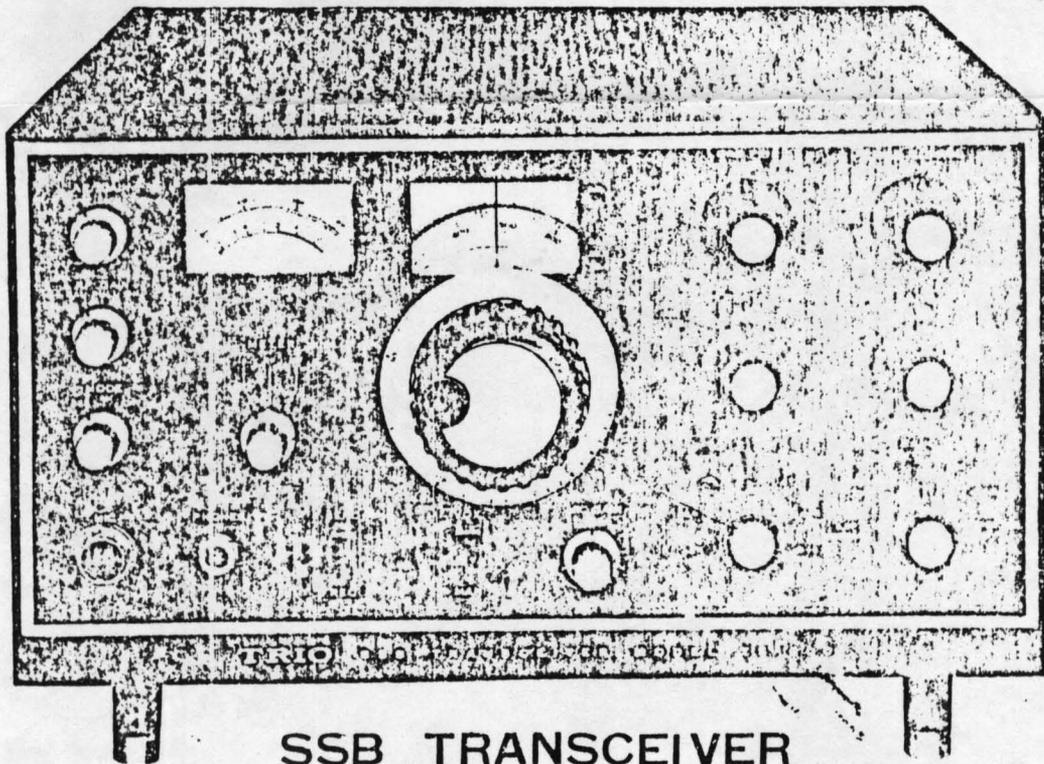


# TRIO

ESBREL  
RUA VITÓRIA N.º 391  
FONE: 221-0683  
SÃO PAULO - SP

ESBREL  
Av. Mal. Floriano, 147 8/Loja  
20060 - Rio de Janeiro, RJ  
Fone (021) 253-8005

MODEL **TS-500**  
(PS-500AC)



SSB TRANSCEIVER

5858-110

**PARTS DESCRIPTION LIST**

**VFC (UC01011) SECTION**

● CAPACITORS

Symbol No.	Description
C305	Mica 6600mmfd±5%
C306	Ceramic 560mmfd±5%
C307	Mica 33mmfd±5%
C308	Ceramic 0.002mfd±20%
C309	Ceramic 0.039mfd+100%, -0%
C310	Ceramic 0.01mfd±5%

● RESISTORS

Symbol No.	Description
R302	Composition 4.7Kohm±10% 1/4W
R303	Composition 15Kohm±10% 1/4W
R304	Composition 4.7Kohm±10% 1/4W
R305	Composition 1Kohm±10% 1/4W
R306	Composition 47Kohm±5% 1/4W
R307	Composition 4.7Kohm±5% 1/4W
R308	Composition 1Kohm±5% 1/4W
R309	Composition 4.7Kohm±5% 1/4W

● TRANSISTORS/DIODE

Symbol No.	Description
Q301	2SC185 VFO OSC
Q302	2SC185 Buffer
D302	SZ-200-18 Stabilizer

**MARKER OSC (UC01021) SECTION**

● CAPACITORS

Symbol No.	Description	Part No.
C401	Ceramic 0.01mfd+100%, -0%	
C402,3	Ceramic 0.04mfd+100%, -0%	
C404	Ceramic 10mmfd±0.5mmfd	
C405	Ceramic 50mmfd±10%	
TC401	Ceramic Trimmer 20mmfd	C4042

● RESISTORS

Symbol No.	Description
R401	Composition 10Kohm±10% 1/4W
R402	Composition 100Kohm±10% 1/4W

Symbol No. Description

R403	Composition	470ohm±10% 1/4W
R404	Composition	10Kohm±10% 1/4W
R405	Composition	68Kohm±10% 1/4W

● TRANSISTOR

Symbol No. Description

Q401	2SC185	Marker OSC
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● COIL

Symbol No. Description

CH401	Choke Coil	6.8mH
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**VFO VOX (UC02011) SECTION**

● CAPACITORS

Symbol No.	Description	Part No.
C501	Mica 30mmfd±5%	
C502	Ceramic 10mmfd±5%	
C503	Ceramic 50mmfd±5%	
C504	Mica 560mmfd±5%	
C505	Mica 3mmfd±5%	
C506	Ceramic 0.003mfd±20%	
CV501	OSC	D01-128
TC502	Frequency Adj.	D02-25B

● RESISTORS

Symbol No. Description

R501	Composition	470Kohm±10% 1/2W
R502	Composition	47Kohm±10% 1/2W

● DIODE

Symbol No. Description

D501	MA-332B	Variable Capacitor
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● COIL

Symbol No. Description Part No.

L501	OSC Coil	L11-62
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**PARTS DESCRIPTION LIST**

**ESBREL**

RUA VITÓRIA N.º 301

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SÃO PAULO - SP.

**MAIN CHASSIS (LA01) SECTION**

**● CAPACITORS**

Symbol No.	Description	
C1	Dip Mica	220mmfd±5%
C2	Mica	0.001mfd±10%
C3	Dip Mica	2mmfd±0.5mmfd
C4	Dip Mica	39mmfd±5%
C5	Dip Mica	2mmfd±0.5mmfd
C6	Ceramic	0.002mfd±20%
C7	Metalized Paper	0.1mfd±10%
C8,9	Ceramic	0.01mfd+100%, -0%
C10	Ceramic	10mmfd±1mmfd
C11~14	Ceramic	0.01mfd+100%, -0%
C15	Ceramic	50mmfd±10%
C16~19	Ceramic	0.01mfd+100%, -0%
C20	Ceramic	50mmfd±10%
C21	Ceramic	200mmfd±10%
C22	Mica	50mmfd±10%
C23~25	Ceramic	0.01mfd+100%, -0%
C26	Mica	250mmfd±10%
C27	Mica	100mmfd±10%
C28	Ceramic	50mmfd±10%
C29	Ceramic	200mmfd±10%
C30	Mica	100mmfd±10%
C31	Ceramic	10mmfd±1mmfd
C32	Ceramic	0.01mfd+100%, -0%
C33	Metalized Paper	0.1mfd±10%
C34~41	Ceramic	0.01mfd+100%, -0%
C42~45	Ceramic	500mmfd+100%, -0%
C46	Ceramic	100mmfd±10%
C47	Ceramic	47mmfd±10%
C48	Mica	0.001mfd±10%
C49~53	Ceramic	150mmfd±10%
C54,55	Mica	440mmfd±10%
C56,57	Ceramic	150mmfd±10%
C58	Mica	500mmfd±10%
C59	Ceramic	0.001mfd±20%
C60,61	Ceramic	0.01mfd+100%, -0%
C62	Ceramic	1mmfd±0.5mmfd
C63	Metalized Paper	0.05mfd±10%
C64	Ceramic	0.01mfd+100%, -0%
C65	Mica	440mmfd±10%
C66	Ceramic	20mmfd±10%
C67~69	Ceramic	0.01mfd+100%, -0%
C70	Electrolytic Tubular	3mfd 350WV
C71	Ceramic	1mmfd±0.5mmfd

Symbol No.	Description	
C72	Ceramic	10mmfd±10%
C73	Ceramic	0.01mfd+100%, -0%
C74	Ceramic	0.001mfd±20%
C75	Metalized Paper	0.2mfd±10%
C76	Ceramic	0.001mfd±20%
C77	Ceramic	0.01mfd+100%, -0%
C78	Electrolytic Tubular	3mfd 350WV
C79	Electrolytic Tubular	10mfd 10WV
C81	Ceramic	0.01mfd+100%, -0%
C82	Ceramic	200mmfd±10%
C83	Ceramic	0.01mfd+100%, -0%
C84	Ceramic	200mmfd±10%
C85	Electrolytic Tubular	3mfd 350WV
C86	Ceramic	200mmfd±10%
C87	Ceramic	1mmfd±0.5mmfd
C88	Ceramic	100mmfd±10%
C89	Ceramic	10mmfd±1mmfd
C90	Ceramic	0.01mfd+100%, -0%
C92	Ceramic	0.01mfd+100%, -0%
C93	Ceramic	100mmfd±10%
C94,95	Ceramic	0.01mfd+100%, -0%
C96	Ceramic	50mfd±10%
C97~99	Ceramic	0.01mfd+100%, -0%
C100	Ceramic	15mmfd±10%
C101	Ceramic	0.01mfd+100%, -0%
~103		
C104	Mica	500mmfd±10%
C105,	Metalized Paper	0.05mfd±10%
106		
C107,	Ceramic	0.01mfd+100%, -0%
108		
C109	Electrolytic Tubular	10mfd 10WV
C110	Ceramic	0.005mfd±20%
C111	Ceramic	0.01mfd+100%, -0%
C112	Electrolytic Tubular	10mfd 10WV
C113,	Ceramic	0.01mfd+100%, -0%
114		
C115	Metalized Paper	0.5mfd±10%
C116	Ceramic	0.01mfd+100%, -0%
C117	Electrolytic Tubular	10mfd 10WV
C118	Ceramic	100mmfd±10%
C119	Electrolytic Tubular	100mfd 25WV

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**PARTS DESCRIPTION LIST**

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Symbol No.	Description	
C120	Metalized Paper	0.05mfd±10%
C121-125	Ceramic	0.01mfd+100%, -0%
C126	Electrolytic Tubular	3mfd 350WV
C127	Ceramic	0.01mfd+100%, -0%
C128	Mica	0.001mfd±10%
C129	Ceramic	100mmfd±10%
C131	Ceramic	12mmfd±10%
C132	Metalized Paper	0.1mfd±10%
C133-135	Ceramic	0.01mfd+100%, -0%
C136	Ceramic	10mmfd±1mmfd
C137	Ceramic	0.01mfd+100%, -0%
C138	Ceramic	2mmfd±0.25mmfd
C139	Ceramic	3mmfd±0.25mmfd
C140-142	Ceramic	0.01mfd+100%, -0%
C143	Ceramic	0.003mfd±20%

● VARIABLE CAPACITORS

Symbol No.	Description	Part No.
CV1	DRIVE	D01-99
CV2	PLATE LR-20 200mmfd	D01-131
CV3	LOAD FINE LM-11 150mmfd	D02-150

● TRIMMERS

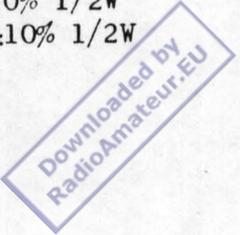
Symbol No.	Description	Part No.
TC1	NEUTRO	D02-07
TC2	CAR OSC Adj.	C09-40F
TC3	IF REJECTION Adj. 20mmfd	C4042

● RESISTORS

Symbol No.	Description	
R1	Composition	470ohm±10% 1/2W
R2	Composition	10Kohm±10% 1/2W
R3	Composition	68ohm±10% 1/2W
R4	Composition	2.2Kohm±10% 1/2W
R5,6	Composition	100Kohm±10% 1/2W
R7	Composition	330ohm±10% 1/2W
R8	Composition	3.3Kohm±10% 1/2W
R9	Composition	33Kohm±10% 1/2W
R10	Composition	1Kohm±10% 1/2W

Symbol No.	Description	
R11	Composition	22Kohm±10% 1/2W
R12	Composition	750ohm±5% 1/2W
R13	Composition	5.6Kohm±10% 1/2W
R14	Composition	1Kohm±10% 1/2W
R15	Composition	47ohm±10% 1/2W
R16	Composition	22Kohm±10% 1/2W
R17	Composition	150ohm±10% 1/2W
R18	Composition	5.6Kohm±10% 1/2W
R19,20	Composition	10 ohm±10% 1/2W
R21	Composition	10Kohm±10% 1/2W
R22	Composition	10 ohm±10% 1/2W
R23,24	Composition	470ohm±10% 1/2W
R25-27	Composition	10Kohm±10% 1/2W
R28,29	Composition	47Kohm±10% 1/2W
R30	Composition	1Kohm±10% 1/2W
R31	Composition	22Kohm±10% 1/2W
R32	Composition	47Kohm±10% 1/2W
R33	Composition	100Kohm±10% 1/2W
R34	Composition	47Kohm±10% 1/2W
R35	Composition	150Kohm±10% 1/2W
R36	Composition	100Kohm±10% 1/2W
R37	Composition	4.7Kohm±10% 1/2W
R38	Composition	150 ohm±10% 1/2W
R39	Composition	1Mohm±10% 1/2W
R40	Composition	22Kohm±10% 1/2W
R41	Composition	1Kohm±10% 1/2W
R42	Composition	10Kohm±10% 1/2W
R43	Composition	33Kohm±10% 1/2W
R45	Composition	47 ohm±10% 1/2W
R46,47	Composition	470Kohm±10% 1/2W
R48	Composition	47Kohm±10% 1/2W
R49	Composition	100Kohm±10% 1/2W
R50	Composition	10Kohm±10% 1/2W
R51	Composition	1Kohm±10% 1/2W
R52	Composition	10Kohm±10% 1/2W
R53,54	Composition	100Kohm±10% 1/2W
R55	Composition	4.7Kohm±10% 1/2W
R56	Composition	220Kohm±10% 1/2W
R57	Composition	1Kohm±10% 1/2W
R58	Composition	68 ohm±10% 1/2W
R59	Composition	100Kohm±10% 1/2W
R60	Composition	1.8Kohm±10% 1/2W
R61	Composition	100Kohm±10% 1/2W
R62	Composition	330 ohm±10% 1/2W
R63	Composition	1Mohm±10% 1/2W
R64	Composition	1Kohm±10% 1/2W
R65	Composition	68 ohm±10% 1/2W
R66	Composition	1Mohm±10% 1/2W
R68	Composition	47Kohm±10% 1/2W

**ESBREL**  
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# PARTS DESCRIPTION LIST

## ESBREL

RUA VITÓRIA N.º 307  
FONE: 221-0683  
SÃO PAULO - SP.

Symbol No.	Description	Part No.
R69	Composition 68 ohm±10% 1/2W	
R70	Composition 1Mohm±10% 1/2W	
R71	Composition 47Kohm±10% 1/2W	
R72	Composition 3.3Mohm±10% 1/2W	
R73	Composition 4.7Mohm±10% 1/2W	
R75	Composition 4.7Kohm±10% 1/2W	
R76	Composition 8.2Kohm±10% 1/2W	
R78	Composition 2.2kohm±10% 1/2W	
R80	Composition 100Kohm±10% 1/2W	
R81	Composition 22Kohm±10% 1/2W	
R82	Composition 3.3Mohm±10% 1/2W	
R83	Composition 100Kohm±10% 1/2W	
R84	Composition 3.3Mohm±10% 1/2W	
R86	Composition 100Kohm±10% 1/2W	
R87	Composition 1Kohm±10% 1/2W	
R88	Composition 470Kohm±10% 1/2W	
R89	Composition 100Kohm±10% 1/2W	
R90	Composition 330 ohm±10% 1/2W	
R91	Composition 100Kohm±10% 1/2W	
R92	Composition 1Kohm±10% 1/2W	
R93	Composition 220Kohm±10% 1/2W	
R94	Composition 47Kohm±10% 1/2W	
R95	Composition 100Kohm±10% 1/2W	
R96	Composition 10Kohm±10% 1/2W	
R97	Metalized Film 3.9Kohm±5% 6W	
R99	Composition 680Kohm±10% 1/2W	
R100	Composition 100Kohm±10% 1/2W	
R101	Composition 3.3Mohm±10% 1/2W	
R102	Resin Film 1.2Kohm±5% 8W	
R103	Composition 10 ohm±10% 1/2W	
R104	Composition 10Kohm±10% 1/2W	
R105	Composition 3.3Kohm±10% 1/2W	
R106	Composition 3.9Kohm±10% 1/2W	
R107,108	Composition 150 ohm±10% 1/2W	
R109	Composition 1Mohm±10% 1/2W	
R110	Composition 100 ohm±10% 1/2W	
R111	Composition 47 ohm±10% 1/2W	

### ● POTENTIOMETER

Symbol No.	Description	Part No.
VR1	BIAS 5K(B)	R01-0191
VR2	CAR LEVEL 500K(A)	R01-0192
VR3	CAR BALANCE 5K(B)	R01-0191
VR4	AF GAIN 500K(A)	R01-1124
VR5	RF GAIN 10K(C)	R01-1123
VR6	METER ZERO Adj. 1K(B)	R01-0198

Symbol No.	Description	Part No.
VR7	RF METER Adj. 1K(B)	R09-8005
VR8	RIT 50K(B)	R01-0172
VR9	ANTI-TRIP 500K(A)	R01-0192
VR10	VOX GAIN 500K(A)	R01-0192
VR11	AF GAIN 500K(A)	R01-0109
VR12	RELAY Adj. 1K(B)	R01-0198
VR13	RIT ZERO Adj. 50K(B)	R10-64
VR14	IIV METER Adj. 20K(B)	R10-75

### ● TRANSFORMERS

Symbol No.	Description	Part No.
T1	OUT PUT	T02-58
IFT1	9MHz IFT	L13-95
IFT2	3.39MHz Balanced Modulator IFT	L13-94
IFT3,4	Single Tuning IFT	L13-96

### ● COILS

Symbol No.	Description	Part No.
L1	OUT PUT Coil (A)	L18-29
L2	Drive 7MHz	L13-93
L3	Drive 3.5 MHz	L12-31
L4	Drive Coil 14MHz	L12-33
L5	Drive Coil 21MHz	L12-34
L6	Drive Coil 28MHz	L12-35
L7	RF Coil 3.5MHz	L12-31
L8	RF Coil 7MHz	L12-32
L9	RF Coil 14MHz	L12-33
L10	RF Coil 21MHz	L12-34
L11	RF Coil 28MHz	L12-35
L12	OSC Coil 28MHz	L11-61
L13	OSC Coil 7MHz	L11-59
L14	OSC Coil 14MHz	L11-60
L15	OSC Coil 28MHz	L11-61
L16	Filter Coil	L13-92
CH1	Choke Coil	L20-102G
CH2,3	Parastic Coil	L18-26
CH4	Choke Coil 22µH	
CH5	Parastic Coil	L18-31
CH6	Peaking Coil 10µH	
CH7	Choke Coil	L20-030
CH8	Choke Coil	L20-030

## ESBREL

Av. Mal. Fieriano, 143 S/Loja  
20060 - Rio de Janeiro, RJ  
Fone (021) 253-8005

S868-110

# PARTS DESCRIPTION LIST

## ESBREL

RUA VITÓRIA N.º 391  
 FONE: 221-0633  
 SÃO PAULO - SP.

● TUBES

Symbol No.	Description	
V1	6BA6	IF Amp.
V2	6BE6	TX 1st Mixer
V3a	1/2 6AW8A	TX 2nd Mixer
V3b	1/2 6AW8A	Local OSC
V4	5763	TX Driver
V5,6	S2001/6146B	Final
V7	7360	Balanced Mod.
V8	6BA6	Carrier OSC
V9	6AQ5	RX Power Amp.
V10a	1/2 6AQ8	RX AF Amp.
V10b	1/2 6AQ8	Product Det.
V11a	1/2 6BL8	IF Amp.
V11b	1/2 6BL8	RELAY Control
V12	6BE6	RX 2nd Mixer
V13	6AU6	RX 1st Mixer
V14	6BZ6	RX RF Amp.
V15a	1/2 6AQ8	VOX Amp.
V15b	1/2 6AQ8	VOX Amp.
V16a	1/2 12AX7	MIC Amp.
V16b	1/2 12AX7	MIC Amp.
V17	VR-150MT/OA2	Stabilizer

● DIODES

Symbol No.	Description	
D1,2	SM-150-01	ALC Rect.
D3	1N60	AM Det.
D4,5	0A95	AGC Det.
D6	SW-05S	Noise Killer
D7	1N60	Meter Diode
D8	SW-05S	Noise Killer
D9	1N60	RF Rect.
D10,11	SM-150-01	ANTI-TRIP Rect.
D12	SM-150-01	VOX Rect.
D13	SM-150-01	Over Current Protection Circuit
D14	SM-150-01	Relay Source Rect.
D15	1N60	AM Det.
D16	SZ-200-12	Voltage Stabilizer

● CRYSTALS

Symbol No.	Description	Part No.
XF1	3390.5 kHz	T13-69
XF2	3388.5 kHz	T13-67

Symbol No.	Description	Part No.
XF3	3392.0kHz	T13-70
XF4	3390.5kHz	T13-69
XF5	3388.5kHz	T13-67
X1	3390.0kHz	T13-68
X2	12.850MHz	T13-73
X3	16.350MHz	T13-74
X4	5.150MHz	T13-71
X5	12.150MHz	T13-72
X6	19.150MHz	T13-75
X7	19.650MHz	T13-76
X8	20.250MHz	T13-77

● MISCELLANEOUS

Symbol No.	Description	Part No.
-	Case	A01-LA01
-	Chassis	A03-LA01
-	Panel	A05-LA01
-	Sub Panel	A06-LA01
-	Dial Scale	A07-LA01
-	Shield Cover	A10-LA01
-	Shield Board (E)	A13-LA01
-	Shield Box (B)	A14-LA01
-	VR Installation	A43-38
-	P.L. Metal Fittings	A44-38
-	Spring	A62-12
-	Shield Board (A)	A90-LA01
-	Shield Board (B)	A91-LA01
-	Shield Board (C)	A92-LA01
-	Shield Box	A93-LA01
-	Ornament Board	A94-LA01
-	Alumi Shaft (A)	A95-LA01
-	Alumi Shaft (B) x 2	A96-LA01
-	Alumi Shaft (C)	A97-LA01
-	Shield Board (D)	A99-LA01
-	Meter Installation	A3908
-	Crystal Installation Board (A)	A4944
-	Crystal Installation Board (B)	A4945
-	7P Mold Socket x 8	E01-17J
-	9P Mold Socket x 7	E01-19J
-	US Socket x 3	E01-38A
-	P.L. Holder x 2	E03-02F
-	Lug	E04-100
-	Lug x 5	E04-101
-	Lug	E04-101B
-	Lug	E04-102
-	Lug	E04-201

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## PARTS DESCRIPTION LIST

Symbol No.	Description	Part No.	Symbol No.	Description	Part No.
-	Lug x 14	E04-202	-	Crystal Socket	E4058
-	Lug x 4	E04-303	-	HC-6/U x 13	
-	M Type Receptacle (Plug Socket)	E07-11M	S1	Rotary Y-5.10.7	S03-627
-	4P Plug Socket (Jack)	E07-14C	S3	Rotary Y-1.2.11 LOAD	S03-628
-	12P Square Shape Plug Socket (Jack) x 2	E07-212	S2	Rotary F-2.6.3 MODE	S07-113
-	6P Plug Socket	E07-360	-	Knob BAND	S14-332
-	M Type Receptacle (Plug)	E09-11K	-	Knob RIT PULL ON	S14-333
-	4P Plug Socket	E09-14C	-	PLATE, LOAD FINE, DRIVE, LOAD COARSE	
-	Plug x 2	E09-61B	-	Knob TUNING	S14-622
-	6P Plug Socket (Plug)	E09-360	-	Knob MODE, RF GAIN	S14-815
-	US Plug	E09-580	PL	Pilot Lamp x 2	S16-18
-	US Jack x 2	E16-09	-	Shaft Coupling	S4013
-	Clamp Pin x 3	E23-46	-	Main Dial Scale	S4097
-	Clamp pin x 2	E23-57	RL2	RELAY AR-43	S4093
-	Shield Case x 6	E24-01	RL1	RELAY MRP-400E-201	S4099
-	Shield Washer x 6	E24-02	S4	Tumbler WD2101	S4100
-	Shield Case x 4	E24-06		STAND BY	
-	Shield Washer x 4	E24-07	S5	Tumbler WD2101 VOX	S4100
-	Plate Cap x 2	E4044	M	S Meter 500 $\mu$ A	T11-71

ESBREL

RUA VITÓRIA N.º 391

FONE: 221-0683

SÃO PAULO - SP.

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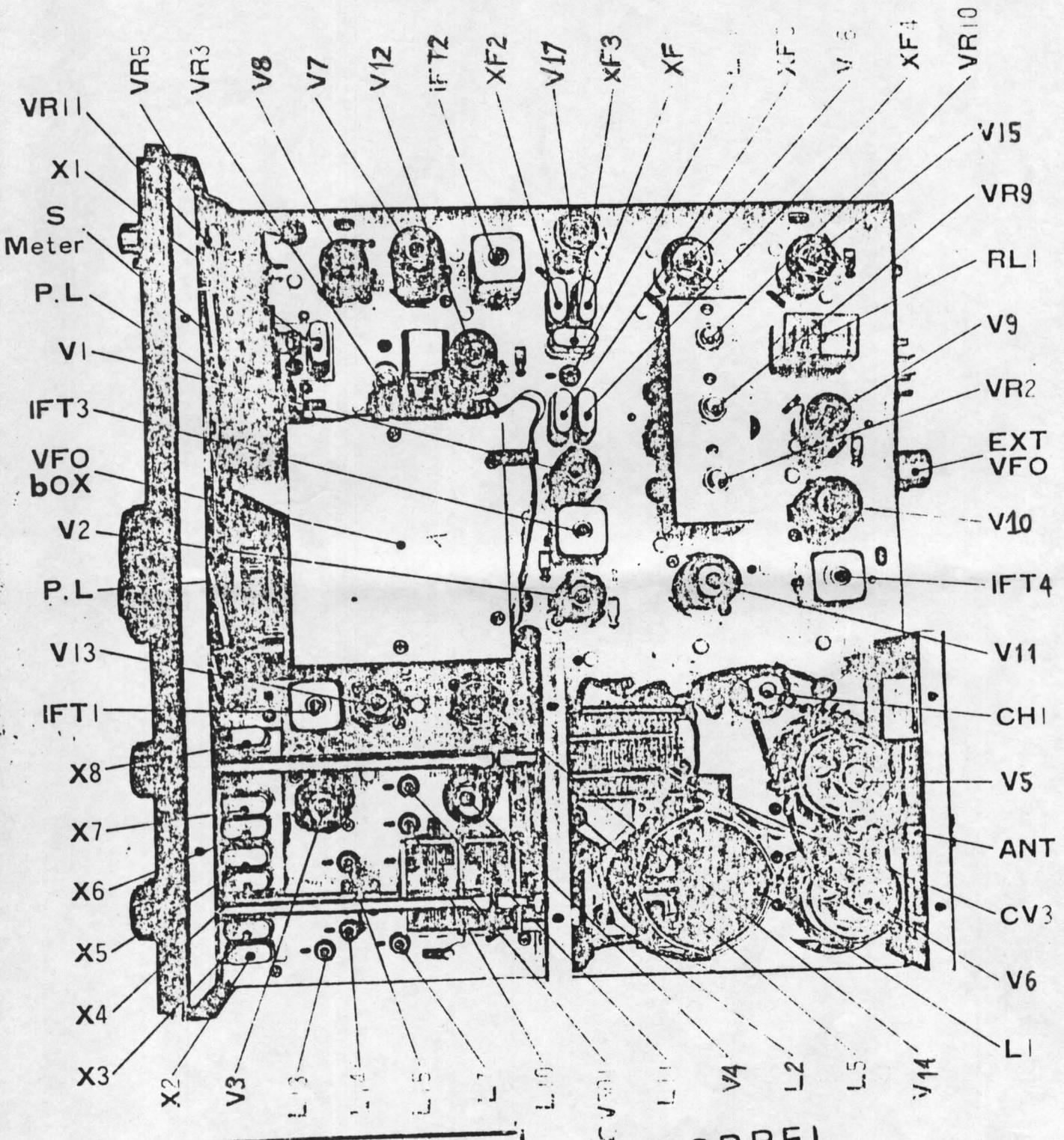
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S868-ALC

# CHASSIS TOP VIEW



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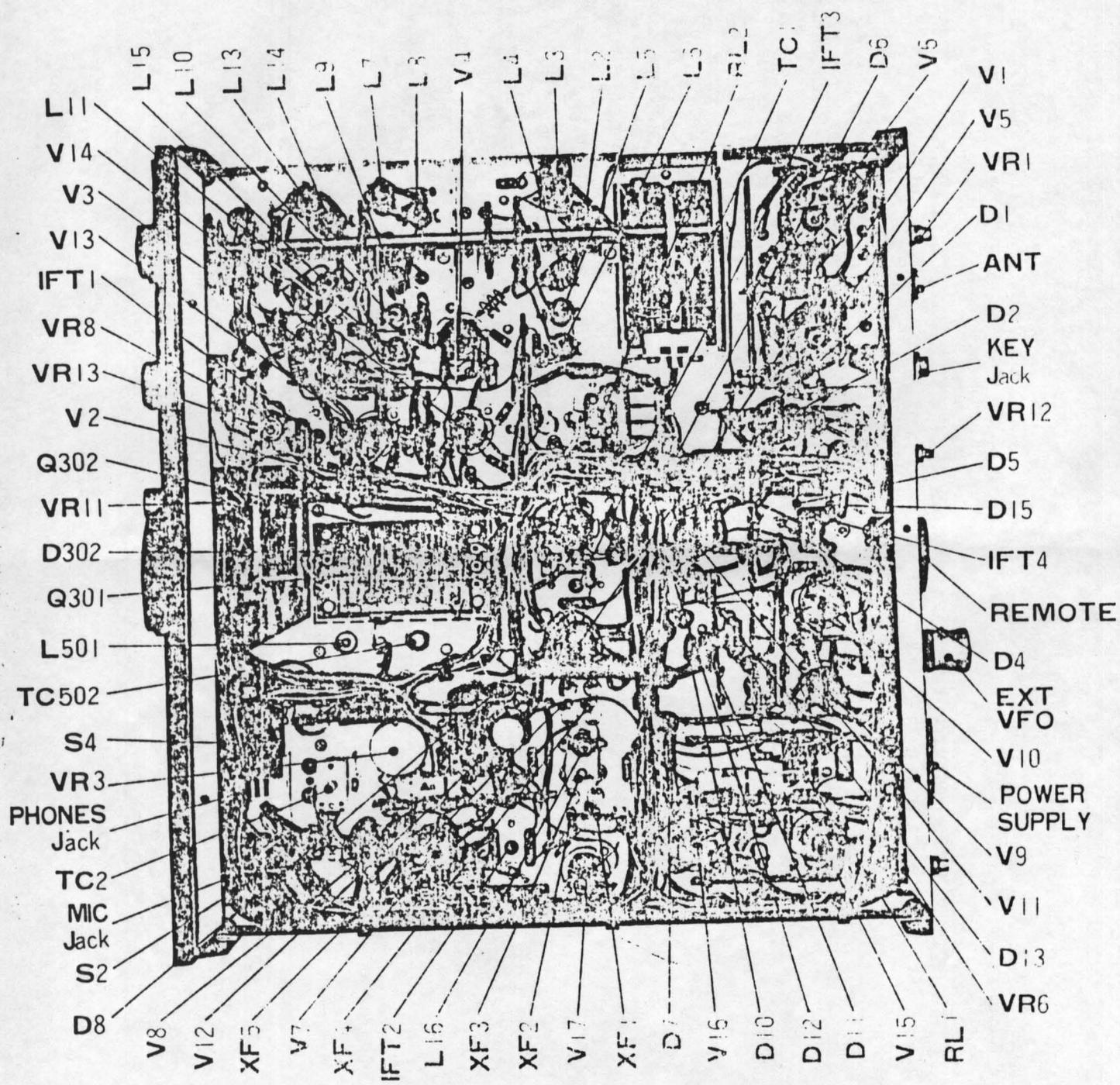
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# CHASSIS BOTTOM VIEW

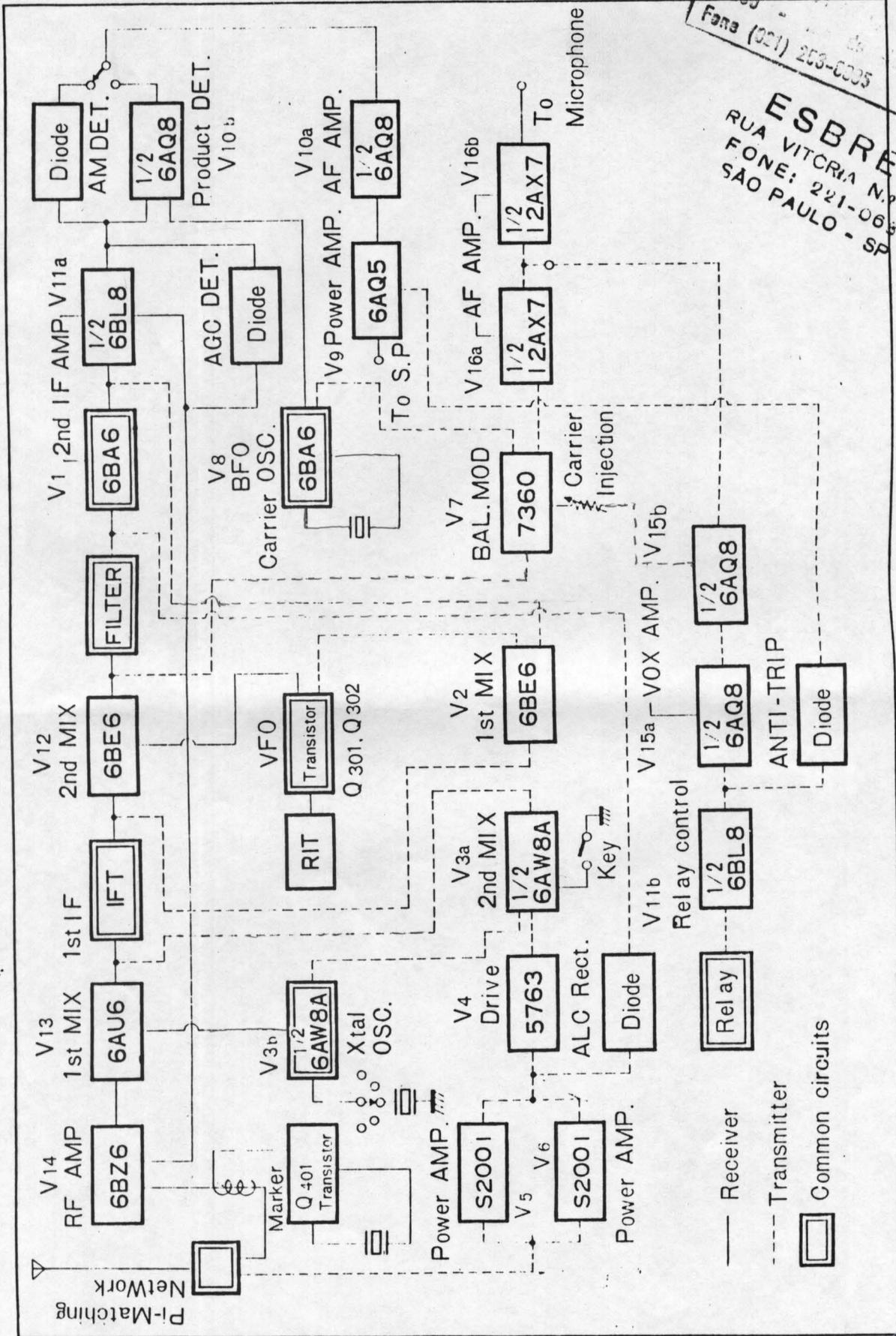
**ESBREL**  
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# BLOCK DIAGRAM



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## ALIGNMENT PROCEDURE

The method of aligning the TS-500's Receiver Section, Transmitter Section and Built-in Circuits is explained below. The STAND-BY switch should always be positioned at REC during receiver section alignment, and at SEND during transmitter section alignment.

### I. RECEIVER SECTION ALIGNMENT

#### 1. VFO FREQUENCY AND RIT ALIGNMENT

Test equipment required -- Frequency Counter, DC Voltmeter or VOM Tester

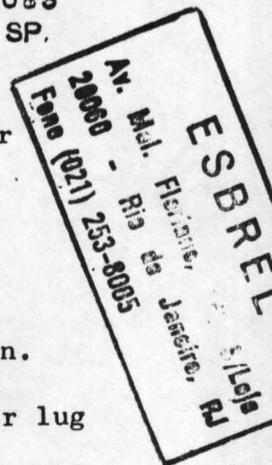
- Step 1. Turn Semi-variable Resistor VR13 to full right.
- Step 2. Set RIT knob on the front panel exactly at "0" position.
- Step 3. Connect the (-) probe of the DC voltmeter to the center lug of VR8, and the (+) probe to the junction of the 2.2 Kohm resistor R78 and D16.
- Step 4. Adjust VR13 to obtain "0" reading of the voltmeter. The lowest range of the voltmeter should be used to check this reading in the final adjustment.
- Step 5. Connect a Frequency Counter through a 10 PF condenser to the OUT terminal of Printed Board (UC01011).
- Step 6. Line up the black lettered "0" on the main dial flush with the red line. At the same time, set the flange (outside rim) reading of the main dial to "0".
- Step 7. Now adjust L501 so that the frequency of oscillation is 12.740 MHz.
- Step 8. Turn the main dial slowly, setting it at 500 (black letters) and the flange reading at 0.

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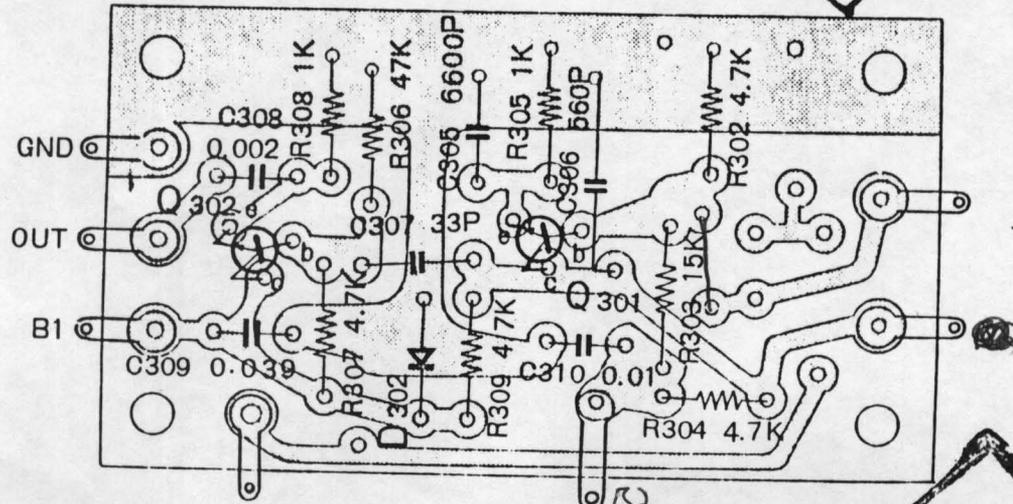


S868-110

# SEALED CIRCUIT ASSEMBLIES - PHANTOM VIEWS

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SÃO PAULO - SP.

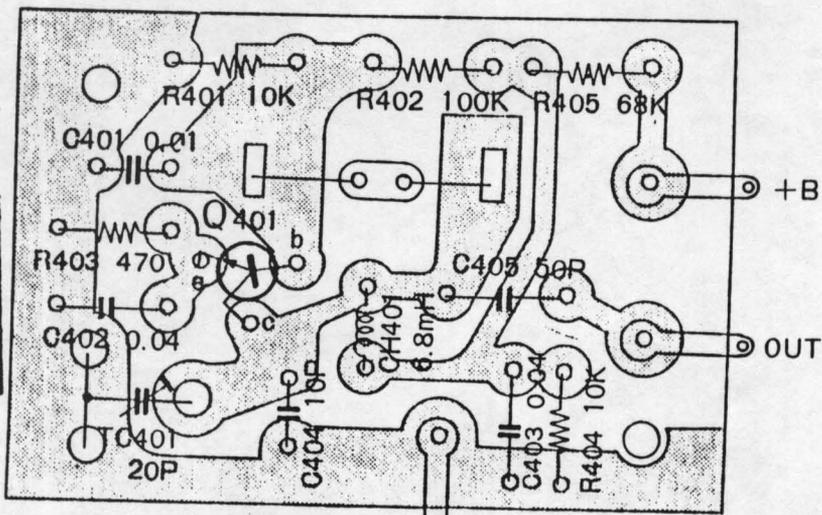
## (UC0101) Section



Q 301,302 2SC185      D 302 SM-200-18

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## (UC0102) Section



Q 401 2SC185

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## ALIGNMENT PROCEDURE

Step 9. Adjust TC-502 so that the oscillator frequency is 12.740 MHz.

Step 10. Repeat steps 6, 7, 8 and 9 several times so that frequency readings are accurate within 1 kHz.

## 2. CRYSTAL OSCILLATOR

Test equipment required -- RF Voltmeter (High Frequency VTVM)

- Step 1. Back off the cores of the oscillator coils L13, L14, L15 toward the collar side) of the bobbin.
- Step 2. After setting the RF voltmeter to about a 3 volt range, connect it from the oscillator coil to the yellow lead going to V13 6AU6. (junction of C99 0.01  $\mu$ F)
- Step 3. Set the Band Switch to the 21 MHz range. Turn the core of L13 slowly in a clockwise direction until the strongest oscillation voltage is obtained just prior to the point where oscillation ceases. Back off the core to the left so that the oscillation voltage decreases by about 0.1 volt.
- Step 4. Now set the Band Switch to the 14 MHz range. Adjust the core of L14 in the same manner as explained in step 3.
- Step 5. Set the Band Switch to the 28 MHz range. Adjust the core of L15 in the same manner as explained in step 3.
- Step 6. Rotate the Band Switch through all ranges from 3.5 to 29.1 MHz, and confirm that the circuit is oscillation on all bands.

## 3. RF AND IF AMPLIFIER ALIGNMENT

Test equipment required -- AM use SSG. Audio VTVM, 8 ohm dummy resistor.

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(021) 253-8005

# ALIGNMENT PROCEDURE

Set RF GAIN and AF GAIN to full right positions, and MODE Switch to AM. The AM-SSG should be adjusted to produce a 30% modulated 1,000 Hz sweep voltage.

- Step 1. Plug the 8 ohm Dummy Load in the Phones jack and connect the audio VTVM across the resistor.
- Step 2. Connect the AM-SSG output to the pink lead of V12 6BE6 and feed a signal with a frequency of about 3.4 MHz, and strength of 100, dB.
- Step 3. Vary the frequency of the SSG slightly, noting the maximum voltage output point with a VTVM.
- Step 4. Adjust cores IFT3, IFT4 for maximum deflection of the VTVM.
- Step 5. Vary the frequency of the SSG slightly again, and when the maximum output voltage point is determined, repeat step 4.
- Step 6. Now connect the output of the SSG to the Antenna terminal.
- Step 7. Set Band Switch to 3.5 MHz, and feed a 3.6 MHz (about 60 dB) signal from the SSG.
- Step 8. Tune in this signal at around the 3.6 MHz setting of the dial and adjust the upper and lower cores of IFT1 for maximum output. The SSG output should be attenuated in accordance with increasing resonance.
- Step 9. Adjust the DRIVE knob on the front panel to the position shown below. Tune the dial as follows on the respective bands shown below.

BAND SWITCH

3.5 MHz  
7.0 MHz

SSG FREQUENCY

3.5 MHz  
7.0 MHz

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# ALIGNMENT PROCEDURE

14.0 MHz	14.0 MHz
21.0 MHz	21.0 MHz
28.5 MHz	28.8 MHz

Step 10. Adjust the cores of the coils for the respective bands shown below for maximum output as in step 9.

BAND	COIL
3.5 MHz	L7
7.0 MHz	L8
14.0 MHz	L9
21.0 MHz	L10
28.5 MHz	L11

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## 4. S METER ALIGNMENT

- Step 1. Set MODE Switch to AM position.
- Step 2. Under no signal conditions, adjust "S" METER ADJ (VR6) for zero reading of the S Meter. Keep RF GAIN turned to full right during this adjustment.

## II. ALIGNMENT OF BUILT-IN CIRCUITS

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### 1. VOX AND STAND BY ALIGNMENT

- Step 1. Set STANDBY Switch to REC position.
- Step 2. Turn VOX GAIN (VR10), located on the chassis topside, to full clockwise position.
- Step 3. Turn RELAY ADJ (VR12) to the left until the relay is energized.
- Step 4. Now turn VR12 slowly to the right until the relay is again de-energized. This point is the correct adjustment for VR12.
- Step 5. Back off VOX GAIN a quarter of a turn to the left and leave it at this point. This will be the correct adjustment for VOX GAIN.

3858-110

# ALIGNMENT PROCEDURE

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28000 - ... sic, RJ  
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### III. TRANSMITTER SECTION ALIGNMENT

#### 1. TRANSMITTER BIAS

- Step 1. Connect one end of a 0.01  $\mu$ F condenser to the junction of the 100 pF condenser C30 and the 10 ohm resistors R19, and R20 in the grid circuits of S2001 V5, and V6. Connect the other end of the above condenser to ground. (chassis)
- Step 2. Set Meter Switch to Ip position.
- Step 3. Set STAND BY Switch to SEND.
- Step 4. Turn BIAS (VR1) to the right until Ip reads 60 mA, completing this alignment.
- Step 5. Return STAND BY to REC position, and remove the 0.01  $\mu$ F condenser inserted in Step 1.

#### 2. DRIVE COIL ALIGNMENT

Required test equipment -- Power Meter (100~200W) or a 100 watt electric lamp.

- Step 1. Connect the Power Meter or the electric lamp to the antenna terminal.
- Step 2. Switch MODE control to CW.
- Step 3. Set METER to Ip position.
- Step 4. Set DRIVE knob as shown below and tune the various bands as follows.

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BAND SWITCH	DIAL FREQUENCY
3.5 MHz	3.500 MHz
7.0 MHz	7.000 MHz
14 MHz	14.000 MHz
21 MHz	21.000 MHz
28.5 MHz	28.800 MHz

2868-1110

## ALIGNMENT PROCEDURE

Step 5. Set STAND BY to SEND position and turn PLATE knob so that a dip indication is obtained on the Ip meter.

Step 6. While repeating step 4, now adjust the following drive coil cores on the respective bands for maximum Ip indication.

L3 for max. Ip.  
L2  
L4  
L5  
L6

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RUA VITORIA N.º 391  
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Step 7. Return STAND BY switch to REC position.

Caution: After step 5 when STAND BY is switched to SEND, adjustments should be made quickly in order to prevent damage to the power transistors. Never leave this switch at SEND for more than a 10 second continuous interval during this adjustment. If more time is required, flip switch back once to REC, and then to SEND before continuing alignment.

### 3. BALANCE MODULATOR AND RF METER

Required test equipment -- Power Meter (100 ~ 200W) or 100 Watt electric lamp.

Step 1. Set Band Switch to the 14 MHz range and the main dial to 14.300 MHz.

Step 2. Switch MODE to CW.

Step 3. Set METER to Ip position.

Step 4. Now set STAND BY to SEND and adjust DRIVE, PLATE, LOAD COARSE, and LOAD FINE knobs for maximum power output.

Step 5. Make a note of the Ip swing level at the maximum power output point.

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# ALIGNMENT PROCEDURE

- Step 6. Now set METER to RF position and adjust RF METER ADJ (VR7) so that an Ip 200 reading is obtained.
- Step 7. Set MODE to SSB.
- Step 8. Adjust CAR. BALANCE (VR3) for zero indication of the RF meter.
- Step 9. Set MODE to AM, and METER to Ip positions.
- Step 10. Now adjust CAR. LEVEL (VR2) so that Ip deflection is about one half of the level observed in step 5.

This completes the adjustments for the Balanced Modulator and the RF Meter.

## 4. FREQUENCY CHARACTERISTIC

Test equipment required -- Power Meter (100 ~ 200W)

### Audio Oscillator

- Step 1. Set Band Switch to the 14 MHz range and the main dial to 14.3 MHz.
- Step 2. Switch MODE to CW position and connect the Power Meter to the antenna terminal.
- Step 3. Set STAND BY to SEND position, and tune for maximum RF Power output.
- Step 4. Switch MODE to SSB.
- Step 5. Feed 1,500 Hz, 5 mV signal from the Audio Oscillator to the MIC terminal.
- Step 6. Adjust MIC GAIN (VR11) to the point just prior to the RF Power output saturation level.

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Fone (021) 253-8905

3862-1110

## ALIGNMENT PROCEDURE

Step 7. Vary the output frequency of the Audio Oscillator from 500 Hz to 2500 Hz, and adjust the Carrier Frequency Control Trimmer TC2 to keep power output level variations within 3 dB throughout the above audio oscillator frequency range.

(Note: After step 3, adjustments should be made quickly. Never permit STANDBY to be in SEND position continuously during these adjustments for more than a 10 second interval. Switch it back once to REC, and then back to SEND before continuing alignment, if more time is necessary.)

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5868-110

# PARTS DESCRIPTION LIST & SPECIFICATION

(PS-500AC)

**ESBREL**  
RUA VITORIA N.º 391  
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● CAPACITORS

Symbol No.	Description	
C1	Oil Tubular	0.01mfd±20%
C2~7	Ceramic	0.01mfd+100%, -0%
C8~11	Electrolytic Block	40mfd x 4 350WV
C12a~c	Electrolytic Block	40mfd x 3 500WV
C13	Ceramic	0.01mfd+100%, -0%
C14,15	Electrolytic Tubular	40mfd 250WV

● RESISTORS

Symbol No.	Description	
R1~6	Composition	470Kohm±10% 1/2W
R7~10	Composition	100Kohm±10% 1/2W
R12,13	Resin Film	1.5Kohm±5% 8W
R14,15	Resin Film	2.2Kohm±5% 8W
R16,17	Resin Film	1.5Kohm±5% 8W
R18	Composition	1Kohm±10% 1/2W
R19	Composition	100Kohm±10% 1/2W
R20~23	Resin Film	3.3Kohm±5% 8W
R24	Resin Film	1.5Kohm±5% 8W

● DIODES

Symbol No.	Description
D1~6	FR-1K Rect.
D7	FR-1M Rect.

● MISCELLANEOUS

Symbol No.	Description	Part No.
-	Case	A01-MA31
-	Chassis	A03-MA31
-	Panel	A05-MA31
-	Shield Cover	A10-MA31
-	Neon Lamp	E03-16
-	Square shape plug socket (Jack)	E07-212
-	Square shape plug socket (Plug)	E09-2ZB
-	Lug x 4	E04-101
-	Lug x 4	E04-202
-	Fuse Holder	S15-03B
F	Fuse x 2	S17-07
P.T	Power Transformer	T01-185
Sp	Speaker	T12-16D

SPECIFICATION

(POWER TRANSFORMER) PRIMARY 230V 50/60 Hz  
SECONDARY (with CW output of TS-500 at 100 Watts)

Terminal	Voltage	Current	Allowable Voltage Values
900V	890V	206 mA	±6%
300V	287V	53.5mA	±8%
200V	225V	74.0mA	±8%
150V	142V	44.5mA	±8%
-120V	-116V	5.5mA	±8%
12.6V	12.6V	3A	±6%
12.6V	12.6V	1A	±6%

Power Consumption Maximum 435W

(SPEAKER)

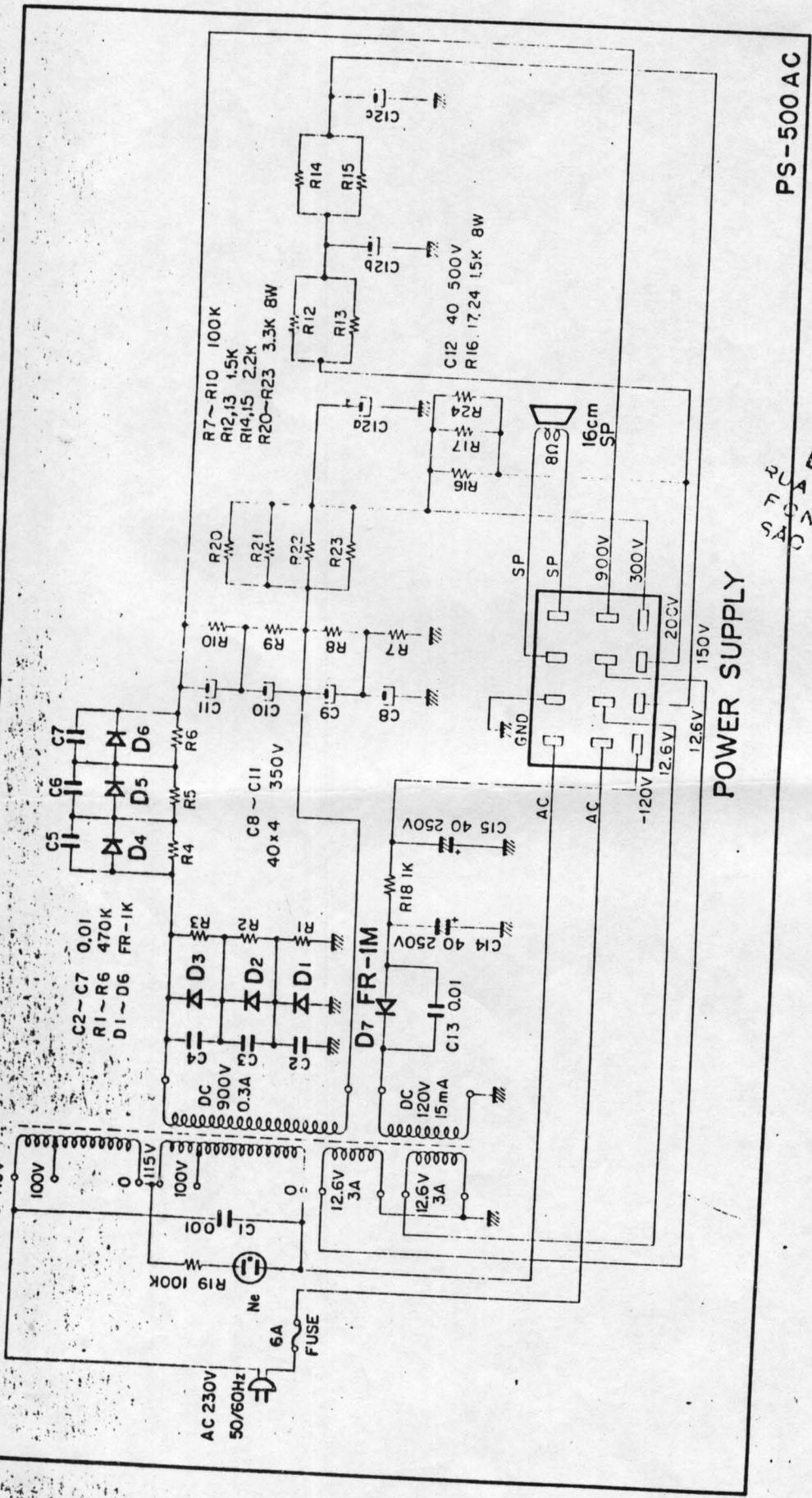
DIAMETER 16cm  
FREQUENCY 150 - 5,000Hz  
MAXIMUM POWER INPUT 1.5W  
DIMENSION W: 200 H: 220 D: 300 (mm)  
WEIGHT 24.2 Lbs

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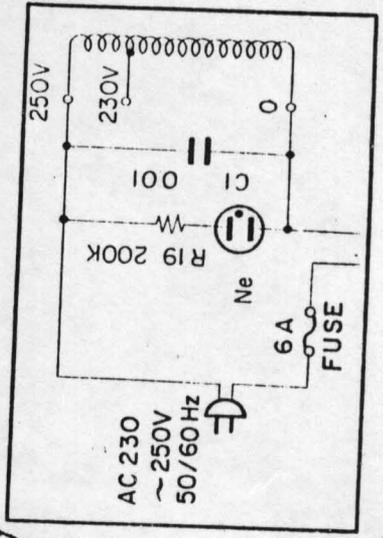
# SCHEMATIC DIAGRAM

(PS-500AC)



PS-500 AC

POWER SUPPLY



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(Note)

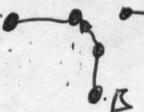
Sets sold in Australia are changed at right.

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CAVE CONJUGADA

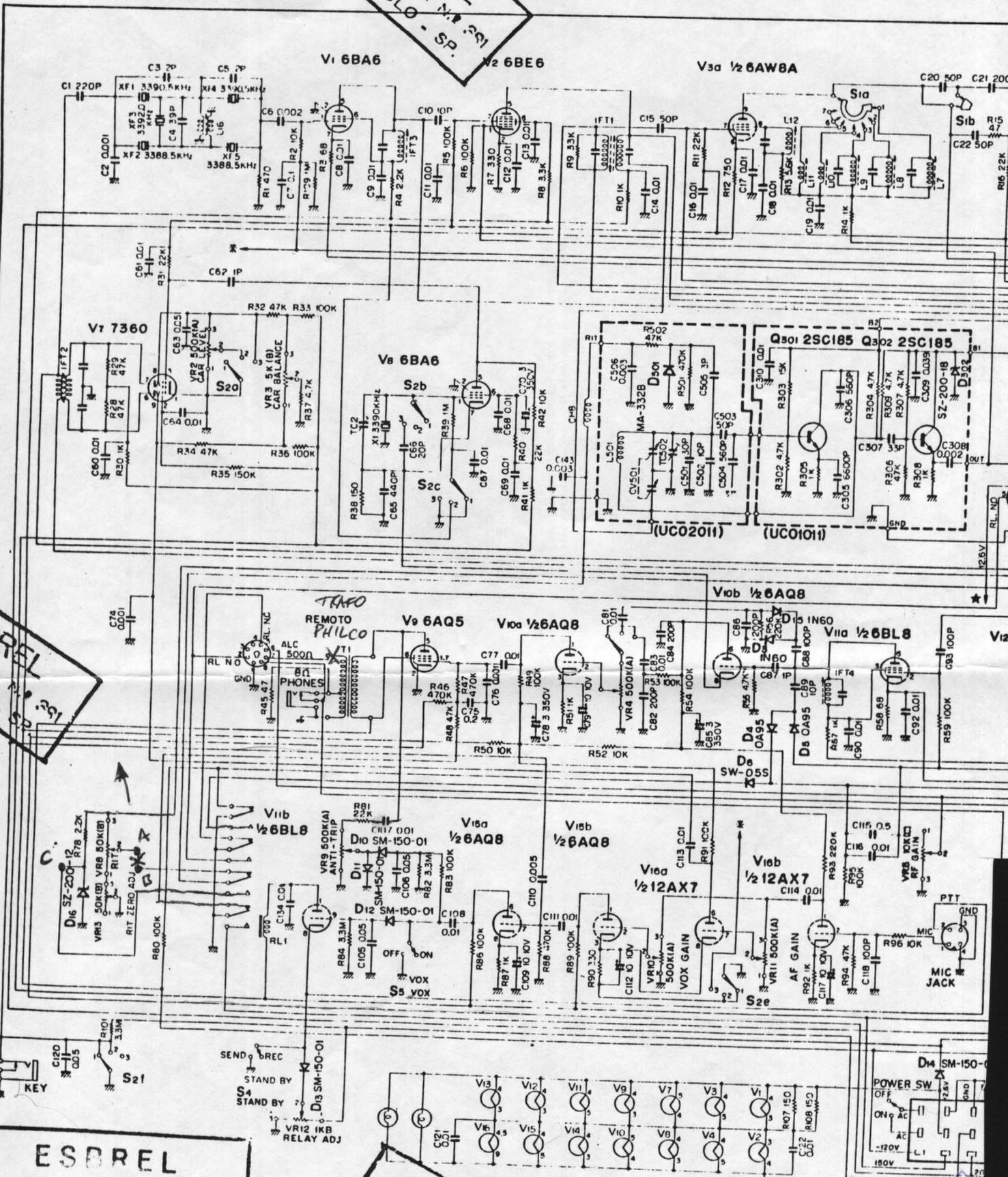
AO MIC GAIN



# SCHEMATIC DIAG

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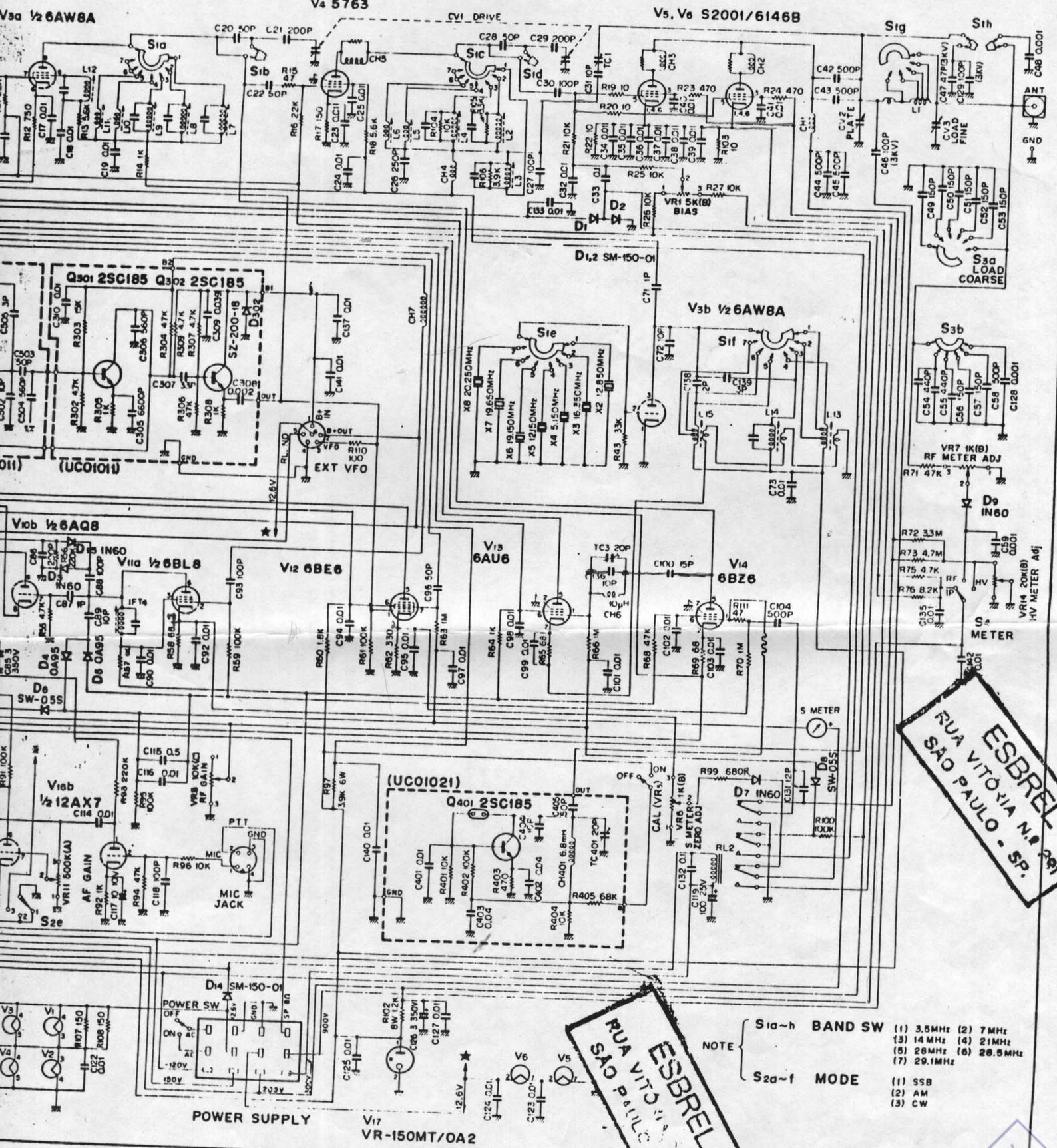


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# CHEMATIC DIAGRAM



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TS-500

- NOTE
- S1a-h BAND SW (1) 3.5MHz (2) 7MHz (3) 14MHz (4) 21MHz (5) 28MHz (6) 28.5MHz (7) 29.1MHz
  - S2a-f MODE (1) SSB (2) AM (3) CW