MUX bus

 T-REFEXT
 0 Capstan PLL, external reference (vari-speed)

5/18

 T
 means:
 TTL level (i.e. 5 V logic) (see next page)

 PWRON
 means:
 AC power on (=mains voltage available)

 1 @ on
 means:
 This signal is high (1) when the AC supply voltage is available.

EDITION: 1. Oktober 1989

If this signal is +5 V this means that AC supply voltage is available.
 If this signal is 0V(Low), no AC supply voltage is available or a power failure is detected.

Signal Names

A810 / A812 / A820 - SIGNAL I	LIST	89/06/10	SEITE	1
*****	*****	*****	*****	**

T = TTL, C = CMOS

+ 0.0 +0.0SENS 0.0 VCU + 5.0 + 5V + 5.6 + 5V-LED +15.0 +24.0 +26.0 +26.0 +110.0 A810 / A812 / A820 - SIGNAL LIST 89/06/10 SEITE 2 ************************* +CAPMOT O Capstan supply voltage +FLSUP1 O Floating supply for FET driver, motor left +FLSUP2 O Floating supply for FET driver, motor left +FLSUP3 O Floating supply for FET driver, motor right +FLSUP4 O Floating supply for FET driver, motor right +PSVTMOT 0 Positive power supply voltage for torque motors O PWM signal mains unit motor supply +PWMMV +PWMNL O PWM signal for motor left, negativ +PWMNR O PWM signal for motor right, negativ +PWMPL O PWM signal for motor left, positiv +PWMPR O PWM signal for motor right, positiv +REMSUP O Remote supply voltage (+24 VDC) +STAB+15 0 Positive input for +15.0 stabilizer +STAB-15 0 Positive input for -15.0 stabilizer +STABIN 0 +STABSNS 0 +STAB5.6 0 Positive input for + 5.6 stabilizer O Low level spooling motor supply voltage +UCOMP +VMOTLFT O Positive voltage torque motor left +VMOTRHT O Positive voltage torque motor right +YSUP O Motor supply voltage positiv +10VREF 0 Analog reference tension -FLSUP1 O Floating supply for FET driver, motor left -FLSUP2 O Floating supply for FET driver, motor left -FLSUP3 O Floating supply for FET driver, motor right -FLSUP4 O Floating supply for FET driver, motor right -PSVTMOT O Negative power supply voltage for torque motors --PWMMV O PWM signal mains unit motor supply -PWMNL O Return motor left, negativ -PWMNR O Return motor right, negativ O Return motor left, positiv -PWMPL O Return motor right, positiv -PWMPR -STAB+15 0 Negative input for +15.0 stabilizer -STAB-15 0 Negative input for -15.0 stabilizer -STABIN 0 -STABSNS 0 -STAB5.6 0 Negative input for + 5.6 stabilizer -UCOMP O Low level spooling motor supply voltage -VMOTLFT O Negative voltage torque motor left -VMOTRHT O Negative voltage torque motor right -YSUP O Motor supply voltage negativ -10VREF O Amalog reference tension A-PNOISE 0 SR calibration signal (pink noise) ACA O Alternativ supply voltage (AC), pole A ACA-130 0 ACAF O AC supply voltage after fuse ACB O Alternativ supply voltage (AC), pole B ACB-130 0 O Alternativ supply voltage (AC), pole C (C=medium) ACC O Motor AC voltage ACM ACPWE-A1 0 ACPWE-A2 0 ACPWE-A3 0 ACPWE-A4 0 ACPWE-A5 0 ACPWE-A6 0

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****************	*****
ACPWE-B1 0	
ACPWE-BZ 0	
ACPWE-B3 0	
ACPWE-B5 0 ACPWE-B6 0	
ACPWE-C1 0	
ACPWE-CZ 0	
ACPWE-C3 0	
ACPWE-C4 0	
ACPWE-C5 0	
ACPWE-C6 0	
ACPWE-D1 0	
ACPWE-D3 0	
ACPWM-A1 O	
ACPWM-A2 O	
ACPWM-A3 0	
ACPWM-A4 0	
ACPWM-A5 0 ACPWM-A6 0	
ACPWM-AB 0	
ACPWM-B2 0	
ACPWM-B3 0	
ACPWM-B4 O	
ACPWM-B5 0	
ACPWM-B6 0	
ACPWM-C1 0	
ACPWM-C2 0	
ACPWM-C3 0	
ACPWM-C4 0	
ACPWM-C5 0	
ACPWM-C6 0	
ACPWM-D1 0 ACPWM-D2 0	
ACPWM-D2 0	
AFCSW-XY O Audio frequency current switch,	1 @ record current on
AN-CSPDC 0 Capstan speed control	10 V @ maximal speed
AN-ICL O Motor current left signal	10 V C maximal speed
AN-ICLD O Motor current left direct	
AN-ICR O Motor current right signal	
AN-ICRD 0 Motor current right direct	
AN-IRL O Reference for motor current left	
AN-IRR O Reference for motor current right	
AN-POT O DC Varispeed control	
AN-R O Spooling motor phase R AN-RES1 O	
AN-RES1 0 AN-RES2 0	
AN-RES3 0	
AN-RES4 0	
AN-RFTTL O Reference tape tension, left (analog)	
AN-RFTTR O Reference tape tension, right (analog))
AN-S O Spooling motor phase S	
AN-T O Spooling motor phase T	
AN-TACHO O Tacho sensor capstan motor	
AN-TTL O Tape tension, left (analog)	
AN-TTR O Tape tension, right (analog)	
ANM-SH1 O Shuttle signal 1 (O v ADC)	
ANM-SH2 O Shuttle signal 2 (cursor)	
ANM-SH3 0 Shuttle signal 3 (+ 5 V ADC)	

A810 / A8 *******						-					****	****		ITE ***	4
B- BDY-XY B-CCIR	0	LED on	mast	er pa	nel) @	pro	cesso	or on	ing	out
B-CH1		LED on												0 0	
B-CH2 B-EAD	0	LED on LED on				audio	al	ignment	,					0 0	on
BCH2 BFAD BFAST	ŏ	LED on													
B-FORW		LED on													
B-INP-XY	-														
B-LEDO B-LED1		LED on												00	
B-LEDI B-LED2		LED on LED on												00	
B-LED3	õ	LED on												õõ	
B-LOC1	0	LED on	comm	nand u	nit			-							
B-MONO		LED on												0 0	
B-NAB		LED on	mast	er pa	nel,									00	
B-PLAY B-REA-XY						.								0 0 0 0	
B-REC		LED on				01,								0 0	
B-REC-XY	Ő	LED on	char	nel c	ontr	ol,								0 @	
B-REP-XY						ol,								00	
		LED on												0 0	
B-SAF-XY B-SLOW	0	LED on LED on	char	inel c	ontr	01,								00	
B-STEREO														0 0	
B-STOP														õē	
B-STORE						audio	al	ignment	:,					00	on
B-SYN-XY										_	-			0 0	
B-TLC-XY						з,			1	. @	Pro	cesso	r on	ing	but
B-TRANSF B-XKEY															
B-YKEY															
B-ZKEY															
BIAFB-XY							ett	ing							
BIASA-XY															
BIASB-XY BIASC-XY							ive	r							
BM-0.2	ŏ	DIAS U	river	, nr	SWIT	cn									
BM-0.3	ō														
BM-0.4	0														
BM-0.5	0														
BM-0.6 BM-0.7	0														
BR-FADRY	-	Status	FADE	R STA		FADY					0 @	LED	or L	amp	on
BR-FORW		Status										LED			
BR-LOCST					,							LED			
BR-PLAY		Status										LED			
BR-REC BR-REHSL		Status Status										LED		•	
BR-REW		Status												•	
BR-STOP		Status										LED			
BR-VRSPD	0	Status	VARI	SPEE							0 @	LED			
BRC-BIA		LED on												0 0	
BRC-LVL		LED on												0 0	
BRC-TRB BRP-BAS		LED on LED on												00	
BRP-LVL		LED on												00	
BRP-TRB		LED on												0 0	

A810 / A812 / A820 - SIGNAL LIST 89/06/10 SEITE 5 CA-ADR-R O CMOS bus (LSB address) CA-ADR-S O CMOS bus CA-ADR-T O CMOS bus CA-ADR-U O CMOS bus (MSB address) CA-BADXY O Electronics 1.820.712/713 bias adjustement enable, O @ write CA-BADXY 1 Electronics 1.820.811/812/813: reference voltage for bias CA-BADXY 2 and erase current, offset voltage of bias loop = 5.3V CA-BATXY O CA-BIAXY O Bias soft switching, 1 @ bias soft switch on CA-BIKXY O Bias switching, 1 @ bias switches on CA-BPDTC O By pass delay time code, 1 @ by pass CA-CHSTC O Time-code CA-CHSXY O Channel select, CMOS bus 0 @ select on for write CA-CMTST O CM-Bus Bit Test CA-DATAO O Data line, CMOS bus CA-DATA1 O Data line, CMOS bus CA-DATA2 O Data line, CMOS bus CA-DATA3 O Data line, CMOS bus CA-DATA4 O Data line, CMOS bus CA-DATA5 O Data line, CMOS bus CA-DATA6 O Data line, CMOS bus CA-DATA7 O Data line, CMOS bus CA-EQLXY O Switching eqalization, low frequency, CA-EQLXY 1 O @ 3180 us on (=NAB) 1 @ CCIR CA-EQRXY O Equalization record adjustment enable, 0 @ write CA-EQTXY O CA-ERAXY O Erase soft switching, 1 @ erase soft switch on CA-ERKXY O Erase switching, 1 @ erase switch on CA-ER1XY O Erase voltage CA-ER2XY O Erase voltage CA-ER3XY O Erase voltage CA-ER4XY O Erase voltage CA-INPXY O Input signal on output, 0 @ input on CA-INSTR O Switching VU or PPM 0 @ Peak, 1 @ VU CA-LERXY O Level record adjustment enable, 0 @ write CA-LETXY O Level tape adjustment enable 0 @ write CA-LLADB O Operating line level 10 dBm, 1 @ on CA-LLODB O Operating line level O dBm, CA-LL4DB O Operating line level 4 dBm, 1 @ on 1 @ on CA-LL8DB O Operating line level 8 dBm, 1 @ on CA-LSBTC O Data load least sign bit time code, 1 @ load CA-LSWXY O Line amplifier switching, 1 @ write CA-MONO O Mono-stereo-switch, CA-MSBTC O Data load most sign bit time code, O @ mono mode 1 @ load CA-MUTXY O Muting of line output, 1 @ mute CA-RSWXY O Electronics 1.820.712/713: Record drop in/out CA-RSWXY 1 switching enable 1 @ write CA-RSWXY 2 Electronics 1.820.811/812/813: Dolby HX Pro Switching 1 @ on CA-RS1TC O Read source time code CA-RS2TC O Read source time code CA-RS2TC 0 Read source time code1 @ sateCA-SAFE 0 Audio safe, reproduce mode,1 @ sateCA-SIGNL 0 Switching Meter or Test0 @ Meter, 1 @ TestCA-SWTCH 0 Switching Input or Tone test generator0 @ Input, 1 @ Gen.CA-SWTCH 0 Switching Input or Tone test generator0 @ Sync onCA-SWTCH 0 Switching Input or Tone test generator0 @ Sync on CA-TRRXY O Treble record adjustment enable, 0 @ write CA-TRTXY O Treble tape adjustment enable, 0 @ write CA-WLOTC O Write level time code CA-WL1TC O Write level time code CA-WL2TC O Write level time code CA-WL3TC O Write level time code

A810 / A812 / A820 - SIGNAL LIST 89/06/10 SEITE 6 CA-WRTTC O Write time code, 1 @ write O Output signal capstan motor direction CDIR O @ direction REVERSE PLAY, 1 @ direction PLAY CDIR 1 CD-SETUP 0 1 @ Setup (calibration) CPHASE-R O Capstan motor supply voltage, phase R CPHASE-S O Capstan motor supply voltage, phase S CPHASE-T O Capstan motor supply voltage, phase T 0 CTS DCPHT-L O DC Phase T left DCPHT-R O DC Phase T right DCPHR-L O DC Phase R left DCPHR-R O DC Phase R right EQUAL-XY 0 ERACS-XY O Erase current off, 0 @ current off ERAHH-TC O Erase head, high, time-code ERAHH-XY O Erase head, high ERAHL-TC O Erase head, low, time-code ERAHL-XY O Erase head, low ERAHM-XY O Erase head, medium ERAHO-XY O Erase head, screen O Power line from main fuse F-LINE1 F-LINE2 0 5 V TO 30 V @ PLAY O FADER START (WIRE A), FAD1 5 V to 30 V @ PLAY O Fader start (wire B), FAD2 FRMGND 0 GND 0 Ground INPAD-XY O Input, adjusted INPAU-XY O Input, uncalibrated INPDI-XY O Input, direct IR-REFEX O Input external reference for capstan PLL K-BRAKE O Brake solenoid K-BRAKEL O Brake solenoid left K-BRAKER O Brake solenoid right K-EDIT O Edit solenoids K-LIFT O Lift solenoid K-PRESS O Press solenoid K-PRESSA 0 K-PRESSB 0 K-REC-XY O Record relay / sync muting, 0 @ record on / sync muting K-STDBY 0 K-TTSL O Solenoid tape tension sensor left K-TTSR O solenoid tape tension sensor right K-TTSR O solenoid tape tension sensor right O Power line LINE1 O Power line LINE2 LINFA-TC O Time-code-line-input, amplifier (wire A) LINFA-XY O Line-input, amplifier (wire A) LINFB-TC O Time-code-line-input, amplifier (wire B) LINFB-XY O Line-input, amplifier (wire B) LINSA-TC O Time-code-line-input, machine (wire A) LINSA-XY O Line-input, machine (wire A) LINSB-TC O Time-code-line-input, machine (wire B) LINSB-XY O Line-input, machine (wire B) LOUFA-TC O Time-code-line-output, amplifier (wire A)

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A810 / A812 / A820 - SIGNAL LIST 89/06/10 SEITE 8 MONIT-XY O Monitor-signal MONITAMP O Monitor-signal, from volume control OR-CMCLK 0 Output signal capstan motor move clock OR-MVCLK O Output signal tape move clock OR-MVDIR O Output signal tape move direction O @ direction REWIND OR-MVDIR 1 1 @ direction FORWARD OR-SYENB 0 Output signal to synchronizer, 0 @ enable OR-SYENB 1 enable for synchronizer mode PENB-L O Power enable left 0 @ enable O Power enable right PENB-R 0 @ enable PRIMV-1 O Mains transformer, primary PRIMV-2 0 Mains transformer, primary PRIMV-3 O Mains transformer, primary PRIMV-5 O Mains transformer, primary PRIMV-6 0 Mains transformer, primary PRIMW-1 O Mains transformer, primary PRIMW-2 0 Mains transformer, primary PRIMW-3 O Mains transformer, primary PRIMW-4 0 Mains transformer, primary PRIMW-5 0 Mains transformer, primary PRIMW-6 O Mains transformer, primary PRIMW-7 O Mains transformer, primary PWMPL-H1 0 PWMPL-H2 0 PWMPL-L1 0 PWMPL-L2 0 PWMPL-L3 0 PWMPL-L4 0 PWMPL-L5 0 PWMPL-L6 0 PWMPR-H1 0 PWMPR-H2 0 PWMPR-L1 0 PWMPR-L2 0 PWMPR-L3 0 PWMPR-L4 0 PWMPR-L5 0 PWMPR-L6 0 RCCOMM 0 RCV-232 0 RCVDATA 0 RECEIVA 0 RECEIVB 0 RECEIVCM 0 RECHH-TC O Record head, high, time-code RECHH-XY O Record head, high RECHL-TC O Record head, low, time-code RECHL-XY O Record head, low RECIN-XY O Record amplifier, input REFLEV O Reference level DC for VU Meter compair REPHH-TC O Reproduce head, high, time-code REPHH-XY O Reproduce head, high REPHL-TC O Reproduce head, low, time-code REPHL-XY O Reproduce head, low REPRE-XY 0 REPRO-XY 0

A810 / A812 / A820 - SIGNAL LIST 89/06/10 SEITE 9 S-AKBENA O Audio parameter keyboard enabled @ 1 S-CADEQU O Common adjust for equalization (CCIR levels = NAB levels) S-EHEAD1 O Type of erase head {AB=10 @ full track, AB=11 @ time code S-EHEAD2 0 {AB=01 @ two track, AB=00 @ record def. S-EQUAL 0 S-FORW 0 0 @ FORWARD command S-INP-XY O O @ INPUT command S-LINELA O Line operating level setting { AB=00 @ 0 dBm, AB=10 @ 4 dBm S-LINELB 0 { AB=01 @ 8 dBm, AB=11 @10 dBm S-LINE1 O Power line from mains switch S-LINEZ O Power line from mains switch S-LLLSDB O Line level lowest significant bit S-LLMSDB O Line level most significant bit O Key on command unit 0 @ LOC1 command S-LOC1 S-NABCCI O Audio parameter equal. for CCIR and NAB S-PLAY O Key on command unit 0 @ PLAY command S-PLCNTR O Parallel control of audio channels, 0 @ parallel 0 @ READY command S-REA-XY O Key on channel control S-REC 0 @ RECORD command O Key on command unit S-RECAPT 0 S-REP-XY O Key on channel control 0 @ REPRODUCE command S-RESET O Key on command unit 0 @ RESET command 0 @ REWIND command S-REW O Key on command unit 0 @ SAFE command S-SAF-XY O Key on channel control S-SPEEDA O O @ SLOW speed 0 @ on command S-SPEEDB 0 0 @ FAST speed O @ on command 0 @ STOP command O Key on command unit S-STOP S-SYN-XY O Key on channel control 0 @ SYNC command S-TRANSF O Key on command unit O @ TRANSFER command to LOC memory S-XKEY O Key on command unit 0 @ on command 0 @ on command S-YKEY O Key on command unit O Key on command unit S-ZKEY 0 @ on command S-0L0C O Key on command unit 0 @ OLOC command SF-LINE1 O Power line from mains filter SF-LINE2 O Power line from mains filter SHIELD 0 SIGN.GND 0 SIN1-L O PWR-Sinus1 cmos logic left SIN1-R O PWR-Sinus1 cmos logic right SIN2-L O PWR-Sinus1 cmos logic left SIN2-R O PWR-Sinus1 cmos logic right SNCOMM 0 SND-232 0 SNDATA 0 SPARE 0 SR-FADRY 0 0 @ FADER START READY command from remote control SR-FORW 0 0 @ FORWARD command from remote control SR-LIFT 0 0 @ LIFTER command from remote control SR-LOCST 0 0 @ LOC START command from remote control SR-LOC1 0 0 @ LOC1 command from remote control SR-MUTE O O @ MUTE command from remote control SR-PLAY 0 0 @ PLAY command from remote control 0 0 @ RECORD command from remote control SR-REC SR-REHSL O O @ REHEARSAL command from remote control SR-RESET 0 0 @ RESET TIMER command from remote control SR-REW 0 0 @ REWIND command from remote control SR-STOP 0 0 @ STOP command from remote control SR-TRANS 0 0 @ TRANSFER command from remote control SR-VRSPD 0 0 @ VARISPEED command from remote control SR-OLOC 0 0 @ ZERO LOC command from remote control

A810 / A812 / A820 - SIGNAL LIST 89/06/10 SEITE 10 STABIN-1 O Stabilizer input STABIN-3 0 Stabilizer input STABIN-4 O Stabilizer input STABIN-5 O Stabilizer input STABIN-6 O Stabilizer input STUBUS1 O STUDER bus line symmetrical STUBUS2 O STUDER bus line symmetrical SYNHH-XY O Record head, high, sync mode SYNHL-XY O Record head, low, sync mode SYPRE-XY 0 SYS-CTS O Sychronizer SSDA clear to send SYS-DTR O Sychronizer SSDA data terminal ready SYS-RX O Sychronizer SSDA receive data SYS-TX O Sychronizer SSDA transmitter data T-ACSTR O Audio controller strobe T-ADOPT1 O Audio VU-panel int/ext 1 @ VU-panel extern T-ADRX O Address bus, micro processor bus TTL T-ADRY O Address bus, micro processor bus TTL O Address bus, micro processor bus TTL T-ADRZ T-BUSSW 0 T-CAPON O Capstan control on/off 0 @ on T-CLK1 O Clock 1 from tape move sensor O Clock 2 from tape move sensor T-CLK2 T-CMCLK O Capstan motor, move clock T-CTS 0 T-CUSTR O Control unit strobe T-DATAO O Data bus T-DATA1 O Data bus T-DATA2 O Data bus T-DATA3 O Data bus T-DATA4 O Data bus T-DATA5 O Data bus T-DATA5 O Data bus T-DATA7 O Data bus T-DIR O Tape move direction 1 @ forward 0 @ driver's enabled T-DRVENB O Drivers ser. IF enable/disable T-DT-CH1 O Data for channel 1, MUX bus T-DT-CH2 O Data for channel 2, MUX bus T-DT-CH3 O Data for channel 3, MUX bus T-DT-CH3 O Data for master panel, MUX bus T-DT-MP O Data for master panel, MUX bus T-DT-RES O Available data line T-DT-RP1 O Data for parallel remote panel, MUX bus T-DT-RP2 O Data for parallel remote panel, MUX bus T-DT-SJM O Data for jumpers ser. IF mode control, MUX bus T-ENB O Processor's clock (1.2288 MHz) T-IRQ O Processor's interrupt line 0 0 @ tape end 0 0 @ tape end T-LEDL T-LEDR 1 @ move T-MECHTM 0 T-MODSEL 0 T-MONMUT O Monitor muting for fader mode, O @ monitor muting 0 @ processor on input T-MRS-XY O Control of Dolby NRS, T-NMI 0 T-NOMSPD 0 T-POS1 0 Position sensor 1 T-POS2 0 Position sensor 2 T-PWRON 0 Power on (AC detection) 1 @ on T-READSL O Select read mode, MUX bus T-REFEXT O Capstan PLL, external reference (vari-speed)

A810 / A812 / A820 - SIGNAL LIST 89/06/10 SEITE 11 T-REFINT O Internal reference for capstan (9.6 kHz) T-REFSEL O Speed reference select 0 @ varispeed T-RESET O System reset line T-RTS 0 T-RVSTR 0 T-RW O Processor's read/write T-RX O Serial IF read line 1 @ read T-SADA O Address A, MUX bus T-SADB O Address B, MUX bus T-SADC 0 Address C, MUX bus T-SL1 0 T-SPDSL O Capstan speed select IPS | 30 | 15 | 7.5|3.75| T-SPDSL1 1 Capstan speed select T-SPDSL2 0 Capstan speed select | 0 | 1 | 1 | 0 | T-SUPVON O Supply voltages on (DC detection) 1 @ on T-SYNCAP O Capstan synchronisation 0 @ sync T-TC/RC 0 T-TCINDL O Time-code input delay T-TCINRC O Time code signal (via R-C) for monitor-INPUT T-TCOUDL O Time-code output delay T-TCOURC O Time code signal (via R-C) for monitor-OUTPUT T-TCPRES O Time code present T-TDSTR O Tape deck controller strobe 0 @ selected T-TENDL O Tape end sensor, left 0 @ tape end T-TENDR O Tape end sensor, right 0 @ tape end T-TNDL 0 T-TNDR 0 T-TPSPD1 O Tape spooling speed T-TPSPD2 O Tape spooling speed T-TX O Serial IF, send line T-VARSPD 0 0 @ external reference for capstan motor control T-WRTSL O Write select, MUX bus T-WCLK1L O Wind clock 1 left (Motor tacho) T-WCLK1R O Wind clock 1 right (Motor tacho) T-WCLK2L O Wind clock 2 left (Motor tacho) T-WCLK2R O Wind clock 2 right (Motor tacho) TA-ACTMO O Mono-stereo-switch stand by, 0 @ switch missing TA-ACTTC O Time-code channel record section stand by TA-ACTTC 1 0 @ defect or missing TA-ACTXY O Channel record section stand by, O @ defect or missing TA-AUIR O Audio interrupt TA-CLK O Audio clock (307.2 KHz) TA-CMPXY O Audio level compair for VU Meter, O @ higher like REFLEV TAPAD-XY O Tape-signal, adjusted TAPAU-XY O Tape-signal, uncalibrated TAPDI-XY O Tape direct TAPLI-XY O Check point TAPMS-XY O Tape-signal, after mono-stereo-switch TC-ADR0 0 TC-ADR1 0 TC-ADR2 0 TC-CAPDC O Capstan direction control 0 @ forward TC-CDIRI 0 TC-CPREF O Reference signal 9.6 kHz @ nominal speed TC-DATAO O TC-DATA1 0 TC-DATA2 0 TC-DATA3 0 TC-DATA4 0 TC-DATA5 0

A810 / A812 / A820 - SIGNAL LIST 89/06/10 SEITE 12 TC-DATA6 0 TC-DATA7 0 TC-ENB 0 0 TC-ENBG TC-EREF 0 TC-HALL1 O Hall element nr. 1, signal output TC-HALL2 O Hall element nr. 2, signal output TC-HALL3 O Hall element nr. 3, signal output TC-INEX 0 TC-IRQ 0 TC-REF 0 TC-REFP 0 TC-RESET 0 TC-RESMP 0 TC-RW 0 TC-SL1 0 TC-SL2 0 TC-SL3 0 TC-TCDIR 0 TC-TCMV 0 TC-TCMVI 0 TD-ADRO 0 TD-ADR1 0 0 TD-ADR2 TD-ADR3 0 TD-BUSSW 0 TD-CAPSY O Capstan Synchronization, 0 @ synchron TD-CLK 0 Clock for spooling motor control (76.8 KHz) TD-CRES O Capstan reset 0 @ reset TD-C307K O Clock for motor supply TD-C614K O Clock for spooling motor driver (PWM) TD-C76K 0 TD-DATAO O TD-DATA1 0 TD-DATA2 0 TD-DATA3 0 TD-DATA4 0 TD-DATA5 0 TD-DATA6 0 TD-DATA7 0 TD-DIRL O Motor direction left TD-DIRR O Motor direction right TD-DRENB 0 TD-E O Processor clock (1.2288 MHz) TD-ENB 0 TD-ENG O Enable gated (write delayed) TD-EVENT O Start event @ lower edge TD-HEACT O Head contact. 0 @ contact TD-ICRE1 0 TD-ICRE2 0 TD-ICRE3 0 TD-ICRE4 0 TD-ICRE5 0 TD-IRQ O Interrupt for tape deck TD-MFL O Tape deck motor frequency left TD-MFR O Tape deck motor frequency right O Tape move indicator, TD-MOVE 0 @ move TD-MOVE1 O Move signal 1 TD-MOVE2 0 Move signal 2 TD-MVCLK O Move sensor clock

A810 / A812 / A820 - SIGNAL LIST 89/06/10 SEITE 13 TD-MVCKS O Move clock symetric (50% duty cicle) TD-MVDIR O Move sensor direction, 1 @ forward TD-NMI O TD-PAVS O Sinus print available TD-PAV1 O Print 1 available TD-PAV2 O Print 2 available TD-PAV3 0 Print 3 available TD-PENB O Power enable 0 @ enable TD-PENBL O Enable for motor driver left 0 @ enable 0 @ enable TD-PENBR O Enable for motor driver right TD-PWENB O Enable for supply motors TD-RALC1 O Roller assembly, motor left, clock 1 TD-RALC2 O Roller assembly, motor left, clock 2 TD-RALEN O Roller assembly, motor left, enable, 0 @ enable TD-RALP1 O Roller assembly, motor left, position 1 TD-RALP2 O Roller assembly, motor left, position 2 TD-RARC1 O Roller assembly, motor right, clock 1 TD-RARC2 O Roller assembly, motor right, clock 2 TD-RAREN O Roller assembly, motor right, enable 0 @ enable TD-RARP1 O Roller assembly, motor right, position 1 TD-RARP2 O Roller assembly, motor right, position 2 TD-RES O Tape deck reset TD-RESET 0 TD-RESMP 0 TD-RESIN O Watch dog output 0 @ reset 0 TD-RW TD-RX 0 TD-SCK O Sinus clock control TD-SHLD O Head block shield, 0 @ closed TD-SL2 0 TD-SL3 0 TD-SL4 O Spooling motor control and periphery controller TD-SL5 0 Tape deck serial interface TD-SL6 0 Counter - Timer TD-SL7 0 TD-SYNC O Lower edge = sync TD-TCM1 O Tachosignal 1, capstan motor TD-TCM2 O Tachosignal 2, capstan motor TD-TML1 O Tacho signal 1, motor left TD-TML2 O Tacho signal 2, motor left TD-TMR1 O Tacho signal 1, motor right TD-TMR2 O Tacho signal 2, motor right TD-TRSP O Optical sensor in tape guide, O @ no tape, transparent tape TD-TRSPR O Optical sensor in tape guide 0 @ transparent red TD-TX 0 TD-WCLKL O Motor wind clock left (4 edges) TD-WCLKR O Motor wind clock right (4 edges) TD-WDIRL O Motor direction left TD-WDIRR O Motor direction right TD-YTRSP 0 Optical sensor in tape guide analog 0 V @ no tape TD-YTRSP 1 analog 12 V @ with tape TD-15VSC 0 +/-15V supply control TD-24VSC 0 24V supply control TD-307K 0 TD-76K8 O Reference frequency TD-9600 0 TDS-CLK O Tape deck SSDA clock TDS-CTS O Tape deck SSDA clear to send TDS-DTR O Tape deck SSDA data terminal ready O Tape deck SSDA receive data TDS-RX

A810 / A812 / A820 - SIGNAL LIST 89/06/10 SEITE 14 TDS-TX O Tape deck SSDA transmitter data TL-AO 0 TL-CS 0 TL-DO 0 TL-D1 0 TL-D2 0 TL-D3 0 TL-D4 0 TL-D5 0 TL-D6 0 TL-D7 0 TL-ENB 0 TL-RESET 0 TL-WR 0 TM-A 0 TM-ADRO O Address bus, micro processor bus TTL O Address bus, micro processor bus TTL O Address bus, micro processor bus TTL TM-ADR1 TM-ADR2 TM-ADR3 O Address bus, micro processor bus TTL тм-в 0 TM-BUSSW 0 TM-C 0 TM-CUE1 O Cue tacho signal 1 TM-CUE2 O Cue tacho signal 2 ТМ-СЗО7К О TM-C614K 0 TM-C76K 0 TM-C9600 0 TM-D 0 TM-DADRO 0 TM-DADR1 0

TM-DADR2 0

A810 / A812 / A820 - SIGNAL LIST	89/06/10	SEITE 15

TM-DATAO O Data bus		
TM-DATA1 O Data bus		
TM-DATA2 O Data bus		
TM-DATA3 O Data bus		
TM-DATA4 O Data bus		
TM-DATA5 0 Data bus		
TM-DATA6 O Data bus TM-DATA7 O Data bus		
TM-DENB O		
TM-DP 0		
TM-DRENB 0		
TM-DRES 0		
TM-DRW O		
TM-DSL4 0		
TM-DSL5 0		
TM-DO O		
TM-D1 0		
TM-D2 0		
TM-D4 0 TM-D5 0		
TM-D6 0		
TM-D7 0		
TM-D8 0		
TM-D9 0		
TM-E O		
TM-ENB O		
TM-ENO O		
TM-EN1 O		
TM-EN2 0		
TM-EN3 O TM-EN4 O		
TM-F 0		
TM-G O		
TM-IADRO O		
TM-IADR1 0		
TM-IADR2 0		
TM-IENB O		
TM-IRES O		
TM-IRQ O Master processor interrupt	request line	
TM-IRW O TM-ISL4 O		
TM-ISL5 0		
TM-KBIR O Keyboard interrupt		
TM-L1 O		
TM-L2 0		
TM-L3 O		
TM-NMI O		
TM-REMIR O Remote interrupt		
TM-RES 0		
TM-RESET O Signal from watch-dog TM-RESMP O		
TM-RLO O		
TM-RL1 0		
TM-RL2 0		
TM-RL3 0		
TM-RL4 O		
TM-RL5 0		
TM-RL6 0		
TM-RL7 0		

STUDER A812

89/06/10 SEITE 16 A810 / A812 / A820 - SIGNAL LIST TM-RW 0 TM-RX 0 TM-SEIR O SMPTE interrupt TM-SHIR O Shuttle interrupt TM-SL2 O Master processor periphery select 2 TM-SL3 0 TM-SL4 0 TM-SL5 0 TM-SL6 0 TM-SL7 Ô TM-TX 0 TM-9600 0 O Tape move clock parallel remote TO-CLK TO-DIR O Tape move direction parallel remote O Tone test generator -6 dBm Veff, @ operating level TONGEN TR-A 0 TR-B 0 TR-REFEX 0 TRANSA 0 TRANSB 0 TRANSCM 0 TS-ADCH1 O Audio adjust, channel 1 TS-ADCH2 O Audio adjust, channel 2 TS-CH1 O Key on board for audio alignment, TS-CH2 O Key on board for audio alignment, TS-DOWN O Key on board for audio alignment, 0 @ on command 0 @ on command 0 @ on command TS-STORE O Key on board for audio alignment, 0 @ on command O Key on board for audio alignment, 0 @ on command TS-UP 0 @ on command TSRC-BIA O Key on board for audio alignment, 0 @ on command TSRC-LVL O Key on board for audio alignment, TSRC-TRB O Key on board for audio alignment, 0 @ on command 0 @ on command TSRP-BAS O Key on board for audio alignment, 0 @ on command TSRP-LVL O Key on board for audio alignment, TSRP-TRB O Key on board for audio alignment, O @ on command VU-A-XY O VU-Meter-signal, wire A VU-B-XY O VU-Meter-signal, wire B Y-ACMUA O Output voltage mains unit Y-ACMUB O Output voltage mains unit Y-ACMUC O Output voltage mains unit Y-ACMUD O Output voltage mains unit 1 @ enable Y-PSENBL O Mains unit motor supply enable Y-TSENS1 O Temperature sensitive signal sensor 1 Y-TSENS2 O Temperature sensitive signal sensor 2 O-TACHO O Tacho sensor capstan motor OCAPMOT 0 OPSVTMOT O Ground power supply voltage for torque motors 0.0VREF 0 0.0V Power reference

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**************************************	1.811.090.00	* * * S *	TUDER	A 812	* ТАРЕ	DECK	& AUD	10 4	INDEX	00
UMMARY									E 1 0 F ORIGIN: F PROC. :	
SSEMBLYS 0 ROUPS 53 LEMENTS 243 INS (TOTAL) 3312 ULTIPLE PINS 0 DJING KEVS 47	(UNUSED P	INS 308						GROUP INTER DIRECT		= = =
IGNALS 564 ECORDS READ 3667	(UNUSED S	IGNALS 46								
PTIONS SPECIFIED :	LOCLIS, SI	GLIS, ALLC	OL, WIRALL							
PTIONS USED :	LOCLIS, SI	GLIS, ALLC	OL, WIRALL							
ISTINGS GENERATED :	PAGE	ERR	WRN							
OMMENTS ROUP SUMMARY OCATION PIN LIST IGNAL WIRE LIST	2 3 5 50	0 0 0	0 0 0 0							
===>> NO PUNCH GENE	ERATED <<=									
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THE LINE AMPLIFIER WITH TRAFO 1.820.714.00/81 MAY BE REPLACED BY THE LINE AMPLIFIER TRAFOLESS 1.820.715.00.

THE MONG STERED SWITCH 1.820.720.00 MAY BE REPLACED BY THE MONG STERED SWITCH WITH TEST GENERATOR 1.820.724.00.
STUDER A812

	1.811.090.00	+ STUDER A 812 + TAPE DECK & AUDIO	******		**********		******	*******	
GRP	PART NUMBER	DESCRIPTION	UNUSED PINS US	BED PINS	TOT.PINS	MULT.PINS	COD.KEYS	TOT.ELM	
1	54.42.0001	POWER INPUT	0	5	5	0	0	2	-
2	55.12.0001	POWER SWITCH	0	4			0	1	
3 4	50 00 0101	LINE FILTER	0	4	4		0	1	
4	53.03.0131	VOLTAGE SELECTOR CHASSIS CONNECTORS	0	8	8 5	0	ő	2	
5	1.811.525.00		8	36	5 44 52	ő	ŏ	5	
7	1.011.020.00	DISTRIBUTOR	4	48	52		ŏ	12	
8	1.811.770.00	POWER SUPPLY CONNECTION BOARD	8	31	39	. 0	1	7	
9			0	16	16		0	6	
10	1.811.799.00	FAN CONNECTION BOARD	18		28		0	3	
11		SUPPLY CABLE, SP. MOT. DRIVE AMP.	4	14			0	3	
12 13		SUPPLY CABLE, SPOOLING MOTOR, LEFT	5	9		0	ŏ	2	
14		SUPPLY CABLE, SPOOLING MOTOR, RIGHT SENSOR CABLE, SUPPLY CONTROL SUPPLY CABLE, ELECTRONICS	5	10	15	ő	ŏ	2	
19	1.820.591.00	SUPPLY CABLE, ELECTRONICS	ō	48	48	ō	ō	2	
20	1.811.700.00	BASIS BOARD	62	1192	1254	0	18	60	
24	1.811.772.00	SPOOLING MOTOR CONTROLLER	Э	43	46		0	з	
25	1.811.779.00	TAPE DECK PERIPHERY DRIVER	10	143	153		1	в	
26	1.811.773.00	TAPE DECK PERIPHERY INTERFACE	3	63	66		0	25	
27	1.811.774.00	TAPE DECK CONTROLLER	3	105 34	108 36	0	1	2	
30 31	1.820.790.00	SWITCHING STABILIZER SPOOLING MOTOR DRIVE AMPLIFIER LEFT	2	20	22	0	ő	3	
32	1.811.771.00			20	22	ő	õ	3	
33	1.820.729.00		3	32	35	ō	1	2	
34		CONN. REMOTE CONTR./SYNCHRONIZER/BUS			56	0	Э	з	
35	1.820.738.00	PARALLEL REMOTE INTERFACE	2 25 0 0	115	117		2	5	
36	1.328.264.00		25	102	127		2	4	
40		INTERFERENCE FILTER, CH 01	0	12	12		2	4	
41		INTERFERENCE FILTER, CH 02	0	12	12		2	4	
42 43	1.820.749.00	INTERFERENCE FILTER, TIME CODE CONNECTORS TO VU PANEL, EXTERNAL	0 8	12 93			2	4	
45	1.810.763.00		11	28	39		2	2	(
46	110101/00100	SMPTE/EBU BUS	ō	18	18		ō	2	
50	1.811.777.00		4	52	56	0	0	2	
51	1.328.215.00		0	13	13		0	2	
52	1.811.776.00	TAPE DECK DISPLAY DRIVER	1	105	106		0	4	
53	1.811.778.00	SUBPANEL PUSH BUTTON BOARD LCD DISPLAY UNIT	3 0	13 16	16 16		0	1	
54 58	1.811.233.00		0	34	34		ő	3	
59	1.820.737.00	FUSE/SUPPLY FAILURE DETECTOR	1	15	16	ŏ	ŏ	1	
60	1.811.250.00	MONITOR UNIT	12	34	46	0	2	7	
70	1.820.794.00	DISTRIBUTION BOARD	21	169	190	0	6	13	
71	1.820.580.00		12	34	46	0	2	7	
72	1.811.888.00		0	0	0	0	0	0	
80 81		LIFT SOLENOID	0	2		0	0	1	
81	1 811 110 00	PRESS ASSEMBLY Tape tension unit, left	4	12	15 41	0	1	5	
83		TAPE TENSION UNIT, RIGHT	8	33	41		î	5	
84		CAPSTAN MOTOR (ELECTRONICS BOARD)	13	15	28	Ō	0	5	
85		CAPSTAN MOTOR DRIVE AMPLIFIER	1	12 33 33 15 33	34		0	з	
86		BRAKE ASSEMBLY	2	4	6	0	0	2	

GRP	1 POWER INPUT	54.42.000	1	
ELM	1 CONNECTOR PO	NER INPUT		P01
PNT	SIGNAL NAME	COLOR LV	ΤΥΡΕ	F
2	L INE1 L INE2 GND	1 6 5-4	L J	
ELM	2 FUSE (LINE)			F01
PNT	SIGNAL NAME	COLOR LV	ΤΥΡΕ	F
	F-LINE1 S-LINE1	1 1	J	

GRP	2	55.12.000	1 .	
	POWER SWITCH			
===:				=
ELM	1			
	POWER SWITCH		50	
	FUNER SWITCH		50	T
				-
PNT	SIGNAL NAME	COLOR LV	TYPE	F
				••
1	LINE1	1	J	
2	LINE2	6	J	
3	S-LINE1	1	Ĩ.	
4	S-LINE2	6	ĩ	
	5 -111-2		5	
				-

т	SIGNAL NAME	COLOR LV	ТҮРЕ	F
	LINE1 LINE2 S-LINE1 S-LINE2	1 6 1 6	ן ר ר ר ר ר	-

GRP 3 LIN	E FILTER			
				=
ELM 1 LINI	E FILTER			
PNT SIG	NAL NAME	COLOR LY	TYPE	F
				÷
1 F-L	INE1	1	J	
2 S-L.	INE2	6	Ĵ	
3 SF-L	INE1	1	J	
4 SF-1	INE2	6	J	

GRP 4 53.03.0131

VOLTAGE	SELECTOR	

ELM 1 VOLTAGE SELECTOR

	VOLIAGE SELE			
PNT	SIGNAL NAME	COLOR LV	ΤΥΡΕ	F
1	SF-LINE2	6-8	L	
2	PRIMW-3	3	L	
3	PRIMW-7	7	L	
4 A	PRIMW-4	4-4	L	
4B	PRIMW-6	6-4	L	
5	PRIMW-1	1	L	
6	PRIMW-5	5	L	
7	SF-LINE1	1-2	L	
				-

GRP 5 CHASSIS CONNECTORS

	CHASSIS CUNN	IEC TURS		
===:				===
ELM	1			
	EARTH CONTAC	TC		
	EAKIN CUNIAL	.15		
PNT	SIGNAL NAME	COLOR LV	TYPE	F
1	GND	5-4	J	
2	GND	0	.1	

3 4	GND GND	0	L L	

ELM 2 EARTH TERMINAL

PNT	SIGNAL	NAME	COLOR	L٧	TYPE	F
1	GND					

_ _ _ GRP 6 1.811.525.00 MAIN TRANSFORMER

ELM 1 1.811.521.00 PRIMARY 1

PNT	SIGNAL NAME	COLOR LV	ТҮРЕ	F
1	PRIMW-1	1	Y	
2	SF-LINE1	2	Y	
3	PRIMW-3	3	Y	
4	PRIMW-4	4	Y	

ELM 2 1.011.522.00 PRIMARY 2 PNT SIGNAL NAME COLOR LV TYPE F 5 PRIMW-5 6 PRIMW-6 7 PRIMW-7 8 SF-LINE2 5 6 7 8 Y Y Y Y

ELM 3 1.811.523.00 SECONDARY 1

PNT	SIGNAL NAME	COLOR LV	TYPE F
9	ACPWE-B3	9	Y
10	ACPWM-C3	0	Y
11	ACPWE-C2	0	Y
12	ACPWE-C1	0	Y
13	ACPWM-C2	0	Y
14	ACPWM-C1	0	Y
15	ACPHM-A1	5	Y
16	ACPWM-A2	6	Y
17	ACPWE-A1	7	Y
18	ACPWE-A2	8	Y
19	ACPWM-A3	9	Y
20	ACPWE-A3	0	Y

<-- <-- CONTINUATION GRP 7 DISTRIBUTOR GRP 6 1.811.525.00 <-- <-- CONTINUATION GRP 6 GRP 7 <-- <-- CONTINUATION ELM 5 70.01.0231 RECTIFIER ELM 4 1.811.524.00 SECONDARY 2 PNT SIGNAL NAME COLOR LV TYPE F ELM 1 DISTRIBUTOR D01 _____ PNT SIGNAL NAME COLOR LV TYPE PNT SIGNAL NAME COLOR LV TYPE F
 PNI
 SIGNAL

 9
 ACPME-B3

 10
 ACPME-B1

 11
 ACPME-B1

 12
 ACPME-B1

 13
 ACPMM-B1

 14
 ACPMM-B1

 15
 ACPMM-B1

 16
 ACPMM-C1

 18
 ACPME-C1

 19
 ACPME-C3

 20
 ACPME-A3
 1 ACPWE-D1 2 ACPWE-B1 3 +STABIN 4 + 0.0 8 5 2 1A ACPWE-D1 1B ACPWE-D1 1C 1D ACPWE-D1 8 8 K K 9 к õ 10 ACPWE-D1 2A 2B ACPWE-A2 2C ACPWE-A1 2D ACPWE-A1 3A ACPWE-B1 3C ACPWE-B1 3C ACPWE-B2 3D ACPWE-B1 87 ELM 6 RECTIFIER 000 70.01.0231 D02 00000 PNT SIGNAL NAME COLOR LV TYPE F 1 ACPWE-D3 2A ACPWE-B3 2B ACPWE-B3 3 + 0.0 4 -STABIN 5 L ELM 2 53.03.0106 FUSE, POSITIVE SUPPLY ELM 6 TO GRPO8, ELMO6 P01 PNT SIGNAL NAME COLOR LV TYPE PNT SIGNAL NAME COLOR LV TYPE ELM 7 RECTIFIER 70.01.0231 1 ACPWE-A1 2 ACPWE-D1 6 8 D03 PNT SIGNAL NAME COLOR LV TYPE F 1 ACPWM-D3 2 ACPWM-B3 3 +CAPMOT 4 OCAPMOT ELM 3 53.03.0106 FUSE, NEGATIVE SUPPLY 4567 ACPWM-B2 ACPWM-A2 PNT SIGNAL NAME COLOR LV TYPE 89 ACPWM-B1 ACPWM-A1 F 4 5 4 L 10 11 12 1A ACPWE-A3 1B ACPWE-A3 0 0 5 1 59.26.7103 ELM 8 CAPACITOR 2 ACPWE-D3 C04 CAPACITOR PNT SIGNAL NAME COLOR LV TYPE F ELM 4 FUSE, CAPSTAN MOTOR SUPPLY 2 0 --L L 1 +STABIN 2 + 0.0 PNT SIGNAL NAME COLOR LV TYPE 1 ACPWM-A3 2 ACPWM-D3 9 1 L ELM 9 CAPACITOR 59.26.7103 C 0 5 ./. PNT SIGNAL NAME COLOR LV TYPE F 2 L 0 L 1 +STABIN 2 + 0.0 ****** * 89/09/18 * 12:22 * PAGE 8 * * 88/05/19 - 00 ************ <-- <-- CONTINUATION GRP 8 1.811.770.00 <-- <-- CONTINUATION GRP 8 1.811.770.00 POWER SUPPLY CONNECTION BOARD --- <-- CONTINUATION</pre> ELM 10 CAPACITOR 59.26.7103 ELM 1 AC INPUT ELM 4 GROUND CONNECTION C 0 6 P05 GRUUND CONTLOTTON PNT SIGNAL NAME COLOR LV TYPE PNT SIGNAL NAME COLOR LV TYPE F 1 GND 0 Y 1 + 0.0 2 - STABIN 0 6 L ELM 5 WIRE FIELD TO FUSES GRP09, ELM05/06 ELM 11 CAPACITOR 59.26.7103 ACPWM-B2 ACPWM-A2 PNT SIGNAL NAME COLOR LV TYPE _____ PNT SIGNAL NAME COLOR LV TYPE ACPWM-B1 ACPWM-A1 1 ACPWM-D1 2 ACPWM-D2 3 ACPWM-B2 4 ACPWM-A2 U U 5 1 +CAPMOT 2 OCAPMOT 2 L 10 11 12 Ŭ ELM 12 CONNECTOR TO GRP30, ELMO1 ELM 6 WIRE FIELD, FROM RECTIFIERS P 0 1 ELM 2 CONN. SUPPLY CONTROL (GRP25, ELMO2) PNT SIGNAL NAME COLOR LV TYPE PNT SIGNAL NAME COLOR LV TYPE PNT SIGNAL NAME COLOR LV TYPE + STAB IN + 0.0 + 0.0 + STAB IN + 0.0 - STAB IN + CAPMOT 2 1 2 3 -UCOMP Y-TSENS1 +UCOMP Y-TSENS2 OPSVTMOT KEY +UCOMP OPSVTMOT -UCUMP 1 + PSVTMOT 2 OPSVTMOT 3 - PSVTMOT 4 OPSVTMOT 2 0 6 4 U U U U 1 2 6 2 ELM 7 WIRE FIELD, TO RECTIFIERS OCAPMOT Acpwe-d1 49 M 10 11 PNT SIGNAL NAME COLOR LV TYPE M ACPWE-B1 12 ELM 3 DC OUTPUT 1 ACPWM-F1 2 ACPWM-E1 3 ACPWM-F2 4 ACPWM-E2 4 4 9 U U U PNT SIGNAL NAME COLOR LV TYPEF ģ ŭ 1 +PSVTMOT 2 OPSVTMOT 3 -PSVTMOT 4 +PSVTMOT 5 OPSVTMOT 6 -PSVTMOT

	********	*******	******	******	TAPE DECK &	********	*******	********	***	*****		*****
											< <-	CONTINUAT
RP							< CONTINUAT	TION		FAN CONNECT		
	1				FLM 6					1		
	RECTIFIER				FUSE, NEG	GATIVE MOT				1.811.510.8		
	SIGNAL NAME		TYPE	F	PNT SIGNAL N			F 1	PNT	SIGNAL NAME	COLOR L	V TYPE
1 2	ACPWM-E2 ACPWM-F2	9 9	L		1 ACPWM-A1 2 ACPWM-D2	3 1	L L		1 2			
3 4	ACPWM-F2 OPSVTMOT -PSVTMOT	4 6	L L						3 4			
									6	+ FAN + 0.0	2 6	L L
	2 RECTIFIER								7 8	+ 0.0 +15.0	0 4	U U
ιT	SIGNAL NAME		ΤΥΡΕ	F				-		2		
		4 4								1.811.510.8	31 + 82 ONI	LY
5	+PSVTMOT OPSVTMOT	2	i L						PNT	SIGNAL NAME		
									1 2			
	3 CAPAC I TOR									+ 0.0	0	м
T	SIGNAL NAME		ΤΥΡΕ	 F					5			
	+PSVTMOT	2	L						7 8			
	OPSVTMOT	ა 	L						9 10			
	4								12	+15.0	0	м
	CAPACITOR		 ТҮРЕ	 c				-		3		
	OPSVIMOT									1.811.510.8		
	-PSVTMOT	6	L					I	PNT			/ ТҮРЕ
	5								1 2	+24.0	7	L
	FUSE, POSITI								3 4	+ 0.0	2	L
	SIGNAL NAME			F					5			
									6			
	ACPWM-B2 ACPWM-D1	7 5 	L L					-	7 8	+ FAN + 0.0	6 2	Y Y
** ** P	ACPWM-B2 ACPMM-D1 WILLI STUDEF ************************************	7 5 ********** R AG * ********** 811.090.0 *********	L L L L C C S S S S S S S S S S S S S S	A T I ********* A 812 * ********	O N P 1 ***********************************	N L ************************************	I S T 	* *********** *********** FT	7 8 897 887 887	+ 0.0 ***********************************	2 ********** 2:22 * ********** - < <-	Ý P A G E 10 ************************************
** ** P ==	ACPHM-B2 ACPHM-D1 WILLI STUDEH II II JUPPLY CABLE	7 5 ********** R AG * ********** 811.090.0 *********	L L L C C *****************************	A T I ********* A 812 * ********	O N P 1	N L ************************************	I S T ***********************************	* ********** ********** G FT ==== =	7 8 **** 89/ **** 88/ ****	+ 0.0 ***********************************	2 ********** 2:22 * *********** - < <- E, SPOOLIN	Ý P A G E 10 ************************************
** ** P ==	ACPWM-B2 ACPMM-D1 WILLI STUDEF ************************************	7 5 ********** R AG * **********************************	L L L L C C S S S S S S S S S S S S S S	A T I ********* A 812 * ********	O N P 1 ************************************	BLE, SPOOL	I S T ***********************************	* ************************************	7 8 **** 89/ **** 88/ ****	+ 0.0 ***********************************	2 ********** 2:22 * - < <- E, SPOOLIN ELMO3 (DR	Y P A G E 10 CONTINUAI IG NOTOR, RIG
** ** P == M	ACPHM-B2 CCPMM-D1 WILLI STUDEF I I SUPPLY CABLE ROM GRP08, E ISAAL NAME	7 5 8 8 AG * 8 811.090.0 5 9 5 9 5 9 5 9 5 9 5 1 0 9 5 1 1 0 9 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	L U C C	A T I ********* A 812 * *********	GRP 12 SUPPLY CA ELM 1 FROM GRP3	AUDIO	I S T	**************************************	7 8 897 **** 887 **** 887 ****	+ 0.0 ***********************************	2 *********** 2:22 * *********** - < <- E, SPOOLIN ELMO3 (DR	Y P A G E 10
*** ** P == M	ACPHM-B2 ACPWM-D1 WILLI STUDEF WILLI STUDEF I SUPPLY CABLE ROM GRPOS, E I STAL NAME PSVTMOT	7 5 8 8 AG * 8 811.090.0 811.090.0 811.090.0 8 8 8 0 8 0	L L C C C C C C C C C C C C C C C C C C	A T I ********* A 812 * *********	GRP 12 SUPPLY CA ELM 1 FROM GRP3	AUDIO	I S T	* ************************************	7 8 897 **** 887 **** 887 ****	+ 0.0 ***********************************	2 ************************************	Y P A G E 10
*** *** P == M	ACPHM-B2 ACPWM-D1 WILLI STUDEF WILLI STUDEF SUPPLY CABLE I SUPPLY CABLE SIGNAL NAME PSVTMOT PSVTMOT PSVTMOT	7 5 8 8 AG * 8 811.090.0 811.090.0 8 5 COLOR LV 2 0 6 2	L L O C	A T I ********* A 812 * *********	CONPLICATION CONTRACTOR CONTRACTO	N L AUDIO AUDI	I S T	* * * * FT G FT === = FT F F F F F F F F F F F F F F F F F F	7 8 8 8 9 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	+ 0.0 ***********************************	2 ************************************	Y P A G E 10
*** *** P === M 	ACPWM-B2 ACPWM-D1 WILLI STUDEF I.I. SUPPLY CABLE I.ROM GRP08, E I.ISMAL NAME PSVTMOT PSVTMOT PSVTMOT	7 5 ******** R AG * ********* \$11.090.0 ********* SP- MOT ELMO2 COLOR LV 2 0 6	L L L L C C C C C C C C C C C C C C C C	A T I ********* A 812 * *********	GRP 12 SUPPLY CA FROM GRP2 FROM GRP2 PNT SIGNAL NA 1 2 3	N L AUDIO ************************************	I S T	**************************************	7 8 89/* 88/* 88/* 88/* 88/* 88/* 88/* 88	+ 0.0 ***********************************	2 2:22 * *********** - < <- E, SPOOLIN ELMO3 (DR COLOR LY	Y P A G E 10 ************* - CONTINUAI IG NOTOR, RIG :IVE AMP, RIG / TYPE
*** *** P === M T M	ACPWM-B2 ACPWM-D1 WILLI STUDEF II UPPLY CABLE ISUPPLY CABLE ISUPPLY CABLE ISUMAL NAME PSVTMOT PSVTMOT PSVTMOT PSVTMOT PSVTMOT PSVTMOT 2 0 GGP 91, ELN	7 5 7 8 AG * 8 A	L L L L C C C C C C C C C C C C C C C C	A T I *********** A 812 * ********** === F 	GRP 12 SUPPLY CA SUPPLY CA ELM 1 FROM GRP2 PNT SIGNAL NA 1 2 3 4 AN-R-L 5 AN-S-L 6 AN-T-L ELM 2	N L NBLE, SPOOL L, ELMO3 (MME COLOR 1 0 7 NG MOTOR,	ING MOTOR, LEF DRIVE AMP. LEF LV TYPE M M LLEFT (GRP87)	**************************************	7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	+ 0.0 +	2 2:22 * *********** - < <- E, SPOOLIN ELMO3 (DR COLOR LV 5 0 8 	Y P A G E 10 CONTINUAL IG MOTOR, RIG / TYPE M M M GHT (GRP88)
*** P === M T	ACPWM-B2 ACPWM-D1 WILLI STUDEF I SUPPLY CABLE I ROM GRPOS, E SIGNAL NAME PSVTMOT PSVTMOT PSVTMOT PSVTMOT PSVTMOT PSVTMOT PSVTMOT 2 0 GRP31, ELM	7 5 7 8 AG * 8 AG * 8 11.090.0 811.090.0 8 6 6 6 6 6 6 6 6 6 6 6 7 0 0 6 6 6 7 0 0 6 6 7 0 0 6 6 7 0 0 6 6 7 0 1 0 1 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0	L L L C C C C C C C C C C C C C C C C C	A T I ***********************************	CON PI TAPE DECK & SUPPLY CA SUPPLY CA FROM GRP FROM GRP PNT SIGNAL NA A AN-R-L SAN-S-L AN-S-L CAN-S-L CAN-S-L CAN-S-L CAN-S-L	AUDIO AUDIO	I S T .ING MOTOR, LEF DRIVE AMP. LEF LV TYPE M M M LEFT (GRP87)	**************************************	7 8 897 8897 887 887 887 887 887 887 887	+ 0.0 + 0.0 + 09/18 + 1 + + + + + + + + + + + + + + + + + + +	2 ************************************	Y P A G E 10 CONTINUAT IG MOTOR, RIG IVE AMP. RIG / TYPE M M GHT (GRP88) / TYPE
2 *** P == M IT IT	ACPWM-B2 ACPWM-D1 WILLI STUDEF SUPPLY CABLE I I ROM GRP08, E SIJNAL NAME PSVTMOT PSVTMOT PSVTMOT PSVTMOT PSVTMOT 20 GRP31, ELM SIJNAL NAME	7 5 7 8 AG * 8 AG * 8 AG * 8 11.090.0 8 COLOR LV 2 0 6 2 0 6 401 (DRIVI COLOR LV	L L L C C C C C C C C C C C C C C C C C	A T I ***********************************	GRP 12 SUPPLY CA SUPPLY CA FROM GRP2 PNT SIGNAL NA 1 2 3 4 AN-R-L 5 AN-S-L 6 AN-T-L ELM 2 TO SPOLLI	AUDIO AUDIO	I S T .ING MOTOR, LEF DRIVE AMP. LEF LV TYPE M M M LEFT (GRP87)	ж т т т т т т т т т т т т т	7 8 8 8 9 9 8 8 8 8 8 8 8 8 8 8 8 8 8 8	+ 0.0 + 0.0 + 09/18 + 1 + + + + + + + + + + + + + + + + + + +	2 2:22 * - < <- E, SPOOLIN ELMO3 (DR COLOR LV 5 0 8 MOTOR, RI COLOR LV	Y P A G E 10 CONTINUAT IG MOTOR. RIG / TYPE M M GHT (GRP88) / TYPE
2 *** * * * * * * * * * * * * * * * * *	ACPWM-B2 ACPWM-D1 	7 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	L L L L L C C C C C C C C C C C C C C C	A T I ***********************************	ONPI TAPE DECK & SUPPLY CA SUPPLY CA FROM GRP2 PNT SIGNAL NA AN-R-L AN-S-L AN-S-L AN-S-L COSPOLLI PNT SIGNAL NA 1	AUDIO	I S T I S T ING MOTOR, LEF DRIVE AMP. LEF LV TYPE M M LEFT (GRP87) LV TYPE	**************************************	7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	+ 0.0 +	2 2:22 * ************ - < <- E, SPOOLIN ELMO3 (DR COLOR LV	Y P A G E 10 CONTINUAT IG MOTOR. RIG IVE AMP. RIG / TYPE M M GHT (GRP88) / TYPE
2 *** * ** P = == M IT IT IT IT	ACPHM-B2 ACPMM-D1 WILLI STUDEF SUPPLY CABLE I SUPPLY CABLE I SUPPLI I SUPPLY CABLE I SUPPLI SUPPLI SUPPLI I SUPPLI SUPPLI SUPPLI SUPPLI SUPPLI S	7 5 7 8 AG * 8 A	L L L C C C C C C C C C C C C C C C C C	A T I ***********************************	0 N P 1 TAPE DECK & SUPPLY CA FROM GRP2 FROM GRP2 PNT SIGNAL NA 1 3 4 AN-R-L 5 AN-S-L 6 AN-T-L TO SPOLLI PNT SIGNAL NA 1 2 3 4 AN-R-L 5 AN-S-L 6 AN-T-L 5 AN-S-L	AUDIO AUDIO ABLE, SPOOL I, ELMO3 (ME COLOR 7 NG MOTOR, ME COLOR	I S T I S T ING MOTOR, LEF DRIVE AMP. LEF LV TYPE M M M LEFT (GRP87) LV TYPE F	**************************************	7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	+ 0.0 +	2 2:22 * - < <- E, SPOOLIN COLOR LV 5 8 MOTOR, RI COLOR LV	Y P A G E 10 CONTINUAT IG MOTOR. RIG / TYPE M M GHT (GRP88) / TYPE F
*** *** P === M T M M	ACPWM-B2 ACPWM-D1 WILLI STUDEF IL SUPPLY CABLE, ISUPPLY CABLE, ISU	7 5 ********* R AG * R AG *	L L L L C C C C C C C C C C C C C C C C	A T I ************************************	O N P I TAPE DECK & SUPPLY CA SUPPLY CA ELM 1 FROM GRP2 PNT SIGNAL NA 1 2 3 4 AN-R-L 5 AN-S-L 6 AN-T-L 2 C GND 3 4 AN-T-L 5 AN-S-L 6 AN-T-L 2 C GND 3 4 AN-T-L 5 AN-S-L 6 AN-R-L 1 2 GND 3 4 AN-R-L 5 AN-S-L 6 AN-R-L 5 AN-S-L 6 AN-R-L 6 AN-R-L 7 C SPOLLI 1 2 C SND 3 4 AN-T-L 5 AN-S-L 6 AN-R-L 7 C SND 3 7 C SND 7 C	N L	I S T I S T ING MOTOR, LEF DRIVE AMP. LEF LV TYPE M M M LEFT (GRP87) LV TYPE F F F	**************************************	7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	+ 0.0 +	2 2:22 * 2:22 * 2:2	Y P A G E 10 CONTINUAT IG MOTOR, RIG IVE AMP. RIG / TYPE GHT (GRP88) / TYPE F F F F
****** P === M M M	ACPWM-B2 ACPWM-D1 WILLI STUDEF IL SUPPLY CABLE, ISUPPLY CABLE, ISU	7 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	L L L L L C C C C C C C C C C C C C C C	A T I ************************************	O N P 1 TAPE DECK & SUPPLY CA FROM GRP3 PNT SIGNAL NA 1 2 3 4 AN-R-L 5 AN-S-L 6 AN-T-L 2 3 4 AN-T-L 5 GND 3 4 AN-T-L 5 AN-S-L 6 AN-T-L 5 AN-S-L 6 AN-T-L	N L L NUDIO NELE, SPOOL 1, ELMO3 (ME COLOR 1 NG MOTOR, ME COLOR 0 7 0 1 NN ECTION	I S T I S T ING MOTOR, LEF DRIVE AMP. LEF LV TYPE M M LEFT (GRP87) LV TYPE F F F F F	**************************************	7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	+ 0.0 +	2 2:22 * 2:22 * 2:2	Y P A G E 10
2 *** P === M IT M IT M	ACPWM-B2 ACPWM-D1 WILLI STUDEF SUPPLY CABLE I SUPPLY I SUPPLY I	7 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	L L L L C C C C C C C C C C C C C C C C	A T I A 812 ** A 812 ** F F 	O N P 1 TAPE DECK & SUPPLY CA SUPPLY CA FROM GRP2 PNT SIGNAL NA 1 2 3 4 AN-R-L 5 AN-S-L 6 AN-T-L TO SPOLLI PNT SIGNAL NA 1 2 GND 3 4 AN-T-L 5 AN-S-L 6 AN-T-L 5 AN-S-L 7 AN-T-L 7 AN-T-L	N LL NUDIO NELE, SPOOL 1, ELMO3 (ME COLOR 0 7 0 1 NNECTION ME COLOR	I S T I S T ING MOTOR, LEF DRIVE AMP. LEF LV TYPE M M M LEFT (GRP87) LV TYPE F F F F LV TYPE	**************************************	7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	+ 0.0 +	2 2:22 * 2:22 * 2:2	Y P A G E 10 CONTINUAT IG MOTOR. RIG IVE AMP. RIG / TYPE M M GHT (GRP88) / TYPE F F F F

2 0 6

F F

+ PSVTMOT OPSVTMOT - PSVTMOT

RP 14 SENSOR CABLE					19 1. SUPPLY CABLE	, ELECTR	ONICS			19 1. <	< <	CONTI	
LM 1 FROM GRP08;	EL MO3			ELM	1 FROM GRP30,					2 TO GRP20, EL			PC
NT SIGNAL NAME	COLOR L	ν τγρε	F	PNT	SIGNAL NAME	COLOR L	V TYPE	F	PNT	SIGNAL NAME	COLOR L	V TYPE	
L -UCOMP 2 Y-TSENS1 3 +UCJMP 4 Y-TSENS2 5 OPSVTMOT 5 7 3 9	6 4 2 9 S	N N N N		1 2 3 4 5 6 7 8 9 10 11	+ 5.6 + 5.6 + 5.65ENS TM-C76K + 0.0 + 0.0 + 0.0 + 0.0 + 0.0 + 15.0 - 15.0 + 0.0	3 3 9 0 0 5 0 0 0 0 2	F F F F F F F F F F		1 2 3 4 5 6 7 8 9 10 11	+ 5.6 + 5.6 +5.65ENS TM-C76K + 0.0 + 0.0 + 0.0 + 0.0 + 0.0 + 0.0 + 0.0 + 15.0	3 3 3		
LM 2 TO GRP25, EL	.M02			12	-15.0 + 0.0	6 0	F F		12	-15.0 + 0.0	6 0	M	
NT SIGNAL NAME 1 -UCOMP 2 Y-TSENS1 3 +UCOMP 4 Y-TSENS2 5 OPSVTMOT 5	COLOR L	V TYPE	F	15 16 17 18	+ 0.0 +24.0 +REMSUP +STABSNS -STABSNS -26.0 +26.0 +0.0 +0.0 +0.0 +0.0 CAPMOT	7 8 3 5	F F F		15 16 17 18 19 20 21 22 23	+ 0.0 +24.0 +REMSUP +STABSNS -STABSNS -STABSNS -26.0 +26.0 + 0.0 + 0.0 + 0.0 SENS 0CAPMOT +CAPMOT	0 4		

<i></i>	
ELM 3 TAPE DECK CONTROLLER (GRP27)	ELM 4 PO3 TAPE DECK DISPLAY DRIVER P
PNT SIGNAL NAME COLOR LV TYPE	
1 GND 2 TDS-CLK 3 TDS-CTS 4 TDS-RX 5 TDS-DTR 6 TDS-TX 7 TD-EVENT 8 GND 9 TD-MVDLK 10 TD-MVDLR	1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 + 224.0 6 + 224.0 7 TM-DSL4 8 TM-ISL4 9 TM-DRES 10 TM-IRES
	23 TM-KBIR 24 0.0 VCU
	25 TH-DATAT 26 0.0 VCU 27 TH-DATA6 28 0.0 VCU 29 TH-DATA5 30 0.0 VCU 31 TH-DATA5 30 0.0 VCU 33 TH-DATA4 32 0.0 VCU 35 TH-DATA2 36 0.0 VCU 37 TH-DATA1 38 0.0 VCU 39 TH-DATA0
	1 GND 2 TOS-CLK 3 TDS-CTS 4 TDS-RX 5 TDS-DTR 6 TDS-TX 7 TD-EVENT 8 GND 2 TD-MVCLK

****************	***************************************	<pre>< < CONTINUATIO</pre>
RP 20 1.811.700.00 < < CONTINUATION	GRP 20 1.811.700.00 < < CONTINUATION	GRP 20 1.811.700.00 < < CONTINUATIO
	< < CONTINUATION	******
M 5 PARALLEL REMOTE IF (GRP35) P05	ELM 6 SMPTE/EBU BUS P06	ELM 8 VU-METER PANEL, EXTERNAL PC
IT SIGNAL NAME COLOR LV TYPE F	SMPTE/EBU BUS POG PNT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE
+ 0.0 + 0.0	1 FRMGND 2 TRANSCM	1 + 0.0 2 + 0.0
+ 5.6 + 5.6	3 TRANSA 4 TRANSB	3 + 5.6 4 + 5.6
+ REMSUP + REMSUP	5 RECEIVB 6 RECEIVA	5 + 15.0 6 - 15.0
TM-OSL5 TM-ISL5	7 RECEIVCM 8 FRMGND	7 T-SADA 8 T-SADB
TM-DRES TM-IRES	9 SPARE 10	9 T-SADC 10 T-READSL
TM-DRW TM-IRW		11 T-WRTSL 12 T-DT-CH1
TM-DENB TM-IENB	ELM 7 VU-METER PANEL, EXTERNAL PO7	13 T-DT-CH2 14 T-DT-CH3
T-REFEXT 0.0 VCU	ELM 7 VU-METER PANEL, EXTERNAL PO7 PNT SIGNAL NAME COLOR LV TYPE F	15 T-DT-MP 16 T-DT-RES
TC-TCMV TC-TCDIR	1 + 0.0	17 18
TM-DADRO TM-IADRO	2 + 0.0 3 + 5.6	19 20 + 0.0
TH-REMIR 0.0 VCU	4 + 5.6 5 +15.0	21 T-VAR SPD 22 + 0.0
TD-MVCLK TD-MVDIR	6 -15.0 7 T-SADA	23 T-REFEXT 24 +24.0
TM-DATA7 0.0 VCU	8 T-SADB 9 T-SADC	25 + 0.0 26 + 0.0
TM-DATA6 0.0_VCU_	10 T-READSL 11 T-WRTSL 12 T-DT-CH1	
TM-DATA5 0.0 VCU	13 T-DT-CH2	
TM-DATA4 0.0 VCU	14 T-DT-CH3 15 T-DT-MP	
TM-DATA3 0.0 VCU	16 T-DT-RES 17	
TM-DATA2 0.0 vcu TM-DATA1	18 19 20 - 1 0 0	
TM-DATA1 0.0 VCU TM-DATAO	20 + 0.0 21 T-VARSPD 22 + 0.0	
0.0 VCU	23 T-REFEXT	
./.	24 +24.0 25 + 0.0 26 + 0.0	
WILLI STUDER AG * L O C A T I.811.090.00 * STUDER A 812	***************************************	* 89/09/18 * 12:22 * PAGE 14 ************************************
WILLI STUDER AG * L O C A T I.811.090.00 * STUDER A 812	ION PINLIST ************************************	* 89/09/18 * 12:22 * PAGE 14 ************************************
WILLI STUDER AG L O C A 1.811.090.00 * STUDER A 812 20 1.811.700.00 CONTINUATION	I O N P I N L I S T ** TAPE DECK & AUDIO GRP 20 1.811.700.00 < < CONTINUATION	* 89/09/18 * 12:22 * PAGE 14 * 88/05/19 - 00 <pre></pre> <pre></pre>
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1 + 5.6
2 + 5.6
3 T-PWRON
4 + 0.0
5 + 0.0
6 + 0.0
8 + 0.0
9 -15.0
0 -15.0
1 T-SUPVON
1 + 0.0
+ 15.0
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- 15.0 PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE F 1 ERAHL-TC 2 ERAHH-TC 3 + 0.0 4 RECHL-TC 5 RECHL-TC 1 LOUFB-01 2 LOUFA-01 3 3 U U 6 U 0 U 6 0 υ ERAHH-TC + 0.0 RECHL-TC RECHL-TC REPHL-TC REPHL-TC LINFB-TC LINFB-TC LOUFB-TC LOUFB-TC LOUFA-TC 2 LUDFA-01 0 3 + 0.0 S 4 LINFB-01 6 5 LINFA-01 0 6 + 0.0 S 7 +15.0 2 5 0 Ŭ ú 000000000000 ม บ บ ELM 30 WIRE FIELD, SUPPLY 10 9 0 11 12 PNT SIGNAL NAME COLOR LV TYPE F 13 14 13 14 15 16 17 2 2 7 U s ----+15.0 Ŭ 15 + 0.0 ŭ 1 + 0.0 2 -15.0 0 U U -26.0 ELM 26 WIRE FIELD, ERASE HEAD CH 1 + SUPPLY 18 +26.0 ELM 31 WIRE FIELD, ERASE HEAD CH 2 -------ELM 21 1.811.898.00 MIRE FIELD, TO CONN. GRP20, ELM67 PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE PNT SIGNAL NAME COLOR LV TYPE 1 + 5.6 2 ERAHL-01 3 ERAHM-01 4 ERAHH-01 5 ERAHO-01 3 6 2 9 5 5 υ 7 6 2 9 S 1 ERACS-02 2 ERAHL-02 3 ERAHM-02 4 ERAHM-02 5 ERAH0-02 U U U U U 0. 5 4 + 0.0 0CAPMOT 0CAPMOT +CAPMOT +CAPMOT 1 2 3 U U U U U 4 6 2 9 ELM 27 WIRE FIELD, RECORD HEAD CH 1 ELM 32 WIRE FIELD, RECORD HEAD CH 2 ,/. PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE 6 9 F RECHL-01 RECHH-01 1 2 U 1 RECHL-02 2 RECHH-02 3 + 0.0 6 9 S U U U Ū + 0.0 S ũ ELM 28 WIRE FIELD, REPRODUCE PREAMP. CH 1 ./. PNT SIGNAL NAME COLOR LV TYPE F 1 REPRO-01 2 REPRE-01 3 + 0.0 6 9 5

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1 + 0.0 \\
2 + 0.0 \\
3 + 5.6 \\
4 + 5.6 \\
5 + 15.0 \\
6 - 15.0 \\
7
\end{array}$ 25 TC-DATA7 26 + 0.0 27 TC-DATA6 28 + 0.0 29 TC-DATA5 30 + 0.0 31 TC-DATA4 32 + 0.0 33 TC-DATA3 34 + 0.0 35 TC-DATA2 36 + 0.0 26 27 + 0.0 TC-DATA6

+ 0.0 TC-DATA5 + 0.0 TC-DATA4 + 0.0 TC-DATA3

+ 0.0 TC-DATA2

TC-DATA2 + 0.0 TC-DATA1 + 0.0 TC-DATA0 + 0.0

23 29 30

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TC-TCDIR

+ 0.0 TC-TCMV + 0.0 T-REFINT

TD-CAPSY TD-MVDIR TD-MVCLK

TC-DAIA2 + 0.0 TC-DATA1 + 0.0 TC-DATA0 + 0.0

36 37

38 39

* WILLI	STUDER AG * L O C A 1	ION PIN	LIST	**************************************
*	1.811.090.00 * STUDER A 8	12 * TAPE DECK & AUDIC)	* 88/05/19 - 00 **********************************
GRP 20	1.811.700.00 < < CONTINUATION		1.700.00 < < CONTINUATION	GRP 20 1.811.700.00

LM	41 1.811.775.00 CAPSTAN MOTOR INTERFACE J05	ELM	42 1.820.764.00 CAPSTAN CONTROL UNIT	JÖ6	ELM 43 1.820.753.00 MASTER SERIAL INTERFACE JU PNT SIGNAL NAME COLOR LV TYPE
PNT	SIGNAL NAME COLOR LV TYPE F	PNT	SIGNAL NAME COLOR LV TYPE	F	PNT SIGNAL NAME COLOR LV TYPE
1	TC-TCDIR	1	TD-TCM1		1A TM-DSL4
2	TC-TCMV	2	TD-TCM2		1B TM-ISL4
3	T-REFINT		TC-REFP		2A TM-DSL5
	TC-TCMVI		TC-CAPDC		2B TM-ISL5
	TC-CDIRI		TC-TCMVI		3A TM-DRES
	TD-TCM1		TC-CDIRI		3B TM-IRES
	TD-TCM2		TD-CAPSY		4A TM-DRW
	TC-REF		TC-REF		48 TM-IRW
	TC-INEX		TC-INEX		5A TM-DENB
	TC-RESMP		TC-RESMP		5B TM-IENB
	TC-ENBG		TC-ENBG		6A TM-DADR2
	T-REFEXT		TA-AUIR		6B TM-IADR2
	TC-IRQ		TC-IRQ		7A TM-DADR1
	TC-EREF		TC-EREF		7B TM-IADR1
	TA-AUIR		TC-SL4		8A TM-DADRO
	AN-CSPDC		TC-SL3		8B TM-IADRO
7		17			SA TM-SL4
	+15.0		+15.0		9B TM-SL5
	KEY		KEY		10A TDS-RX
	+ 5.6		+ 5.6		10B TDS-TX
	+ 0.0		+ 0.0		11A TDS-DTR
	-15.0		-15.0		11B TDS-CTS
	TC-SL2		TC-SL2		12A SYS-RX
	TC-SL1		TC-SL1		12B SYS-TX
	TC-REFP	25			13A SYS-DTR
6			TD-CRES		13B SYS-CTS
	TC-RW		TC-RW		14A TM-SHIR
	TC-ENB		TC-ENB		14B TM-KBIR
	TC-ADR2		TC-ADR2		15A +15.0
	TC-ADR1 TC-ADR0		TC-ADR1		15B +15.0
	TC-DATA7		TC-ADRO TC-DATA7		16A + 5.6
	TC-DATA6		TC-DATA6		16B + 5.6 17A + 0.0
	TC-DA TA5		TC-DATAS		178 + 0.0
	TC-DATA4		TC-DATAS		18A -15.0
	TC-DATA3		TC-DATA3		188 - 15.0
7	TC-DATA2	37	TC-DATA2		19A TDS-CLK
8	TC-DATAL	38	TC-DATA1		19B TM-REMIR
9	TC-DATAO	39	TC-DATAO		20A TD-HEACT
	TC-DATA1 TC-DATA0				20B TM-SEIR
	•/•			•/•	21A TD-MOVE
					21B TA-AUIR
					22A TD-CAPSY
					22B TM-SL2
					23A TM-RESMP
					23B TM-ADR3
					24A TM-RES

GRP 20 1.811.700.00 < < CONTINUATION	GRP 20 1.811.700.00 CONTINUATION	< < CONTINUATION GRP 20 i.81i.700.00 < < CONTINUATION
ELM 43 1.820.753.00 < < CONTINUATION	ELM 44 1.811.786.00 MP-UNIT MASTER J08	ELM 45 1.820.751.00 SMPTE/EBU INTERFACE J09
PNT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE F
248 TM-IRQ 254 TD-MVDIR 256 TD-MVDIR 266 TM-RS 268 TM-RW 276 TM-BN 278 TM-BNR 288 TM-ADR1 288 TM-ADR1 298 TM-DATA5 300 TM-DATA6 304 TM-DATA5 306 TM-DATA5 308 TM-DATA5 308 TM-DATA4 318 TM-DATA3 318 TM-DATA1 328 TM-DATA1 328 TM-DATA0	1 TD-EVENT 2 T-SUPVON 3 TM-SL3 4 TM-SL2 5 TM-RESMP 6 TM-ADRA 7 TM-C614K 8 TM-BUSSW 9 TM-NM1 10 TM-KX 11 TM-TX 12 TM-DRENB 13 TM-TR 14 T-PWRCN 14 T-PWRCN 15 TM-SL7 16 TM-C76K 17 TM-C76K 17 TM-C76K 17 TM-C76K 20 + 5.6 21 + 0.0 22 TM-C307K 23 TM-SL4 24 TM-SL5 25 TM-SL5 25 TM-SL6 25 TM-SL5 25 TM-SL6 26 TM-RESET 27 TM-RW 20 TM-ADR1 31 TM-ADR0 31 TM-ADR1 31 TM-ADR1 31 TM-DATA6 34 TM-DATA4 35 TM-DATA4 36 TM-DATA1	1 FRIGND 2 TRANSCH 3 TRANSCH 4 TRANSCH 4 TRANSCH 5 RECEIVA 6 RECEIVA 6 RECEIVA 7 RECEIVCH 8 FRIGND 9 RCV-232 10 IM-RX 11 IM-RX 12 IM-DRENB 13 IM-SEIR 14 SND-232 15 IM-BUSSW 16 IM-SL3 17 TM-ADR3 18 +15.0 19 KEY 20 + 5.6 21 + 0.0 22 -15.0 23 IM-SL5 25 IM-SL5 25 IM-SL5 26 IM-RES 27 IM-RB 20 IM-ADR2 31 IM-ADR3 31 IM-ADR3 33 IM-DATA5 35 IM-DATA3 37 IM-DATA3 37 IM-DATA3 37 IM-DATA3 37 IM-DATA3 36 IM-DATA3 36 IM-DATA1 36 IM-DATA3 37 IM-DATA3 36 IM-DATA1 37 IM-DATA3 37 IM-DATA1 36 IM-DATA1 37 IM-DATA1 36 IM-DATA1 37 IM-DATA1 36 IM-DATA1 37 IM-DATA1 38 IM-DATA1 37 IM-DATA1 38 IM-DATA1 37 IM-DATA1 37 IM-DATA1 37 IM-DATA1 37 IM-DATA1 37 IM-DATA1 37 IM-DATA1 36 IM-DATA1 37 IM-DATA1 37 IM-DATA1 37 IM-DATA1 38 IM-DATA1 37 IM
	39 TM-DATAO	39 TM-DATAO

RP 20	1.811.700.00		c	RP 2	0	1.811.700	0.00			GRP	20		< <	CONTINU	UATION
	< < <		ION			< <	<					<	< <		
MASTER P	1.820.728.00 ERIPHERY CONTR.		J10		6	1.820.728 < <	<				TIME COD	E WRI	20.721.81 Te/read un		J11
T SIGNAL N	IAME COLOR LV T	YPE	F P	NT S	IGNAL M	AME COLOR	LV TY	PE		PNT	SIGNAL N	AME (COLOR LV 1	TYPE	
$ B \ T - READSL $			2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3	568 C 74 T 78 C 34 T 368 C 364 T 368 C 364 T 368 C 364 T 368 C 364 T 368 C 364 T 368 C 364 T 368 C	M-DATAG A-DATAG A-DATAG M-DATAG M-DATAG M-DATAG A-DATAG A-DATAG M-DATAG A-DATAG A-DATAG A-DATAG A-DATAG				 ./.	5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 22 23 4 5 26 27 8 30 1 52 33 1 52 33 34 5 36 37 8	ERAHL-TC ERAHL-TC FRAHL-TC RECHH-TC RECHH-TC RECHH-TC REPHL-TC T-TCPRES LINFA-TC LUNFA-TC LUNFA-TC LUNFA-TC LUNFA-TC LUNFA-TC LUNFA-TC LUNFA-TC LUNFA-TC LUNFA-TC REPHL-TC REPHL-TC TA-ACTTC A-07 TA-ACTTC CA-07 C				
A TM-ADR2 B CA-ADR-T A TM-ADR1 B CA-ADR-T A TM-ADR0 ************************************	**************************************	LOCA	Α Τ Ι Ο	N	Р	IN L	IS	S T	4	· 89/	09/18 *	12:	22 * P	AGE 2	20 🕯
24 TM-ADR2 28 CA-ADA-3 50 CA-ADR-3 50 CA-ADR-4 50 CA-ADR-7 50 CA-		L O C A *********** * STUDER *****	A T I O ********* A 812 * *********	N **** TAPE ****	P ******** DECK 8 *******	I N L ***********************************	I 5 ******	5 T *******	ه ********* *	* 89/ ***** * 88/ *****	09/18 * ******** 05/19 - *******	12: ***** 00 ***** <	22 * P ********** *********** < <	A G E 2	20
A TM-ADR2 B CA-ADR-5 A TM-ADR1 B CA-ADR-T A TM-ADR0 WILLIS **********************************	1.811.700.00 < <	L O C 4 ************ * STUDER ************* CONTINUATI	A T I O *********** A 812 * ********** G ION === =	N IAPE ****	P ******** DECK 8 ********	I N L ***********************************	I 9	5 T ********* ********* CONTINUA	**************************************	\$ 89/ ***** 88/ ***** GRP ====	09/18 * ******** 05/19 - ********* 20	12:: ****** 00 < 1.8: <	22 * P *********** < < 11.700.00 < <	A G E 2 ********** CONTINU CONTINU	20 * ******* ****** VATION
A TM-ADR2 B CA-ADR-S A TM-ADR1 B CA-ADR-T A TM-ADR0 A TM-ADR0 WILLI S ************************************	TUDER AG * ***********************************	L O C / /	A T I O *********** A 812 * *********** G ION === = E J12	N IAPE **** RP 2 ==== -M 4 H	P ******* DECK 8 ******* 0 ======= 9 IF-DRIVE	I N L ************************************	I 5	5 T ********* ********* CONT I NU A	*********** *********** ATION =====	* 89/ ***** * 88/ GRP ==== ELM 	09/18 * ********* 05/19 - ********* 20 ========= 50 RECORD A	12: ****** 00 ****** < 1.8: < 1.8: MPLIF	22 * P ********** < < 11.700.00 < < 20.712.81 IER, CH 1	A G E 2	* 02 ****** * ****** * ****** * * * * * *
A TM-ADR2 B CA-ADR-5 A TM-ADR1 B CA-ADR-7 A TM-ADR0 MILLIS S*********************************	TUDER AG * TUDER AG * 1.811.700.00 < < < 1.820.722.81 E DELAY UNIT IAME COLOR LV T	L O C A ***********************************	A T I O *********** A 812 * G ION === = J12 E F P 	N X P 2 X P 2	P ******* DECK & ******* 0 	I N L ***********************************	I 5 ******* 0.00 < 3.00	5 T ********* CONT INU A 	4 *********** ATION ===== J13 F	* 89/ ****** GRP ==== ELM PNT 1	09/18 * ******** 05/19 - ********* 20 ======== 50 RECORD A SIGNAL N	12: ****** 00 ****** < 1.8: MPLIF AME	22 * P *********** < < 11.700.00 < < ======== 20.712.81 IER, CH 1	A G E 2	20 * ****** * ****** UATION JATION ===== J14 F

* WILLI STUDER AG * L O C A T I O N P I N L I S T * 89/09/18 * 12:22 * P A G E 21 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 <-- <-- CONTINUATION GRP 20 1.811.700.00 <-- <-- CONTINUATION GRP 20 1.811.700.00 <-- <-- CONTINUATION GRP 20 1.811.700.00 <-- <-- CONTINUATION GRP 20 ELM 53 1.820.720.00 MONO-STEREO-SWITCH J17 PNT SIGNAL NAME COLOR LV TYPE F ELM 52 1.820.714.81 LINE AMPLIFIER, CH 1 ELM 51 1.820.710.81 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 J15 PNT SIGNAL NAME COLOR LV TYPE F J16 PNT SIGNAL NAME COLOR LV TYPE F INPAD-01 + 0.0 INPAD-02 + 0.0 TAPMS-02 + 0.0 TAPMS-01 + 0.0 $\begin{array}{c} & \text{MONIT-01} \\ + & 0.0 \\ LOUFA-01 \\ LOUFA-01 \\ IVFB-01 \\ + & 0.0 \\ \text{INPAD-01} \\ \text{RECIN-01} \\ \text{RECIN-01} \\ + & 0.0 \\ \text{TAPAD-01-1} \\ + & 0.0 \\ \text{TAPAD-01-1} \\ + & 0.0 \\ \text{TAPAD-01-1} \\ + & 0.0 \\ \text{LINFA-01} \\ \text{LINFA-01} \\ \text{LINFA-01} \\ \text{LAFE-01} \\ \text{CA-EQL01} \\ \text{CA-EQL01} \\ \text{CA-EQL01} \\ \text{CA-EQL01} \\ \text{CA-SYN01} \\ \text{CA-SYN01} \\ \text{CA-SYN01} \\ \text{CA-SAFE} \\ \text{CA-ADR-W} \\ \text{CA-ADR-W} \\ \text{CA-ADR-W} \\ \text{CA-ADR-W} \\ \text{CA-DATA3} \\ \text{CA-DATA3} \\ \text{CA-DATA4} \\ \text{CA-DATA4} \\ \text{CA-DATA5} \\ \text{CA-DATA5} \\ \text{CA-DATA6} \\ \text{CA-CAS0} \\ \text{CA-CA$ 1 2 3 1234567 4567 + 0.0 TAPDI-01 10 + 0.0 11 TAPDI-02 12 + 0.0 13 RECIN-02 14 + 0.0 15 RECIN-01 16 17 18 20 TA-ACTMO 21 + 0.0 22 + 15.0 23 - 15.0 24 + 5.6 25 TM-C307K 26 CA-SAFE 27 CA-ADR-R 28 CA-ADR-S 29 CA-ADR-S 29 CA-ADR-S 29 CA-ADR-S 29 CA-ADR-S 20 CA-ADR-S 20 CA-ADR-S 21 CA-DATAS 35 CA-DATAS 35 CA-DATAS 37 CA-DATAS 37 CA-DATAS 38 CA-DATAS 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 _____ * MILLI STUDER AG * L O C A T I O N P I N L I S T * 89/09/18 * 12:22 * P A G E 22 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 86/05/19 - 00 * <-- <-- CONTINUATION GRP 20 1.811.700.00 <-- <-- CONTINUATION GRP 20 1.811.700.00 <-- <-- CONTINUATION GRP 20 1.811.700.00 <-- <-- CONTINUATION ELM 56 1.820.710.81 REPRODUCE AMPLIFIER, CH 2 J20 PNT SIGNAL NAME COLOR LV TYPE F ELM 54 1.820.713.00 HF-DRIVER, CH 2 J18 PNT SIGNAL NAME COLOR LV TYPE F ELM 55 1.820.712.81 RECORD AMPLIFIER, CH 2 J **J**19 PNT SIGNAL NAME COLOR LV TYPE F BIAFB-02 K-REC-02 + 0.0 + 0.0 BIASA-02 BIASB-02 BIASC-02 1 TAPLI-02 2 EQUAL-02 3 SYPRE-02 RECIN-02 1 2 3 4 5 6 7 8 9 10 11 12 13 1234567 RECIN-02 EQUAL-02 BIAFB-02 K-REC-02 + 0.0 BIASA-02 BIASA-02 BIASC-02 RECHL-02 RECHL-02 RECHL-02 + 0.0 SYNHL-02 SYNHH-02 + 0.0 TAPLI-02 EQUAL-02 SYPRE-02 K-REC-02 + 0.0 REPRE-02 + 0.0 TAPDI-02 + 0.0 SYNHL-02 SYNHH-02 + 0.0 456780 ERACS-02 AFCSW-02 + 0.0 ERAHL-02 ERAHH-02 ERAHH-02 ERAHO-02 + 0.0 10 11 10 11 12 13 12 13 14 15 + 0.0 CA-BADO2 CA-RSWO2 KEY TA-ACTO2 + 0.0 + 15.0 - 15.0 + 5.6 TM-C307K CA-SAFE CA-ADR-T CA-ADR-S CA-ADR-T CA-ADR-U CA-DATA0 CA-DATA1 CA-DATA1 • 0.0 CA-BA.002 CA-RA.002 KEY TA-ACT02 + 0.0 + 15.0 - 15.0 + 5.6 CA-30R-R CA-30R-R CA-30R-R CA-30R-R CA-30R-CA-30R-R CA-30R-1 CA-CA-DATA2 CA-DATA3 CA-DATA4 CA-DATA5 CA-DATA6 CA-DATA7 CA-CHS02 CA-DATA3 CA-DATA4 CA-DATA5 CA-DATA5 38 39 CA-DATA7 CA-CHS02

* 88/05/19 – 00 * <---<-- <-- CONTINUATION GRP 20 1.811.700.00 <-- <-- CONTINUATION GRP 20 1.811.700.00 <-- <- CONTINUATION GRP 20 1.811.700.00 <-- <-- CONTINUATION ELM 57 1.820.714.81 LINE AMPLIFIER, CH 2 ELM 67 1.811.898.00 CONNECTOR TO GRP85, ELM03 ELM 65 CONNECTOR TO GRP25, ELMO1 J21 P15 P17 PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE K-PRESSB K-BRAKE +24.0 +0.0 K-PRESSA +24.0 +24.0 +0.0 K-LIFT +24.0 +24.0 +24.0 +24.0 +24.0 +24.0 +24.0 K-TISR +24.0 K-TISL +24.0 K-TISL +24.0 K-TISL +24.0 K-TISL +24.0 K-TISL K-CONT 1 F 1 OCAPMOT 4 F 2 2 3 +CAPMOT 4 OCAPMOT 5 + 0.0 6 +CAPMOT 2 3 4 5 F F 9 6 5 2 ò 37 6789101111213141516171819202122324 ELM 68 1.811.898.00 TO GRP80, ELMO1 0 PNT SIGNAL NAME COLOR LV TYPE 0 7 4 1 +24.0 2 K-LIFT x ELM 69 1.811.898.00 TO GRP81, ELMO1 PNT SIGNAL NAME COLOR LV TYPE K-EDIT K-STDBY ā 8 7 3 X X 1 +24.0 2 K-PRESSA + 5.6 3 ELM 66 CONNECTOR TO GRP27, ELMO4 ELM 70 1.811.898.00 TO GRP81, ELM02 P16 F PNT SIGNAL NAME COLOR LV TYPE PNT SIGNAL NAME COLOR LV TYPE +15.0 + 0.0 -15.0 + 5.6 + 0.0 T-PWRON 1 +24.0 2 K-PRESSB 7 2 F 12345 206305 ELM 71 1.811.898.00 TO GRP81, ELM03 PNT SIGNAL NAME COLOR LV TYPE 8 9 T-SUPVON 9 F 1 +24.0 2 K-STDBY 7 8 ./. 10 x x F + 0.0 0 11 12

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 I.811.090.00
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 STUDER A & E12 * TAPE DECK & AUDIO
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 88/05/19 - 00
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 STUDER A & E12 * TAPE DECK & AUDIO
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 88/05/19 - 00
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 GRP 20 1.811.700.00 <-- <-- CONTINUATION GRP 20 1.811.700.00 <-- <-- CONTINUATION GRP 20 1.811.700.00 <-- <-- CONTINUATION ELM 72 1.811.898.00 TO GRP82, ELM05 ELM 80 CONN. HEAD BLOCK ASSEMBLY ELM 80 PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE 7 X 6 X 48 + 0.0 49 REPRO-01 50 REPRE-01 S 6 9 B B B 1 +24.0 2 K-TTSL ELM 73 1.811.898.00 TO GRP83, ELM05 ELM 90 RC-FILTER 6 7 8 0 PNT SIGNAL NAME COLOR LV TYPE PNT SIGNAL NAME COLOR LV TYPE 1 +24.0 7 X 2 K-TTSR 5 X 10 11 12 13 14 15 + 0.0 + 5.6 +15.0 -15.0 1 T-TCINDL 2 T-TC/RCL 0 3 2 6 B B B B ELM 74 1.811.898.00 TO GRP86, ELMOI PNT SIGNAL NAME COLOR LV TYPE F 16 17 i +24.0 2 K-BRAKE X X ERAHO-02 ERAHH-02 ERAHL-02 ERAHM-02 ERAHH-TC RECHH-TC S 9 6 2 0 9 ELM 75 1.811.898.00 TO GRP86, ELMO2 PNT SIGNAL NAME COLOR LV TYPE REPHH-TC ŝ В 1 +24.0 2 K-EDIT 7 X 9 X RECHL-02 RECHH-02 + 0.0 REPR0-02 6 9 B B B B B B . / . ŝ 69 REPRE-02 ERAHO-01 ERAHH-01 ERAHL-01 ERAHL-TC RECHL-TC RECHL-TC + 0.0 ERACS-02 BECHL-01 S 9 8 8 8 8 6266657 8

RECHL-01 RECHH-01

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1.811.090.00 * STUDE	R A 812	**************************************	* 88/05/19 - 00
RP 24 1.811.772.00 Spooling Motor Controller		GRP 24 1.811.772.00 < < CONTINUATION	GRP 25 1.811.779.00 TAPE DECK PERIPHERY DRIVER
LM 1 TO GRP31, ELM02	P 02	ELM 3 FROM GRP26, ELMO2 PO1	ELM 1 SUPPLY + SOLENOIDS PO
		PNT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE
L + 0.0		1 + 0.0	1 K-PRESSB M
2 + 0.0 DCPHT-L		2 + 0.0 3 + 5.6	2 K-BRAKE M 3 +24.0 M
DCPHR-L + 15.0		4 + 5.6 5 +15.0	4 + 0.0 M 5 K-PRESSA M
PENB-L SIN1-L		6 +15.0 7 -15.0	6 +24.0 M 7 +24.0 M
0.0VREF SIN2-L		8 -15.0 9 TD-PENB	8 + 0.0 M S K-LIFT M
0.0VREF		10 TD-PAVS 11 TD-76K8	10 +24.0 M 11 +24.0 M
M 2		12 13 TD-MFL	12 + 0.0 M 13 K-TTSR M
TO GRP32, ELMO2		14 15 TD-MFR	14 +24.0 M 15 +24.0 M
IT SIGNAL NAME COLOR LV TYPE	F	16 TD-RES 17 TD-DIRL	16 –15.0 M 17 K-TTSL M
+ 0.0		18 TD-INF 19 TD-DIRR	18 +24.0 M 19 +24.0 M
DCPHT-R DCPHR-R		20 TD-24VSC 21 AN-VML	20 +15.0 M 21 K-EDIT M
+15.0 PENB-R		23 AN-VMR 24 AN-TTR	22 K-STDBY M
SINI-R 0.0VREF		25 TD-SCK 26 AN-TTL	23 24 + 5.6 M
SIN2-R 0.0VREF		59	FLM 2
0.00 KEF			FROM GRP08, ELMO3 JO
	•/•		PNT SIGNAL NAME COLOR LV TYPE
			1 -UCOMP
			2 Y-TSENS1 3 +UCOMP
			4 Y-TSENS2 5 OPSVTMOT
			6 KEY
WILLI STUDER AG * L O C ***********************************	A T 1 ********* R A 812		* 88/05/19 - 00
WILLI STUDER AG * L O C ***********************************	A T 1 ********* R A 812	I O N P I N L I S T	* 89/09/18 * 12:22 * P A G E 26 * 88/05/19 - 00 < < CONTINUATIO
WILLI STUDER AC * L O C 1.811.090.00 * STUDE ************************************	A T 1 *********** R A 812 **********	I O N P I N L I S T ***********************************	* 89/09/18 * 12:22 * P A G E 26 * 88/05/19 - 00 < < CONTINUATIO GRP 25 1.811.779.00 < < CONTINUATIO
WILLI STUDER AG + L O C 1.811.090.00 * STUDE ************************************	A T 1 ********** R A 812 **********	I O N P I N L I S T * TAPE DECK & AUDIO GRP 25 1.811.779.00 < CONTINUATION	* 89/09/18 * 12:22 * P A G E 26 * 88/05/19 - 00 < < < CONTINUATIO GRP 25 i.811.779.00 < CONTINUATIO
WILLI STUDER AG * L O C 1.811.090.00 * STUDE P 25 1.811.779.00 <	A T 1 ********* R A 812 ********** ATION ===== P08 	I O N P I N L I S T * TAPE DECK & AUDIO *	* 89/09/18 * 12:22 * P A G E 26 * 88/05/19 - 00 < < CONTINUATIO GRP 25 1.811.779.00 < < CONTINUATIO ELM 7 FROM GRP26, ELMO1 PO
WILLI STUDER AG * L O C 1.811.090.00 * STUDE .811.779.00 CONTINU <	A T 1 ********* R A 812 ********** ATION ===== P08 	I 0 N P I N L I S T * TAPE DECK & AUDIO * * * * * TAPE DECK & AUDIO *	* 89/09/18 * 12:22 * P A G E 26 * 88/05/19 - 00 < < CONTINUATIO GRP 25 1.811.779.00 < < CONTINUATIO ELM 7 FROM GRP26, ELMO1 PO PNT SIGNAL NAME COLOR LV TYPE
WILLI STUDER AG * L O C 1.811.090.00 * STUDE ************************************	A T 1 ********* R A 812 ********** ATION ===== P08 	I O N P I N L I S T * TAPE DECK & AUDIO GRP 25 1.811.779.00 	* 89/09/18 * 12:22 * P A G E 26 * 88/05/19 - 00 < < CONTINUATIO GRP 25 1.811.779.00 < < CONTINUATIO ELM 7 FROM GRP26, ELM01 PO PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0
WILLI STUDER AG * L 0 C 1.811.090.00 * STUDE ************************************	A T 1 ********* R A 812 ********** ATION ===== P08 	I O N P I N L I S T * TAPE DECK & AUDIO GRP 25 1.811.779.00 	* 89/09/18 * 12:22 * P A G E 26 * 88/05/19 - 00 < < CONTINUATIO GRP 25 1.811.779.00 < < CONTINUATIO ELM 7 FROM GRP26, ELM01 PO PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0
WILLI STUDER AG * L O C 1.811.090.00 * STUDE ************************************	A T 1 ********* R A 812 ********** ATION ===== P08 	I O N P I N L I S T * TAPE DECK & AUDIO GRP 25 1.811.779.00 	<pre>* 89/09/18 * 12:22 * P A G E 26 * 88/05/19 - 00 </pre> <pre></pre> <pre></pre> <pre></pre> <pre></pre> <pre>C C CONTINUATIO </pre> <pre>GRP 25 1.811.779.00 <pre></pre> <pre></pre> <pre>ELM 7 </pre> <pre>FROM GRP26, ELM01 PO </pre> <pre>PNT SIGNAL NAME COLOR LV TYPE </pre> <pre>1 * 0.0 2 * 0.0 3 * 5.6 4 * 5.6 5 * 115.0 6 * 115.0 </pre></pre>
WILLI STUDER AG * L 0 C 1.811.090.00 * STUDE 1.811.090.00 * STUDE ************************************	A T 1 ********* R A 812 ********** ATION ===== P08 	I O N P I N L I S T * TAPE DECK & AUDIO GRP 25 1.811.779.00 < < CONTINUATION ELM 5 TAPE TENSION SENSOR, LEFT PO4 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 + 15.0 6 - 15.0	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 < < CONTINUATIO GRP 25 1.811.779.00 < < CONTINUATIO FROM GRP26, ELM01 PO PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 * 5.6 4 * 5.6 5 * 15.0 6 * 15.0 7 - 15.0</pre>
WILLI STUDER AG * L 0 C 1.811.090.00 * STUDE	A T 1 ********* R A 812 ********** ATION ===== P08 	I O N P I N L I S T * TAPE DECK & AUDIO GRP 25 1.811.779.00 < < CONTINUATION ELM 5 TAPE TENSION SENSOR, LEFT PO4 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 +15.0 6 -15.0 7 T-WCLKIL 8 T-WCLKIL 8 T-WCLKIL 9 10	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 < < CONTINUATIO GRP 25 1.811.779.00 < < CONTINUATIO CONTINUATIO CONTINUATIO CONTINUATIO CONTINUATIO CONTINUATIO CONTINUATIO CONTINUATIO </pre>
WILLI STUDER AG * L O C 1.811.090.00 * STUDE	A T 1 ********* R A 812 ********** ATION ===== P08 	I 0 N P I N L I S T * TAPE DECK & AUDIO ************************************	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 < < CONTINUATIO GRP 25 1.811-779.00 < < CONTINUATIO < CONTINUATIO PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 * 5.6 4 * 5.6 5 * 15.0 6 * 15.0 7 - 15.0 8 - 15.0 9 T0-DATAT 10 T0-DATA5 12 T0-DATA4</pre>
WILLI STUDER AG * L 0 C 1.811.090.00 * STUDE	A T 1 R A 812 ************************************	I O N P I N L I S T * TAPE DECK & AUDIO GRP 25 1.811.779.00	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 < < < CONTINUATIO GRP 25</pre>
WILLI STUDER AG * L 0 C 1.811.090.00 * STUDE .1.811.090.00 * STUDE	A T 1 R A 812 	I 0 N P I N L I S T * TAPE DECK & AUDIO ************************************	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00</pre>
WILLI STUDER AG * L O C 1.811.090.00 * STUDE ***********************************	A T 1 R A 812 	I 0 N P I N L I S T * TAPE DECK & AUDIO * * CONTINUATION *	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00</pre>
WILLI STUDER AG * L O C 1.811.090.00 * STUDE * 1.811.090.00 * STUDE * 1.811.090.00 * STUDE * 1.811.090.00 * STUDE * 1.811.079.00 STUDE * - <	A T 1 R A 812 	I 0 N P I N L I S T * TAPE DECK & AUDIO ************************************	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 </pre> <pre></pre>
HILLI STUDER AG + L O C 1.811.090.00 * STUDE 1.811.090.00 * STUDE .1.811.090.00 * STUDE	A T 1 R A 812 	I 0 N P I N L I S T * TAPE DECK & AUDIO * * * T *	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 </pre> <pre></pre> <pre>* 88/05/19 - 00 </pre> <pre>C < CONTINUATIO GRP 25 1.811.779.00 <pre> < CONTINUATIO GRP 25 1.811.779.00 <pre>C < CONTINUATIO TO C < CONTINUATIO TO PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 + 5.6 4 * 5.6 5 * 15.0 6 * 15.0 6 * 15.0 6 * 15.0 6 * 15.0 6 * 15.0 7 - 15.0 8 - 15.0 8 - 15.0 8 - 15.0 8 - 15.0 10 TO DATA6 11 TO DATA6 12 TO DATA6 13 TO DATA5 12 TD DATA1 14 TO DATA5 12 TD DATA1 15 TO DATA1 16 TO DATA6 17 TO DATA1 16 TO DATA1 16 TO DATA1 17 TO DATA1 17 TO DATA1 17 TO DATA1 15 TO DATA1 16 TO DATA2 15 TO DATA1 17 TO DATA1 17 TO DATA2 15 TO DATA1 17 TO DATA2 15 TO DATA1 16 TO DATA2 17 TO DATA1 17 TO DATA2 17 TO DATA1 17 TO DATA1 17 TO DATA2 17 TO DATA1 17 TO DATA5 17 TO DATA2 17 TO DATA1 18 TO DATA2 19 TO DATA1 19 TO DATA5 19 TO DATA5 10 TO DATA5 10 TO DATA5 11 TO DATA5 12 TO DATA1 13 TO DATA3 14 TO DATA5 15 TO DATA3 15 TO DATA3 15 TO DATA5 15 TO DATA3 15 TO DATA5 15 TO DAT</pre></pre></pre>
WILLI STUDER AG * L O C 1.811.090.00 * STUDE * 1.811.090.00 * STUDE * 1.811.090.00 * STUDE * 1.811.779.00 STUDE CONTINU * CONTINU * CONTINU * CONTINU * CONTINU * * * * * * * * * * * * *	A T 1 R A 812 	I O N P I N L I S T * TAPE DECK & AUDIO GRP 25 1.811.779.00	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 < < < CONTINUATIO GRP 25</pre>
WILLI STUDER AG * L O C 1.811.090.00 * STUDE 1.811.090.00 * STUDE .1.811.090.00 * STUDE	A T 1 R A 812 	I 0 N P I N L I S T * TAPE DECK & AUDIO ************************************	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 </pre> <pre></pre> <pre>* 88/05/19 - 00 </pre> <pre></pre> <pre></pre> <pre></pre> <pre></pre> <pre>Continuatio </pre> <pre>GRP 25 i.811.779.00 <pre><pre><pre><pre><pre><pre><pre><pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>
willi StudeR AG * L 0 C 1.811.090.00 * Stude 1.811.090.00 * Stude XP 25 1.811.779.00 < < < CONTINU	A T 1 R A 812 	I 0 N P I N L I S T * TAPE DECK & AUDIO * * TAPE DECK & AUDIO * TAPE DECK & AUDIO * * CONTINUATION * TAPE TENSION SENSOR, LEFT P04 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 3 + 5.6 4 + 5.6 4 + 5.6 5 + 15.0 0 - 15.0 7 T-WCLK2L 9 10 10 AN-TTL 12 T-TENDL 13 T-CLK1 14 T-CLK2 15 T-POS1 16 T-POS2 ************************************	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 </pre> <pre></pre> <pre>* 89/0 5/19 - 00 </pre> <pre></pre> <pre>* 88/05/19 - 00 </pre> <pre></pre>
HILLI STUDER AG + L O C 1.811.090.00 * STUDE I.811.779.00 <	A T 1 R A 812 	I 0 N P I N L I S T * TAPE DECK & AUDIO * * TAPE DECK & AUDIO * TAPE DECK & AUDIO *	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 </pre> <pre></pre> <pre>* 89/0 5/19 - 00 </pre> <pre></pre> <pre>* 600 GRP 25 i.811.779.00 <pre><pre><pre></pre> <pre></pre> <pre><!--</td--></pre></pre></pre></pre>
willi Studer AG + L O C 1.811.090.00 * Studer Studer RP 25 1.811.779.00 Studer <	A T 1 R A 812 	I 0 N P I N L I S T * TAPE DECK & AUDIO * * TAPE OECK & AUDIO * TAPE DECK & AUDIO * * CONTINUATION * TAPE TENSION SENSOR, LEFT P04 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 3 + 5.6 5 + 15.0 0 - 0.0 3 + 5.6 5 + 15.0 0 - 0.0 1 AN-TIL 1 T-ENDL 3 T-CLK1 1 AN-TIL 1 T-CLK1 1 T-CLK2 15 T-POS1 16 T-POS2 T + 0.0 2 + 0.0 3 + 5.6 5 + 15.0	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 C C C CONTINUATIO GRP 25 i.811.779.00 C C C CONTINUATIO ELM 7 FROM GRP26, ELM01 P0 PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 + 5.6 4 * 5.6 5 * 15.0 6 * 15.0 6 * 15.0 7 - 15.0 8 - 15.0 8 - 15.0 9 T0-DATA7 10 T0-DATA6 11 T0-DATA5 12 T0-DATA6 11 T0-DATA5 12 T0-DATA1 16 T0-DATA1 16 T0-DATA 15 T0-DATA1 16 T0-DATA 16 T0-DATA 17 T0-ADR0 18 T0-ADR1 19 T0-ADR1 19 T0-ADR2 20 T0-PAV1 21 T0-R 22 T0-RESET 23 TD-E 24 T0-PAV2 25 T0-FAV2 25 T0-FAV2 25 T0-FAV2 25 T0-FAV3 27 TD-RVCLK 28 T0-SL2 29 T0-SL1 30 T0-SL0 31 T0-RW0 28 T0-RW0 20 T0-FW0 20 T0-FW0 20 T0-FW0 20 T0-FAV3 21 T0-FAV2 25 T0-FAV3 27 TD-WVCLK 28 T0-SL2 29 T0-SL1 30 T0-SL0 31 T0-TW0 28 T0-FW0 20 T0-FW</pre>
HILLI STUDER AG + L 0 C 1.811.090.00 + STUDE .1.811.090.00 - STUDE .1.811.090.00 + STUDE .1.811.090.00 - STUDE .1.811.090.00 - STUDE .1.811.090.00 - STUDE .1.811.090.00 - - .1.811.090.00 - STUDE .1.90.01 - - .1.90.01 - - .1.90.01 - - .1.90.01 - - .1.90.01 - - .1.90.01 - - .1.90.01 - - .1.90.01 - - .1.90.01 - - .1.90.01 - - .1.90.01 - - .1.90.01 <td< td=""><td>A T 1 R A 812 </td><td>I 0 N P I N L I S T * TAPE DECK & AUDIO ************************************</td><td><pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 </pre> <pre></pre> <pre></pre></td></td<>	A T 1 R A 812 	I 0 N P I N L I S T * TAPE DECK & AUDIO ************************************	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 </pre> <pre></pre>
WILLI STUDER AG * L O C 1.811.090.00 * STUDE 1.811.090.00 * STUDE ************************************	A T 1 R A 812 	I 0 N P I N L I S T * TAPE DECK & AUDIO ************************************	<pre>* 89/0 9/18 * 12:22 * P A G E 26 * 88/05/19 - 00 </pre> <pre>< < < CONTINUATIO GRP 25 1.811.779.00 </pre> <pre>C < CONTINUATIO ELM 7 FROM GRP26, ELM01 PO PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 * 5.6 4 * 5.6 5 * 15.0 6 * 15.0 7 - 15.0 8 - 15.0 9 TD-DATA7 10 TD-DATA6 11 TD-DATA5 12 TD-DATA4 13 TD-DATA5 12 TD-DATA4 13 TD-DATA1 16 TD-DATA2 15 TD-DATA1 16 TD-DATA2 17 TD-ABR0 18 TD-ABR2 20 TD-FAV1 21 TD-RK 22 TD-FAV1 21 TD-RK 22 TD-FAV3 27 TD-NVCLK 26 TD-SL2 29 TD-SL1 30 TD-SL0 31 TD-IRQ 32 TD-MVCLK 34 + 10VREF</pre>
WILLI STUDER AG * L 0 C 1.811.090.00 * STUDE 1.811.090.00 * STUDE	A T 1 ************************************	I 0 N P I N L I S T * TAPE DECK & AUDIO	<pre>* 89/09/18 * 12:22 * P A G E 26 * 88/05/19 - 00 * 68/05/19 - 00 C C C CONTINUATIO GRP 25 1.811.779.00 C C C CONTINUATIO ELM 7 FROM GRP26, ELM01 PC PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 + 5.6 4 * 5.6 5 * 15.0 6 * 15.0 6 * 15.0 7 - 15.0 8 - 15.0 9 T0-DATA7 10 T0-DATA6 11 T0-DATA5 12 T0-DATA6 11 T0-DATA5 12 T0-DATA1 16 T0-DATA1 16 T0-DATA 16 T0-DATA 16 T0-DATA 16 T0-DATA 17 T0-ADR0 18 T0-ADR1 19 T0-ADR1 19 T0-ADR2 20 T0-FAV1 22 T0-FE 22 T0-FE 22 T0-FE 23 T0-FE 24 T0-FAV2 25 T0-FNG 26 T0-FAV3 27 TD-MVCLK 28 T0-SL2 29 T0-SL1 30 T0-SL0 31 T0-TRQ 32 T0-MVDIR 33 T0-MVCKS 34 +10VREF</pre>

* WILLI STUDER AG * L D C A T I O N P I N L I S T * 89/09/18 * 12:22 * P A G E 27 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00
* 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 <-- <-- CONTINUATION GRP 26 1.811.773.00 <-- <-- CONTINUATION GRP 25 1.811.779.00 <-- <-- CONTINUATION GRP 26 1.811.773.00 TAPE DECK PERIPHERY INTERFACE ELM 1 TO GRP25, ELMO7/GRP27, ELMO3 PNT SIGNAL NAME COLOR LV TYPE F ELM 8 FROM GRP 26, ELMO2 PO1 PNT SIGNAL NAME COLOR LV TYPE F ELM 2 TO GRP24, ELMO3/GRP25, ELMO8 PNT SIGNAL NAME COLOR LV TYPE F -NT SIGNAL 1 + 0.0 2 + 0.0 3 + 5.6 5 + 15.0 7 - 15.0 1 TD-DATA6 TD-DATA6 TD-DATA5 TD-DATA7 TD-DATA7 TD-DATA7
 NT
 SIGNAL

 1
 + 0.0

 2
 + 0.0

 3
 + 5.6

 4
 + 5.6

 5
 + 15.0

 7
 - 15.0

 9
 TD-PENB

 1
 TD-76K8
 - NI SIGNAL 1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 + 15.0 6 + 15.0 7 - 15.0 9 TD-PENB 0 TD-PAVS 1 TD-76K8 2 3 TD-47 1 4 5 6 7 8 9 10 11 12 13 10 11 12 13 14 15 16 TD-MFL TD-MFL TD-DATA2 TD-DATA1 TD-DATA0 TD-ADR0 TD-ADR1 TD-ADR1 TD-ADR2 TD-PAV1 TD-R5 TD-PAV2 TD-FAV2 TD-FAV3 TD-MVCLK TD-SL0 TD-IR0 TD-MVCLK TD-MVCLKR L 14 15 TD-MFR 16 TD-RES 17 TD-DIRL 18 TD-INF 19 TD-DIRR 20 TD-24VSC 21 AN-VML 22 14 15 16 17 18 19 TD-MER Ē TD-RES TD-DIRL TD-INF TD-DIRR Ē 16 17 18 19 20 21 22 23 L 18 L Ē 20 21 22 TD-24VSC AN-VML L 21 AN-VMR 22 23 AN-VMR 24 AN-TTR 25 TD-SCK 26 AN-TTL L 23 24 25 AN-VMR AN-TTR TD-SCK AN-TTL 24 25 L 26 26 27 28 29 30 31 32 33 34 35 36 37 -10VREF TD-WCLKL TD-WDIRL TD-RESIN 38 39 40 * WILLI STUDER AG * L O C A T I O N P I N L I S T * 89/09/18 * 12:22 * P A G E 28 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 888/05/19 - 00 * <-- <-- CONTINUATION GRP 27 1.811.774.00 <-- <-- CONTINUATION GRP 27 i.811.774.00 <-- <-- CONTINUATION GRP 27 1.811.774.00 TAPE DECK CONTROLLER ELM 3 FROM GRP26, ELMO1 ELM 2 FROM GRP20, ELM39 PO2 PNT SIGNAL NAME COLOR LV TYPE F ELM 1 FROM GRP20, ELM03 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 TRC-C'" P03 _____ PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL N) 1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 + 15.0 6 + 15.0 7 - 15.0 9 TD-DATA5 10 TD-DATA5 11 TD-DATA5 12 TD-DATA5 14 TD-DATA3 14 TD-DATA3 15 TD-DATA3 15 TD-DATA1 16 TD-DATA1 17 TD-ADR2 20 TD-PAV1 21 TD-RESET 10 -RESET T SIGNAL NAME + 0.0 TDS-CLK TDS-CTS TDS-RX TDS-DTR TDS-TX TD-EVENT + 0.0 TD-MVCLK TD-MVDIR 1 TC-SL3 2 + 0.0 3 TC-SL4 4 + 0.0 5 TC-IRQ 6 + 0.0 7 TC-ENBG 1 2 3 + 0.0 TC-RESMP 8 9 10 11 12 13 14 15 16 17 18 19 TC-RESMF + 0.0 TC-SL1 + 0.0 TD-CRES + 0.0 TC-RW + 0.0 TC-ENB + 0.0 TC-ADR2 10 ./. 19 221 222 224 225 227 229 31 233 323 334 56 7 20 21 + 0.0 TC-ADR1 TD-RESET TD-E TD-PAV2 TD-ENG TD-PAV3 TD-WCLK TD-SL2 TD-SL2 TD-SL2 TD-SL2 TD-RQ TD-MVCKS +10VREF TD-WCLKR TD-W0 IRR TD-W0 IRR TD-W0 FR TD-WCLKL 22 23 + 0.0 TC-ADRO 24 25 + 0.0 TC-DATA7 26 27 + 0.0 TC-DATA6 TC-DATA6 + 0.0 TC-DATA5 + 0.0 TC-DATA4 + 0.0 TC-DATA3 + 0.0 TC-DATA2 + 0.0 TC-DATA1 + 0.0 TC-DATA1 + 0.0 28 29 30 31 32 33 34 35 36 37

38 39 40

TD-WDIRL TD-RESIN

* 1.811.090.00 * STUDER A 81 ************************************	2 * TAPE DECK & AUDIO ************************************	<pre>************************************</pre>
RP 27 1.811.774.00 < < CONTINUATION	GRP 30 1.820.790.00 SWITCHING STABILIZER	GRP 31 1.811.771.00 SPOOLING MOTOR DRIVE AMPLIFIER LEFT
LM 4 SUPPLY (FROM GRP20, ELM20) JO1	ELM 1 DC INPUT (FROM GRP07, ELM12) J01	ELM 1 SUPPLY (FROM GRP08, ELM02) JO)
NT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE
L +15.0 M	1 +STABIN F 2 + 0.0 F	1
3 -15.0 M	3 + 0.0 F	3
+ + 5.6 M 5 + 0.0 M 5 T−PWRON M	4 + STABIN F 5 + 0•0 F 6 − STABIN F	4 +PSVTMOT M 5 OPSVTMOT M 6 -PSVTMOT M
+ 0 _* 0	7 +CAPMOT F	
T-SUPVON M	9 OCAPMOT F 10 ACPWE-D1 F	ELM 2 FROM GRP24, ELMO1 PO
+ 0.0 M	11 12 ACPWE-B1 F	PNT SIGNAL NAME COLOR LV TYPE
		1 + 0.0
M 5 CONNECTOR RS 232 (SERVICE) JO2	ELM 2 DUTPUT (TO GRP20, ELM10) PO1	2 + 0.0 3 DCPHT-L
IT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE F	5 +15.0
TD-TX	1 + 5.6 M	6 PENB-L 7 SINI-L
2 -15.0	2 + 5.6 M 3 +5.6SENS M	8 0.0VREF 9 SIN2-L
+ 0.0 + 5.0	4 TM-C76K M 5 + 0.0 M	10 0.0VR EF
6 KEY 7 TD-RX	6 + 0.0 M 7 T-PWRON M 8 + 0.0 M	ELM 3 TO SPOOLING MOTOR LEFT PO
	9 + 0.0 M 10 + 0.0 M	PNT SIGNAL NAME COLOR LV TYPE
	11 +15.0 M 12 -15.0 M	1 AN-R-L F
	13 + 0.0 M 14 + 0.0 M	2 AN-S-L F
	15 + 24.0 M 16 + REMSUP M	3 AN-T-L F 4 AN-R-L F 5 AN-S-L F
	17 + STABSNS M 18 - STABSNS M	6 AN-T-L F
	19 -26.0 M 20 +26.0 M	
	21 + 0.0 M	
WILLI STUDER AG * L D C A T ***********************************	22 +0.05ENS M 23 OCAPMOT M 24 +CAPMOT M 	* 89/09/18 * 12:22 * PAGE 30 ************************************
WILLI STUDER AG * L D C A T	22 +0,05ENS M 23 0CAPMOT M 24 +CAPMOT M 	* 89/09/18 * 12:22 * PAGE 30 ************************************
WILLI STUDER AG * L D C A T	22 +0.05ENS M 23 OCAPMOT M 24 +CAPMOT M 	* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 **********************************
HILLI STUDER AG * L D C A T 	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE	* 89/09/18 * 12:22 * P A G E 30 ************************************
WILLI STUDER AG * L O C A T 1.811.090.00 * STUDER A 81 1.811.090.00 * STUDER A 81 SUP 32 1.811.771.00 SPODLING MOTOR DRIVE AMPLIFIER RIGHT SUPPLY (FROM GRP08, ELM02) J01	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE	* 89/09/18 * 12:22 * P A G E 30 ************************************
HILLI STUDER AG * L D C A T 	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE FROM GRP35, ELMO1 P01 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0	* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 C < CONTINUATIO GRP 34 CONN. REMOTE CONTR./SYNCHRONIZER/BL ELM 1 CONN. AUTOLOCATOR, REMOTE TIMER JC PNT SIGNAL NAME COLOR LV TYPE 1 SHIELD B
MILLI STUDER AG * L O C A T 	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 10 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE FROM GRP35, ELMO1 PO1 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 + 5.0 3 * REMSUP	* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 C < CONTINUATIO GRP 34 CONN. REMOTE CONTR./SYNCHRONIZER/BL ELM 1 CONN. AUTOLOCATOR, REMOTE TIMER JO PNT SIGNAL NAME COLOR LV TYPE 1 SHIELD 8 2 8 3 TR-A B
WILLI STUDER AG * L O C A T 1.811.090.00 * STUDER A 81 1.811.090.00 * STUDER A 81 P 32 1.811.771.00 SPODLING MOTOR DRIVE AMPLIFIER RIGHT M 1 SUPPLY (FROM GRP08, ELMO2) JO1 IT SIGNAL NAME COLOR LV TYPE F GND M +PSVTMOT M OPSVTMOT M	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 10 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE FROM GRP35, ELMOI POI PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 + 5.0 3 + REMSUP 4 T-RL0 5 T-RL1	* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 C < CONTINUATIO GRP 34 CONN. REMOTE CONTR./SYNCHRONIZER/BL
HILLI STUDER AG * L O C A T 	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 	* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 C < CONTINUATIO GRP 34 CONN. REMOTE CONTR./SYNCHRONIZER/BL
M 1 SUPPLY (FROM GRPO8, ELMO2) ISIGNAL NAME COLOR LV TYPE GND H 2 M 2 M 2 M 2 M 2 M 2 M 2 M 2 M	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 24 +CAPMOT M 10 N P I L I S 1 0 N P I L I S 2* TAPE DECK & AUDIO	* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 * 68/05/19 - 00 C < CONTINUATIO GRP 34 CONN. REMOTE CONTR./SYNCHRONIZER/BL
HILLI STUDER AG * L D C A T 1.811.090.00 * STUDER A 81 1.811.090.00 * STUDER A 81 1.811.771.00 SPODLING MOTOR DRIVE AMPLIFIER RIGHT SUPPLY (FROM GRP08, ELM02) JO1 IT SIGNAL NAME COLOR LV TYPE F GND M +PSVTMOT M OPSVTMOT M -PSVTMOT M SUPPLY (GRP24, ELM02 P01	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 10 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE ELM 1 FROM GRP35, ELMO1 PO1 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 + 5.0 3 + REMSUP 4 T-RL0 5 T-RL1 6 T-SL3 7 T-A3 8 T-B0 9 T-A1 10 T-A2 11 T-B3	* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 * 88/05/19 - 00 C < CONTINUATIO GRP 34 CONN. REMOTE CONTR./SYNCHRONIZER/BL
WILLI STUDER AG * L O C A T 1.811.090.00 * STUDER A 81 P 32 1.811.771.00 SPODLING MOTOR DRIVE AMPLIFIER RIGHT M 1 SUPPLY (FROM GRP08, ELM02) J01 TT SIGNAL NAME COLOR LV TYPE F GND M +PSVTMOT N -PSVTMOT M FROM GRP24, ELM02 P01 TT SIGNAL NAME COLOR LV TYPE F + 0.0 + 0.0	22 +0.05ENS M 23 0.02APMOT M 24 +CAPMOT M 24 +CAPMOT M 1 0 N P I I S 1 0 N P I I S T 2 * TAPE DECK & AUDIO	* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 C < CONTINUATIO GRP 34 CONN. REMOTE CONTR./SYNCHRONIZER/BL
HILLI STUDER AG * L D C A T 1.811.090.00 * STUDER A 81 1.811.090.00 * STUDER A 81	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 1 0 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE 	* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 C < CONTINUATIO GRP 34 CONN. REMOTE CONTR./SYNCHRONIZER/BU
HILLI STUDER AG * L D C A T 	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 2* TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE 	<pre>* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 **********************************</pre>
HILLI STUDER AG * L D C A T 1.811.090.00 * STUDER A 81 1.811.771.00 SPODLING MOTOR DRIVE AMPLIFIER RIGHT	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 2* TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE 	 # 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 * 88/05/19 - 00 * 68/05/19 - 00 * 68/05/19 - 00 CONNINUATIONAL GRP 34 CONN. AUTOLOCATOR, REMOTE TIMER JG CONN. AUTOLOCATOR, REMOTE TIMER JG PNT SIGNAL NAME COLOR LV TYPE SHIELD B 3 TR-A B 4 KEY B 5 + 0.0 B 6 B 7 TR-B B 8 SIGN.GND B 9 +REMSUP B CONNECTOR SYNCHRONIZER JG PNT SIGNAL NAME COLOR LV TYPE 1 + 0.0 B 2 BR-REM B 3 BR-FORM B 4 BR-VRSPD B
WILLI STUDER AG * L D C A T 1.811.090.00 * STUDER A 81 1.811.090.00 * STUDER A 81 W 32 1.811.771.00 SPDDLING MOTOR DRIVE AMPLIFIER RIGHT	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE 	<pre>* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 **********************************</pre>
WILLI STUDER AG * L D C A T 1.811.090.00 * STUDER A A 1.91 SUPPLY (FROM GRP08, ELMO2) JO1 JO1 NT SIGNAL NAME COLOR LV TYPE F 1 + O.0 * OON M 3 DCPHT-R * OCOUR TYPE F 1 + O.0 * OON * PO1 VT SIGNAL NAME COLOR LV TYPE F 1 + O.0 * OON * 2 O.0	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 2* TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE 	<pre>* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 **********************************</pre>
WILLI STUDER AG * L D C A T 1.811.090.00 * STUDER A 81 I.811.090.00 * STUDER A 81 SP00LING MOTOR DRIVE AMPLIFIER RIGHT SP00LING MOTOR DRIVE AMPLIFIER RIGHT SUPPLY (FROM GRP08, ELM02) J01 NT SIGNAL NAME COLOR LV TYPE F 2 2 3 4 4 4 5 2 5 1 4 4 7 7 8 7 8 9 9 9 10 11 12 12 13 14 15 15 16 17 18 11 12 14 15 15 16 17 18 18 19 10 10 <tr< td=""><td>22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE </td><td><pre>* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 **********************************</pre></td></tr<>	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE 	<pre>* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 **********************************</pre>
WILLI STUDER AG * L D C A T 1.811.090.00 * STUDER A 81 1.811.090.00 * STUDER A 81 SP00LING MOTOR DRIVE AMPLIFIER RIGHT SP00LING MOTOR DRIVE AMPLIFIER RIGHT SUPPLY (FROM GRP08, ELM02) J01 NT SIGNAL NAME COLOR LV TYPE F 1 2 GND M 3 CRD M 4 4 PSVTMOT M 5 1 1 2 GND M 3 PROM GRP24, ELM02 P01 NT SIGNAL NAME COLOR LV TYPE F 1 1 2 NT SIGNAL NAME COLOR LV TYPE F 1 1 1 1 1 1 1 1 1 1 2 3 1 3 4 5 5 5 5 6 7	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 2* TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE ELM 1 FROM GRP35, ELMO1 P01 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 + 5.0 3 + REMSUP 4 T-RL0 5 T-RL1 6 T-SL3 7 T-A3 8 T-B0 9 T-A1 10 T-A2 11 T-B3 12 T-A0 13 T-B1 14 T-B2 12 T-A0 13 T-B1 14 T-B2 12 T-A0 13 T-B1 14 T-B2 12 T-A0 13 T-B1 14 T-B2 15 T-B0 16 T-SL1 17 T-SL1 18 T-RL7 19 T-RL6 20 T-0E 21 T-SL2 22 T-RL5 23 T-RL4 24 T-RESET 25 T-RL3 25 T-RL3 26 T-RL2	<pre>* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 **********************************</pre>
WILLI STUDER AG * L D C A T 1.811.090.00 * STUDER A 81 1.811.090.00 * STUDER A 81 SPOOLING MOTOR DRIVE AMPLIFIER RIGHT SPOOLING MOTOR DRIVE AMPLIFIER RIGHT SUPPLY (FROM GRP08, ELMO2) J01 VT SIGNAL NAME COLOR LV TYPE 2 GND 4 SUPPLY (FROM GRP08, ELMO2) J01 VT SIGNAL NAME COLOR LV TYPE F 1 4 5 7 6 7 8 1 10 11 12 13 14 15 15 16 17 18 11 11 12 12 14 14 15 15 16 17 18 19 19 14 15 15 <td>22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 1 0 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE </td> <td><pre>* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 * C < CONTINUATIO GRP 34 CONN. REMOTE CONTR./SYNCHRONIZER/BU</pre></td>	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 1 0 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE 	<pre>* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 * C < CONTINUATIO GRP 34 CONN. REMOTE CONTR./SYNCHRONIZER/BU</pre>
MILLI STUDER AG * L D C A T 1.811.090.00 * STUDER A 81 1.811.090.00 * STUDER A 81 NOTOR DRIVE AMPLIFIER RIGHT SPOOLING MOTOR DRIVE AMPLIFIER RIGHT SUPPLY (FROM GRP08, ELM02) J01 VT SIGNAL NAME COLOR LV TYPE F 2 GND M 3 +PSVTMOT M 5 -PSVTMOT M 5 -PSVTMOT M 5 -PSVTMOT M 6 -PSVTMOT M 7 SIGNAL NAME COLOR LV TYPE F 1 SIGNAL NAME COLOR LV TYPE F 1 +O.0 +O.0 2 + O.0 -O.0 3 DCPHR-R - 5 + D.0 - 2 - O.0 - 3 D.0 - 4 0.0 - 4 - - 5 + D.0 - 4 - - - 5 - - - 1 N	22 +0.05ENS M 23 0CAPMOT M 24 +CAPMOT M 1 0 N P I N L I S T 2* TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE 	 # 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 * 88/05/19 - 00 C < CONTINUATIO CONN. REMOTE CONTR./SYNCHRONIZER/BL CONN. AUTOLOCATOR, REMOTE TIMER JC PNT SIGNAL NAME COLOR LV TYPE 1 SHIELD 8 3 TR-A 8 4 KEY 8 5 + 0.0 8 6 TR-B 8 SIGN.GND 8 9 *REMSUP 8 CONNECTOR SYNCHRONIZER JC PNT SIGNAL NAME COLOR LV TYPE 1 SHIELD 8 2 CONNECTOR SYNCHRONIZER JC CONNECTOR SYNCHRONIZER JC PNT SIGNAL NAME COLOR LV TYPE 1 + 0.0 8 3 BR-REM 8 3 BR-FORM 8 4 BR-VRSPD 8 5 SR -WSSPD 8 5 SR -WSSPD 8 6 SR -REMSL 8 7 OR-MVCLK 8 8 KEY/COIR 8 9 BR-REC 8 10 OR-MVDIR 8 11 OR-SYEN8 6 13 IR-REFEX 8 14 + 0.0 8 14 H 0.0 8 15 BR-PLAY 8
WILLI STUDER AG * L D C A T 1.811.090.00 * STUDER A 81 1.811.090.00 * STUDER A 81 SPOOLING MOTOR DRIVE AMPLIFIER RIGHT SUPPLY (FROM GRP08, ELM02) JO1 VT SIGNAL NAME COLOR LV TYPE F 2 GND M 4 +PSVTMOT M 5 OPSVTMOT M 6 -PSVTMOT M 5 OPSVTMOT M 1 + 0.0 2 P01 VT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 P01 VT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 P01 VT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 P01 VT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 P00 VT SIGNAL NAME COLOR LV TYPE F 1 N - R P00 VT SIGNAL NAME COLOR LV TYPE F 1 AN-R-R F 2 AN-S-R F 3 AN-T-R F 4 AN-R-R F	22 +0.05ENS M 23 0.02PMOT M 24 +CAPMOT M 1 0 N P I N L I S T 24 +CAPMOT M	 # 89/09/18 * 12:22 * P A G E 30 ************************************
NILLI STUDER AG * L D C A T 1.811.090.00 * STUDER A A 1.811.090.00 * STUDER A A NT SPODLING MOTOR DRIVE AMPLIFIER RIGHT SUPPLY (FROM GRP08, ELM02) JO1 NT SIGNAL NAME COLOR LV TYPE F 1 GND M A A A A 3 GOD M A A A A 4 PSYTMOT N A A A A 5 OPSYTMOT M A A A A A 1 POUTOT M A A A A A 2 GND M A A A A 2 GND M A A A A 2 GN	22 +0.05ENS M 23 0.02PMOT M 24 +CAPMOT M 1 0 N P I N L I S T 1 0 N P I N L I S T 2 + CAPHOT M M M M M M 2 + CAPHOT M M L I S T 2 + CAPE DECK & AUDIO M M M M M M 2 * TAPE DECK & AUDIO M POI M M M M 2 * TAPE DECK & AUDIO POI POI POI M M M M M 2 * TAI POI POI POI POI POI POI M	<pre>* 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 **********************************</pre>
NILLI STUDER AG * L D C A T 1.811.090.00 * STUDER A A 1.811.090.00 * STUDER A A NT SPODLING MOTOR DRIVE AMPLIFIER RIGHT SUPPLY (FROM GRP08, ELM02) JO1 NT SIGNAL NAME COLOR LV TYPE F 1 GND M A A A A 3 GOD M A A A A 4 PSYTMOT N A A A A 5 OPSYTMOT M A A A A A 1 POUTOT M A A A A A 2 GND M A A A A 2 GND M A A A A 2 GN	22 + 0,05ENS M 23 0CAPMOT M 24 + CAPMOT M 24 + CAPMOT M 1 0 N P I N L I S T 2 * TAPE DECK & AUDIO GRP 33 1.820.729.00 SERIAL REMOTE INTERFACE ELM 1 POI FROM GRP35, ELMOI POI PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 * 5.0 3 * REMSUP 4 T-RL0 5 T-RL1 6 T-SL3 7 T-A3 8 T-80 9 T-A1 10 T-A2 11 T-83 12 T-A0 13 T-81 14 T-82 15 T-80 16 T-SL0 17 T-SL1 18 T-RL7 19 T-RL6 20 T-0E 21 T-SL2 22 T-RL5 23 T-RL4 24 T-RL5 25 T-RL3 26 T-RL2 TO GRP34, ELMO1 PO2 PNT SIGNAL NAME COLOR LV TYPE F 1 SHIELD 2 TR-B 5 TR-A 6 SIGN.GND	 # 89/09/18 * 12:22 * P A G E 30 * 88/05/19 - 00 * 88/05/19 - 00 * 68/05/19 - 00 C < CONTINUATIO CONN. REMOTE CONTR./SYNCHRONIZER/BL CONN. AUTOLOCATOR, REMOTE TIMER JC PNT SIGNAL NAME COLOR LV TYPE 1 SHIELD 8 3 TR-A 8 4 KEY 8 5 + 0.0 8 6 + 0.0 8 7 TR-B 8 8 SIGN.GND 8 9 *REMSUP 8 CONNECTOR SYNCHRONIZER JC PNT SIGNAL NAME COLOR LV TYPE 1 + 0.0 8 9 *REMSUP 8 CONNECTOR SYNCHRONIZER JC PNT SIGNAL NAME COLOR LV TYPE 1 + 0.0 8 8 AF-FORM 8 9 BR-REM 8 9 BR-REM 8 1 DR-MVCLK 8 8 KEY/COIR 8 9 BR-REC 8 10 RC-MVCLK 8 11 GR-GKCLK 8 13 IR-REFEX 8 14 + 0.0 8 14 FOR 8 15 BR-PLAY 16 BR-STOP 8 17 SR-LIFT 8 18 SR-MUTE 8 19 SR-REC 8 10 SR-REM 8 11 GR-SYENB 6 12 GR-SYENB 6 13 IR-REFEX 8 14 0.0 8 15 SR-PLAY 8 16 SR-PLAY 8 17 SR-LIFT 8 18 SR-PLAY 8 18 SR-PLAY 8
WILLI STUDER AG * L D C A T I.811.771.00 SPOOLING MOTOR DRIVE AMPLIFIER RIGHT SUPLY (FROM GRP08, ELM02) JOI NT SIGNAL NAME COLOR LV TYPE F IM SIN2-R O .00VREF LM 3 SIN2-R O .00VREF I INT SIGNAL NAME COLOR LV TYPE F I SIN2-R O .00VREF I I I I I I I I	22 +0.05ENS M 23 0.02PMOT M 24 +CAPMOT M 1 0 N P I N L I S T 1 0 N P I N L I S T 2 + CAPHOT M	* 89/09/18 * 12:22 * P A G E 30 * 89/05/19 - 00 * 88/05/19 - 00 C < CONTINUATIO GRP 34 CONN. REMOTE CONTR./SYNCHRONIZER/BU ELM 1 CONN. AUTOLOCATOR, REMOTE TIMER JO PNT SIGNAL NAME COLOR LV TYPE 1 SHIELD 8 2 B 3 TR-A 8 4 KEY 8 5 + 0.0 8 6 8 5 F 0.0 8 6 8 7 TR-B 8 8 SIGN.GND 8 9 +REMSUP 8 CONNECTOR SYNCHRONIZER JO PNT SIGNAL NAME COLOR LV TYPE 1 + 0.0 8 2 BR-REM 8 3 BR-FORM 8 3 BR-FORM 8 4 KEY CDIR 5 5 SR-VKSPD 8 5 SR-VKSPD 8 5 SR-VKSPD 8 6 CONNECTOR SYNCHRONIZER 30 7 OR-WYCLK 8 8 KEY/CDIR 8 10 OR-MYOIR 8 11 OR-CMCLK 8 11 OR-CMCLK 8 12 OR-SYEN8 6 13 IR-REFEX 8 14 + 0.0 8 16 BR-PLAY 8 16 BR-PLAY 8 20 SR-REW 8 3 SR-PORM 8 3 RA-FORM

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P 34 < < CONTINUATION	GRP 35 1.820.738.00 Parallel Remote Interface	<pre>< < CONTINUATION GRP 35 1.820.738.00</pre>
M 3 CONN. PARALLEL REMOTE CONTROL J03		
T SIGNAL NAME COLOR LV TYPE F	PO1 TO GRP33, ELMO1 PNT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE
b b BR-RKW B BR-FARM B BR-VASPD B SR-VASPD B BR-FARY B SR-REC B FAD2 B FAD2 B SR-OLOC B BR-STOP B SR-LIFT B SR-LOCST B SR-REC B SR-REC B SR-REC B SR-PLAY B SR-FLAY B SR-	1 + 0.0 2 + 5.0 3 +REMSUP 4 T-RL0 5 T-RL1 6 T-SL3 7 T-A3 8 T-BD 9 T-A1 10 T-A2 11 T-B3 12 T-A0 13 T-B1 14 T-B2 15 T-B0 16 T-SL0 17 T-SL1 18 T-RL7 19 T-RL6 20 T-OE 21 T-SL2 22 T-RL5 23 T-RL4 24 T-RESET 25 T-RL3 26 T-RL2 	1 + C.O 2 + O.O 3 + 5.6 5 + REMSUP 6 + REMSUP 7 TM-DSL5 8 TM-ISL5 9 TM-DRES 10 TM-IRES 11 TM-ORM 12 TM-ORM 13 TM-DENB 14 TM-IENB 15 T-REFEXT 16 O.O VCU 17 TC-TCMV 18 TC-TCDIR 19 TM-DADRO 20 TM-IADRO 20 TM-IADRO 21 TM-REMIR 22 O.O VCU 23 TD-MVCLK 24 TD-MVDIR 25 TM-DATAT 26 O.O VCU 27 TM-DATA5 30 O.O VCU 31 TM-DATA5 30 O.O VCU 33 TM-DATA3 34 O.O VCU 35 TM-DATA0 36 O.O VCU 37 TM-DATA0 36 O.O VCU
**************************************	GRP 35 1.820.738.00 < < CONTINUATION 	**************************************

ELM 5 P05
PNT SIGNAL NAME COLOR LV TYPF F
1 GND Y

EDITION: 1. Oktober 1989

* 1.811.090.00 * S	TUDER A 812	* TAPE DECK & AUDIO	**************************************
** *** *** * *** *** *** *** *** *** ****	******	*************	**************************************
RP 36 1.328.264.00		GRP 36 1.328.264.00 < < CONTINUATION	GRP 36 1.328.264.00 < < CONTINUATIO
< < CON		< < CONTINUATION	< < CONTINUATIO
LM 2 INPUT FROM BASIS BOARD	803	ELM 3	ELM 4
NT SIGNAL NAME COLOR LV TYPE		CONNECTION REMOTE PANEL PO3 PNT SIGNAL NAME COLOR LV TYPE F	CHANNEL REMOTE CONNECTOR JO
1 + 0.0			1 + 0.0
2 + 0.0 3 + 5.6		2 SR-REA01 3	2 KEY 3 SR-INP01
4 + 5.6 5 +15.0		4 SR-REPO1 5 SR-INPO1	4 SR-REA01 5 SR-REP02
6 -15.0 7 T-SADA		6 SR-INPO2 7 SR-REAO2	6 SR-INPTC 7 SR-ARENB
8 T-SADB 9 T-SADC		8 SR-REATC 9 SR-REPO2	8 BR-REA01 9 BR-SYNO1
0 T-READSL 1 T-WRTSL		10 SR-REPTC 11 SR-INPTC	10 BR-RECO2 11 BR-INPO2
2 T-DT-CH1 3 T-DT-CH2 4 T-DT-CH3		12 BR-RECO1 13 SR-ARENB 14 DR LND01	12 BR-REP02 13 BR-REATC
5 T-DT-MP		14 BR-INP01 15 BR-REA01	14 BR-SYNTC 15 BR-TCPRS
6 T-DT-RES 7 8		16 BR-REPO1 17 BR-SYNO1 18 BR-REAO2	16 17
9 0 + 0.0		19 BR-REC02 20 BR-SYN02	18 19 20 SR-REAO1
1 T-VARSPD 2 + 0.0		21 BR-INP02 22 BR-RECTC	21 SR-REP01 22 SR-INP02
3 T-REFEXT 4 +24.0		23 BR-REP02 24 BR-INPTC	23 SR-REATC 24 SR-REPTC
5 + 0.0 6 + 0.0		25 BR-REATC 26 BR-REPTC	25 BR-REC01 26 BR-INP01
	./.	27 BR-SYNTC 28 +24.0	27 BR-REP01 28 BR-REA02
		29 BR-TCPRS 30	29 BR-SYND2 30 BR-RECTC
		31 32	31 BR-INPTC 32 BR-REPTC
		33 34	33 +24.0 34 KEY
		35 36	35 36
		37 38	37
	*****	39 40	****
WILLI STUDER AG * L A *********************************	D C A T ************** TUDER A 812	40 40 1 O N P I N L I S T	* 89/09/18 * 12:22 * PAGE 34 ************************************
will I Studer AG * L ************************************	D C A T ************** TUDER A 812 *************	40 1 Ο Ν Ρ Ι Ν L Ι S Τ * TAPE DECK & AUDIO	* 89/09/18 * 12:22 * PAGE 34 ************************************
WILLI STUDER AG L 1.811.090.00 + S 1.811.090.00 + S NUMBER AG L RP 4.0 1.820.749.00 INTERFERENCE FILTER, CH 01 L	D C A T ***********************************	40 I O N P I N L I S T * TAPE DECK & AUDIO GRP 41 1.820.749.00 INTERFERENCE FILTER, CH 02	* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00 ***********************************
WILLI STUDER AG * L 1.811.090.00 * S 1.820.749.00 INTERFERENCE FILTER, CH 01 INTERFERENCE FILTER, CH 01 CJNNECTOR XLR, INPUT	D C A T	40 I O N P I N L I S T * TAPE DECK & AUDIO GRP 41 1.820.749.00 INTERFERENCE FILTER, CH 02	* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00 ***********************************
WILLI STUDER AG * L I 1.811.090.00 * S 1.820.749.00 INTERFERENCE FILTER, CH 01 CINNECTOR XLR, INPUT NT SIGNAL NAME COLOR LV TYPE	D C A T *********************************	40 I O N P I N L I S T * TAPE DECK & AUDIO GRP 41 1.820.749.00 INTERFERENCE FILTER, CH 02 	* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00 < CONTINUATI GRP 42 1.820.749.00 INTERFERENCE FILTER, TIME CODE ELM 1 CONNECTOR XLR, INPUT J PNT SIGNAL NAME COLOR LV TYPE
WILLI STUDER AG * L I 1.811.090.00 * S 1.811.090.00 * S INTERFERENCE FILTER, CH 01 INTERFERENCE FILTER, CH 01 CINNECTOR XLR, INPUT NT SIGNAL NAME COLOR LV TYPE 1 GND 2 LINSA-01	D C A T *********************************	40 I O N P I N L I S T * TAPE DECK & AUDIO GRP 41 1.820.749.00 INTERFERENCE FILTER, CH 02	* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00 ***********************************
WILLI STUDER AG * L 1.811.090.00 * S 1.820.749.00 INTERFERENCE FILTER, CH 01 INTERFERENCE FILTER, CH 01 NT SIGNAL NAME COLOR LV TYPE 1 GND 2 LINSA-01 3 LINSB-01	UDER A 812	40 40 40 40 40 40 40 40 40 40	<pre>* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00</pre>
<pre>ILLI STUDER AG * L I ILLI STUDER AG * L I INTERFERENCE FILTER, CH OI INTERFERENCE FILTER, CH OI ILLI SIGNAL NAME COLOR LV TYPE I GND 2 LINSA-01 3 LINSA-01 3 LINSA-01 ILLI 2 CONNECTOR XLR, DUTPUT</pre>	0 C A T TUDER A 812 J01 F P01	40 I O N P I N L I S T * TAPE DECK & AUDIO GRP 41 1.820.749.00 INTERFERENCE FILTER, CH 02 ELM 1 CONNECTOR XLR, INPUT JOI PNT SIGNAL NAME COLOR LV TYPE F 1 GND 2 LINSA-02 3 LINSB-02 ELM 2 CONNECTOR XLR, OUTPUT P01	<pre>* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00</pre>
 WILLI STUDER AG * L I I.811.090.00 * S I.820.749.00 INTERFERENCE FILTER, CH 01 INTERFERENCE FILTER, CH 01 INT SIGNAL NAME COLOR LV TYPE GND 2 LINSA-01 LINSA-01 LINSB-01 LINSB-01 LINSB-01 LINSB-01 SIGNAL NAME COLOR LV TYPE TSIGNAL NAME COLOR LV TYPE 	D C A T TUDER A 812 J01 F P01 F	40 I O N P I N L I S T * TAPE DECK & AUDIO GRP 41 1.820.749.00 INTERFERENCE FILTER, CH 02 ELM 1 CONNECTOR XLR, INPUT JOI PNT SIGNAL NAME COLOR LV TYPE F CONNECTOR XLR, OUTPUT P01 PNT SIGNAL NAME COLOR LV TYPE F	<pre>* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00</pre>
WILLI STUDER AG * L 1.811.090.00 * S INTERFERENCE FILTER, CH 01 INT CONNECTOR XLR, INPUT INSA-01 1 LINSA-01 ILINSA-01 2 LINSA-01 ILINSA-01 IM 2 CONNECTOR XLR, OJTPUT IMT SIGNAL NAME COLOR LV TYPE I 1 GND LOUSA-01	D C A T TUDER A 812 J01 F P01 F	40 I O N P I N L I S T * TAPE DECK & AUDIO GRP 41 1.820.749.00 INTERFERENCE FILTER, CH 02 TONNECTOR XLR, INPUT JOI PNT SIGNAL NAME COLOR LV TYPE F I GND 2 LINSB-02 ELM 2 CONNECTOR XLR, OUTPUT POI PNT SIGNAL NAME COLOR LV TYPE F	<pre>* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00 **********************************</pre>
ILLI STUDER AG L INTERFERENCE 1.811.090.00 S INTERFERENCE ILTER, CH 01 INTERFERENCE FILTER, CH 01 INT SIGNAL NAME COLOR LV TYPE I GND LINSA-01 ILINSB-01 ILINSB-01 INT SIGNAL NAME COLOR LV TYPE I GND LINSB-01 ILINSB-01 ILINSB-01	D C A T TUDER A 812 J01 F P01 F F F F F F F	40 I O N P I N L I S T * TAPE DECK & AUDIO * TAPE DECK & AUDIO GRP 41 1.820.749.00 INTERFERENCE FILTER, CH 02 ELM 1 CONNECTOR XLR, INPUT J01 PNT SIGNAL NAME COLOR LV TYPE F 1 GND 2 LINSB-02 ELM 2 CONNECTOR XLR, OUTPUT PNT SIGNAL NAME COLOR LV TYPE F 1 GND 2 LOUSA-02 3 LOUSB-02	<pre>* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00 **********************************</pre>
 WILLI STUDER AG * L I I.811.090.00 * S I.820.749.00 INTERFERENCE FILTER, CH 01 CINNECTOR XLR, INPUT T SIGNAL NAME COLOR LV TYPE GND 2 LINSA-01 3 LINSA-01 LINSA-01 LINSB-01 CONNECTOR XLR, DJTPUT GND 2 LOUSA-01 3 LOUSA-01 3 LOUSA-01 LOUSA-01 3 LOUSA-01 LOUSA-01 3 LOUSA-01 LINSB-01 	D C A T TUDER A 812 J01 F P01 F F T P01 F	40 40 40 40 40 40 40 40 40 40	<pre>* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00</pre>
WILLI STUDER AG * L * 1.811.090.00 * * 1.811.090.00 * * 1.811.090.00 * * 1.820.749.00 INTERFERENCE FILTER, CH 01 INT SIGNAL NAME COLOR LV TYPE INT SIGNAL NAME COLOR LV TYPE 1 GND LINSA-01 3 LINSB-01 INT SIGNAL NAME COLOR LV TYPE IGND LUNSB-01 LUNSB-01 LUNSB-01 LOUSB-01 LOUSB-01 LM 3 CONNECTOR LINE FILTER, INPUT NT SIGNAL NAME COLOR LV TYPE LINFB-01 6	D C A T TUDER A 812 J01 F P01 F F T P01 F	40 40 40 40 40 40 40 40 40 40	<pre>* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00</pre>
WILLI STUDER AG L I.811.090.00 * S INTERFERENCE FILTER, CH 01 I.NT SIGNAL NAME COLOR LV TYPE I GND LINSA-01 J LINSA-01 J LINSA-01 J LOUSA-01 J COUSA-01 J LOUSA-01 J LOUSA-01 J LOUSA-01 J LOUSA-01 J LUNSA-01 LINFB-01 A J LINFB-01 A J + 0.0	D C A T TUDER A 812 J01 F P01 F F T P01 F	40 40 40 40 40 40 40 40 40 40	<pre>* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00 **********************************</pre>
WILLI STUDER AG * L 1.811.090.00 * S 1.01 LINERFERENCE FILTER, CH 01 INT SIGNAL NAME COLOR LV TYPE S 1 GND LINSA-01 2 LINSA-01 LINSB-01 LM CONNECTOR XLR, DJTPUT NT SIGNAL NAME COLOR LV TYPE S 1 GND LOUSA-01 3 LOUSA-01 LOUSA-01 3 LOUSA-01 S 2 CONNECTOR LINE FILTER, INPUT NT SIGNAL NAME COLOR LV TYPE 1 LINFB-01 D 2 KB O 3 + 0.0 S 3 + 0.0 S 2 KUNFA-01 D	UDER A 812 TUDER A 812 J01 F P01 F T P01 F T P01 F JJ P02	40 I O N P I N L I S T * TAPE DECK & AUDIO GRP 41 1.820.749.00 INTERFERENCE FILTER, CH 02 ELM 1 CONNECTOR XLR, INPUT J01 PNT SIGNAL NAME COLOR LV TYPE F 1 GND 2 LINSB-02 CONNECTOR XLR, OUTPUT PNT SIGNAL NAME COLOR LV TYPE F 1 GND 2 LOUSA-02 3 LINSB-02 CONNECTOR XLR, OUTPUT PNT SIGNAL NAME COLOR LV TYPE F 1 GND 2 LOUSA-02 3 LINSB-02 CONNECTOR XLR, OUTPUT PO1 PNT SIGNAL NAME COLOR LV TYPE F 1 LINFB-02 6 D 2 KEY S 3 + 0.0 S 4 LINFA-02 O D D 4 LINFA-02 O CONNECTOR LINE FILTER, OUTPUT P02	<pre>* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00</pre>
WILLI STUDER AG L 1.811.090.00 + Si 1.811.090.00 + Si 1.811.090.00 + Si I.811.090.00 + Si INT SIGNAL NAME COLOR LV TYPE I I GND I LINSA-01 I SUDSA-01 I I GND I LINSB-01 I I GND I LOUSA-01 I I GND I CONNECTOR LINE FILTER, INPUT NT SIGNAL NAME COLOR LV TYPE I LINFB-01 D 2 KEY D 3 + 0.0 D LINFA-01 O LM 4 CONNECTOR LINE FILTER, GUTPU CONNECTOR LINE FILTER, GUTPU I	D C A T TUDER A 812 J01 F P01 F P01 F JT P01 F JT P02 F	40 40 40 40 40 40 40 40 40 40	<pre>* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00</pre>
ILLI STUDER AG L I.811.090.00 S I.811.090.00 S I.811.090.00 S INTERFERENCE FILTER, CH 01 INTERFERENCE FILTER, CH 01 INT SIGNAL NAME COLOR LV TYPE I GND LINSA-01 J LINSA-01 J LINSA-01 J LOUSA-01 J LOUSA-01 J LOUSA-01 J LOUSA-01 J LINFB-01 L LINFA-01 J LINFA-01 J LUNFA-01	D C A T TUDER A 812 J01 F P01 F P01 F JT P01 F JT P02 F	40 40 40 40 40 40 40 40 40 40	<pre>* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00</pre>
 WILLI STUDER AG * L I I.811.090.00 * S I.820.749.00 INTERFERENCE FILTER, CH 01 INTERFERENCE FILTER, CH 01 CINNECTOR XLR, INPUT CONNECTOR XLR, OJTPUT CONNECTOR XLR, OJTPUT SIGNAL NAME COLOR LV TYPE GND LINSB-01 LOUSA-01 LUNFB-01 D ELM 4 CONNECTOR LINE FILTER, OUTPUT 	D C A T TUDER A 812 J01 F P01 F P01 F JT P01 F JT P02 F	40 I O N P I N L I S T * TAPE DECK & AUDIO GRP 41 1.820.749.00 INTERFERENCE FILTER, CH 02 ELM 1 CONNECTOR XLR, INPUT J01 PNT SIGNAL NAME COLOR LV TYPE F 1 GND 2 LINSA-02 3 LINSB-02 PNT SIGNAL NAME COLOR LV TYPE F 1 GND 2 LOUSA-02 3 LOUSB-02 ELM 3 CONNECTOR LINE FILTER, INPUT PO1 PNT SIGNAL NAME COLOR LV TYPE F 1 GND 2 LOUSA-02 3 LOUSB-02 ELM 3 CONNECTOR LINE FILTER, INPUT PO1 PNT SIGNAL NAME COLOR LV TYPE F 1 LINFB-02 D 2 KEY 3 + 0.0 S 4 LINFA-02 O CONNECTOR LINE FILTER, OUTPUT P02 PNT SIGNAL NAME COLOR LV TYPE F	<pre>* 89/09/18 * 12:22 * P A G E 34 * 88/05/19 - 00</pre>

STUDER A812

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WILLISTUDER AG \star LOCA T	**************************************	* 89/09/18 * 12:22 * PAGE 35 *
1.811.090.00 * STUDER A 81	2 * TAPE DECK & AUDIO	* 88/05/19 - 00 *
RP 43	CDD (2	< < CONTINUATION
CONNECTORS TO VU PANEL, EXTERNAL	GRP 43 < < CONTINUATION	GRP 43 < < CONTINUATION
LM 1	51 M 2	 ELM 11
AUDIO CONN., FROM GRP20, ELM15/16/17	CONTRGL CONN., FROM GRP20, ELMO7	CABLE TO GRP70, ELM09/11/12
NT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE
1 TAPMS-01 0 A 2 + 0.0 S A	1 + 0.0 2 + 5.6	1 TAPMS-01 0 B 2 + 0.0 S B
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	3 +15.0 4 T-SADA	3 INPAD-01 6 B 4 LUUFA-01 0 B
5 + J.U 5 A 6 MONIT-01 9 A 7 T-TC(DC 9 A	5 T-SADC 6 T-WRTSL	6 MONIT-01 9 B
7 T-TC/RC 9 A 8 + 0.0 S A 9 TAPMS-02 0 A	7 T-DT-CH2 8 T-DT-MP 9	7 T-TC/RC 9 B 8 + 0.0 S B 9 TAPMS-02 0 B
D INPAD-02 6 A	10 11 T-VARSPD	5 TAPMS-02 0 B 10 INPAD-02 6 B 11 + 0.0 S B
2 LOUFA-02 D A 3 GND O A 4 TAPAD-01 6 A	12 T-REFEXT 13 + 0.0	12 LOUFA-02 0 B 13 GND 0 B
	14 + 0.0 15 + 5.6	14 TAPAD-01 6 B 15 + 0.0 S B
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	16 -15.0 17 T-SADB	16 INPDI-01 0 B 17 LOUFB-01 6 B
B + 0.0 S A 9 + 0.0 S A	18 T-READSL 19 T-DT-CH1	18 + 0.0 S B 19 + 0.0 S B
0 MONIT-02 9 A 1 + 0.0 S A	20 T-DT-CH3 21	20 MONIT-02 9 B 21 + 0.0 S B
2 TAPAD-02 6 A 3 INPDI-02 0 A	22 + 0.0	22 TAPAD-02 6 B 23 INPDI-02 0 B
+ + 0.0 S A 5 LOUFB-02 6 A	24 + 0.0 25 +24.0	24 + 0.0 S B 25 LOUFB-02 6 B
•/•	ELM 3	./.
	PNT SIGNAL NAME COLOR LV TYPE F	
	1 GND 0 L	
M 12 CABLE TO GRP70, ELMO1	ELM 1 CONNECTOR SMPTE/EBU BUS J04 PNT SIGNAL NAME COLOR LV TYPE F	PUSHBUTTON / DISPLAY BOARD ELM 1 TO GRP53, ELMO1 PNT SIGNAL NAME COLOR LV TYPE F
M 12 CABLE TO GRP70, ELMO1 T SIGMAL NAME COLUR LV TYPE F 1 + 0.0 2 + 5.6 3 +15.0 5 T-5ADA 5 T-5ADA 5 T-0T-CH2 3 T-0T-CH3 6 - 15.0 7 T-ARSPD 2 T-&RSPD 2 T-&RSPD 4 - 0.0 5 + 5.6 5 - 15.0 7 T-SAD8 5 T-OT-CH1 0 T-OT-CH3	ELM 1 J04 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVB B 6 TRANSCM B 5 SPARE B 6 TRANSCM B 7 TRANSB B 8 RECEIVA B 9 FRMGND B 5 SPARE 1 FRMGND B 105 PNT SIGNAL NAME COLOR LV 1 FRMGND B 2 TRANSA 2 TRANSA B 3 RECEIVE 1 FRMGND B 2 TRANSA 3 RECEIVB B 3 RECEIVB 4 RECEIVB B 5 5 SPARE B 5	ELM 1 TO GRP53, ELMO1 PO1
M 12 CABLE TO GRP70, ELMO1 T SIGNAL NAME COLUR LV TYPE F + 0.0 + 5.6 + 15.0 T-SADA T-SADA T-SADA T-SADC T-VARSPD T-VARSPD T-REFEXT + 0.0 + 5.6 -15.0 T-SADB T-REFEXT + 0.0 + 5.6 + 0.0 + 5.6 + 0.0 +	ELM 1 J04 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVB B 6 TRANSA B 4 RECEIVCM B 5 SPARE B 6 TRANSA B 7 TRANSB B 7 TRANSB B 5 SPARE B 8 RECEIVA B 5 SPARE B 7 TRANSB B 5 SPARE B 9 FRMGND B 5 SPARE S 1 FMGND B 5 S S 2 TRANSA B 5 S S 1 FRMGND B 5 S 2 TRANSA B 3 RECEIVB 3 RECEIVB B 3 RECEIVB	ELM 1 TO GRP53, ELMO1 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 + 0.0 3 + 5.6 5 5 6 TH-EN4 7 TM-EN3 8 TH=EN2 9 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL3 14 TM-RL3 14 TM-RL2 15 TM-RL5 16 TM-RL4
M 12 CABLE TO GRPTO, ELMO1 IT SIGNAL NAME COLUR LV TYPE F + 0.0 + 5.0 + 15.0 T-SADA T-SADA T-VARSPD T-VARSPD T-REFEXT + 0.0 + 5.6 -15.0 T-REFEXT + 0.0 + 5.6 -15.0 T-CH2 T-CH2 T-DT-CH2 T-DT-CH2 + 0.0 + 0.0 + 0.0 + 0.0	ELM 1 J04 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVB B 5 SPARE B 6 TRANSCM B 7 TRANSA B 7 TRANSCM B 7 TRANSCM B 9 FRMGND B 5 SPARE 1 FRMGND B 5 5 PTT SIGNAL NAME COLOR LV 1 FRMGND B 5 5 2 TRANSA B 6 7 1 FRMGND B 8 6 2 TRANSA B 8 8 4 RECEIVB B 8 8 4 RECEIVB B 8 6 5 SPARE B 6 7 6 TRANSCM B 7 7 6 TRANSCM B 7 7	ELM 1 TO GRP53, ELMO1 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 + 0.0 3 + 5.6 5 5 6 TH-EN4 7 TM-EN3 8 TH=EN2 9 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL3 14 TM-RL3 14 TM-RL2 15 TM-RL5 16 TM-RL4
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M 12 CABLE TO GRPTO, ELMO1 NT SIGNAL NAME COLUR LV TYPE F + 3.0 2 + 5.6 + 15.0 T - SADA 5 - SADC 5 - T-ARTSL T - VAR SPD 2 T - REFEXT 4 - 3.0 5 - 5.6 - 15.0 T - SADB 1 - VAR SPD 2 T - REFEXT 4 - 3.0 5 - 5.6 - 15.0 T - SADB 1 - ACADSL 1	ELM 1 J04 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVE B 4 RECEIVE B 5 SPARE B 6 TRANSA B 7 TRANSA B 8 RECEIVA B 9 FRMGND B 2 CONNECTOR SMPTE/EBU BUS J05 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVA B 4 RECEIVA B 5 SPARE B 6 TRANSA B 7 TRANSA B 8 RECEIVA B 9 FRMGND B 1 TRANSB B 8 RECEIVA B 9 FRMGND B <	ELM 1 TO GRP53, ELMO1 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 + 0.0 3 + 5.6 5 5 6 TM-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL3 14 TM-RL2 15 TM-RL5 16 TM-RL4 ./-
M 12 CABLE TO GRPTO, ELMO1 NT SIGNAL NAME COLUR LV TYPE F + 3.0 2 + 5.6 + 15.0 T -5ADA T -5ADA T -5ADA T -0T-MP - 1 - VAR SPD 2 T-REFEXT 3 - 0.0 + 0.0 5 - 5.6 - 15.0 T -5ADB 1 - READSL 1 - 0.0 + 0.0 5 - 5.6 - 15.0 T -0T-CH1 T -0T-CH3 - H - 0.0 + 3.0 + 3.0 + 3.0 + 3.0 + 3.0 + 3.0 + 3.0 + 3.0 + 24.0 - - - - - - - - - - - - -	ELM 1 J04 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVE B 4 RECEIVE B 5 SPARE B 6 TRANSA B 7 TRANSA B 8 RECEIVA B 9 FRMGND B 2 CONNECTOR SMPTE/EBU BUS J05 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVA B 2 TRANSA B 2 TRANSA B 3 RECEIVA B 4 RECEIVA B 5 SPARE B 6 TRANSCH B 7 TRANSB B 8 RECEIVA B 9 FRMGND B <td>ELM 1 TO GRP53, ELMO1 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 + 0.0 3 + 5.6 5 5 6 TM-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL2 15 TM-RL3 14 TM-RL2 16 TM-RL4 -/-</td>	ELM 1 TO GRP53, ELMO1 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 + 0.0 3 + 5.6 5 5 6 TM-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL2 15 TM-RL3 14 TM-RL2 16 TM-RL4 -/-
M 12 C ABLE TO GRPTO, ELMO1 NT SIGNAL NAME COLUR LV TYPE F + 3.0 + 5.6 + 15.0 T -5ADA T -5ADA T -5ADA T -7AFEXT 3 T -0T-MP - 1 T -VAR SPD 2 T -REFEXT 3 + 3.0 + 3.0 5 + 5.6 - 15.0 T -5ADB 3 T -6ADSL 1 T -0T-CH1 1 T -0T-CH1 1 T -0T-CH3 4 + 3.0 + 3.0 + 3.0 + 3.0 + 3.0 1 -0T-CH3 2 T -8ADSL 1 T -0T-CH3 2 T -7C-CH3 2 T -7C-CH3	ELM 1 J04 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVB B 4 RECEIVCM B 5 SPARE B 6 TRANSB B 7 TRANSB B 8 RECEIVA B 9 FRMGND B 2 CONNECTOR SMPTE/EBU BUS J05 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVA B 4 RECEIVA B 5 SPARE B 6 TRANSCM B 7 TRANSA B 8 RECEIVA B 9 FRMGND B 1 TRANSB B 7 TRANSB B 8 RECEIVA B </td <td>ELM 1 TO GRP53, ELNO1 POI PNT SIGNAL NAME COLOR LV TYPE F 1 * 0.0 2 * 0.0 3 * 5.6 5 TM-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL2 15 TM-RL5 16 TM-RL4 * 88/10/24 * 14112 * * *</td>	ELM 1 TO GRP53, ELNO1 POI PNT SIGNAL NAME COLOR LV TYPE F 1 * 0.0 2 * 0.0 3 * 5.6 5 TM-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL2 15 TM-RL5 16 TM-RL4 * 88/10/24 * 14112 * * *
M 12 C ABLE TO GRPTO, ELMO1 NT SIGNAL NAME COLUR LV TYPE F + 3.0 2 + 5.6 + 15.0 T -5ADA T -5ADA T -5ADA T -0T-MP - 1 - VAR SPD 2 T -REFET 3 + 0.0 + 0.0 5 + 5.6 - 15.0 T -5ADB 3 T -ACADSL 1 -0T-CH1 1 -0T-CH1 1 -0T-CH1 1 -0T-CH1 2 + 0.0 + 0.0 + 0.0 5 + 5.6 - 15.0 T -5ADB 1 -7ACADSL 1 -0T-CH1 2 + 0.0 + 0.0 + 0.0 5 + 5.6 - 15.0 T -0T-CH1 1 -0T-CH1 2 + 0.0 + 0.0 + 0.0 5 + 5.6 - 15.0 T -5ADB 1 -0T-CH1 2 + 0.0 + 0.0 5 + 5.6 - 15.0 T -5ADB 1 -0T-CH1 2 + 0.0 + 0.0 5 + 5.6 - 15.0 T -5ADB 1 -0T-CH1 2 + 0.0 + 0.0 + 0.0 5 + 5.6 - 15.0 T -5ADB 1 -0T-CH1 2 + 0.0 + 0.0 5 + 5.6 - 15.0 T -5ADB 1 -0T-CH1 2 + 0.0 + 0.0 5 + 5.6 - 15.0 T -5ADB 1 -0T-CH1 2 + 0.0 - 1.5 1 -0T-CH2 2 + 0.0 - 1.5 - 1.5 - 0 + 0.0 - 1.5 - 0 + 0.0 - 0 + 0.0	ELM 1 J04 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVE B 4 RECEIVE B 5 SPARE B 6 TRANSB B 7 TRANSB B 8 RECEIVA B 9 FRMGND B 2 CONNECTOR SMPTE/EBU BUS J05 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVA B 4 RECEIVA B 5 SPARE B 6 TRANSCM B 7 TRANSA B 8 RECEIVA B 9 FRMGND B 1 TRANSB B 7 TRANSB B 8 RECEIVA B <td>ELM 1 TO GRP53, ELNO1 POI PNT SIGNAL NAME COLOR LV TYPE F 1 * 0.0 2 * 0.0 3 * 5.6 5 TM-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL2 15 TM-RL5 16 TM-RL4 * 88/10/24 * 14112 * * *</td>	ELM 1 TO GRP53, ELNO1 POI PNT SIGNAL NAME COLOR LV TYPE F 1 * 0.0 2 * 0.0 3 * 5.6 5 TM-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL2 15 TM-RL5 16 TM-RL4 * 88/10/24 * 14112 * * *
M 12 CABLE TO GRP70, ELMO1 AT SIGNAL NAME COLUR LV TYPE F + 3.0 + 5.6 + 15.0 T -5ADA T -5ADA T -5ADA T -7AR SE T -0T-MP - T -VAR SPD T -V	ELM 1 J04 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVE B 4 RECEIVE B 5 SPARE B 6 TRANSB B 7 TRANSB B 8 RECEIVA B 9 FRMGND B 2 CONNECTOR SMPTE/EBU BUS J05 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVA B 4 RECEIVA B 5 SPARE B 6 TRANSCM B 7 TRANSA B 8 RECEIVA B 9 FRMGND B 10 N P I 1 O N P I 9 <t< td=""><td>ELM 1 TO GRP53, ELNO1 POI PNT SIGNAL NAME COLOR LV TYPE F 1 * 0.0 2 * 0.0 3 * 5.6 5 TM-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL2 15 TM-RL5 16 TM-RL4 * 88/10/24 * 14112 * * *</td></t<>	ELM 1 TO GRP53, ELNO1 POI PNT SIGNAL NAME COLOR LV TYPE F 1 * 0.0 2 * 0.0 3 * 5.6 5 TM-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL2 15 TM-RL5 16 TM-RL4 * 88/10/24 * 14112 * * *
M 12 CABLE TO GRP70, ELMO1 T SIGNAL NAME COLUR LV TYPE F + 3.0 + 5.6 + 15.0 T-SADA T-SADA T-SADA T-SADA T-ARTSL T-OT-CH2 T-OT-CH2 T-OT-CH2 T-AEFEXT + 3.0 + 5.6 -15.0 T-SADB T-READSL T-OT-CH3 + 3.0 + 3.0 + 3.0 + 3.0 + 3.0 + 3.0 + 24.0 MILLI STUDER AG + L O C A T MILLI STUDER AG + L O C A T 1.811.090.00 + STUDER A B12 MILLI STUDER AG + L O C A T 1.811.090.00 + STUDER A B12 MILLI STUDER AG + L O C A T 1.811.090.00 + STUDER A B12 MILLI STUDER AG + L O C A T 1.811.090.00 + STUDER A B12 MILLI STUDER AG + L O C A T 1.811.090.00 + STUDER A B12 MILLI STUDER AG + L O C A T 1.811.090.00 + STUDER A B12 MILLI STUDER AG + L O C A T 1.811.090.00 + STUDER A B12 MILLI STUDER AG + L O C A T 1.811.090.00 + STUDER A B12 MILLI STUDER AG + L O C A T MILLI STUDER AG + L O C A T 1.811.090.00 + STUDER A B12 MILLI STUDER AG + L O C A T MILLI STUDER AG + L O C A T HILLI STUDER AG	ELM 1 J04 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVB B 4 RECEIVCM B 5 SPARE B 6 TRANSA B 7 TRANSA B 8 RECEIVA B 9 FRMGND B 2 CONNECTOR SMPTE/EBU BUS J05 PNT SIGNAL NAME COLOR LV TYPE F 1 FRMGND B 2 TRANSA B 3 RECEIVA B 4 RECEIVA B 5 SPARE B 6 TRANSCM B 7 TRANSA B 8 RECEIVA B 9 FRMOND B 1 FRAMSA B 7 TRANSCM B 9 FRMEND B	ELM 1 TO GRP53, ELNO1 POI PNT SIGNAL NAME COLOR LV TYPE F 1 * 0.0 2 * 0.0 3 * 5.6 5 TM-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL2 15 TM-RL5 16 TM-RL4 * 88/10/24 * 14:12 * * *

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RP 50 1.811.777.00 < < CONTINUATION	GRP 51 1.328.215.00 EDIT ASSEMBLY	GRP 52 i.811.776.00 TAPE DECK DISPLAY DRIVER
LM 2 FROM GRP52, ELNO2 PO2	ELM 1 FROM GRP52, ELMO3	ELM 1 FROM GRP20, ELMO4 P(
NT SIGNAL NAME COLOR LV TYPE F	PNT SIGNÁL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE
1 + 0.0 2 + 0.0	1 TM-RL3 2 TM-RL2	1 + 0.0
+ 5.6 + 5.6	3 TM-RL1 4 TM-CUE1	2 + 0.0 3 + 5.6 4 + 5.6
; 5 TM-EN4	5 TH-RLO 6 TH-CUE2	5 +24.0 6 +24.0
TM-EN3 TM-EN2	7 TM-ENO 8 ANM-SH3	7 TH-DSL4 8 TH-ISL4
TM-EN1 TM-RL6 TM-RL7	9 ANM-SH2 10 ANM-SH1	9 TM-DRES 10 TM-IRES 11 TM-DRW
TM-RLO TM-RLI	 ELM 2	12 TM-IRW
TM-RL2 TM-RL3	WIRE FIELD POTENTIOMETER	13 TM-DENB 14 TM-IENB
5 TM-RL4 TM-RL5	PNT SIGNAL NAME COLOR LV TYPE F	16 TM-IADR2 17 TM-DADR1
T M-B TM-DP	1 ANM-SH1 2 ANM-SH2	16 TM-IADR1 19 TM-DADR0
TM-A TM-C	3 ANM-SH3	20 TM-IADRO 21 TM-SHIR
TM-D TM-F		22 0.0 VCU 23 TM-KBIR
TM-E TM-G TM-D9		24 0.0 VCU 25 TM-DATA7
TM-D9 TM-D8 TM-D7		26 0.0 VCU 27 TM-DATA6
TM-D6 TM-D5		28 0.0 VCU 29 TM-DATA5
TM-D4 TM-D3		30 0.0 VCU 31 TM-DATA4 32 0.0 VCU
TM-D2 TM-D1		32 0.0 VCU 33 TM-DATA3 34 0.0 VCU
TM-DO TM-L2		35 TM-DATA2 36 0.0 VCU
TM-L1 TM-L3		37 TM-DATA1 38 0.0 VCU
TM-L4 TM-L5		39 TM-DATAO 40 0.0 VCU
**************************************	**************************************	**************************************
1.811.090.00 * STUDER A 812	GRP 52 1-811.776.00	* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 * < CONTINUATIO
 ************************************	GRP 52 1.811.776.00 <	* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 <pre></pre>
************************************	GRP 52 1.811.776.00 	* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 CONTINUATIO GRP 53 1.811.778.00 SUBPANEL PUSH BUTTON BOARD
1.811.090.00 * STUDER A 812 52 1.811.776.00 <	GRP 52 1.811.776.00 CONNECTOR PUSHBUTTON ASSEMBLY PO2 PNT SIGNAL NAME COLOR LV TYPE F	* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 < CONTINUATIN GRP 53 1.811.778.00 SUBPANEL PUSH BUTTON BOARD ELM 1 FROM GRP50, ELMO1 PNT SIGNAL NAME COLOR LV TYPE
************************************	GRP 52 1.811.776.00 CONNECTOR PUSHBUTTON ASSEMBLY PO2 PNT SIGNAL NAME COLOR LV TYPE F 1 TM-RL3 2 TM-RL2	* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 < CONTINUATI GRP 53 1.811.778.00 SUBPANEL PUSH BUTTON BOARD
1.811.090.00 * STUDER A 812 52 1.811.776.00 < < CONTINUATION	GRP 52 1.811.776.00 	* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 < CONTINUATI GRP 53 1.811.778.00 SUBPANEL PUSH BUTTON BOARD
************************************	GRP 52 1.811.776.00 	<pre>* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00</pre>
************************************	GRP 52 1.811.776.00 	<pre>* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 **********************************</pre>
************************************	GRP 52 1.811.776.00 	* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 < CONTINUATI GRP 53 1.811.778.00 SUBPANEL PUSH BUTTON BOARD
4 2 1.811.090.00 + STUDER A 812 2 1.811.776.00	GRP 52 1.811.776.00	* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 < < CONTINUATI GRP 53 1.811.778.00 SUBPANEL PUSH BUTTON BOARD ELM 1 FROM GRP50, ELM01 P PNT SIGNAL NAME COLOR LV TYPE 1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 TM-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL7 12 13 TM-RL3
* 1.611.090.00 * STUDER A 812 * 52 1.811.776.00 < < CONTINUATION	GRP 52 1.811.776.00	<pre>* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00</pre>
************************************	GRP 52 1.811.776.00	* 89/09/18 * 12:22 * P A G E 38 88/05/19 - 00 * 88/05/19 - 00 < < CONTINUATI
* 1.00 C A 1 1.811.090.00 * STUDER A 812 * 52 1.811.776.00 < < CONTINUATION	GRP 52 1.811.776.00 CONNECTOR PUSHBUTTON ASSEMBLY PO2 PNT SIGNAL NAME COLOR LV TYPE T TM-RL3 2 TM-RL2 3 TM-RL1 4 TM-CUE1 5 TM-RL0 6 TM-CUE2 7 TM-EN0 8 ANM-SH3 9 ANM-SH3 9 ANM-SH4 CONNECTOR LCD DISPLAY UNIT PO4 PNT SIGNAL NAME COLOR LV TYPE F	 # 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 C < CONTINUATION BOARD SUBPANEL PUSH BUITON BOARD ELM 1 FROM GRP50, ELMO1 PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 * 5.6 4 * 5.6 5 6 TM-EN4 7 TM-EN3 8 TM-EL2 14 TM-RL2 15 TM-RL5 16 TM-RL4
* 1.811.3100ER AC * 1.00.0 A 1.811.090.00 * STUDER A 812 * 2 1.811.776.00 < < CONTINUATION	GRP 52 1.811.776.00	 # 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 C < CONTINUATION BOARD SUBPANEL PUSH BUITON BOARD ELM 1 FROM GRP50, ELMO1 PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 * 5.6 4 * 5.6 5 6 TM-EN4 7 TM-EN3 8 TM-EL2 14 TM-RL2 15 TM-RL5 16 TM-RL4
* 1.811.090.00 * 5.00 C A 1 * 1.811.090.00 * STUDER A 812 * 52 1.811.776.00 < < CONTINUATION	GRP 52 1.811.776.00	 # 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00
************************************	GRP 52 1.811.776.00	 # 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 C < CONTINUATION BOARD SUBPANEL PUSH BUITON BOARD ELM 1 FROM GRP50, ELMO1 PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 * 5.6 4 * 5.6 5 6 TM-EN4 7 TM-EN3 8 TM-EL2 14 TM-RL2 15 TM-RL5 16 TM-RL4
WILLI SIDDER AC + L C A 1.811.070.00 * STUDER A 812 2 1.811.776.00 - - <	GRP 52 1.811.776.00	 # 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 C < CONTINUATION BOARD SUBPANEL PUSH BUITON BOARD ELM 1 FROM GRP50, ELMO1 PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 * 5.6 4 * 5.6 5 6 TM-EN4 7 TM-EN3 8 TM-EL2 14 TM-RL2 15 TM-RL5 16 TM-RL4
* 1.011.076.00 * 52 1.811.776.00 <	GRP 52 1.811.776.00	 # 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 C < CONTINUATION BOARD SUBPANEL PUSH BUITON BOARD ELM 1 FROM GRP50, ELMO1 PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 * 5.6 4 * 5.6 5 6 TM-EN4 7 TM-EN3 8 TM-EL2 14 TM-RL2 15 TM-RL5 16 TM-RL4
MILLISIONER AD + L U C A 1.811.070.00 + STUDER A 812 P 52 1.811.776.00 - - CONNECTOR COMMAND UNIT P03 CONNECTOR COMMAND UNIT P03 CONNECTOR COMMAND UNIT P03 * 0.0 + * 0.0 + * 0.0 + * 0.0 + * 0.0 + * 0.0 + * 0.0 + * 5.6 + TM-EN4 + TM-EN2 + TM-RL0 + TM-RL1 + TM-RL2 + TM-RL3 + TM-F + TM-C + TM-D0 + TM-F + TM-C + TM-D0 + TM-D1 + TM-D2 + TM-D3 + TM-D2 + TM-D2 + TM-D3 + <	GRP 52 1.811.776.00	 # 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 * 88/05/19 - 00 * 68/05/19 - 00 * 600 SUBPANEL PUSH BUTTON BOARD ELM 1 FROM GRP50, ELM01 PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 * 5.6 4 * 5.6 5 6 TH-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL7 12 13 TM-RL3 14 TM-RL2 15 TM-RL5 16 TM-RL4
MILLISTOPERAC I.BIL.090.00 * STUDER A BIZ 1.BIL.090.00 * STUDER A BIZ I.BIL.776.00 CONTRUCTION CONTRUCTION CONTRUCTION CONTRUCTION T SIGNAL NAME COLOR LV TYPE F CONTRUCTION T PO3 T SIGNAL NAME COLOR LV TYPE F + 0.0 + 0.0 + 0.0 + 0.0 + 5.6 T M-ENA T M-DA T M-D	GRP 52 1.811.776.00	* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 < < < CONTINUATION BOARD Control
MILLI SLOVE AD + L U C A 1.811.070.00 + STUDER A B12 1.811.070.00 + STUDER A B12 P 52 1.811.776.00 - - A B12 CONNECTOR COMMAND UNIT PO3 - - - CONTINUATION M 2 CONNECTOR COMMAND UNIT PO3 -	GRP 52 1.811.776.00	* 89/09/18 * 12:22 * P A G E 38 * 88/05/19 - 00 C < < CONTINUATION BOARD GRP 53 1.811.778.00 SUBPANEL PUSH BUTTON BOARD ELM 1 FROM GRP50, ELM01 PO PNT SIGNAL NAME COLOR LV TYPE 1 * 0.0 2 * 0.0 3 * 5.6 4 * 5.6 5 TH-EN4 7 TM-EN3 8 TM-EN2 9 10 TM-RL6 11 TM-RL2 13 TM-RL3 14 TM-RL2 15 TM-RL5 16 TM-RL4

<-- <-- CONTINUATION GRP 58 1.820.861.00 <-- <-- CONTINUATION GRP 58 1.820.861.00 TIMER CONTROL BOARD GRP 54 1.811.233.00 LCD DISPLAY UNIT ELM 1 FROM B. BOARD TAPE DECK, ELM 19 P01 ELM 3 TO MECHANICAL TIMER ELM 1 FROM GRP52, ELM04 P04 PNT SIGNAL NAME COLOR LV TYPE F P03 PNT SIGNAL NAME COLOR LV TYPE F
 I
 SIGNAL

 1
 + 0.0

 2
 + 0.0

 3
 + 5.6

 4
 + 5.6

 5
 + 15.0

 6
 - 15.0

 7
 T-SADA

 8
 T-SADA

 9
 T-SADA

 1
 T-DT-CH1

 1
 T-DT-CH2

 T-DT-CH3
 T-DT-CH3

 T-DT-CH4
 T-DT-CH3

 T-DT-MP
 + 0.0
 PNT SIGNAL NAME COLOR LV TYPE F + 0.0 + 0.0 + 5.0 TL-CS TL-ENB TL-MR TL-A0 TL-D1 TL-D2 TL-D3 TL-D4 TL-D5 TL-D6 TL-D6 TL-D6 TL-D6 TL-R5SET + 0.0 1 +15.0T 2 + 0.0T 2 ELM 2 TO VU-METER PANEL P02 PNT SIGNAL 1 + 0.0 2 + 0.0 3 + 5.6 5 + 15.0 7 T-SADB 9 T-SADB 9 T-SADC 1 T-WRTSL T-DT-CH2 T-DT-CH2 T-DT-CH2 T-DT-CH2 H - DT-CH2 T-DT-CH2 T-DT PNT SIGNAL NAME COLOR LV TYPE F CONTINUATION GRP 60 1.811.250.00 <-- <-- CONTINUATION GRP 60 i.811.250.00 MONITOR UNIT GRP 59 1.820.737.00 FUSE/SUPPLY FAILURE DETECTOR JR ----------ELM 4 TO POTENTIONETER PNT SIGNAL NAME COLOR LV TYPE ELM 1 FROM GRP20, ELM12 P01 PNT SIGNAL NAME COLOR LV TYPE F ELM 1 AUDIO INPUT (FROM GRP20, ELM17) J01 -----F PNT SIGNAL NAME COLOR LV TYPE F 1 MONIT-01 2 + 0.0 3 INPDI-01 4 + 0.0 5 MONIT-02 6 + 0.0 7 INPDI-02 1P 2P 3P 4P 5P 6P 9 5 9 1 2 3 z z z z z z z z 1 +CAPMOT 2 +CAPMOT U U +24.0 -STABSNS T-SUPVON +STABSNS +5.6 +5.6 +0.0 -15.0 +15.0 +26.0 -26.0 3 4 5 6 7 8 9 10 11 12 13 14 4 0 0 U U U 9 9 5 6 7 8 9 10 9 S + 0.0 KEY ELM 5 TO PHONES CONNECTOR J02 T-TC/RC + 0.0 9 N N 11 12 PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 S-0 N 2 HEADPH-2 9 N 3 HEADPH-1 6 N 4 KEY 5 S-MONMUT 2 N ELM 2 FROM GRP20, ELM09 15 16 P01 PNT SIGNAL 1 + 0.0 2 + 0.0 3 + 5.6 5 + 15.0 7 T-SADB 7 T-SADB 7 T-SADB 1 T-BEADSL T-WRTSL T-DT-CH2 T-DT-CH2 T-DT-CH2 T-DT-RES PNT SIGNAL NAME COLOR LV TYPE F ELM 6 PHONES CONNECTOR PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 1A S-MONMUT 2 HEADPH-2 3 HEADPH-1 S-0 2 9 L L 6 ELM 7 LOUDSPEAKER -----PNT SIGNAL NAME COLOR LV TYPE 0 8 L 1 2 ELM 3 CONNECTOR LOUDSPEAKER L J03 PNT SIGNAL NAME COLOR LV TYPE F N N N

* WILLI STUDER AG * L O C A T I O N P I N L I S T * 89/09/18 * 12:22 * P A G E 41 * * I.BII.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 86/05/19 - 00 <---<---<---CONTINUATION GRP 70 1.820.794.00 <-- <-- CONTINUATION GRP 70 1.820.794.00 DISTRIBUTION BOARD GRP 70 1.820.794.00 <-- <-- CONTINUATION ELM 1 FROM GRP43, ELM12 P01 ELM 2 RESERVE ELM 3 RESERVE P02 P03 PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE F PNI SIGMAL NA 1 + 0.0 2 + 0.0 3 + 5.6 5 + 15.0 6 -15.0 7 T-SADB 9 T-SADB T-SADC 10 10 T-READSL 11 T-MRTSL 12 T-DT-CH1 14 T-OT-CH2 14 T-OT-CH2 16 T-OT-RES 17 18 19 20 + 0.0 1 + 0.0 2 + 0.0 3 + 5.6 5 + 15.0 7 T-SADA 8 T-SADB 9 T-SADE 11 T-WRTSL 12 T-DT-CH2 14 T-DT-CH2 15 T-DT-MP 16 T-DT-RES 17 T PNI SIGNAL 1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 + 15.0 7 T-SADA 8 T-SADB 9 T-SADB 10 T-READSL 11 T-MRTSL 12 T-DT-MP 13 T-REFEXT 14 + 0.0 15 T-VARSPD 16 + 24.0 11 12 13 14 15 16 17 18 19 20 21 22 23 ELM 4 COMMANDS CH 03 19 20 + 0.0 21 T-VARSPD 22 + 0.0 23 T-REFEXT 24 +24.0 25 + 0.0 26 + 0.0 + 0.0 T-VARSPD + 0.C T-REFEXT +24.0 + 0.0 + 0.0 PNT SIGNAL NAME COLOR LV TYPE -NT SIGNAL 1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 + 15.0 6 - 15.0 7 T-SADA 1 T-SADC T-READSL T-WRTSL T-DT-CH3 ----F 24 25 26 ------./. ./. 10 11 12 13 14 15 +24.0 16 . 1. * WILLI STUDER AG * L O C A T I O N P I N L I S T * 89/09/18 * 12:22 * P A G E 42 * * l.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 * C-- C-- CONTINUATION GRP 70 1.820.794.00 <-- <-- CONTINUATION GRP 70 1.820.794.00 <-- <-- CONTINUATION GRP 70 1.820.794.00 <-- <-- CONTINUATION ELM 5 COMMANDS CH 01 ELM 7 COMMANDS MONITOR AMPLIFIER ELM 9 AUDIO CH 01 (FRON GRP43, ELM11) J02 P 0 5 P07 COMMANDS MUNITUR ANTLA LA PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE F IT SIGNAL NAME COLOR LV TYPE F + 0.0 + 0.0 + 5.6 + 5.6 + 15.0 -15.0 T-SADA T-SADA T-SADA T-SADC T-READSL T-UT-CH1 T-DT-CH2 T-DT-CH3 T-0T-CH3 T-0T-MP + 0.0 + 0.0 + 0.0 + 5.6 + 5.6 + 15.0 -15.0 T-SADA T-SADA T-SADC T-READSL T-WRTSL T-DT-CH1 + 0.0 LOUFA-01 LOUFB-01 + 0.0 INPDI-01 INPAD-01 TAPAD-01 TAPAD-01 KEY 1 2 3 4 5 6 7 8 1234567 1 2 3 4 10 10 11 12 13 14 15 16 ıó 11 12 13 14 15 16 ELM 10 VU-METER CH 02, AUDIO J03 PNT SIGNAL NAME COLOR LV TYPE F +24.0 + 0.0 LOUFA-02 LOUFB-02 + 0.0 INPDI-02 INPAD-02 TAPAD-02 TAPMS-02 KEY 1 2 3 ELM 8 VU-METER CH 01, AUDIO J01 PNT SIGNAL NAME COLOR LV TYPE F ELM 6 COMMANDS CH 02 COMMANDS CH 02 P06 PNT SIGNAL NAME COLOR LV TYPE F 45 1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 +15.0 6 -15.0 7 T-SAJA 8 T-SADB 9 T-SAJC 7 T-READSL T-READSL T-OT-CH2 67 + 0.0 LOUFA-01 LOUFB-01 + 0.0 INPDI-01 INPAD-01 1 2 3 8 9 10 0 INFAU-01 7 + 0.0 8 TAPAD-01 9 TAPMS-01 10 KEY ELM 11 AUDIO CH 02 (FROM GRP43, ELM11) J04 PNT SIGNAL NAME COLOR LV TYPE F + 0.0 LOUFA-02 LOUFA-02 + 0.0 INPDI-02 INPAD-02 + 0.0 TAPAD-02 TAPMS-02 KEY ./. 1 2 3 14 16 +24.0 -----./.

10

	* 88/05/19 - 00 * ********************************
GRP 71 1.820.580.00 Monitor Unit	GRP 71 1.820.580.00 < < CONTINUATION
ELM 1 AUDIO INPUT JO1	ELM 4 TO POTENTIOMETER
PNT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE F
1 MONIT-01 9 N 2 + 0.0 S N	1P 1 U 2P 2 U
4 + 0.0 S N	3P 3 U 4P 4 U 5P 0 U
6 + 0.0 S N 7 INPDI-02 9 N	6Ρ 0 U
8 + 0.0 S N 9 KEY	ELM 5 To phones connector Jo2
11 T-TC/RC 9 N 12 + 0.0 S N	TO PHONES CONNECTOR JO2 PNT SIGNAL NAME COLOR LV TYPE F
	1 + 0.0 S-0 N
ELM 2 FROM GRP70, ELMO7 PO1	2 HEADPH-2 9 N 3 HEADPH-1 6 N 4 KEY
PNT SIGNAL NAME COLOR LV TYPE F	5 S-MONMUT 2 N
1 + 0.0 2 + 0.0 3 + 5.6	ELM 6 PHONES CONNECTOR
3 + 5.6 4 + 5.6 5 + 15.0	PHUNES CONNECTOR PNT SIGNAL NAME COLOR LV TYPE F
6 -15.0 7 T-SADA	1 + 0.0 S-0 L
9 T-SADC	1A S-MGNMUT 2 L 2 HEADPH-2 9 L 3 HEADPH-1 6 L
11 T-WRTSL 12 T-DT-CH1	
14 T-DT-CH3	ELM 7 LOUDSPEAKER
	PNT SIGNAL NAME COLOR LV TYPE F
ELM 3	1 0 L 2 8 L

1 N	
L 8 N 3 0 N	
2 8 N 3 0 N	*****
2 8 N 3 0 N 	* 89/09/18 * 12:22 * PAGE 44 *
2 8 N 3 0 N 	* 89/09/18 * 12:22 * PAGE 44 * *********************************
2 8 N 3 0 N 	* 89/09/18 * 12:22 * P A G E 44 * * 88/05/19 - 00 * ********************************
2 8 N 3 0 N 1 0 N P I N L I S T 12 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID 	* 89/09/18 * 12:22 * P A G E .4 * * 88/05/19 - 00 < < CONTINUATION GRP 81 PRESS ASSEMBLY
2 8 N 3 0 N 1 0 N P I N L I S T 12 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID 	* 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 < CONTINUATION GRP 81 PRESS ASSEMBLY ELM 1 PRESS SOLENOID A
2 8 N 3 0 N 	* 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 < CONTINUATION GRP 81 PRESS ASSEMBLY ELM 1 PRESS SOLENOID A PNT SIGNAL NAME COLOR LV TYPE F
2 8 N 3 0 N 1 0 N P I N L I S T 12 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F	* 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 * ********************************
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	* 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 * <pre></pre>
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	* 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 ** <pre></pre>
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	* 89/09/18 * 12:22 * P A G E .4. * * 88/05/19 - 00 * < CONTINUATION GRP 81 PRESS ASSEMBLY
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	* 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 ** < CONTINUATION GRP 81 PRESS ASSEMBLY ELM 1 PRESS SOLENOID A PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-PRESSA ELM 2 PRESS SOLENOID B PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-PRESS B
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	* 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 < CONTINUATION GRP 81 PRESS ASSEMBLY ELM 1 PRESS SOLENOID A PNT SIGNAL NAME COLOR LV TYPE F 1 + 24.0 2 K-PRESSA ELM 2 PRESS SOLENOID B PNT SIGNAL NAME COLOR LV TYPE F 1 + 24.0 2 K-PRESSA ELM 3 STAND BY SOLENOID
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	* 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 * < CONTINUATION GRP 81 PRESS ASSEMBLY ELM 1 PRESS SOLENOID A PNT SIGNAL NAME COLOR LV TYPE F 1 +24.0 2 K-PRESS A ELM 2 PNT SIGNAL NAME COLOR LV TYPE F 1 +24.0 2 K-PRESS B
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	* 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 * <pre></pre>
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	* 89/09/18 * 12:22 * P A G E .44 * * 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 * < < CONTINUATION GRP 81 PRESS ASSEMBLY ELM 1 PRESS SOLENOID A PNT SIGNAL NAME COLOR LV TYPE F 1 + 24.0 2 K-PRESSA ELM 2 PRESS SOLENOID B PNT SIGNAL NAME COLOR LV TYPE F 1 + 24.0 2 K-PRESSB ELM 3 STAND BY SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 + 24.0 2 K-PRESSB ELM 3 STAND BY SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 + 24.0 2 K-STOBY
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	* 89/09/18 * 12:22 * P A G E .44 * * 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 * < < CONTINUATION GRP 81 PRESS ASSEMBLY ELM 1 PRESS SOLENOID A PNT SIGNAL NAME COLOR LV TYPE F 1 + 24.0 2 K-PRESSB ELM 3 STAND BY SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 + 24.0 2 K-PRESSB ELM 3 STAND BY SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 + 24.0 2 K-PRESSB
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	<pre>* 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00</pre>
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	<pre>* 89/09/18 * 12:22 * P A G E .44 * * 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00</pre>
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	* 89/09/18 * 12:22 * P A G E .44 * * 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 * < < CONTINUATION GRP 81 PRESS ASSEMBLY
2 8 N 3 0 N 1 0 N P I N L I S T 1 0 N P I N L I S T 1 2 * TAPE DECK & AUDIO GRP 80 LIFT SOLENOID ELM 1 LIFT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24-0 2 K-LIFT	* 89/09/18 * 12:22 * P A G E .44 * * 89/09/18 * 12:22 * P A G E .44 * * 88/05/19 - 00 * <pre></pre>
8	MONITOR UNIT AUDIO INPUT JOI PNT SIGNAL NAME COLOR LV TYPE F 1 MONIT-01 9 N 2 + 0.0 S N 3 INPDI-01 9 N 4 + 0.0 S N 5 MONIT-02 9 N 6 + 0.0 S N 7 INPDI-02 9 N 6 + 0.0 S N 7 INPDI-02 9 N 8 + 0.0 S N 9 KEY IO IO 10 T-TC/RC 9 N 12 + 0.0 S N 10 T-TC/RC 9 N 12 + 0.0 S N 14 + 0.0 S N 11 T-TC/RC 9 N 12 + 0.0 S N

* 1.811.090.00 * STUDER A 812	2 * TAPE DECK & AUDIU ***********************************	* 88/05/19 - 00 **********************************
RP 82 1.811.110.00 TAPE TENSION UNIT, LEFT	GRP 82 1.811.110.00 < < CONTINUATION	GRP 83 1.811.120.00 TAPE TENSION UNIT, RIGHT
LM 1 TO TD PERIPHERY DRIVER PO1	ELM 4 TO SPOOLING MOTOR TACHO SENSOR L.PO3	ELM 1 TO TD PERIPHERY DRIVER PO
NT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE F	PNT SIGNAL NAME COLOR LV TYPE
1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 + 15.0 6 - 15.0 7 T-WCLK1L 8 T-WCLK1L 9 T-WCLK1L 9 T-WCLK1L 1 AN-TTL 2 T-TENDL 3 T-CLK1 4 T-CLK1 4 T-CLK1 4 T-CLK2	1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 6 7 T-WCLK1L 8 T-WCLK2L 9 10 ELM 5 HOLD SOLENOID, LEFT	1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 + 15.0 6 - 15.0 7 T-WCLK1R 8 T-WCLK2R 9 10 11 AN-TTR 12 T-TENDR 13 T-CLK1 14 T-CLK2 15 T-POS1
5 T-POS1 6 T-POS2	PNT SIGNAL NAME COLOR LV TYPE F	15 T-POSI 16 T-POS2
LM 2 TAPE END SWITCH, LEFT	1 +24.0 2 K-TTSL	ELM 2 TAPE END SWITCH, RIGHT
NT SIGNAL NAME COLOR LV TYPE F		PNT SIGNAL NAME COLOR LV TYPE
1 T-LEDL 1 N 2 +5-0L 2 N 3 T-TNDL 4 N 4 KEY		1 T-LEDR I N 2 +5-0R 2 N 3 T-TNDR 4 N 4 KEV
LM 3 TO TAPE MOVE SENSOR, LEFT PO2		ELM 3 TO TAPE MOVE SENSOR, RIGHT PO
NT SIGNAL NAME COLOR LV TYPE F		PNT SIGNAL NAME COLOR LV TYPE
+ 0.0 2 + 0.0 3 + 5.6 5 - 7 - POS1 5 - T - POS2 5 - T - CK1		1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 T-POS1 6 T-POS2
8 T-CLKZ 9		7 T-CLK1 8 T-CLK2 9
a T-CLK2 b willistuder AG * L O C A T willistuder AG * L O C A T 1.811.090.00 * STUDER A 812 VI SIGNAL A A A VI SIGNAL NAME COLOR LV TYPE F 1 + 0.0 A 5.6 A 5.6 5 T-WCLK1R B T-WCLK2R D C A	:* TAPE DECK & AUDIO GRP 84 1.021.695.00 CAPSTAN MOTOR (ELECTRONICS BOARD)	7 T-CLK1 8 T-CLK2 9 10 * 89/09/18 * 12:22 * PAGE 46 * 88/09/18 * 12:22 * PAGE 46
MILLI STUDER AG L D C A MILLI STUDER AG L D C A I.811.090.00 STUDER A 812 V 1.811.120.00 C C A C C CONTINUATION M 4 TO SPOOLING MOTOR TACHO SENSOR R.PO3 MT SIGNAL NAME COLOR LV TYPE F + 0.0 + + 5.6 + T-WCLK1R T-WCLK2R - M 5 - HOLD SOLENOID, RIGHT -	I O N P I N L I S T + TAPE DECK & AUDIO 	7 T-CLK1 8 T-CLK2 9 10 * 89/09/18 * 12:22 * P A G E 46 * 88/05/19 - 00 (< CONTINUATIO GRP 84 1.021.695.00 (< CONTINUATIO ELM 4 STATOR (WIRE FIELD)
WILLI STUDER AG * L O C A WILLI STUDER AG * L O C A I.811.090.00 * STUDER A 812 I.811.120.00 STUDER A 812	I O N P I N L I S T ** TAPE DECK & AUDIO GRP 84 1.021.695.00 CAPSTAN MOTOR (ELECTRONICS BOARD)	7 T-CLK1 8 T-CLK2 9 10 * 89/09/18 * 12:22 * P A G E 46 * 88/05/19 - 00 (< CONTINUATIO GRP 84 1.021.695.00 (< CONTINUATIO ELM 4 STATOR (WIRE FIELD)
MILLI STUDER AG * L O C A WILLI STUDER AG * L O C A I.BI1.090.00 * STUDER A 812 .BI1.090.00 * STUDER A 812	I O N P I N L I S T ************************************	7 T-CLK1 8 T-CLK2 9 10 * 89/09/18 * 12:22 * P A G E 46 * 88/05/19 - 00 (< CONTINUATIO GRP 84 1.021.695.00 (< CONTINUATIO ELM 4 STATOR (WIRE FIELD)
MILLI STUDER AG * L O C A WILLI STUDER AG * L O C A I.BI1.090.00 * STUDER A 812 .BI1.090.00 * STUDER A 812	I O N P I N L I S T ** TAPE DECK & AUDIO ************************************	7 T-CLK1 8 T-CLK2 9 10 * 89/09/18 * 12:22 * P A G E 46 * 88/05/19 - 00 (< CONTINUATIO GRP 84 1.021.695.00 (< CONTINUATIO ELM 4 STATOR (WIRE FIELD) T CPHASE-R 2 L 2 CPHASE-S 0 L 3 CPHASE-T 9 L ELM 5 GROUND CONNECTION (WIRE FIELD) PNT SIGNAL NAME COLOR LV TYPE I GND 0 L
B T-CLK2 WILLI STUDER AG * L O C A T I.BI1.090.00 * STUDER A 812 	I O N P I N L I S T ** TAPE DECK & AUDIO GRP 84 1.021.695.00 CAPSTAN MOTOR (ELECTRONICS BOARD)	7 T-CLK1 8 T-CLK2 9 10 * 89/09/18 * 12:22 * P A G E 46 * 88/05/19 - 00 (< CONTINUATIO GRP 84 1.021.695.00 (< CONTINUATIO ELM 4 STATOR (WIRE FIELD) T CPHASE-R 2 L 2 CPHASE-S 0 L 3 CPHASE-T 9 L ELM 5 GROUND CONNECTION (WIRE FIELD) PNT SIGNAL NAME COLOR LV TYPE I GND 0 L
B T-CLK2 WILLI STUDER AG * L O C A T WILLI STUDER AG * L O C A T 1.811.090.00 * STUDER A 812 ************************************	I O N P I N L I S T ** TAPE DECK & AUDIO GRP 84 1.021.695.00 CAPSTAN MOTOR (ELECTRONICS BOARD)	7 T-CLK1 8 T-CLK2 9 10 * 89/09/18 * 12:22 * P A G E 46 * 88/05/19 - 00 (< CONTINUATIO GRP 84 1.021.695.00 (< CONTINUATIO ELM 4 STATOR (WIRE FIELD) T CPHASE-R 2 L 2 CPHASE-S 0 L 3 CPHASE-T 9 L ELM 5 GROUND CONNECTION (WIRE FIELD) PNT SIGNAL NAME COLOR LV TYPE I GND 0 L
B T-CLK2 9 0 	I 0 N P I I S T I TAPE DECK & AUDIO I I S T I TAPE DECK & AUDIO I I I I I I TAPE DECK & AUDIO I	7 T-CLK1 8 T-CLK2 9 10 * 89/09/18 * 12:22 * P A G E 46 * 88/05/19 - 00 (< CONTINUATIO GRP 84 1.021.695.00 (< CONTINUATIO ELM 4 STATOR (WIRE FIELD) T CPHASE-R 2 L 2 CPHASE-S 0 L 3 CPHASE-T 9 L ELM 5 GROUND CONNECTION (WIRE FIELD) PNT SIGNAL NAME COLOR LV TYPE I GND 0 L

* WILLISTUDERAG * LOCATION PINLIST * 89/09/18 * 12:22 * PAGE 47 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 * <---<-- <-- CONTINUATION GRP 85 1.820.774.00 CAPSTAN MOTOR DRIVE AMPLIFIER GRP 86 BRAKE ASSEMBLY GRP 85 1.820.774.00 <-- <-- CONTINUATION ELM 1 ELM 3 SUPPLY (FROM GRP20, ELM72) ELM 1 BRAKE SOLENOID PO1 OLDR LV TYPE F P03 PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE F PNT SIGNAL NAME COLOR LV TYPE PNT SIGNAL NAME COLOR LV TYPE F 1 + 0.0 2 + 0.0 3 + 5.6 4 + 5.6 5 + 15.0 6 - 15.0 7 AN-CSPDC 8 TD-TCM1 9 + 0.0 10 TD-TCM2 11 + 0.0 12 + 0.0 13 TC-CAREF 14 TC-CAREF 14 TC-CAREF 14 TC-CARE 16 + 0.0 1 OCAPMOT 2 3 +CAPMOT 4 OCAPMOT 5 + 0.0 м 1 +24.0 2 K-BRAKE M +CAPMOT OCAPMOT + 0.0 +CAPMOT 3 ELM 2 EDIT SOLENOID PNT SIGNAL NAME COLOR LV TYPE F 1 +24.0 2 K-EDIT 3 M -----ELM 2 TO GRPB4, ELMO1 PNT SIGNAL NAME COLOR LV TYPE P 02 -----F 1 CPHASE-R 2 CPHASE-T 3 CPHASE-T 4 TC-HALL1 5 -15.0 6 +15.0 7 TC-HALL2 8 TD-TCM1 9 + 5V 10 TC-HALL3 11 TD-TCM2 12 + 0.0 9 10 11 12
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 TAPE
 DECK & AUDIO
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 <-- <-- CONTINUATION GRP 87 SPJOLING MOTOR, LEFT GRP 88 SPOOLING MOTOR, RIGHT GRP 90 HEAD BLOCK ASSEMBLY, 2 CH. TIME CODE ELM 1 CONNECTOR SPOOLING MOTOR RIGHT J01 PNT SIGNAL NAME COLOR LV TYPE F ELM 1 HEAD BLOCK CONNECTOR ELM 1 CONNECTOR SPOULING MOTOR LEFT J01 PNT SIGNAL NAME COLOR LV TYPE F P01 _____ PNT SIGNAL NAME COLOR LV TYPE 1 2 GND 123 4 GND м 4 м AN-R-L AN-S-L AN-T-1 AN-R-R AN-S-R AN-T-R M M M 4 5 M M M ELM 2 CONN. TACHO SENSOR (S 2000 ONLY) PO3 ELM 2 CONN. TACHO SENSOR (S 2000 ONLY) PO3 10 + 0.0 + 5.6 +15.0 -15.0 0 A PNT SIGNAL NAME COLOR LV TYPE F 11 12 13 14 15 16 17 18 PNT SIGNAL NAME COLOR LV TYPE F 2 A + 0.0 + 0.0 + 5.6 + 5.6 + 0.0 + 0.0 + 5.6 + 5.6 1 1 45678 5 6 7 8

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 ERAHO-02

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WILLI S ************* ************* IGNAL NAME	TUDER A ******** 1.811 ******* COLOR	G **** •090 ****	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	*** I *** STU ***	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	2 20 22 25 26 ***** A **** PNT	A L **** 812 **** S	***** * T *****	W I R E ***********************************	VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL L I S T * 4 JOIO * 6 DESCRIPTION OF ELEMENT	P08 P08 P08 P08 P08 P08 P08 P08 B9/09/18 B9/09/18 B9/09/18	* 12:22 •••••••••••• • 00 •••••••••••••••••••	* PAGE 51 ********************
WILLI S ************* ************* IGNAL NAME	TUDER A ******** 1.811 ******* COLOR	G **** •090 ****	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2) + I + T + P - 000000000000000000000000000000000	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	2 20 22 22 26 ***** PNT 1 2 5 6 8 9 10 13 14 21 3 4 5 7 8 11	A L **** 812 **** S -	***** * T *****	W [R E ***************** APE DECK & Al ************************************	VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL UU-METER PANEL, EXTERNAL L I S T * 4 4 0010 * 6 DESCRIPTION OF ELEMENT	P08 P08 P08 P08 P08 P08 P08 P09 P09 P09 P09 P09 P09 2 J01 2	* 12:22 •••••••••••• • 00 •••••••••••••••••••	* PAGE 51 ************************************

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	ASY GRP ELM PNT S LV TYPE	DESCRIPTION OF ELEMENT	REMARK	ELEMENT NR.
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+ 0.0	20 39 2 20 39 4	TO TAPE DECK GRP27, ELMO2 To Tape Deck grp27, ELMO2	P13 P13	
	20 39 6	TO TAPE DECK GRP27, ELMO2	P13	
	20 39 10	TO TAPE DECK GRP27, ELMO2	P13	
	20 39 12 20 39 14	TO TAPE DECK GRP27, ELMO2 To Tape Deck grp27, elmo2	P13 P13	
	20 39 16	TO TAPE DECK GRP27, ELMO2	P13	
	20 39 18 20 39 20	TO TAPE DECK GRP27, ELMO2 TO TAPE DECK GRP27, ELMO2	P13	
	20 39 22 20 39 24	TO TAPE DECK GRP27, ELMO2 To tape deck grp27, elmo2	P13 P13	
	20 39 26	TO TAPE DECK GRP27, ELMO2	P13	
	20 39 28 20 39 30	TO TAPE DECK GRP27, ELMO2 TO TAPE DECK GRP27, ELMO2	P13 P13	
	20 39 32 20 39 34	TO TAPE DECK GRP27, ELMO2 To Tape Deck Grp27, Elmo2	P13 P13 P13	
	20 39 36	TO TAPE DECK GRP27, ELMO2	P13	
	20 39 38 20 39 40	TO TAPE DECK GRP27, ELMO2 TO TAPE DECK GRP27, ELMO2	P13 P13	
	20 40 2 20 40 4	OPTION INT. SYNCHRONIZER Option Int. Synchronizer	P14 P14	
	20 40 6	OPTION INT. SYNCHRONIZER	P14	
	20 40 8 20 40 10	OPTION INT. SYNCHRONIZER	P14 P14	
	20 40 12 20 40 14	OPTION INT. SYNCHRONIZER OPTION INT. SYNCHRONIZER	P14 P14	
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	20 40 22 20 40 24	OPTION INT. SYNCHRONIZER OPTION INT. SYNCHRONIZER OPTION INT. SYNCHRONIZER OPTION INT. SYNCHRONIZER	P14	
	20 40 24 20 40 26	OPTION INT. SYNCHRONIZER OPTION INT. SYNCHRONIZER OPTION INT. SYNCHRONIZER	P14 P14	
	20 40 28 20 40 30	OPTION INT. SYNCHRONIZER OPTION INT. SYNCHRONIZER	P14 P14	
	20 40 32	OPTION INT. SYNCHRONIZER	P14	
	20 40 34 20 40 36	OPTION INT. SYNCHRONIZER OPTION INT. SYNCHRONIZER	P14 P14	
	20 40 38 20 40 40	OPTION INT. SYNCHRONIZER OPTION INT. SYNCHRONIZER OPTION INT. SYNCHRONIZER	P14 P14	
	20 41 21	CAPSTAN MOTOR INTERFACE	JOS	1.811.775.00
	20 42 21 20 43 i7A	MASTER SERIAL INTERFACE	J05 J07	1.820.764.00 1.820.753.00
	20 43 17B 20 44 21	MASTER SERIAL INTERFACE	J07 J08	1.820.753.00 1.811.786.00
	20 45 21	SMPTE/EBU INTERFACE	J09	1.820.751.00
	20 46 16A 20 46 16B	MASTER PERIPHERY CONTR. MASTER PERIPHERY CONTR.	J10 J10	1.820.728.00 1.820.728.00 1.820.721.81
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	20 47 9	TIME CODE WRITE/READ UNIT	J11	1.820.721.81
	20 47 21 20 48 3	TIME CODE WRITE/READ UNIT	J12	1.820.721.81 1.820.722.81
	SIGNAL WIRE	LIST * 89/	09/18 * 12:22 *	* PAGE 53 *
* WILLI STUDER AG * **********************************	S I G N A L N I R E S I G N A L N I R E 00 * STUDER A 812 * TAPE DECK & AUDI ASY GRP ELM PNT S LV TYPE 	L I S T * 89/ ************************************	09/18 * 12:22 * *********************************	* P A G E 53 * **********************************
* WILLI STUDER AG * **********************************	S I G N A L H I R E 00 + STUDER A 812 + TAPE DECK & AUDI ASY GRP ELH PNT S LV TYPE 20 48 5 20 48 7	L I S T * 89/ ************************************	09/18 * 12:22 * *********************************	• P A G E 53 * ••••••••••••••••••••••••••••••••••••
* HILLI STUDER AG * **********************************	S I G N A L H I R E 00 + STUDER A 812 + TAPE DECK & AUDI ASY GRP ELH PNT S LV TYPE 20 48 5 - - - 20 48 7 - - - 20 48 9 - - -	L I S T * 89/ ************************************	09/18 * 12:22 * *********************************	ELEMENT NR. 1.820.722.81 1.920.722.81 1.920.722.81 1.920.722.81
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* HILLI STUDER AG * **********************************	S I G N A L H I R 20 + STUDER A 812 + TAPE DECK A UDI ASY GRP ELM PNT S LV TYPE 20 +8 5 - - - 20 +8 7 - - - 20 +8 9 - - - 20 +8 9 - - - 20 +8 9 - - - 20 +8 9 - - - 20 +8 9 - - - 20 +8 9 - - - 20 48 9 - - - 20 49 1 - - - 20 49 1 - - - 20 50 5 - - - 20 50 1 - - - 20 50 1 - - - 20 50 21 - - -	L I S T * 89/ D * 88/ TIME CODE DELAY UNIT TIME CODE DELAY UNIT THF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1	09/18 * 12:22 4 ************************************	ELEMENT NR. ELEMENT NR. ELEMENT NR. 1. 820. 722.81 1. 820. 722.81 1. 820. 722.81 1. 820. 722.81 1. 820. 713.00 1. 820.713.00 1. 820.713.00 1. 820.713.00 1. 820.713.00 1. 820.712.81 1. 620.712.81 1. 620.
* HILLI STUDER AG * **********************************	S I G N A L H I R 20 + S S TAPE DECK A AUDI ASY GR ELM PNT S LV TYPE 20 + 48 5 20 + 8 5 20 + 8 9 20 + 8 9 20 + 8 9 20 + 8 9 20 + 8 9 20 + 8 9 20 + 8 9 20 + 8 9 20 + 8 9 20 + 8 9 20 49 1 1 20 49 1 1 20 50 5 1 20 50 1 1 20 50 1 1 20 50 1 2 20 51 8 20 51 9	L I S T * 89/ D * 88/ TIME CODE DELAY UNIT TIME CODE DELAY UNIT THF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REFORDUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1	09/18 + 12:22 *********************************	ELEMENT NR. ELEMENT NR. ELEMENT NR. 1. 820. 722.81 1. 820. 722.81 1. 820. 722.81 1. 820. 722.81 1. 820. 722.81 1. 820. 713.00 1. 820.713.00 1. 820.713.00 1. 820.713.00 1. 820.712.81 1. 820.712.81 1. 820.712.81 1. 820.712.81 1. 820.712.81 1. 820.712.81 1. 820.710.81 1. 820.710.81 1. 820.710.81 1. 820.710.81
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* HILLI STUDER AG * **********************************	S I G N A L H I R 00 + STUDER A 812 + TAPE DECK & AUDI ASY GRP ELH PNT S LV TYPE 20 48 5 - - 20 48 7 - - 20 48 9 - - 20 48 9 - - 20 48 9 - - 20 48 9 - - 20 48 21 - - 20 49 1 - - 20 49 1 - - 20 49 1 - - 20 50 5 - - 20 50 1 - - 20 50 14 - - 20 51 1 - - 20 51 14 - -	L I S T * 89/ D * 88/ DESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEMENT NR. ELEMENT NR. ELEMENT NR. 1.820.722.81 1.820.722.81 1.820.722.81 1.820.722.81 1.820.713.00 1.820.713.00 1.820.713.00 1.820.713.00 1.820.713.00 1.820.712.81 1.820.712.81 1.820.712.81 1.820.710.81 1.820.710.81 1.820.710.81 1.820.710.81 1.820.710.81 1.820.710.81
* HILLI STUDER AG * **********************************	S I G N A L H I R 20 + S LV TAPE DECK A AUDI 20 + S LV TYPE 20 + S L TYPE 20 + S S S 20 S S S S 20 S S S <td>L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT - TIME CODE DELAY UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRO</td> <td>09/18 * 12:22 * **********************************</td> <td>ELEMENT NR. ELEMENT NR. ELEME</td>	L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT - TIME CODE DELAY UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRO	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L H I R E 00 * STUDER A 812 * TAPE DECK & AUDI ASY GRP ELH PNT S LV TYPE 20 48 5 20 48 8 20 48 7 20 48 9 20 48 9 20 48 21 20 49 1 20 49 1 20 49 1 20 50 5 20 49 16 20 50 14 20 50 16 20 50 16 20 51 18 20 51 19 20 51 14 20 51 14 20 51 14 20 51 18	L I S T * 89/ D * 88/ D & 88/ TIME CODE DELAY UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1	09/18 + 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEMENT NR. 1. 820. 722.81 1. 820. 722.81 1. 820. 722.81 1. 820. 722.81 1. 820. 713.00 1. 820. 712.81 1. 820. 712.81 1. 820. 712.81 1. 820. 712.81 1. 820. 710.81 1. 820.
* HILLI STUDER AG * **********************************	S I G N A L H I R C S S I I I R ASY GRP ELH PNT S LV TYPE 20 48 5 I I I 20 48 7 I I I 20 48 9 I I I 20 48 1 I I I 20 48 1 I I I 20 48 21 I I I 20 49 1 I I I 20 50 1 I I I 20 50 1 I I I 20 51 1 I I I 20 51 1 I I I 20 51 1 I I I 20 51 <td>L I S T * 89/ D * 88/ DESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 INE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1</td> <td>09/18 + 12:22 *********************************</td> <td>ELEMENT NR. ELEMENT NR. ELEME</td>	L I S T * 89/ D * 88/ DESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 INE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1	09/18 + 12:22 *********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L H I R C S S TAPE TAPE DECK A AUDI ASY GRP ELH PNT S LV TYPE 20 48 5 20 48 20 20 48 7 20 48 20 20 48 9 20 48 20 20 48 9 20 48 20 20 49 1 20 49 1 20 49 1 20 20 49 20 49 1 20 20 49 20 49 1 20 50 1 20 50 1 20 50 1 20 50 1 1 20 50 20 50 16 20 50 1 20 51 18 20 51 14 20 52 5 20 52 2 20 52 5 20 52 2 20 52 5 2 2	L I S T * 89/ D * 88/ DESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1	09/18 + 12:22 *********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L H I R 00 * STUDER A 812 * TAPE DECK & AUDI ASY GRP ELH PNT S LV TYPE 20 48 5 20 48 20 20 48 7 20 48 20 20 48 9 20 48 20 20 48 21 20 49 1 20 49 1 20 49 1 20 49 1 20 49 1 20 49 1 20 50 16 20 50 16 20 50 16 20 51 1 20 51 1 20 51 1 20 51 14 20 51 21 20 52 5 20 52 5 20 52 2 20 52 5 20 52 2 20 52 5 20 52 2 20 52 5 20 52 2	L I S T * 89/ C * 88/ DESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UN	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEMENT NR. ELEMENT NR. ELEMENT NR. 1.820.722.81 1.820.722.81 1.820.722.81 1.820.722.81 1.820.713.00 1.820.713.00 1.820.713.00 1.820.713.00 1.820.713.00 1.820.712.81 1.820.712.81 1.820.712.81 1.820.712.81 1.820.710.81 1.820.714.81 1.820.714.81 1.820.714.81 1.820.714.81 1.820.720.00 1.820.720.00
* HILLI STUDER AG * **********************************	S I G N A L H I R 20 + S LV TAPE DECK & AUDI ASY GRP ELM PNT S LV TYPE 20 +8 5 20 +8 8 20 +8 7 20 48 7 20 48 7 20 20 49 20 48 7 20 20 49 20 48 21 20 49 1 20 49 1 20 49 1 20 49 1 20 50 5 20 50 5 20 50 1 20 50 1 20 50 1 20 50 1 20 50 1 20 50 1 20 50 1 20 50 1 20 50 1 20 51 18 20 51 1 20 52 5 2 2 20 20 52 13 2 2 20 53	L I S T * 89/ D * 88/ TIME CODE DELAY UNIT TIME CODE DELAY UNIT THE-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STERED-SWITCH	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L H I R 20 + S LV TAPE DECK A JUDI ASY GR ELM PNT S LV TYPE 20 +8 5 20 48 7 20 +8 7 20 48 7 20 +8 9 20 48 21 20 49 1 20 49 1 20 49 1 20 49 1 20 49 1 20 50 5 20 50 5 20 50 1 20 50 14 20 50 1 20 51 18 20 51 18 20 51 14 20 51 18 20 51 13 20 52 2 20 52 5 2 52 20 52 13 2 52 20 52 13 2 2 20 52 13 2 53 20 53 10<	L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT THF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH MONO-STEREO-SWITCH MONO-STEREO-SWITCH	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L H I R 20 48 A 812 * TAPE DECK & A UDI 20 48 5 20 48 7 20 48 5 20 48 7 20 48 7 20 20 49 20 48 7 20 20 20 48 7 20 20 20 48 7 20 20 20 48 7 20 20 20 48 7 20 20 20 48 7 20 20 20 49 1 20 20 20 49 1 20 20 20 50 1 20 50 20 50 1 20 50 20 50 1 20 50 20 51 18 20 51 20 52 13 20 52 20 52 13 20 53 20 53 4 20 53 20 <	L I S T * 89/ D * 88/ TIME CODE DELAY UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REFORDUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPL	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L H I R 20 + STUDER A 812 * TAPE DECK & AUDI ASY GRP ELM PNT S LV TYPE 20 48 5 20 48 7 20 48 7 20 48 7 20 48 7 20 48 20 20 48 21 20 49 1 20 49 1 20 50 5 20 50 5 20 50 5 20 50 11 20 50 14 20 51 16 20 51 5 20 51 14 20 51 14 20 52 5 20 52 2 20 52 13 20 53 2 20 53 12 20 53 12 20 53 12 20 53 12 20 53 12 20 53 14 20 53 12 20	L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT - THE CODE DELAY UNIT TIME CODE DELAY UNIT THE-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH MONO-	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L H I R E 00 * STUDER A 812 * TAPE DECK & AUDI ASY GRP ELM PNT S LV TYPE 20 48 5 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 21 20 49 1 20 49 1 16 20 50 50 20 50 51 1 20 50 16 20 50 14 20 51 18 20 51 11 20 51 14 20 51 14 20 52 20 52 20 52 20 52 52 20 52 20 52 20 53 20 52 52 <td>L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT THE-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 INE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH MONO</td> <td>09/18 * 12:22 * **********************************</td> <td>ELEMENT NR. ELEMENT NR. ELEME</td>	L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT THE-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 INE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH MONO	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L H I R 20 + STUDER A 812 * TAPE DECK & AUDI ASY GRP ELM PNT S LV TYPE 20 +8 5 20 48 7 20 48 7 20 48 7 20 48 7 20 49 1 20 48 21 20 49 1 20 49 1 20 50 5 20 49 1 20 50 5 20 50 5 5 5 20 50 11 20 50 14 20 51 11 20 51 14 20 51 14 20 51 14 20 52 5 20 52 5 20 52 13 20 53 12 20 53 12 20 53 12 20 53 12 20 53 12 20 53 10 20 53 12	L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT THF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 INE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH MONO-STER	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L N I R 20 48 5 7 7 7 7 7 20 48 5 7 7 7 7 20 48 7 7 7 7 20 48 7 7 7 7 20 48 7 7 7 7 20 48 7 7 7 7 20 48 7 7 7 7 20 48 9 7 7 7 20 48 9 7 7 7 20 49 1 7 7 7 20 49 1 7 7 7 20 50 1 1 7 7 20 50 1 1 7 7 20 50 1 1 7 7 20 50 1 1 7 7 20 51 1 1 7 7 20 52 1 1 7 7 20 <td< td=""><td>L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT THF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 HONO-STEREO-SWITCH MONO</td><td>09/18 * 12:22 * **********************************</td><td>ELEMENT NR. ELEMENT NR. ELEME</td></td<>	L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT THF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 HONO-STEREO-SWITCH MONO	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L H I R 20 48 5 X TAPE DECK & AUDI 20 48 5 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 49 1 20 49 1 20 49 1 20 49 1 20 50 11 20 50 14 20 51 14 20 51 14 20 52 2 20 52 13 20 52 13 20 52 13 20 53 12 20 53 12 20 53 12 20 53 12 20 53 12 20 53 12 20 53	L I S T * 89/ DESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT THE-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 HTOMON-STEREO-SWITCH MONO-STE	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L H I R 20 48 5 X TAPE DECK & AUDI 20 48 5 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 49 1 20 49 1 20 49 1 20 49 1 20 50 1 20 50 1 20 50 1 20 50 1 20 50 1 20 50 1 20 50 1 20 51 1 20 51 1 20 52 2 20 52 2 20 52 2 20 52 2 20 52 2 20 52 2 <td>L I S T * 89/ C * 88/ DESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 2 HF-DRIVER, C</td> <td>09/18 * 12:22 * **********************************</td> <td>ELEMENT NR. ELEMENT NR. ELEME</td>	L I S T * 89/ C * 88/ DESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 2 HF-DRIVER, C	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L H I R E 00 * STUDER A 812 * TAPE DECK & AUDI ASY GRP ELH PNT S LV TYPE 20 48 5 20 48 7 20 48 7 20 48 20 20 48 9 20 48 20 20 48 21 20 49 1 20 49 1 20 49 1 20 49 16 20 50 1 20 50 16 20 50 1 20 50 16 20 51 1 20 51 14 20 51 1 20 52 2	L I S T * 89/ D * 88/ DESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 2 HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L W I R E 20 48 5 7<	L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT THF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L W I R E 20 48 5 X X TAPE DECK & AUDI 20 48 5 X Y TYPE 20 48 5 X Y TYPE 20 48 7 X X Y 20 49 1 X X X 20 49 1 X X X 20 50 1 X X X 20 51 1 X X X 20 51 1 X X X <t< td=""><td>L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT THE-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 INE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2</td><td>09/18 * 12:22 * **********************************</td><td>ELEMENT NR. ELEMENT NR. ELEME</td></t<>	L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT THE-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 INE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L W I R E 20 48 5 A 812 * TAPE DECK & A AUDI 20 48 5 20 48 7 20 48 5 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 49 1 20 49 1 20 49 1 20 50 5 20 50 5 20 50 20 50 11 20 50 14 20 51 14 20 51 18 20 51 14 20 51 14 20 52 2 2 20 52 20 52 13 2 2 53 20 52 13 2 2 3 20 53 10 2 2 20 <td>L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT THE-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPL</td> <td>09/18 * 12:22 * **********************************</td> <td>ELEMENT NR. ELEMENT NR. ELEME</td>	L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT THE-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPL	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME
* HILLI STUDER AG * **********************************	S I G N A L H I R 20 48 5 44 444 444 20 48 5 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 7 20 48 21 20 49 1 20 49 1 20 49 1 20 49 1 20 49 1 20 50 1 20 49 1 20 50 1 20 50 1 20 50 14 20 51 1 20 51 1 20 51 1 20 52 2 20 52 2 20 52 2 20 52 1 20 52 2 20 52 2 20 52 2 20 53 <	L I S T * 89/ D * 88/ D ESCRIPTION OF ELEMENT DESCRIPTION OF ELEMENT TIME CODE DELAY UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH MONO-STEREO-	09/18 * 12:22 * **********************************	ELEMENT NR. ELEMENT NR. ELEME

				L I S T * 89/0		
*	1.811.090	.00 * STUDER A 81	2 * TAPE DECK & AU	**************************************	5/19 - 00	*
SIGNAL NAME	COLOR MI	ASY GRP ELM PNT	S LV TYPE	DESCRIPTION OF ELEMENT	REMARK	ELEMENT NR.
< CONT.OF + 0.0	0 0 0 0	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	F F F F B B B B B B B B B B B B B B B B	DESCRIPTION OF ELEMENT LINE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2 CONNECTOR TO GRP25, ELMOI CONNECTOR TO GRP25, ELMOI CONNECTOR TO GRP27, ELMO4 CONNECTOR TO GRP27, ELMO4 CONN. HEAD BLOCK ASSEMBLY CONN. HEAD B	J21 J21 J21 P15 P15 P15 P16 P16 P16	1.820.714.81 1.820.714.81 1.820.714.81
	S 0 S S S	20 67 5 20 80 11 20 80 31 20 80 44 20 80 48 24 1 1 24 1 2	F B B B B	CONNECTOR TO GROPS, ELHO3 CONN. HEAD BLOCK ASSEMBLY CONN. HEAD BLOCK ASSEMBLY CONN. HEAD BLOCK ASSEMBLY CONN. HEAD BLOCK ASSEMBLY CONN. HEAD BLOCK ASSEMBLY TO GRP31, FLMO2		1.811.898.00
		25 3 1	M M M	TAPE TRANSPARENT	P03 P03 P01 P07 P07 P07 P07 P08	
		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		TAPE TRANSPARENT USER USER USER USER TAPE TENSION SENSOR, LEFT TAPE TENSION SENSOR, LEFT	P08 P06 P06 P06 P06 P06 P04 P04	
		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		TAPE TENSION SENSOR, RIGHT TAPE TENSION SENSOR, RIGHT FROM GRP26, ELMO1 FROM GRP26, ELMO1 FROM GRP26, ELMO2 FROM GRP 26, ELMO2 TO GRP25, ELMO7/GRP27, ELMO3 TO GRP25, ELMO7/GRP27, ELMO3 TO GRP24, ELMO3/GRP25, ELMO8 TO GRP24, ELMO3/GRP25, ELMO8	P03 P02 P02 P02 P01 P01	
		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		FROM GRP20, ELM03 FROM GRP20, ELM03 FROM GRP20, ELM39 FROM GRP20, ELM39 FROM GRP20, ELM39 FROM GRP20, ELM39 FROM GRP20, ELM39 FROM GRP20, ELM39	P01 P01 P02 P02 P02 P02 P02 P02 P02 P02	
		27 2 16 27 2 18 27 2 20		FROM GRP2O, ELM39 FROM GRP2O, ELM39 FROM GRP2O, ELM39 FROM GRP2O, ELM39 FROM GRP2O, ELM39	P02 P02 P02 P02	
*****	****	27 2 22	****	FROM GRP20, ELM39	P02	*****
* WILLI ST ************************************	UDER AG * *************** 1.811.090.	**************************************	L W I R E ***********************************	FRUM GRP20, ELM39 L I S T * 89/0 ************************************	******************** 9/18 * 12:22 **********************************	* PAGE 55 * *********************************
* WILLI ST **************** * SIGNAL NAME	TUDER AG * 1.811.090. ************ COLOR MI	A SY GRP ELM PNT	L W I R E	L I S T * B9/0 10 * 86/0 DESCRIPTION OF ELEMENT	*************** 9/18 * 12:22 ***************** 5/19 - 00 **********************************	* PAGE 55 * *********************************
* WILLI ST ************************************	TUDER AG * 1.811.090. ************ COLOR MI	S I G N A .00 * STUDER A 81 .01 .01 .01 .01 .01 .01 .01 .01 .01 .01 .02 .02 .02 .02 .02 .02 .01 .01 .01 .01 .01 .01 .02 </td <td>L W I R E ******************************** 2 * TAPE DECK & AUE ************************************</td> <td>L I S T * 89/0 * 89/0 DESCRIPTION OF ELEMENT FROM GRP20, ELM39 FROM GRP20, ELM39</td> <td>9/18 + 12:22 ************************************</td> <td>* PAGE 55 * *********************************</td>	L W I R E ******************************** 2 * TAPE DECK & AUE ************************************	L I S T * 89/0 * 89/0 DESCRIPTION OF ELEMENT FROM GRP20, ELM39 FROM GRP20, ELM39	9/18 + 12:22 ************************************	* PAGE 55 * *********************************
* WILLI ST ***************** SIGNAL NAME 	TUDER AG * 1.811.090. ************ COLOR MI	S I G N 0.0 * STUDER A 81 .00 * STUDER 30 1 2 .0 1 S 30 1 5 30 2 5	L W I R E ******************************** 2 * TAPE DECK & AUE ************************************	L I S T * 89/0 DESCRIPTION OF ELEMENT 	9/18 * 12:22 **********************************	* PAGE 55 * *********************************
* WILLI ST ***************** SIGNAL NAME 	TUDER AG * 1.811.090. ************ COLOR MI	S I G N .00 * STUDER A 81. .00 .0 STUDER A 81. .00 .0 .0 .0 .0 .0 .00 .0	L W I R E ** TAPE DECK & AUC 2 * TAPE DECK & AUC S LV TYPE 	L I S T * 89/0 DESCRIPTION OF ELEMENT 	9/18 12:22 5/19 00 P02 P02 P02 P02 P02 P02 P02 P02 P02 P03 J01 J01 J01 J01 J01 J01 J01 P01 P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* PAGE 55 * *********************************
* WILLI ST ***************** SIGNAL NAME 	TUDER AG * 1.811.090. ************ COLOR MI	S I G N ASY GRP ELM PNT 27 2 24 27 2 26 27 2 30 27 2 34 27 2 34 27 2 34 27 2 34 27 2 36 27 2 36 27 2 36 27 2 36 27 2 36 27 2 36 27 3 1 27 4 2 27 4 2 27 4 2 27 4 2 30 1 2 30 1 2 30 2 5 30 2 1 30 2 1 30 2 1<	L W I R E	L I S T * 88/0 	9/16 * 12:22 ************************************	* PAGE 55 * *********************************
* WILLI ST ***************** SIGNAL NAME 	TUDER AG * 1.811.090. ************ COLOR MI	S I G N ASY GRP ELM PNT 27 2 24 27 2 26 27 2 30 27 2 34 27 2 34 27 2 34 27 2 34 27 2 36 27 2 36 27 2 36 27 2 36 27 2 36 27 2 36 27 3 1 27 4 2 27 4 2 27 4 2 27 4 2 30 1 2 30 1 2 30 1 3 30 2 1 30 2 1 30 2 1<	L H I R E	L I S T * 89/0 * 89/0 DESCRIPTION OF ELEMENT 	Y/18 12:22 Y/18 12:22 Y/19 00 REMARK P02 P02 P02 P02 P02 P02 P02 P02 P03 J01 J01 J01 J01 J02 P03 J03 J01 J04 P01 P01 P01 P01	* PAGE 55 * *********************************

IGNAL NAME	COLOR	MI ASY GRP	ELM	PNT	S LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
CUNT.OF 0.0		36	2	26			INPUT FROM BASIS BOARD P	02 03		
	S	36 40	3 4 3	1		D		04		
	s s	40 41	4	3		D	CONNECTOR LINE FILTER, OUTPUT P	02		
	S S	41 42	4 3	3		D		02		
	s s	42 43	4	3		D A	CONNECTOR LINE FILTER, DUTPUT P AUDIO CONN., FROM GRP20, ELM15/16/	02		
	s s	43 43		5		A A	AUDIO CONN., FROM GRP20, ELM15/16/ AUDIO CONN., FROM GRP20, ELM15/16/	17		
	s s	43 43	1	11		А	AUDIO CONN., FROM GRP20, ELMIS/16/ AUDIO CONN., FROM GRP20, ELMIS/16/	17		
	s S	43 43	1	18		A A	AUDIO CONN., FROM GRP20, ELMI5/16/ AUDIO CONN., FROM GRP20, ELMI5/16/	17		
	s s	43 43	1	21		A A A	AUDIO CONN., FROM GRP20, ELMI5/16/ AUDIO CONN., FROM GRP20, ELMI5/16/ AUDIO CONN., FROM GRP20, ELM15/16/	17		
	3	43 43	2	1		*	CONTROL CONN., FROM GRP20, ELMO7 CONTROL CONN., FROM GRP20, ELMO7	11		
		43 43	2	14			CONTROL CONN., FROM GRP20, ELMO7 Control conn., From Grp20, ELMO7			
	S	43 43	2			в	CONTROL CONN., FROM GRP20, ELM07 CABLE TO GRP70, ELM09/11/12			
	s s		11	5		B	CABLE TO GRP70, ELM09/11/12 CABLE TO GRP70, ELM09/11/12			
	s s	43	11 11	11		B	CABLE TO GRP70, ELM09/11/12 CABLE TO GRP70, ELM09/11/12			
	S		11 11	18		B	CABLE TO GRP70, ELM09/11/12 CABLE TO GRP70, ELM09/11/12			
	S	43	11	21		B B	CABLE TO GRP70, ELMO9/11/12 CABLE TO GRP70, ELMO9/11/12			
	5	43	12	1		0	CABLE TO GRP70, ELMO1			
		43 43 43	12 12 12				CABLE TO GRP70, ELMO1 Cable to grp70, Elmo1 Cable to grp70, Elmo1			
			12	23 24 1			CABLE TO GRP70, ELMO1 CABLE TO GRP70, ELMO1 TO GRP53, ELMO1 P	01		
		50 50	1 2	2			TO GRP53, ELMO1 P	01 02		
		50 52	2	2			FROM GRP52, ELMO2 P	02		
		52 52	1 2	2			FROM GRP20, ELMO4 P	01 03		
		52 52	24	2			CONNECTOR COMMAND UNIT P	03 04		
		52 53	4				CONNECTOR LCD DISPLAY UNIT P	04 01		
		53 54	1	2			FROM GRP50, ELMO1 P	01 04		
							FROM GRP52, ELMO4 P	04		
		54	1				FROM B. BOARD TAPE DECK. ELM 19 P	01		
WILLI ST	UDER AG ******** 1.811.0	54 58 58 *********** * S I *********** 90.00 * ST	1 1 1 \$**** G \$****	1 2 16 ****** N A ****** A 81	L ****** 2 * T	W I R E ***********************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 89/09/1 AUDIO * 88/05/1	01 01 **** 8 ****	* 12:22 *********** 00	* PAGE 57 ************************************
WILLI ST ************* ************* GNAL NAME	UDER AG ******** 1.811.0 *********	54 58 58 *********** * S I *********** 90.00 * ST	1 1 1 w**** G ***** UDER ***** ELM	1 2 16 ****** N A ****** A 81 ****** PNT	L ****** 2 * T *****	W I R E ***************** APE DECK & A ******	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 89/09/1 VUDIO * 88/05/1 DESCRIPTION OF ELEMENT	01 01 **** .8 **** .9 - ***	* 12:22 *********** 00 *********	* PAGE 57 ***********************************
WILLI ST	UDER AG ******** 1.811.0 *********	54 58 58 *********** 90.00 * ST **********************************	1 1 1 ***** UDER ***** ELM 2 2	1 2 16 ****** N A ****** A 81 ****** PNT 1 2	L ****** 2 * T *****	W I R E ***********************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 89/09/1 L I S T * 88/05/1 DESCRIPTION OF ELEMENT TO VU-METER PANEL TO VU-METER PANEL P	01 01 **** .8 **** .9 - ***	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************
WILLI ST	UDER AG ******** 1.811.0 *********	54 58 58 58 90.00 * ST **********************************	1 1 1 ***** G ***** UDER ***** ELM 2 2 2 1	1 2 16 ****** A 81 ****** PNT 1 2 16 11	L ****** 2 * T *****	W I R E ***********************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T WILL I S T BESCRIPTION OF ELEMENT DESCRIPTION OF ELEMENT TO VU-METER PANEL TO VU-METER PANEL FROM GRP20, ELMI2	01 01 **** 9 - ****	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************
WILLI ST	UDER AG ******** 1.811.0 *********	54 58 58 58 ****************************	1 1 1 S S S S S S S S S S S S S S S S S	1 2 16 ****** N A ****** A 81 ****** PNT 1 2 16 11 12	L ****** 2 * T *****	W I R E ***********************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 89/09/1 * 88/05/1 DESCRIPTION OF ELEMENT TO VU-METER PANEL P TO VU-METER PANEL P FROM GRP20, ELM12 P FROM GRP20, ELM12	01 01 **** 9 - *** 02 02 02 02 01 01	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************
WILLI ST	UDER AG	54 58 58 58 ********** 90.00 * ST **********************************	1 1 1 ***** G ***** UDER ***** ELM 2 2 2 1	1 2 16 ****** A 81 ****** PNT 1 2 16 11 12 2 4	L ****** 2 * T *****	W I R E ***********************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 8870971 MUDIO * 8870571 DESCRIPTION OF ELEMENT * 8870571 TO VU-METER PANEL P TO VU-METER PANEL P TO VU-METER PANEL P FROM GRP20, ELMI2 P	01 01 **** .9 - **** -02 02 02 02 01 01 01	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************
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WILLI ST	UDER AG ******** 1.811.0 ********* COLOR S S S S S S S	54 58 58 58 58 58 58 58 58 58 58 58 58 58	1 1 1 ***** G ***** UDER** 2 2 2 2 1 1 1 1 1 1 1 1 1 2 5 6	1 2 16 ****** N A ****** PNT 1 2 16 11 12 2 4 6 8 12 1 2 1 1 2 1 1	L ****** 2 * T *****	W I R E ***********************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 89/09/1 DESCRIPTION OF ELEMENT TO VU-METER PANEL P TO VU-METER PANEL P FROM GR20, ELMI2 P FROM GR20, ELMI2 P FROM GR20, ELMI2 P AUDIO INPUT (FROM GR20, ELMI7) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT	01 01 ***** 8 ***** 9 02 002 002 002 002 001 001 001 001 001	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************
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WILLI ST	UDER AG ********* 1.811.2 ********* COLOR S S S S S S S S S	54 58 58 58 90.00 * ST **********************************	1 1 1	1 2 16 ******** PNT 1 2 16 11 12 2 4 6 8 8 12 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	L ****** 2 * T *****	M I R E APE DECK & / ************************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 89/09/1 DESCRIPTION OF ELEMENT TO VU-METER PANEL P TO VU-METER PANEL P FROM GR20, ELM12 P FROM GR20, ELM12 P FROM GR20, ELM12 P AUDIO INPUT (FROM GR20, ELM17) J AUDIO NONECTOR FROM GR20, ELM12 P FROM GR24, ELM12 P F	01 01 ***** **** **** **** **** **** **	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************
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WILLI ST	UDER AG ********* 1.811.2 ********* COLOR S S S S S S S S S	54 58 58 58 58 58 58 58 58 58 58 58 58 58	1 1 1 ****** ***** ELLM 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1	1 2 16 PNT 1 2 16 6 8 12 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2	L ****** 2 * T *****	M I R E APE DECK & / ************************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 89/09/1 DESCRIPTION OF ELEMENT DESCRIPTION OF ELEMENT TO VU-METER PANEL TO VU-METER PANEL P FROM GRP20, ELM12 FROM GRP20, ELM12 P FROM GRP20, ELM12 AUDIO INPUT IFROM GRP20, ELM171 PHONES CONNECTOR PHONES CONNECTOR FROM GRP43, ELM12 P <	01 01 ***** 8 **** 	* 12:22 *********** 00 *********** REMARK	* PAGE 57
WILLI ST	UDER AG ********* 1.811.2 ********* COLOR S S S S S S S S S	54 58 58 58 58 58 58 58 58 58 58 58 58 58	1 1 1 ***** **************************	1 2 16 ******* N A 81 ******* 1 2 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	L ****** 2 * T *****	M I R E APE DECK & / ************************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 89/09/1 DESCRIPTION OF ELEMENT TO VU-METER PANEL P TO VU-METER PANEL P TO VU-METER PANEL P FROM GRP20, ELMI2 P AUDIO INPUT IFROM GRP20, ELMI71 J AUDIO INPUT IFROM GRP20, ELM171 P FROM GRP43, ELM12 P	01 01 8 8 9 9 9 9 02 002 002 002 002 002 002 001 001 001	* 12:22 *********** 00 *********** REMARK	* PAGE 57
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WILLI ST	UDER AG ********* 1.811.2 ********* COLOR S S S S S S S S S	54 58 58 58 58 58 58 58 58 58 59 60 60 60 60 60 60 60 60 60 60 60 60 60	1 1 1 ***** G**************************	1 2 16 ******* N A * 81 ****** PNT 1 2 1 1 2 2 4 6 8 1 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	L ****** 2 * T *****	M I R E APE DECK & / ************************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 8670571 DESCRIPTION OF ELEMENT DESCRIPTION OF ELEMENT TO VU-METER PANEL TO VU-METER PANEL FROM GR20, ELMI2 FROM GR20, ELMI2 AUDIO INPUT IFROM GR20, ELMI71 FROM GR24, ELMI2 P RESERVE P </td <td>01 01 **** 8 *** 9 </td> <td>* 12:22 *********** 00 *********** REMARK</td> <td>* PAGE 57 ***********************************</td>	01 01 **** 8 *** 9 	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************
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WILLI ST	UDER AG ********* 1.811.2 ********* COLOR S S S S S S S S S	54 58 58 58 58 58 58 58 58 58 58 58 58 58	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 2 16 ******** N A *81 ********** PNT 1 2 4 6 8 12 11 12 22 26 12 20 22 25 12 14 1 2 1 2 1 2 16 16 1 2 2 2 2 5 1 2 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	L ****** 2 * T *****	M I R E APE DECK & / ************************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 8670571 DESCRIPTION OF ELEMENT DESCRIPTION OF ELEMENT TO VU-METER PANEL FROM GR20, ELMI2 FROM GR20, ELMI2 FROM GR20, ELMI2 FROM GR20, ELMI2 AUDIO INPUT (FROM GR20, ELMI7) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT FROM GR20, ELM17 PHONES CONNECTOR FROM GR24, ELM12 P GOM GR24, ELM12 P ROM GR24, ELM12 P ROM GR24, ELM12 FROM GR24, ELM12 P ROM GR24, ELM12	01 ***** 8 *** 99 - * 002 002 001 001 001 001 001 001 001 001	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************
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WILLI ST ************* *************** GNAL NAME CONT.OF	UDER AG ********* 1.811.2 ********* COLOR S S S S S S S S S	54 58 58 58 58 58 58 58 59 59 60 60 60 60 60 60 60 60 60 60 60 60 60	1 1 1 1 1 1 *** G *** C *** C *** C *** C ** C	1 2 1 6 ******** N A **** PNT 1 2 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	L ****** 2 * T *****	M I R E APE DECK & / ************************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 8670571 DESCRIPTION OF ELEMENT DESCRIPTION OF ELEMENT TO VU-METER PANEL TO VU-METER PANEL FROM GR20, ELMI2 AUDIO INPUT (FROM GRP20, ELMI7) AUDIO INPUT (FROM GRP20, ELM17) AUDIO MONECTOR FROM GRP43, ELM12 P FROM GRP43, ELM12 P FROM GRP43, ELM12 P RESERVE P RESERVE P RESERVE P RESERVE P RESERVE P RESERVE P RESERVE </td <td>01 ***** **** **** **** **** **** ****</td> <td>* 12:22 *********** 00 *********** REMARK</td> <td>* PAGE 57 ***********************************</td>	01 ***** **** **** **** **** **** ****	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************
WILLI ST	UDER AG ********* 1.811.2 ********* COLOR S S S S S S S S S	54 58 58 58 90.00 * 51 **********************************	1 1 1 1 1 1 * Geter: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 3 3 3 4 4 5 5 6 6 6 7 7 7 8 8 8 8 9 9 9	1 2 1 6 **** N A *** A 81 **** P-N- 1 2 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	L ****** 2 * T *****	M I R E APE DECK & / ************************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 8970971 DESCRIPTION OF ELEMENT DESCRIPTION OF ELEMENT TO VU-METER PANEL FROM GR20, ELMI2 FROM GR20, ELMI2 FROM GR20, ELMI2 FROM GR20, ELMI2 AUDIO INPUT (FROM GR20, ELMI7) AUDIO INPUT (FROM GR20, ELM17) AUDIO INPUT FROM GR20, ELM17) AUDIO MONT FROM GR20, ELM17) AUDIO NOS CONNECTOR FROM GR24, ELM12 P RESERVE P <tr< td=""><td>01 ***** </td><td>* 12:22 *********** 00 *********** REMARK</td><td>* PAGE 57 ***********************************</td></tr<>	01 ***** 	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************
WILLI ST	UDER AG ********* 1.811.2 ********* COLOR S S S S S S S S S	54 58 58 58 90.00 * 51 **********************************	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 2 1 6 **** N A A*** N A A*** P NT 1 2 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	L ****** 2 * T *****	M I R E APE DECK & / ************************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 8970971 DESCRIPTION OF ELEMENT DESCRIPTION OF ELEMENT TO VU-METER PANEL TO VU-METER PANEL FROM GR20, ELMI2 PROM GR20, ELMI2 AUDIO INPUT (FROM GRP20, ELMI7) AUDIO INPUT (FROM GRP20, ELM17) AUDIO INPUT FROM GRP20, ELM12 FROM GRP43, ELM12 PHONES CONNECTOR FROM GRP43, ELM12 FROM GRP43, ELM12 FROM GRP43, ELM12 PROM GRP43, ELM12	01 ***** -02 002 001 **** -02 002 001 001 001 001 001 001 001 001 0	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************
WILLI ST	UDER AG ********* 1.811.2 ********* COLOR S S S S S S S S S	54 58 58 58 90.00 * 51 **********************************	1 1 1 1 4 4 5 6 4 5 5 6 6 7 7 7 8 8 8 9 9 9 10 0 1 1 1 1 1 1 1 1 1 1 1 1 1	1 2 1 4 4 1 1 2 4 4 4 4 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	L ****** 2 * T *****	M I R E APE DECK & / ************************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 8970971 DESCRIPTION OF ELEMENT DESCRIPTION OF ELEMENT TO VU-METER PANEL TO VU-METER PANEL FROM GR20, ELMI2 PROM GR20, ELMI2 AUDIO INPUT (FROM GRP20, ELMI7) AUDIO INPUT (FROM GRP20, ELM17) AUDIO INPUT (FROM GRP20, ELM12 FROM GRP43, ELM12 PHONES CONNECTOR FROM GRP43, ELM12 P FROM GRP43, ELM12 P FROM GRP43, ELM12 P FROM GRP43, ELM12 P RESERVE P RESERVE P RESERVE P RESERVE	01 ***** -02 00 01 **** -02 00 01 00 00 00 00 00 00 00 00 00 00 00	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************
WILLI ST ************* ************* GNAL NAME	UDER AG ********* 1.811.2 ********* COLOR S S S S S S S S S	54 58 58 58 58 58 58 58 58 58 58 58 59 60 60 60 60 60 60 60 60 60 60 60 60 60	1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 2 16 ******* N A ** PNT 1 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	L ****** 2 * T *****	M I R E APE DECK & / ************************************	FROM B. BOARD TAPE DECK, ELM 19 P FROM B. BOARD TAPE DECK, ELM 19 P L I S T * 89/09/1 DESCRIPTION OF ELEMENT TO VU-METER PANEL P TO VU-METER PANEL P TO VU-METER PANEL P FROM GRP20, ELM12 P FROM GRP20, ELM12 P AUDIO INPUT (FROM GRP20, ELM17) J AUDIO TOR APC1 FROM GRP20, ELM12 FROM GRP20, ELM12 P FROM GRP43, ELM12 P FROM GRP43, ELM12 P FROM GRP43, ELM12 P	01 ****- ***0222001 001 ****0222001 001 001 001 001 001 001 001 002222 003 004 45556 00777 001 002 002 00 00 00 00 00 00 00 00 00 00 0	* 12:22 *********** 00 *********** REMARK	* PAGE 57 ***********************************

SIGNAL NAME	COLOR	MI A	Y GRP	ELM P	PNT		TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
< CONT.OF 0.0			70	13 13	4			MONITOR AMPLIFIER, AUDIO	10.6		
			70 70	13 13 1	8 .2			MONITOR AMPLIFIER, AUDIO MONITOR AMPLIFIER, AUDIO MONITOR AMPLIFIER, AUDIO	J06		
	s		71	1	2		N N	AUDIO INPUT AUDIO INPUT	J01 J01		
	S S S		71 71 71	1 1 1 1	ь 8 2		N N N	AUDIO INPUT Audio input Audio input	J01 J01 J01		
	5		71 71	2	1 2			FROM GRP70, ELM07 FROM GRP70, ELM07	P01 P01		
	S-0		71 71		1		N	FROM GRP70, ELMO7 TO PHONES CONNECTOR	P01 J02		
	S- 0		71 81 81	4	1 1 2		L	DDECC ACCEMPLY CENCOD	P01 P01		
			82 82	1	1			TO TD PERIPHERY DRIVER To TD PERIPHERY DRIVER	P01 P01		
			82 82	3	1 2			TO TAPE MOVE SENSOR, LEFT TO TAPE MOVE SENSOR, LEFT	P02 P02		
			82 82 83	4 4 1	1 2 1			TO SPOOLING MOTOR TACHO SENSOR L TO SPOOLING MOTOR TACHO SENSOR L	• P0 3		
			83 83	1 3	2			TO TD PERIPHERY DRIVER TO TD PERIPHERY DRIVER TO TAPE MOVE SENSOR, RIGHT	PUI		
			83 83	-	2			TO TAPE MOVE SENSOR, RIGHT To Tape Move Sensor, right To spooling motor Tacho Sensor F	.P03		
			83 84	i ı			F	TO SPOOLING MOTOR TACHO SENSOR R FROM GRP85, ELMO2	J01		
			85 85 85	1	1 2 9				P01 P01 P01		
			85 85	1 1	i i				P01 P01		
			85 85	1 1 2 1	2		м	TO GRP84, ELMO1	P01 P02		
			85 87	2	5		м	SUPPLY (FROM GRP20, ELM72) Conn. Tacho Sensor (S 2000 Only) Conn. Tacho Sensor (S 2000 Only)	P03		
			87 88 88	2	2 1 2			CONN. TACHO SENSOR (S 2000 ONLY)	P03		
	0 S			1 1 1 3			A A	CONN. TACHO SENSOR (S 2000 ONLY) HEAD BLOCK CONNECTOR HEAD BLOCK CONNECTOR	P01 P01		
	S S		90	1 4	48		A A	HEAD BLOCK CONNECTOR HEAD BLOCK CONNECTOR Reproduce preamplifier	P01 P01		
	s s		90	2 2	5		L L 	REPRODUCE PREAMPLIFIER			
0.0T	6 			3				TO MECHANICAL TIMER			
5.0			27	5	5			CONNECTOR RS 232 (SERVICE)	J02		
			33	1	2 2			TO GRP33, ELMOI	P01 P01		
WILLI ST	TUDER AG	* ******* 090.00	33 35 52 54 ****** S I ****** * STU	1 4 1 ******* G N ******	2 2 ***** A *****	L ****** 2 * T	W I R E ***********************************		P01 P04 P04 /18 /18 /19 -	* 12:22 * ************ 00	* PAGE 59
WILLI ST ************************************	TUDER AG ******** 1.811. *******	* ****** 090.00 ******	33 35 52 54 ***** \$ I ***** * STU *****	1 4 1 G N #*****	2 2 2 ***** A ***** A 812 ****	L ****** 2 * T *****	W I R E ***********************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04	P01 P04 P04 /18 /18 /19 -	* 12:22 * *********** 00	* PAGE 59
WILLI ST ************ ************ GNAL NAME 	TUDER AG ********* 1.811. ********* COLOR 3	******** 090.00 *******	33 35 52 54 54 54 54 54 54 54 54 54 54 54 54 54	1 4 1 S N ****** JDER / ELM PI 1	2 2 2 ***** A ***** A 812 ***** NT 5 1	L ****** ****** 6 LV 	W I R E ***************** APE DECK & AUDI **************** TYPE F	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 10 * 88/05 DESCRIPTION OF ELEMENT FROM GRP30, ELM02	P01 P04 P04 /18 ****** /19 - ******	* 12:22 * ************ 00	PAGE 59 **********************************
WILLI ST ************ ************ GNAL NAME 	TUDER AG	******** 090.00 *******	33 35 52 54 ****** * S I ****** * S TU ****** * S TU ****** * S TU ******	1 4 1 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4	2 2 2 ***** A ***** A 812 ***** NT 2	L ****** ****** 6 LV 	W I R E ***********************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 10 * 88/05 DESCRIPTION OF ELEMENT FROM GRP30, ELM02 FROM GRP30, ELM02 TO GRP20, ELM0	P01 P04 P04 //18 //18 //19 - //19 - //19 - //19 - //19 - //19 - //101 J01 J01 P01	* 12:22 ********************************	* PAGE 59
WILLI ST ************ ************ GNAL NAME 	TUDER AG	******** 090.00 *******	33 35 52 54 ****** S I ****** * STU ******* Y GRP 	1 1 4 1 S N ***** DDER A ***** ELM PI 1 2 2 1 2 1	2 2 2 ***** A ***** A 812 ***** NT 2	L ****** ****** 6 LV 	W I R E ***********************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 10 * 88/05 DESCRIPTION OF ELEMENT 	P01 P04 P04 /18 ****** /19 - ****** J01 J01 J01 P01 P01 P01 P01	* 12:22 ********************************	* PAGE 59
WILLI ST ************ ************ GNAL NAME 	TUDER AG	******** 090.00 *******	33 35 52 54 ****** * S I ****** * S TU ****** iY GRP 19 19 19 19 19 20 20 20	1 1 4 1 G N IDER 1 2 1 1 2 1 4 4 4	2 2 2 ***** A ***** A 812 ***** 1 2 1 2 1 2 3 4 3 4	L ****** ****** 6 LV 	W I R E ***********************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT FROM GRP30, ELM02 FROM GRP30, ELM02 FROM GRP30, ELM00 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR DRIVE AMPLIFIER TAPE DECK DISPLAY DRIVER TAPE DECK DISPLAY DRIVER	P01 P04 P04 /18 /18 /19 J01 J01 P01 P01 P01 P01 P01 P04 P04	* 12:22 ********************************	PAGE 59 **********************************
WILLI ST ************ ************ GNAL NAME 	TUDER AG	******** 090.00 *******	33 35 52 54 ****** * S I ****** Y GRP 19 19 19 19 19 19 20 20 20 20 20	1 1 4 1 5 4 1 4 1 2 2 2 2 4 5 4 5 4 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 5 5 5 5 5 5 5 5 5 5 5 5	2 2 2 ** A ** 8 ** 8 ** * * * * * * * * * * * * *	L ****** ****** 6 LV 	W I R E ***********************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT FROM GRP30, ELM02 FROM GRP30, ELM02 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR DRIVE AMPLIFIER TAPE DECK DISPLAY DRIVER TAPE DECK DISPLAY DRIVER TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) PARALLEL REMOTE IF (GRP35)	P01 P04 P04 /18 /18 /19 - /18 /19 - /19 /19 - /101 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 ********************************	PAGE 59 **********************************
WILLI ST ************ ************ GNAL NAME 	TUDER AG	******** 090.00 *******	33 35 52 54 54 54 54 54 54 54 54 54 54 54 54 54	1 1 4 1 G N ****** DER ELM PI 1 2 2 1 4 4 5 4 7 7	2 2 2 ***** **************************	L ****** ****** 6 LV 	W I R E ***********************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 10 * 88/05 FROM GRP30, ELM02 FROM GRP30, ELM02 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO FROM GRP30, ELM10 CAPSTAN MOTOR DRIVE AMPLIFIER TAPE DECK DISPLAY DRIVER TAPE TECK DISPLAY DRIVER TAPE DECK	P01 P04 P04 V18 V18 V19 J01 J01 P01 P01 P01 P01 P01 P01 P04 P05	* 12:22 ********************************	PAGE 59 **********************************
WILLI ST ************* ************* GNAL NAME 	TUDER AG	******** 090.00 *******	33 35 52 54 ***** * STU ****** Y GRP 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 1 	2 2 2 2 * * * * * * * * * * * * * * * *	L ****** ****** 6 LV 	W I R E ***********************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 10 * 88/05 FROM GRP30, ELM02 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR DRIVE AMPLIFIER TAPE DECK DISPLAY DRIVER TAPE DECK DISPLAY DRIVER	P01 P04 P04 P04 P04 P04 P04 P04 P01 P01 P01 P01 P01 P01 P01 P05 P07 P07 P08 P07 P08 P09	* 12:22 ********************************	PAGE 59 **********************************
WILLI ST ************* ************* GNAL NAME 	TUDER AG	******** 090.00 *******	33 35 52 54 51 52 54 51 ****** * STU ****** * STU ****** * STU ****** 19 19 19 19 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 1 4 1 1 3 4 4 5 1 2 2 2 1 2 1 2 3 4 4 5 4 5 4 5 4 5 4 5 4 5 4 5 6 8 7 7 8 8 8 8 8 8 8 8 8 8 8 8 8	2 2 2 2 **** *************************	L ****** ****** 6 LV 	W I R E ***********************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 CONNECTOR CONTRACT DESCRIPTION OF ELEMENT FROM GRP30, ELM02 FROM GRP30, ELM02 TO GRP20, ELM10 TO GRP20, ELM10 CARSTAN MOTOR DRIVE AMPLIFIER CARSTAN MOTOR DRIVE AMPLIFIER TAPE DECK DISPLAY DRIVER TAPE DECK DISPLAY DRIVER	P01 P04 P04 P04 P04 P04 P04 P01 P01 P01 P01 P01 P01 P01 P01 P04 P05 P07 P07 P07 P08 P09 P09 P09 P09 P09 P09 P09 P09 P04 P04 P04 P04 P04 P04 P04 P04 P04 P04	* 12:22 ********************************	PAGE 59 **********************************
WILLI ST ************* ************* GNAL NAME 	UDER AG	******** 090.00 *******	33 35 52 54 ****** * STU ****** * STU ****** * STU ****** 19 19 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 4 1 1 4 4 1 1 5 1 2 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 2 1 1 2 2 1 1 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1	2 2 2 *** ****************************	L ****** ****** 6 LV 	W I R E APE DECK & AUDI TYPE F M M M F F F F F F F F	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT 	P01 P04 P04 P04 P04 P04 P04 P04 P01 P01 P01 P01 P01 P01 P01 P04 P05 P07 P08 P07 P08 P07 P08 P07 P09 P09 P09 P09 P09 P04 P04 P04 P04 P04 P04 P04 P04 P04 P04	* 12:22 ********************************	P A G E 59
WILLI ST ************* ************* GNAL NAME 	IUDER AG 1.811 COLOR 3 3 3 3 3 3 3 3 3 3 3 3 3	******** 090.00 *******	33 35 52 54 ****** * STU ****** * STU ****** * STU ****** 19 19 19 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 4 1 1 4 5 4 5 1 1 2 2 2 1 1 2 2 3 1 4 4 5 7 4 5 7 8 8 8 9 9 9 9 9 9 9 9 9 9 9 10 10 10 10 10 10 10 10 10 10	2 2 2 * * * * * * * * * * * * * * * * * * *	L ****** ****** 6 LV 	W I R E APE DECK & AUD) ************************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT 	P01 P04 P04 P04 P04 P04 P04 P04 P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 ********************************	► P A G E 59
WILLI ST ************* ************* GNAL NAME 	TUDER AG ************************************	******** 090.00 *******	33 35 52 54 ****** * STU ****** * STU ****** 19 19 19 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 5 7 4 5 1 2 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	2 2 2 * * * * * * * * * * * * * * * * *	L ****** ****** 6 LV 	W I R E APE DECK & AUD TYPE F M M F F F F F F F F F F F F U	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT 	P01 P04 P04 P04 P04 P04 P04 P04 P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 ********************************	► P A G E 59
WILLI ST ************* ************* GNAL NAME 	IUDER AG 1.811 COLOR 3 3 3 3 3 3 3 3 3 3 3 3 3	******** 090.00 *******	33 35 52 54 ******* * STU 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 1 	2 2 2 * * * * * * * * * * * * * * * * *	L ****** ****** 6 LV 	W I R E APE DECK & AUD) ************************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT FROM GRP30, ELM02 FROM GRP30, ELM02 FROM GRP30, ELM02 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO FRP20, ELM10 TO FR00, ISTAGLIZER GRP30, ELM02 FR00 STAGLIZER GRP30, ELM02 FR00 STAGLIZER GRP30, ELM02 SYNCHRONIZER (SUPPLY) SYNCHRONIZER (SUPPLY) SYNCHRONIZEN (SUPPLY) SYNCHRONIZEN (SUPPLY) SYNCHRONIZEN (SUPPLY) SYNCHRONIZEN (SUPPLY) SYNCHRONIZEN (SUPLY) SYNCHRONIZEN (SUPLY) SYNCHRONIZEN (SUPLY) SYNCHRONIZEN (SUPLY) SYNCHRONIZEN (SUPLY) SYNCHRONIZEN (SUPLY) SYNCHRONIZEN (SUPLY) SYNCHR	P01 P04 P04 P04 P05 P05 P01 P01 P01 P01 P01 P01 P01 P01 P01 P05 P05 P05 P07 P08 P05 P07 P08 P05 P07 P08 P05 P07 P08 P09 P04 P04 P04 P04 P04 P04 P04 P04 P04 P04	* 12:22 ********************************	P A G E 59 ELEMENT NR. 1.811.898.0 1.811.898.0 1.911.775.0 1.820.764.0
WILLI ST ************* ************** GNAL NAME	IUDER AG 1.811 	******** 090.00 *******	33 35 52 54 ****** * STU 19 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 1	2 2 2 - * * A * NT-1212343434343412121213400AB	L ****** ****** 6 LV 	W I R E APE DECK & AUD) ************************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT FROM GRP30, ELM02 FROM GRP30, ELM02 FROM GRP30, ELM02 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 CAPSTAN MOTOR DRIVE AMPLIFIER TAPE DECK DISPLAY DRIVER TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL WU-METER PANEL CAPSTAN MOTOR UNIT, INTERN FROM STABLIZER CAPSTAN ONTOR UNIT, SYNCHRONIZER CAPSTAN CONTOR UNIT MASTER SERIAL INTERFACE CAPSTAN CONTOR UNIT MASTER SERIAL INTERFACE	P01 P04 P04 P04 P04 P05 P07 P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 ********************************	P A G E 59 ELEMENT NR. ELEMENT NR. 1.811.898.0 1.911.898.0 1.911.775.0 1.920.764.0 1.820.753.0 1.820.753.0 1.820.753.0
WILLI ST ************* ************* GNAL NAME	IUDER AG 1.811 	******** 090.00 *******	33 35 52 54 * STU * STU 19 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 1 1 6 6 1 1 1 1 4 1 1 1 1 1 1 1 1	2 2 2 - * * A * NT-1 2 1 2 3 4 3 4 3 4 3 4 3 4 1 2 1 2 1 3 4 0 0 6 6 6 0 0 * * 4 * 8 1 * * 5 -	L ****** ****** 6 LV 	W I R E APE DECK & AUD) ************************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT FROM GRP30, ELM02 FROM GRP30, ELM02 FROM GRP30, ELM02 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO POECK DISPLAY DRIVER TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) PARALLEL REMOTE IF (GRP35) PARALLEL REMOTE IF (GRP35) PARALLEL REMOTE IF (GRP35) PARALLEL REMOTE IF (GRP35) VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL MONITOR UNIT, INTENN FROM STABILIZER GRP30, ELM02 SYNCHRONIZER (SUPPLY) WIRE FIELD, TO CONN. GRP20, ELM6 WIRE F	P01 P04 P04 P04 P04 P05 P07 P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 ********************************	P A G E 59 ELEMENT NR. ELEMENT NR. 1.811.898.0 1.811.775.0 1.820.753.0 1.811.786.0 1.811.786.0
WILLI ST ************* ************* GNAL NAME	IUDER AG 1.811 	******** 090.00 *******	33 35 52 54 ******* * STU ******* * STU 19 19 19 19 19 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 5 6 8 7 6 8 9 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 2 2 - * * * * * * * * * * * * * * * *	L ****** ****** 6 LV 	W I R E APE DECK & AUD) ************************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT 	P01 P04 P04 P04 P04 P04 P04 P04 P04 P04 P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 ********************************	PAGE 59 ELEMENT NR. ELEMENT NR. 1.811.898.0 1.811.898.0 1.811.898.0 1.811.898.0 1.811.898.0 1.811.775.0 1.820.753.0 1.820.753.0 1.820.751.0 1.820.751.0 1.820.728.0 1.820.728.0 1.820.728.0 1.820.728.0
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WILLI ST ************* ************* GNAL NAME 	IUDER AG 1.811 	******** 090.00 *******	33 35 52 54 ******* * STU ******* * STU 19 19 19 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 1 6 1 1 1 6 1 1 1 1 1 1 1 1 1 1 1 1	2 2 2 - * * A * NT-1211234343434341211211213400066B0088844444	L ****** ****** 6 LV 	W I R E APE DECK & AUD) ************************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT FROM GRP30, ELM02 FROM GRP30, ELM02 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR DRIVE AMPLIFIER TAPE DECK DISPLAY DRIVER TAPE DECK DISPLAY DRIVER PARALEL REMOTE IF (GRP35) PARALEL REMOTE IF (GRP35) VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL MONITOR UNIT, INTERN MONITOR UNIT, INTERN MASTER SERIAL INTERFACE MASTER PERIPHERY CONTR. MASTER PERIPHENY CONTR. MASTER PERIPHENY CONTR. MASTER PERIPHENY CONTR. MASTER	P01 P04 P04 P04 P04 P05 P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 ********************************	PAGE59 ELEMENT NR. ELEMENT NR. ELEMENT NR. 1.811.898.0 1.811.898.0 1.811.775.0 1.820.753.0 1.820.753.0 1.811.786.0 1.820.753.0 1.820.753.0 1.820.753.0 1.820.753.0 1.820.728.0
WILLI ST ************* ************* GNAL NAME 	IUDER AG 1.811 	******** 090.00 *******	333 3552 54 ******* * STU 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 1 4 4 1	2 2 2 - * * * * * * T-121234343434341212121213400066B0088844444444	L ****** ****** 6 LV 	W I R E APE DECK & AUD) ************************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT FROM GRP30, ELM02 FROM GRP30, ELM02 FROM GRP30, ELM02 TO GRP20, ELM10 TO GRP20, ELM10 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR DRIVE AMPLIFIER TAPE DECK DISPLAY DRIVER TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) VU-METER PANEL EXTERNAL VU-METER PANEL, EXTERNAL VU-METER CANSO, ELM02 FROM STABILIZER GRP30, ELM02 FROM GRP30, ELM1 FROM STABILIZER GRP30, ELM02 FROM GRP30, ELM1 GROMONIZER GRP30, ELM02 FROM GRP30, ELM1 GROMONIZER GROMONIZER GRP30, ELM02 FROM GRP30, ELM1 HEFRON GROMONIZER GROMONIZER GRP30, ELM02 MASTER SERIAL INTERFACE MASTER FERIPHERY CONTR. MASTER FERIPHERY CONTR. MASTER FERIPHERY CONTR. MASTER FERIPHERY CONTR.	P01 P04 P04 P04 P04 P05 P07 P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 ********************************	P.A. G. E. 59 ELEMENT NR. ELEMENT NR. ELEMENT NR. I.811.898.0 I.811.898.0 I.811.898.0 I.811.775.0 I.820.753.0 I.811.786.0 I.820.753.0 I.820.753.0 I.820.728.0
WILLI ST ************* ************* GNAL NAME 	IUDER AG 1.811 	******** 090.00 *******	33 35 52 54 ******* Y GRP 19 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 1 1 6 1 1 1 1 1 4 1 1 1 1 1 1 1 1	2 2 2 - * * * * * T-121234343434343412121213400066B008884444444444444444444444444444	L ****** ****** 6 LV 	W I R E APE DECK & AUD) ************************************	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT 	P01 P04 P04 P04 P04 P04 P04 P04 P04 P04 P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 ********************************	PAGE59 ELEMENT NR. ELEMENT NR. ELEMENT NR. I.811.898.0 I.811.775.0 I.820.764.0 I.820.753.0 I.811.786.0 I.820.773.0 I.811.786.0 I.820.773.0 I.820.7728.0 I.820.7748.0
WILLI ST ************* ************* GNAL NAME 	TUDER AG ******** 1-811- 3 3 3 3 3 3 3 3	******** 090.00 *******	333 35 52 54 ******* Y GRP 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 1 1 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	2 2 2 - * * A* NT-121234343434343412121213400066000884444444444444444444444444444	L ****** ****** 6 LV 	м I R E	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT 	P01 P04 P04 P04 P04 P04 P04 P04 P04 P04 P04	* 12:22 ********************************	PAGE 59 ELEMENT NR. ELEMENT NR. 1.811.898.0 1.811.898.0 1.811.898.0 1.811.898.0 1.811.898.0 1.820.753.0 1.820.753.0 1.820.751.0 1.820.728.0
WILLI ST ************ ************ GNAL NAME 	TUDER AG ********* 1-811- ***********************************	******** 090.00 *******	333 35522 54 54 754 754 754 754 754 754 754 754 7	1 1 4 1 1 4 1 1 1 1 4 1 1 1 1 4 1 1 1 1	2 2 2 - * * A* NT-121234343434343412121213400666008884444444444444444444444444444	L ****** ****** 6 LV 	W I R E APE DECK & AUD F F F M M F F U U U U	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT 	P01 P04 P04 P04 P04 P04 P04 P04 P04 P04 P04	* 12:22 ********************************	* PAGE 59
WILL I ST	TUDER AG ********* 1.811. **********************	******** 090.00 *******	333 35522 54 ****** * STU 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 1 4 1	2 2 2 - * * A* NT-121234343434343412121213400660088844444444444444444444444444444	L ****** ****** 6 LV 	W I R E APE DECK & AUD TYPE F F M M F F F F F F F F F F F F F	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 L I S T * 89/09 DESCRIPTION OF ELEMENT FROM GRP30, ELM02 FROM GRP30, ELM02 FROM GRP30, ELM02 TO GRP20, ELM10 TO GRP20, ELM10 CARSTAN MOTOR DRIVE AMPLIFIER CARSTAN MOTOR DRIVE AMPLIFIER TAPE DECK DISPLAY DRIVER TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) VU-METER PANEL EXTERNAL VU-METER PANEL, EXTERNAL VU-METER CANSO, ELM02 FROM STABILIZER GRP30, ELM02 GONNE GAP1, FIEN, GH 2 CONNECTAR TO GRP27, ELM04 CONNECTAR TO GRP27, ELM04	P01 P04 P04 P04 P04 P04 P04 P04 P04 P04 P04	* 12:22 ********************************	PAGE 59 ELEMENT NR. ELEMENT NR. ELEMENT NR. 1.811.898.0 1.811.898.0 1.811.898.0 1.811.898.0 1.820.753.0 1.820.753.0 1.820.751.0 1.820.728.0
WILLI ST ************************************	TUDER AG ******** 1.811. ************* COLOR 3 3 3 3 3 3 3 3 3 3	******** 090.00 *******	333 35 52 54 ******* Y GRP 19 19 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20	1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 1 1 4 4 4 1	2 2 2 - * * A* NT-121234343434343412121213400660088844444444444444444444444444444	L ****** ****** 6 LV 	м I R E APE DECK & AUDI TYPE F F M M M F F F F F F F F F F F F F	CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04 DESCRIPTION OF ELEMENT DESCRIPTION OF ELEMENT TO # 88/05 DESCRIPTION OF ELEMENT FROM GRP30, ELM02 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO GRP20, ELM10 TO FOR CONTROL AMPLIFIER TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) PARALLEL REMOTE IF (GRP35) VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL NONITOR UNIT, INTERN MONITOR UNIT, INTERN MONITOR UNIT, INTERN MONITOR UNIT, INTERN MONITOR UNIT, INTERNACE ANSTER SERIAL INTERFACE MASTER SERIAL INTERFACE MASTER PERIPHERY CONTR. MASTER PERIPHERY CONTR. MAS	P01 P04 P04 P04 P04 P04 P04 P04 P04 P04 P04	* 12:22 ********************************	P.A. G.E. 59 ELEMENT NR. ELEMENT NR. I811.898.0 I811.898.0 I811.898.0 I811.775.0 I820.775.0

 DESCRIPTION OF ELEMENT

 TAPE TENSION SENSOR, LEFT

 TAPE TENSION SENSOR, LEFT

 TAPE TENSION SENSOR, RIGHT

 FROM GRP26, ELMO1

 TO GRP27, ELMO3/GRP27, ELMO3

 TO GRP26, ELMO1

 SUPPLY (FROM GRP20, ELMO1

 SUPPLY (FROM GRP20, ELMO1

 OUTPUT TO VU-PANEL

 INPUT FROM BASIS BOARD

 INPUT FROM BASIS BOARD

 CONTROL CONN., FROM GRP20, ELM07

 CABLE TO GRP70, ELM01

 TO GRP53, ELMO1

 FROM GRP52, ELMO1

 FROM GRP52, ELMO1

 FROM GRP52, ELMO1

 FROM GRP50, ELMO1

 FROM GRP50, ELMO1

 FROM GRP50, ELMO1

 FROM GRP50, ELMO1

 FROM GRP SIGNAL NAME COLOR MI ASY GRP ELM PNT S LV TYPE DESCRIPTION OF ELEMENT REMARK ELEMENT NR. <<-- CONT.OF + 5.6 434343434 5 25 25 25 25 25 25 25 25 25 26 26 26 26 27 27 P04 P03 P02 P02 P02 P01 P01 Ĺ 34344123434 P03 P03 J01 P01 P02 P02 P01 P01 P02 P02 23333333444455555555555555555666717777777777 M 3 4 2 15 12 12 2 P01 34343434343434349 P01 P02 P01 P01 P03 P03 P03 10 3 4 3 4 2 2334455 4343434 ******* * WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 61 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 ASY GRP ELM PNT S LV TYPE DESCRIPTION OF ELEMENT SIGNAL NAME COLOR MI DESCRIPTION OF ELEMENT COMMANDS CH 02 COMMANDS CH 02 COMMANDS MONITOR AMPLIFIER COMMANDS MONITOR AMPLIFIER FROM GRPTO, ELMOT FROM GRPTO, ELMOT FROM GRPTO, ELMOT PRESS ASSEMBLY SENSOR PRESS ASSEMBLY SENSOR TO TO PERIPHERY DRIVER TO TAPE MOVE SENSOR, LEFT TO TAPE MOVE SENSOR, LEFT TO SPOOLING MOTOR TACHO SENSOR TO TD PERIPHERY DRIVER TO TD PERIPHERY DRIVER TO TD PERIPHERY DRIVER TO TAPE MOVE SENSOR, RIGHT TO SPOOLING MOTOR TACHO SENSOR TO SPOOLING MOTOR TACHO SENSOR REMARK ELEMENT NR. <--- CONT.OF + 5.6 70 70 P06 P07 P07 P01 P01 P01 P01 P01 P01 P01 P02 P02 L.P03 34343434343 667722441 70 71 71 81 82 82 82 82 82 82 82 83 83 •P03 P01 P01 P02 P02 83 83 83 85 85 87 87 87 88 87 88 90 P02 R.P03 R.P03 P01 P01 Y) P03 Y) P03 Y) P03 4 CONN. TACHD SENSOR (S 2000 ONLY) HEAD BLOCK CONNECTOR FROM GRP55, ELM02 TD GRP84, ELM01 2 2 2 1 4 3 P03 P03 P01 12 + 5V 84 85 1 2 9 9 .101 F
 FROM GRP3, ELM02
 JUL

 TO GRP84, ELM01
 PO2

 RECTIFIER
 D03

 CAPACITOR
 CGRP30, ELM01

 CONNECTOR TO GRP30, ELM01
 PO1

 FROM GRP30, ELM02
 JO1

 TO GRP80, ELM02
 JO1

 FROM GRP30, ELM02
 PO1

 FUSE FAILURE DETECTOR (GRP50)
 P11

 FUSE FAILURE DETECTOR (GRP50)
 P11

 MIRE FIELD, TO CONN. GRP20, ELM67
 WIRE FIELD, TO CONN. GRP20, ELM67

 CONNECTOR TO GRP35, ELM03
 P17

 CONNECTOR TO GRP35, ELM03
 P17

 CONNECTOR TO GRP35, ELM03
 P17

 DOUTPUT (FROM GRP30, ELM12)
 P01

 FROM GRP20, ELM12
 P01

 FROM GRP20, ELM12
 P01

 SUPPLY (FROM GRP20, ELM72)
 P03

 SUPPLY (FROM GRP20, ELM72)
 P03

 FOC OUTPUT
 FROM GRP20, ELM72)
 P03
 POZ +CAPMOT 22 70.01.0231 7 11 12 10 12 12 21 21 67 67 3 1 24 24 24 24 222 1 2 4 5 3 6 7 24 1.811.898.00 1.811.898.00 1.811.898.00 1.811.898.00 1.811.898.00 2992 UUF 1 1 2 3 3 3 M M 6 DC OUTPUT DC OUTPUT WIRE FIELD, FROM RECTIFIERS RECTIFIER +PSVTMOT 8 8 8 9 F F U L 1 4 1 3 3 3 6 2 2 2

CIGNAL NAME			9 11 11 11	3 1	1 1 4 4		түре M M F F F	DESCRIPTION OF ELEMENT CAPACITOR FROM GROOB, ELMO2 FROM GROOB, ELMO2 FROM GROOB, ELMO2 TO GROJI, ELMO1 (DRIVE AMP. LEFT TO GROJ2, ELMO1 (DRIVE AMP. RIGF SUPPLY (FROM GROGA, ELMO2)	(T)	REMARK	ELEMENT NR.
FREMSUP	8 8		19 19 20 20	1 2 5 10 2 1	16 16 5 6 16 16 3		м F М F	SUPPLY (FROM GRPO3, ELMO2) SUPPLY (FROM GRPO3, ELMO2) FROM GRP30, ELMO2 TO GRP20, ELMI0 PARALLEL REMOTE IF (GRP35) PARALLEL REMOTE IF (GRP35) FROM STABILIZER GRP30, ELMO2 OUTPUT (TO GRP20, ELMI0) FROM GRP35, ELMO1 TO GRP34, ELMO1 CONN. AUTOLOCATOR, REMOTE TIMER	J01 P01 P05 P05 J01 P01 P01 P02		
			35 35 35	1 2 2				TO GRP33, ELMO1 FROM GRP20, ELMO5 FROM GRP20, ELMO5	P01 P02 P02		
STABIN	2 2 2 2 2		7 7 7 30 30	8 9 12 12 1	1 1 1 4		L L M F F	RECTIFIER CAPACITOR CAPACITOR Connector To GRP30, Elmo1 Connector To GRP30, Elmo1 DC Input (Fram Grp07, Elm12) DC Input (Fram Grp07, Elm12)	D01 C04 C05 P01 P01 J01 J01		70.01.023 59.26.710 59.26.710
STABSNS	3 3		19 20 20 20 30	1 2 10 12 12 2 1	17 17 7 8 17 7		 Р М Г	FROM GRP30, ELM02 TO GRP20, ELM10 FROM STABILIZER GRP30, ELM02 FUSE FAILURE DETECTOR (GRP59) FUSE FAILURE DETECTOR (GRP59) OUTPUT ITO GRP20, ELM12 FROM GRP20, ELM12	J01 P01 J01 P11 P11 P01 P01 P01		
UCOMP	2 2		8 8 14 14	2 2 1	3 7 3 3		 N N	CONN. SUPPLY CONTROL (GRP25, ELM CONN. SUPPLY CONTROL (GRP25, ELM FROM GRP08, ELM03 TO GRP25, ELM02 FROM GRP08, ELM03	102)		
•0.0SENS	0 0		19	1 2 10	22 22 22		F M F	FROM GRP30, ELMO2 TO GRP20, ELMI0 FROM STABILIZER GRP30, ELMO2 Output (TO GRP20, ELMI0)	J01 P01 J01 P01		
			30	2	22		m				
**************************************	******* 1.811	***** •090•	25 26 27 	7 1 3 ***** I G ***** TUDER	34 34 34 ***** N A *****	******	W I R E ***********************************	FROM GRP26, ELMOI TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03 	* 12:22 * ********** 00	PAGE 63
************** * WILLI ST ************************************	******** 1.811 ******** COLOR	**** 090 *****	25 26 27 27 	7 1 3 ***** I G ***** TUDER ***** P ELN	34 34 34 34 ***** N A ***** A 8 *****	****** 12 * ******* S LV	W I R E ***********************************	FROM GRP26, ELMOI TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/00 * 88/05 DESCRIPTION OF ELEMENT	P02 P03 	 *******************************	PAGE 63
************** * WILLI ST ************************************	1.811. ********* COLOR	**** 090 *****	255 26 27 27 28 27 20 20 20 20 20 20 20 20 20 20 20 20 20	7 1 3 ****** I G ****** TUDER ****** 1 2 1 2 1 7 8 9 10	34 34 34 34 34 34 34 ****** ***********	****** 12 * ******* S LV	H I R E TAPE DECK & AUDIO TYPE U M F M F	FROM GRP26, ELMOI TO GRP25, ELMOJ/GRP27, ELMO3 FROM GRP26, ELMOI	P02 P03 	********** * 12:22 * *********** 00 **********	PAGE 63 ************************************
**************************************	L.811 L.811 COLOR 4 0 2	**** 090 *****	25 26 27 27 27 27 27 27 27 27 27 27 27 27 27	7 1 3 ****** TUDER ****** 1 2 1 2 1 2 1 3 9 10 11 12 20 20 20 20 20 20	34 34 34 8 8 8 12 11 11 5 5 5 11 12 14 14 15 7	****** 12 * ******* S LV	W I R E TAPE DECK & AUDIO	FROM GRP26, ELMOI TO GRP25, ELMOJ/GRP27, ELMO3 FROM GRP26, ELMO1 	P02 P03 P03 P03 P03 P03 P04 P04 P04 P04 P04 P04 P05 P08 P09 J010 P11 P55/66	********** * 12:22 * *********** 00 **********	PAGE 63 ************************************
************** * WILLI ST ************************************	**************************************	**** 090 *****	ASY GR 10 10 10 10 10 10 10 10 10 10	7 1 3 3 I G G S TUDER TUDER TUDER 1 1 2 1 1 2 1 1 2 2 1 1 2 2 0 2 9 9 1 1 2 2 0 2 9 9 1 1 2 2 0 2 9 9 1 1 2 2 0 2 9 9 1 1 2 2 0 2 9 9 5 1 1 2 2 0 2 5 5 5 5 5 5 5 5 5 5 5 5 5	34 34 34 34 34 34 34 34 34 34 34 34 34 3	****** 12 * ******* S LV	H I R E TAPE DECK & AUDIO TYPE U M F M F F U U U	FROM GRP26, ELMOI TO GRP25, ELMOJ/GRP27, ELMO3 FROM GRP26, ELMO1 	P02 P03 P03 P03 P01 P01 P01 P01 P07 P08 P09 P07 P08 P09 P07 P09 P07 P09 P07 P09 P07 P09 P01 P07 P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	********** * 12:22 * *********** 00 **********	P A G E 63 ELENENT NR. ELENENT NR. ELENENT NR. 1.811.898.0 1.811.775.0 1.820.764.0 1.820.753.0 1.820.728.0 1.820.728.0 1.820.728.0 1.820.728.0 1.820.728.0 1.820.728.8 1.820.
************** * WILLI ST ************************************	**************************************	**** 090 *****	25 26 27 27 27 27 27 27 27 20 27 27 27 27 27 27 27 27 27 27 27 27 27	7 13 3 3 1 G 2 1 UDER TUDER P ELL 1 2 2 1 1 7 8 9 9 10 11 1 2 2 0 2 9 9 3 0 11 1 2 2 0 2 9 9 4 2 4 3 4 4 4 5 4 6 6 6 4 7 5 5 5 5 5 5 7 7	 34 34 34 34 8 8 12 11 11 5 5 5 11 12 14 15 5 5 11 12 14 15 5 5 11 15 15 15 16 18 18 18 18 18 18 18 18 18 18	****** 12 * ******* S LV	H I R E TAPE DECK & AUDIO TYPE U M F M F F U U U	FROM GRP26, ELM01 TO GRP25, ELM07/GRP27, ELM03 FROM GRP26, ELM01 FROM GRP26, ELM01 FROM GRP26, ELM01 I I S T * 89/01 ************************************	P02 P03 P03 P03 P03 P01 P01 P01 P01 P07 P08 P09 P01 P07 P08 P09 P01 P07 P05 P05 P05 P05 P05 P05 P05 P05 P05 P05	********** * 12:22 * *********** 00 **********	P A G E 63

STUDER A812

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					DESCRIPTION OF ELEMENT	REMARK	ELEMENI NK.
<< CONT.OF +15.0			27 3 6 27 4 1 27 5 3 30 2 11 31 2 5 32 2 5 36 1 5 36 2 5	M	FROM GRP26, ELMO1 PO3 SUPPLY (FROM GRP20, ELM20) J01 CONNECTOR RS 232 (SERVICE) J02 OUTPUT (TO GRP20, ELM10) P01 FROM GRP24, ELM01 P01 FROM GRP24, ELM02 P01 FROM GRP24, ELM02 P01 OUTPUT TO VUPANEL P01 INPUT FROM BASIS BOARD P02 CONTENL CONN. FROM GRP20, ELM07 EM07		
			43 2 3 43 12 3 58 1 5 58 2 5 59 1 14 60 2 5		CABLE TO GRP7O, ELMO1 FROM B. BOARD TAPE DECK, ELM 19 PO1 TO VU-METER PANEL PO2 FROM GRP2O, ELM12 PO1		
			$\begin{array}{cccccccccccccccccccccccccccccccccccc$		RESERVE P02 RESERVE P03 COMMANDS CH 03 P04 COMMANDS CH 01 P05 COMMANDS CH 02 P06		
			$\begin{array}{cccccccccccccccccccccccccccccccccccc$	F	COMMANDS MONITOR AMPLIFIER P07 FROM GRP70, ELMO7 P01 TO TD PERIPHERY DRIVER P01 TO TD PERIPHERY DRIVER P01 FROM GRP35, ELMO2 P01 TO GRP84, ELMO1 P02		
	2 2		85 2 6 90 1 13 90 2 1	A L	TO GRP84, ELMO1 PO2 HEAD BLOCK CONNECTOR PO1 REPRODUCE PREAMPLIFIER		
+15.0T	2		58 3 1		TO MECHANICAL TIMER PO3		
+24.0	7 7 7		$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	L F M	1.811.510.83 FROM GRP30, ELM02 J01 TG GRP20, ELM10 P01 TAPE DECK DISPLAY DRIVER P04 TAPE DECK DISPLAY DRIVER P04 VU-METER PANEL, EXTERNAL P07 VU-METER PANEL, EXTERNAL P08 E000 SIMPLIZE GODDO ELM03		
	7 7 7 7		20 10 15	c	TAPE DECK DISPLAY DRIVER P04 TAPE DECK DISPLAY DRIVER P04 VU-METER PANEL, EXTERNAL P07 VU-METER PANEL, EXTERNAL P08 FROM STABLILZER GRP30, ELM02 J01 FUSE FAILURE DETECTOR (GRP50) P11 WIRE FIELD, TO CONN. GRP20, ELM05/66 CONNECTOR TO GRP25, ELM01 P15 CONNECTOR TO GRP25, ELM01 P15 TO GRP30, ELM01 TO GRP30, ELM01		1.811.898.00
	, 7 7 7 7 7 7		20 12 4 20 20 65 3 20 65 3 20 65 7 20 65 10 20 65 11 20 65 14 20 65 14 20 65 18 20 65 18 20 68 1 20 69 1 20 69 1 20 69 1	, F F F	CONNECTOR TO GRP25, ELMOI P15 CONNECTOR TO GRP25, ELMOI P15		
	7 7 7		20 68 1 20 69 1	x	TO GRP80, ELMOI TO GRP81, ELMOI TO GRP81, ELMO2		1.811.898.00 1.811.898.00 1.811.898.00
د WILLI ST ************************************	UDER AG ******** 1.811.0	* ***** 090.0	**************************************	********************** L W I R E ***********************************	L I S T * 89/09/18 * J I S T * 89/09/18 * ***********************************	12:22 * ***********	PAGE 65 * **********************************
* WILLI ST	UDER AG ******** 1.811.0 *******	* ***** 090.0 ****	S I G N A S I G N A S S S S S S S S S S S S S S S S S S S	**************************************	L I S T * 89/09/18 * . 	12:22 * *********************************	PAGE 65 * **********************************
WILLI ST ***************	UDER AG ******** 1.811.0 *******	* ***** 090.0 ****	S I G N A S I G N A V STUDER A 81 V STUDER A 81 V STUDER A 81 20 71 1 20 20 72 1 20 73 20 73 1 20 75 1 20 75 1 3 25 1 6 25 1 75 1 1 25 1 1 25 1 10 25 1 1 25 1 1 25 1 11 25 1 1 25 1 1	L W I R E ************************************	L I S T * 89/09/18 *	12:22 * *********************************	PAGE 65 * **********************************
WILLI ST ****************	UDER AG ******** 1.811.0 *******	* ***** 090.0 ****	S I G N A 0 * STUDER A 81 ************************************	L W I R E TAPE DECK & AI S LV TYPE 	L I S T * 89/09/18 *. JDIO * 88/05/19 - 0 CESCRIPTION OF ELEMENT R TO GRP81, ELMO3 TO GRP82, ELMO5 TO GRP84, ELMO5 TO GRP84, ELMO1 TO GRP84, ELMO1 TO GRP84, ELMO1 SUPPLY + SOLENOIDS PO7 SUPPLY + SOLENOIDS PO7 SU	12:22 * *********************************	PAGE 65 *
WILLI ST ****************	UDER AG ******** 1.811.0 *******	* ***** 090.0 ****	S I G N A 00 * STUDER A 81 ASY GRP ELN PNT 20 71 1 20 72 1 20 72 1 20 72 1 20 72 1 20 74 1 20 75 1 25 1 16 25 1 17 25 1 14 25 1 15 25 1 15 25 1 19 25 4 16 30 2 15 36 1 24 36 2 24 36 3 26 36 4 33 43 12 25 5 2 1	L W I R E 2 * TAPE DECK & A S LV TYPE X X X M M M M M M M	L I S T * 89/09/18 *. JDIO * 88/05/19 - 0 DESCRIPTION OF ELEMENT R TO GRP81, ELMO3 TO GRP82, ELMO5 TO GRP83, ELMO5 TO GRP84, ELMO1 TO GRP86, ELMO1 TO GRP86, ELMO1 TO GRP86, ELMO1 TO GRP86, ELMO1 SUPPLY + SOLENOIDS PO7 SUPPLY - SOLENOI	12:22 * *********************************	PAGE 65 *
WILLI ST ****************	UDER AG ******** 1.811.0 *******	* ***** 090.0 ****	S I G N A 00 * STUDER A 81 ASY GRP ELN PNT 20 71 1 20 72 1 20 72 1 20 72 1 20 74 1 20 74 1 20 75 1 25 1 10 25 1 10 25 1 11 25 1 14 25 1 15 25 1 19 25 4 16 30 2 15 36 1 24 36 2 24 36 2 24 30 16 24 70 1 24 70 3 16	L W I R E 2 * TAPE DECK & A S LV TYPE X X X M M M M M M M	L I S T * 89/09/18 *. JDIO * 88/05/19 - 0 DESCRIPTION OF ELEMENT R DESCRIPTION OF ELEMENT R TO GRP81, ELMO3 TO GRP82, ELMO5 TO GRP82, ELMO5 TO GRP84, ELMO5 TO GRP84, ELMO1 TO GRP84, ELMO1 TO GRP84, ELMO1 TO GRP84, ELMO1 SUPPLY + SOLENOIDS P07 SUPPLY - SOLENOIS P07 SUPPLY - SOLENOIS P07 SUPPLY - SOLENOI	12:22 * *********************************	P A G E 65 *
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" WILLI ST	UDER AG ******** 1.811.0 *******	* ***** 090.0 ****	S I G N A 0 * STUDER A 81 * * * A 81 * * * 1 20 72 1 20 71 1 20 74 1 20 75 1 32 5 1 11 25 1 15 25 1 15 25 1 15 25 1 15 36 2 24 36 2 25 52 1 6 5 12 25 52 1 6 5 12 25 52 1 6 70 <td< td=""><td>L W I R E 2 * TAPE DECK & A S LV TYPE X X X M M M M M M M</td><td>L I S T * 89/09/18 * JDIO * 86/05/19 - 0 DESCRIPTION OF ELEMENT R DESCRIPTION OF ELEMENT R TO GRP81, ELMO3 TO GRP82, ELMO5 TO GRP83, ELMO5 TO GRP84, ELMO1 TO GRP86, ELMO1 SUPPLY + SOLENOIDS P07 SUPPLY + SOLENOID P06 COMMANDS CH 03 P05 COMMANDS CH 03 P05 COMMANDS CH 03 P05 COMMANDS CH 01 P06 LIFT SOLENOID A PRESS SOLENO</td><td>12:22 * *********************************</td><td>PAGE 65 *</td></td<>	L W I R E 2 * TAPE DECK & A S LV TYPE X X X M M M M M M M	L I S T * 89/09/18 * JDIO * 86/05/19 - 0 DESCRIPTION OF ELEMENT R DESCRIPTION OF ELEMENT R TO GRP81, ELMO3 TO GRP82, ELMO5 TO GRP83, ELMO5 TO GRP84, ELMO1 TO GRP86, ELMO1 SUPPLY + SOLENOIDS P07 SUPPLY + SOLENOID P06 COMMANDS CH 03 P05 COMMANDS CH 03 P05 COMMANDS CH 03 P05 COMMANDS CH 01 P06 LIFT SOLENOID A PRESS SOLENO	12:22 * *********************************	PAGE 65 *
MILLI ST ************************************	UDER AG ********* 1.911./ ************************************	* ***** 090.0 ****	S I G N 0 * STUDER A 81 ASY GRP ELM PNT 20 71 1 20 72 1 20 72 1 20 74 1 20 74 1 20 74 1 20 74 1 25 1 3 25 1 6 25 1 14 25 1 15 25 1 16 25 1 15 25 1 15 25 1 16 25 1 15 36 2 24 36 2 24 36 3 1 25 1 6 59 1 4 70 2 4 70	L W I R E	L I S T * 89/09/18 * JDIO * 88/05/19 - 0 DESCRIPTION OF ELEMENT R DESCRIPTION OF ELEMENT R TO GRP81, ELMO3 TO GRP82, ELMO5 TO GRP83, ELMO5 TO GRP84, ELMO1 TO GRP84, ELMO1 TO GRP84, ELMO1 TO GRP84, ELMO1 TO GRP84, ELMO1 SUPPLY + SOLENOIDS P07 SUPPLY + SOLENOIDS P07 CUTPUT TO GRP20, ELMI0 P01 OUTPUT TO GRP20, ELMI0 P01 OUTPUT TO GRP20, ELMO4 P01 FROM GRP20, ELM04 P01 FROM GRP	12:22 * *********************************	PAGE 65 *
<pre>4 HILI ST 4 GAL NAME 5 GAL NAME 5</pre>	UDER AG ******** 1.811.0 *******	* ***** 090.0 ****	S I G N A S S S U R S U R S U R S U R S U R S U R S U R S U R	L W I R E	L I S T * 89/09/18 *. JDIO * 88/05/19 - 0 ************************************	12:22 * *********************************	PAGE 65 *

EDITION: 1. Oktober 1989

* WILLI STUDER AG * S I G N A L N I R E L I S T * 89/09/18 * 12:22 * P A G E 66 * * 1.811.990.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 * *

SIGNAL NAME	COLUR	MI	ASY GRP	ELM	I PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT	REMARK	ELEMENT NR.
+5.0R	2		83	2	2			N	TAPE END SWITCH, RIGHT		
+5.6SENS	3 3		20	1 2 10 12 12 2		-		F M F	FROM GRP30, ELM02 JOI TG GRP20, ELM10 PO1 FROM STABLIZER GRP30, ELM02 JOI FUSE FAILURE DETECTOR (GRP59) P11 FUSE FAILURE DETECTOR (GRP59) P11 OUTPUT (TO GRP20, ELM10) P01		
-PSVTMOT	6 6 6 6 6 6 6		8 8 9 9 11 11 11 11 11 31 32	3 6 1 4 1 2 3 1 1	3 6 3 4 2 3 6 6 6 6 6	-		F F U L M M F F M M	DC QUTPUT DC QUTPUT WIRE FIELD, FROM RECTIFIERS RECTIFIER CAPACITOR FROM GRPO8, ELMO2 FROM GRPO8, ELMO2 FROM GRPO8, ELMO2 TO GRP31, ELMO1 (DRIVE AMP. RIGHT) SUPPLY (FROM GRPO8, ELMO2) JO1 SUPPLY (FROM GRPO8, ELMO2) JO1		
-STABIN	6 6 6			6 10 12 1	4 2 6	-		L L M F	RECTIFIER D02 CAPACITOR C06 CONNECTOR TO GRP30, ELM01 P01 DC INPUT (FROM GRP07, ELM12) J01		70.01.0231 59.26.7103
- STABSNS	5 5			2 10 12	18 18 18 5 18 5	-		F M F M	FROM GRP30, ELM02 JOI TO GRP20, ELM10 PO1 FROM STABLIZER GRP30, ELM02 JOI FUSE FAILURE DETECTOR (GRP59) P11 OUTPUT (TO GRP20, ELM10) PO1 FROM GRP20, ELM12 PO1		
-UCOMP	6 6		8 8 14 14 25	2 2 1 2 2 2	1 9 1 1 1	-		N N	CONN. SUPPLY CONTROL (GRP25, ELMO2) CONN. SUPPLY CONTROL (GRP25, ELMO2) FROM GRP08, ELMO3 TO GRP25, ELMO2 FROM GRP08, ELMO3 JO2		
-10VREF			25 26 27	1	37 37 37			L	FROM GRP26, ELMO1 PO2 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 PO3		
-15.0	6 6		20		6 6 12 9			F M F F F	FROM GRP30, ELM02 JOI TO GRP20, ELM10 POI CAPSIAN MOTOR DRIVE AMPLIFIER POI VU-METER PANEL, EXTERNAL POS WU-METER PANEL, EXTERNAL POS MONITOR UNIT, INTERN PO9 FROM SIABILIZER GRP30, ELM02 JOI SYNCHRONIZER (SUPPLY) PI0 FUSE FAILURE DETECTOR (GRP59) PI1 MIRE FIELD, TO CONN. GRP20, ELM05/66 FI1		1.811.898.00
	6 6			20 20 30				U U	WIRE FIELD, TO CONN. GRP20, ELM65766 WIRE FIELD, TO CONN. GRP20, ELM65766 WIRE FIELD, SUPPLY		1.811.898.00

* WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 67 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 *

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20 42 22 CAPSTAN CONTROL UNIT J06 20 43 188 MASTER SERIAL INTERFACE J07 20 43 188 MASTER SERIAL INTERFACE J07 20 45 22 SMPTE/EBU INTERFACE J09 20 46 17A MASTER PERIPHERY CONTR. J10 20 46 178 MASTER PERIPHERY CONTR. J10 20 46 178 MASTER PERIPHERY CONTR. J10 20 47 23 TIME CODE WRITE/READ UNIT J12 20 48 23 TIME CODE MARTE/READ UNIT J13 20 49 23 TIME CODE MARTE/READ UNIT J13 20 50 23 REPORDUCE AMPLIFIER, CH 1 J14 20 51 23 REPRODUCE AMPLIFIER, CH 1 J16 20 52 23 MONO-STERECONSWITCH J17 20 54 23 REPRODUCE AMPLIFIER, CH 2 J18 20 55 23 REPRODUCE AMPLIFIER, CH 2 J20 20 57 23 <td>$\begin{array}{c} 1.820.764.00\\ 1.820.753.00\\ 1.820.753.00\\ 1.820.753.00\\ 1.820.728.00\\ 1.820.728.00\\ 1.820.728.00\\ 1.820.728.00\\ 1.820.722.81\\ 1.820.722.01\\ 1.820.713.00\\ 1.820.713.00\\ 1.820.714.81\\ 1.820.710.81\\ 1.820.714.81\\ 1.820.714.81\\ 1.820.712.00\\ 1.820.712.00\\ 1.820.712.00\\ 1.820.712.00\\ 1.820.712.00\\ 1.820.710.81\\ 1.820.710$</td>	$\begin{array}{c} 1.820.764.00\\ 1.820.753.00\\ 1.820.753.00\\ 1.820.753.00\\ 1.820.728.00\\ 1.820.728.00\\ 1.820.728.00\\ 1.820.728.00\\ 1.820.722.81\\ 1.820.722.01\\ 1.820.713.00\\ 1.820.713.00\\ 1.820.714.81\\ 1.820.710.81\\ 1.820.714.81\\ 1.820.714.81\\ 1.820.712.00\\ 1.820.712.00\\ 1.820.712.00\\ 1.820.712.00\\ 1.820.712.00\\ 1.820.710.81\\ 1.820.710$
20 43 18A MASTER SERIAL INTERFACE JO7 20 43 18B MASTER SERIAL INTERFACE JO7 20 45 22 SMPTE/EBU INTERFACE JO9 20 46 17A MASTER PERIPHERY CONTR. J10 20 46 17B MASTER PERIPHERY CONTR. J10 20 46 17B MASTER PERIPHERY CONTR. J10 20 47 23 TIME CODE WRITE/READ UNIT J11 20 48 23 TIME CODE LAY UNIT J12 20 49 23 RECRON AMPLIFIER, CH 1 J13 20 50 23 REPRODUCE AMPLIFIER, CH 1 J16 20 51 23 REPRODUCE AMPLIFIER, CH 1 J16 20 52 23 REPRODUCE AMPLIFIER, CH 2 J18 20 54 23 REPRODUCE AMPLIFIER, CH 2 J18 20 54 23 REPRODUCE AMPLIFIER, CH 2 J20 20 54 23 REPRODUCE AMPLIFIER, CH 2 J21 20 55 23 <td>$\begin{array}{c} 1.820.753.00\\ 1.820.753.00\\ 1.820.751.00\\ 1.820.728.00\\ 1.820.728.00\\ 1.820.722.80\\ 1.820.722.81\\ 1.820.722.81\\ 1.820.712.81\\ 1.820.712.81\\ 1.820.712.81\\ 1.820.710$</td>	$\begin{array}{c} 1.820.753.00\\ 1.820.753.00\\ 1.820.751.00\\ 1.820.728.00\\ 1.820.728.00\\ 1.820.722.80\\ 1.820.722.81\\ 1.820.722.81\\ 1.820.712.81\\ 1.820.712.81\\ 1.820.712.81\\ 1.820.710$
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20 48 23 TIME CODE DELAY UNIT 112 20 49 23 HF-DRIVER, CH 1 113 20 50 23 RECORD AMPLIFIER, CH 1 114 20 51 23 REPRODUCE AMPLIFIER, CH 1 115 20 52 23 LINE AMPLIFIER, CH 1 116 20 52 23 LINE AMPLIFIER, CH 1 116 20 52 23 HONO-STERED-SWITCH 117 20 54 23 HF-ORIVER, CH 2 118 20 55 23 RECORD AMPLIFIER, CH 2 120 20 55 23 RECORD AMPLIFIER, CH 2 120 20 55 23 RECORD AMPLIFIER, CH 2 120 20 57 23 REPRODUCE AMPLIFIER, CH 2 120 20 57 23 REPRODUCE AMPLIFIER, CH 2 120 20 57 23 REPRODUCE AMPLIFIER, CH 2 120 20 57 24 3 FCONNECTOR TO GRP27, ELMO4 16 6 20 66 3 <td>1.820.722.81 1.820.713.00 1.820.712.81 1.820.710.81 1.820.714.81 1.820.720.00 1.820.713.00 1.820.712.81 1.820.712.81</td>	1.820.722.81 1.820.713.00 1.820.712.81 1.820.710.81 1.820.714.81 1.820.720.00 1.820.713.00 1.820.712.81 1.820.712.81
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20 50 23 RECORD AMPLIFIER, CH 1 J14 20 51 23 REPRODUCE AMPLIFIER, CH 1 J15 20 52 23 LINE AMPLIFIER, CH 1 J16 20 53 23 MONO-STEREO-SWITCH J17 20 54 23 MONO-STEREO-SWITCH J17 20 55 23 RECRON AMPLIFIER, CH 2 J18 20 55 23 RECRON AMPLIFIER, CH 2 J20 20 56 23 REPRODUCE AMPLIFIER, CH 2 J21 20 57 23 LINE AMPLIFIER, CH 2 J21 20 57 23 LINE AMPLIFIER, CH 2 J21 6 20 65 16 F CONNECTOR TO GRP25, ELMO1 P15 6 20 65 16 F CONNECTOR TO GRP25, ELMO1 P15 6 20 66 3 F CONNECTOR TO GRP25, ELMO1 P16 6 20 80 14 B CONNECTOR TO GRP25, ELMO2 P01 24 3 7 FROM GRP26, ELMO2 P01 25 3 6 TAPPE TRANSPARENT P08 24 3 6 TAPPE TRANSPARENT<	1.820.712.81 1.820.710.81 1.820.714.81 1.820.714.81 1.820.720.00 1.820.713.00 1.820.712.81 1.820.710.81
20 51 23 REPRODUCE AMPLIFIER, CH 1 15 20 52 23 LINE AMPLIFIER, CH 1 16 20 53 23 MOND-STERED-SWITCH 117 20 54 23 HF-DRIVER, CH 2 18 20 54 23 RECORD AMPLIFIER, CH 2 118 20 55 23 RECORD AMPLIFIER, CH 2 120 20 56 23 LINE AMPLIFIER, CH 2 120 20 57 23 LINE AMPLIFIER, CH 2 120 20 57 23 LINE AMPLIFIER, CH 2 120 6 20 65 16 F CONNECTOR TO GRP25, ELMO1 P15 6 20 65 14 B CONN. HEAD BLOCK ASSEMBLY 16 24 3 7 FROM GRP26, ELMO2 P01 16 24 3 7 FROM GRP26, ELMO2 P01 24 3 8 FROM GRP26, ELMO2 P01 25 3 6 TAPE TRANSPARENT P08 25 3 <td>1.820.710.81 1.820.714.81 1.820.720.00 1.820.713.00 1.820.712.81 1.820.710.81</td>	1.820.710.81 1.820.714.81 1.820.720.00 1.820.713.00 1.820.712.81 1.820.710.81
20 52 23 LINE AMPLIFIER, CH 1 J16 20 53 23 MONO-STEREO-SWITCH J17 20 54 23 HF-ORIVER, CH 2 J18 20 55 23 RECRO AMPLIFIER, CH 2 J19 20 55 23 REPRODUCE AMPLIFIER, CH 2 J20 20 57 23 LINE AMPLIFIER, CH 2 J21 6 20 65 16 F CONNECTOR TO GRP25, ELMO1 P15 6 20 66 3 F CONNECTOR TO GRP25, ELMO1 P16 6 20 66 3 F CONNECTOR TO GRP25, ELMO1 P16 6 20 8 GONN. HEAD BLOCK ASSEMBLY P01 24 3 7 FROM GRP26, ELMO2 P01 24 3 6 TAPPE TRANSPARENT P08 25 1 16 M SUPPLY + SOLENDIDS P07 25 3 6 TAPPE TRANSPARENT P08 25 4 6 USER P06	1.820.714.81 1.820.720.00 1.820.713.00 1.820.712.81 1.820.710.81
20 53 23 MONO-STERED-SWITCH 17 20 54 23 HF-ORIVER, CH 2 J18 20 55 23 RECORD AMPLIFIER, CH 2 J19 20 56 23 REPRODUCE AMPLIFIER, CH 2 J20 20 57 23 LINE AMPLIFIER, CH 2 J21 6 20 57 23 LINE AMPLIFIER, CH 2 J21 6 20 57 23 LINE AMPLIFIER, CH 2 J21 6 20 65 16 F CONNECTOR TO GRP25, ELMO1 P15 6 20 66 3 F CONNECTOR TO GRP25, ELMO4 P16 6 20 80 14 B CONN. HEAD BLOCK ASSEMBLY 24 3 7 FROM GRP26, ELMO2 P01 24 3 7 FROM GRP26, ELMO2 P01 25 1 6 SUPPLY + SOLENOIDS P03 25 3 6 TAPE TRANSPARENT P08 25 4 6 USER P06 25<	1.820.720.00 1.820.713.00 1.820.712.81 1.820.710.81
20 54 23 HF-ORIVER, CH 2 J18 20 55 23 RECROR AMPLIFIER, CH 2 J19 20 56 23 REPRODUCE AMPLIFIER, CH 2 J20 20 57 23 LINE AMPLIFIER, CH 2 J21 6 20 65 16 F CONNECTOR TO GR25, ELMO1 P15 6 20 66 3 F CONNECTOR TO GR25, ELMO4 P16 6 20 80 14 B CONN, HEAD BLOCK ASSEMBLY P01 24 3 7 FROM GR26, ELMO2 P01 24 3 8 FROM GR26, ELMO2 P01 25 3 6 TAPPE TRANSPARENT P08 25 3 G TAPPE TRANSPARENT P06 25 6 TAPPE TENSION SENSOR, LEFT P06	1.820.713.00 1.820.712.81 1.820.710.81
20 55 23 RECORD AMPLIFIER, CH 2 10 20 56 23 REPRDUCE AMPLIFIER, CH 2 20 20 57 23 LINE AMPLIFIER, CH 2 21 6 20 65 16 F CONNECTOR TO GAP25, ELMO1 P15 6 20 66 3 F CONNECTOR TO GAP25, ELMO4 P16 6 20 80 14 B CONN. HEAD BLOCK ASSEMBLY 24 3 7 FROM GAP26, ELMO2 P01 24 3 8 FROM GAP26, ELMO2 P01 25 1 6 SUPPLY + SOLENOIDS P08 25 3 6 TAPE TRANSPARENT P08 25 4 6 USER P06 25 5 6 TAPE TENSION SENSOR, LEFT P04	1.820.712.81 1.820.710.81
20 56 23 REPRODUCE AMPLIFIER, CH 2 J20 20 57 23 LINE AMPLIFIER, CH 2 J21 6 20 65 16 F CONNECTOR TO GRP25, ELMO1 P15 6 20 66 3 F CONNECTOR TO GRP25, ELMO1 P16 6 20 80 14 B CONN, HEAD BLOCK ASSEMBLY 24 3 7 FROM GRP26, ELMO2 P01 24 3 8 FROM GRP26, ELMO2 P01 24 3 6 SUPPLY + SOLENOIDS P07 25 3 6 TAPPE TRANSPARENT P08 25 4 6 USER P06 25 5 6 TAPPE TENSION SENSOR, LEFT P06	1.820.710.81
20 57 23 LINE AMPLIFIER, CH 2 J21 6 20 65 16 F CONNECTOR TO GRP25, ELM01 P15 6 20 66 3 F CONNECTOR TO GRP25, ELM04 P16 6 20 80 14 B CONN. HEAD BLOCK ASSEMBLY 24 3 7 FROM GRP26, ELM02 P01 24 3 8 FROM GRP26, ELM02 P01 25 1 16 M SUPPLY + SOLENOIDS P03 25 3 6 TAPE TRANSPARENT P08 25 4 6 USER P06 25 5 6 TAPE TENSION SENSOR, LEFT P04	
6 20 65 16 F CÜNNECTOR TÜ GRP25, ELMOI P15 6 20 66 3 F CÜNNECTOR TÜ GRP25, ELMOI P16 6 20 80 14 B CONN, HEAD BLOCK ASSEMBLY 24 3 7 FROM GRP26, ELMO2 P01 24 3 8 FROM GRP26, ELMO2 P01 24 3 8 FROM GRP26, ELMO2 P01 25 1 6 M SUPPLY + SOLEMOIDS P07 25 3 6 TAPE TRANSPARENT P08 25 4 6 USER P06 25 5 TAPE TENSION SENSOR, LEFT P04	1.820.714.81
6 20 66 3 F CONNECTOR TO GRP27, ELMO2 PI6 6 20 80 14 B CONN. HEAD BLOCK ASSEMBLY 24 3 7 FRUM GRP26, ELMO2 PO1 24 3 8 FRUM GRP26, ELMO2 PO1 24 3 8 FRUM GRP26, ELMO2 PO1 24 3 6 SUPPLY + SOLENOIDS PO1 25 1 6 M SUPPLY + SOLENOIDS PO3 25 3 6 TAPE TRANSPARENT PO8 25 4 6 USER PO6 25 5 6 TAPE TENSION SENSOR, LEFT PO4	
6 20 80 14 B CDNN. HEAD BLOCK ASSEMBLY 24 3 7 FROM GRP26, ELM02 P01 24 3 8 FROM GRP26, ELM02 P01 24 3 8 FROM GRP26, ELM02 P01 25 1 6 M SUPPLY + SOLENOIDS P07 25 3 6 TAPE TRANSPARENT P08 25 4 6 USER P06 25 5 6 TAPE TENSION SENSOR, LEFT P04	
24 3 7 FROM GRP26, ELM02 P01 24 3 8 FROM GRP26, ELM02 P01 25 1 16 M SUPPLY + SOLENOIDS P07 25 3 6 TAPE TRANSPARENT P08 25 4 6 USER P06 25 5 6 TAPE TENSION SENSOR, LEFT P04	
24 3 8 FROM GRP26, ELMO2 POI 25 16 M SUPPLY + SOLENOIDS PO7 25 3 6 TAPE TRANSPARENT PO8 25 4 6 USER PO6 25 5 6 TAPE TENSION SENSOR, LEFT PO4	
25 1 6 M SUPPLY + SOLENGIDS P07 25 3 6 TAPE TRANSPARENT P08 25 4 6 USER P06 25 5 6 TAPE TENSION SENSOR, LEFT P04	
25 3 6 TAPE TRANSPARENT P08 25 4 6 USER P06 25 5 6 TAPE TENSION SENSOR, LEFT P04	
25 4 6 USER P06 25 5 6 TAPE TENSION SENSOR, LEFT P04	
25 5 6 TAPE TENSION SENSOR, LEFT P04	
25 7 7 FROM GRP26, ELMO1 PO2	
25 7 8 FROM GRP26, ELMO1 PO2	
25 8 7 FROM GRP 26, ELMO2 PO1	
25 8 8 FROM GRP 26, ELMO2 PO1	
26 1 7 L TO GRP25, ELM07/GRP27, ELM03	
26 1 8 L TO GRP25, ELM07/GRP27, ELM03	
26 2 7 L TO GRP24, ELMO3/GRP25, ELMO8	
26 2 8 L TO GRP24, ELMO3/GRP25, ELMO8	
27 3 7 FROM GRP26, ELMO1 PO3	
27 3 8 FROM GRP26, ELMO1 PO3	
27 4 3 M SUPPLY (FRUM GRP20, ELM20) JO1	
27 5 2 CONNECTOR RS 232 (SERVICE) JO2	
30 2 12 M OUTPUT (TO GRP20, ELM10) P01	
36 1 6 OUTPUT TO VU-PANEL PO1	
36 2 6 INPUT FROM BASIS BOARD PO2	
43 2 16 CONTROL CONN., FROM GRP20, ELMO7	
43 12 16 CABLE TO GRP70, ELMOI	
58 1 6 FROM B. BOARD TAPE DECK, ELM 19 PO1	
58 2 6 TO VU-METER PANEL PO2	
59 1 13 FROM GRP20, ELM12 PO1	
60 2 6 FROM GRP20, ELMO9 PO1	
70 1 6 FROM GRP43, ELM12 PO1	
70 2 6 RESERVE P02	
70 3 6 RESERVE P03 70 4 6 COMMANDS CH 03 P04	

SIGNAL NAME	COLOR	MI	ASY (JR P	ELM	PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
<< CONT.OF				70		6				COMMANDS CH 01	P05		
-15.0				70		6				COMMANDS CH 02	P06		
				70						COMMANDS MONITOR AMPLIFIER	P07		
				71						FROM GRP70, ELMO7 To TD Periphery Driver	P01		
					1						P01		
					1					TO TO PERIPHERY DRIVER	P01 P01		
				85	2				M	TO GRP84, ELMO1	P01 P02		
	6				ī				A	HEAD BLOCK CONNECTOR	P01		
	6			90	2	8			ĩ	REPRODUCE PREAMPLIFIER	.01		
-26.0	9				1		-		F	FROM GRP30, ELMO2	J01		
	9		1	19	2	19			м	TO GRP20, ELM10	P01		
				20					F	FROM STABILIZER GRP30, ELMO2			
				20						FUSE FAILURE DETECTOR (GRP59)			
				20						WIRE FIELD, TO CONN. GRP20, ELM	65/66		1.811.898.00
				30					м	OUTPUT (TO GRP20, ELM10) FROM GRP20, ELM12	P01		
				59		16	-			FROM GRP20, ELM12	P01		
ACPWE-A1	7			6					Y	SECONDARY 1			1.811.523.00
	7					2 C			к	DISTRIBUTOR			
	6					2 D			к	DISTRIBUTOR			
	6			7	2	1	-		L	FUSE, POSITIVE SUPPLY	F		53.03.0106
ΔCPWE-Δ2	8			6					Y	SECONDARY 1			1.811.523.00
	8					2 B	-		к	DISTRIBUTOR			
ACPWE-A3	0				3				Y	SECONDARY 1			1.811.523.00
	0			6					Y	SECONDARY 2			1.811.524.00
	0					1 A			L	FUSE, NEGATIVE SUPPLY FUSE, NEGATIVE SUPPLY	F		53.03.0106 53.03.0106
	0 			7		18	_		L	FUSE, NEGATIVE SUPPLY	۴۰۰		53.03.0106
ACPWE-B1	2			6					Y	SECONDARY 2			1.811.524.00
	5			7	1	3A			к	DISTRIBUTOR			
	2			4	1	38			к	DISTRIBUTOR			
	5			4	τ. Έ	3B 3D 2 12			ĸ	DISTRIBUTOR			70.01.0001
	5			4	12	12			L M	RECTIFIER Connector to grp30, elmoi	D01		70.01.0231
	,		3	30	1	12			F	DC INPUT (FROM GRP07, ELM12)	P01 J01		
AC PWE-B2	1			6			-		Y	SECONDARY 2			1.811.524.00
	ī			7	1	30			ĸ	DISTRIBUTOR			
ACPWE-B3	9			6			-		Y	SECONDARY 1			1.811.523.00
	9			6	4	9			Y	SECONDARY 2			1.811.524.00
	9					2A			L,	RECTIFIER	D02		70.01.0231
	9					2B	_		L	RECTIFIER	002		70.01.0231
ACPWE-C1	0					12				SECONDARY 1			1.811.523.00
	0					17	_		Y	SECONDARY 2			1.811.524.00
ACPWE-C2	0					11 .			Y	SECONDARY 1			1.811.523.00
	0			6		18			Y	SECONDARY 2			1.811.524.00

* WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 6 * * * * 1.811.990.00 * N 8 1.712 * 88/09/18 * 12:22 * P A G E 6 9 *

SIGNAL NAME	COLOR	MI	ASY	GRP	ELM	PNT	s	LV	ТҮРЕ	DESCRIPTION OF ELEMENT	REMARK	ELEMENT NR.
ACPWE-D1	8 8 9 8 8 8 9				1 1 2 5 12 1	10			К К Ц Г	DISTRIBUTOR DISTRIBUTOR DISTRIBUTOR FUSE, POSITIVE SUPPLY F RECTIFIER DOI CONNECTOR TO GRP30, ELMO1 POI DC LINPUT (FROM GRP37, ELM12) JOI		53.03.0106 70.01.0231
ACPWE-D3	5 5	~~		7 7	3 6	2 1	-		L L	FUSE, NEGATIVE SUPPLY F RECTIFIER DO2		53.03.0106 70.01.0231
ACPWM-A1	5 5 3			6 6 8 9	3 6 1 6	15 9 1	-		Y F M L	SECONDARY 1 TO GRP08, ELM06 P01 AC INPUT FUSE, NEGATIVE MOTOR SUPPLY		1.811.523.00
ACPWM-A2	6 6 3			6 6 8 8	3 6 1 5	6	-		 Ү Ғ М U	SECONDARY 1 TO GRP08, ELM06 P01 AG INPUT WIRE FIELD TO FUSES GRP09, ELM05/06		1.811.523.00
ACPWM-A3	9 9				3 4		-		Y L	SECONDARY 1 FUSE, CAPSTAN MOTOR SUPPLY F		1.811.523.00
AC PWM-B1	4 4 4			6	4 6 1	8	-		Y F M	SECGNDARY 2 TO GRP08, ELNO6 PO1 AC INPUT		1.811.524.00
ACPWM-B2	3 3 3 7			6 6 8 8 9	4 6 1 5 5	5 5 3	-		Y F M U L	SECONDARY 2 TO GRPOS, ELMO6 POI AC INPUT WIRE FIELD TO FUSES GRPO9, ELMO5/06 FUSE, POSITIVE MOTOR SUPPLY		1.811.524.00
АСР₩М-ВЗ	0 0				4 7		-		 Ү L	SECONDARY 2 RECTIFIER D03		1.811.524.00 70.01.0231
ACPWM-C1	0 0			6 6	3 4		-		Y Y	SECONDARY 1 SECONDARY 2		1.811.523.00 1.811.524.00
ACPWM-C2	0 0			6	3 4		-		Y Y	SECUNDARY 1 SECONDARY 2		1.811.523.00 1.811.524.00
ACPWM-C3	0			6	3 4		-		Y Y	SECONDARY 1 SECONDARY 2		1.811.523.00 1.811.524.00
ACPWM-D1	5 5			8 9	5 5		-		U L	WIRE FIELD TO FUSES GRP09, ELM05/06 Fuse, positive motor supply		
ACPWM-D2	1			8 9	5	2	-		U L	WIRE FIELD TO FUSES GRP09, ELM05/06 FUSE, NEGATIVE MOTOR SUPPLY		
ACPWM-D3	1			7 7	4 7	2 1	-		L L	FUSE, CAPSTAN MOTOR SUPPLY F RECTIFIER D03		70.01.0231

* WILLI STUDER AG * S I G N A L W I R E L I S T * 897/09/18 * 12:22 * P A G E 70 *

SIGNAL NAME	COLOR	MI	ASY GR	P EL	M PN	r s	LV	TYPE	DESCRIPTION OF ELEMENT	REMARK	ELEMENT NR.
ACPWM-E1	4 4		 8 9					U L	WIRE FIELD, TO RECTIFIERS RECTIFIER		
ACPWM-E2	9 9		 و		4 1			U L	WIRE FIELD, TO RECTIFIERS RECTIFIER		
AC PWM-F1	4 4		6 9	3 7 2 2				U L	WIRE FIELD, TO RECTIFIERS RECTIFIER		
AC PWM-F2	9 9		8 5		3 2			U L	WIRE FIELD, TO RECTIFIERS RECTIFIER		
AFCSW-01) 49) 50					HF-DRIVER, CH 1 J13 RECORD AMPLIFIER, CH 1 J14		1.820.713.00 1.820.712.81
AFCSW-02) 54) 55					HF-DRIVER, CH 2 J18 RECORD AMPLIFIER, CH 2 J19		1.820.713.00 1.820.712.81
AN-CSPDC			20 20 85) 41	16				CAPSTAN MOTOR DRIVE AMPLIFIER POI CAPSTAN MOTOR INTERFACE JO5 PO1		1.811.775.00
AN-R-L	1 1		12 12 31 31 87	2 2 . 3 . 3	6 1 4			 F F F M	FROM GRP31, ELMO3 (DRIVE AMP. LEFT) TO SPOLLING MOTOR, LEFT (GRP87) TO SPODLING MOTOR LEFT PO2 TO SPODLING MOTOR LEFT PO2 CONNECTOR SPOOLING MOTOR LEFT JO1		
AN-R-R	5 5		13 13 32 32 88	3 2 2 3 2 3	4 1 4			м F F F M	FROM GRP32, ELM03 (DRIVE AMP. RIGHT) TO SPOOLING MOTOR, RIGHT (GRP88) TO SPOOLING MOTOR RIGHT PO2 TO SPOOLING MOTOR RIGHT PO2 CONNECTOR SPOOLING MOTOR RIGHT JO1		
AN-S-L	0 0		12 12 31 31 31	22. 31.31.3	5 2 5			м F F F M	FROM GRP31, ELMO3 (DRIVE AMP. LEFT) TO SPOLLING MOTOR, LEFT (GRP87) TO SPODLING MOTOR LEFT PO2 TO SPODLING MOTOR LEFT PO2 CONNECTOR SPODLING MOTOR LEFT JO1		
AN-S-R	0 0		13 13 32 32 88	2 2 3 2 3 1	5 2 5			 М F F F M	FROM GRP32, ELM03 (DRIVE AMP. RIGHT) TO SPOOLING MOTOR, RIGHT (GRP88) TO SPOOLING MOTOR RIGHT PO2 TO SPOOLING MOTOR RIGHT PO2 CONNECTOR SPOOLING MOTOR RIGHT JO1		
AN-T-L	7 7 7		12 12 31 31 87	2 1 2 2 1 3	4 3 6			м ғ Ғ Ғ М	FROM GRP31, ELN03 (DRIVE AMP. LEFT) TO SPOLLING MOTOR, LEFT (GRP87) TO SPOQLING MOTOR LEFT PO2 TO SPOQLING MOTOR LEFT PO2 CONNECTOR SPOQLING MOTOR LEFT JO1		
AN-T-R	8 8		13 13 32	32	6			—————— F F	FROM GRP32, ELMO3 (DRIVE AMP. RIGHT) TO SPOOLING MOTOR, RIGHT (GRP88) TO SPOOLING MOTOR RIGHT PO2		

SIGNAL NAME	COLOR	MI	ASY GRP	ELM	PNT	s	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
<< CONT.OF AN-T-R			32 88	3 1	6 6	-		F M	TO SPOOLING MOTOR RIGHT CONNECTOR SPOOLING MOTOR RIGHT	P02 J01		
AN-TTL			24 25 25 26 82	8 2	26 11 26 26 11	-		L	FROM GRP26, ELMO2 TAPE TENSION SENSOR, LEFT FROM GRP 26, ELMO2 TO GRP24, ELMO3/GRP25, ELMO8 TO TD PERIPHERY DRIVER	P01 P04 P01 P01		
AN-TTR			24 25 25 26 83	8 2	24 11 24 24 11	-		L	FROM GRP26, ELMO2 TAPE TENSION SENSOR, RIGHT FROM GRP 26, ELMO2 TO GRP24, ELMO3/GAP25, ELMO8 TO TD PERIPHERY DRIVER	P01 P03 P01 P01		
AN-VML			24 25 26	8	21 21 21 21	-		L	FROM GRP26, ELMO2 FROM GRP 26, ELMO2 TO GRP24, ELMO3/GRP25, ELMO8	P01 P01		
AN-VMR			24 25 26	8	23 23 23	-		L	FROM GRP26, ELMO2 FROM GRP 26, ELMO2 TO GRP24, ELMO3/GRP25, ELMO8	P01 P01		
ANM-SH1			51 51 52		10 1 10	-			FROM GRP52, ELMO3 WIRE FIELD POTENTIOMETER CONNECTOR PUSHBUTTON ASSEMBLY	P02		
ANM-SH2			51 51 52	1 2 3	9 2 9	-			FROM.GRP52, ELMO3 WIRE FIELD POTENTIOMETER CONNECTOR PUSHBUTTON ASSEMBLY	P02		
ANM-SH3			51 51 52	1 2 3	8 3 8	-			FROM GRP52, ELMO3 WIRE FIELD POTENTIOMETER Connector Pushbutton Assembly	P02		
BIAFB-01				49 50	1 3	-			HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1	J13 J14		1.820.713.00 1.820.712.81
BIAFB-02			20 20	54 55	1 3	-			HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2	J18 J19		1.820.713.00
BIASA-01			20 20	49 50	5 6	-			HF-DRIVER, CH 1 Record Amplifier, CH 1	J13 J14		1.820.713.00 1.820.712.81
BIASA-02			20 20	54 55	5 6	-			HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2	J18 J19		1.820.713.00 1.820.712.81
BIASB-01				49 50	6 7	-			HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1	J13 J14		1.820.713.00
BIASB-02				54 55	6 7	_			HF-DRIVER, CH 2 Record Amplifier, CH 2	J18 J19		1.820.713.00 1.820.712.81
BIASC-01				49 50	7 8	2			HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1	J13 J14		1.820.713.00

EDITION: 1. Oktober 1989

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 89/09/18 * 12:22 * P A G E 72 *

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 88/05/19 - 00
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SIGNAL NAME	COLOR	MI	ASY GRE	ELI	1 PNT	S	Łν	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
BIASC-02			20 20	54 55	7 8	-			HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2	J18 J19		1.820.713.00 1.820.712.81
BR-FADRY			34 35	3 4	8 15	-		В	CONN. PARALLEL REMOTE CONTROL TO CONN. PARALLEL REMOTE CONTR.	J03		
BR-FORW			34 34 35 35	2 3 3 4	3 3 5 5	-		B B	CONNECTOR SYNCHRONIZER CONN. PARALLEL REMOTE CONTROL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.	J0 2 J0 3 P0 3 P0 4		
BR-INPTC			36 36	3 4		-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
BR-INPO1			36 36		14 26	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
BR-INPO2			36 36		21 11	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
BR-LOCST			34 35	3 4	7 13	-		В	CONN. PARALLEL REMOTE CONTROL TO CONN. PARALLEL REMOTE CONTR.	J03 P04		
BR-PLAY			34 34 35 35	2 3 3 4	15 15 4 4	-		B B	CONNECTOR SYNCHRONIZER CONN. PARALLEL REMOTE CONTROL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.	J02 J03 P03 P04		
BR-REATC			36 36		25 13	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
BR-REA01			36 36	3	15 8	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
BR-REA02			36 36	3	18 28	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
∂R−REC			34 34 35 35	2 3 3 4	9 9 17 17	-		в В	CONNECTOR SYNCHRONIZER CONN. PARALLEL REMOTE CONTROL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.	J02 J03 P03 P04		
BR-RECTC			36 36	3 4	22 30	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
BR-RECO1			36 36	3 4	12 25	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
BR-REC02			36 36		19 10	-			CONNECTION REMOTE PANEL Channel Remote Connector	P03 J04		
BR-REPTC			36 36		26 32	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
BR-REP01			36 36		16 27	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03		

SIGNAL NAME	COLOR	MI	ASY GRE	ELM	PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
BR-REP02			36 36		23 12				CONNECTION REMOTE PANEL Channel remote connector	P03 J04		
BR-REW			34 34 35 35	2 3 3 4	2 2 3 3	_		В В	CONNECTOR SYNCHRONIZER CONN. PARALLEL REMOTE CONIROL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.	J02 J03 P03 P04		
BR-STOP			34 34 35 35		16 16 6 6	-		B B	CONNECTOR SYNCHRONIZER CONN. PARALLEL REMOTE CONTROL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.	J02 J03 P03 P04		
BR-SYNTC			36 36		27 14	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
BR-SYN01			36 36	3 4	17 9	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
BR-SYN02			36 36	4	20 29	-			CONNECTION REMOTE PANEL Channel remote connector	P03 J04		
BR-TCPRS			36 36	3	29 15	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
BR-VRSPD			34 34 35 35	2 3 3 4	4 4 7 7	-		В В	CONNECTOR SYNCHRONIZER CUNN. PARALLEL REMOIE CUNIRUL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.	J02 J03 P03 P04		
CA-ADR-R			20 20 20 20 20 20 20 20 20 20 20 20 20	46 47 48 50 51 52 53 54 55 56 57	27 27 27 27 27 27 27 27 27 27 27				MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT THE CODE DELAY UNIT HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 INE AMPLIFIER, CH 1 MONO-STEREO-SWITCH HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J11 J12 J13 J14 J15 J16 J17 J18 J19 J20 J21		1.820.728.0 1.820.721.6 1.820.722.8 1.820.712.6 1.820.712.8 1.820.710.8 1.820.710.8 1.820.710.8 1.820.710.8 1.820.712.8 1.820.712.8 1.820.712.8 1.820.714.8 1.820.714.8
CA-ADR-S			20 20 20 20 20 20 20 20 20 20 20 20 20 2	53 54 55	28 28 28 28 28 28 28 28 28 28				MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT THE CODE DELAY UNIT HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J11 J12 J13 J14 J15 J16 J16 J17 J18 J19 J20 J21		1.820.728.0 1.820.721.8 1.820.722.8 1.820.713.0 1.820.712.8 1.820.710.8 1.820.710.8 1.820.710.8 1.820.710.8 1.820.712.0 1.820.712.8 1.820.710.8 1.820.710.8
* WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 74 * * I.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 * *

SIGNAL NAME	COLOR	MI	ASY	GR P	ELM	PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
CA-ADR-T				20 20 20 20 20 20 20 20 20 20 20 20 20 2	46 47 48 49 50 51 52 53 54 55 56 57	23B 29 29 29 29 29 29 29 29 29 29 29 29 29	-			MASTER PERIPHERY CONTR. TIME CODE WAITE/READ UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J11 J12 J13 J14 J15 J16 J17 J18 J19 J20 J21		1.820.728.00 1.820.721.81 1.820.721.81 1.820.712.81 1.820.710.81 1.820.710.81 1.820.714.81 1.820.714.81 1.820.713.00 1.820.713.00 1.820.710.81 1.820.710.81
CA-ADR-U				20 20 20 20 20 20 20 20 20 20 20 20 20 2	46 47 48 50 51 52 53 54 55 56 57	24B 30 30 30 30 30 30 30 30 30 30 30	-			MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MOND-STERED-SWITCH HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J11 J12 J13 J14 J15 J16 J17 J18 J19 J20 J21		1.820.728.00 1.820.721.81 1.820.721.81 1.820.712.81 1.820.710.81 1.820.710.81 1.820.710.81 1.820.710.81 1.820.710.81 1.820.713.90 1.820.713.81 1.820.713.81 1.820.714.81
CA-BADO1				20 20		17 17	-			HF-DRIVER, CH 1 Record Amplifier, CH 1	J13 J14		1.820.713.00 1.820.712.81
CA-BAD02				20 20	54 55					HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2	J18 J19		1.820.713.00 1.820.712.81
CA-CHSTC				20 20 20	47		_			MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT	J10 J11 J12		1.820.728.00 1.820.721.81 1.820.722.81
CA-CHSO1				20 20 20 20 20 20	46 49 50 51 52	39	-			MASTER PERIPHERY CONTR. HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1	J10 J13 J14 J15 J16		1.820.728.00 1.820.713.00 1.820.712.81 1.820.710.81 1.820.714.81
CA-CHSO2				20 20 20 20 20 20	46 54 55 56 57	39 39	-			MASTER PERIPHERY CONTR. HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J18 J19 J20 J21		1.820.728.00 1.820.713.00 1.820.712.81 1.820.710.81 1.820.710.81 1.820.714.81
CA-DATA0				20 20 20 20 20 20 20 20 20	46 47 48 49 50 51 52	25B 31 31 31 31 31 31 31 31	-			MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1	J10 J11 J12 J13 J14 J15 J16		1.820.728.00 1.820.721.81 1.820.722.81 1.820.713.00 1.820.713.00 1.820.710.81 1.820.710.81 1.820.714.81

* WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 75 * * I.BIL.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 *

SIGNAL NAME	COLOR	MI	ASY GRP EL	M PN	IT S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
< CONT.OF CA-DATAO			20 53 20 54 20 55 20 56 20 56 20 57	31 31 31				MONO-STEREO-SWITCH HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J17 J18 J19 J20 J21		1.820.720.00 1.820.713.00 1.820.712.81 1.820.710.81 1.820.714.81
CA-DATAI			20 46 20 47 20 48 20 50 20 51 20 52 20 53 20 54 20 55 20 56 20 56 20 57	32 32 32 32 32 32 32 32 32 32 32 32				MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J11 J12 J13 J14 J15 J16 J17 J18 J19 J20 J21		1.820.728.00 1.820.721.81 1.820.721.81 1.820.712.81 1.820.712.81 1.820.710.81 1.820.710.81 1.820.720.00 1.820.714.81 1.820.712.61 1.820.712.61 1.820.714.81
CA-DATA2			20 46 20 47 20 48 20 50 20 51 20 52 20 53 20 54 20 55 20 56 20 56 20 56	33 33 33 33 33 33 33 33 33 33 33 33 33				MASTER PERIPHERY CONTR. TIME CODE MRITE/READ UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MOND-STEREO-SWITCH HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J11 J12 J13 J14 J15 J16 J17 J18 J19 J20 J21		1.820.728.00 1.820.721.81 1.820.721.81 1.820.712.81 1.820.712.81 1.820.710.81 1.820.714.81 1.820.714.81 1.820.712.81 1.820.712.81 1.820.714.81 1.820.714.81
CA-DATA3			20 46 20 47 20 48 20 50 20 51 20 52 20 53 20 54 20 55 20 56 20 56 20 57	34 34 34 34 34 34 34 34 34 34				MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J11 J12 J13 J14 J15 J16 J17 J18 J19 J20 J21		1.820.728.00 1.820.721.81 1.820.721.81 1.820.712.81 1.820.712.81 1.820.710.81 1.820.710.81 1.820.714.81 1.820.712.81 1.820.712.81 1.820.714.81
CA-DATA4		_	20 46 20 47 20 48 20 49 20 50 20 51 20 52 20 53 20 54	35 35 35 35 35 35				MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH HF-DRIVER, CH 2	J10 J11 J12 J13 J14 J15 J16 J17 J18		$\begin{array}{c} 1.820.728.00\\ 1.820.722.81\\ 1.820.722.81\\ 1.820.713.00\\ 1.820.712.01\\ 1.820.710.81\\ 1.820.710.81\\ 1.820.714.81\\ 1.820.720.00\\ 1.820.713.00\end{array}$

SIGNAL NAME	COLOR	MI	ASY GR	P ELI	M PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
<< CONT.OF CA-DATA4				55 56 57		-			RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J19 J20 J21		1.820.712.81 1.820.710.81 1.820.714.81
CA-DATA5			20 20 20 20 20 20 20 20 20 20 20 20	47 48 49 50 51 52 53 54 55	36 36 36 36 36 36 36 36 36	-			MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 REGORD AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH HF-DRIVER, CH 2 REFORDUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J1i J12 J13 J14 J15 J16 J17 J18 J19 J20 J21		1.820.728.00 1.820.721.81 1.820.721.91 1.820.712.81 1.820.710.81 1.820.710.81 1.820.710.81 1.820.720.00 1.820.712.81 1.820.712.81 1.820.710.81 1.820.712.81 1.820.714.81 1.
CA-DATA6			20 20 20 20 20 20 20 20 20 20 20 20 20	47 48 49 50 51 52 53 54 55 56	37 37 37 37 37 37 37 37 37 37 37	-			MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT HF-ORIVER, CH 1 RECORD AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH HF-ORIVER, CH 2 REFORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J11 J12 J13 J14 J15 J16 J17 J18 J19 J20 J21		1.820.728.00 1.820.721.61 1.820.722.81 1.820.712.91 1.820.712.91 1.820.710.81 1.820.710.81 1.820.710.81 1.820.712.00 1.820.713.00 1.820.713.81 1.820.710.81 1.820.710.81 1.820.714.81
CA-DATAT			20 20 20 20 20 20	47 48 49 50 51 52 53 54 55	38 38 38 38 38 38 38 38 38 38 38 38 38	-			MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STERED-SWITCH HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J11 J12 J13 J14 J15 J16 J17 J18 J19 J20 J21		1.820.728.00 1.820.721.81 1.820.721.81 1.820.713.00 1.820.710.81 1.820.710.81 1.820.710.81 1.820.720.00 1.820.714.81 1.820.712.81 1.820.712.81 1.820.710.81 1.820.710.81 1.820.714.81
CA-EQLO1				51 52		-			REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1	J15 J16		1.820.710.81 1.820.714.81
CA-EQL02				56 57		-			REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J20 J21		1.820.710.81 1.820.714.81
CA-LSW01				51 52		_			REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1	J15 J16		1.820.710.81 1.820.714.81
CA-LSW02				56 57		-			REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J20		1.820.710.81 1.820.714.81

* MILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * □P A G E 77 * * HILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * □P A G E 77 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00

SIGNAL NAME	COLOR	MI	ASY GRP	ELM	I PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
CA-MONO				46 53	13B 39	-			MASTER PERIPHERY CONTR. MONO-STEREO-SWITCH	J10 J17		1.820.728.00 1.820.720.00
CA-R 5₩01				49 50					HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1	J13 J14		1.820.713.00 1.820.712.81
CA-RSW02			20 20		18 18				HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2	J18 J19		1.820.713.00 1.820.712.81
CA-SAFE			20 20 20 20 20 20 20 20 20 20 20 20 20 2	46 47 48 49 50 51 52 53 54 55 56 57	26 26 26 26 26				MASTER PERIPHERY CONTR. TIME CODE VALTE/READ UNIT TIME CODE DELAY UNIT HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MOND-STERED-SWITCH HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J11 J12 J13 J14 J15 J16 J17 J18 J19 J20 J21		1.820.728.00 1.820.721.01 1.820.712.81 1.620.712.81 1.820.710.81 1.820.710.81 1.820.710.81 1.820.710.81 1.820.712.81 1.820.710.81 1.820.710.81 1.820.710.81 1.820.710.81
CA-SYN01			20 20	51 52	16 17				REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1	J15 J16		1.820.710.81 1.820.714.81
CA-SYN02			20 20	56 57	16 17				REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J20 J21		1.820.710.81 1.820.714.81
CPHASE-R	2 2		84 84 85	1 4 2	1 1 1			F L M	FROM GRP85, ELMO2 STATOR (WIRE FIELD) TO GRP84, ELMO1	J01 P02		
CPHASE-S	0 0		84 84 85	1 4 2	3 2 3			F L M	FROM GRP85, ELMO2 STATOR (WIRE FIELD) TO GRP84, ELMO1	J01 P02		
CPHASE-T	9 9 9		84 84 85	1 4 2	2 3 2			F L M	FROM GRP85, ELMO2 STATOR (WIRE FIELD) TO GRP84, ELMO1	J01 P02		
DC PHR-L			24 31	1 2	4 4				TO GRP31, ELMO2 FROM GRP24, ELMO1	P02 P01		
DC PHR-R			24 32	2 2	4 4			***********	TO GRP32, ELMO2 FROM GRP24, ELMO2	P03 P01		******
DC PHT-L			24 31	1 2	3 3				TO GRP31, ELMO2 FROM GRP24, ELMOI	P02 P01		
DC PHT-R			24 32	2 2	3 3		-		TO GRP32, ELMO2 FROM GRP24, ELMO2	P03 P01		
EQUAL-01				50 51	2 2				RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1	J14 J15		1.820.712.81 1.820.710.81

* MILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 78 * * 1.011.000.00 * STUDER A 012 * TAPE DECK A JUDIO

SIGNAL NAME	COLOR	MI	ASY GRI	> ELM	PNT	s _	L V 	ТҮРЕ	DESCRIPTION OF ELEMENT	REMARK	ELEMENT NR.
EQUAL-02			20 20		2 2				RECORD AMPLIFIER, CH 2 J19 REPRODUCE AMPLIFIER, CH 2 J20		1.820.712.81
R AC S-01			20			-			HF-DRIVER, CH 1 J13		1.820.713.00
ER AC S-02	7		20	31	1	-		U	WIRE FIELD, ERASE HEAD CH 2		
	7		20 20 90		9 45 45			В	HF-DRIVER, CH 2 J18 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR PO1		1.820.713.00
ER AHH-TC	0		20		2	-		U	WIRE FIELD, TC HEADS + TC IN/OUT		
	0 3		20 20 90		4 25 25			B A	TIME CODE WRITE/READ UNIT J11 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR POI		1.820.721.81
ERAHH-01	9		20	26	.4	-		U	WIRE FIELD, ERASE HEAD CH 1 + SUPPLY		
	9		20 20 90		14 38 38			В	HF-DRIVER, CH 1 J13 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR PO1		1.820.713.00
ERAHH-02	9		20		.4	-		U	WIRE FIELD, ERASE HEAD CH 2		
	9		20 20 90	80	14 22 22			В	HF-DRIVER, CH 2 J18 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR P01		1.820.713.00
ERAHL-TC	6		20		1	-		U	WIRE FIELD, TC HEADS + TC IN/OUT		
	6 5		20 20 90		5 41 41			B A	TIME CODE WRITE/READ UNIT J11 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR P01		1.820.721.81
ERAHL-01	 6		20	26	 2	-		U	WIRE FIELD, ERASE HEAD CH 1 + SUPPLY		
	6		20 20	49	12 39			в	HF-DRIVER, CH 1 J13 CONN. HEAD BLOCK ASSEMBLY		1.820.713.00
	3		90	1		-		A	HEAD BLOCK CONNECTOR PO1		
ERAHL-02	6		20 20		2 12			U	WIRE FIELD, ERASE HEAD CH 2 HF-DRIVER, CH 2 J18		1.820.713.00
	6 3		20 90		23			B A	CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR PO1		
ERAHM-01	2		20		3	-		U	WIRE FIELD, ERASE HEAD CH 1 + SUPPLY		
	2 5		20 20 90		13 40 40			B A	HF-DRIVER, CH 1 J13 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR P01		1.820.713.00
ERAHM-02	2		20			-		 U	WIRE FIELD, ERASE HEAD CH 2		
	- Z 5		20 20 90		13 24 24			B	HF-DRIVER, CH 2 J18 CDNN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR P01		1.820.713.00
ERAH0-01	 S		20	26		-		U	WIRE FIELD, ERASE HEAD CH 1 + SUPPLY		
	-		20 20	49 80	15 37			в	HF-DRIVER, CH 1 J13 CONN. HEAD BLOCK ASSEMBLY		1.820.713.00
	S				37				HEAD BLOCK CONNECTOR PO1		
**************************************	******* UDER AG ******	****	S ******	I G *****	 **** N *****	A L ***4	***** * T	W I R E	*******	* 12:22 ************	* PAGE 79 * **********************************
* WILLI ST *************** * ***********	****** UDER AG ****** 1.811. ******	**** 090. ****	******** S ********	***** I G ***** TUDER ****	**** N ***** A ****	A L **** 812 ****	**** * T ****	W I R E ***********************************	L I S T * 89/09/18 ************************************	* 12:22 ************	* PAGE 79 * **********************************
* WILLI ST *************** * * SIGNAL NAME	****** UDER AG ****** 1.811. ******	**** 090. ****	ASY GRI	***** I G ***** TUDER ***** P ELM 31	***** N ***** A ***** 1 PNT 5	A L **** 812 ****	**** * T ****	W I R E ***********************************	L I S T * 89/09/18 10 * 88/05/19 DESCRIPTION OF ELEMENT MIRE FIELD, ERASE HEAD CH 2	* 12:22 ************ - 00 *********************	* PAGE 79 * **********************************
* WILLI ST **************** * *****************	******* UDER AG ******* 1.811. ******* COLOR	**** 090. ****	******* S ******** 00 * S ******* ASY GR	***** I G ***** TUDER ***** P ELM 31 54 80	**** N ***** PNT 5 15 21	A L **** 812 ****	**** * T ****	W I R E	L I S T * 89/09/18 DIO * 88/05/19 CESCRIPTION OF ELEMENT	* 12:22 ************* - 00 ********************	* PAGE 79 * **********************************
* WILLI ST *************** * *************	******* UDER AG ******* 1.811. ******* COLOR S	**** 090. ****	ASY GRI 200 200 200 200 200 200	***** I G ***** TUDER ***** P ELM 31 54 80 1 2	**** N ***** PNT 5 15 21	A L **** 812 ****	**** * T ****	W I R E **************** APE DECK & AUI *************** <u>TYPE</u> U	L I S T * 89/09/18 10 * 88/05/19 ESCRIPTION OF ELEMENT WIRE FIELD, ERASE HEAD CH 2 HF-ORIVER, CH 2 J18 CONN. HEAD BLOCK ASSEMBLY	* 12:22 ************* - 00 ********************	* PAGE 79 * **********************************
* WILLI ST ***************** ******************	******* UDER AG ******** 1.811. ******* COLOR S S S	**** 090. ****	ASY GR 20 20 20 20 20 20 20	***** I G ***** TUDER ***** 9 ELM 31 54 80 1 2 1 3	***** N ***** PNT 5 15 21 21 21 1	A L **** 812 ****	**** * T ****	W I R E	L I S T * 89/09/18 210 * 88/05/19 DESCRIPTION OF ELEMENT WIRE FIELD, ERASE HEAD CH 2 HF-ORIVER, CH 2 J18 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR POI FUSE (LINE) FOI	* 12:22 ************* - 00 ********************	* PAGE 79 * **********************************
* WILLI ST ************************************	******* UDER AG ******** 1.811. ******* COLOR S S S	**** 090. ****	******* S ******* ASY GRI 20 20 20 20 20 20 20 20 20 20 20 20 20	* * * * * * I G * * * * * TUDER * * * * * P ELN 31 54 80 1 2 1 2 1 3 4	A PNT 5 15 21 21 1 1 1	A L **** 812 ****	**** * T ****	W I R E	L I S T * 89/09/18 DIO * 88/05/19 ESCRIPTION OF ELEMENT WIRE FIELD, ERASE HEAD CH 2 HF-DRIVER, CH 2 HF-DRIVER, CH 2 HEAD BLOCK CONNECTOR POI TUSE (LINE) FOI LINE FILTER CONN. PARALLEL REMOTE CONTROL J03	* 12:22 ************* - 00 ********************	* PAGE 79 * **********************************
* WILLI ST ************************************	******* UDER AG ******** 1.811. ******* COLOR S S S	**** 090. ****	ASY GRI 	***** I G ***** TUDER P ELM P ELM 80 1 2 1 3 4 4 3 4 4 6	N A A A A A A A A A A A A A	A L **** 812 ****	**** * T ****	W I R E APE DECK & AUI	L I S T * 89/09/18 DIO * 88/05/19 WIRE FIELD, ERASE HEAD CH 2 HF-ORIVER, CH 2 J18 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR POI FUSE (LINE) FOI LINE FILTER FOI CONN. PARALLEL REMOTE CONTROL J03 TO CONN. PARALLEL REMOTE CONTR. PO4 CONN. PARALLEL REMOTE CONTR. PO4	* 12:22	* PAGE 79 * **********************************
* WILLI ST ************************************	******* UDER AG ******** 1.811. ******* COLOR S S S	**** 090. ****	******** S **************************	***** I G ***** TUDER P ELN 31 54 80 1 1 2 1 1 3 4 4 6 6 6 45	***** N ***** 1 5 15 21 21 1 1 1 21 21 1 1 21 21 1 1 21 21 1 1 21 2	A L **** 812 ****	**** * T ****	W I R E APE DECK & AUI	L I S T * 89/09/18 DIO * 88/05/19 DESCRIPTION OF ELEMENT MIRE FIELD, ERASE HEAD CH 2 HF-ORIVER, CH 2 J18 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR POI LINE FILTER CONN. PARALLEL REMOTE CONTROL JO3 TO CONN. PARALLEL REMOTE CONTROL JO3	* 12:22	P A G E 79 **********************************
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INPAD-01	6 6 6	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	N A B	TO VU-METER PANEL, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH AUDIG CONN., FROM GRP20, ELM15/1 CABLE TO GRP70, ELM09/11/12 VU-METER CH 01, AUDIG AUDIG CH 01 (FROM GRP43, ELM11)	J01	 1.820.714.81 1.820.720.00
INPAD-02	6 6 6	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	N A B	TO VU-METER PANEL, CH 2 MOND-STERED-SWITCH LINE AMPLIFIER, CH 2 AUDIO CONN., FROM GRP20, ELM15/1 CABLE TO GRP70, ELM09/11/12 VU-METER CH 02, AUDIO AUDIO CH 02 (FROM GRP43, ELM11)	J03	1.820.720.00 1.820.714.81
INPDI-01	0 9 0 9 9	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	N N B N	TO VU-METER PANEL, CH 1 TO SOURCE SELECTOR (AUDIO) LINE AMPLIFIER, CH 1 AUDIO CONN., FROM GRP20, ELM15/J CABLE TO GRP70, ELM05/11/12 AUDIO INPUT (FROM GRP20, ELM17) VU-METER CH 01, AUDIO AUDIO CH 01 (FROM GRP43, ELM11) MONITOR AMPLIFIER, AUDIO AUDIO INPUT	J02 J04 J16 .6/17 J01 J01 J02 J06 J01	 1.820.714.81
INPDI-02	0 9 0 9 9	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	N N B N	TO VU-METER PANEL, CH 2 TO SOURCE SELECTOR (AUDIO) LINE AMPLIFIER, CH 2 AUDIO CONN., FROM GRP20, ELMI5/J CABLE TO GRP70, ELMO5/J1/22 AUDIO INPUT (FROM GRP20, ELMI7) VU-METER CH 02, AUDIO AUDID CH 02 (FROM GRP43, ELMI1) MONITOR AMPLIFIER, AUDIO AUDIO INPUT	J01 J03	 1.820.714.81
IR-REFEX		34 2 13 34 3 13 35 3 25 35 4 25		CONNECTOR SYNCHRONIZER CONN. PARALLEL REMOTE CONTROL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.	J02 J03 P03 P04	

SIGNAL NAME	COLOR	MI	ASY GRP	ELM	PNT	S L	V	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
K-BRAKE	1		20	65 74	2			F X	CONNECTOR TO GRP25, ELMO1 TO GRP86, ELMO1	P15		1.811.898.0
			25 86	1	2 2			M M	SUPPLY + SOLENDIDS BRAKE SOLENDID	P07		
K-EDIT	9		20	65 75				F X	CONNECTOR TO GRP 25, ELMO1	P15		
	9		20 25 86		2 21 2			х М М	TO GRP86, ELMO2 SUPPLY + SOLENOIDS EDIT SOLENOID	P07		1.811.898.00
K-LIFT	4			65 68	9 2			F X	CONNECTOR TO GRP25, ELMO1 TO GRP80, ELMO1	P15		1 011 000 0
	,		20 25 80	1	2 2			ĥ	SUPPLY + SOLENOIDS LIFT SOLENOID	P07		1.811.898.00
K-PRESSA	3			65 69	5			F X	CONNECTOR TO GRP25, ELMO1	P15		
	5		25 81	1	5	_		Ŵ	TO GRP81, ELMO1 SUPPLY + SOLENOIDS PRESS SOLENOID A	P07		1.811.898.00
K-PRESSB	2			65 70	1 2			F X	CONNECTOR TO GRP25, ELMO1 TO GRP81, ELMO2	P15		1 011 000 0
	2		25 81	1 2	1 2			Ŵ	SUPPLY + SOLENOIDS PRESS SOLENOID B	P07		1.811.898.00
K-REC-01			20	49 50	2				HF-DRIVER, CH 1	J13		1.820.713.00
				51	4				RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1	J14 J15		1.820.712.81
K-REC-02				54 55	2 4				HF-DRIVER, CH 2	J18		1.820.713.00
				56	4				RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2	J19 J20		1.820.712.81 1.820.710.81
K-STDBY	8			65 71				F X	CONNECTOR TO GRP25, ELMO1 TO GRP81, ELMO3	P15		1.811.898.00
	0		25 81	1 3	22			M	SUPPLY + SOLENDIDS STAND BY SOLENDID	P07		1.011.090.00
K-TT SL	6			65 72				F	CONNECTOR TO GRP25, ELMO1	P15		
	0		20 25 82	1 5	17			X M	TO GRP82, ELMO5 Supply + Solenoids Hold Solenoid, Left	P 0 7		1.811.898.00
K-TTSR	5 5			65 73				F X	CONNECTOR TO GRP25, ELMO1	P15		
	5		20 25 83	1 5	13			4	TO GRP83, ELMO5 Supply + Solengids Hold Solengid, Right	P07		1.811.898.00
KEY/CDIR			34 35	2 3	8 15			B	CONNECTOR SYNCHRONIZER TO CONNECTOR SYNCHRONIZER	J02 P03		
LINE1	1 1		1 2	1	1 1			J	CONNECTOR POWER INPUT POWER SWITCH	P01 S01		
LINE2	6 6		1 2	1	2 2			J	CONNECTOR POWER INPUT POWER SWITCH	P01 501		

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SIGNAL NAME	COLOR	MI	ASY G	RP EL	M PNT	s	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
LINFA-TC	9 9		2	0 25 0 47 2 3		-		U D	WIRE FIELD, TC HEADS + TC IN/OUT TIME CODE WRITE/READ UNIT			1.820.721.81
LINFA-01	0 0			0 29 0 52 0 3	14	-		U D	WIRE FIELD, IN/DUT CH 1 + SUPPLY LINE AMPLIFIER, CH 1 CONNECTOR LINE FILTER, INPUT	J16 P01		1.820.714.81
L INF A-02	0 0		2	0 34 0 57 1 3	14	-		U D	WIRE FIELD, IN/OUT CH 2 LINE AMPLIFIER, CH 2 CONNECTOR LINE FILTER, INPUT	J21 P01		1.820.714.81
LINFB-TC	6 6			0 25	10	-		U D	WIRE FIELD, TC HEADS + TC IN/OUT TIME CODE WRITE/READ UNIT CONNECTOR LINE FILTER, INPUT	J11 P01		1.820.721.81
LINFB-01	6 6			5 52		-		U D	WIRE FIELD, IN/OUT CH 1 + SUPPLY LINE AMPLIFIER, CH 1 CONNECTOR LINE FILTER, INPUT	J16 P01		1.820.714.81
LINFB-02	6 6		2 4	1 3	15 1	-		U D	WIRE FIELD, IN/DUT CH 2 LINE AMPLIFIER, CH 2 Connector Line Filter, Input	J21 P01		1.820.714.81
LINSA-TC					2	-			CONNECTOR XLR, INPUT	J0 1		
LINSA-01					2	-			CONNECTOR XLR, INPUT	J01		
LINSA-02			4	1 1	2	-			CONNECTOR XLR, INPUT	J01		
LINSB-TC			4	2 1	3	-			CONNECTOR XLR, INPUT	J01		
LINSB-01			4	0 1	3	-			CONNECTOR XLR, INPUT	J01		
LINSB-02			4		3	-			CONNECTOR XLR, INPUT	J01		
LOUFA-TC	9		2		14 17 4	-		 U D	WIRE FIELD, TC HEADS + TC IN/OUT TIME CODE WRITE/READ UNIT CONNECTOR LINE FILTER, OUTPUT	J11 P02		1.820.721.81
LOUFA-01	0 0 0 0		2 4 4 4	0 29 0 52 0 4 3 1 3 11 0 8	23444	-		N U D A B	TO VU-METER PANEL, CH 1 WIRE FIELD, IN/DUT CH 1 + SUPPLY LINE AMPLIFIER, CH 1 CONNECTOR LINE FILTER, OUTPUT AUDIO CONN., FROM GR20, ELMI5/1/ CABLE TO GRPTO, ELMOS/11/12 VU-METER CH 01, AUDIO AUDIO CH 01 (FROM GRP43, ELMI1)	J02 J16 P02 6/17 J01		1.620.714.81
LOUFA-02	0 0 0 0 0		2 2 4 4		2 3 4 12	-		N U D A B	TO VU-METER PANEL, CH 2 WIRE FIELD, IN/OUT CH 2 LINE AMPLIFIER, CH 2 CONNECTOR LINE FILTER, OUTPUT AUDIO CONN., FROM GRP20, ELMI5/10 CABLE TO GRP70, ELMO9/11/12	J03 J21 P02 6/17		1.820.714.81

* WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 83 * * I.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 *

SIGNAL NAME	COLOR	MI	ASY GRP	ELM	PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT	1	REMARK	ELEMENT NR.
< CONT.OF LOUFA-02				10 11	2 2	-			VU-METER CH 02, AUDIO JO AUDIO CH 02 (FROM GRP43, ELM11) JO			
LOUFB-TC	6		20 20 42	25 47 4	13 18 1	-		U D	WIRE FIELD, TC HEADS + TC IN/OUT TIME CODE WRITE/READ UNIT J1 CONNECTOR LINE FILTER, OUTPUT PO			1.820.721.8
LOUFB-01	6 6 6 6 6		20 20 20 40 43 43 70 70	15 29	3 1 4 1 17	-		N U D A B	TO VU-METER PANEL, CH 1 JO WIRE FIELD, IN/OUT CH 1 + SUPPLY LINE AMPLIFIER, CH 1 J1 CONNECTOR LINE FILTER, OUTPUT PO AUDIO CONN., FROM GRP2O, ELM15/16/1 CABLE TO GRP7O, ELM09/11/12 VU-METER CH 01, AUDIO JO AUDIO CH 01 (FROM GRP43, ELM11) JO	6 2 .7		1.820.714.81
LUUFB-02	6 6 6 6 6		70	16 34 57 4 1 11 10 11	3 1 4 1 25 25 3 3	-		N U D A B	TO VU-METER PANEL, CH 2 JO WIRE FIELD, IN/OUT CH 2 J2 LINE AMPLIFIER, CH 2 J2 CONNECTOR LINE FILTER, OUTPUT PO AUDIO CONN., FROM GRP20, ELM15/16/1 CABLE TO GRP70, ELM09/11/12 VU-METER CH 02, AUDIO J0 AUDIO CH 02 (FROM GRP43, ELM1) J0	1 12 17		1.820.714.81
LOUSA-TC			42	2	2	-			CONNECTOR XLR, OUTPUT PO			
LOUSA-01			40	2	2	-			CONNECTOR XLR, OUTPUT PO	1		
LOUSA-02			41	2	2	-			CONNECTOR XLR, OUTPUT PO			
LOUSB-TC			42	 2		-			CONNECTOR XLR, OUTPUT PO			
LOUSB-01			40	2		-			CONNECTOR XLR, OUTPUT PO			
LOUSB-02				 2		-			CONNECTOR XLR, DUTPUT PO			
MONIT-01	9 9 9 9 9		20 20 43 43 60 70 70 71	17 52 1 11 12 13 1	 1 6 1 1 1 1	-		N B N	TO SOURCE SELECTOR (AUDIO) JO LINE AMPLIFIER, CH 1 JI AUDIO CONN., FROM GR20, ELM15/16/1 CABLE TO GRP70, ELM09/11/12 AUDIO INPUT (FROM GRP20, ELM1) JO AUDIO INPUT (FROM GRP43, ELM1) JO MONITOR AMPLIFIER, AUDIO JO AUDIO INPUT JO	4 .6 .7 11 15		1.820.714.81
MGNIT-02	9 9 9 9 9 9		20 20 43 43 60 70 70 71	17 57 1 11 12 13 1		-		N A B N	TO SOURCE SELECTOR (AUDIO) JO LINE AMPLIFIER, CH 2 J2 AUDIO CONN., FROM GAP2O, ELMI5/16/1 CABLE TO GAP7O, ELMO9/11/12 AUDIO INPUT (FROM GAP43, ELMI1) JO AUDIO + TC (FROM GAP43, ELMI1) JO MONITOR AMPLIFIER, AUDIO JO AUDIO INPUT JO	1 7 1 5 6		1.820.714.81

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SIGNAL NAME	COLOR	МI	ASY GRP ELM PNT	S LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
UR-CMCLK			34 2 11 35 3 21		В	CONNECTOR SYNCHRONIZER TO CONNECTOR SYNCHRONIZER	J0 2 P0 3		
OR-MVCLK			34 2 7 35 3 13		в	CONNECTOR SYNCHRONIZER TO CONNECTOR SYNCHRONIZER	J0 2 P0 3		
GR-MVDIR			34 2 10 35 3 19		В	CONNECTOR SYNCHRONIZER TO CONNECTOR SYNCHRONIZER	J02 P03		
UR-SYENB			34 2 12 35 3 23		в	CONNECTOR SYNCHRONIZER TO CONNECTOR SYNCHRONIZER	J0 2 P0 3		
PENB-L			24 1 6 31 2 6			TO GRP31, ELMO2 FROM GRP24, ELMO1	P02 P01		
PENB-R			24 2 6 32 2 6			TO GRP32, ELMO2 FROM GRP24, ELMO2	P03 P01		
PRIMW-1	1 1		$\begin{array}{r} 4 & 1 & 5 \\ 6 & 1 & 1 \end{array}$		L Y	VOLTAGE SELECTOR PRIMARY 1			1.811.521.0
PRIMW-3	3 3		$\begin{array}{c} 4 & 1 & 2 \\ 6 & 1 & 3 \end{array}$		L Y	VOLTAGE SELECTOR PRIMARY 1			1.811.521.0
PRIMW-4	4-4 4		4 1 4A 6 1 4		L Y	VOLTAGE SELECTOR PRIMARY 1			1.811.521.0
PRIMW-5	5 5		4 1 6 6 2 5		L Y	VOLTAGE SELECTOR PRIMARY 2			1.811.522.0
PRIMW-6	6-4 6		4 1 4B 6 2 6		L Y	VOLTAGE SELECTOR PRIMARY 2			1.811.522.0
PRIMW-7	7 7		4 1 3 6 2 7		L Y	VOLTAGE SELECTOR PRIMARY 2			1.811.522.0
RCV-232			20 45 9			SMPTE/EBU INTERFACE	 90L		1.820.751.0
RECEIVA			20 6 6 20 45 6 46 1 8 46 2 8		в В	SMPTE/EBU BUS SMPTE/EBU INTERFACE CONNECTOR SMPTE/EBU BUS CONNECTOR SMPTE/EBU BUS	P06 J09 J04 J05		1.820.751.0
RECEIVB			20 6 5 20 45 5 46 1 3 46 2 3		в В	SMPTE/EBU BUS SMPTE/EBU INTERFACE CONNECTOR SMPTE/EBU BUS CONNECTOR SMPTE/EBU BUS	P06 J09 J04 J05		1.820.751.0
RECEIVCM			20 6 7 20 45 7 46 1 4 46 2 4		в	SMPTE/EBU BUS SMPTE/EBU INTERFACE CONNECTOR SMPTE/EBU BUS CONNECTOR SMPTE/EBU BUS	P06 J09 J04 J05		1.820.751.0

SIGNAL NAME	COLOR	MI	ASY	GR P	ELM	PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
RECHH-TC	9 9 5				25 47 80 1		-		U B A	WIRE FIELD, TC HEADS + TC IN/OUT TIME CODE WRITE/READ UNIT CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR	J11 P01		1.820.721.81
RECHH-01	9 9 1			20 20 20 90	27 50 80 1	47	-		B A	WIRE FIELD, RECORD HEAD CH 1 RECORD AMPLIFIER, CH 1 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR	J14 P01		1.820.712.81
RECHH-02	9 9 1			20 20 20 90	32 55 80 1	30	-		 U В А	WIRE FIELD, RECORD HEAD CH 2 RECORD AMPLIFIER, CH 2 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR	J19 P01		1.820.712.81
RECHL-TC	6 6 3			20 20 20 90	25 47 80 1	4 8 42 42	-		U B A	WIRE FIELD, TC HEADS + TC IN/OUT TIME CODE WRITE/READ UNIT CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR	J11 P01		1.820.721.81
RECHL-01	6 6 0			20 20 20 90	27 50 80 1	1 9 46 46	-		U B A	WIRE FIELD, RECORD HEAD CH 1 RECORD AMPLIFIER, CH 1 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR	J14 P01		1.820.712.81
RECHL-02	6 6 0			20 20 20 90	32 55 80 1	1 9 29 29	-		U B A	WIRE FIELD, RECORD HEAD CH 2 RECORD AMPLIFIER, CH 2 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR	J19 P01		1.820.712.81
RECIN-01				20 20 20	50 52 53	1 8 15	-			RECORD AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH	J14 J16 J17		1.820.712.81 1.820.714.81 1.820.720.00
RECIN-02				20 20 20	53 55 57	13 1 8	-			MONO-STEREO-SWITCH RECORD AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J17 J19 J21		1.820.720.00 1.820.712.81 1.820.714.81
REPHH-TC	9 9 5			20	25 47 80 1	27	-		U B A	WIRE FIELD, TC HEADS + TC IN/OUT TIME CODE WRITE/READ UNIT CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR	J11 P01		1.820.721.81
REPHH-01	1			90	2	12	-		L	REPRODUCE PREAMPLIFIER			
REPHH-02	1			90	2	14	-		L	REPRODUCE PREAMPLIFIER			
REPHL-TC	6 6 3				25 47 80 1	43	-		 U В А	WIRE FIELD, TC HEADS + TC IN/OUT TIME CODE WRITE/READ UNIT CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR	J11 P01		1.820.721.81
REPHL-01	0			90	2	11	-		L	REPRODUCE PREAMPLIFIER			
	0			90		13	-			REPRODUCE PREAMPLIFIER			

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* MILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 86 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 * SIGNAL NAME COLOR MI ASY GRP ELM PNT S LV TYPE DESCRIPTION OF ELEMENT REMARK ELEMENT NR.

SIGNAL NAME	COLOR	MI	ASY G	SRP	ELM	I PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
REPRE-01	9 9 0 0		2 2 9	0	28 51 80 1 2		-		 U B A L	WIRE FIELD, REPRODUCE PREAMP. CI REPRODUCE AMPLIFIER, CH 1 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR REPRODUCE PREAMPLIFIER	H 1 J15 P01		1.820.710.81
REPRE-02	9 9 0 0		2 2 9	0		2 6 33 33 7	-		 U B A L	WIRE FIELD, REPRODUCE PREAMP. CI REPRODUCE AMPLIFIER, CH 2 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR REPRODUCE PREAMPLIFIER	H 2 J20 P01		1.820.710.81
REPRO-01	6 6 6 6		2 2 9	20 20		1 7 49 49 3	-		U B A L	WIRE FIELD, REPRODUCE PREAMP. C REPRODUCE AMPLIFIER, CH 1 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR REPRODUCE PREAMPLIFIER	+ 1 J15 P01		1.820.710.81
REPR0-02	6 6 6 6		2 2 9	0	56 80	1 7 32 32 6	-		 U B A L	WIRE FIELD, REPRODUCE PREAMP. CH REPRODUCE AMPLIFIER, CH 2 CONN. HEAD BLOCK ASSEMBLY HEAD BLOCK CONNECTOR REPRODUCE PREAMPLIFIER	H 2 J20 P01		1.820.710.81
S-LINE1	1			1 2	2 1		-		J J	FUSE (LINE) Power Switch	F01 S01		
S-LINE2	6 6			2 3	1	4 2	-		ـــــــــــــــــــــــــــــــــــــ	POWER SWITCH LINE FILTER	S01		
S-MONMUT	2 2 2 2 2		6 7	0 0 1 1	5 6 5 6	5 1A 5 1A	-		 N L N L	TO PHONES CONNECTOR PHONES CONNECTOR TO PHONES CONNECTOR PHONES CONNECTOR	J02 J02		
SF-LINE1	1 1-2 2			3 4 6	1 1 1	3 7 2	-		L Y	LINE FILTER VOLTAGE SELECTOR PRIMARY 1			1.811.521.00
SF-LINE2	6 6-8 8			3 4 6	1 1 2	4 1 8	-		J L Y	LINE FILTER VOLTAGE SELECTOR PRIMARY 2			1.811.522.00
SHIELD				3 4	2 1	1 1	-		В	TO GRP34, ELMO1 Conn. Autolocator, remote timer	P02 J01		
SIGN.GND				3 4	2 1	6 8	-		в	TO GRP34, ELMO1 CONN. AUTOLOCATOR, REMOTE TIMER	P0 2		
SIN1-L				4	1 2	7 7	-			TO GRP31, ELMO2 FROM GRP24, ELMO1	P02 P01		
SIN1-R				4	2 2	7 7	-			TO GRP32, ELMO2 FROM GRP24, ELMO2	P03 P01		
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SIGNAL NAME	COLOR	MI	ASY G	P ELM	1 PNT	s _	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
SIN2-L			24 31		9 9	_			TO GRP31, ELMO2 FROM GRP24, ELMO1	P02 P01		
SIN2-R			24 37		9 9	_			TO GRP32, ELMO2 FROM GRP24, ELMO2	Р03 Р01		
SND-232			20) 45	14				SMPTE/EBU INTERFACE	6 OL		1.820.751.00
SPARE			2 (46 46	- 1	9 5 5	-		В В	SMPTE/EBU BUS Connector Smpte/ebu bus Connector Smpte/ebu bus	P06 J04 J05		
SK-ARENB			30 36		13 7	-			CUNNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
SR-FADRY			34 35		6 11	-		в	CONN. PARALLEL REMOTE CONTROL TO CONN. PARALLEL REMOTE CONTR.	J03 P04		
SR-FORW			34 34 35	3	21	-		В В	CONNECTOR SYNCHRONIZER CONN. PARALLEL REMOTE CONTROL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.	J02 J03 P03 P04		
SR-INPTC			36 36		11 6	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
SR-INPO1			36 36		5 3	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
SR-INPO2			36 36		6 22	-		***********	CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
SR-LIFT			34 34 35 35	3	17 17 8 8	-		в В	CONNECTOR SYNCHRONIZER CONN. PARALLEL REMOTE CONTROL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.			
SR-LOCST			34 35		18 10	-		в	CONN. PARALLEL REMOTE CONTROL TO CONN. PARALLEL REMOTE CONTR.			
SR-MUTE			34 35		18 10	-		В	CONNECTOR SYNCHRONIZER To connector synchronizer	J02 P03		
SR-PLAY			34 34 35 35	3	18	-		В В	CONNECTOR SYNCHRONIZER CONN. PARALLEL REMOTE CONTROL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.	J02 J03 P03 P04		
SR-REATC			 36 36		8 23	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR	P03 J04		
SR-REA01			36 36 36	4	2 4 20	-			CONNECTION REMOTE PANEL CHANNEL REMOTE CONNECTOR CHANNEL REMOTE CONNECTOR	P03 J04 J04		
SR-REA02			36	3	7	-			CONNECTION REMOTE PANEL	P03		

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SIGNAL NAM	E COLOR MI	ASY GRP ELM	IPNT S LV	TYPE	DESCRIPTION OF ELEMENT	REMARK	LEMENT NR.

SIGNAL NAME	COLOR	MI	ASY GRP ELM PNT	S LV	ТҮРЕ	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
SR-REC			34 2 19 34 3 19 35 ⁻ 3 12 35 ⁻ 4 12	_	B B	CONNECTOR SYNCHRONIZER CONN. PARALLEL REMOTE CONTROL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.	J02 J03 P03 P04		
SR-REHSL			34 2 6 35 3 11		в	CONNECTOR SYNCHRONIZER To Connector Synchronizer	J02 P03		
SR-REPTC			36 3 10 36 4 24			CONNECTION REMOTE PANEL Channel remote connector	P0 3 J0 4		
SR-REP01			36 3 4 36 4 21			CONNECTION REMOTE PANEL Channel remote connector	P0 3 J0 4		
SR-REP02			36 3 9 36 4 5			CONNECTION REMOTE PANEL Channel Remote Connector	P03 J04		
SR-RESET			34 3 10 35 4 19		В	CONN. PARALLEL REMOTE CONTROL TO CONN. PARALLEL REMOTE CONTR.	J03 P04		
SR-REW			$\begin{array}{cccccccccccccccccccccccccccccccccccc$		в В	CONNECTOR SYNCHRONIZER CONN. PARALLEL REMOTE CONTRGL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.	J02 J03 P03 P04		
SR-STOP			34 2 23 34 3 23 35 3 20 35 4 20		8 8	CONNECTOR SYNCHRONIZER CONN- PARALLEL REMOTE CONTROL TO CONNECTOR SYNCHRONIZER TO CONN- PARALLEL REMOTE CONTR.	J02 J03 P03 P04		
SR-VRSPD			34 2 5 34 3 5 35 3 9 35 4 9		в В	CONNECTOR SYNCHRONIZER CONN. PARALLEL REMOTE CONTROL TO CONNECTOR SYNCHRONIZER TO CONN. PARALLEL REMOTE CONTR.	J02 J03 P03 P04		
SR-OLOC			34 3 14 35 4 2		В	CONN. PARALLEL REMOTE CONTROL TO CONN. PARALLEL REMOTE CONTR.	J03 P04		
SYNHH-01			20 50 13 20 51 13			RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1	J14 J15		1.820.712.81 1.820.710.81
SYNHH-02			20 55 13 20 56 13			RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2	J19 J20		1.820.712.81 1.820.710.81
SYNHL-01			20 50 12 20 51 12			RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1	J14 J15		1.820.712.81 1.820.710.81
SYNHL-02			20 55 12 20 56 12			RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2	J19 J20		1.820.712.81 1.820.710.81
SYPRE-01			20 51 3			REPRODUCE AMPLIFIER, CH 1	J15		1.820.710.81
SYPRE-02			20 56 3			REPRODUCE AMPLIFIER, CH 2	J20		1.820.710.81
SYS-CTS			20 2 3 20 43 13B			SSDA SYNCHRONIZER MASTER SERIAL INTERFACE	P0 2 J0 7		1.820.753.00

SIGNAL NAME	COLOR	MI	ASY GRP	EL/	1 PNT	S I	٧	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
S Y S-D TR			20 20	2 43	5 13A		-		SSDA SYNCHRONIZER MASTER SERIAL INTERFACE	P02		1.820.753.00
SYS-RX			20 20	2 43	4 12A		-		SSDA SYNCHRONIZER MASTER SERIAL INTERFACE	P0 2 J0 7		1.820.753.00
SYS-TX			20 20	2 43	6 12B		-		SSDA SYNCHRONIZER MASTER SERIAL INTERFACE	P02 J07		1.820.753.00
T-A0			33 35	1	12 12		-		FROM GRP35, ELMO1 To grp33, ELMO1	P01 P01		
T-A1			33 35	1	9		-		FROM GRP35, ELMO1 TO GRP33, ELMO1	P01 P01		
T-A2			33 35	1	10 10		-		FROM GRP35, ELMO1 TO GRP33, ELMO1	P01 P01		
T-A3			33 35	1			-		FROM GRP35, ELMO1 TO GRP33, ELMO1	P01 P01		
T-BD			33 35	1	8 8		-		FRCM GRP35, ELMO1 TO GRP33, ELMO1	P01 P01		
т-во			33 35		15 15		-		FROM GRP35, ELMO1 TO GRP33, ELMO1	P01 P01		
Т-В1			33 35		13 13		-		FROM GRP35, ELMO1 TO GRP33, ELMO1	P01 P01		
т- в2			33 35		14 14		-		FROM GRP35, ELMO1 TO GRP33, ELMO1	P01 P01		
т-вз			33 35		11 11		-		FROM GRP35, ELMO1 TO GRP33, ELMO1	P01 P01		
T-CLK1			25 25 81 82 82 83 83	6 4 1 3	13 13 7 13 7 13 7		-		TAPE TENSION SENSOR, LEFT TAPE TENSION SENSOR, RIGHT PRESS ASSEMBLY SENSOR TO TO PERIPHERY DRIVER TO TAPE MOVE SENSOR, LEFT TO TAPE MOVE SENSOR, RIGHT	P04 P03 P01 P01 P02 P01 P02		
T~CLK2			25 25 81 82 82 83 83	6 4 1 3	14 14 8 14 8 14 8		-		TAPE TENSION SENSOR, LEFT TAPE TENSION SENSOR, RIGHT PRESS ASSEMBLY SENSOR TO TD PERIPHERY DRIVER TO TAPE MOVE SENSOR, LEFT TO TO PERIPHERY DRIVER TO TAPE MOVE SENSOR, RIGHT	P04 P03 P01 P02 P01 P02 P01 P02		
т-рт-сн1			20 20 20	8	12 12 12		-		VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL MONITOR UNIT, INTERN	P07 P08 P09		

* WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 90 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 *

SIGNAL NAME	COLOR MI	ASY GRP ELM PNT S LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
 		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		MASTER PERIPHERY CONTR. OUTPUT TO VU-PANEL INPUT FROM BASIS BOARD CONTROL CONN., FROM GRP20, ELMOT CABLE TO GRP70, ELMO1 FROM G. BOARD TAPE DECK, ELM 19 TO VU-METER PANEL FROM GRP20, ELMO9 FROM GRP43, ELM12 RESERVE COMMANDS CH 01 COMMANDS HONITOR AMPLIFIER FROM GRP70, ELMO7			1.820.728.00
T-DT-CH2		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL	P07 P08 P09 J10 P01 P02		1.820.728.00
T-DT-CH3		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL MONITOR UNIT, INTERN MASTER PERIPHERY CONTR. OUTPUT TO VU-PANEL INPUT FROM BASIS BOARD CONTROL CONN., FROM GRP20, ELMOT CABLE TO GRP70, ELMOI FROM B. BOARD TAPE DECK, ELM 19 TO VU-METER PANEL FROM GRP20, ELMOJ FROM GRP20, ELMOJ COMMANDS HONITOR AMPLIFIER FROM GRP43, TO ALMOT	P02 P01 P02 P02 P04 P07 P01		1.820.728.00
T-DT-MP		$\begin{array}{cccccccccccccccccccccccccccccccccccc$		VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL MONITOR UNIT, INTERN	P07 P08 P09 J10 P01 P02		1.820.728.00

* WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 91 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 *

SIGNAL NAME	COLOR	MI	ASY GRP	ELM	PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
< CONT.OF T-DT-MP			43 43 58 60 70 70 70 70 71	2 2 1 2 3 7	8 8 15 15 15 15 15 15 12 15 15	-			CONTROL CONN., FROM GRP20, ELMO7 CABLE TO GRP70, ELMO1 FROM 6. BOARD TAFE DECK, ELM 19 TO VU-METER PANEL FROM GRP40, ELM09 FROM GRP43, ELM12 RESERVE RESERVE COMMANDS MONITOR AMPLIFIER FROM GRP70, ELMO7			
T-DT-RES			20 20 20 36 36 60 70 70	8 9 46 1 2 2 1	16 16 16 16	-			VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL MONITOR UNIT, INTERN MASTER PERIPHERY CONTR. OUTPUT TO VU-PANEL INPUT FROM BASIS BOARD FRUM GRP20, ELM09 FROM GRP3, ELM12 RESERVE	P07 P08 P09 J10 P01 P01 P01 P01 P02		1.820.728.00
T-DT-RP1				46	5B	-			MASTER PERIPHERY CONTR.	J10		1.820.728.00
T-DT-RP2				46	6A	-			MASTER PERIPHERY CONTR.			1.820.728.00
T-DT-SJM			20	46	7A	-			MASTER PERIPHERY CONTR.	J10		1.820.728.00
T-LEDL	1		82	2	1	-		N	TAPE END SWITCH, LEFT			
T-LEDR	1		83	2	1	-		N	TAPE END SWITCH, RIGHT			
T- 0E			33 35		20	-			FROM GRP35, ELM01 TO GRP33, ELM01	P01 P01		
T-POS1			25 25 82 83 83	6 1 3 1 3	15 15 15 5 15 5	-			TAPE TENSION SENSOR, LEFT TAPE TENSION SENSOR, RIGHT TO TO PERIPHERY DRIVER TO TAPE MOVE SENSOR, LEFT TO TO PERIPHERY DRIVER TO TAPE MOVE SENSOR, RIGHT	P04 P03 P01 P02 P01 P02		
T-POS2			25 25 82 82 83 83	5 6 1 3	16 16 16 6 16 1	-			TAPE TENSION SENSOR, LEFT TAPE TENSION SENSOR, RIGHT TO TD PERIPHERY DRIVER TO TAPE MOVE SENSOR, LEFT TO TD PERIPHERY DRIVER TO TAPE MOVE SENSOR, RIGHT	P04 P03 P01 P02 P01 P02		
T-PWRON	5 5		19 19 20 20 20 20	1 2 10 11 20 44	7 7 7 6 3 14	-		F M F F U	FROM GRP30, ELMO2 TO GRP20, ELMO2 FROM STABILIZER GRP30, ELMO2 SYNCHRONIZER (SUPPLY) WIRE FIELD, TO CONN. GRP20, ELM6 MP-UNIT MASTER	J01 P01 J01 P10 5/66 J08		1.811.898.00 1.811.786.00

IGNAL NAME		MI	ASY GRE			s -	L V 			DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
< CONT.OF -PWRON	5		20 27 30	4				F M M		CONNECTOR TO GRP27, ELMO4 Supply (FROM GRP20, ELM20) Output (To GRP20, ELM10)	P16 J01 P01		
-READS						-				OUTPUT TO VU-PANEL	P01		
-READSL			20 20 20 20 36 43	7 8 9 46 2 2	10 10 2B 10 18	-				VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL MONITOR UNIT, INTERN MASTER PERIPHERY CUNTR. INPUT FROM BASIS BOARD CONTROL CONN., FROM GRP2O, ELMO	P07 P08 P09 J10 P02		1.820.728.00
			43 58 50 70 70 70 70 70 70	4 5 6	10 10 10 10 10 10 10 10					CABLE TO GRP70, ELMOI FROM B. BOARD TAPE DECK, ELM 19 TO VU-METER PANEL FROM GRP20, ELMO9 FROM GRP43, ELM12 RESERVE RESERVE COMMANDS CH 03 COMMANDS CH 01 COMMANDS CH 02	P02 P01 P02 P03 P04 P05 P06		
-REFEXT			70 71 20	2	10	-				COMMANDS MONITOR AMPLIFIER FROM GRP70, ELM07 	P01 P05		
			20 20 35 36 36 43 43 70	7 8 41 2 1 2 12 12	12 15 23 23 12 12 23					VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL CAPSTAN MOTOR INTERFACE FROM GRZO, ELMO5 OUTPUT TO VU-PANEL IMPUT FROM BASIS BOARD CONTROL CONN., FROM GRP20, ELMO CABLE TO GRP70, ELMO1 FROM GRP43, ELM12	P07 P08 J05 P02 P01 P02 7 P01 P02		1.811.775.00
			70 70	2 3	13	_				RESERVE RESERVE	P02 P03		
-REFINT			20 20	38 41	12	-			10 (100 all) all (10 all) (10 TH (17	PAR. CONT. INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE	J05		1.811.775.00
-RESET			35	1	24					FROM GRP35, ELMO1 TO GRP33, ELMO1	P01 P01		
-RL0			33	1 1	4 4	_				FROM GRP35, ELMO1 To GRP33, ELMO1	P01 P01		
-RL1			33 35	1 1	5 5	_				FROM GRP35, ELMO1 To GRP33, ELMO1	P01 P01		
-RL2			33 35	1	26 26	_				FROM GRP35, ELMO1 TO GRP33, ELMO1	P01		
r-RL3			33 35	1	25					FROM GRP35, ELMO1 To GRP33, ELMO1	P01		
∝ WILLIST ****************	TUDER AG	; * **** 090.	s : ********* 00 * S	I G ≰≉≉*¥∺ TUDER	N A ****** A 8	∖ L **** 812	**** * T	₩ I ******* APE DEC	R E ************************************	L I S T * 89/0 * 88/0 * 88/0	9/18 ****** 5/19 -	* 12:22 * *********************************	PAGE 93 * **********************************
WILLI ST	TUDER AG	, 1 **** 090. ****	S ******** 00 * S ********	I G ***** TUDER ***** P ELM	N A ***** A { *****	L **** 812 **** S	***** * T *****	W I ******** APE DEC ******* TYPE	R E ********* & & AUDIO *********	LIST * 89/0' ******	9/18 ****** 5/19 - *****	* 12:22 * *********************************	PAGE 93 * **********************************
• WILLI ST • • • • • • • • • • • • • • • • • • •	TUDER AG	, 1 **** 090. ****	S ********* 00 * S ******** ASY GRI 33 35	I G ***** TUDER ***** P ELM 1 1	N A ***** PNT 23 23	L **** 812 **** S	***** * T *****	₩ I ******* APE DEC ******	R E ********* & & AUDIO *********	L I S T * 89/0 ************************************	9/18 ****** 5/19 - ****** P01 P01	* 12:22 * ************ - 00 ***********	PAGE 93 * **********************************
⊧ WILLI ST ⊧************* ⊧	TUDER AG	, 1 **** 090. ****	ASY GRI ASY GRI 33 35	I G ***** TUDER ***** P ELM 1 1 1	N A ****** PNT 23 23 22 22	L **** 812 **** S	***** * T *****	W I ******** APE DEC ******* TYPE	R E ********* & & AUDIO *********	L I S T * 89/0: ************************************	P/18 ****** 5/19 - ****** P01 P01 P01 P01 P01	* 12:22 * *************** 00 ****************	PAGE 93 * **********************************
⊭ WILLI ST **************** * *****************	TUDER AG	, 1 **** 090. ****	ASY GRI 	I G ***** TUDER ***** 1 1 1 1 1 1	N A ****** PNT 23 23 22 22 19 19	L **** 812 **** S	***** * T *****	W I ******** APE DEC ******* TYPE	R E ********* & & AUDIO *********	L I S T * 89/0 * 88/0 * 88/0 ESCRIPTION OF ELEMENT FROM GRP35, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 TO GRP35, ELMO1 TO GRP35, ELMO1 TO GRP35, ELMO1	P/18 ****** 5/19 - ******* P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 * *************** 00 ****************	PAGE 93 * **********************************
 WILLI ST WILLI ST SIGNAL NAME I-RL4 I-RL5 I-RL6 I-RL7 	TUDER AC ******* 1.811 COLOR 	, 1 **** 090. ****	S ******** ASY GRI 33 35 33 35 33 35 33 35 33 35	I G ***** TUDER ****** P ELM 1 1 1 1 1 1	N A ***** PNT 23 23 22 22 19 19 18	L **** 812 **** S	***** * T *****	W I ******** APE DEC ******* TYPE	R E ********* & & AUDIO *********	L I S T * 89/0 * 88/0 * 88/0 FROM GRP35, ELMOI TO GRP33, ELMOI FROM GRP35, ELMOI TO GRP35, ELMOI FROM GRP35, ELMOI FROM GRP35, ELMOI	P/18 ****** 5/19 - ******* P01 P01 P01 P01 P01 P01 P01	* 12:22 * *************** 00 ****************	PAGE 93 * **********************************
<pre># WILLI ST ####################################</pre>	TUDER AG	, 1 **** 090. ****	 S ASY GRI ASY GRI 33 35 33 35 33 35 20 20 20 20 36 	I G ***** TUDER ***** P ELM 1 1 1 1 1 1 1 1 1 1 1 7 8 9 46 1	N A ****** PNT 23 23 22 22 22 19 18 18 18 7 7 7 1A 7	L **** 812 **** S	***** * T *****	W I ******** APE DEC ******* TYPE	R E ********* & & AUDIO *********	L I S T * 89/0 * 88/0 * 88/0 FROM GRP35, ELMO1 TO GRP33, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 FROM GRP35, ELMO1 VU-METER PANEL, EXTERNAL VU-METER PANEL	9/18 ****** PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1	* 12:22 * *************** 00 ****************	P A G E 93 *
<pre># ILLI ST ####################################</pre>	TUDER AC ******* 1.811 COLOR 	, 1 **** 090. ****	ASY GRI 0.00 * S *********************************	I G ****** P ELM 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	N A ***** PNT 23 23 22 22 22 19 19 18 18 18 18 7 7 1A	L **** 812 **** S	***** * T *****	W I ******** APE DEC ******* TYPE	R E ********* & & AUDIO *********	L I S T * 89/0 * 88/0 * 88/0	9/18 ******* PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1	* 12:22 * *************** 00 ****************	P A G E 93 *
<pre></pre>	TUDER AC ******* 1.811 COLOR 	, 1 **** 090. ****	ASY GRI ASY GRI ASY GRI 33 35 35	I G K K K K K K K K K K K K K K K K K K	N A 4 ****** PNT 23 23 23 22 22 22 22 22 19 18 18 7 7 1 18 7 7 7 4 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7	L **** 812 **** S	***** * T *****	W I ******** APE DEC ******* TYPE	R E ********* & & AUDIO *********	L I S T * 89/0 * 88/0 * 88/0 * 88/0 FROM GRP35, ELMO1 TO GRP33, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 VU-METER PANEL, EXTERNAL MONITOR UNIT, INTERN MASTER PERIPHERY CONTR. OUTPUT TO VU-PANEL UNU-METER PANEL, EXTERNAL MONITOR UNIT, INTERN MASTER PERIPHERY CONTR. OUTPUT TO VU-PANEL UNU-METER PANEL, EXTERNAL MONITOR UNIT, INTERN MASTER PERIPHERY CONTR. OUTPUT TO VU-PANEL INPUT FROM BASIS BOARD CONTROL CONN., FRUM GRP20, ELMO CABLE TO GRP70, ELMO1 FROM GRP43, ELM12 RESERVE RESERVE RESERVE RESERVE RESERVE RESERVE RESERVE RESERVE COMMANDS CH 03 COMMANDS CH 02	9/18 55/19 - P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 * *************** 00 ****************	P A G E 93 *
- WILLI ST ************************************	TUDER AC ******* 1.811 COLOR 	, 1 **** 090. ****	ASY GRI ASY GRI ASY GRI 33 35 33 35 33 35 20 20 20 20 20 20 20 20 20 20	I G TUDER TUDER P ELM 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	N A 4 ****** PNT 23 23 22 22 22 22 22 19 19 18 18 10 7 7 1A 7 7 4 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	L **** 812 **** S	***** * T *****	W I ******** APE DEC ******* TYPE	R E ********* & & AUDIO *********	L I S T * 89/0 * 88/0 * 88/0 FROM GRP35, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 TO GRP34, ELMO1 TO U-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL VU-METER PANEL, EXTERNAL INPUT FROM BASIS BOARD CONTROL CONN., FROM GRP20, ELMO CABLE TO GRP70, ELMO1 FROM GRP43, ELMO1 TO VU-METER PANEL ESERVE COMMANDS CH 03 COMMANDS CH 02 COMMANDS GH 02	9/18 5/19 - 5/19 - P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 * *************** 00 ****************	P A G E 93 *
<pre>% WILLT ST % % % % % % % % % % % % % % % % % % %</pre>	TUDER AC ******* 1.811 COLOR 	, 1 **** 090. ****	ASY GRI ASY GRI ASY GRI 33 35 35	I G K K K K K K K K K K K K K K K K K K	N A 8 8 8 8 17 7 7 7 7 7 7 7 7 7 7 7 7 7 7	L **** 812 **** S	***** * T *****	W I ******** APE DEC ******* TYPE	R E ********* & & AUDIO *********	L I S T * 89/0 * 88/0 * 88/0 * 88/0 FROM GRP35, ELMO1 TO GRP33, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 VU-METER PANEL, EXTERNAL MONITOR UNIT, INTERN MASTER PERIPHERY GONTR. OUTPUT TO VU-PANEL INPUT FROM BASIS BOARD COMTADL CONN., FROM GRP20, ELMO CABLE TO GRP70, ELMO1 FROM GRP43, ELMO1 TO GRP33, ELMO1 COMMANDS CH 03 COMMANDS CH 03 COMMANDS CH 03 COMMANDS CH 02 COMMANDS CH 02 COMMANDS CH 03 COMMANDS CH 03 COMMANDS CH 02 COMMANDS CH 02 COMMANDS CH 02 COMMANDS CH 03 COMMANDS CH 03 COMM	9/18 5/19 - 5/19 - P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 * *************** 00 ****************	P A G E 93 *
<pre>k ILLI ST k************************************</pre>	TUDER AC ******* 1.811 COLOR 	, 1 **** 090. ****	ASY GRI ASY GRI ASY GRI 33 35 	I G K K K K K K K K K K K K K K K K K K	N A 4 4 4 4 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7	L **** 812 **** S	***** * T *****	W I ******** APE DEC ******* TYPE	R E ********* & & AUDIO *********	L I S T * 89/0 * 88/0 * 80/0 *	9/18 5/19 - 5/19 - 7/18 P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 * *************** 00 ****************	PAGE 93 * **********************************
<pre>k ILLI ST k************************************</pre>	TUDER AC ******* 1.811 COLOR 	, 1 **** 090. ****	ASY GRI ASY GRI ASY GRI 33 35 	I G K K K K K K K K K K K K K K K K K K	N A & & & & & & & & & & & & & & & & & &	L **** 812 **** S	***** * T *****	W I ******** APE DEC ******* TYPE	R E ********* & & AUDIO *********	L I S T * 89/0 * 88/0 * 88/0 * 88/0 FROM GRP35, ELMO1 TO GRP35, ELMO1 TO GRP35, ELMO1 TO GRP35, ELMO1 TO GRP35, ELMO1 FROM GRP35, ELMO1 TO GRP33, ELMO1 * FROM GRP35, ELMO1 TO GRP33, ELMO1 * VU-METER PANEL, EXTERNAL MONITOR UNIT, INTERN MASTER PERIPHERY CONTR. OUTPUT TO VU-PANEL INPUT FROM BASIS BOARD CONTROL CONN., FRUM GRP20, ELMO CABLE TO GRP70, ELMO1 TA UV-METER PANEL, EXTERNAL MONITOR UNIT, INTERN MASTER PERIPHERY CONTR. OUTPUT TO VU-PANEL INPUT FROM BASIS BOARD CONTROL CONN., FRUM GRP20, ELMO CABLE TO GRP70, ELMO1 FROM GRP43, ELM12 RESERVE RESERVE RESERVE COMMANDS CH 03 COMMANDS CH 02 COMMANDS CH 02 COMMANDS CH 02 COMMANDS CH 02 COMMANDS CH 03 COMMANDS CH 04 VU-METER PANEL, EXTERNAL VU-METER PANEL INPUT FROM BASIS BOARD CONTROL CONN., FROM GRP20, ELMO7 	9/18 5/19 - 5/19 - P01 P01 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 * *************** 00 ****************	P A G E 93 *

* *********	*****	****			****	****							
IGNAL NAME	COLOR	M I				s _	LV 	TYPE		DESCRIPTION OF ELEMENT			
< CONT.OF -SADC			36 43 43 58 60 70 70 70 70 70 70 70	46 1 2 12 1 2 2 1 2 3 4 5 6 7	2 A 9 5 5 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9					MASTER PERIPHERY CONTR. OUTPUT TO VU-PANEL INPUT FROM BASIS BOARD CUNIRUL CONN., FRUM GRP20, EL CABLE TO GRP70, ELMO1 FROM 8. BOARD TAPE DECK, ELM TO VU-METER PANEL FROM GRP20, ELMO9 FROM GRP20, ELMO9 FROM GRP43, ELM12 RESERVE RESERVE COMMANDS CH 03 COMMANDS CH 03 COMMANDS CH 02 COMMANDS CH 02 COMMANDS CH 02 COMMANDS CH 02	P01 P02 M07 19 P01 P01 P01 P01 P02 P03 P04 P05 P06 P07		1.820.728.00
				2 1		-				FROM GRP70, ELM07 FROM GRP35, ELM01 TO GPP33, ELM01			
- SL 1				1 		-				TO GRP33, ELMO1 FROM GRP35, ELMO1			
-SL2			35	1	17	-				10 GRP33, ELMOI	P01		
					21	-				FROM GRP35, ELMO1 TO GRP33, ELMO1	P01		
-SL3				1	6	_				FROM GRP35, ELMO1 TO GRP33, ELMO1	P01 P01		
r-SUPVON	9 9		20 20 20 27 59	1	11 2 9 9			U F M		FUSE FAILURE DETECTOR (GRP59) WIRE FIELD, TO CONN. GRP20, E MP-UNIT MASTER CONNECTOR TO GRP27, ELM04 SUPPLY (FROM GRP20, ELM20) FROM GRP20, ELM12	LM65/66 J08 P16 J01 P01		1.811.895.00 1.811.786.00
T-TC/RC	9 9 9 9 9		43 60 70 70 71	17 1 11 12 13 1	7 7 11 11 11	-		N A B N		TO SOURCE SELECTOR (AUDIO) AUDIO CONN., FROM GRP2O, ELMI CABLE TO GRP7O, ELMO9/11/12 AUDIO INPUT (FROM GRP2O, ELMI AUDIO + TC (FROM GRP43, ELMI1 MONITOR AMPLIFIER, AUDIO AUDIO INPUT	5/16/17 7) J01) J05		
-TC/RCL			20	90	2	-				RC-FILTER			
- TC I NDL			20	11 47	1			F		SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT RC-FILTER	P10 J11 J12		1.820.721.81 1.820.722.81
			20 20	48 90		-							
************** * WILLI ST ***********	UDER AG ******* 1.811.	**** 090•	20 20 20 20 20 20 20 20 20 20 20 20 20 2	11 47 48 ****** G *****	11 2 2 ***** N *****	- **** \ L ****	**** * 1	W I R ********* APE DECK	E L ********** & AUDIO	SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT . I S T * 89 * 88	P10 J11 J12 *********	 *******************************	1.820.722.81
************* * WILLI ST **************** * * * SIGNAL NAME	UDER AG ******** 1.811. ******* COLOR	**** 090. **** MI 	20 20 20 20 20 ******** S I ******** 00 * ST *********	11 47 48 ****** G ****** UDER ******	11 2 2 N A ***** PNT	- **** 312 **** S -	**** * 7 ****	W I R ******** APE DECK *******	E L ********** & AUDIO *********	SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT I S T * 89 * 88 DESCRIPTION OF ELEMENT	P10 J11 J12 	 * 12:22 * *********************************	PAGE 95 * **********************************
************** * WILLI ST *************** * * ****************	UDER AG	**** 090. **** MI 	20 20 20 20 ******** 00 * ST ******* ASY GRP	11 47 48 ****** G ****** UDER ***** ELM 47 48	11 2 2 N ***** PNT 14	- **** 312 **** S -	**** * 7 ****	W I R ******** APE DECK ******** TYPE	E L ********** & AUDIO *********	SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT . I S T * 89 . I S T * 88 . B S T * 88 . DESCRIPTION OF ELEMENT	P10 J1i J12 ********* /09/18 ******** /05/19 - ********* J11		1.820.722.81
WILLI ST WILLI ST SIGNAL NAME I-TCPRES	UDER AG ******* 1.811. ****** COLOR 	**** 090. **** MI 	20 20 20 20 20 20 20 4******* S I ******** ASY GRP 20 20 20 20 20 20 20 20 20 20 20 20 20	11 47 48 ****** UDER ***** ELM 47 48 5 1	11 2 2 ×**** N ***** PNT 14 14 14 12 12	- **** 312 **** S -	**** * 7 ****	W I R ******** APE DECK ******** TYPE	E L ********** & AUDIO **********	SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT 	P10 J11 J12 /09/18 ******* /05/19 - ******** J11 J12 P04 P01	********* * 12:22 * 00 ***********	1.820.722.81
SIGNAL NAME T-TCPRES T-TCNDL	UDER AG ******* 1.811. ******* COLOR 	MI 	20 20 20 20 20 ******** 00 * 5T ******** ASY GRP 20 20 20 20 20 20 20 20 20 20 20 20 20	11 47 48 ****** UDER ***** ELM 47 48 5 1	11 2 2 ****** PNT 14 14 12 12	- **** 312 **** S - - -	**** **** LV 	W I R ******** APE DECK ********* TYPE 	: E L ***********************************	SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT 	P10 J11 J12 //9/18 //9/18 //05/19 //11 J12 P04 P01 P03 P03		1.820.722.81
* WILLI ST * * T-TCPRES T-TENDL T-TENDR	UDER AG	**** 090. **** MI 	20 20 20 20 20 ************************	11 47 48 ****** UDER ****** ELM 47 48 5 1 6	11 2 2 ****** A ***** A ***** A ****** A ******	- ***** 312 **** S - - -	**** * T ****	W I R ******** APE DECK ********* TYPE 	: E L ***********************************	SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT 	P10 J11 J12 //09/18 //05/19 //05/10 //		1.820.722.81
* HILLI ST * SIGNAL NAME T-TCPRES T-TENDL T-TENDR T-TNDL T-TNDR	UDER AG ********* 1.811. ******** COLOR 4 4 	MI 	20 20 20 20 20 20 20 20 20 20 20 20 20 2	11 47 48 ****** G ****** UDER ****** 47 48 5 1 	11 2 2 ****** A ***** PNT 14 14 12 12 12 12 3 3	- ***** 312 **** S - - -	**** * T **** 	W I R ******** APE DECK ********* TYPE 	: E L L ********** **********************	SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT . I S T * 89 **********************************	P10 J11 J12 /09/18 /09/18 /09/18 /09/18 /09/18 /09/18 /09/18 /09/18 /09/18 /09/18 /09/18 /09/18 /09/19 /00/19 /09/19 /00/19 /00/19 /00/19 /00/19 /00/19 /00/19 /00/19 /00/10 /00/		1.820.722.83
SIGNAL NAME T-TCPRES T-TENDL T-TENDR T-TENDR	UDER AG ********* 1.811. ******** COLOR 4 4 	MI	20 20 20 20 20 20 20 20 20 20 20 20 20 2	11 47 48 ****** 6 ****** 47 48 5 1 	11 2 2 N N PNT 14 14 14 12 12 12 12 12 12 12 12 12 12	- ***** 312 **** S - - -	**** * T **** 	W I R ***********************************	: E L L ********** **********************	SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT 	PIO J11 J12 /09/18 /05/19 - 		1.820.722.81
WILLI ST WILLI ST WILLI ST SIGNAL NAME T-TCPRES T-TENDL T-TENDR T-TENDL T-TNDL T-TNDL T-TNDL T-TNDL T-VARSPD T-VARSPD	UDER AG ******* 1.811. ******* COLOR 4 4 	MI	20 20 20 20 20 20 20 20 20 20 20 20 20 2	11 47 48 5 5 1 2 2 7 8 1 2 2 7 8 1 2 2 2 7 8 1 2 2 3 3 5 1 4 4 2	PNT 14 14 14 12 12 12 12 12 12 12 12 12 12	- ***** 312 **** S - - -	**** * T **** 	W I R ***********************************	: E L L ********** **********************	SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT TIME CODE DELAY UNIT 	PIO J11 J12 /09/18 /05/19 - 		1.820.722.83
WILLT ST WILLT ST WILLT ST SIGNAL NAME T-TCPRES T-TENDL T-TENDR T-TENDR T-TNDL T-TNDL T-TNPR T-TNPR T-TNPR T-TNPR T-VARSPD	UDER AG ******* 1.811. ******* COLOR 4 4 	MI	20 20 20 20 20 20 20 20 20 20 20 20 20 2	11 47 48 6 ***** UDER 47 48 5 1 6 1 2 2 2 2 2 2 2 2 12 3 3 5 1 4 4 2 6 1 4 4 2	II 2 2 2 3 3 21 21 21 21 21 21 3 7 7 7 7 7 7 7 7 7 7 7 7	- ***** 312 **** S - - -	**** * T **** 	W I R ***********************************	E L AUDIO	SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT 	P10 J11 J12 J12 J12 J12 J12 J12 J12 J12 P04 P01 P03 P01 P03 P01 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P03 P04 P03 P01 P03 P04 P03 P03 P04 P03 P03 P04 P03 P03 P04 P03 P03 P04 P03 P03 P04 P03 P03 P04 P03 P03 P04 P03 P04 P03 P03 P04 P03 P03 P03 P03 P03 P03 P03 P03 P03 P03		1.820.722.81
WILLI ST WILLI ST WILLI ST SIGNAL NAME I-TCPRES T-TENDL T-TENDR T-TENDR T-TNDL T-TNDL T-TNDL T-WCLK1L -WCLK1R -WCLK2L	UDER AG ******* 1.811. ****** COLOR 4 4 4 	MI	20 20 20 20 20 20 20 20 20 20 20 20 20 2	11 47 48 G 48 5 1 47 48 5 1 47 48 5 1 2 2 7 8 1 2 2 7 8 1 2 2 7 8 1 2 2 1 2 2 1 2 3 5 1 4 4 2 5 1 4 4 2	II 2 2 2 N J A 4 PNT 14 14 14 12 12 12 12 12 12 12 12 11 11 21 21 21 21 21 7 7 7 7 7 7 7 8 8 8 8	- ***** 312 **** S - - -	**** * T **** 	W I R ******** APE DECK ********* TYPE	E L	SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT 	PIO J11 J12 /09/18 /05/19 - /10/18 /05/19 - /10/18 /05/19 - /01 /02 /03 /04 /04 /04 /04 /04 /04 /04 /04 /04 /04		1.820.722.83
WILLI ST WILLI ST WILLI ST WILLI ST WILLI ST TO TO THE ST TO TO THE ST TO TO THE ST TO THE	UDER AG ******* 1.811. ******* COLOR 4 4 4 	MI	20 20 20 20 20 20 20 20 20 20 20 20 20 2	11 47 48 48 5 1 2 2 7 8 1 2 2 2 7 8 1 2 2 2 7 8 1 2 2 2 7 8 1 2 2 1 2 1 2 3 3 5 1 4 4 2 5 1 4 4 2 5 1 4 4 7 4 8 4 8 4 7 4 8 4 8 4 8 4 8 4 8 4	11 2 2 2 3 11 12 12 12 12 12 12 12 12 12 12 7 7 7 7 7 7 7 7 8 8 8 8 8 8 8 8 8 8	- ***** 312 **** S - - -	**** * T **** 	W I R ******** APE DECK ********* TYPE	E L L	SYNCHRONIZER (SUPPLY) TIME CODE WRITE/READ UNIT TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT 	PIO J11 J12 J12 J12 J12 J12 J12 J12 PO PO PO PO PO PO PO PO PO PO PO PO PO		1.820.722.81

SIGNAL NAME	COLOR	MI	ASY GRP	ELM	1 PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
<< CONT.OF T-wRTSL			70 70 70 70 70 70 70 71	4 5 6 7	11 11 11 11 11 11 11 11	-			RESERVE RESERVE COMMANDS CH 03 COMMANDS CH 01 COMMANDS CH 02 COMMANDS MONITOR AMPLIFIER FROM GRP70, ELM07	P02 P03 P04 P05 P06 P07 P01		
ТА-АСТМЭ			20 20	46 53	68 20	-			MASTER PERIPHERY CONTR. MOND-STEREO-SWITCH	J10 J17		1.820.728.0 1.820.720.0
TA-ACTTC			20 20 20		88 20 20	-			MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT TIME CODE DELAY UNIT	J10 J11 J12		1.820.728.0 1.820.721.8 1.820.722.8
TA-ACT01			20 20 20 20 20 20			-			MASTER PERIPHERY CONTR. HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1	J10 J13 J14 J15 J16		1.820.728.00 1.820.713.00 1.820.712.83 1.820.710.83 1.820.714.83
TA-AC TO2			20 20 20 20 20 20	46 54 55 56 57	98 20 20 20 20 20	-			MASTER PERIPHERY CONTR. HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J10 J18 J19 J20 J21		1.820.728.0 1.820.713.0 1.820.712.8 1.820.710.8 1.820.714.8
TA-AUIR			20 20 20 20 20	42 43	15 12 21B 11A	-			CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT MASTER SERIAL INTERFACE MASTER PERIPHERY CONTR.	J05 J06 J07 J10		1.811.775.0 1.820.764.00 1.820.753.0 1.820.753.0
TAPAD-01	6 6 6		20 43		8 10 14 14 8 8	-		N A B	TO VU-METER PANEL, CH 1 LINE AMPLIFIER, CH 1 AUDIO CONN., FROM GRP20, ELM15/J CABLE TO GRP70, ELM09/11/12 VU-METER CH 01, AUDIO AUDIO CH 01 (FROM GRP43, ELM11)	J01		1.820.714.8
TAPAD-02	6 6 6		20 43 43	1 11 10	8 10 22 22 8 8	-		N A B	TO VU-METER PANEL, CH 2 LINE AMPLIFIER, CH 2 ANDIO CONN., FROM GRP20, ELM15/J CABLE TO GRP70, ELM09/11/12 VU-METER CH 02, ANDIO ANDIO CH 02 (FROM GRP43, ELM11)	J 03		1.820.714.8
TAPDI-01			20 20 20	51 52 53		-			REPRODUCE AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MUNU-STEREO-SWITCH	J15 J16 J17		1.820.710.8 1.820.714.8 1.820.720.00
TAPDI-02			20	53 56 57	10	-			MONO-STERED-SWITCH REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J17 J20 J21		1.820.720.00 1.820.710.81 1.820.714.81
TAPLI-01			20	51	1	-			REPRODUCE AMPLIFIER, CH 1	J15		1.820.710.8

SIGNAL NAME	COLOR	'MI	AS	r gri	P ELI	9 PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
TAPL I -02				20	56	1	-				J20		1.820.710.81
TAPMS-01	0 0 0			20 20 20 43 43 70 70	52 53 1	9 11 7 1 1 9 9	-		A B	TO VU-METER PANEL, CH 1 LINE AMPLIFIER, CH 1 MONO-STEREO-SWITCH AUDIO CONN., FROM GRP20, ELM15/16. CABLE TO GRP70, ELM09/11/12 VU-METER CH 01, AUDIO	J02 J16 J17		1.820.714.81 1.820.720.00
TAPMS-02	0 0 0			20 20 43 43 70	16 53 57 1 11 10 11	9 5 11 9 9 9	-		N A B	MONO-STEREO-SWITCH LINE AMPLIFIER, CH 2 AUDIO CONN., FROM GRP20, ELM15/16 CABLE TO GRP70, ELM09/11/12 VU-METER CH 02, AUDIO	J03 J17 J21 /17 J03 J04		1.820.720.00 1.820.714.81
TC-ADRO				20 20 20 20 20 27	41 42		-			OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39	P13 P14 J05 J06 P02		1.811.775.00 1.820.764.00
TC-ADR1				20 20 20 20 20 27	40 41 42	21 21 30 30 21	-			TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39	P13 P14 J05 J06 P02		1.811.775.00 1.820.764.00
TC-ADR2				20 20 20 20 20 27	40 41 42		-			TO TAPE DECK GRP27, ELMO2 F OPTION INT. SYNCHRONIZER F CAPSTAN MOTOR INTERFACE . CAPSTAN CONTROL UNIT . FROM GRP20, ELM39 F	P13 P14 J05 J06 P02		1.811.775.00 1.820.764.00
TC-CAP DC				20 20 85	1 42 1	4	-			CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN CONTROL UNIT	P01 J06 P01		1.820.764.00
TC-CDIRI				20 20	41 42	5	-			CAPSTAN MOTOR INTERFACE	J05 J06		1.811.775.00 1.820.764.00
TC-CPREF				20 85		13 13	-			CAPSTAN MOTOR DRIVE AMPLIFIER	P01 P01		
TC-DA TAO				20 20 20 20 20 27	39 40 41 42 2	39 39 39	-			TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39	P13 P14 J05 J06 P02		1.811.775.00 1.820.764.00
TC-DATA1				20 20 20	39 40 41	37	-			TO TAPE DECK GRP27, ELMO2 F OPTIGN INT. SYNCHRONIZER F	913 914 J05		1.811.775.00

* WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 98 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 *

SIGNAL NAME	COLOR	MI	ASY GR	P ELM	PNT	S	L٧	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
<< CONT.OF			20	42	38	-			CAPSTAN CONTROL UNIT	J06		1.820.764.00
TC-DATA1 TC-DATA2			27	2 39	37	-			TO TAPE DECK GRP27, ELM02	P02		
			20 20 20 27	40 41 42 2	35				OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39	P14 J05 J06 P02		1.811.775.00 1.820.764.00
TC-DATA3			20 20 20 20	39 40 41 42	33 33 36 36	-			TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT			1.811.775.00 1.820.764.00
 TC-DATA4			27	2 39	33 31	-			FROM GRP20, ELM39 TO TAPE DECK GRP27, ELM02	P02		
TC-DATA4			20 20 20 20 27	40 41 42 2	31 35 35				OPTION INT. SYNCHRONIZER Capstan motor interface Capstan control unit FROM GRP20, ELM39	P14 J05 J06 P02		1.811.775.00 1.820.764.00
TC-DATA5			20 20 20 20 20 27	39 40 41 42 2	29 34	-			TO TAPE DECK GRP27, ELMO2 Option int. Synchronizer Capstan Motor Interface Capstan cunirol uni From Grp20, Elm39	P13 P14 J05 J06 P02		1.811.775.00 1.820.764.00
TC-DATA6			20 20 20 20 27	39 40 41 42 2	27 27 33 33 27	-			TO TAPE DECK GRP27, ELMO2 OPTIGN INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39	P13 P14 J05 J06 P02		1.811.775.00 1.820.764.00
TC-DA TA 7			20 20 20 20 20 27	39 40 41 42 2	32	-			TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39	P13 P14 J05 J06 P02		1.811.775.00 1.820.764.00
TC-ENB			20 20 20 20 27	39 40 41 42 2	28	-			TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39	P13 P14 J05 J06 P02		1.811.775.00 1.820.764.00
TC-ENBG			27	42 2	11 7	-			TO TAPE DECK GRP2T, ELMO2 Option int. Synchronizer Capstan Motor Interface Capstan Control Unit From Grp20, ElM39	P13 P14 J05 J06 P02		1.811.775.00 1.820.764.00
TC-EREF				41 42		-			CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT	J05 J06		1.811.775.00 1.820.764.00
*******						812	* T	APE DECK &		8/05/19 -	00	*
SIGNAL NAME	COLOR	****	ASY GR	***** P ELM	*****	812 ****	* T ****	APE DECK & ************************************	AUDIO * 8	8/05/19 - **********	00 ********** REMARK	*
TC-HALL1	COLOR	****	ASY GRI 84 85	ELM	***** 4 4 	812 ****	* T ****	APE DECK & ************ TYPE F M	AUDIO * 8	8/05/19 - ********** J01 P02	00 ********** REMARK	* ************************************
TC-HALL 1	COLOR	****	ASY GR	***** P ELM 	***** 4 4 	812 ****	* T ****	APE DECK & ************* TYPE F	AUDIO * 8 **********************************	8/05/19 - ********** J01 P02	00 ********** REMARK	* ************************************
TC-HALL1 TC-HALL2 TC-HALL3	COLOR	****	ASY GR 84 85 	ELM 1 2 1 2 1 2	***** 4 4 	812 ****	* T ****	APE DECK & ************ TYPE F M	AUDIO * 8 DESCRIPTION OF ELEMENT FROM GRP85, ELMO2 FROM GRP85, ELMO1 FROM GRP85, ELMO2	8/05/19 - ********** J01 P02 J01 P02 J01 P02 J01 P02	00 ********** REMARK	* ************************************
TC-HALL 1 TC-HALL 2	COLOR	****	ASY GR 84 85 	ELM 1 2 1 2 1 2	**** PNT 4 4 7 7 10	812 ****	* T ****	APE DECK & *********** TYPE F M F M M	AUDIO * 8	8/05/19 - ********* J01 P02 J01 P02 J01	00 ********** REMARK	* ************************************
TC-HALL1 TC-HALL2 TC-HALL2	COLOR	****	ASY GR 84 85 	ELM ELM 1 2 1 2 41 42 39 40 41 42	***** 4 10 10 9 9 5 13 13	812 ****	* T ****	APE DECK & *********** TYPE F M F M M	AUDIO * 8 DESCRIPTION OF ELEMENT FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT	8/05/19 - ********* JO1 P02 JO1 P02 JO5 J06 P13 P14 J05 J06	00 *********** REMARK 	* ELEMENT NR
TC-HALL1 TC-HALL2 TC-HALL3 TC-INEX	COLOR	****	ASY GR 84 85 	ELM 1 2 1 2 1 2 41 42 39 40 41 42 2	**************************************	812 ****	* T ****	APE DECK & *********** TYPE F M F M M	AUDIO * 8 DESCRIPTION OF ELEMENT FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39	8/05/19 - J01 P02 J01 P02 J01 P02 J05 J06 P13 P14 J05 J06 P13 P14 P02	00 REMARK	* ELEMENT NR. ELEMENT NR
TC-HALL1 TC-HALL2 TC-HALL3 TC-INEX TC-INEX	COLOR 	****	ASY GRU 84 85 84 85 20 20 20 20 20 20 20 20 20 20 20 20 20	ELM 1 2 2 1 2 2 1 2 2 2 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	**************************************	812 ****	* T ****	APE DECK & *********** TYPE F M F M M	AUDIO * 8 DESCRIPTION OF ELEMENT FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT	8/05/19 - J01 P02 J01 P02 J01 J01 J01 P02 J05 J06 P02 J05 J06	00 REMARK	* ELEMENT NR.
TC-HALL1 TC-HALL2 TC-HALL3 TC-INEX TC-IRQ TC-REF TC-REF	COLOR 	****	ASY GR 	ELM 1 2 2 1 2 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	**************************************	812 ****	* T ****	APE DECK & *********** TYPE F M F M M	AUDIO * 8 DESCRIPTION OF ELEMENT FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SVNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39 CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT CAPSTAN MOTOR INTERFACE	8/05/19 - J01 P02 J01 P02 J01 J05 J06 P13 P14 J05 J06 J06 J06	00 REMARK 	* ELEMENT NR. 1.811.775.00 1.820.764.00 1.811.775.00 1.820.764.00 1.811.775.00 1.820.764.00
TC-HALL 1 TC-HALL 2 TC-HALL 3 TC-INEX TC-INEX TC-IRQ	COLOR 	****	ASY GRU B4 B5 B4 B5 B4 B5 B4 B5 C0 20 20 20 20 20 20 20 20 20 2	2 ELP 1 2 2 1 1 2 3 9 4 0 4 1 4 2 2 4 1 4 2 4 1 4 2 3 9 4 0 4 1 4 2 2 4 1 4 2 4 2 4 1 4 1 4 1 4 2 4 1 4 1 4 2 4 1 4 1 4 2 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1	**************************************	812 ****	* T ****	APE DECK & *********** TYPE F M F M M	AUDIO * 8 AUDIO * 8 DESCRIPTION OF ELEMENT FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT	8/05/19 - J01 P02 J01 P02 J01 P02 J05 J06 P02 J05 J06 P02 J05 J06 P02 P02 P02 P02 J05 J06 P02 J05 J06 P02 J05 J06 P02 P02 P02 P02 P02 P02 P02 P02	00 REMARK	* ELEMENT NR.
TC-HALL1 TC-HALL2 TC-HALL3 TC-INEX TC-IRQ TC-REF TC-REF	COLOR 	****	ASY GR 	ELP 1 2 1 2 1 2 2 1 2 2 1 2 2 1 2 2 41 42 41 42 41 42 41 42 41 42 41 42 41 42 41 42 41 42 41 42 40 40 40 41 42 41 42 41 42 40 40 40 40 41 42 42 2 2 41 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 42 42 41 44 42 42 2 2 2	**************************************	812 ****	* T ****	APE DECK & *********** TYPE F M F M M	AUDIO * 8 AUDIO * 8 DESCRIPTION OF ELEMENT FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39	8/05/19 - J01 P02 J01 P02 J01 P02 J05 J06 P13 P14 J05 J06 P02 P02 P02 P02 P02 P02 P02 P02	00 REMARK	* ELEMENT NR.
TC-HALL 1 TC-HALL 2 TC-HALL 3 TC-INEX TC-IRQ TC-REF TC-REF TC-REFP TC-REFP	COLOR 	****	**************************************	ELP 1 2 1 2 1 2 41 42 39 40 41 42 39 40 41 42 39 40 41 42 39 40 41 42 39 40 41 42 39 40 41 42 39 40 41 42 39 40 41 42 39 40 41 42 39 40 41 42 41 42	***** PNT 4 4 4 7 7 7 7 10 10 10 9 9 9 5 5 5 5 13 13 5 8 8 8 9 9 10 10 9 9 13 13 5 5 5 5 5 5 5 5 5 13 13 5 9 9 9 9 10 10 10 9 9 9 9 9 9 9 9 	812 ****	* T ****	APE DECK & *********** TYPE F M F M M	AUDIO * 8 AUDIO	8/05/19 - J01 P02 J01 P02 J01 P02 J05 J06 P13 P14 J05 J06 P02 J05 J06 P02 P02 P02 P02 P02 P02 P02 P02	00 REMARK	* ELEMENT NR. 1.811.775.00 1.820.764.00 1.811.775.00 1.820.764.00 1.811.775.00 1.820.764.00 1.811.775.00 1.820.764.00 1.811.775.00 1.820.764.00 1.811.775.00 1.820.764.00
TC-HALL 1 TC-HALL 2 TC-HALL 3 TC-INEX TC-INEX TC-IRQ TC-REF TC-REF TC-REFP TC-RESMP	COLOR 	****	ASY GR 84 85 84 85 84 85 20 20 20 20 20 20 20 20 20 20	ELP 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	***** PNT	812 ****	* T ****	APE DECK & *********** TYPE F M F M M	AUDIO + 8 DESCRIPTION OF ELEMENT FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELM02 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39	8/05/19 - J01 P02 J01 P02 J01 P02 J05 J06 P13 P14 J05 J06 P13 P14 J05 J06 P02 P13 P14 J05 J05 J05 J05 J05 J05 J05 J05	00 REMARK	* ELEMENT NR.
TC-HALL 1 TC-HALL 2 TC-HALL 3 TC-INEX TC-INEX TC-REF TC-REF TC-REFP TC-RESMP TC-RESMP TC-SL1	COLOR 	****	ASY GR B4 B5 B4 B5 B4 B5 B4 B5 C0 C0 C0 C0 C0 C0 C0 C0 C0 C0	ELP 1 2 1 2 1 2 41 42 41 42 39 401 42 41 42 39 40 41 42 39 40 41 42 2 41 42 39 40 41 42 39 40 41 42 2 39 40 42 2	**** PNT 	812 ****	* T ****	APE DECK & *********** TYPE F M F M M	AUDIO * 8 AUDIO * 8 DESCRIPTION OF ELEMENT FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 CORP84, ELMO1 CORP84, ELMO1 CORP84, ELMO1 CORP84, ELMO2 TO GRP84, ELMO2 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELM02 OPTION INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELM02 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELM02 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELM02 OPTION INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELM02 OPTION INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELM02 OPTION INTERFACE CAPSTAN CONTROL UNIT FROM GRP20, ELM3	8/05/19 - J01 P02 J01 P02 J01 P02 J05 J06 P13 P14 J05 J06 P02 J05 J06 P02 J05 J06 P02 P13 P14 J06 P02 J05 J06 P02 P13 P14 J06 P02 J05 J06 P02 P13 P14 J06 P02 P02 J05 J06 P02 P13 P14 J06 P02 P02 P02 P02 P02 P02 P02 P02	00 REMARK	* ELEMENT NR.
TC-HALL1 TC-HALL2 TC-HALL3 TC-INEX TC-INEX TC-IRQ TC-REF TC-REFP TC-RESMP TC-RESMP TC-RU TC-SL1	COLOR 	****	ASY GR B4 B5 B4 B5 B4 B5 B4 B5 C0 C0 C0 C0 C0 C0 C0 C0 C0 C0	ELP 1 2 1 2 1 2 41 42 41 42 39 401 42 41 42 39 40 41 42 39 40 41 42 2 41 42 39 40 41 42 39 40 41 42 2 39 40 42 2	**** PNT 	812 ****	* T ****	APE DECK & *********** TYPE F M F M M	AUDIO + 8 AUDIO + 8 AUDIO + 8 DESCRIPTION OF ELEMENT FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 FROM GRP85, ELMO2 TO GRP84, ELMO1 CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39 TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELM02 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT TO TAPE DECK GRP27, ELM02 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT	8/05/19 - J01 P02 J01 P02 J01 P02 J05 J06 P13 P13 P13 P13 P02 J05 J06 P02 P02 P02 P13 P14 J05 J06 P02 P13 P14 J05 J06 P02 P13 P14 J05 J06 P02 P13 P14 J05 J06 P02 P13 P14 J05 J06 P02 P13 P14 J05 J06 P02 P02 P13 P14 J05 J06 P02 P02 P02 P02 P02 P02 P02 P02	00 REMARK	* ELEMENT NR.

* WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 100 * * I.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 * *

SIGNAL NAME	COLOR	MI	ASY GRE	P ELP	1 PNT	S	LV	ΤΥΡΕ	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
TC-TCDIR			20 20 20 35	5 38 41 2	18 8 1 18	-			PARALLEL REMOTE IF (GRP35) PAR. CONT. INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE FROM GRP20, ELM05	P05 P12 J05 P02		1.811.775.00
тс-тсму			20 20 20 35	38 41	17 10 2 17	-			PARALLEL REMOTE IF (GRP35) PAR. CONT. INT. SYNCHRONIZER CAPSTAN MOTOR INTERFACE FROM GRP20, ELM05	P05 P12 J05 P02		1.811.775.00
TC-TCMVI			20 20		4 5	-			CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT	J05 J06		1.811.775.00 1.820.764.00
T D-ADRO			25 26 27	1	17 17 17	-		L	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
TD-ADR1			25 26 27	1	18 18 18	-		L	FROM GRP26, ELMO1 TO GRP25, ELMO1/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
TD-ADR2			25 26 27	1	19 19 19	-		L	FROM GRP26, ELMO1 TO GRP25, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02		
TD-AU IR			20	2	7	-			SSDA SYNCHRONIZER	P02		
TD-CAPSY			20 20 20	42	13 7 22A	-			PAR. CONT. INT. SYNCHRONIZER CAPSTAN CONTROL UNIT MASTER SERIAL INTERFACE	P12 J06 J07		1.820.764.00 1.820.753.00
TD-CRES			20 20 20 27	40 42	13 13 26 13	-			TO TAPE DECK GRP27, ELMO2 OPTION INT. SYNCHRONIZER CAPSTAN CONTROL UNIT FROM GRP20, ELM39	P13 P14 J06 P02		1.820.764.00
TD-DATA0			25 26 27	1	16 16 16	-		L	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
TD-DATA1			25 26 27	1	15 15 15	-		L	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
TD-DATA2			25 26 27	1	14 14 14	-		L	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
TD-DATA3			25 26 27	1	13 13 13	-		L	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
TD-DATA4			25 26 27	1	12 12 12	-		L	FROM GRP26, ELM01 TO GRP25, ELM07/GRP27, ELM03 FROM GRP26, ELM01	P02		

* WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 101 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00

SIGNAL NAME	COLOR	MI	ASY 0	RP E	LM	PNT S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
TD-DATA5			2		7 1 3	11		L	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
TD-DATA6			2	6	7 1 3	10		L	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
TD-DATA7			2	6	7 1 3	9 9 9		L	FROM GRP26, ELMO1 To GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
TD-DIRL			2	5	3 8 2			L	FROM GRP26, ELMO2 FROM GRP 26, ELMO2 TO GRP24, ELMO3/GRP25, ELMO8	P01 P01		
TD-DIRR			2	5	3 8 2	19		L	FROM GRP26, ELMO2 FROM GRP 26, ELMO2 TO GRP24, ELMO3/GRP25, ELMO8	P01 P01		
ТО-Е			2	6	7 1 3	23		L	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
T D- EN G			2	6	7 1 3	25		L	FROM GRP26, ELMO1 TO GRP25, ELMO1/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
TD-EVENT			2	0 0 4 7		7 1 7			TAPE DECK CONTROLLER (GRP27) MP-UNIT MASTER FROM GRP20, ELMO3	P03 J08 P01		1.811.786.0
TD-HEACT			2	0 4	3	20A			MASTER SERIAL INTERFACE	J07		1.820.753.0
TD-INF			2	5	3 8 2	18		L	FROM GRP26, ELMO2 FROM GRP 26, ELMO2 TO GRP24, ELMO3/GRP25, ELMO8	P01 P01		
TD-IRQ			2	6	7 1 3	31		L .	FROM GRP26, ELMO1 TO GRP25, ELMO1/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
TD-MFL			2	5	3 8 2	13		L	FROM GRP26, ELMO2 FROM GRP 26, ELMO2 FROM GRP 26, ELMO2 TO GRP24, ELMO3/GRP25, ELMO8	P01 P01		
TD-MFR			2	5	3 8 2	15		L	FROM GRP26, ELMO2 FROM GRP 26, ELMO2 TO GRP24, ELMO3/GRP25, ELMO8	P01 P01		
TD-MOVE			2	0 4	3	21 A			MASTER SERIAL INTERFACE	J07		1.820.753.00
TD-MVCKS			2	6	7 1 3	33		L	FROM GRP26, ELMO1 TO GRP25, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		

SIGNAL NAME								TYPE	DESCRIPTION OF ELEMENT	*****	REMARK	ELEMENT NR.
TD-MVCLK			20	3		-			TAPE DECK CONTROLLER (GRP27)			
			20 20 20	38	23 15 258				PARALLEL REMOTE IF (GRP35) PAR. CONT. INT. SYNCHRONIZER MASTER SERIAL INTERFACE	P05 P12 J07		1.820.753.00
			20 25	48	6 8				TIME CODE DELAY UNIT	J12 P06		1.820.722.81
			25	7 1	27			L	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3	P02		
			27 27	1 3	9 27				FROM GRP20, ELMO3 FROM GRP26, ELMO1	P01 P03		
TD-MVDIR			35		23	-			FROM GRP20, ELM05	P02		
ID-HVDIK			20 20 20	5	10 24 14				TAPE DECK CONTROLLER (GRP27) PARALLEL REMOTE IF (GRP35) PAR. CONT. INT. SYNCHRONIZER	P03 P05 P12		
					25A 4				MASTER SERIAL INTERFACE TIME CODE DELAY UNIT	J07 J12		1.820.753.00 1.820.722.81
			25 25	4 7	10 32				USER From Grp26, Elmoi	P06 P02		
			26 27		10			L	TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP20, ELMO3	P01		
			27 35	3	32	_			FROM GRP26, ELMO1 FROM GRP20, ELMO5	P03 P02		
TD-PAVS			24 25		10 10				FROM GRP26, ELM02 FROM GRP 26, ELM02	P01 P01		
			26	2	10	-		L 	TO GRP24, ELM03/GRP25, ELM08			
TD-PAV1			25 26	1				L	FROM GRP26, ELMO1 To GRP25, ELMO7/GRP27, ELMO3	P02		
TD-PAV2			27		20 24	-			FROM GRP26, ELM01 FROM GRP26, ELM01	P03		
			26 27	1	24 24			L	TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P03		
TD-PAV3				7		-			FROM GRP26, ELMO1	P02		
			26 27	i 3	26 26			L	TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P03		
TD-PENB			24 25	3	9 9	-			FROM GRP26, ELMO2 FROM GRP 26, ELMO2	P01 P01		
				2		-		L	TO GRP24, ELMO3/GRP25, ELMO8			
TD-RES			24 25		16				FROM GRP26, ELMO2 FROM GRP 26, ELMO2	P01 P01		
TD-RESET				2		-		L 	TO GRP24, ELMO3/GRP25, ELMO8 FROM GRP26, ELMO1			
ID-RESET			26	1	22			L	TO GRP25, ELM07/GRP27, ELM03	P02		
			27						FROM GRP26. FLM01	P0 3		
TD-RESIN			27		22	-			FROM GRP26, ELM01 FROM GRP26, ELM01	P03		
* WILLIST ************************************	UDER AG	* **** 090.	25 26 27 	3 7 1 3 **** G **** DER	22 40 40 40 **** N A 8	L ****	**** * TA	W I R E ***********************************	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/	P02 P03 ******************************	* 12:22 * *********** 00	PAGE103 * ***********************************
**************************************	UDER AG	**** 090. ****	25 26 27 	3 7 1 3 **** G VER ****	22 40 40 40 ***** N A ***** A 8 *****	**** 12 * ****	**** * TA *****	W I R E ***********************************	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/1 UDIO * 88/1 DESCRIPTION OF ELEMENT	P02 P03 ******************************	* 12:22 * *********** 00	PAGE103 * ***********************************
************* * Willi ST ************************************	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 ******** S I ********* 00 * STU ********* ASY GRP 	3 7 1 3 **** G **** DER **** ELM 7 1	22 40 40 40 ***** A 8 ***** PNT 21 21	**** 12 * ****	***** * T/ ***** LV 	 W I R E *********** PE DECK & A *************	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89// UDIO * 88// DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3	P02 P03 	* 12:22 * ********** 00 *****	PAGE103 * ***********************************
* WILLI ST * WILLI ST * * * * * * * * * * * * * * * * * * *	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 ******** S I ********* 00 * STU ********* ASY GRP 25 26 27	3 7 1 3 ***** G ***** DER * ELM 7 1 3	22 40 40 40 ***** A 8 ***** PNT 21 21	**** 12 * ****	***** * T/ ***** LV 		FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/0 UDI0 * 88/0 DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03 09/18 09/18 05/19 - ******** P02 P03	* 12:22 * ********** 00 *****	PAGE103 * ***********************************
* WILLI ST * SIGNAL NAME TD-RH	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 I 5 I 5 I 5 I 5 I 5 I 5 I 5 I 6 STU 25 26 27	3 7 1 3 ***** G **** DER **** ELM 7 1 3 5	22 40 40 40 ***** A 8 ***** PNT 21 21 21 21 21 7 7	**** 12 * ****	***** * T/ ***** LV 		FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89// UDID * 88// DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO1 GONNECTOR RS 232 (SERVICE)	P02 P03 P03 P0718 ******* D5/19 - ******* P02 P03	* 12:22 * ********** 00 *****	PAGE103 * ***********************************
* WILLI ST * **********************************	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 I 00 * STU 25 26 27 25 26 27 27 27 24 25	3 7 1 3 ***** G ***** DER * ELM 7 1 3	22 40 40 40 ***** A 8 ***** PNT 21 21 21 7 	**** 12 * ****	***** * T/ ***** LV 		FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/0 UDI0 * 88/0 DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03 P03 P0718 P0718 P0718 P02 P02 P03 J02	* 12:22 * ********** 00 *****	PAGE103 * ***********************************
WILLI ST WILLI ST SIGNAL NAME ID-RW ID-RX ID-RX	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 I 5 I 00 * 5 SI 00 * 5 SI 25 26 27 27 27 27 24 25 26 27 27 24 25 26	3 7 1 3 ***** G ***** DER ***** ELM 7 1 3 5 5 3 8 2 7	22 40 40 40 40 20 20 21 21 21 21 21 22 25 25 25 25 25 30	**** 12 * ****	LV 		FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/ UDIO * 88/ DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO2 FROM GRP26, ELMO2 FROM GRP26, ELMO2 FROM GRP26, ELMO3 FROM GRP26, ELMO3 FROM GRP26, ELMO3	P02 P03 P04 P0718 P0718 P02 P03 J02 P01	* 12:22 * ********** 00 *****	PAGE103 * ***********************************
* WILLI ST ************************************	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 1 **********************************	3 7 1 3 	22 40 40 40 40 40 21 21 21 21 21 21 21 21 21 21 21 21 21	**** 12 * ****	LV 	<pre>************************************</pre>	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/1 DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO2 FROM GRP26, ELMO2 TO GRP25, ELMO2 FROM GRP26, ELMO2 TO GRP25, ELMO3 FROM GRP26, ELMO2 TO GRP25, ELMO3/GRP25, ELMO8 FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP26, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03 P03 P07 P02 P02 P03 J02 P01 P01 P02 P01 P02 P03	* 12:22 * ********** 00 *****	PAGE103 * ***********************************
* WILLI ST ************************************	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 I 5 I 25 26 27 25 26 27 27 24 25 26 27 27 24 25 26 27 25 26 27 25 26	3 7 1 3 ***** G ***** DER ***** ELM 7 1 3 8 2 7 1 3 7 1	22 40 40 40 40 40 20 21 21 21 21 21 21 21 25 25 25 25 25 25 25 25 25 25 25 25 25	**** 12 * ****	LV 	<pre>************************************</pre>	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/1 DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO2 FROM GRP26, ELMO2 FROM GRP26, ELMO3 FROM GRP26, ELMO2 FROM GRP26, ELMO3 FROM GRP26, ELMO1 TO GRP25, ELMO3/GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP26, ELMO7/GRP27, ELMO3	P02 P03 P04 P04 P02 P03 J02 P01 P01 P02 P03 P02 P03 P02 P03 P02 P03 P02	* 12:22 * ********** 00 *****	PAGE103 * ***********************************
* WILLI ST * * SIGNAL NAME DD-RW TD-RX TD-SCK TD-SL0	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 1 ********* ASY GRP 25 26 27 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27	3 7 1 3 6 4 5 7 1 3 8 2 7 1 3 7 1 3	222 40 40 40 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	**** 12 * ****	LV 	<pre>************************************</pre>	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/1 UDID * 88/1 DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP25, ELMO2 FROM GRP26, ELMO1 TO GRP25, ELMO3/GRP25, ELMO8 FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03 P03 P07 P02 P02 P03 J02 P01 P01 P02 P01 P02 P03	* 12:22 * ********** 00 *****	PAGE103 * ***********************************
************* * WILLI ST ***************** ******************	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 *********************************	3 7 1 3 **** G **** ELM 7 1 3 8 2 7 1 3 7 1 3 7 1	22 40 40 40 40 20 21 21 21 21 21 21 21 21 21 21 21 21 21	**** 12 * ****	****** ******** LV 	<pre>************************************</pre>	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/i DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP26, ELMO1 FROM GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP27, ELMO3/GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP26, ELMO1 TO GRP27, ELMO3/GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03 P04 P04 P04 P04 P04 P04 P04 P04	* 12:22 * ********** 00 *****	PAGE103 * ***********************************
* WILLI ST * **********************************	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 *********************************	3 7 1 3 **** G **** G **** ELM 7 1 3 8 2 7 1 3 7 1 3 7 1 3 7 1 3 7 1 3	222 40 40 ***** A ** * * * * * * * * * * * * * *	**** 12 * ****	****** ******** LV 	<pre>************************************</pre>	FROM GRP26, ELM01 TO GRP25, ELM07/GRP27, ELM03 FROM GRP26, ELM01 L I S T * 89/i DESCRIPTION OF ELEMENT FROM GRP26, ELM01 TO GRP25, ELM07/GRP27, ELM03 FROM GRP26, ELM01 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELM02 FROM GRP26, ELM01 TO GRP26, ELM01 FROM GRP26, ELM02 FROM GRP26, ELM02 FROM GRP26, ELM03 FROM GRP26, ELM03 FROM GRP26, ELM03 FROM GRP26, ELM03 FROM GRP26, ELM01 TO GRP26, ELM03 FROM GRP26, ELM01 FROM GRP26, ELM01 TO GRP25, ELM07/GRP27, ELM03 FROM GRP26, ELM01 FROM GRP26, ELM01 TO GRP25, ELM07/GRP27, ELM03 FROM GRP26, ELM01 TO GRP25, ELM01 TO GRP26, ELM01	P02 P03 P02 P02 P03 J02 P01 P01 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P01 P02 P01 P01 P01 P02 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 * ********** 00 *****	P A G E 103 *
MILLI ST MILLI	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 *********************************	3 7 1 3 6 **** DER **** ELM 7 1 3 8 2 7 1 3 8 2 7 1 3 7 1 3 7 1 3 7 1 3 7 1 3 7 1 3 7 1 3	222 40 40 40 ***** A ** PNT 21 21 21 21 21 21 21 21 21 21 21 21 21	**** 12 * ****	LV	**************************************	FROM GRP26, ELM01 TO GRP25, ELM07/GRP27, ELM03 FROM GRP26, ELM01 L I S T * 89/i UDIO * 86/i DESCRIPTION OF ELEMENT FROM GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM01 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELM01 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELM01 TO GRP26, ELM02 FROM GRP26, ELM01 TO GRP27, ELM03 FROM GRP26, FLM01 TO GRP27, ELM03 FROM GRP26, FLM01 TO GRP27, ELM03 FROM GRP26, FLM01 TO GRP27, FLM03 FROM GRP26, FLM01 FROM GRP26, FLM01 FROM GRP26 FROM GR	P02 P03 P02 P02 P03 J02 P01 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P02 P03 P01 P02 P03 P02 P03 P02 P03 P02 P03 P01 P02 P03 P01 P02 P03 P02 P03 P01 P02 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P03 P03 P01 P03 P01 P03 P03 P01 P03 P03 P01 P03 P01 P03 P03 P01 P03 P03 P01 P03 P03 P01 P03 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P03 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 * ********** 00 *****	PAGE103 * ***********************************
MILLI ST MILLI	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 1 ********** ASY GRP 25 26 27 	3 7 1 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	222 40 40 40 ***** 8 ***** 8 ***** 7 21 21 21 21 21 21 21 21 22 25 25 25 25 25 25 25 25 25 25 25 25	**** 12 * ****	LV	<pre>************************************</pre>	FROM GRP26, ELM01 TO GRP25, ELM07/GRP27, ELM03 FROM GRP26, ELM01 L I S T * 89/1 DESCRIPTION OF ELEMENT FROM GRP26, ELM01 TO GRP26, ELM01 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELM01 TO GRP26, ELM01 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELM01 TO GRP26, ELM01 FROM GRP26, E	P02 P03 P02 P02 P02 P03 J02 P01 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02	* 12:22 * ********** 00 *****	P A G E 103 *
MILLI ST SIGNAL NAHE ID-RW ID-RX ID-SL0 ID-SL2 ID-SL2	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 1 ********* ASY GRP 	3 7 1 3 6 **** 0 ELM 7 1 3 8 2 7 1 3 8 2 7 1 3 3 8 2 7 1 3 3 8 2 7 1 3 3 8 2 7 1 3 3 8 2 7 1 3 1 3 1 3 1 3 1 3 1 1 3 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 3 1 1 1 3 1 1 1 1 3 1	40 40 40 ***** * A 8 ***** PNT 21 21 21 21 21 21 21 21 21 21 21 21 22 25 25 25 25 25 25 25 25 25 25 29 29 28 28 28 28 8 6 1 1 8 8 8 8 8 8 8 8 8 10	**** 12 * ****	LV	**************************************	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/ DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO1 TO GRP25, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP26, ELMO1 GAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN CONTROL UNIT FROM GRP34, ELMO2 TO GRP84, ELMO1 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR DRIVE AMPLIFIER	P02 P03 P02 P03 P02 P03 J02 P01 P01 P02 P03 P01 P01 P02 P03 P01 P01 P01 P01 P02 P03 P01 P01 P02 P03 P01 P01 P02 P03 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P01 P02 P03 P02 P01 P02 P03 P02 P01 P02 P01 P02 P01 P02 P01	* 12:22 * ********** 00 *****	P A G E 103 *
MILLI ST MILLI ST GIGNAL NAHE D-RW D-RW D-RX D-SL0 D-SL0 D-SL2 D-SL2 D-TCM1	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 1 ********* ASY GRP 25 26 27 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 27 24 25 26 27 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 27 24 25 26 27 27 27 24 25 26 27 27 27 27 27 27 27 27 27 27 27 27 27	3 7 1 3 7 1 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	222 40 40 40 40 20 20 21 21 21 21 21 21 21 21 21 21 21 21 21	**** 12 * ****	LV 	************************************	FROM GRP26, ELM01 TO GRP25, ELM07/GRP27, ELM03 FROM GRP26, ELM01 L I S T * 89/ DESCRIPTION OF ELEMENT FROM GRP26, ELM01 TO GRP25, ELM01 TO GRP25, ELM01 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELM01 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM02 FROM GRP26, ELM02 FROM GRP26, ELM01 TO GRP26, ELM01 TO GRP27, ELM03/GRP27, ELM03 FROM GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM01 FROM GRP26, ELM01 TO GRP26, ELM01 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR INTERFACE	P02 P03 P02 P03 P02 P03 P01 P02 P01 P01 P02 P03 P01 P01 P02 P03 P01 P02 P03 P01 P03 P01 P01 P01 P01 P03 P01 P01 P01 P01 P01 P02 P03 P01 P01 P03 P01 P01 P03 P01 P01 P03 P01 P01 P01 P03 P01 P01 P01 P01 P01 P01 P01 P03 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 * *********** 00 *****	P A G E 103 *
MILLI ST MILLI ST GIGNAL NAHE D-RW D-RW D-RX D-SL0 D-SL0 D-SL2 D-SL2 D-TCM1	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 1 ********* ASY GRP 	3 7 1 3 6 ***** 0 ELM 7 1 3 8 2 7 1 3 8 2 7 1 3 3 8 2 7 1 3 3 7 1 3 3 7 1 3 3 7 1 3 3 8 2 7 1 1 3 4 2 7 1 1 3 4 4 1 4 1 4 4 1 4 4 1 4 4 1 4 1 4	222 40 40 40 40 20 20 21 21 21 21 21 21 21 21 21 21 22 25 25 25 25 25 25 25 25 25 25 29 229 2	**** 12 * ****	LV 	**************************************	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 80/4 DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP25, ELMO2 FROM GRP26, ELMO1 FROM GRP26, ELMO1 TO GRP25, ELMO2 FROM GRP26, ELMO1 FROM GRP26, ELMO1 FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP27, ELMO7 GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP26, ELMO1 CAPSTAN MOTOR DR IVE AMPLIFIER CAPSTAN MOTOR DR IVE AMPLIFIER CAPSTAN MOTOR DR INTERFACE	P02 P03 P02 P03 P02 P03 J02 P01 P01 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P01 P01 P02 P03 P02 P03 P01 P01 P02 P03 P02 P03 P01 P01 P01 P02 P03 P02 P03 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 * *********** 00 *****	P A G E 103 *
MILLI ST MILLI ST SIGNAL NAME ID-RW D-SCK D-SL0 ID-SL1 ID-SL2 ID-TCM1	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 1 ********* ASY GRP 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 27 24 25 26 27 27 27 24 25 26 27 27 27 24 25 26 27 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 24 25 26 27 27 27 24 25 26 27 27 24 25 26 27 27 27 24 25 26 27 27 26 27 27 26 27 27 26 27 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 27 26 27 26 27 26 27 26 27 26 27 27 26 26 27 27 26 26 27 27 26 26 27 20 26 27 26 27 26 27 20 26 27 26 27 20 26 27 26 27 26 27 26 26 27 20 20 20 20 20 20 27 20 26 27 20 20 20 20 20 20 20 20 20 20 20 20 20	3 7 1 3 	222 40 40 40 40 20 22 21 21 21 21 21 21 21 22 22 25 25 25 25 25 25 22 22 23 30 30 229 229 228 86 1 1 88 8 8 10 7 21 11 10 10 9	**** 12 * ****	LV 	************************************	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/ * DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP26, ELMO1 FROM GRP26, ELMO1 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR INTERFACE CAPSTAN C	P02 P03 P01 J05 J06 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 * *********** 00 *****	P A G E 103 *
MILLI ST MILLI ST GRAL NAME D-RX D-SL0 D-SL1 D-SL2 D-TCM1 D-TCM2	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 1 ********* ASY GRP 25 26 27 27 24 25 26 27 27 27 24 25 26 27 27 27 24 25 26 27 27 26 27 27 27 27 24 25 26 27 27 27 27 27 24 25 26 27 27 25 26 27 27 25 26 27 27 27 25 26 27 27 25 26 27 27 25 26 27 27 25 26 27 27 25 26 27 27 25 26 27 27 25 26 27 25 26 27 27 25 26 27 25 26 27 25 26 27 27 25 26 27 25 26 27 25 26 27 27 25 26 27 20 20 20 20 20 20 20 20 20 20 20 20 20	3 7 1 3 3 4 5 7 1 3 8 8 2 7 1 3 8 8 2 7 1 3 3 7 1 3 3 7 1 3 3 7 1 3 3 7 1 3 3 7 1 3 3 7 1 3 3 7 1 3 3 7 1 3 3 7 1 3 7 1 3 7 7 1 3 7 7 7 1 3 7 7 7 7	222 40 40 40 40 20 20 21 21 21 21 22 22 25 25 25 25 25 22 22 23 30 30 229 229 228 8 6 1 1 10 11 10 11 10 13	**** 12 * ****	LV 	************************************	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/ DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP26, ELMO1 FROM GRP26, ELMO1 FROM GRP26, ELMO1 FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP26, ELMO1 FROM GRP26, ELMO1 FROM GRP26, ELMO1 GRP27, ELMO3/GRP27, ELMO3 FROM GRP26, ELMO1 FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP85, ELMO2 TO GRP84, ELMO1 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN CONTROL UNIT FROM GRP85, ELMO2 TO GRP84, ELMO1 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN CONTROL UNIT FROM GRP85, ELMO2 TO GRP84, ELMO1 TAPE TRANSPARENT USER	P02 P03 P02 P03 P02 P03 J02 P01 P02 P03 P01 P01 P01 P02 P03 P02 P03 P01 P01 P01 P02 P03 P01 P01 P01 P01 P01 P01 P02 P03 P01 P01 P01 P01 P01 P01 P01 P01	* 12:22 * *********** 00 *****	P A G E 103 *
MILLI ST MILLI ST GRAL NAME D-RX D-SL0 D-SL1 D-SL2 D-TCM1 D-TCM2	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 1 ********** ASY GRP 	3 7 1 3 	222 40 40 40 40 20 21 21 21 21 21 21 21 21 21 21 21 21 21	**** 12 * ****	LV 	************************************	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/ * DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP26, ELMO1 FROM GRP26, ELMO1 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR INTERFACE CAPSTAN C	P02 P03 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P01 P02 P01 P02 P01 P02 P01 P02 P01 P02 P01 P02 P01 P02 P01 P02 P01 P02 P01 P02 P01 P02 P01 P02 P03 P01 P02 P01 P02 P01 P02 P01 P02 P03 P05 P06 P06 P06	* 12:22 * *********** 00 *****	P A G E 103 *
MILLI ST MILLI ST SIGNAL NAME D-RW D-SL0 D-SL1 D-SL2 D-TCM1 D-TCM2 D-TRSP D-TRSP	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 *********************************	3 7 1 3 6 4 7 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 7 7 1 3 8 8 2 7 7 1 3 8 8 2 7 7 1 3 8 8 7 7 1 3 8 8 7 7 1 3 8 8 7 7 1 3 8 8 7 7 1 3 8 8 7 7 1 3 8 8 7 7 1 1 3 8 8 7 7 1 1 3 8 8 7 7 1 1 3 8 8 7 7 1 1 3 8 8 7 7 1 1 3 8 8 7 7 1 1 3 8 8 7 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	40 40 40 40 40 22 22 21 21 21 21 21 21 21 21 21 21 21	**** 12 * ****	LV 	************************************	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/ DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP26, ELMO2 FROM GRP26, ELMO1 TO GRP26, ELMO2 FROM GRP26, ELMO1 TO GRP26, ELMO1 FROM GRP26, ELMO1 TO GRP27, ELMO3 FROM GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP27, ELMO1 TO GRP37, ELMO1 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP36, ELMO1 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN CONTROL UNIT FROM GRP36, ELMO2 TO GRP34, ELMO1 TO FRANSPARENT USER TAPE TRANSPARENT USER TAPE TRANSPARENT USER	P02 P03 P02 P03 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P02 P03 P02 P03 P01 P02 P03 P06 P06 P06 P06 P06 P06 P06 P06	* 12:22 * *********** 00 *****	P A G E 103 *
MILLI ST MILLI ST SIGNAL NAME D-RW D-SL0 D-SL1 D-SL2 D-TCM1 D-TCM2 D-TRSP D-TRSP	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 *********************************	3 7 1 3 6 4 7 7 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 8 2 7 7 1 3 8 8 2 7 7 1 3 8 8 7 7 1 1 3 8 8 7 7 1 1 3 8 7 7 1 1 3 8 8 7 7 1 1 3 8 8 7 7 1 1 3 8 8 7 7 7 1 1 3 8 8 7 7 7 1 1 3 8 8 7 7 7 1 1 3 8 8 7 7 7 1 1 3 8 8 7 7 7 7 1 1 3 8 8 7 7 7 1 1 3 8 8 7 7 7 7 1 1 1 1 3 8 8 7 7 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	40 40	**** 12 * ****	LV 	************************************	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/ DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP26, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP26, ELMO2 FROM GRP26, ELMO1 TO GRP27, ELMO3/GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP27, ELMO1 TO GRP27, ELMO1 TO GRP27, ELMO1 TO GRP26, ELMO1 TO GRP27, ELMO1 TO GRP27, ELMO1 TO GRP37, ELMO1 TO GRP37, ELMO1 TO GRP34, ELMO1 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN CONTROL UNIT FROM GRP35, ELMO2 TO GRP34, ELMO1 TO GRP35, ELMO2 TO GRP34, ELMO1 TO GRP35, ELMO2 TO GRP34, ELMO1 TO GRP34, ELMO7 GRP34, ELM	P02 P03 P02 P03 P02 P03 P01 P02 P03 P01 P02 P03 P03 P02 P03 P03 P06 P06 P06 P06 P06 P06 P06 P06 P06 P06	* 12:22 * *********** 00 *****	P A G E 103 *
WILLI ST WILLI ST SIGNAL NAME D-RW D-RX D-SL0 D-SL1 D-SL2 D-TCM1 D-TCM2 D-TRSP D-TX D-TX D-TX	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 *********************************	3 7 1 3 G F DER ELM 7 1 3 8 2 7 7 1 3 3 8 2 7 7 1 3 3 7 1 3 3 7 1 3 3 7 1 3 3 8 2 7 7 1 3 3 8 2 7 7 1 3 3 8 2 7 7 1 3 3 7 7 7 1 3 8 7 7 7 1 3 8 7 7 7 1 3 8 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	222 40 40 40 40 20 22 21 21 21 21 21 21 21 21 21 21 21 21	**** 12 * ****	LV 	************************************	FROM GRP26, ELM01 TO GRP25, ELM07/GRP27, ELM03 FROM GRP26, ELM01 L I S T * 89/ UDIO DESCRIPTION OF ELEMENT FROM GRP26, ELM01 TO GRP25, ELM01 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELM01 TO GRP26, ELM01 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM01 FROM GRP26, ELM01 TO GRP26, ELM01 FROM GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM01 FROM GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM01 TO GRP26, ELM01 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR INTERFACE CAPSTAN MOTOR INTERFACE CAPSTAN CONTACL UNIT FROM GRP86, ELM02 TO GRP84, ELM01 TAPE TRANSPARENT USER CONNECTOR RS 232 (SERVICE)	P02 P03 P02 P03 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P02 P03 P02 P03 P01 P02 P03 P06 P06 P06 P06 P06 P06 P06 P06	* 12:22 * *********** 00 *****	P A G E 103 *
WILLI ST ************************************	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 *********************************	3 7 1 3 6 4 7 1 3 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 8 8 2 7 7 1 3 8 7 7 1 3 8 8 2 7 7 1 3 8 8 7 7 1 3 8 8 7 7 1 3 8 8 7 7 1 3 8 8 7 7 1 3 8 8 7 7 1 3 8 8 7 7 1 1 3 8 8 7 7 1 1 3 8 8 7 7 1 1 3 8 8 7 7 1 1 3 8 8 7 7 1 1 3 8 8 7 7 7 1 1 3 8 8 7 7 7 1 1 3 8 8 7 7 7 1 1 3 8 8 7 7 7 7 1 1 3 8 8 7 7 7 7 1 1 3 8 8 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	222 40 40 40 40 221 221 221 221 221 225 225 225 225 225	**** 12 * ****		************************************	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89/1 DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP27, ELMO1 GRD26, ELMO1 TO GRP27, ELMO1 TO GRP37, ELMO1 CAPSTAN MOTOR DRIVE AMPLIFIER CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP36, ELMO1 CAPSTAN MOTOR INTERFACE CAPSTAN CONTROL UNIT FROM GRP36, ELMO1 TO GRP	P02 P03 P02 P03 P02 P03 P01 P02 P03 P01 P02 P03 P02 P03 P02 P03 P01 P02 P03 P02 P03 P01 P02 P03 P02 P03 P02 P03 P01 P02 P03 P02 P03 P02 P03 P02 P03 P01 P02 P03 P02 P03 P02 P03 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P06 P06 P06 P06 P06 P06 P06 P06	* 12:22 * *********** 00 *****	P A G E 103 *
* WILLI ST * * SIGNAL NAME TD-RW TD-RX TD-SCK TD-SL1 TD-SL2	UDER AG ******** 1.811. ******** COLOR	**** 090. ****	25 26 27 5 1 **********************************	3 7 1 3 6 4 7 1 3 7 1 3 8 2 7 7 1 3 8 2 7 7 1 3 7 1 3 7 1 3 7 1 3 7 1 3 7 1 3 7 1 3 7 1 3 7 1 3 7 1 3 7 1 3 7 1 3 7 7 1 3 7 7 1 3 7 7 1 3 7 7 1 3 7 7 7 1 3 7 7 7 1 3 7 7 7 1 3 7 7 7 1 3 7 7 7 1 3 7 7 7 1 3 7 7 7 1 3 7 7 7 1 3 7 7 7 1 3 7 7 7 1 3 7 7 7 1 3 7 7 7 7	40 40 40 40 22 22 22 23 22 22 22 22 22 22 22 22 22	**** 12 * ****		************************************	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 L I S T * 89// DESCRIPTION OF ELEMENT FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP26, ELMO1 CONNECTOR RS 232 (SERVICE) FROM GRP26, ELMO1 TO GRP27, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP26, ELMO1 TO GRP27, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP26, ELMO1 TO GRP27, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1 TO GRP27, ELMO1 TO GRP27, ELMO1 TO GRP27, ELMO1 TO GRP27, ELMO1 TO GRP27, ELMO1 TO GRP37, ELMO1 TO GRP37, ELMO1 TAPE TRANSPARENT USER TAPE TRANSPARENT USER	P02 P03 P02 P03 P02 P03 P01 P02 P03 P01 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P01 P02 P03 P02 P03 P01 P02 P03 P02 P03 P02 P01 P02 P03 P01 P02 P03 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P01 P02 P03 P02 P03 P01 P02 P03 P02 P03 P01 P02 P03 P02 P03 P02 P03 P01 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P03 P02 P02 P03 P02 P03 P02 P02 P03 P02 P03 P02 P02 P03	* 12:22 * *********** 00 *****	P A G E 103 *

----- -----EDITION: 1. Oktober 1989

SIGNAL NAME	COLOR	MI	ASY GRP ELM PN1	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
TD-WDIRR			25 7 36 26 1 36 27 3 36			L	FROM GRP26, ELMO1 TO GRP25, ELMO7/GRP27, ELMO3 FROM GRP26, ELMO1	P02 P03		
TD-YTRSP			25 3 7 25 4 12	-			TAPE TRANSPARENT USER	P08 P06		
TD-24VSC			24 3 20 25 8 20 26 2 20	-		L	FROM GRP26, ELM02 FROM GRP 26, ELM02 TO GRP24, ELM03/GRP25, ELM08	P01 P01		
TD-76K8			24 3 11 25 8 11 26 2 11	-		L	FROM GRP26, ELMO2 FROM GRP 26, ELMO2 FROM GRP 26, ELMO2 TO GRP24, ELMO3/GRP25, ELMO8	P01 P01		
TDS-CLK			20 2 2 20 3 2 20 43 194 27 1 2	_			SSDA SYNCHRONIZER TAPE DECK CONTROLLER (GRP27) MASTER SERIAL INTERFACE FROM GRP20, ELM03	P02 P03 J07 P01		1.820.753.0
TD S-CTS			20 3 3 20 43 116 27 1 3	-			TAPE DECK CONTROLLER (GRP27) MASTER SERIAL INTERFACE FROM GRP20, ELMO3	P03 J07 P01		1.820.753.0
TDS-DTR			20 3 5 20 43 114 27 1 5	-			TAPE DECK CONTROLLER (GRP27) MASTER SERIAL INTERFACE FROM GRP20, ELM03	P03 J07 P01		1.820.753.0
TDS-RX			20 3 4 20 43 104 27 1 4	-			TAPE DECK CONTROLLER (GRP27) MASTER SERIAL INTERFACE FROM GRP20, ELM03	P03 J07 P01		1.820.753.0
TDS-TX			20 3 6 20 43 108 27 1 6	-			TAPE DECK CONTROLLER (GRP27) MASTER SERIAL INTERFACE FROM GRP20, ELMO3	P03 J07 P01		1.820.753.0
TL-AO			52 4 6 54 1 6	-			CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELMO4	P04 P04		
TL-CS			52 4 3 54 1 3	-			CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04	P04 P04		
TL-D0			52 4 7 54 1 7	-			CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELMO4	P04 P04		
TL-D1			52 4 8 54 1 8	-			CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04	P04 P04	*******	
TL-D2			52 4 9 54 1 9	-			CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04	P04 P04		
TL-D3			52 4 10 54 1 10	-			CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELM04	P04 P04		
TL-04			52 4 11 54 1 11				CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELMO4	P0 4 P0 4		*************

SIGNAL NAME	COLOR	MI	ASY GRP	ELM	PNT	S L	/ TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
TL-D5			52 54		12 12			CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELMO4	P04 P04		
TL-D6			52 54		13 13			CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELMO4	P04 P04		
TL-D7			52 54		14 14			CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELMO4	P04 P04		
TL-ENB			52 54	4 1	4 4			CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELMO4	P04 P04		
TL-RESET			52 54		15 15			CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELMO4	P04 P04		
TL-WR			52 54	4 1	5 5			CONNECTOR LCD DISPLAY UNIT FROM GRP52, ELMO4	P04 P04		
ТМ-А			50 52		20 20			FROM GRP52, ELMO2 Connector Command Unit	P02 P03		
TM-ADRO			20 20 20 20 20		288 31 31 24A			MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/EBU INTERFACE MASTER PERIPHERY CONTR.	J07 J08 J09 J10		1.820.753.00 1.811.786.00 1.820.751.00 1.820.728.00
TM-ADR1			20 20 20 20	43 44 45 46	30 30			MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/EBU INTERFACE MASTER PERIPHERY CONTR.	70L 80L 90L 01L		1.820.753.00 1.811.786.00 1.820.751.00 1.820.728.00
TM-ADR2			20 20 20 20	43 44 45 46	27B 29 29 22A			MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/EBU INTERFACE MASTER PERIPHERY CONTR.	J07 J08 J09 J10		1.820.753.00 1.811.786.00 1.820.751.00 1.820.728.00
TM-ADR3			20 20 20	43 44 45	6			MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/EBU INTERFACE	J07 J08 J09		1.820.753.00 1.811.78c.00 1.820.751.00
тм-в			50 52		18 18			FROM GRP52, ELMO2 CONNECTOR COMMAND UNIT	P02 P03		
TM-BUSSW			20 20	44 45	8 15			MP-UNIT MASTER SMPTE/EBU INTERFACE	80L 60L		1.811.786.00 1.820.751.00
ТМ-С			50 52		21 21			FROM GRP52, ELMO2 Connector command unit	P0 2 P0 3		
TM-CUE1			51 52	1 3	4 4			FROM GRP52, ELMO3 Connector pushbutton assembly	P0 2		
TM-CUE2			51 52	1	6 6			FROM GRP52, ELMO3 CONNECTOR PUSHBUTTON ASSEMBLY	P0 2		

* WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/16 * 12:22 * P A G E 106 * * 1.811.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00

SIGNAL NAME	COLOR	MI	ASY GR	RP E	LM	PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
TM-C307K			20 20 20 20 20 20 20 20 20 20 20 20 20 2	4 4 4 4 4 4 5	6 7 8 9 0 1 2 3 4 5	25 25	-			MP-UNIT MASTER MASTER PERIPHERY CONTR. TIME CODE WRITE/READ UNIT TIME CODE WRITE/READ UNIT HF-DRIVER, CH 1 RECORD AMPLIFIER, CH 1 LINE AMPLIFIER, CH 1 MOND-STERED-SWITCH HF-DRIVER, CH 2 RECORD AMPLIFIER, CH 2 REPRODUCE AMPLIFIER, CH 2 LINE AMPLIFIER, CH 2	J08 J10 J11 J12 J13 J14 J15 J16 J17 J18 J19 J20 J21		1.811.786.00 1.820.728.00 1.820.721.81 1.820.712.81 1.820.712.91 1.820.712.91 1.820.710.81 1.820.714.81 1.820.720.00 1.820.712.91 1.820.712.91 1.820.714.81 1.820.714.81
TM-C614K			20	5 4	4	7	-			MP-UNIT MASTER	J08		1.811.786.00
тм-с76к	9 9		19 19 20 20 20 30 85	9 0 1 0 4 0 4	0	4 15 4 16 4 15	-		F M F M	FROM GRP30, ELM02 TO GRP20, ELM10 CAPSIAN MOTOR DRIVE AMPLIFIER FROM STABILIZER GRP30, ELM02 MP-UNIT MASTER DUTPUT (TO GRP20, ELM10)	J01 P01 J01 J08 P01 P01		1.811.786.00
TM-C9600			20	5 4	4	17	-			MP-UNIT MASTER	J0 8		1.811.786.00
тм-D			50 52		2		-			FROM GRP52, ELMO2 Connector Command Unit	P02 P03		
TM-DADRO			20 20 20 35 52)) 4 5	4 5 3 2 1	19 8A 19	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE FROM GRP20, ELM05 FROM GRP20, ELM04	P04 P05 J07 P02 P01		1.820.753.00
TM-DADR1			20 20 52) 4	4 3 1	7 A	-			TAPE DECK DISPLAY DRIVER MASTER SERIAL INTERFACE FROM GRP20, ELM04	P04 J07 P01		1.820.753.00
TM-DADR2			20 20 52	5 4	4 3 1	6 A	-			TAPE DECK DISPLAY DRIVER MASTER SERIAL INTERFACE FROM GRP20, ELM04	P04 J07 P01		1.820.753.00
TM-DATAO			20 20 20 20 20 20 20 20 20 20 20 20 20 2	0 4 0 4 0 4 0 4 0 4 5	5 3 4 5 6 2	39 39 32B 39 39 39 32A 39 32A 39	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/EBU INTERFACE MASTER PERIPHERY CONTR. FROM GRP20, ELM05 FROM GRP20, ELM05	P04 P05 J07 J08 J09 J10 P02 P01		1.820.753.00 1.811.786.00 1.820.751.00 1.820.728.00
TM-DATA1			20 20 20)	5	37 37 32 A	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE	P04 P05 J07		1.820.753.00

SIGNAL NAME	COLOR	MI	ASY G	RP	ELM	PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
< CONT.OF TM-DATA1			2 2 3	0		38 38 31 A 37 37	-			MP-UNIT MASTER SMPTE/EBU INTERFACE MASTER PERIPHERY CONTR. FROM GRP20, ELMO5 FROM GRP20, ELMO4	J08 J09 J10 P02 P01		1.811.786.00 1.820.751.00 1.820.728.00
TM-DATA2			2 2 2 2 2 3	0	46	35 35 31B 37 37 30A 35 35	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/SED UNTERFACE MASTER PERIPHERY CONTR. FROM GRP20, ELMO5 FROM GRP20, ELMO4	P04 P05 J07 J08 J09 J10 P02 P01		1.820.753.00 1.811.786.00 1.820.751.00 1.820.728.00
TM-DATA3			2 2 2 2 2 3	0 ·	44 45 46	33 33 31A 36 36 29A 33 33	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/SEDU INTERFACE MASTER PERIPHERY CONTR. FROM GRP20, ELMO5 FROM GRP20, ELMO4	P04 P05 J07 J08 J09 J10 P02 P01		1.820.753.00 1.811.786.00 1.820.751.00 1.820.728.00
ΤΜ- υα τ Α4			2 2 2 2 2 3	0		31 31 30B 35 35 28A 31 31	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/SEDU INTERFACE MASTER PERIPHERY CONTR. FROM GRP20, ELM05 FROM GRP20, ELM04	P04 P05 J07 J08 J09 J10 P02 P01		1.820.753.00 1.811.786.00 1.820.751.00 1.820.728.00
TM-DATA5			2 2 2 2 3	0	2	27A	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/ABU INTERFACE MASTER PERIPHERY CONTR. FROM GRP20, ELM04	P04 P05 J07 J08 J09 J10 P02 P01		1.820.753.00 1.811.786.00 1.820.751.00 1.820.728.00
TM-DATA6			2 2 2 2 3	0	44 45	27 27 29B 33 33 26A 27 27	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTF/ERU INTERFACE MASTER PERIPHERY CONTR. FROM GRP20, ELM05 FROM GRP20, ELM04	P04 P05 J07 J08 J09 J10 P02 P01		1.820.753.00 1.811.786.00 1.820.751.00 1.820.728.00
ΤΜ-ΟΑΤΑ7			2 2 2	0	4 5 43	25 25 29A	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE	P04 P05 J07		1.820.753.00

* WILLI STUDER AG * S I G N A L W I R E L I S T * 89/09/18 * 12:22 * P A G E 108 * * 1.611.090.00 * STUDER A 812 * TAPE DECK & AUDIO * 88/05/19 - 00 *

SIGNAL NAME	COLOR	MI	ASY GRE	EL	M PN1	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
< CONT.OF TM-DATA7			20 20 20 35 52	46 2	32 32 254 25 25				MP-UNIT MASTER SMPTE/EBU INTERFACE MASTER PERIPHERY CUNTR. FROM GRP20, ELMO5 FROM GRP20, ELMO4	J08 J09 J10 P02 P01		1.811.786.00 1.820.751.00 1.820.728.00
TM-DENB			20 20 20 35 52	5 43 2 1	13 13 54 13 13	~			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE FROM GRP20, ELMO5 FROM GRP20, ELMO4	P04 P05 J07 P02 P01		1.820.753.00
тм-ор			50 52	2	19 19	-			FROM GRP52, ELMO2 CONNECTOR COMMAND UNIT	P02 P03		
T M-DR ENB			20 20		12 12	-			MP-UNIT MASTER SMPTE/EBU INTERFACE	301 109		1.811.786.00 1.820.751.00
TM-DRES			20 20 20 35 52	4 5 43 2 1	9 34 9				TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE FROM GRP20, ELMO5 FROM GRP20, ELMO4	P04 P05 J07 P02 P01		1.820.753.00
TM-DRW			20 20 20 35 52	2					TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE FROM GRP20, ELMO5 FROM GRP20, ELMO4	P04 P05 J07 P02 P01		1.820.753.00
TM-DSL4			20 20 52	4 43 1					TAPE DECK DISPLAY DRIVER MASTER SERIAL INTERFACE FROM GRP20, ELM04	P04 J07 P01		1.820.753.00
TM-DSL5			20 20 35	5 43 2					PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE FROM GRP20, ELM05	P05 J07 P02		1.820.753.00
ТМ-D0			50 52		35 35	-			FROM GRP52, ELMO2 Connector Command Unit	P02 P03		
ТМ-D1			50 52		34 34	-			FROM GRP52; ELM02 Connector Command Unit	P02 P03		
TM-D2			50 52		33 33	-			FROM GRP52, ELMO2 Connector command unit	P02 P03		
ТМ-D3			50 52		32 32	_			FROM GRP52, ELMO2 Connector command unit	P02 P03		
TM-D4			50 52		31 31	-			FROM GRP52, ELMO2 Connector Command Unit	P02 P03		
TM-D5			50 52		30 30	-			FROM GRP52, ELMO2 Connector command unit	P02 P03		

SIGNAL NAME	COLOR	MI	ASY GRP ELM PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
TM-D6			50 2 29 52 2 29	-			FROM GRP52, ELMO2 Connector command unit	P02 P03		
TM-D7			50 2 28 52 2 28	-			FROM GRP52. ELMO2 CONNECTOR COMMAND UNIT	P02 P03		
TM-D8			50 2 2 7 52 2 27	-			FROM GRP52, ELM02 Connector command unit	P02 P03		
TM-D9			50 2 26 52 2 26	-			FROM GRP52, ELM02 Connector command unit	P02 P03		
ТМ-Е			50 2 24 52 2 24	-			FROM GRP52, ELMO2 CONNECTOR COMMAND UNIT	P02 P03		
TM-ENB			20 43 27A 20 44 28 20 45 28 20 46 21A	-			MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/EBU INTERFACE MASTER PERIPHERY CONTR.	70L 80L 90L 110		1.820.753.00 1.811.786.00 1.820.751.00 1.820.728.00
TM-ENO			51 1 7 52 3 7	-			FROM GRP52, ELM03 CONNECTOR PUSHBUTTON ASSEMBLY	P02		
TM-EN1			50 2 9 52 2 9	-			FROM GRP52, ELMO2 Connector command unit	, P02 P03		
TM-EN2			50 2 8 52 2 8	-			FROM GRP52, ELMO2 CONNECTOR COMMAND UNIT	P02 P03		
TM-EN3			50 1 7 50 2 7 52 2 7 53 1 7	-			TO GRP53, ELMO1 FROM GRP52, ELMO2 CDNNECTOR COMMAND UNIT FROM GRP50, ELMO1	P01 P02 P03 P01		
TM-EN4			$\begin{array}{cccccccccccccccccccccccccccccccccccc$	-			TO GRP53, ELMO1 FROM GRP52, ELMO2 CONNECTOR COMMAND UNIT FROM GRP50, ELMO1	P01 P02 P03 P01		
ТМ-Е			50 2 23 52 2 23	-			FROM GRP52, ELM02 CONNECTOR COMMAND UNIT	P02 P03		
TM-G			50 2 25 52 2 25	-			FROM GRP52, ELMO2 CONNECTOR COMMAND UNIT	P02 P03		
TM-IADRO			20 4 20 20 5 20 20 43 8B 35 2 20 52 1 20	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE FROM GRP20, ELMO5 FROM GRP20, ELMO4	P04 P05 J07 P02 P01		1.820.753.00
TM-IADR1			20 4 18 20 43 7B 52 1 18	-			TAPE DECK DISPLAY DRIVER MASTER SERIAL INTERFACE FROM GRP20, ELM04	P04 J07 P01		1.820.753.00

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SIGNAL NAME	COLOR	MI	ASY G	RP E	LM	PNŤ	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
TM-IADR2			20 20 52	0 4		16 68 16	-			TAPE DECK DISPLAY DRIVER MASTER SERIAL INTERFACE FROM GRP20, ELM04	P04 J07 P01		1.820.753.00
TM-IENB			20 20 20 31 57	0 4 0 4		14 5B 14	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE FROM GRP20, ELMO5 FROM GRP20, ELMO4	P04 P05 J07 P02 P01		1.820.753.00
TM-IRES			3	0 0 4	3 2 1	10 3B 10 10	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE FROM GRP20, ELMO5 FROM GRP20, ELMO4	P04 P05 J07 P02 P01		1.820.753.00
TM-IRQ			20		3	24B	-			MASTER SERIAL INTERFACE MP-UNIT MASTER	J07 J08		1.820.753.00 1.811.786.00
TM-IRW			20 20 20 35	0 0 4: 5		12 4B 12	-			TAPE DECK DISPLAY DRIVER PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE FROM GRP20, ELMO5 FROM GRP20, ELMO4	P04 P05 J07 P02 P01		1.820.753.00
TM-ISL4			20 20 52	0 43		8 18 8	-			TAPE DECK DISPLAY DRIVER MASTER SERIAL INTERFACE FROM GRP20, ELM04	P04 J07 P01		1.820.753.00
TM-ISL5)) 4. 5 .	3	8 2 B 8	-			PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE FROM GRP20, ELM05	P05 J07 P02		1.820.753.00
TM-KBIR			52	0 4 0 4 2	1	14B 23	-			TAPE DECK DISPLAY DRIVER MASTER SERIAL INTERFACE FROM GRP20, ELM04	P04 J07 P01		1.820.753.00
TM-L1			5(52	o :		37	-			FROM GRP52, ELMO2 CONNECTOR COMMAND UNIT	P02 P03		
TM-L2				2	2 2 2	36	-			FROM GRP52, ELMO2 CONNECTOR COMMAND UNIT	P02 P03		
 TM-L3			50 52	2	2 2	38 38	-			FROM GRP52, ELMO2 Connector Command Unit			
TM-L4			50	2	2	39	-			FROM GRP52, ELMO2 Connector command unit	P02 P03		
TM-L5			50 52		2		-			FROM GRP52, ELMO2 Connector command unit	P02 P03		
TM-NM I			20) 44	4	9	-			MP-UNIT MASTER	J08		1.811.786.00

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SIGNAL NAME	COLOR	MI	ASY	GRP	ELM	PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
TM-REMIR				35			_			PARALLEL REMOTE IF (GRP35) MASTER SERIAL INTERFACE FROM GRP20, ELMOS			1.820.753.00
TM-RES				20 20 20		24A 26 19A	-			MASTER SERIAL INTERFACE SMPTE/EBU INTERFACE MASTER PERIPHERY CONTR.	J07 J09 J10		1.820.753.00 1.820.751.00 1.820.728.00
TM-RESET				20	43 44	26A	-			MASTER SERIAL INTERFACE MP-UNIT MASTER	J07 J08		1.820.753.00 1.811.786.00
TM-RESMP				20	43 44		_			MASTER SERIAL INTERFACE MP-UNIT MASTER	J07 J08		1.820.753.00 1.811.786.00
TM-RLO				50 51 52 52	2 1 2	12 5 12 5				FROM GRP52, ELMO2 FROM GRP52, ELMO3 CONNECTOR COMMAND UNIT CONNECTOR PUSHBUTTON ASSEMBLY	P02 P03 P02		
TM-RL1				50 51 52 52	2 1 2	13 3	-			FROM GRP52, ELM02 FROM GRP52, ELM03 CONNECTOR COMMAND UNIT CONNECTOR PUSHBUTTON ASSEMBLY	P02 P03 P02		
TM-RL2				50 50 51 52 52 53	2 1 2 3 1	14	-			TO GRP53, ELMOI FROM GRP52, ELMOI FROM GRP52, ELMO3 CONNECTOR COMMAND UNIT CONNECTOR PUSHBUTTON ASSEMBLY FROM GRP50, ELMOI	P01 P02 P03 P02 P01		
TM-RL3				50 50 51 52 52 53	1 2 1 2 3 1	13 15 1 15 1 13	-			TO GRP53, ELMOI FROM GRP52, ELMOI FROM GRP52, ELMO3 CONNECTOR COMMAND UNIT CONNECTOR PUSHBUTTON ASSEMBLY FROM GRP50, ELMOI	P01 P02 P03 P02 P01		
TM-RL4				50 50 52 53	2 2 1	16 16 16 16	-			TO GRP53, ELMO1 FROM GRP52, ELMO2 CONNECTOR COMMAND UNIT FROM GRP50, ELMO1	P01 P02 P03 P01		
TM-RL5				50 50 52 53	1 2 2 1	15 17 17 15	-			TO GRP53, ELMO1 FROM GRP52, ELMO2 CONNECTOR COMMAND UNIT FROM GRP50, ELMO1	P01 P02 P03 P01		
TM-RL6				50 50 52 53	1 2 2 1	10 10 10	-			TO GRP53, ELMO1 FROM GRP52, ELMO2 CONNECTOR COMMAND UNIT FROM GRP50, ELMO1	P01 P02 P03 P01		

SIGNAL NAME	COLOR	MI	ASY GRP ELM PNT	S LV	TYPE	DESCRIPTION OF ELEMENT		REMARK	ELEMENT NR.
TM-RL 7			50 1 11 50 2 11 52 2 11 53 1 11			TO GRP53, ELMO1 FROM GRP52, ELMO2 Connector Command Unit FROM GRP50, ELMO1	P01 P02 P03 P01		
TM-RW			20 43 26B 20 44 27 20 45 27 20 46 20A			MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/EBU INTERFACE MASTER PERIPHERY CONTR.	J07 J08 J09 J10		1.820.753.00 1.811.786.00 1.820.751.00 1.820.728.00
TM-RX			20 44 10 20 45 10			MP-UNIT MASTER Smpte/ebu interface	90L 90L		1.811.786.00
TM-SE IR			20 43 20B 20 45 13			MASTER SERIAL INTERFACE SMPTE/EBU INTERFACE	J07 J09		1.820.753.00 1.820.751.00
TM-SHIR			20 4 21 20 43 14A 52 1 21			TAPE DECK DISPLAY DRIVER MASTER SERIAL INTERFACE FROM GRP20, ELM04	P04 J07 P01		1.820.753.00
TM-SL2			20 43 22B 20 44 4			MASTER SERIAL INTERFACE MP-UNIT MASTER	J07 J08		1.820.753.00 1.811.786.00
TM-SL3			20 44 3 20 45 16			MP-UNIT MASTER SMPTE/EBU INTERFACE	80L 90L		1.811.786.00
TM-SL4			20 43 9A 20 44 23 20 45 23			MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/EBU INTERFACE	J07 J08 J09		1.820.753.00 1.811.786.00 1.820.751.00
TM-SL5			20 43 9B 20 44 24 20 45 24			MASTER SERIAL INTERFACE MP-UNIT MASTER SMPTE/EBU INTERFACE	J07 J08 J09		1.820.753.00 1.811.786.00 1.820.751.00
TM-SL6			20 44 25 20 45 25 20 46 14A			MP-UNIT MASTER SMPTE/EBU INTERFACE MASTER PERIPHERY CONTR.	J08 J09 J10		1.811.786.00 1.820.751.00 1.820.728.00
TM-SL7			20 44 15			MP-UNIT MASTER	J08		1.811.786.00
тм-тх			20 44 11 20 45 11			MP-UNIT MASTER SMPTE/EBU INTERFACE	80L 90 L		1.811.786.00
TM=EN2			50 1 8 53 1 8			TO GRP53, ELMO1 FROM GRP50, ELMO1	P01 P01		
TR-A			33 2 5 34 1 3		в	TO GRP34, ELMO1 Conn. Autolocator, remote timer	P02 J01		
Т R – В			33 2 4 34 1 7		в	TO GRP34, ELMO1 CONN. AUTOLOCATOR, REMOTE TIMER	P02 J01		
TRANSA			20 6 3 20 45 3 46 1 2		в в	SMPTE/EBU BUS SMPTE/EBU INTERFACE CONNECTOR SMPTE/EBU BUS CONNECTOR SMPTE/EBU BUS	P06 J09 J04 J05		1.820.751.00

SIGNAL NAME	COLOR	MI	ASY GRP	ELM	1 PNT	S	LV	TYPE	DESCRIPTION OF ELEMENT	REMARK	ELEMENT NR.
TRANSB			20 20 46 46	6 45 1 2	4 4 7 7			B B	SMPTE/EBU BUS P00 SMPTE/EBU INTERFACE J00 CONNECTOR SMPTE/EBU BUS J00 CONNECTOR SMPTE/EBU BUS J01		1.820.751.00
TRANSCM			20 20 46 46	6 45 1 2	2 2 6			B B	SMPTE/EBU BUS PO SMPTE/EBU INTERFACE JO CONNECTOR SMPTE/EBU BUS JO CONNECTOR SMPTE/EBU BUS JO		1.820.751.00
Y-TSEN51	4 4		8 14 14 25	2 1 2 2	2 2 2 2			N N	CONN. SUPPLY CONTROL (GRP25, ELMO2) FROM GRP08, ELMO3 TO GRP25, ELMO2 FROM GRP08, ELMO3 JO:		
Y-TSENS2	9 9		8 14 14 25	2 1 2 2	4 4 4 4	-		N N	CONN. SUPPLY CONTROL (GRP25, ELMO2) FROM GRP03, ELMO3 TO GRP25, ELMO2 FROM GRP08, ELMO3 JO.		
0.0 VCU			20	44444444444555555555555552222222222111	224 224 3324 3324 3324 162 226 3324 346 3324 36 324 324 3324 324 3324 3				TAPE DECK DISPLAY DRIVER PO TAPE DECK DISPLAY DRIVER PO PARALLEL REMOTE IF (GRP35) PO FROM GR20, ELMO35 PO FROM GR20, ELMO35 PO FROM GR20, ELMO35 PO FROM GR20, ELMO36 PO FROM GR		

SIGNAL NAME COLOR MI ASY GRP ELM PNT S LV TYPE DESCRIPTION OF ELEMENT REMARK ELEMENT NR. <<-- CONT.OF 0.0 VCU FROM GRP20, ELM04 52 52 52 52 52 1 1 P01 P01 P01 P01 P01 32 34 36 38 40 1 ī TO GRP31, ELMO2 TO GRP31, ELMO2 TO GRP32, ELMO2 TO GRP32, ELMO2 FROM GRP24, ELMO1 FROM GRP24, ELMO1 FROM GRP24, ELMO2 FROM GRP24, ELMO2 0.0VREF 8 10 8 10 24 24 24 31 31 32 32 P02 P03 P03 P01 P01 P01 P01 8 10 8 10
 FROM GRP24, ELMO2
 P

 RECTIFIER
 CAPACITUR
 CAPACITUR

 CAPACITUR
 CR0NSETGR TO GRP30, ELMO1
 C

 FROM GRP30, ELM32
 J
 J

 TO GRP20, ELM10
 J
 J

 FROM STRAD, ELMO2
 J
 J

 MIRE FIELD, TO CONN. GRP20, ELMO2
 J

 MIRE FIELD, TO CONN. GRP20, ELMO2
 J

 CONNECTOR TO GRP35, ELMO3
 P

 DC INPUT (FROM GRP07, ELM12)
 J

 SUPPLY (FROM GRP20, ELM72)
 P

 SUPPLY (FROM GRP20, ELM72)
 P

 CONN.
 GRP20, ELM72)
 P
 _____ 4 2 9 23 D03 C07 P01 J01 P01 J01 OCAPMOT 7 70.01.0231 59.26.7103 7 7 19 20 20 20 20 30 30 85 444 11 12 10 21 21 67 67 4 23 23 M 4646 1.811.898.00 1.811.898.00 1.811.898.00 1.811.898.00 1.811.898.00 UUE 2 3 1 4 9 2 3 P17 P17 J01 P01 P03 P03 FMMM 1 2 3 3 SUPPLY (FROM GRP20, ELM72) P03 CONN. SUPPLY CONTROL (GRP25, ELM02) CONN. SUPPLY CONTROL (GRP25, ELM02) DC OUTPUT WIRE FIELD, FROM RECTIFIERS WIRE FIELD, FROM RECTIFIERS RECTIFIER RECTIFIER RECTIFIER CAPACITOR C OPSVTMOT 8 8 2 5 8 8 8 8 8 9 9 9 9 9 9 25 FFUULL 3 6 044004000055 243 6 1 2 3 42 ī 1 2 5 LMMFD 1 11 11 11 14 25 31 32 N N J02 J01 J01 M M ------

A812 Tape Transport Section



Block Diagram Tape Transport A812



Tape Deck Control Master Section





Block Diagram MP Unit Tape Deck Control "ESE" 1.820.785

MPU Master Control 1.811.786.25



MPU Master Control 1.811.786.25





Block Diagram Master Serial Interface PCB "ESE" 1.820.753



Master Serial Interface ESE 1.820.753.00





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Master Serial Interface ESE 1.820.753.81



Master Serial Interface ESE 1.820.753.81







Block Diagram Master Periphery Controller PCB "ESE" 1.820.728

Block Diagram Channel Control



Block Diagram C-MOS Bus (Audio)



Master Periphery Controller ESE 1.820.728.81








Block Diagram Serial Remote Controller 1.810.751

Block Diagram SMPTE/EBU-Interface 1.820.751





Serial Remote Controller 1.810.751-82



Serial Remote Controller 1.810.751-82









SMPTE/EBU Bus Interface 1.820.751.21



20) D1 50 21) D2 50. 23) D3 50. 23) D4 50 23) D4 50. 23) D4 50. 23) D4 50. 23) D4 50. 20) D4 50. 20) D4 50. 20) D4 50. 20) D4 50.	-26.0683 58 -26.0713 47 -26.0713 47 -26.0713 47 -26.0713 47 -26.0703 48 -26.0683 58 -26.0683 58 -26.0683 58 -34.02210 22 -34.0512 1N 5 -04.0125 1N 4 -04.0125 1	818 1N 5819 948 948 948 948	не тр 24 С р 25 Гр 25 Гр 26 Гр	
(20) D1 50 (20) D2 50. (20) D3 50. (20) D4 50 (20) D5 50. (20) D5 50. (20) D.L1 50. (20) D.L1 50. (20) D.L3 50.	.34.0512 IN 5 .04.0125 IN 4 .04.0125 IN 4 .04.0125 IN 4 .04.0125 IN 4 .04.0125 IN 4 .04.0125 IN 4 .04.2107 555- .04.2107 555-	818 1N 5819 948 948 948 948	1-61 FP 1-62 FP 1-72 FP 1-72 FP 1-73 F 1-74 F	
(20) D1 50 (20) D2 50. (20) D3 50. (20) D4 50 (20) D5 50. (20) D5 50. (20) D.L1 50. (20) D.L1 50. (20) D.L3 50.	.34.0512 IN 5 .04.0125 IN 4 .04.0125 IN 4 .04.0125 IN 4 .04.0125 IN 4 .04.0125 IN 4 .04.0125 IN 4 .04.2107 555- .04.2107 555-	818 1N 5819 948 948 948 948	ER Fc,ITT+Ph,Ses,T Fc,ITT+Ph,Ses,T Fc,ITT+Ph,Ses,T Fc,ITT+Ph,Ses,T Fc,ITT+Ph,Ses,T	
(20) DL1 50 (20) DL2 50 (20) DL3 50	.04.2107 555- .04.2107 555- .04.2107 555-	448 448 2007 2007	Fc, III, Ph, Ses, I Fc, III, Ph, Ses, I	t f
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$.04.2107 555- .04.2107 555- .05.0541 74 LS		Di Di Di	
(20) IC3 50 (20) IC4 50 (20) IC5 50 (20) IC5 50 (20) IC5 50 (20) IC5 50 (20) IC5 50		2007 2007 54174 LS 541. 57474 HC 574.	Mot.NS.Ph.RCA.SGS.TI.To	
(20) [[.04.2107 535- .06.0541 74 LS .17.1574 74 HC .15.0106 MC 14 .15.0106 MC 14 .15.0106 MC 14 .15.0115 ST7 .17.1032 74 HC .15.0115 ST7 .17.1032 74 HC .17.1032 74 HC .17.1032 74 HC .17.1030 74 HC .15.0115 ST7 .12.104 FC .17.1037 74 HC .17.1037 74 HC .17.1037 74 HC .17.1037 74 HC .17.1037 74 HC .17.1057 74 HC .17.1057 74 HC .17.1057 74 HC .17.1057 74 HC .17.1057 74 HC .17.1057 74 HC	8 P	Moti/IS-Phi/RA/SGS/11/1 Moti/IS-Phi/RA/SGS/11/1 Moti/IS-Phi/RA/SGS/11/1 Moti/IS-Phi/RA/SGS/11/1 Moti/IS-Phi/RA/SGS/11/1 Moti/IS-Phi/RA/SGS/11/1 Moti/IS-Phi/RA/SGS/11/1 Moti/IS-Phi/RA/SGS/11/1	Y D
(20) 109 50 (20) 1010 50 (20) 1011 50	.17.1032 74 HC .17.1574 74 HC .07.0020 MC140 .15.0115 SN75	3274 HC 32. 57474 HC 574. 20BCP4020 176AP DS 3695 N	Mot.NS.Ph.RCA.SGS.TI.To Mot.NS.Ph.RCA.SGS.TI.To Mot.NS.Ph.RCA.SGS.TI.To Mot.NS.Ph.RCA.To NS.T	D D D I
(20) IC++12 50 (20) IC++13 50 (20) IC++14 50 (20) IC++15 50	.L7.L000 74 HC .35.0541 74 LS .17.L004 74 HC .L7.L573 74 HC	0074 HC 00. 54174 LS 541. 0474 HC 04. 57374 HC 573.	 Mot.NS.Ph.RCA.SGS.TI.TC Mot.NS.Ph.RCA.SGS.TI.TC Not.NS.Ph.RCA.SGS.TI.TC Mot.NS.Ph.RCA.SGS.TI.TC 	5 5 5
STUDER (20)86,	/05/12_CM _ SMPT	E ∕ EBU INTERFACE	PL 1.820.751.00 PAGE	ı
IND. POS.NO. I	PART ND. V	ALUE SPECIFICATIO	IS / EQUIVALENT MANUF	·-
	.14.0113 U 27 0.998.20 .16.0107 MC680 .16.0101 MC68 .17.1393 74 HC		Hi, It, SGS, TJ 85, SNPTE/EUU IF SI Hi, Mot ANI, Mot Mot, NS, Ph, RCA, SGS, TI, TC	
(20) 1010 53. (20) 1019 50. (20) JS1	-10-0101 HL88 . -17-1393 74 HC	393 ••74 HC 393. See note 1 See note 1	AMI& HOD Mot •NS • Ph • RCA • SGS • TI • To	5
US US US US		See note 1 See note 1		
(20) 01 50 (20) 02 50 (20) 03 50 (20) 04 50	•03•0523 2TX •03•0523 2TX •03•0523 2TX •03•0523 2TX •03•0523 2TX	551 S 551 S 551 S 551 S	54 54 54 54 54	
(20) R 57.	.11.4332 3.3	küha 5% see note 2		
	*88*4332 *88*4332 *88*4332 *88*4332 *88*4332 *88*4332	see note 2 see note 2 see note 2 see note 2 see note 2		
(20) Y1 89	.01.0550	4.000 MHz, •	- 40 рря	
STUDER (20) 86,	/06/12 CM SMPT	/ EBU INTERFACE	PL 1.820.751.00 PAGE	z
IND. POS.NO.	9.0T NO. V		S / FOILMALENT	
(20) (01) 86+06+12 Co		ALUE SPECIFICATION		
Note 1 - Jumper switc)	h			
Contact Pi	in: Studer Nr. Barg Nr. Philips Nr. Fawag Nr.	54.01.0020 77 311-102-36 2422 062 43241 AS 1-034/058-36 G-	-0.75u Au	
Bridgel	Studer Nr. Berg Nr. Philips Nr. AMP Nr.	54-01.0021 65 474-001 2422 024 88003 141 767-1		
Note 2 - Resistor nati	work 8 * 3.3 kūhi	. 52		
	Bourns Nr. Beckmann Nr. Sprague Nr. Matsushita N Tama Nr.	4609 X - 101 332 L - 09 - 1 - R 3. 256 C J 332 X 2 P(F 9 E 3.3 K 5% NRG C 09 X 3.3 K	5 K J 3	
SER=Ceramic, PETP=Pol;	yesterfilm, SAL=	solid Aluminium.		
MANUFACTURERS: AND=Adi Di=Dia ITT=in Ph=Pni St=Stuc Zy=Zyte	vanced Micro Dev lco, fc=Fairchil termetall, Not=M lips, RCA=RCA Co der, Tf=Telefunk og.	ces, AMI=American Hi 9 Fe=Ferranti, Hi=Hj 9torola, NS=National poration, Ses=Sescos 9n, TI=Texas Instrume	crosystem Inc., tachi, It=Intel, Semiconductors, em, SGS=SUS/Ates, mts, To=Toshiba,	
0RI5 86706712 STUDER (20) 867			PL 1.020.751.00 PAGE	



Block Diagram Parallel Remote Interface PCB "ESE" 1.820.738

Parallel Remote Interface ESE 1.820.738.00



Parallel Remote Interface ESE 1.820.738.00



Parallel Remote Interface ESE 1.820.738.81



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Parallel Remote Interface ESE 1.820.738.81



EDITION: 1. Oktober 1989



Block Diagram Serial Remote Interface PCB "ESE" (Option) 1.820.729



Serial Remote Interface ESE 1.820.729-00

Serial Remote Interface ESE 1.820.729-00







Block Diagram Display Driver Board











Push Button / Display Board 1.811.777-00



Push Button / Display Board 1.811.777-00



Subpanel Push Button Board 1.811.778-00



Subpanel Push Button Board 1.811.778-00



Shuttle Board 1.328.214.00



Shuttle Board 1.328.214.00



IND.	POS.NO.	PART NO+	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	P 01	54.14.2001		see note 1	
	R • • • • 02 R • • • • 03	57 . 11 . 4471 57 . 11 . 4471	470 Dhm 470 Dhm	2% 2%	
	501	55.03.0261	TTL-switch	1 ≑ 0C, Rafi Nr.3.13001.110	

Note 1 - Connector 10 contacts: Yamaichi Nr. FAP-10-08#4 Burndy Nr. BPH 9 8 10 800 GS

DRIG 85/03/22 S T U D E R - (*P) 85/03/22 SU SHUTTLE BOARD PL 1.328.214.00 PAGE





LC Display Einheit 1.811.233.82



Channel Control Board 1.820.732-00



Channel Control Board 1.820.732-00



TC Channel Control Board 1.820.735-00



TC Channel Control Board 1.820.735-00



6. Tape Deck Section

ESE = Electrostatically sensitive assembly

Contents		GRP/ELM	Page
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Power Supply	1.811.510-83	GRP 1-12	6/19
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Block Diagram Tape Deck Controller	1.811.774	GRP 27	6/40
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Block Diagram Spooling Motor Controller	1.811.772.21	GRP 24	6/73
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Tape Move Sensor PCB	1.811.731.82	GRP82/ELM3	6/109
Tape Move Sensor	1.811.731.83	GRP82/ELM3	6/111
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Power Supply 1.811.510-00
















Power Supply 1.811.510-81













Power Supply 1.811.510-82













Power Supply 1.811.510-83













Power Supply Connection Board 1.811.770.00



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EL7

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C 13

C 12

C 11

Fan Connector Board 1.811.799.00







Fan Connector Board 1.811.798.00





Block Diagram Switching Stabilizer PCB 1.820.790 Block Diagram Stabilizer/Limiter PCB 1.820.792







Switching Stabilizer 1.820.790.81



EDITION: 1. Oktober 1989

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	P05+N0+	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT		I HD.	P05+N0+	PART NO+	VALUE	SPECIFICATIONS / EQ	UIVACENI	MANUF.
		1.820.792.81 59.06.0103	10 nF	Stabilizer/Limiter Board 101. 634. PETP 202. 254. 1600, PP 202. 254. 1600, PP 202. 254. 161 202. 354. 161 544. 654. 66 545. 66 545. 66 545. 66 545. 66 545. 655. PETP 102. 637. PETP 102. 637. PETP 102. 637. PETP 103. 637. 66	St		818 819 R20 R21	57+11+3580 57+11+4823 57+11+3472 58+05-0501	68 0hm 82 k0hm 4+7 k0hm 500 0hm	13 23 12		
	L2 L3 L5 L7 L8 L7 L8 L9 L10 L11 L12	59.05.2332 59.05.2332 59.26.5479	3.3 nF 4.7 uF	2,5%, 160V, PP 20%, 25/, 5al	Ph		8 22	57-11-6331	82 kOhn 547 kOhn 500 Ohn 330 Ohn 68 Ohn 10 kOhn 39 Ohn 47 Ohn 68 Ohn 68 Ohn	see note 2 2% 1%		
	£5 £6	59.22.6107 59.22.6107	10 uF 10 uF	-20%, 35V, E1 -20%, 35V, E1 63M, Co			R24 R25 R26 R27 R21 R29	57-11-3470 57-11-3680 57-11-3103 57-11-4390	68 Ohm 10 kOhm 39 Ohm	1% 5% 5%		
	C8 C9	59.36.5105	1 uF 3.3 nF	52, 63V, PETP 2,52, 160V, PP			R27	57.11.4390 57.11.3470 57.11.3680 57.11.3681	47 Ohn 68 Ohn	11		
	C10 C11	59.06.5105 59.06.5105 59.06.0103	1 uF 1 uF	5%, 63V, PETP 5%, 63V, PETP 10%, 63V, PETP			R 31	57+11+3183	18 k0hm 2.2 k0hm	1.5 1.8 5 %		
	C 13	59.05.0334 59.05.5105	0.33 uF 1 uF	102, 63V, PETP 52, 63V, PETP			R • • • • 32	57+11+4330 57+11+3132 57-11-3132	33 Ohm 1-3 kOhm 1-3 kOhm	22 15		
	C15 C16 C17	59.32.1330 59.36.0103 59.06.5104	10 nF 3.33 nF 3.33 nF 4.7 uF 10 uF 2.2 pF 10 uF 2.2 pF 1 uF 3.3 nG 1 uF 4.7 uF 4.7 uF 0.1 uF 4.1 uF 1.0 nF 1.0 nF 1.0 nF 1.0 nF 1.0 nF 1.0 uF 1.0 nF 1.0 uF 1.0	102, 63V, PETP 52, 63V, PETP			8 • • • 35 8 • • • 36	57+11+3132 57+11+3132 57+11+3132 57+11+3132 57+11+3131	130 Ohm 2+2 kOhm	12.52		
	C18 C19	59.05.5104 59.05.2332	0.1 uF 3.3 nF	5%, 63V, PETP 2,5%, 16CV, PP 5%, 63V, PETP			R	57.11.3183 57.11.3183 57.11.3202	18 KOhm 18 KOhm 2 KOhm	13 13 13		
	C21 C22	59.22.6100 59.06.5104	10 UF 0.1 UF	-20%, 35V, E1 5%, 63V, PETP			R40 R41	57.11.3202 57.11.4390	2 k0hm 39 0hm	12		
	C 23 C 24 C 25	59.05.5104 59.22.6103 59.22.6100	0.1 UF 10 UF 10 UF	-20%, 35%, E1 -20%, 35%, E1			X43 R44	57+11+3222 57+11+3103	2.2 kOhm 10 kOhm	17, 13		
	$\begin{array}{c} c \dots 14 \\ c \dots 15 \\ c \dots 15 \\ c \dots 18 \\ c \dots 17 \\ c \dots 20 \\ c \dots 21 \\ c \dots 22 \\ c \dots 22 \\ c \dots 23 \\ c \dots 24 \\ c \dots 25 \\ c \dots 25 \\ c \dots 27 \\ c \dots 28 \\ c \dots 27 \\ c \dots 28 \\ c \dots 27 \\ c \dots 30 \\ c \dots 31 \\ c \dots 32 \\ c \dots 33 \\ c \dots 3$	$\begin{array}{c} \mathbf{y}_{0} = 0 $		5. 6.97, 0217 10.7, 6.97, 0217 10.7, 6.97, 0217 10.7, 6.97, 9217 5.7, 6.37, 9217 2.35, 1607, 987 2.35, 107, 61 2.35, 107, 107, 61 2.35, 107, 107, 107,			$\begin{array}{c} (\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	57-11-3222 57-11-3103 57-11-3103 57-11-3202 57-11-3202 57-11-3202 57-11-3202 57-11-3202 57-11-3202 57-11-3222 57-11-3103 57-11-3103 57-11-3103 57-11-3103 57-11-3103 57-11-3103 57-11-3222 57-11-	39 One 47 Ohe 68 Ohe 680 Ohe 680 Ohe 52 KOhe 52 KOhe 53 KOhe 13 KOhe 13 KOhe 13 KOhe 13 KOhe 14 KOH 14	1999 · · · · · · · · · · · · · · · · · ·		
	C29 C30	59.22.5220	2200 UF 0.1 UF 22 UF	-20%, 16V, E1 5%, 53V, PETP -20%, 25V, E1 -20%, 25V, E1			K • • • • 48 R • • • • 49 Z • • • • 50	57.11.3183 57.11.3183 57.11.3183	18 k0hm 18 k0hm 18 k0hm	12		
	C32 C33	59.34.2270 59.34.2270	22 uF 27 pF 27 pF				851 852	57+11+3103 57+11+3222	10 ±0hm 2.2 ±0hm	58		
	C	59.06.0474 59.25.4132	0.47 UF 1000 UF	10%, Ce 10%, 63V, PETP -20%, 25V, £1				57.11.3922 57.11.3922				
τu	D E R (0	1) 87/05/04 80	SWITCHING :	STABILIZER BGARD PL 1.820	.790.82 PAGE 1	510	D∈R (0	01) s7/35/09 RO	SWITCHING	STABILIZER BUARD	PL 1.820.790.82	PAGE \$
ND.	P05+N0+	PART ND.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	140.	P05+N0+	PART ND.	VALUE	SPECIFICATIONS / EQ	UIVALENT	MANUF.
	C 36	59.25.4102 59.05.2472 59.32.1101 59.06.0474 59.26.9109 59.26.0334	1000 uF 4.7 nF 100 pF 0.47 uF 1 uF	-20%+ 25V+ E1 2+5%+ 163V+ PP				57.11.4105 57.11.4102 57.11.3222 57.11.3333		21		
	C37 C38 C40 C40 C41	59.32.1101 59.06.0474 59.26.9109	100 pF 0+47 uF 1 uF	10%, Le 10%, 63V, PETP -20%, 43V, Sal	Ph		R	57.11.3162	33 kOhm 1.8 kOhm	11		
		59.06.0334	0.33 uE				455 R56 k57 k58 k60 k62 k62 k65 k65 k65 k65 k65 k65 k65 k65	57.11.4102 57.11.3182 57.1.4272	1 NOhn 1 kOhn 2 2 kOhn 33 kOhn 1 8 kOhn 1 kOhn 1 8 kOhn 2 7 kOhn 2 7 kOhn 1 kOhn 1 kOhn	L % L % 5 % 5 % 5 % 5 % 5 % 5 % 5 % 5		
	D • • • • • 2 D • • • • • 3	50.34.0127 50.34.0127 50.04.0127 50.04.0125	BAT 85 BAT 85	8AS 40-32 8AS 40-32 8AS 40-32	Ph.Sie Ph.Sie Ph.Sie		8	57.11.4272 57.11.4272 57.11.4102	2+7 k0hm 1 k0hm 1 k0hm	51 52		
	0	50.04.0125	1N 4448 not used 1N 4448		Fc,ITT,Ph,Ses,Tf Fc,ITT,Ph,Ses,Tf		865 k67 R67	57.11.4102 57.1.4102 57.1.3101	1 kDhm	55 12		
	D 2 D 3 D 5 D 5 D 5 D 6 D 7 D 7 D 8 D 9 D 9 D 9 D 10	50.04.0125 50.04.1102 50.34.1102 50.34.0125 50.04.0125	BAT 85 BAT 85 BAT 85 IN 4448 NOT USAD IN 4448 6.8 V Z IN 4448 IN 4448	BZX83C6V8, BZX55C6V8, ZPD6. BZX83C6V8, BZX55C6V8, ZPD6.	.8 ITT+Ses .8 ITT+Ses FC+ITT+Ph+Ses+Tf FC+ITT+Ph+Ses+Tf		R69 51	57.1.43182 57.11+4102 55.99.0133	1.5 kOhm 1 kOhm	51 51 Seu note 3		
		50-34-0127 50-04-0508 50-04-0125 50-04-1121 50-34-0125 50-34-0127 50-34-0127 50-34-0127 50-34-0127 50-34-0125 50-34-0517 50-34-0517	0AT 85 1N 4935 24 V Z 1N+002 BAT 85 1N 4448 1N 4448 1N 4448 1N 4448 1N 4448 1N 4448	BAS 40-02 BYD 33 0, BYN 100-200 G	Ph.Sie Sl.Not.Ph.Tho/Ses Fc.ITT.Ph.Ses.Tf ITT.Mot.Ph.Tf.Tho Mot		T1 T2 T3	1.022.253.00 1.022.224.00 1.022.224.00		Power Supply Drive Power Supply Trans Power Supply Trans	Transformer former former	St St
00) 01)	$0 \dots 12$ $0 \dots 13$ $0 \dots 14$ $0 \dots 14$ $0 \dots 15$ $0 \dots 15$ $0 \dots 16$ $0 \dots 17$ $0 \dots 19$ $0 \dots 20$ $0 \dots 21$ $0 \dots 21$ $0 \dots 22$ $0 \dots 23$ $0 \dots 24$	50.04.0125	24 V Z 1N4002	82X 55-024 I (*** 4007) 8AS 40-02	TT.Mot.Ph.Tf.Tho Mot		# • • • • • 1 # • • • • • 2	1.010.117.64	not used	Wire bridge Wire bridge		St
	D16 D17 D18	50.04.0125 50.04.0125	IN 4448 1N 4448	WAS 40-02	Mot Ph,Sie Fc,ITT,Ph,Ses,Tf Fc,ITT,Ph,Ses,Tf		******	1.013111104		alle ollog-		
	D20 D21	50.04.0125 50.04.0125 50.04.0105	1N 4448 1N 4448 1N4002	(*** 4007)	Fc+ITT+Ph+Ses+Tf Fc+ITT+Ph+Ses+Tf Fc+ITT+Ph+Ses+Tf Mot							
	D++++22 D++++23 D++++24	50.34.0517 50.34.0517 50.34.0517	BYV 32-200 BYV 32-200 BYV 32-200		Ph Ph Ph							
	101	50.05.0279 50.05.0279 50.05.0279	SG 3524 BN SG 3524 BN SG 3524 BN		56 56							
	10	50.05.0286	LM 358 N	LM 358 > STABILIZER BOARD PL 1.820	Not+NS+TI)+790-82 PAGE 2			011 57/05/06 80	SHETCHING	STABILIZER BOARD	PL 1-820-790-82	PAGE 5
10	0 E K (U	11) 37703704 90	SWITCHING	STABLIZER BURKD PL 1-820	-140-82 FAGE 2							
4D.	P05+N0+	PART NO.			MANUF.	IND.	PO5-10.	PART NO.	VALUE	SPECIFICATIONS / EQ	UIVALENT	MANUF.
	105 107 107 108	50.05.0286 50.17.1123 50.35.0283 50.10.0104	LM 358 N 76 HC 123N LM 393 N LM 317 T	LM 358 P LM 393 P. TDB01930P LM 317 KC. LM 317 SP M	Mot +NS+TI Mot +NS+TI NS+Tho+TI Not+NS+SGS+Tho+TI	(01)	04+05+87 D. (4	14 replaced by Z overvoltage prot	aner diode action of D	:4V 10).		
	L1	1.322.217.00 1.322.202.00 1.322.202.00 52.01.0128 1.322.189.00 1.022.217.00 1.322.217.00	11.5 UH 16.9 mH 16.9 mH 1 mH 130 UH 11.5 UH 11.5 UH	HF-Coil	St St St	HOEN :	Gowanda Delevar	nductivity: 104 a Nr. 17 - 10 a Nr. 1641 -	4. 1 mH 105. 1 mH			
	L2 L5	1.322.202.00 52.01.0128	16.9 mH 1 mH	see note 1		Not:	2 - 500 00 Bourns	hm Potenciometer Nr. 3296 Z	lin., 10%			
	L7	1.022.217.00	11.5 UH 11.5 UH	HF-Coil HF-Coil	St St St		Spectro Murata	hm Potenciometer Nr. 3296 Z of Nr. 64 Z 50 Nr. PUT 310	1 T 000 5 Z - 1 - 5	14		
		50.03.0523 50.03.0551	ZTX 651 S BC 639		Fe Mot•Ph	Note :	3 - Thermo- Electro	-switch, 90 degr ovac Nr. 28030.2	ees Celsius			
	υ \$0,31,0523 272,951 Fe Not 3 Tharko-system (ch = 0) dayress (elsius υ \$0,31,0531 UK 6.549 Mot.Ph Electrovac Vr. 2000/c u											
	Q5 Q6		2.7 kDhm	5% 5% 5%		MANUF.	ACTURERI F	c=Fairchild, Fe= IT=Internetall,	Ferranti, G Mot=Motorol	l=General Instruments, ion, h=>hilips, Ses=Sescos ites, Siz=Sizemens, >=Thomson=CSF,		
	R1	57.11.4272 57.11.3472 57.11.3103	10 k0hm				N	tt=Nippon Electr S=National Semic GeSilicon Genera	ic Corporat onductors+ I+ SGS=SGS-	ion: Ph=Philips, Ses=Sescos Ntes, Sic=Sicmens,	en.	
	R1	57.11.4272 57.11.3972 57.11.3103 57.11.4390 57.11.3472 58.05.050	10 k0hm 39 0hm 4+7 k0hm 500 0hm	12			51					
	R1	57.11.4272 57.11.3472 57.11.3103 57.11.4390 57.11.3472 58.05.0501 57.11.3222 57.11.3222	10 k0hm 39 0hm 4+7 k0hm 500 0hm 2+2 k0hm 2+2 k0hm 2+2 k0hm	12			51 5 T.	t=Studer, Tf=Tel I=Texas Instrume	efunken, Th nts.	rtnomson−CSF.		
	R1	$57 \cdot 11 \cdot 4272$ $57 \cdot 11 \cdot 303$ $57 \cdot 11 \cdot 303$ $57 \cdot 11 \cdot 4390$ $57 \cdot 11 \cdot 4395$ $57 \cdot 11 \cdot 3472$ $58 \cdot 05 \cdot 0501$ $57 \cdot 11 \cdot 3222$ $57 \cdot 11 \cdot 3222$ $57 \cdot 11 \cdot 3222$ $57 \cdot 11 \cdot 3222$	10 k0hm 39 0hm 500 0hm 2+2 k0hm 2+2 k0hm 18 k0hm 47 0hm 2+2 k0hm	12			s s t	t=Studer, TF=Tel I=Texas Instrume	afunken, Th nts.	>= Thomson - CSF +		
	R1	57.11.4272 57.11.3103 57.11.43103 57.11.43103 57.11.4372 58.05.0501 57.11.3222 57.11.3222 57.11.3223 57.11.3223 57.11.3233 57.11.32470 57.11.3472 57.11.3472 57.11.3473	10 k0hm 39 0hm 4+7 k0hm 500 0hm 2+2 k0hm 2+2 k0hm 18 k0hm 47 0hm 2+2 k0hm 4+7 k0hm 39 0hm 10 k0hm	12			S S T	t=Studer, Tf+Tel I=Texas Instrum	əfunken, Th nts.	>=Thomason-CSۥ		
	0	57.41.43972 57.41.43972 57.11.3103 57.11.3103 57.11.43970 57.11.3072 57.11.3222 57.11.3222 57.11.3222 57.11.3222 57.11.3222 57.11.3222 57.11.3222 57.11.3222 57.11.3222 57.11.3222 57.11.4323 57.	2.7 kDhm 4.7 kDhm 10 kDhm 39 Ohm 500 Chm 2.2 kOhm 18 kDhm 4.7 kDhm 4.7 kDhm 10 kDhm 10 kDhm 82 kDhm 82 kDhm	12				t=Studer, TF=Tel I=Texas Instrume (01) #7/05/04	afunken, Th∙ nt≲.	>=Thomson-CSP.		





Basis Board 1.811.700.82







20.5.89 He	Stockolia grann A812				
STUDER	Tape Deck Control			PAGE 1	of 1

Block Diagram Tape Deck Controller 1.811.774



Tape Deck Controller ESE 1.811.774.20










Tape Deck Controller ESE 1.811.774.20



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	IND. POS.ND. PART NO. VALUE SPECIFICATIONS / EQUIVALENT MANUF.	IND. POSING. PARTING. VALUE SPECIFICATIONS / EQUIVALENT NAMUF.	IND. POS.NO. PART NO. VALUE SPECIFICATIONS / EQUIVALENT MANUF.
The second se	Gao IC17 50.15.0106 MCGBA21P 509A21P F69A21P M1,Fe,Het Gao IC17 50.15.0106 MCGBA21P	Irdes Date Medification Personner 300 (1768: Date Medification Personner 300 Natta 1 - 176 Marinare 300 Resonner Capability Resonner Capability Resonne	Prilips Nr. 2422 034 68003 Note 3 - Concentri ease, 12 contacts, 8542 m, 12 contacts, 9542 m, 12 contacts, 12 contacts, 13 contacts, 10 contacts, 1
100 1000 100 100	COD FZ4 97.69.4332 Network is 3.3 kOne, 55, see sets 7 COD FZ5 97.69.4332 Network is 3.3 kOne, 55, see sets 7 COD FZ5 97.69.4332 Network is 3.3 kOne, 55, see sets 7 COD FZ5 97.69.4332 Network is 3.3 kOne, 55, see sets 7 COD FZ5 97.69.4332 Network is 3.3 kOne, 55, see sets 7 COD FZ5 97.69.4332 Network is 3.3 kOne, 55, see sets 7 COD FZ5 95.04.332 Network is 3.3 kOne, 55, see sets 7 COD FZ5 95.04.05.05 Test sets 7 COD FZ5 95.03.05 Network is 3.3 kOne, 55, see sets 7 COD FZ5 95.03.05 Test sets 7 COD FZ5 95.03.05 Test sets 7 COD FZ5 95.02.05 Test sets 7 COD FZ5 </th <th> Index Data Modification Co. 64/07 - 100/1101 Rest P. 101 - 100/1101 Rest P. 100/1101 Rest</th> <th>DRIG 86/06/19 (20) 86/05/18 (21) 86/11/10 (22) 86/11/14 (23) 87/04/28 (23) 86/03/30 (25) 86/05/01 (20) 89/02/01</th>	 Index Data Modification Co. 64/07 - 100/1101 Rest P. 101 - 100/1101 Rest P. 100/1101 Rest	DRIG 86/06/19 (20) 86/05/18 (21) 86/11/10 (22) 86/11/14 (23) 87/04/28 (23) 86/03/30 (25) 86/05/01 (20) 89/02/01
	(30) R21 97.08.4332 Network B * 3.3 40hm, 53. exe note 7 (30) R22 97.08.4332 Network B * 3.3 40hm, 53. exe note 7 (30) R23 97.08.4332 Network B * 3.3 40hm, 53. exe note 7 (30) R24 97.08.4332 Network B * 3.3 40hm, 53. exe note 7 (30) R25 97.08.4332 Network B * 3.3 40hm, 53. exe note 7 (30) R26 97.08.4332 Network B * 3.3 40hm, 53. exe note 7 (30) R27 97.08.4332 Network B * 3.3 40hm, 53. exe note 7 (30) R27 97.08.4332 Network B * 3.3 40hm, 53. exe note 7 (30) R27 97.08.4322 Network B * 3.3 40hm, 53. exe note 7 (30) R21 97.08.4322 Network B * 3.3 40hm, 53. exe note 7 (30) R21 95.03.0122 Network B * 3.3 40hm, 53. exe note 7 (30) R21 94.02.03030 Test point (30) R21 94.02.03030 Test point (30) R21 94.02.03030 Test point (30) R22	10 contacts, Yamaichi Nr. FAP-16-08-40 55 Burndy Nr. Nete 7 - Networki Beckmann Nr. L - 09 - 11 9.3 B J Burndy Nr. Beckmann Nr. Hor State J Burndy Nr. Hor State J Byreges Nr. HOR J 232 X2 PO Tama Nr. HOR J 232 X2 PO Tama Nr. HOR J 232 X2 PO Tama Nr. HOR J 200 A J.3 A J Selectarat, Electarizita, PCP-Polyseterfile, S	
	S T U D E R (30) 07/11/04 80 TAPE DECK CONTROLLER PL 1.011.774.00 PAGE B		

Block Diagram Tape Deck Periphery Driver 1.811.779



Tape Deck Periphery DR PCB ESE 1.811.779.00



Tape Deck Periphery DR PCB ESE 1.811.779.00



Tape Deck Periphery DR PCB ESE 1.811.779.00



Tape Deck Periphery DR PCB ESE 1.811.779.00



EDITION: 1. Oktober 1989

Block Diagram Tape Deck Periphery Control 1.811.773



Tape Deck Periphery IF ESE 1.811.773.00



EDITION: 1. Oktober 1989

Tape Deck Periphery IF ESE 1.811.773.00



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Tape Deck Periphery IF ESE 1.811.773.00



Tape Deck Periphery IF ESE 1.811.773.00



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Tape Deck Periphery IF ESE 1.811.773.81





Tape Deck Periphery IF ESE 1.811.773.81





Tape Deck Periphery IF ESE 1.811.773.81



Tape Deck Periphery IF ESE 1.811.773.81



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Spooling Motor Control



Block Diagram Spooling Motor Controller 1.811.772.20



Spooling Motor Controller 1.811.772.20



Spooling Motor Controller 1.811.772.20



Spooling Motor Controller 1.811.772.20



Spooling Motor Controller 1.811.772.20



Block Diagram Slew Rate Limiter Board 1.811.780



Slew Rate Limiter Board 1.811.780.00



Slew Rate Limiter Board 1.811.780.00



Block Diagram Spooling Motor Controller 1.811.772.21



Spooling Motor Controller 1.811.772.21



Spooling Motor Controller 1.811.772.21







Spooling Motor Controller 1.811.772.81



EDITION: 1. Oktober 1989

Spooling Motor Controller 1.811.772.81

	POS • NO •	PART VD.	VALJE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND. POS.NO		VALUE	SPECIFICATIONS /	EQUIVALENT	MANU
(21) (21) (21)	R14 R15 R15	57.11.4104 57.11.4322 57.11.4322	100 kūhm 8.2 kūhm 8.2 kūhm	2% 2% 2%			ector, 10 contacts: Yamaichi Nr. Burndy Nr. 3M Nr.	FAP-10-08- BPH 9 810 7610-6002	800 GS		
(21) (21) (21) (21)	R 17 R 18 R 19 R 20	57.11.4102 57.11.5106 57.11.3243 57.11.3243	1 kDhm 10 MOhm 24 kDhm 24 kDhm	2% 5% 1% 1%		Note 2 - conne	ector, 25 contacts: Yamaichi Nr.	FAP-26-08-	4055		
(21) (21) (21) (21)	R • • • • 21 R • • • • 22 R • • • • 23 R • • • • 24	57.11.3123 57.11.4474 57.11.4104 57.11.4822	12 kühm 470 kühm 100 kühm 8.2 kühm	1% 2% 2%			Burndy Nr. 3M Nr. stor Network 8 © 3.	BPH 9 B26 7626-6002 3 kDhm, 5%	vz		
(21) (21) (21) (21)	R • • • • 25 R • • • 26 R • • • 27 R • • • 28	57.11.4822 57.11.5106 57.11.3243 57.11.3243	8.2 kOhm 10 MOhm 24 kOhm 24 kOhm	2% 5% 1%			Bourns Nr. Beckmann Nr. Sprague Nr. Matsushita Nr.	4609 X - 1 L - 09 - 1 256 C J 33 F 9 E 3.3	- R 3.3 k J 2 XZ PD		
(21) (21) (21)	R • • • • 29 R • • • • 30 R • • • • 31	57.11.3123 57.11.4474 57.11.4104	12 kühm 470 kühm 100 kühm	1 እ 2 እ 2 እ			Tama Nr. Ce=Ceramic, El=Ele	MRG C 09 X	3.3 k J	10.	
(21) (21) (21) (21)	R • • • • 32 R • • • • 33 R • • • • 34 R • • • • 35	57.11.4822 57.11.4822 57.11.4102 57.11.5106	8.2 kühm 8.2 kühm 1 kühm 10 Mühm	2% 2% 2% 5%			PETP=Polyesterfil:	∎, PP=Polypr	opylene		
(21) (21) (21) (21) (21) (21) (21) (21)	R36 R37 R38 R39 R40 R42 R42 R42 R43 R45 K45 K45 K46	57.11.3243 57.11.3243 57.11.3123 57.11.4474 57.11.4104 57.11.4104 57.11.4822 57.11.5106 57.11.3243 57.11.3123 57.11.3123 57.11.3123 57.11.3123	24 kOhm 24 kOhm 12 kOhm 470 kOhm 100 kOhm 8.2 kOhm 8.2 kOhm 10 MOhm 24 kOhm 24 kOhm 12 kOhm 3.3 kOhm 7.5 kOhm	12 12 12 23 23 23 24 25 25 25 25 25 25 25 25 25 25 25 25 25		MANUFACTURER:	Nat=National (Mate Ph=Philips, RCA=RC SGS=SGS/Ates, Sie	ories, Mot=M ushita), NS A Corporati Siemens, Si	airchild, ITT=Inte otorola, MPS=Micro =National Semicond on of America, Ses x=Siliconix, St=St F, TI=Texas Instru	o Power Systems, luctors, ≔Sescosem, uder,	
(21) (21)	R • • • • 49 R • • • • 50	57•11•5155 57•11•4472	1.5 Mühm 4.7 kühm	5% 2%		DRIG 87/06/26		5000 ING 1			D.C.
sтu	DER (21,) 37/06/25 PZ	SPODLING MO	TOR CUNTROLLER PL 1.811.772.21	PAGE 5	STUDER	(21) 87/06/25 PZ	SPOOLING M	OTOR CONTROLLER	PL 1.811.772.2	L PAGE
IND.	P05+N0+	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.						
(21) (21)	K51 R52	57.11.4102 57.11.4102	l kühm 1 kühm	2% 2%							
(21) (21) (21) (21)	K • • • • 53 R • • • • 54 R • • • • 55 R • • • • 56	57.11.4332 57.11.4224 57.11.4102 57.11.4104	3.3 kühm 220 kühm 1 kühm 100 kühm	2% 2% 2% 2%							
(21) (21) (21) (21)	K • • • • 57 R • • • • 58 R • • • • 59 R • • • • 60	57.11.4121 57.11.4472 57.11.4471 57.11.4471	120 Ohm 4•7 k0hm 470 Ohm 470 Ohm	2% 2% 2% 2%							
(21) (21) (21) (21)	R • • • • 61 R • • • 62 R • • • 63 R • • • 64	57.11.3243 57.11.3713 57.11.4331 57.11.4331	24 k0hm 91 k0hm 330 0hm 330 0hm	1% 1% 2% 2%							
(21) (21) (21) (21)	R • • • • 65 R • • • • 66 R • • • • 67	57.11.4222 57.11.4222 57.11.4101	2.2 kUhm 2.2 kUhm 100 Uhm	2% 2% 2%							
(21) (21) (21) (21)	R • • • • 68 R • • • • 69 R • • • • 70 R • • • • 71	57.11.4122 57.11.4103 57.11.4474 57.11.4474	1.2 kühm 10 kühm 470 kühm 10 kühm	2% 2% 2% 2%							
(21) (21) (21) (21)	R • • • • 72 R • • • • 73 R • • • • 74 R • • • • 75	57.11.4182 57.11.4102 57.11.4103 57.11.4474	1.8 kühm 1 kühm 10 kühm 470 kühm	2% 2% 2% 2%							
(21) (21) (21)	R • • • • 76 R • • • • 77 R • • • • 78	57.11.4104 57.11.4104 57.11.4474	100 kühm 100 kühm 470 kühm 47 kühm	2% 2% 2% 2%							
(21) (21) (21) (21)	R • • • • 79 R • • • • 80 R • • • • 81 R • • • • 82	57.11.4473 57.11.4472 57.11.4332 57.11.4272	4.7 kDhm 3.3 kDhm 2.7 kDhm	2% 2% 2%							
(21) (21) (21) (21)	R • • • • 83 R • • • • 84 R • • • • 85 R • • • • 86	57.11.4124 57.11.4103 57.11.4104 57.11.4104	120 k0hm 10 k0hm 100 k0hm 100 0hm	2% 2% 2% 2% 2%							
(21) s т u	R	57•11•4121) 37/36/26 PZ	120 Dhm SPOOLING M	24 DTOR CONTROLLER PL 1+811+772+2	1 PAGE 6						
N).	P05+N0+	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF						
(21) (21) (21)	R • • • • 88 R • • • • 89 R • • • • 90	57.11.4104 57.11.4151 57.11.4102	100 kühm 150 ühm 1 kühm	2% 2% 2%							
(21) (21) (21)	RZ2 RZ2 RZ3	57.88.4332 57.88.4332 37.88.9332		Network 8 ≑ 3.3 kOhm 5%, see note Network 8 ≑ 3.3 kOhm 5%, see note Network 8 ¢ 3.3 kOhm 5%, see note	3						
.	0 5 0		conce the me		0.00						
1.0	иск (21)	1 81/06/26 PZ	SPUULING MO	TOR CONTROLLER PL 1.811.772.21	PAGE 7						



Block Diagram Spooling Motor Drive Amplifier 1.811.771.00/81



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Spooling Motor Drive Amplifier ESE 1.811.771.00


Spooling Motor Drive Amplifier ESE 1.811.771.00



Spooling Motor Drive Ampl. ESE 1.811.771.81



Spooling Motor Drive Ampl. ESE 1.811.771.81





Block Diagram (Survey) Capstan Motor Control



Block Diagram Capstan Control Unit Generel 1.811.775

Capstan Control Unit ESE 1.820.764.00



Capstan Control Unit ESE 1.820.764.00





Capstan Motor Interface 1.811.775.00



Capstan Motor Interface 1.811.775.00





Block Diagram Capstan Motor Drive Amplifier PCB "ESE" 1.820.774

Capstan Motor Drive Amplifier PCB 1.820.774.00



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P 3

Capstan Motor Drive Amplifier PCB 1.820.774.00





Block Diagram Tacho Sensor Electronics PCB "ESE" 1.021.695

Tacho Sensor Electronics PCB 1.021.695.83



EDITION: 1. Oktober 1989

Tacho Sensor Electronics PCB 1.021.695.83



Hall Sensor PCB 1.021.697.00

To Tacho Sensor Electronic PCB I 61k OV Ο ł red +1.21 O 9 | org C HE3 41 1 yel $^{\circ}$ 8 grn 5 Ыu С ٦l vio $^{\circ}$ 6١ gry 1 HE2 L_J HE1 0 03.12.84 BUR \bigcirc • • A 820 Tape Transport Section Hall Sensor PCB PAGE 1 OF 1 SC 1.021.697.00 STUDER

Hall Sensor PCB 1.021.697.00



Tape Tension Sensor Left 1.811.730.00



Tape Tension Sensor Left 1.811.730.00







Tape Move Sensor PCB 1.811.731.00



IND• POS	• NO•	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF
C	•••1	59.26.2100	10 uF	20%, 16V, Sal	Ph.Ri
D	•••1	50.04.0512	1N 5818	1N 5819	Mot
	•••1	50.04.2128 50.04.2128	0P8 804 0P8 804	MST 804, ISTS 804 MST 804, ISTS 804	GI+ISO+Up GI+ISO+Up
		50.15.0114		9637 ATC	Fc+TI
		1.023.110.01		Flat cable	St
R	••••1	57.11.4222	2.2 kühm	2%	
R • •	• • • 2	57.11.4222	2.2 kühm	2%	
R	•••3	57.11.4102	1 kühm	2%	
R	4	57.11.4561	560 Dhm	2%	
R	5	57.11.4221	220 Dha	2%	
R • •	6	57.11.4102	1 kühm	2%	
8	7	57.11.4561	560 Ohm	2%	
R	8	57.11.4221 57.11.3511	220 Uhm 510 Uhm	23	
8		57.11.3511	510 Ohm	12	
	••10		2.2 kühm	2%	
TP.	•••1	54.02.0320		Test point	
	•••2			Test point	
TP.	•••3	54.02.0320		Test point	
MANUFACTUR	ER: Fc	=Fairchild, GI	General Inst	ppylene, Sal≅Solid aluminium ruments, Iso≅Isocom,	
	TI	it=Motorola, Up =Texas Instrum		nilips, Ri=Rifa, St=Studer,	
OR1G 86/06	/24				
STUDE	R (0	0) 86/05/24 PB	TAPE MOVE S	SENSOR PL 1.811.	731.00 PAGE 1

Tape Move Sensor PCB 1.811.731.81



Tape Move Sensor PCB 1.811.731.81



Tape Move Sensor PCB 1.811.731.82



EDITION: 1. Oktober 1989

Tape Move Sensor PCB 1.811.731.82



Tape Move Sensor 1.811.731.83



Tape Move Sensor 1.811.731.83



Tape Tension Sensor Right 1.811.728.00



Tape Tension Sensor Right 1.811.728.00



7. Audio Section

ESE = Electrostatically sensitive assembly

Contents		GRP/ELM	Page
Audio Block Diagram A812			7/1
Level Diagrams, Line Amplifier			7/2
Line Amplifier	1.820.714-83	GRP20/ELM52+57	7/3
Line Amplifier	1.820.714-84	GRP20/ELM52+57	7/5
Line Amp. Trafoless	1.820.715.81	GRP20/ELM52+57	7/9
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Line Amp. Trafoless	1.820.715-83	GRP20/ELM52+57	7/13
Line Output Amplifier	1.820.862.00		7/15
Interference Filter	1.820.749-00	GPR40+41	7/17
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Reproduce Preamplifier 2CH	1.810.711-81	GRP90/ELM2	7/21
Reproduce Preamplifier 1CH	1.810.714-00	GRP90/ELM2	7/23
Reproduce Preamplifier 2CH	1.810.717-00	GRP90/ELM2	7/25
Level Diagrams, Reproduce Amplifier			7/27
Reproduce Amplifier	1.820.710-83	GRP20/ELM51+56	7/29
Reproduce Amplifier	1.820.710-84	GRP20/ELM51+56	7/31
Reproduce Amplifier	1.820.710-85	GRP20/ELM51+56	7/33
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Record Amplifier	1.820.712-82	GRP20/ELM50+55	7/39
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Adaption Board	1.820.740.00		7/42
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Erase Head Connector			7/46
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Time Code Read-Write Unit	1.820.721-85	GRP20/ELM47	7/57
Time Code Read-Write Unit	1.820.721-85	GRP20/ELM47	7/60
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Monitor Control Unit	1.820.235-00	GRP 28	7/69

Audio Block Diagram A812



Level Diagrams, Line Amplifier



Line Amplifier 1.820.714-83



Line Amplifier 1.820.714-83









EDITION: 1. Oktober 1989

Line Amplifier 1.820.714-84










Line Amp. Trafoless 1.820.715.81



Line Ampl. Trafoless 1.820.715-82



Line Ampl. Trafoless 1.820.715-82



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Line Ampl. Trafoless 1.820.715-83



Line Ampl. Trafoless 1.820.715-83



Line Output Amplifier PCB 1.820.862.00



Interference Filter 1.820.749-00



Interference Filter 1.820.749-00



Reproduce Preamplifier 1CH 1.810.710.81



Reproduce Preamplifier 1CH 1.810.710.81



Reproduce Preamplifier 2CH 1.810.711-81



Reproduce Preamplifier 2CH 1.810.711-81



Reproduce Preamplifier 1CH 1.810.714-00



Reproduce Preamplifier 1CH 1.810.714-00



Reproduce Preamplifier 2CH 1.810.717-00



Reproduce Preamplifier 2CH 1.810.717-00



Level Diagrams, Reproduce Amplifier



EDITION: 1. Oktober 1989

Reproduce Amplifier 1.820.710-83



Reproduce Amplifier 1.820.710-83



Reproduce Amplifier 1.820.710-84



Reproduce Amplifier 1.820.710-84



Reproduce Amplifier 1.820.710-85



Reproduce Amplifier 1.820.710-85



EDITION: 1. Oktober 1989

Level Diagrams, Record Amplifier





Adaption Board 1.820.740.00/81 for 1.317... heads

Record Amplifier 1.820.712-81



Record Amplifier 1.820.712-81







Record Amplifier 1.820.712-82







HF-Driver 1.820.713-00



HF-Driver 1.820.713-00



Erase Head Connector



Erase Head Connector



18 36	17 (35) (15 (3 3	2 1) (I) (13)	
	4		с _е		- 19 - <u>37</u>) (19) (37	\sim	
19 18	17	16	15	14	13	12	11	

2 x ORIGINAL SIZE

-	FOR	A820	MONO	VERSI	ONS	AND	STER	EO	VERS	IONS	WITHOUT	VU-METERS	
	(A82)	0-1,	A820-	-1 VU,	A82	0-0.	75,	A82	0-2	F)			

POS.NO.	PART NO.	VALUE	SPECIFICATIONS	CONNECTED TO	PIN NO. 11 GROUNDED
C _E	59.04.9332	3.3 nF	5 %, 630 V, PP	Points 16/19	YES

- FOR A820 STEREO VERSION WITH VU-METERS, 2-CHANNEL VERSIONS, AND 2-CHANNEL VERSIONS WITH TIME CODE (A820-0.75 VU, A820-2, A820-2 VU, A820-2/2 VU, A820-2 TC, A820-2 TC VU)

POS.NO.	PART NO.	VALUE	SPECIFICATIONS	CONNECTED TO	PIN NO. 11 GROUNDED
C _D	59.04.9332	3.3 nF	5 %, 630 V, PP	Points 34/37	NO
C _E	59.04.9332	3.3 nF	5 %, 630 V, PP	Points 16/19	



- FOR A820 1/2" 2-CHANNEL VERSIONS (A820-2/2-1/2" VU, A820-2/2-1/2" TC VU)							
POS.NO.	PART NO.	VALUE	SPECIFICATIONS	CONNECTED TO	PIN NO. 11 GROUNDED		
с _А с _В	59.04.9271 59.04.9271	270 pF 270 pF	5 %, 630 V, PP 5 %, 630 V, PP	Points 36/37 Points 18/19	NO		


Mono Stereo Switch 1.820.720-00



Mono Stereo Switch 1.820.720-00



EDITION: 1. Oktober 1989

Mono Stereo Switch with Test Generator 1.820.724-00



EDITION: 1. Oktober 1989

Mono Stereo Switch with Test Generator 1.820.724-00





Noise Reduction System Control 1.810.763-81

Noise Reduction System Control 1.810.763-81





Block Diagram Time-Code Generel 1.820.721

Time Code Read-Write Unit 1.820.721-84



Time Code Read-Write Unit 1.820.721-84



EDITION: 1. Oktober 1939

Time Code Read - Write Unit 1.820.721-85



Time Code Read - Write Unit 1.820.721-85







EDITION: 1. Oktober 1989

Time Code Read - Write Unit 1.820.721-85

D. POSND. PART ND. VALUE SPECIFICATIONS / EQUIVALENT MANAF- C1 05.26.2100 10 uF 201, 167, 5ai Ph,8i C2 55.02100 10 uF 201, 167, 5ai Ph,8i C2 55.02100 10 uF 201, 167, 5ai Ph,8i C3 55.02100 10 uF 201, 167, 5ai Ph,8i C5 55.000000 00 uF 201 c5 55.00000 00 uF 201 c5 55.000000 00 uF 201 c5 55.00000 00 uF 201 c5 55.000000 00 uF 201 c5 55.000000 00 uF 201 c5 55.000000 00 uF 201 c5 55.000000 00 uF 201 c5 55.0000000 00 uF 201 c5 55.0000000 00 uF 201 c5 55.0000000 00 uF 201 c5 55.00000000 00 uF 201 c5 55.000000000 00 uF 201 c5 55.0000000000000000000000000000000	100. POS.NO. PART NO. VALUE SPECIFICATIONS / EQUIVALENT MANUF. 111 05.00.2125 1.2 wH TOK Nr. CBK.015-122 J J J MANUF. 111 05.00.2125 1.2 wH TOK Nr. CBK.015-122 J J J MANUF. 011 05.00.30468 BC5000C TTT.Mo.12 wL MANUF. 011 05.00.30468 BC5000C TTT.Mo.12 wL MANUF. 014 050.00.3046 BC5000C TTT.Mo.12 wL MANUF. 014 050.00.3046 BC107-02 TTT.Mo.14 wL MANUF. 014 050.00.3049 BC107-02 TTT.Mo.14 wL MANUF. 014 050.00.3049 HF148 DC5500 TTT.Mo.14 wL MANUF. 0110 050.00.3049 HF149 J112. TM00002 BC.00.004 MANUF. 0111 050.00.3049 HF149 J112. TM00002 BC.00.004 MANUF. 0111 050.00.3049 HF149 J112. TM00002 BC.00.004 MANUF.	NO. DBJ.MO. PART NO. VALLE BECLEFICATIONS / EQUIVALENT MANUF. R46 07.11.4122 1 kOhe 21 R46 07.11.4122 1 kOhe 21 R47 07.11.3242 2.4 kOhe 51 R48 07.11.3242 2.4 kOhe 52 R49 07.11.3242 2.4 kOhe 52 R49 07.11.3242 2.4 kOhe 52 R49 07.11.3242 2.4 kOhe 52 R400 07.11.3242 10.00 53 R102 07.11.412 10 MOhe 53 R102 07.11.412 10 MOhe 53 R102 07.11.412 10 MOhe 53 R102 07.11.412 2.7 Mohe 53 R105 07.11.422 2.7 Mohe 53 R105 07.11.422 2.7 Mohe 53 R105 07.11.422 2.7 Mohe 54 R105 07.11.422 2.7 Mohe 54
C15 99.20.4579 4.7 uF 200, 224, 841 P4,81 C15 99.20.4579 4.7 uF 200, 224, 841 P4,81 C17 99.00.4003 90 97 103 C18 99.00.4021 2.7 uF 2.00 C10 99.00.4021 4.7 uF 2.00 C10 99.00.4024 4.70 uF 104 C10 99.00.4024 4.70 uF 105 C10 99.00.4029 4.10 uF 98.4.9 Bal C10 99.00.00.202 4.7 UF 98.4 Bal C10 99.00.1029 4.10 uF 98.4.9 Bal C10 99.00.1029 4.10 uF 98.4.9 Bal C10 99.00.00.202 4.10 uF 98.4 Bal C	R1 97.11.4101 100 DPh 93 R2 98.11.4202 10 kDPh 93 R2 95.11.4102 10 kDPh 93 R2 97.11.4102 10 kDPh 93 R2 97.11.4102 10 kDPh 93 R2 97.11.4105 10 kDPh 93 R2 90.11.3203 10 kDPh 93 R2 90.11.3203 10 kDPh 93 R2 90.11.4203 10 kDPh 93 R2 80.11.420	S T U D E R (01) 86/11/27 80 CODE READ/ARITE UNIT PL 1.820.721.85 PAGE 7
ND. POSING. PARTING. VALUE SPECIFICATIONS / EQUIVALENT MANUF.	IND. POS.NG. PART NO. VALUE SPECIFICATIONS / EQUIVALENT MANUF.	IND. POS.NO. PART NO. VALUE SPECIFICATIONS / EQUIVALENT MANUF.
C30 99,05,1102 1 15 C30 99,05,1102 1 15 C31 99,05,1102 1 15 C41 99,92,01,1102 1 15 C41 99,92,01,1102 1 15 C41 99,92,01,1102 1 15 C42 99,92,01,1102 100,97 15 C43 99,20,01,012 100,97 15 C43 99,20,01,012 100,97 15 C44 99,20,01,012 100,97 15 C45 99,20,01,012 100,97 15 C45 99,20,01,012 100,97 15 C45 99,20,01,012 100,97 101 C45 99,20,01,012 100,97 101 C45 99,20,01,012 100,97 101 C45 99,20,01,012 100,97 101 C45 99,20,0102 100,97 101 101,97 C45 99,20,01010<	 R20 W21 W21 W21 W21 W21 W22 W22	 (i) (ii) (ii) (ii) (ii) (iii) (iii) (iii) (iii) (iii) (iii) (iii) (iii) (iiii) (iii) (iiii) (iiii) (iiii) (iiii) (iiii) (iiii) (iiii) (iiii) (iiii) (iiii) (iiii) (iiii) (iiii) (iiii) (iiii) (iiiii) (iiii) (iii) (iiii) (iiii) (iiii) (iiii) (iii) (iiii) (iiii) (iii) (
I L D E.R. (UI) 86/11/27 60 LUGE REBURNING OWN		
ND. POLNO. PART ND. VALUE SPECIFICATIONS / EDUVALENT MANJE.	Inc. POS.NO. PART NO. VALUE SPECIFICATIONS / EQUIVALENT MANUE. 857 57.11.3102 1 kOhn 13	
Dimensional state Display and the state Display and state Display and the state Dis	<pre>Stude C = 00 Bestizy T = 0 Expansion Expa</pre>	

EDITION: 1. Oktober 1989



Code Delay Unit 1.820.722.81



Code Delay Unit 1.820.722.81









VU-Meter Amplifier 1.820.730-81



Calibration Board 1.820.731.00



Calibration Board 1.820.731.00



Monitor Control Unit 1.820.580-00 (GRP 71) Monitor Control Unit 1.820.235-00 (GRP 28)



Monitor Control Unit 1.820.580-00 (GRP 71) Monitor Control Unit 1.820.235-00 (GRP 28)



8. SPARE PARTS

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8.1 TAPE DECK PANEL



Pos	Qty	Order No.	Part Name
1	1	1.811.230.00	Control compl.
1.1 1.2	1	1.811.230.01 1.811.230.02	Front cover plate Snap action door
2	1	1.820.110.18	Edit (splice-)Block
3 3.1	1	1.811.777.00 1.820.232.81	Push button/Display Board Push buttonhousing compl. with buttons
3.2	1	1.810.302.81	Housing for 5-push button
4	1	1.328.215.81	Shuttle unit
4.1	1	1.328.218.00	Shuttle bar
4.2	1	1.328.214.00	Shuttle board
4.3	1	1.328.215.22	Shuttle wheel with bearing
4.4	1	58.99.0139	Potentiometer 5 k–Ohm 2W
5	1	1.811.233.82	LC-Display-Unit
5.1	1	1.811.230.04	Cover plate LCD-unit

Labels and push buttons: see section 8.15





COVERS

Pos	Qty	Order No.	Part Name
1	1	1.811.090.22	Upper tape transport cover without monitor
or		1.811.090.21	Tape transport cover with monitor
	8	21.51.8455	Oval head allen screw M 4 x 8
1.1		1.811.090.20	Tape hold rail
1.2	1	55.12.0001	Mainsswitch
2	1	1.810.186.00	Head block cover compl.
3	1	1.811.490.02	Rear cover
	4	1.010.043.21	Counter sunk screw black M 4 x 6
4.1	1	1.811.090.07	Rack mount rail right
4.2	1	1.811.090.06	Rack mount rail left
		21.51.2455	Counter sunk screw Ni M 4 x 8
		21.51.2456	Counter sunk screw Ni M 4 x 10
5	1	1.811.090.23	Bottom tape transport cover
		1.010.034.21	Oval head screw black M 4 x 8
6	1	1.811.510.05	Power supply cover
	5	1.010.043.21	Counter sunk screw black M 4 x 6
	2	1.010.034.21	Oval head screw black M 4 x 8
6.1	1	1.811.510.15	Fan cover
7		1.811.500.05	Front cover braket
or		1.811.500.20	Front cover braket for channel remote
		1 010 040 04	interface
	4	1.010.043.21 1.010.041.21	Counter sunk screw black M 4 x 6 Cheesehead screw spez. M 4 x 8,5
	2	24.16.2240	Serrated washer M 4
	2 2	24.16.3032	Retaining washer 3,2
	1	31.03.0110	Plastic cover, round
or		54.24.0102	Headphone socket
	1	1.010.013.31	Plastic cover, rectangular
or		73.01.0116	Mechanical elapsed timer counter
	1	1.820.861.00	Time counter control PCB
7.1	1	1.820.507.00	Latch fro electronic unit
	2	1.010.034.21	Counter sunk screw black M 4 x 8
8	1	1.811.500.07	Hinged cover
9.1	1	1.811.500.03	Sidepanel left (amplifier bay)
9.2	1	1.811.500.04	Sidepanel right (amplifier bay)
		1.010.043.21	Counter sunk screw M 4 x 6
10		1.811.500.06	Bottom cover (connector field)
		1.010.043.21	Counter sunk screw M 4 x 6

8.3 REEL ADAPTER



RE	EL	ADA	PTER
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Pos	Qty	Order No.	Part Name
1	2	1.013.328.00	Spooling plate Diameter 300 mm/12"
2	2	1.013.326.00	Ciné adaptor
2.1	2	1.013.326.06	Special shaft screw
2.2	2	1.062.390.01	Guiding sleeve
2.3	2	1.736.794.03	Pressure spring
2.4	3	1.013.326.03	Latch
2.5	3	1.011.010.05	Pressure spring
3	2	1.013.343.00	DIN-Adaptor
4	2	1.013.344.00	NAB-Adaptor Professional
4.1	1	31.99.0123	Rubber-O-Ring
5	1	1.013.325.00	Adaptor lower part
5.1	3	1.010.039.21	Centering screw M 4x10
5.2	3	24.16.1040	Lock washer to M 4
5.3	1	37.02.0216	Springwasher D 40,5/61,5
5.4	1	1.013.325.03	Rubber-O-ring

8.4 TAPE LIFTER ASSEMBLY



TAPE LIFTER ASSEMBLY

Pos	Qty	Order No.	Part Name
1	1	1.014.718.00	Lifter solenoid
1.1	1	1.811.132.00	Connection lever complete
2	1	1.811.130.00	Lifter arm left, complete
2.1	2	24.16.3040	Circlip 4,0/9,3
3	1	1.811.131.00	Tape lifter arm right, cplt
3.1	1	24.16.3019	Circlip 1,9
3.2	1	1.810.130.08	Bearing bush
4.1	2	1.810.130.10	Lifter bolt
4.2	2	1.020.820.12	Pressure spring
4.3	2	1.810.130.09	Sleeve
4.4	2	22.99.0112	Hex.Nut M 3, locking type
4.5	4	1.810.130.13	Guide washer
4.6	2	23.01.1032	Washer D 3,2/6 x 0,5
4.7	2	24.16.1030	Lock washer to M 3
4.8	2	22.01.5030	Hex.nut M 3 x 0,5
5.1	2	21.53.0453	Cyl.screw IS M 4 x 5
5.2	2	21.53.0455	Cyl.screw IS M 4 x 8
5.3	4	24.16.1040	Lock washer to M 4
5.4	1	1.811.090.16	Fixing angle
6.1	2	1.010.038.37	Tension spring
6.2	1	1.810.130.12	Plastic shin

8.5 PINCH ROLLER ASSEMBLY



8.5 PINCH ROLLER ASSEMBLY

Pos	Qty	Order No.	Part Name
1	1	1.811.140.00	Pressure assembly complete
1.1	1	1.810.100.01	Pressure assembly support
1.2	1	1.067.170.02	Lower lever
1.3	1	1.811.141.00	Pressure lever complete
1.4	1	1.067.170.10	Pressure roller shaft
1.5	1	1.014.718.00	Lifter solenoid
1.6	1	1.810.100.09	Shield
1.7	1	1.810.100.08	Rubber bellows
1.8	1	1.810.100.11	Plate-spring
1.9	1	1.067.170.05	Small shaft to lower lever
1.10	1	22.01.8040	Hexagonal nut M 4 x 0,5d
1.11	3	24.16.1040	Lock-washer D 4,3/7
1.12	2	21.53.0455	Cyl.screw IS M 4 x 8
1.13	2	23.01.2043	Washer D 9,0/4,3 (M 4)
1.14	1	1.811.105.81	Pinch roller only
1.15	1	1.810.106.00	Cover to pinch roller





Pos	Qty	Order No.	Part Name
1	1	1.820.502.00	Connection XLR-3 complete
1.1	1	54.21.2002	XLR-3 F Female socket
1.2	1	54.21.2001	XLR-3 M Male plug
1.3	or	1.820.500.23	Blank panel instead of 1.820.502.00
2		1.811.565.00	VU-Panel connector compl.
2.1	1	1.811.894.00	Panel cable harness complete Audio
2.2	1	1.023.152.04	Panel cable harness complete Control
2.3	1	1.811.500.11	Connection plate Panel
2.4	or	1.811.500.10	Blank panel
3	1	20.812.945.00	NRS-Control-Kit (incl. cable harness with Interface PCB)
3.1	1	1.820.504.01	NRS-Ctrl. Connection plate
3.2	or	1.820.500.22	Blank panel
4	1	20.812.885.00	Serial interface RS232 kit compl. with wireharness & IF
	or	20.812.886.00	Serial interface RS422 and SMPTE/EBU Protocol compl.
			with Wireharness & IF
4.1 4.2		1.811.500.12	Connector mounting plate
4.2 4.3	1	1.820.560.05 1.023.190.05	Cover plate for RS232 connectors Cable harness RS232 complete
4.3		1.023.190.05	Cable harness R3232 complete
5	16	1.010.007.21	Oval head screw IS M 4 x 8 black
5.1	16	24.16.1040	Lock washer M 4
6	1	20.812.938.00	Channel remote control IF kit (incl. cable harness with IF PCB)
6.1	or	1.811.500.17	Connection plate CH–Control and NRS Control



BRAKE CHASSIS

Pos	Qty	Order No.	Part Name
1	1	1.810.165.00	Brake chassis compl. with solenoids etc.
1	1	1.810.166.00	Brake chassis complete
1.1	3	21.53.0355	Cyl.screw IS M 3 x 8
1.2	3	24.161.1030	Lock-washer D 3,2/5,5
1.3	3	23.01.2032	Washer D 3,2/7 x 0,5
1.4	2	1.167.864.00	Brake lever straight
1.5	2	1.167.863.00	Brake lever angled
1.6	2	1.067.170.14	Shock-absorber rubber
1.7	3	1.010.141.27	Hex.fixing bolt M4/M3x9
1.8	2	1.077.100.13	Brake tension spring
1.9	1	1.010.101.37	Tension spring short
1.10	4	21.53.0353	Cyl.screw IS M 3 x 5
1.11	4	24.16.1030	Lock washer D 3,2 x 5,5
1.12	4	23.01.2032	Washer D 3,2/7 x 0,5
1.13	2	1.067.100.36	Shock-absorber rubber
1.14	2	1.014.806.00	Brake solenoid
1.15	2	1.014.808.00	Plunger complete
1.16	4	24.16.3032	Clip
2	2	1.021.274.00	Brake drum complete
2.1	2 2	21.53.2457	Countersunk screw IS M 4 x 12
2.2	2	1.080.105.08	Pressure ring
2.3	6	1.080.105.07	Locking disc
3	2	1.811.165.00	Brake band complete
3.1	2	1.077.100.13	Brake tension spring
3.2	4	24.16.3032	Clip
4		1.021.270.00	Spooling motor





Pos	Qty	Order No.	Part Name
1		1.021.270.00	Spooling motor complete
1.1	1	1.021.240.06	Clip polished
1.2	1	24.16.5100	Clip D10
1.3	2	41.99.0103	Ball bearing
1.4	2	24.16.4220	Clip D22
1.5	4	37.02.0106	Springwasher
1.6	3	21.53.0457	Cyl.screw IS M 4 x 12
1.7	3	24.16.1040	Lockwasher to M 4
1.8	1	54.02.0418	Connector shell "MOLEX"
1.8.1	4	54.02.0411	Connector pins to above connector





TAPE TENSION SENSOR LEFT

TAPE TENSION SENSOR RIGHT

Pos	Qty	Order No.	Part Name
		1.811.110.82	Tape tension sensor left complete
1	1	1.811.117.82	Move sensor roller left complete
1.1	1	1.810.150.08	Move sensor roller
1.2	2	41.99.0106	Ball bearing ZZ, D 5/16 x 6
1.3	1	1.010.091.37	Pressure spring Shape D, D 15,7 X 17
1.4	1	21.51.2356	Countersunk screw IS M 3 x 10
1.5	1	1.811.111.02	Move sensor ring
1.6	1	1.167.838.02	Distance sleeve
1.7	1	24.16.4160	Clip D 16
1.8	1	1.811.111.06	Shaft for move roller
1.9	1	23.01.1064	Washer D 6,4/II
1.10	1	24.16.1060	Lock washer D 6,4/10
1.11	1	22.01.8060	Hexagonal nut M6
1.12	3	21.53.0357	Cyl.screw IS M 3 x 12
1.13	3	24.16.1030	Lock washer D 3,2/5,5
1.14	1	1.810.150.03	Cover for move and guide roller
2	1	1.811.113.00	Tape tension roller
2.1	1	1.811.112.00	Cover for tension roller
2.2	4	21.01.0203	Cyl.screw M 2 x 5
2.3	4	24.16.1020	Lock washer to M 2
2.4	1	1.811.110.02	End stop rubber sleeve
3.1	1	1.010.032.37	Tension spring short
4.1	1	1.010.105.37	Tension spring long
4.2	1	1.067.170.16	Shock absorber rubber
5.1	1	1.810.111.81	Base plate left complete
6.1	1	21.53.0353	Cyl.screw IS M 3 x 5
6.2	1	24.16.1030	Lock washer D 3,2/6
6.3	1	23.01.2032	Washer D 3,2/7
7	1	1.810.115.81	Air damper unit left complete
7.1	1	37.02.0101	Spring washer D 6,2//9,8
7.2	1	22.01.5060	Nut M 6
7.3	1	1.811.120.03	Air vent
8	1	1.811.731.83	Tape move sensor Board
8.1	2	21.53.0356	Cyl.screw IS M 3 x 10
8.2	2	24.16.1030	Lock washer D 3,2/6
8.3	2	23.01.1032	Washer D 3,2/6
9	1	1.811.730.00	Tape tension sensor board complete
9.1	2	21.53.0353	Cyl.screw M 3 x 5
9.2	2	24.16.1030	Lock washer D 3,2/6

Pos	Qty	Order No.	Part Name
		1.811.120.81	Tape tension sensor right, complete
1	1	1.811.114.00	Guide roller right compl.
1.1	1	1.811.114.01	Guide roller
1.2	2	41.99.0106	Ball bearing ZZ, D 5/16 x 6
1.3	1	1.010.091.37	Pressure spring shape D, D 15,7 X 17
1.4	1	21.51.2356	Countersunk screw IS M 3 x 10
1.6	1	1.167.838.02	Distance sleeve
1.7	1	24.16.4160	Clip
1.8	1	1.811.111.06	Shaft for guide roller
1.9	1	23.01.1064	Washer
1.10	1	24.16.1060	Lock washer
1.11	1	22.01.8060	Hexagonal nut
1.12	3	21.53.0357	Cyl.screw IS M 3 x 12
1.13	3	24.16.1030	Lock washer D 3,2/5,5
1.14	1	1.810.150.03	Cover to guide roller
2	1	1.811.113.00	Tape tension roller right complete
2.1	1	1.811.112.00	Cover for tension roller
2.2	4	21.01.0203	Cyl.screw M 2 x 5
2.3	4	24.16.1020	Lock washer to M 2
2.4	1	1.811.110.02	End stop rubber sleeve
3.1	1	1.010.032.37	Tension spring short
4.1	1	1.010.105.37	Tension spring long
4.2	1	1.067.170.16	Shock absorber rubber
5.1	1	1.810.111.81	Base plate left complete
6.1	1	21.53.0353	Cyl.screw IS M 3 x 5
6.2	1	24.16.1030	Lock washer D 3,2/6
6.3	1	23.01.2032	Washer D 3,2/7
7	1	1.810.116.81	Air damper unit right, complete
7.1	1	37.02.0101	Plate spring D 6,2/9,8
7.2	1	22.01.5060	Nut M 6
7.3	1	1.811.120.03	Air vent
9	1	1.811.728.00	Tape tension sensor board right, compl.
9.1	2	21.53.0353	Cyl.screw M 3 x 5
9.2	2	24.16.1030	Lock washer D 3,2/6
8.10 HEAD BLOCK



Pos	Qty	Order No.	Part Name	
1	1	1.810.186.00	Head block cover complete	
1.1	1	1.810.171.00	Head cover	
1.2	1	1.810.176.00	Screening flap	
1.3	1	1.810.185.02	Cover for scissor hole	
1.4	1	1.810.185.03	Сар	
1.5	1	20.25.0105	Self tapping screw D 2,2 x 9,5	
1.6	1	1.810.178.00	Right-hard braket, riveted	
1.7	1	21.53.0354	Cyl.screw IS M 3 x 6	
1.8	1	1.010.025.37	Tension spring	
1.9	3	21,51,2354	Countersunk screw M 3 x 6 IS	
1.10	1	1.810.186.01	Head block cover plate	
1.11	2	1.010.011.21	Oval head screw M 4 x 12	
1.12	2	1.810.186.02	Plastic pressfit cover	
1.13	2	1.010.010.21	Oval head screw M 4 x 8	
1.14	1	1.810.400.05	Wire spring oval	
2	1	1.810.402.81	Tape marker	
3.1	1	1.020.880.05	Ground clip-spring	
3.2	1	21.53.0354	Cyl.screw M 3 x 6	
3.3	1	24,16,1030	Lock washer D 3,2/6	
4	1	1.020.888.83	Tape scissors complete	
4.1	1	1.020.888.70	Fixed blade	
4.2	1	1.020.888.11	Blade movable	
5	1	1.020.859.00	Tape guide bolt	
6	1	Varies, see Pos.20	Head preamplifier	
6.1	2	21.01.0279	Head preamplifier Cyl.screw M 2,5 x 6	
6.2	2	21.53.0355	Cyl.screw M 3 x 8	
6.3	2	35.05.0311	Cable clamp D 4,8	
0.5	2	35.05.0311		
7	1	1.020.850.24	Guide bolt right, long	
8	1	Varies, see Pos.20	Erase head	
9	1	Varies, see Pos.20	Record head	
10	1	Varies, see Pos.20	Reproduce head	
11	1	Varies, see Pos.20	Time code head	
12.1	1	1.050.201.06	Tape rejecter bracket	
12.1		1.050.201.00	Base plate of Tape rejecter	
12.3		21.51.2355	Countersunk screw IS M 3 x 8	
12.0		21.31.2033		
13	1	1.020.890.00	Scrape flutter idler	
13.1	1	21.53.0355	Cyl.screw IS M 3 x 8	
13.2	1	24.16.1030	Lock washer D 3,2/5,5	

HEAD BLOCK

Pos	Qty	Order No.	Part Name	
14	1	1.020.883.01	Swivel base plate for TC-head	
14.1	1	22.01.8030	Hexagonal nut M 3 x 0,8	
14.2	10	37.01.0101	Disc spring D 3,2/8	
14.3	1	1.020.710.05	Azimuth alignment screw	
14.4	1	21.53.0471	Cyl. screw IS M 4 x 14	
14.5	1	24.16.1040	Lock washer D 4,3/7	
15	2	1.020.850.06	Swivelbase plate for Rec/Reprohead	
15.1	2	21.53.0455	Cyl.screw IS M 4 x 8	
15.2	2	24.16.1040	Lock washer D 4,3/7	
15.3	2	1.020.710.05	Azimuth alignment screw	
16.1	1	21.53.0455	Cyl.screw IS M 4 x 8	
16.2	1	24.16.1040	Lock washer D 4,3/7 Distance shim D 4,2/15,5 x 0,1	
16.3	2	1.020.500.01		
17.1	1	54.02.0188	50 pole D-Type Connector	
17.2	1	1.050.201.03	Distanze bracket	
17.3	1	1.050.102.11	Connection PCB for Erase head	
17.4	1	1.050.201.02	Distance Hex bolt	
18.1	3	21.53.0465	Cyl.screw IS M 4 x 3,5	
18.2	3	24.16.1040	Lock washer D 4,3/7	
18.3	2	21.53.0354	Cyl.screw m 3 x 6	
18.4	2	24.16.1030	Lock washer D 3,2 x 5,5	
19	1	1.050.299.01	Head block chassis, machined	

HEAD BLOCK FULL TRACK (MONO)

Pos	Qty	Order No.	Part Name
20	1	1.050.201.00	Head Block Full track complete, until S.No. 1559
6	1	1.810.710.82	Head Preamplifier, until S.No. 1559
8	1	1.116.097.81	Erase head Full track
9	1	1.317.710.00	Record head
10	1	1.317.716.00	Reproduce head, until 1559
20	1	1.050.201.81	Head Block Full track, complete, from S.No. 1560
6	1	1.810.714.81	Preamplifier, from S.No. 1560
8	1	1.116.097.81	Erase head Full track
9	1	1.318.710.00	Record head, from S.No. 1560
10	1	1.318.716.00	Reproduce head, from S.No. 1560

HEAD BLOCK STEREO 0,75mm

Pos	Qty	Order No.	Part Name	
20	1	1.050.202.00	Head Block 0,75 complete with full-	
	4	1 010 711 00	track erase head, until S.No. 1/559 Preamplifier, until S.No. 1/559	
6	1	1.810.711.82	Preamplifier, until S.No. 1559 Erase head, full track	
8 9	1	1.116.097.81 1.317.730.00		
9 10	1	1.317.736.00	Reproduce head, until S.No. 1559 Reproduce head, until S.No. 1559	
10	1	1.317.730.00	Reproduce field, until 3.140. 1559	
20	1	1.050.202.81	Head Block 0,75 complete, with full-	
			track Erase head, from S.No. 1560	
6	1	1.810.717.81	Preamplifier, from S.No. 1560	
8	1	1.116.097.81	Erase head, full track	
9	1	1.318.730.00	Record head, from S.No. 1560	
10	1	1.318.736.00	Reproduce head, from S.No. 1560	
20	1	1.050.203.00	Head Block 0,75 complete, with 2- track erase head, overlapping,	
6	1	1.810.711.82	Preamplifier, until S.No. 1559 until S.No. 1559	
8		1.116.092.81	2-track erase head, overlapping	
9		1.317.730.00	Record head, until S.No. 1559	
10		1.317.736.00	Reproduce head, until S.No. 1559	
10		1.317.730.00		
20	1	1.050.203.00	Head Block 0,75 complete, with 2– track erase head, overlapping, from S.No. 1560	
6	1	1.810.717.81	Preamplifier, from S.No. 1560	
8	1	1.116.092.81	2-track erase head, overlapping	
9	1	1.318.730.00	Record head, from S.No. 1560	
10	1	1.318.736.00	Reproduce head, from S.No. 1560	

HEAD BLOCK 2-TRACK 2mm

Pos	Qty	Order No.	Part Name
20	1	1.050.207.00	Head Block 2-track 2mm with full- track erase head, until S.No. 1559
6	1	1.810.711.82	Preamplifier, until S.No. 1559
8	1	1.116.097.81	Erase head full track
9 .	1	1.317.720.00	Record head, until S.No. 1559
10	1	1.317.726.00	Reproduce head, until S.No. 1559
20	1	1.050.207.81	Head Block 2-track 2mm with full- track Erase head, from S.No. 1560
6	1	1.810.717.81	Preamplifier, from S.No. 1560
8	1	1.116.097.81	Erase head full track
9	1	1.318.720.00	Record head, from S.No. 1560
10	1	1.318.726.00	Reproduce head, from S.No. 1560

HEAD BLOCK 2-TRACK 2mm

Pos	Qty	Order No.	Part Name
20	1	1.050.204.00	Head Block 2-track 2mm complete with 2-track erase head overlapping until S.No. 1559
6	1	1.810.711.82	Preamplifier, until S.No. 1559
8	1	1.116.092.81	2-track erase head, overlapping
o 9	1	1.317.720.00	Record head, until S.No. 1559
9 10	1	1.317.726.00	Reproduce head, until S.No. 1559
10		1.317.720.00	
20	1	1.050.204.81	Head Block 2-track 2mm complete with 2-track erase head overlapping from S.No. 1560
6	1	1.810.717.81	Preamplifier, from S.No. 1560
8	1.	1.116.092.81	2-track Erase head, overlapping
9	1	1.318.720.00	Record head, from S.No. 1560
10	1	1.318.726.00	Reproduce head, from S.No. 1560
20	1	1.050.205.00	Head Block 2-track 2mm complete, with Time Code, and 2-track erasing until S.No. 1559
6	1	1.810.711.82	Preamplifier
8	1	1.116.810.01	2-track Erase head with Time Code
9	1	1.317.720.00	Record head, until S.No. 1559
10	1	1.317.726.00	Reproduce head, until S.No. 1559
11	1	1.116.810.02	Time Code head
20	1	1.050.205.81	Head Block 2-track 2mm complete, with Time Code, from S.No. 1560
6	1	1.810.711.81	Preamplifier, from S.No. 1560
8	1	1.116.810.01	2-track Erase head with Time Code
9	1	1.318.720.00	Record head, from S.No. 1560
10	1	1.318.726.00	Reproduce head, from S.No. 1560
11	1	1.116.810.02	Time Code head
20	1	1.050.206.00	Head Block 2-track 2mm complete, 2-track Erase head, not overlapping until S.No. 1559
6	1	1.810.711.82	Preamplifier until S.No. 1559
8	1	1.116.814.00	2-track Erase head, 0,8mm
			separation
9	1	1.317.720.00	Record head, until S.No. 1559
10	1	1.317.726.00	Reproduce head, until S.No. 1559
20	1	1.050.206.81	Head Block 2-track 2mm complete, 2-track Erase head not overlapping
-			from S.No. 1560
6	1	1.810.717.81	Preamplifier, from S.No. 1560
8	1	1.116.814.01	2-track Erase head, 0,8mm
			separation
9	1	1.318.720.00	Record head
10	1	1.318.726.00	Reproduce head

8.11 CAPSTAN MOTOR



CAPSTAN MOTOR

VERSION 1

Pos	Qty	Order No.	Part Name
1	1	1.021.604.00	Capstan motor 0,25 "and 0,5" complete, equipped with sinter bearings, lubricated with PDP 65 oil.
2	1	1.021.601.07	Bearing cover
3	1	1.021.695.83	Tacho sensor unit (pcb)
4	3	1.010.035.21	Cyl.screw M 4 x 16 special

Attention: Apply one drop of PDP 65 oil every six months. (Order No. 20.020.401.04) This motor version is not marked with any sticker–label

VERSION 2

Pos	Qty	Order No.	Part Name
1	1	1.021.604.81	Capstan motor 0,25 "and 0,5" complete, equipped with sinter bearings, lubricated with grease "Constant GLY 2100"
2	1	1.021.601.07	Bearing cover
3	1	1.021.695.83	Tacho sensor unit (pcb)
4	3	1.010.035.21	Cyl.screw M 4 x 16 special

Attention: Use grease "Klüber Constant GLY 2100 for lubrication only! Apply a few drops (Order No. 20.020.401.10) once a year. This version of motor is marked with a red sticker–label

VERSION 3

Pos	Qty	Order No.	Part Name	
1	1	1.021.625.00	Capstan Motor A 812 complete, equipped with ball bearings	
2	1	1.021.621.09	Bearing cover	
3	1	1.021.695.84	Tacho sensor unit (pcb)	
4	3	1.010.035.21	Cyl.screw M 4 x 16 special	

Attention: This motor contains permanently lubricated ball bearings. DO NOT APPLY OIL! Damage to the ball bearings may occur! This version of motor is marked with a white sticker–label



8.12 ECONOMY STUDIO CONSOLE WITHOUT OVERBRIDGE



ECONOMY STUDIO CONSOLE WITHOUT OVERBRIDGE

' os	Qty	Order No.	Part Name
		20.020.204.85	Console with traverse for machines without overbridge.
		20.020.204.95	Console with pedestal rack 19" for machines without overbridge
1		1.058.053.00	Console-set without overbridge
1.1	1	1.058.053.02	Wooden side panel left
1.2	1	1.058.053.03	Wooden side panel right
1.3	1	1.058.067.00	Leather hand rest
	2 2	21.53.0456	Cyl.screw IS M 4 x 10
4.4	6	24.16.1040	Lock washer D 4,3/7
1.4		1.010.037.21	Cyl.screw IS M 5 x 30 black Lock washer D 5,3/9
1.5 1.6	10 2	24.16.1050 1.058.053.05	Special screw M 10
1.7	2	1.058.053.05	Handwheel M 10
1.8	2 8	37.01.0128	Disc spring washer
1.9	2	1.058.053.04	Thrust-ring
1.10	4	1.010.052.21	Cyl.screw IS M 5 x 50 black
1.11	2	1.058.068.00	Bearing bracket
2		1.058.050.00	Set of legs
2.1	1	1.058.060.00	Leg left H=780/840 mm
2.2	1	1.058.061.00	Leg right H=780/840 mm
2.3	2	1.038.880.01	Plastic cover cap straight
2.4	2	1.058.001.05	Plastic cover chamfered
2.5	4	31.03.0106	Plastic cover
2.6	4	21.53.0571	Cyl.screw IS M 6 x 14
2.7	4	26.16.1060	Lock washer D 6,4 x 10
3		1.058.101.00	Traverse-set complete srews incl.
3.1	1	1.058.112.00	Traverse
4		1.058.057.00	19"-Pedestal rack
5.1 5.2	2	33.04.0270 33.04.0271	Castor black without brake Castor black with brake

FILLER PANELS FOR 19" PEDESTAL RACK

	Finish		sh
	Gray paint		Anodized
1 unit width 2 units width 3 units width	1.918.011.00 1.918.012.00 1.918.013.00		1.918.001.00 1.918.002.00 1.918.003.00
Screw for 19" rack mounting M 6 x Screw for 19" rack mounting M 6 x Washer for 19" rack mounting D6,4	16	21.99. 21.99. 23.99.	0167



8.13 ECONOMY STUDIO WITH OVERBRIDGE



ECONOMY STUDIO WITH OVERBRIDGE

Pos	Qty	Order No.	Part Name
		20.020.204.65 20.020.204.75	Console with overbridge and traverse Console with overbridge and 19" pedestal rack
1 1.1 1.2 1.12 1.13 1.14	1 1 1 1 4	1.058.054.00 1.058.054.01 1.058.054.02 1.058.066.00 1.058.100.17 1.010.034.21	Console set with overbridge Wooden side panel left Wooden side panel right Console rear panel with neck Plate cover neck Counter sunk screw M 4 x 8 black
2		21.811.560.00	Shelf
3			Overbridge-Versions: see paragraph 8.14

8.14





STUDIO-CONSOLE AND OVERBRIDGE

Pos	Qty	Order No.	Part Name	
1		21.811.560.00	Shelf complete with neck + rear cover	r
2		21.811.563.00	Shelf with monitor complete	
2.1		1.820.572.01	Wooden Side panel left	
3		1.811.550.00	Overbridge housing without elec- tronics	
3.1		1.810.320.81	VU-Panel 1 unit per channel	
3.2	1	1.820.580.00	Monitor unit	
3.3	1	1.810.002.04	Blank panel	
3.4	1	1.820.550.03	Wooden side panel left	
3.5	1	1.820.550.04	Wooden side panel right	
3.6		1.811.551.00	Overbridge housing compl.	
4		1.058.058.00	Panel extension for TLS-LCU-	
			Installation, Incl. wooden sides	
4.1	1	1.058.058.04	Wooden side panel LCU left	
4.2	1	1.058.058.05	Wooden side panel LCU right	
4.3	1	1.810.337.00	TC-channel control panel	
5			Studio console complete, Order	
			Number see table 5 on left side	
5.1	1	1.058.100.13	Wooden side panel right	
5.1.1	8	1.058.005.03 Sleeve black for M 5 screw cyl.		
5.1.2	8	1.010.037.21	Cyl.screw M 5 x 30 black	
5.2	1	1.058.100.12 Wooden side panel left		
5.3	1	1.058.113.00	Hand rest, leather brown	
5.4	1	1.058.100.07	Front cover, console	
5.4.1	6	1.010.007.21	Oval head screw M 4 x 8 black	
5.5	1	1.058.103.00	Rear panel (no shelf or overbridge version)	
or	1	1.058.102.00	Rear (overbridge version)	
5.6	1	1.058.100.17	Cover to overbridge	
5.6.1	4	1.010.034.21	Countersunk screw M 4 x 8 black	
5.7	3	33.03.0216	Hard grip plastic	
6	1	1.058.101.00	Traverse set complete	
or		1.058.057.00	Pedestal rack complete	
6.1	4	21.53.0571	Cyl.screw IS M 6 x 14	
or	4	21.53.0572	Cyl.screw IS M 6 x 16	
6.2	4	24.16.1060	Lock washer D 6,4/10	
7	1	1.058.011.00	Console leg 780/840 mm left	ft
or	1	1.058.015.00	Console leg 840/900 mm left	ft
or	1	1.058.017.00	Console leg 900/960 mm left	ft
	1	21.53.0621	Cyl.screw M 8 x 14	
	1	23.01.1084	Washer D 8,4/15	
	1	24.16.1080	Lock washer D 8,4/13	

8 or or 8.1	1 1 1 1 1 1 4	1.058.012.00 1.058.016.00 1.058.018.00 21.53.0621 23.01.1084 24.16.1080 31.03.0106	Console leg 780/840 mm right Console leg 840/900 mm right Console leg 900/960 mm right Cyl.screw M 8 x 14 Washer D 8,4/15 Fin washer D 8,4/13 Plastic cover black	
9.1 9.2 or	2 2 4	33.04.0271 33.04.0270 33.04.0103	70 Castor without brake	
10	1	1.811.500.07	Hinged cover	

8.15 LABEL





PLAY



CCIR

STEREO

STEREO

MONO

STEREO

MONO

⊖ STEREO

TAPE A

TAPE A

TAPE B

TAPE A

TAPE B

O TAPE A

○ TAPE B

SPOT ERASE





CCIR

NAB

CCIR

NAB

⊖ CCIR

⊖ NAB

VU-METER

PANEL



1.820.041.01

FADER

1.328.210.07

O FADER

REMOTE

1.011.210.03



	REC
1.01	1.210.05

1.820.012.01

REHEARSE



1.011.210.32

SET

ADDR

1.0)11.210.10	VARI SPEED
1.0	011.210.11	REM CONTR
		TAPE DUMP

1.011.210.13

1.011.210.14

1.011.210.15

1.011.210.17

1.011.210.18

1.011.210.19

RESET

TIMER

ZERO

LOC

LOC 1

LOC 2

LOC 3







LOC

START

FADER



1.011.210.09

СН1	CH1
CH2	CH2
AUDIO	CODE





CHZ	CH2
AUDIO	COD
1.81	0.335
	1 (



Enclosed and the contract of the	
AUDI	о сн 1
INPUT	OUTP
	O CH1
OUTPUT	INPL

INPUT

OUTPUT

AUDIO CH2

AUDIO CH2 OUTPUT

TIME CODE CH INPUT

TIME CODE CH

OUTPUT

INPUT

OUTPUT

INPUT

15 IPS

15 IPS

7.5 IPS

MODE

15 IPS

7.5 IPS

() 15 IPS

○ 7.5 IPS

30 IPS

3.75 IPS

30 IPS

3.75 IPS

🔿 30 IPS

🔿 3.75 IPS

SAFE

SAFE

VARISPEED

VARISPEED

O SAFE

MUTE 1.820.090.37

AUTO





 CAP-IF
 CAP-GTR
 M-S IF
 M-MPU
 Rem IF
 M-PER CTR
 TC-DELAY
 HF-DRIV
 REC-AMPL [REP-AMPL]
 LINE AMPL
 M/S SW
 HF-DRIV
 REC AMPL [REP-AMPL]
 LINE AMPL
 M/S SW
 HF-DRIV
 REC AMPL [REP-AMPL]
 LINE AMPL
 M/S SW
 HF-DRIV
 REC AMPL [REP AMPL]
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 HF-DRIV
 REC AMPL [REP AMPL]
 LINE AMPL
 M/S SW
 M/S SW
 M/S SW
 1.811.500.14



-4

> FADER FADER

REC PLAY

 $\langle \cdot \cdot \rangle$

FADER SHUTTLE

START

REMOTE TIMER

3.75 7.5 IPS 15 30 IPS

NAB

FRAME/S OFFSET MASTER

SELECT SELECT SAFE

VU

PPM ΗХ GUARD PLAY

A/B

-

CURSOR CURSOR LAST STORE

RESET LIFTER

7.5 15 IPS

TAPE A CCIR

FORMAT

NEXT

30 IPS 15 IPS 7.5 IPS 3.75 IPS REMOTE SKIMMING

R'HEARSE

SPEED

SELECT

STEREO

MONO TAPE B

VARI SPOT

SPEED ERASE

BACK DISPLAY

SPACE

LIFTER

1.328.256.02

1.811.500.15

UNLOAD

EDIT

LAP

LIBRARY VS DISPL

REV. PLAY INPUT

WIND A/B A/B

SHUTTLE

A/B WIND FORMAT

DOLBY TAPE REVERSE

SET SET SET

VARISP ADDRESS TIMER

HOLD TRANSFER AUTO

REV. PLAY

AUTO LIBRARY

STOP WIND

43.01.0104

-	-	
CURSOR	CURSOR	
STORE	REMOTE	
15 IPS	7.5 IPS	
FRAME/S SELECT	R'HEARSE	SPEED SELECT
TAPE A	CCIR	SPOT
TAPE B	NAB	ERASE
SET VARISP	SET TIMER	∽
FADER START	SET ADDRESS	☜
	STORE 15 IPS FRAME/S SELECT TAPE A TAPE B SET VARISP FADER	STORE REMOTE 151PS 7.51PS FRAME/S R'HEARSE TAPE A CCIR NAB SET VARISP SET TIMER FADER SET

Transparent labels for: Tape deck remote control modul 1.328.255.00



1.010.023.43



BEFORE REMOVING OR INSERTING CARDS, MACHINE MUST BE SWITCHED OFF MINIMUM 5 SEC

1.820.500.31

9. Spare parts/Diagrams accessories

PARALLEL TAPE DECK REMOTE CONTROL CABINET 20.820.30 Tape transport remote control table cabinet with 15m connection cable Tape deck remote control board	1.328.250.00 9/1
PARALLEL TAPE DECK REMOTE CONTROL MODULE (SET) 20.820.30 Tape transport remote control module including 15m connection cable 1.328.29	
 Pushbutton board Connector board 	1.328.256.00 9/7
VARI-SPEED CONTROLLER UNIT 21.328.25 For installation into table cabinet (without cable) Vari-speed remote control module (without cable) for intallation into remote stand	1.328.253.00 9/11 21.328.290.00 1.328.290.00 9/11
VARI-SPEED CONTROL MODULE (DE LUXE) Vari-speed remote control (witout cable) Vari-speed display and keyboard Vari-speed connectors board Vari-speed main board	1.328.281.00 9/17 1.328.283.00 9/19
REMOTE COUNTER (RS 232) 21.328.27 including 15m connection cable 1.328.27 Remote counter 0 CPU board 0 Display board 0	97.00 1.328.275.00 9/23 1.328.276.20 9/25
SERIAL REMOTE COUNTER (LAP) 20.820.36 Including 15m connection cable 1.328.29 Serial remote counter 1.328.29 • Stabilizer board 1.328.29 • Timer driver board 1.328.29 • Timer driver board 1.328.29 • Timer driver board 1.328.29	93.81 1.328.270.00 9/29 1.328.213.00 9/31 1.328.272.00 9/33
SERIAL REMOTE CONTROL CABINET20.820.36Modul for installation into remote stand20.820.37Connecting cable (included in both)1.328.29	59.00 7 0.00 93.81
Serial remote control CABINET Serial remote control MODULE Stabilizer board Remote control driver board Remote control display board	1.328.220.00 9/37 1.328.213.00 9/39 1.328.211.21 9/41 1.328.212.00 9/43
Shuttle board	1.328.214.00 9/45

SERIAL REMOTE SELECTOR	21.328.248.00	
including 1m connetion cable	1.328.269.00	
Serial remote selector		9/47
		9/49
 Remote selector connectors bo 	ard 1.328.246.00	9/51
PARALLEL CHANNEL REMOTE CONTROL		
MODUL	21.328.260.00	
PARALLEL CHANNEL REMOTE CONTROL		
INTERFACE	1.328.901.00	
Parallel channel remote control modul		9/53
Display board		9/55
 Key board (1-3) 		9/57
Observations and the second second second		- 1=-

Channel remote logic board 1.328.265.00

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TAPE DECK REMOTE CONTROL CABINET (PARALLEL) 1.328.250

TAPE DECK REMOTE CONTROL CABINET (PARALLEL) 1.328.250

	ANZ	BESTELLNR.	BEZEICHNUNG SPEZIFIKATION
	1	1.328.250.00	Laufwerk-Fernsteuerung (parallel) (Klebeschilder: Paragraph 8.12)
	1 4 4 4	1.328.250.08 1.010.025.21 24.16.1030	Laufwerk control Print Sechskantbolzen Linsenkopfschraube M3xó Sicherungsscheibe Unterlagsscheibe
01	6	1.010.025.21	Linsenkopfschraube M3x6
02	1	1.328.250.05	Blindabdeckung
03	1	1.328.250.03	Frontblende
04	1	1.820.921.00	Gehäuse kompl. (mit Pos 5,6,10 und Füssen) Fuss
05	1 4 4	21.53.0454	Holzseitenwand rechts Z-Schraube IS M4x6 Unterlagsscheibe
06	1 4 4	21.53.0454	Holzseitenwand links Z-Schraube IS M4x6 Unterlagsscneide
07	10 10	1.011.210.01 1.010.202.37	
08	2 2	1.810.300.03 1.810.300.06	
09	3	1.810.300.21	Abdeckkappe
10	1 1 1	35.03.0120 21.51.8454 24.16.1040	Kabelbefestigungssockel LIN-Schraube IS M4xć Sicherungsscheibe

	QTY	ORDER NUMBER	PART NAME SPECIFICATION
	1	1.328.250.00	Tape deck remote control cabinet (parallel) (self-adhesive labels:Paragraph8.12)
	1 4 4 4	1.328.250.08	
01	6	1.010.025.21	Round head allen screw M3x6
02	1	1.328.250.05	Dummy plate
03	1	1.328.250.03	Front cover
04	1	1.820.921.00 31.02.0211	Housing compl. (with pos.5, 6, 10 and feet) Foot
05	1 4 4		Side panel right Allen screw M4x6 Fin washer
06	1 4 4		Side panel left Allen screw M4x6 Fin washer
07	10 10	1.011.210.01 1.010.202.37	Push button Pressure spring
08	2 2		Push button housing Damping strip
09	3	1.810.300.21	Plastic cover
10	1 1 1	21.51.8454	Cable mounting support Round head allen screw M4x6 Fin washer

TAPE DECK REMOTE CONTROL CABINET (PARALLEL) 1.328.250.00 -TAPE DECK REMOTE CONTROL PCB 1.328.252.00



TAPE DECK REMOTE CONTROL CABINET (PARALLEL) 1,328.250.00 -TAPE DECK REMOTE CONTROL PCB 1.328.252.00





TAPE DECK REMOTE CONTROL MODULE (PARALLEL) 1.328.255

	ANZ	BESTELLNR.	BEZEICHNUNG SPE	ZIFIKATION
	1	1.328.255.00	Parallele Laufwerksteuerun (Schilder: Paragraph 8.12)	
	1 1 4 4 4	1.328.257.00 1.010.110.27 21.53.0354 24.16.1030	Drucktasten Print Connector Print Sechskant-Gewinde-Bolzen Z-Schraube IS Sicherungsring Unterlagsscheibe	M3x6
01	1	1.328.255.01	Träger	
02	1	1.328.255.02	Frontplatte	
03	1 3	55.15.0122 55.15.0128		rot graŭ
04	1 5 1 5 6	55.15.0202 55.15.0212 55.15.0221		konkav flach rot weiss

TAPE DECK REMOTE CONTROL MODULE (PARALLEL) 1.328.255

	QTY	ORDER NUMBER	PART NAME SPECIFIC	ATION
	1	1.328.255.00	Tape deck remote control module (parallel) (labels: Paragraph 8.12)	
	1 1 4 4 4	1.328.257.00 1.010.110.27		M3x6
01	1	1.328.255.01	Support	
02	1	1.328.255.02	Front plate	
03	1 3		Push button knob Push button knob	red grey
04	1 5 1 5 6	55.15.0202 55.15.0212 55.15.0221	Push button cover co Push button cover Diffusing screen Diffusing screen Push button frame	ncave flat red white

TAPE DECK REMOTE CONTROL MODULE (PARALLEL) 1.328.255.00 -PUSHBUTTON PCB 1.328.256.00



TAPE DECK REMOTE CONTROL MODULE (PARALLEL) 1.328.255.00 -PUSHBUTTON PCB 1.328.256.00



> DOLMO PART NO. VALUE SPECIFICATIONS / COUNTALENT MANUE 1
C1 95-06-083 .0.08 U 100.637.917 C1 95-06-083 .0.08 U 100.637.917 D1 55-06-0125 IN 4484 77 VI.6.4 51 D1 55-06-0125 IN 4484 77 VI.6.4 78 PV 11 Fe- D1 55-05-0125 IN 4484 78 VI.6.4 78 PV 11 Fe- D1 55-05-0125 IN 4484 78 VI.6.4 78 PV 11 Fe- D1 55-05-0105 IN 45 24 0007 FF D1 55-05-00 FACE 1 D1 55-00 FACE 1 D1 55-05-00 FACE 1
C1 95-06-083 .0.08 U 100.637.917 C1 95-06-083 .0.08 U 100.637.917 D1 55-06-0125 IN 4484 77 VI.6.4 51 D1 55-06-0125 IN 4484 77 VI.6.4 78 PV 11 Fe- D1 55-05-0125 IN 4484 78 VI.6.4 78 PV 11 Fe- D1 55-05-0125 IN 4484 78 VI.6.4 78 PV 11 Fe- D1 55-05-0105 IN 45 24 0007 FF D1 55-05-00 FACE 1 D1 55-00 FACE 1 D1 55-05-00 FACE 1
DL1 00.04-227 HED DIFF. CW 11-7 PL1 1010-019-5 27 24 PIN L-00 MR DL1 0010-019-5 27 24 PIN L-00 MR DL1 0010-019-5 27 75 811 00 11 4 PN 11 5000-0525 77 811 00 11 4 PN 11 5000-0520 77 81 5000-0520 750000 78 5000-0520 77 81 5
DL1 00.04-227 HED DIFF. CW 11-7 PL1 1010-019-5 27 24 PIN L-00 MR DL1 0010-019-5 27 24 PIN L-00 MR DL1 0010-019-5 27 75 811 00 11 4 PN 11 5000-0525 77 811 00 11 4 PN 11 5000-0520 77 81 5000-0520 750000 78 5000-0520 77 81 5
P1 1-010-019-5 2* 2* 2* PIN L - 20 MM 01 500-01952 2* 2* 7* 71 1 6 0* 2* 4 PP 51 01 500-01952 2* 2* 7* 71 1 6 0* 2* 4 PP 51 01 500-01952 2* 7* 71 1 6 0* 2* 4 PP 51 01 500-01952 2* 7* 71 1 6 0* 1 4 PP 51 01 500-01952 2* 7* 71 1 6 0* 1 4 PP 51 01 57:11-121 2*0 1***********************************
N. PD5-ND. PART NO. VALUE SPECIFICATIONS / EQUIVALENT
N. PD5-ND. PART NO. VALUE SPECIFICATIONS / EQUIVALENT
U_D_L_K (0) 0.0/2/2/13 (e) U_DUINTON BOARD L_L_L_L_L_L_L_L_L_L MAXUE
A. POLNO. PART NG. VALUE SPECIFICATIONS / SULVALENT MANUEL R
 T-11+102 i-0 k 21,020 W S-11+102 i-0 k 21,020 W S-15+11+101 i-0 k 11 M S-15+1012 WK II M S-15+102 I-10 W S-15+102
52 35.15.0112 WK 11 KOMENTARP POSIUUTION SATTER ME. 52 55.15.0112 WK 11 KOMENTARP POSIUUTION SATTER ME. 55 55.15.011 WK 11 KOMENTARP POSIUUTION SATTER ME. 55 55.15.0211 KOMENTARP POSIUUTION SATTER E. 55 55.15.0211 KOMENTARP POSIUUTION SATTER E. 55 55.15.0211 KOMENTARP POSIUUTION SATTER E. 55 55.15.0211 KOMENTARP POSIUUTION SATTER E. 510 35.15.0211 KOMENTARP POSIULING SATTER E. 510 55.15.0211 KOMENTARP POSIULING SATTER
1
T U D E R (00) 86/02/13 CM PUSHBUTTON BDARD 1-328-256-00 PAGE 2
D. POS-ND. PART NO. VALUE SPECIFICATIONS / KOULVALENT MANUF.
R=Geramic; EL=Electrolytic; HP=Metallized Paper, HPC=Metallized Poly- rbonate: MEETP=Metallized Polyester; PC+Polycarbonate; PETP=Polyester •Polypropyleme: PS=Polystyrol; SAL=Solid Aluminium; TA=Tantal memt=Geramic Metal; MEFMetal Film=
NUFACTURERS: EAD = Elektro Apparaten Olten Fa = Ferranti MEX = Mexanisk Elektrisk Compagni af 1975 Sie = Siemens



TAPE DECK REMOTE CONTROL MODULE (PARALLEL) 1.328.255.00 -CONNECTOR PCB 1.328.257.00

TAPE DECK REMOTE CONTROL MODULE (PARALLEL) 1.328.255.00 -CONNECTOR PCB 1.328.257.00





VARISPEED CONVERSION KIT (FOR PAR. REMOTE CONTROL ONLY) 1.328.253.00 VARISPEED CONTROL MODULE 1.328.290.00

VARISPEED CONVERSION KIT (FOR PAR. REMOTE CONTROL ONLY) 1.328.253.00 VARISPEED CONTROL MODULE 1.328.290.00

	AI	٧Z	BESTELLNR.	BEZEICHNUNG SPEZIF	[KATION
	1		1.328.253.00	Nachrüstsatz Varispeed (nur für parallele Fernsteu	erung)
		1	1.328.290.00	Varispeed Einheit	
	1 3 3	1 3 3 1	21.01.0279	Varispeed control Print Z-Schraube Sicherungsscheibe Isolation	M2,5x6
01	1 1	1	1.328.250.10 1.810.330.02 1.328.290.01 1.328.290.02	Unterlage Träger	
01	2		1.010.025.21	Linsenkopfschraube	M3x6
03	1	1	58.99.0116	Feinantrieb mit Ableseskala	
04	1	1	1.810.320.07	Druckknopf, Lang	rot

	Ø.	ΓY	ORDER NUMBER	PART NAME SPECIF	ICATION
	1		1.328.253.00	Varispeed conversion kit (for parallel remote control o	only)
		1	1.328.290.00	Varispeed control module	
	1 3 3	1331	21.01.0279		M2.5x6
01	1	1	1.328.250.10 1.810.330.02 1.328.290.01 1.328.290.02	Spacer Support	
02	2		1.010.025.21	Round head allen screw	M3x6
03	1	1	58.99.0116	Fine drive with reading scale	
04	1	1	1.810.320.07	Push button, long	red



VARISPEED CONVERSION KIT (FOR PAR. REMOTE CONTROL ONLY) 1.328.253.00 VARISPEED CONTROL MODULE 1.328.290.00 -VARISPEED CONTROL PCB 1.810.762.82



VARISPEED CONVERSION KIT (FOR PAR. REMOTE CONTROL ONLY) 1.328.253.00 VARISPEED CONTROL MODULE 1.328.290.00 -VARISPEED CONTROL PCB 1.810.762.82



VARISPEED CONTROLLER 1.328.280



VARISPEED CONTROLLER 1.328.280

	BESTELLNR.	BEZEICHNUNG
1	1.328.280.01	Frontblende
2	1.328.280.03	Blende
3	55.15.0122	Tastenknopf rot
4	55.15.0123	Tastenknopf orange
5	55.15.0128	Tastenknopf grau

	ORDER NUMBER	PART NAME	SPECIFICATION
1	1.328.280.01	Front cover	
2	1.328.280.03	Display cover	
3	55.15.0122	Push button red	
4	55.15.0123	Push button orange	
5	55.15.0128	push button grey	



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VARISPEED DISPLAY AND KEYBOARD 1.328.281.00



	P05.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	c1	59-26-2100	10	202. 164 . 541	
	6 • • • • • 2	59.36.0104	-1 4	103. 63V . PETP	
	C3	59.06.0104	•1 u •1 u	102, 63V . PETP 102, 63V . PETP	
	6	59.06.0104	•1 u		
	6	59.06.0104	•1 u	10%, 63V , PETP	
	C • • • • • 7 C • • • • • 8	59.06.0104 59.06.0104	-1 u -1 u	10%, 63V , PETP 10%, 63V , PETP 10%, 63V , PETP 10%, 63V , PETP	
	۵	59.06.0104	•1 u		
	DL • • • • 1 DL • • • • 2	50.04.2130 50.04.2129	LY 3160 LS 3160	Diffused yellow. Diffused red.	Sie. Sie.
	0LZ+++1 DLZ+++2	73.01.0128 73.01.0128	HDSP-7303	Red Micro-Bright 7 Seg. Display: 7+6 Red Micro-Bright 7 Seg. Display: 7+6 Red Micro-Bright 7 Seg. Display: 7+6 Red Micro-Bright 7 Seg. Display: 7+6	NR. HP.
	DLZ3	73.01.0128	HDSP-7303	Red Micro-Bright 7 Seg. Display, 7.6	MR. HP.
	DL 2 4	73.01.0128	H05P-7303	Red Micro-Bright 7 Seg. Display, 7.6	MB. HP.
	101	50.07.0511	CD 4511	BCD-to-7 Seg. Latch/Decoder/Driver.	
	102	50.07.0511	CD 4511 CD 4511	BCD-to-7 Seg. Latch/Decoder/Driver. BCD-to-7 Seg. Latch/Decoder/Driver.	
	10	50.17.1010	74 HC 10 74 HC 02	Triple 3-Input NANO Gate. Quad 2-Input NOR Gate.	
	105	50.17.1002	74 HC 02 74 HC 132	Quad 2-Input NOR Gate. Quad 2-Input Schwitt Trigger NAND Gat	
	106				
	J1	53+03+0218	24 * 1 pin	Straight socket strip (24 pcs.)	
	P•••••1 P••••2	54.01.0020 54.01.0020	0.6300.63	Straight soldering male pin. Straight soldering male pin.	
	81	57.11.3331	330	1%, 0207 . MF	
	RZ1	57.88.3331	8 * 330 8 * 330 8 * 330	2%, DIL16	
	RZZ RZ3	57.88.3331 57.88.3331	8 * 330	2%, DIL16 2%, DIL16 2%, SIP 9	
	RZ	57.88.4103	8 * 10 K	2%, SIP 9	
1 ND .	P05+N0+				MANUF.
	S 2	55.15.0113 55.15.0113	2 * U 2 * U	Push-Push Button Schwitch. Push-Push Button Schwitch.	MEC.
	S	55.15.0112	2 2 11	Homentary Push Button Switch.	MEC.
	S4 S5	55.15.0112 55.15.0112	2 * 0	Homentary Push Button Switch. Momentary Push Button Switch. Momentary Push Button Switch.	MEC.
	5	55+15+0112	2 = 0	Momentary Push Button Switch.	MEC.
	TP1	54.02.0320	2.8 0 0.8	Straight soldering strip.	
		OL 2 are mounte L2 1-to-4 are r iume PETP=Polyc		xets #53+03+0230 (2 pcs+) > 5 pcs+ #53+03+0218 pins+ ■ Film-	
SAL=So					
SAL = So	ACTURERS :	HP = Hewlet F MEL = Mekanisk Sie = Siemens	Packard k Elektrisk Co	ampagni af 1975	
SAL = Sc HANUF#		MEL = Mekanisk	Packard k Elektrisk Co	ampagni af 1975	



VARISPEED MAIN BOARD 1.328.282.20


VARISPEED MAIN BOARD 1.328.282.20



VARISPEED MAIN BOARD 1.328.282.20



REMOTE TIMER (SERIAL) 1.328.275



REMOTE TIMER (SERIAL) 1.328.275

	BESTELLNR.	BEZEICHNUNG	SPEZIFIKATION
1	1.010.045.21 21.51.2354	Schraube schwarz Schraube Ni	M3x6 M3x6
2	31.02.0211	Fuss schwarz	D16x6,5
3	1.328.275.01	Frontplatte	
4	1.810.253.00	Display-Gehäuse komple	ett
5	1.810.303.01	Display-Gehäuse	
6	1.810.303.02	Filterglas	
7	1.011.210.14 1.011.210.01	Schild RESET TIMER Taste	
8	1.011.210.15 1.011.210.01	Schild ZERO LOC Taste	

	ORDER NUMBER	PART NAME	SPECIFICATION
1	1.010.045.21 21.51.2354	Screw black Screw Ni	M3x6 M3x5
2	31.02.0211	Foot black	D16x6,5
.3	1.328.275.01	Front cover	
4	1.810.253.00	Display cover compl.	
5	1.810.303.01	Display cover	
ć	1.810.303.02	Display window	
7	1.011.210.14 1.011.210.01	Label ZERO TIMER Push button	
8	1.011.210.15 1.011.210.01	Label ZERO LOC Push button	

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ACCESSORIES



	BESTELLNR.	BEZEICHNUNG
9	1.328.275.31	Befestigungsblende für 1 Zähler
10	1.328.275.32	Befestigungsblende für 2 Zähler
11	1.328.275.33	Befestigungsblende für 3 Zähler

	ORDER NUMBER	PART NAME SPECIFICATION
9	1.328.275.31	Mounting frame for 1 counter
10	1.328.275.32	Mounting frame for 2 counter
11	1.328.275.33	Mounting frame for 3 counter



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CPU BOARD 1.328.276.00





DISPLAY BOARD 1.328.277.00



DISPLAY BOARD 1.328.277.00





REMOTE TIMER/LAP MODE DISPLAY (SERIAL) 1.328.270

REMOTE TIMER/LAP MODE DISPLAY (SERIAL) 1.328.270

	QTY	ORDER NUMBER	PART NAME SPECIFICATION
	1	1.328.270.00	Remote timer/lap mode display (self-adhesive labels: Section 8.23)
	1 3 3 1	21.53.0354 23.01.1032 24.16.1030	
	1 2 2 2	23.01.1032 24.16.1030	Allen screw M3x6 Washer
	4 3 3 1	21.53.0354 23.01.1032 24.16.1030	Allen screw M3x6 Washer
01	2	1.010.025.21	Round head allen screw M3x6
02	1 1		Push button housing Damping strip
03	2 2	1.011.210.01 1.010.202.37	Push button Pressure spring
04	1 4	1.328.270.01 1.010.034.21	Front cover Countersunk allen head screw
05	1 6	1.328.274.00 1.010.045.21	Housing upper Countersunk allen head screw
06	1 4	1.328.273.00 31.02.0211	Bottom cover Foot
07	1	1.820.232.02	Filter screen red

REMOTE TIMER/LAP MODE DISPLAY 1.328.270.00 -STABILIZER PCB 1.328.213.00



REMOTE TIMER/LAP MODE DISPLAY 1.328.270.00 -STABILIZER PCB 1.328.213.00





REMOTE TIMER/LAP MODE DISPLAY 1.328.270.00 -TIMER DRIVER PCB 1.328.272.20



REMOTE TIMER/LAP MODE DISPLAY 1.328.270.00 -TIMER DRIVER PCB 1.328.272.20



IND. POS.NO. C2 C7 C6 C10 C12 C13 C14 C15	PART ND.	VALUE	SPECIFICATIONS / E	QUIVALENT MANUF.	
C 1 C 2 C 7 C 8 C 9 C 10 C 11 C 12	59.06.0683				
C 13	59.06.0683 59.06.0683 59.06.0683 59.06.0683 59.22.3471 59.34.2330 59.34.2330 59.26.1100 59.06.0104 59.06.0683 59.06.0683	68 nF 68 nF 68 nF 470 uF 33 pF 10 uF 100 uF 68 nF 68 nF	10%, 63%, PETP 10%, 63%, PETP 10%, 63%, PETP 10%, 63%, PETP -20%, 10%, E1 5%, N150, Cer 5%, N150, Cer 20%, 10%, Sal 10%, 63%, PETP 10%, 63%, PETP 10%, 63%, PETP		
C15 D2 D3	59.06.0683 50.04.0125 50.04.0125 50.04.0125 50.04.0125 50.04.0125	68 nF 1N 4448 1N 4448 1N 4448 1N 4448 1N 4448	10%, 63V, PETP	Fc + ITT +Ph + Ses + Tf Fc + ITT +Ph + Ses + Tf Fc + ITT +Ph + Ses + Tf Fc + ITT +Ph + Ses + Tf	
D4			Software 13/85	Fc + ITT +Ph + Ses + Tf Fc + ITT +Ph + Ses + Tf St	
1C2 1C2 1C3 1C4 1C8 1C8 1C8 1C9 1C10 1C11 1C12 1C13 1C14 1C15	$\begin{array}{c} 1.328.999.20\\ 50.17.1573\\ 50.17.1138\\ 50.17.1004\\ 50.17.1259\\ 50.17.1259\\ 50.17.1259\\ 50.16.0107\\ 50.15.0102\\ 50.15.0102\\ 50.15.0113\\ 50.15.0113\\ 50.15.0115\\ 50.15.0102\\ \end{array}$	74 HC 573 74 HC 138 74 HC 04 74 HC 259 74 HC 541 NC 5603P-1 NE 590 N 74 HC 574 SN 75498 N 74 HC 574 SN 75498 N SN 75176AP NE 590 N	Software 13/85 - 74 HC 573. - 74 HC 138. - 74 HC 138. - 74 HC 259. HD 6803P-1 - 74 HC 574. DS 3695 N	Not-NS-Ph-RCA-SGS.TI-To Not-NS-Ph-RCA-SGS-TI-To Not-NS-Ph-RCA-TI-To Not-NS-Ph-RCA-TI-To Not-NS-Ph-RCA-SGS-TI-To HI-Not- NS-Ph-RCA-SGS-TI-To Ti Not-NS-Ph-RCA-SGS-TI-To Ti NS-TI NS-TI NS-TI Sig Sig	
P2 P4 P5	5011510101	AC 570 A	see note 3 see note 2 see note 4	114	
Q3 Q4	50.03.0352 50.03.0352	ZTX 751 S ZTX 751 S		Fe Fe	
STUDER (20)		TIMER DRI	VER BOARD	Fe 1.328.272.00 PAGE 1	
IND . PDS . NO .	PART NO.	VALUE	SPECIFICATIONS / E		
Q5 Q8 Q9 Q10 Q11 Q12 Q13 Q14	50.03.0352 50.03.0352 50.03.0352 50.03.0352 50.03.0352 50.03.0352 50.03.0352 50.03.0352 50.03.0352 50.03.0352 50.03.0352 50.03.0352	ZTX 751 S ZTX 751 S		F0 F0 F0 F0 F0 F0 F0 F0 F0 F0 F0 F0 F0 F	
R8 R9 R10 R11 R12 R13	57.11.4332 57.11.4103 57.11.4102 57.11.4103 57.11.4103	3.3 k0hm 10 k0hm 1 k0hm 10 k0hm not used 3.3 k0hm	22 22 22 22 22	94	
R21 R22 R24 R25 R26 R27 R29 R29 R29	57-88-4332 57-88-4332 57-88-4332 57-88-4332 57-88-4332 57-88-4332 57-88-4332 57-88-4332 57-88-4332 57-88-3101 57-88-4332		Network, 8 ¢ 3. Network, 8 ¢ 3.	3 kDhn, 2%, single line 3 kDhn, 2%, single line 0 dhn, 3%, single line 5 kDhn, 5%, single line	
Y1	89+01+0560	4.9152 MH	z +−100 ppM+ Nymph	Nr. TD 18/NMP 049	
STUDER (20) 1NO- POS-NO-		TIMER ORI VALUE	SPECIFICATIONS / F	L.328.272.00 PAGE 2 Duivalent Hanuf.	
Note 2 - Connecto	r: 10 Contacts Studer Nr Yamaichi Burody Nr	• 54.14.20 Nr. FAP-10-0 • BPH 7 B	01 8//4 10 800 65		
Note 3 - Connecto	r: 40 Contacts Studer Nr Yamaichi Burndy Nr	- 54-14-20 Nr - FAP-40-0 - 3PH 9 B	04 8//4 40 800 GS		
Note 4 - Connector	r: 10 Pieces Studer Nr	. 1.010.01			
Cer=Ceramic, E1=E1	lectrolytic, PE	TP=Polyester	film, Sal=Solid al	uminium.	
	=Fairchild, Fe= [=[ntermetal], =Philips, RCA=R	Ferranti, Hi Mot-Motorola CA Corporati -Studer, Tf= nts, To=Tosh	=hitachi, Is=Inters , NS=National Semico on, Ses=Sescosen, Si Telefunken, iba.	il, anductors SS=SGS/Ates,	
MANUFACTURERS: Fc ITT Phi Sig TI	signetics, st Texas Instrume				
MANUFACTURERS: Fcc IT Ph Ph Si TI	josignetics, se Texas Instrume				
MANUFACTURERS: Fcc IT Ph Ph St Tt ORIG 85/04/23 S T U D E R (20)		TIMER DRI		1.328.272.00 PAGE 3	



REMOTE TIMER/LAP MODE DISPLAY 1.328.270.00 -TIMER DISPLAY PCB 1.328.271.00

REMOTE TIMER/LAP MODE DISPLAY 1.328.270.00 -TIMER DISPLAY PCB 1.328.271.00



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	
	C • • • • • 1	59.26.1479	4•7uF	-20%, 10V, Sal	F
	DL2.0 DL2.1	50.04.2130	LY 3160-GK not used	Yellow	
	DL • • 2 • 2 DL • • 2 • 3	50.04.2130 50.04.2130	LY 3160-GK LY 3160-GK	Yellow Yellow	
	DL •• 2 • 4 DL •• 2 • 5	50.04.2131 50.04.2129	LG 3160-GK LS 3160-HL LY 3160-GK	Green Red	
	DL • • 2 • 6 DL • • 2 • 7	50.04.2130 50.04.2131	LG 3160-GK	Yellow Green	
	DL3.0 DL3.1	50.04.2130	LY 3160-GK not used	Yellow	
	DL •• 3 • 2 DL •• 3 • 3	50.04.2130 50.04.2130	LY 3160-GK LY 3160-GK	Yellow Yellow	
	DL •• 3• 4 DL •• 3• 5	50.04.2130 50.04.2130	LY 3160-GK LY 3160-GK LY 3160-GK	Yellow Yellow	
	DL •• 3•6 DL •• 3•7	50.04.2130 50.04.2130	LY 3160-GK LY 3160-GK	Yellow Yellow	
	DLZ • • • 1 DLZ • • • 2	73.01.0124 73.01.0124	MAN 6660 Man 6660	7-Segments, Red, Brightness "G" 7-Segments, Red, Brightness "G" 7-Segments, Red, Brightness "G" 7-Segments, Red, Brightness "G"	
	DL Z • • • 3 DL Z • • • 4	73-01-0124 73-01-0124	MAN 6660 Man 6660	7-Segments, Red, Brightness "G" 7-Segments, Red, Brightness "G"	
	DL Z 5 DL Z 6	73.01.0124 73.01.0124	MAN 6660 MAN 6660	7-Segments, Red, Brightness "G" 7-Segments, Red, Brightness "G"	
	DLZ7 DLZ8	73.01.0124 73.01.0124	MAN 6660 MAN 6660	7-Segments, Red, Brightness "G"	
	DL Z9 DL Z10	73.01.0124 73.01.0124	MAN 6660 MAN 6660	7-Segments, Red, Brightness "G" 7-Segments, Red, Brightness "G" 7-Segments, Red, Brightness "G"	
	S 4 . 0	55.03.0261	TTL-switch	1 ¢ OC, Rafi Nr. 3.13001.110 1 ¢ OC, Rafi Nr. 3.13001.110	
	S4.1 P1	55.03.0261 54.14.2004	TTL-switch 40 cont.	1 ≑ OC+ Rafi Nr• 3•13001•110 see note 1	
	- Connecto				
		Bu	rndy Nr. BP	P-40-08-40SS 1 9 B 40 B00 GS	
Sal=So	lid Alumini	ium			
MANUFAC	CTURERS: G	[=General Inst	ruments, Ph=P	nilips, Ri=Rífa, Sie=Siemens.	
	5/04/23				
			TIMER DI	SPLAY BOARD 1+328+271+00	
STUC	DER (≑F	▶) 85/04/23 SU			
S T U (DER (*f	γ 85/04/23 SU			
S T U C	DER (of	-) a5/04/23 SU			
S T U () 85/04/23 SU)	
S T U (P1)	
S T U (P1)	
S T U (P1				
S T U (P1)	

REMOTE CONTROL CABINET (SERIAL) 1.328.210 REMOTE CONTROL MODULE (SERIAL) 1.328.220



REMOTE CONTROL CABINET (SERIAL) 1.328.210 REMOTE CONTROL CABINET (SERIAL) 1.328.220

	Q	Γ¥	ORDER NUMBER	PART NAME SPECIFICATION
	1		1.328.210.00	Remote control cabinet (serial) (self-adhesive labels: section 8.23)
		1	1.328.220.00	Remote control module (serial) (self-adhesive labels: section 8.23)
	133314 44632	1 3 3 1 4 8 8 8	21.53.0354 24.16.1030 23.01.1032 1.328.211.21 1.010.055.27 1.010.021.27 21.53.0354 1.010.025.21 24.16.1030 23.01.1032	REMOTE CONTROL DRIVER PCB Hex stud bolt Hex stud bolt Allen screw M3x6 Round head allen screw M3x6 Fin washer
01	1	1 1 6 6 6 1 1	1.328.220.01 1.010.118.27 24.16.1030 23.01.1032	Bottom cover Chassis Hex stud bolt Fin washer Washer Border protection
02	1 4 4			Side panel right Allen screw M4x6 Fin washer
03	1 4 4			Side panel left Allen screw M4x6 Fin washer
04	6		1.010.025.21	Round head allen screw M3x6
05	1	1	1.328.217.00 1.328.221.00	Front cover compl. containing all parts marked with "∎" Front cover compl. containing all parts marked with "∎"
	1.		1.328.210.03 1.328.220.11	
	61 61		1.328.210.06 21.53.0353 23.01.1032	REMOTE CONTROL DRIVER PCB Hex stud bolt Allen screw M3x5 Washer Fin washer
06	11	1	1.820.232.02	Filter screen red
07	1	5a 5a		Push button Pressure spring
08	1	a1 a1 a1	1.820.232.01 1.810.300.05 1.820.232.03	Push button housing Damping strip, for 2 push buttons Damping strip, for 8 push buttons
09		1 101 101		Push button housing Damping strip, for 5 push buttons

1∎1 2∎2 2₩2	1.328.214.00 1.328.210.09 22.01.8030	Spec. nut	мз
		Push button compl.	
		Toothed wheel	
		Tension spring	
1m1	58.99.0139	Potentiometer 5 kQ, 2	W
	1		



REMOTE TIMER/LAP MODE DISPLAY 1.328.270.00 -STABILIZER PCB 1.328.213.00

REMOTE TIMER/LAP MODE DISPLAY 1.328.270.00 -STABILIZER PCB 1.328.213.00





REMOTE CONTROL CABINET (SERIAL) 1.328.210.00 REMOTE CONTROL CABINET (SERIAL) 1.328.220.00 -REMOTE CONTROL DRIVER PCB 1.328.211.21 REMOTE CONTROL CABINET (SERIAL) 1.328.210.00 REMOTE CONTROL MODULE (SERIAL) 1.328.220.00 -REMOTE CONTROL DRIVER PCB 1.328.211.21



REMOTE CONTROL CABINET (SERIAL) 1.328.210.00 REMOTE CONTROL MODULE (SERIAL) 1.328.220.00 -REMOTE CONTROL DISPLAY PCB 1.328.212.00



REMOTE CONTROL CABINET (SERIAL) 1.328.210.00 REMOTE CONTROL MODULE (SERIAL) 1.328.220.00 -REMOTE CONTROL DISPLAY PCB 1.328.212.00



	C 01 C 02	59+26+1220 59+06+0683	22.uF	-20%, 10V , SAL 10%, PETP	
	DL++0+3	50+04+2111	MV 5753	LED, Red, HLMP 3301	Sie
	0L0.4	50.04.2112	MV 5353	LED, Yellow, HLMP 3401 LED, Yellow, HLMP 3401	Sie
	DL0.5	50.04.2112	NV 5353	LED. Yellow, HLMP 3401 LED. Yellow, HLMP 3401 LED. Yellow, HLMP 3401 LED. Yellow LED. Yellow LED. Yellow LED. Yellow LED. Yellow LED. Yellow LED. Yellow LED. Yellow LED. Yellow	Sie
	DL 0.6	50-04-2112	MV 5353	LED, Yellow, HLMP 3401	Sie
	DL	50.04.2112	MV 5353	LED, Yellow, HLMP 3401	Sie
	DL	50.04.2130	CQV 13-7	LED. THITOW	Sie
	01 1 2	50.04.2130	COV 13-7	LED, Tellow	Sie
	01 1 2	50.04.2130	COV 13-7	LED. Vellow	Sie
	Danalas	50.06.3130	COV 13-7	LED Valley	Sie
		50 04 2130	CON 13-7	LEDI TETTOW	Sie
	011.6	50-04-2130	COV 13-7	LED. Yollow	Sie
	DI 1.7	50-04-2130	CON 13-7	LED. Yollow	Sie
	01 2 - 0	50-04-2130	CON 13-7	LED. Yollow	Sie
	012.1		not used		
	04 2 2	50-06-2130	CON 13-7	LED. Yollow	Sie
	01	50-06-2130	COV 13-7	LED, Yellow LED, Yellow LED, Greent CQY 15-6 LED, Red LED, Yellow LED, Greent CQY 15-6 LED, Yellow	Sie
	01 2.4	50-04-2131	COV 15-5	LED. Cross. COV 15-6	Sie
	01 2 . 5	50.04.2129	CON 11-7	LED. Red	Sie
	01	50 04 2130	COV 13-7	LED, Yelley	Sie
	012.7	50 04 2131	CON 15-5	LED. Crears, COV 18-4	Sie
	01 3 - 0	50-04-2130	COV 13-7	LED. Yellow	Sie
	013.2	50-04-2130	COV 13-7	LED. Yellow	Sie
	01 3 . 3	50-04-2130	COV 13-7	LED. Yellow	Sie
	01 3 - 6	50-04-2130	COV 13-7	LED. Yellow	Sie
	DL 3 . 5	50-04-2130	COV 13-7	LED. Yellow	Sie
	Dissistants	50+04+2130	COV 13-7	1ED. Yellow	Sie
	DL++3+7	50.04.2130 50.04.2130 50.04.2130 50.04.2130 50.04.2130 50.04.2130 50.04.2130	CQV 13-7	LED, Yellow	Sie
	DL Z 01	73.01.0124	MAN 6660	7-Segments, Red, Brightness "G"	GI
	0LZ02	73.01.0124	MAN 6660	7-Segments, Red, Brightness "G"	GI
	DL203				ĠI
				7-Segments, Red, Brightness "G"	
	DL204	73-01-0124	MAN 6660	7-Segments, Red, Brightness "G" 7-Segments, Red, Brightness "G" 7-Segments, Red, Brightness "G" 7-Segments, Red, Brightness "G"	61
s t∙u	DL204			7-Segments, Red, Brightness "G" 7-Segments, Red, Brightness "G" INTROL DISPLAY BOARD 1,328,212,00	ĞI
s t∙u	DL204				ĞI
IND.	DL2++04	1) 86/01/23 PB	REMOTE CO Value		GI PAGE
IND.	DL2D4	1) 86/01/23 PB PART NO.	REMOTE CO VALUE	MTROL DISPLAY BOARD 1.328.212.00	GI PAGE MANUF
IND.	DL2D4	1) 86/01/23 PB PART NO.	REMOTE CO VALUE	MTROL DISPLAY BOARD 1.328.212.00	GI PAGE MANUF
IND.	DL2D4	1) 86/01/23 PB PART NO.	REMOTE CO VALUE	MTROL DISPLAY BOARD 1.328.212.00	GI PAGE MANUF
IND.	DL2D4	1) 86/01/23 PB PART NO.	REMOTE CO VALUE	MTROL DISPLAY BOARD 1.328.212.00	GI PAGE
IND.	DL2D4	1) 86/01/23 PB PART NO.	REMOTE CO VALUE	MTROL DISPLAY BOARD 1.328.212.00	GI PAGE MANUF GI GI GI GI
IND.	DL2D4	1) 86/01/23 PB Part No.	REMOTE CO VALUE	MTROL DISPLAY BOARD 1.328.212.00	GI PAGE HANUF GI GI GI GI GI
IND.	DL2++04 DER (0) POS+NO- DL2++05 DL2++06 DL2++08 DL2++10 DL2++10 S-++04	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124	REMDTE CC VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660	NTERL DISPLY BOAD 1-328-212-00 SPECIFICATIONS / EQUIVALENT	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2++04 DER (0) POS+NO- DL2++05 DL2++06 DL2++08 DL2++10 DL2++10 S-++04	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124	REMDTE CC VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660	NTERL DISPLY BOAD 1:328-212-00 SPECIFICATIONS / GUIVALENT 	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2++04 DER (0) POS+NO+ DL2++05 DL2++06 DL2++06 DL2++06 DL2++07 DL2++09 DL2++10 S+++0+2 S+++0+3	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124	VALUE VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660 THL 5witch TTL-Switch	NTEGL DISPLY BOAD 1,328-212.00 SPECIFICATIONS / EQUIVALENT LORDNILL AND DISPLAY BOAD	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2++04 DER (0) POS+NO+ DL2++05 DL2++06 DL2++06 DL2++06 DL2++07 DL2++09 DL2++10 S+++0+2 S+++0+3	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124	VALUE VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660 THL 5witch TTL-Switch	MTAGL DISPLAY 80AN0 1.328-212.00 SPECIFICATIONS / EQUIVALENT 	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2++04 DER (0) POS+NO+ DL2++05 DL2++06 DL2++06 DL2++06 DL2++07 DL2++09 DL2++10 S+++0+2 S+++0+3	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124	VALUE VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660 THL 5witch TTL-Switch	THERE DISPLY BOAD 1:328-212-00	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2++04 DER (0) POS+NO+ DL2++05 DL2++06 DL2++06 DL2++06 DL2++07 DL2++09 DL2++10 S+++0+2 S+++0+3	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 55-03-0261 55-03-0261	VALUE VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660 TIL-Switch TIL-Switch TIL-Switch TIL-Switch	ATTEL DISPLY BOAD 1:328-212-00 SPECIFICATIONS / EDUTALENT 	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2++04 DER (0) POS+NO+ DL2++05 DL2++06 DL2++06 DL2++06 DL2++07 DL2++09 DL2++10 S+++0+2 S+++0+3	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 55-03-0261 55-03-0261	VALUE VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660 TIL-Switch TIL-Switch TIL-Switch TIL-Switch	ATTEL DISPLY BOAD 1:328-212-00 SPECIFICATIONS / EDUTALENT 	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2++04 DER (0) POS+NO+ DL2++05 DL2++06 DL2++06 DL2++06 DL2++07 DL2++09 DL2++10 S+++0+2 S+++0+3	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 55-03-0261 55-03-0261	VALUE VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660 TIL-Switch TIL-Switch TIL-Switch TIL-Switch	ATTEL DISPLY BOAD 1:328-212-00 SPECIFICATIONS / EDUTALENT 	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2++04 DER (0) POS+NO+ DL2++05 DL2++06 DL2++06 DL2++06 DL2++07 DL2++09 DL2++10 S+++0+2 S+++0+3	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 55-03-0261 55-03-0261	VALUE VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660 TIL-Switch TIL-Switch TIL-Switch TIL-Switch	ATTEL DISPLY BOAD 1:328-212-00 SPECIFICATIONS / EDUTALENT 	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2+-04 DER (0) POS-NO- DL205 DL205 DL206 DL207 DL207 DL203 Sc0-3 Sc0-3 Sc0-5 Sc0-5 Sc1-0 Sc2-6 Sc2-5 Sc2-5 Sc2-5 Sc2-5	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 55-03-0261 55-03-0261	VALUE VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660 TIL-Switch TIL-Switch TIL-Switch TIL-Switch	ATTEL DISPLY BOAD 1:328-212-00 SPECIFICATIONS / EDUTALENT 	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2+-04 DER (0) POS-NO- DL205 DL205 DL207 DL20	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 55-03-0261 55-03-0261	VALUE VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660 TIL-Switch TIL-Switch TIL-Switch TIL-Switch	ATTEL DISPLY BOAD 1:328-212-00 SPECIFICATIONS / EDUTALENT 	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2+-04 DER (0) POS-NO- DL205 DL205 DL207 DL20	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 55-03-0261 55-03-0261	VALUE VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660 TIL-Switch TIL-Switch TIL-Switch TIL-Switch	ATTEL DISPLY BOAD 1:328-212-00 SPECIFICATIONS / EDUTALENT 	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2+-04 DER (0) POS-NO- DL205 DL205 DL207 DL20	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 55-03-0261 55-03-0261	VALUE VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660 TIL-Switch TIL-Switch TIL-Switch TIL-Switch	ATTEL DISPLY BOAD 1:328-212-00 SPECIFICATIONS / EDUTALENT 	GI PAGE MANUF GI GI GI GI GI GI
IND.	DL2+-04 DER (0) POS-NO- DL205 DL205 DL207 DL20	PART NO. 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 73-01-0124 55-03-0261 55-03-0261	VALUE VALUE MAN 6660 MAN 6660 MAN 6660 MAN 6660 MAN 6660 TIL-Switch TIL-Switch TIL-Switch TIL-Switch	THERE DISPLY BOAD 1:328-212-00	GI PAGE MANUF GI GI GI GI GI GI

SAL=Solid Aluminium, PETP=Polyester

MANUFACTURERS: Gl-General Instruments, Sie-Siemens ORT6 #4/11/2# (01) #6/01/23 S T U D E R (01) #6/01/23 PB RENOTE CUNTROL 01SPLAr 00ARD 1.328+212+00 PAGE 2



REMOTE CONTROL CABINET (SERIAL) 1.328.210.00 REMOTE CONTROL MODULE (SERIAL) 1.328.220.00 -SHUTTLE PCB 1.328.214.00

REMOTE CONTROL CABINET (SERIAL) 1.328.210.00 REMOTE CONTROL MODULE (SERIAL) 1.328.220.00 -SHUTTLE PCB 1.328.214.00







SERIAL REMOTE SELECTOR 1.328.248.00

	QTY	ORDER NUMBER	PART NAME SPECIFICATION
	1	1.328.248.00	Serial remote selector
01	1	1.328.248.01	Frontpanel
02	4 8 4	1.010.110.27 23.01.1032 21.53.0354	Hex stud bolt Washer D 3,2/6 x0,5 Round head allen screw
03	5 5 5 5 1	55.15.0231 55.15.0201 55.15.0221 55.15.0228 1.328.358.04	Push buttom (pulse) Push buttom cover concave Filter screen white Push buttom housing Labels

SERIAL REMOTE SELECTOR -KEYBOARD 1.328.245.00



SERIAL REMOTE SELECTOR -KEYBOARD 1.328.245.00



SERIAL REMOTE SELECTOR -CONNECTORS PCB 1.328.246.00



SERIAL REMOTE SELECTOR -CONNECTORS PCB 1.328.246.00



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PARALLEL CHANNEL REMOTE CONTROL 1.328.267.00

DISPLAY BOARD 1.328.261.00



DISPLAY BOARD 1.328.261.00



KEYBOARD 1-3 1.328.262.00



KEYBOARD 1-3 1.328.262.00



CHANNEL REMOTE INTERFACE 1.328.264.00



CHANNEL REMOTE INTERFACE 1.328.264.00





CHANNEL REMOTE LOGIC BOARD 1.328.265.00

CHANNEL REMOTE LOGIC BOARD 1.328.265.00

