

HF TRANSCEIVER  
**TS-570D**

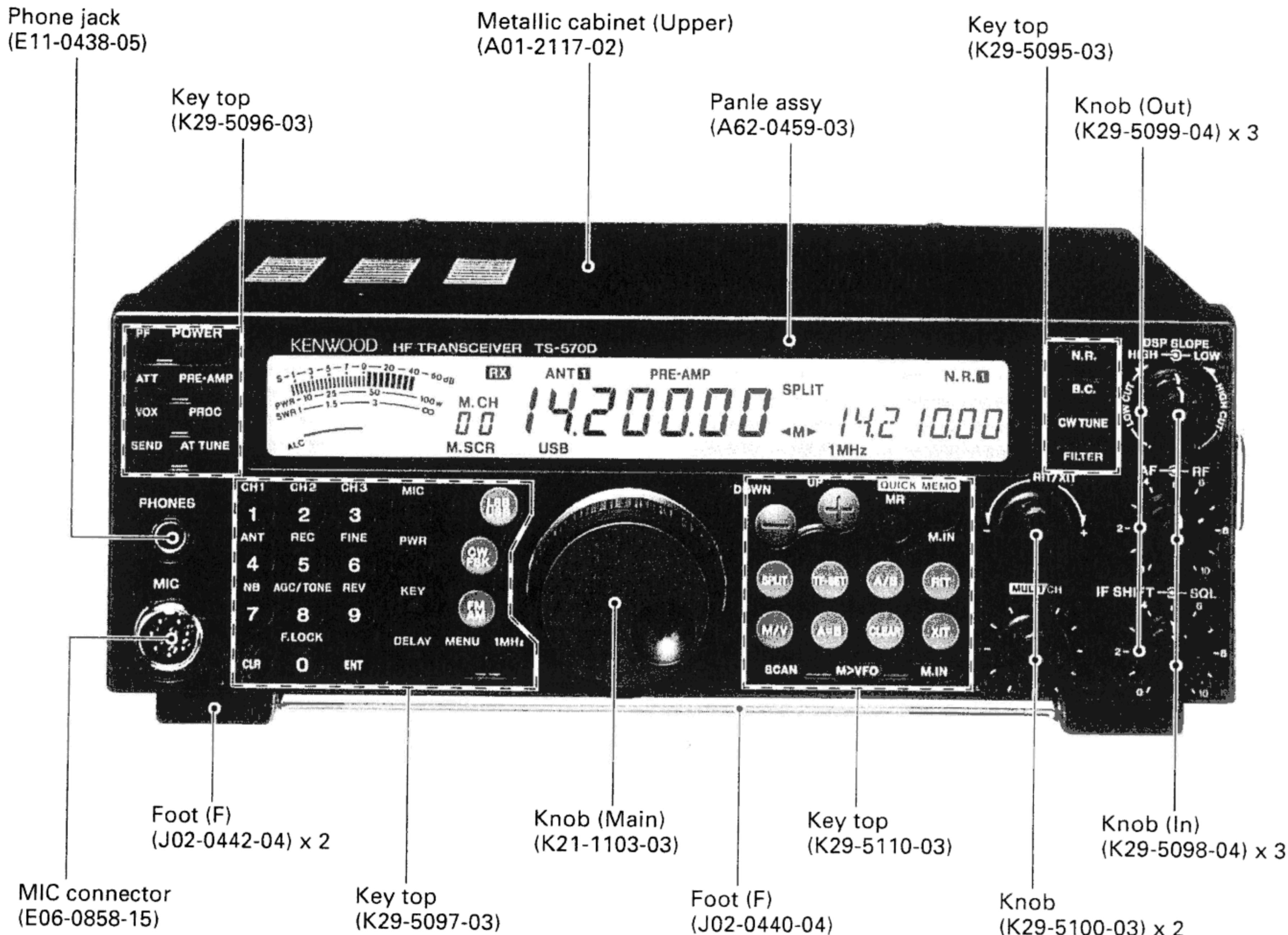
**SERVICE MANUAL**

**KENWOOD**



**KENW-04708**

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# TS-570D

## CIRCUIT DESCRIPTION

### Frequency Configuration

The TS-570D utilizes double conversion in all transmit modes and non-FM receive modes, and triple conversion in FM mode.

When the receiver frequency  $f_{IN}$  from the antenna in SSB mode is zero beat (i.e., at zero to the SSB signal with a carrier point of  $f_{IN}$ ), the relationship between these signals is expressed as follows:

$$f_{IN} = f_{LO1} - f_{LO2} - f_{CAR}$$

All the frequencies are generated by the PLL circuit as shown in the PLL block diagram in Figure 2, and the receiver frequency is determined by the reference frequency  $f_{STD}$ , the PLL divide ratio and DDS data. Therefore, the reference frequency accuracy equals the operating frequency accuracy.

The accuracy of the reference crystal oscillator in the TS-570D is 10 ppm ( $-10$  to  $+50^{\circ}\text{C}$ ). If an optional temperature compensated crystal oscillator (TCXO) SO-2 is installed, the accuracy becomes 0.5 ppm ( $-10$  to  $+50^{\circ}\text{C}$ ).

When the transmitter is used in SSB mode or in other modes, likewise, the frequency is determined by the reference frequency  $f_{STD}$  and PLL divide ratio. The display frequencies in the modes are listed in Table 1.

In FSK mode, the TS-570D displays the mark transmitter frequency.

In CW mode, the TS-570D uses the variable CW pitch system so that the receiving pitch can be changed in the range 400 to 1000Hz in 50Hz steps while the desired signal remains in the center of the IF filter band. Since the receiving pitch varies with the side tone, it is possible to zero in by receiving the desired signal at the same pitch as the side tone.

FM transmission is carried out by sending the audio signal from the microphone to the 64.22MHz VCO and modulating  $f_{LO2}$ .

Mode	Display frequency
USB, LSB	Carrier point frequency
CW	Transmission carrier frequency
FSK	Mark transmitter frequency
AM, FM	IF filter center frequency

Table 1 Display frequency in each mode

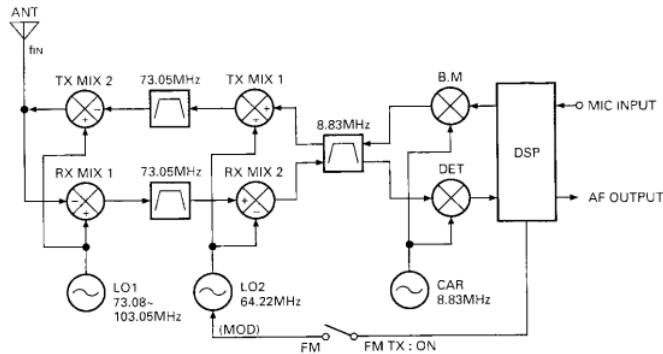


Fig. 1 Frequency configuration

## CIRCUIT DESCRIPTION

### PLL Circuit

The TS-570D PLL circuit consists of a PLL loop that includes a DDS that covers a frequency range 30kHz to 30MHz in 10Hz or 1Hz steps according to the 20MHz reference frequency, a DDS circuit that generates CAR and a PLL loop that produces LO2.

The divide ratio data to each PLL loop and DDS data are controlled by a microprocessor. Each loop is controlled by a single crystal frequency control system based on the reference frequency f<sub>STB</sub>. (See the PLL block diagram in Figure 2.)

### ■ Reference Signal Generation Circuit

The reference frequency f<sub>STB</sub> used for frequency control is produced by the 20MHz crystal oscillator 'X500 and Q500: 2SC2714(Y). It is used as the reference signal f<sub>REF</sub> for the PLL IC and DDS1 in the PLL unit.

The 10MHz signal divided by 2 by DDS1 goes to DDS2 in the LO1 generator. The signal also goes to the CAR generator to produce a 8.83MHz signal.

The crystal oscillator can be replaced by an optional TCXO (SO-2). It is switched to the TCXO by cutting lead resistors R503 and R504.

### ■ LO2

Q509: 2SK1975(V) in VCO2 generates 64.22MHz. The 20MHz reference frequency f<sub>REF</sub> is supplied to pin 15 of IC500: MB86001PF, and is divided by 1000 (4000 in FM mode) to produce a 20kHz (5kHz in FM mode) comparison frequency.

The VCO2 output is applied to pin 6 of IC500: MB86001PF and divided by 3211 (12844 in FM mode). The signal is compared with the 20kHz (5kHz in FM mode) signal with the phase comparator. The VCO2 frequency is locked. The divide ratio is transmitted from the control unit.

The output from the PLL passes through buffer Q510, amplified by amplifier Q511, Q546, and passes through a low-pass filter. The impedance is converted and the resulting signal is output to the RF unit as LO2.

### ■ LO1

Three VCOs Q528, Q530, Q532: 2SK1875(V)x3 generate 73.08MHz to 103.05MHz. The 20MHz reference frequency is applied to pin 15 of PLL IC IC507: MB86001PF, and divided by 40 to produce a 500kHz comparison frequency.

The output passes through the Q535 buffer. One output is amplified by amplifier Q534: 2SC2714(Y) and band-pass filter and goes to the RF unit. The other output passes through buffer Q533: 2SC2714(Y) and goes to pin 5 of mixer IC506: SN76514. A signal of 65.54 to 66.04 MHz is input to pin 11 of IC506 to produce a signal of 7.5 to 37MHz. The signal is output from pin 13, passes through a low-pass filter, a high-pass filter, buffer Q523, and amplifier Q522 and goes to pin 6 of IC507.

This signal is divided by N, and compared with the 500kHz signal with the phase comparator. The mixer output frequency is locked in 500kHz steps. The divide ratio N is transmitted from the control unit as data (N: 15 to 75) corresponding to 0 to 30MHz in 500kHz steps. One of three VCOs is selected by the serial/parallel IC IC14: NJU3718G in the TX-RX unit according to the VCO change signals (VCO1A, VCO1B, and VCO1C).

DDS2 (IC502: F71022) generates a 540 to 1040kHz digital signal. It is converted to an analog signal by a digital-to-analog converter consisting of CP502, CP503, and Q518, passes through a low-pass filter, and goes to pin 6 of IC504: UPC1037GR. The 5MHz signal produced by dividing the 10MHz reference frequency for the DDS2 by 2 goes to pin 8 of the mixer, and a 5.54 and 6.04MHz signal is output from pin 2. The output signal passes through a band-pass filter and buffer Q519, and input to pin 8 of mixer IC506: UPC1686G. It is mixed with the 60MHz signal obtained by tripling 20MHz reference frequency f<sub>REF</sub> by multiplying circuit Q521 to produce a 64.54- to 66.04MHz signal. This signal passes through a band-pass filter, and goes to pin 11 of mixer IC506.

DDS2 sweeps the 540 to 1040kHz digital signal in 10 or 1Hz steps. LO1 covers 73.08 to 103.05MHz in 10 or 1Hz steps and is output as LO1 to the RF unit.

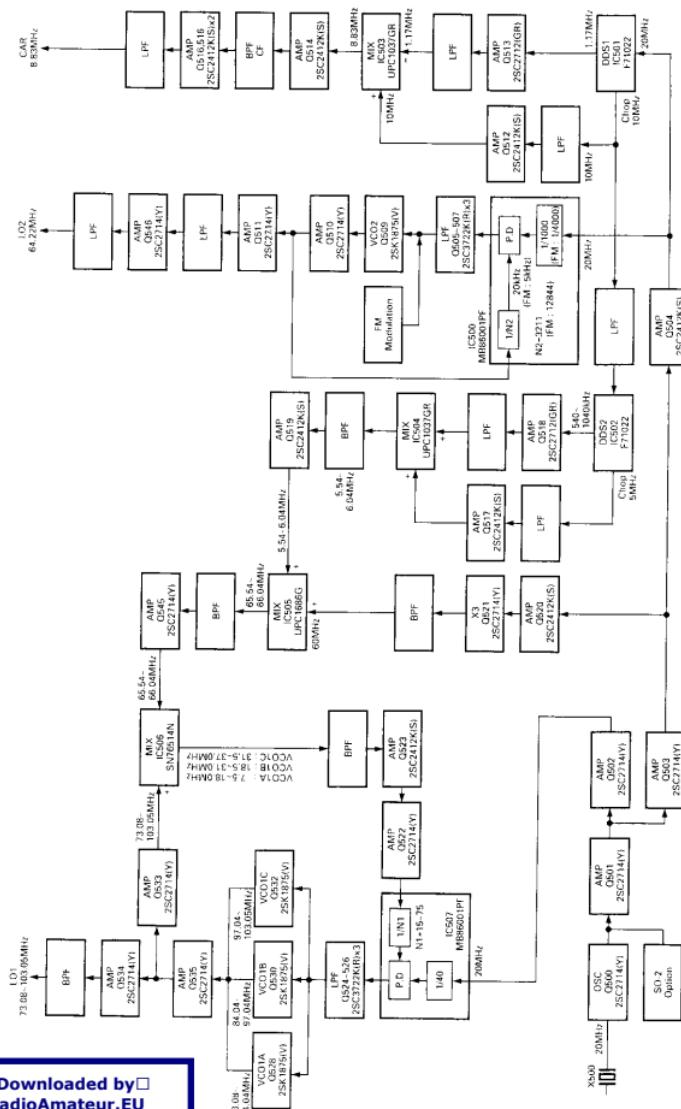
### ■ CAR

To generate the 8.83MHz signal used for local oscillation and detection, DDS1 (IC501: F71022) generates a digital signal with the 1.17MHz basic frequency. It is converted to an analog signal by a digital-to-analog converter consisting of CP500, CP501, and Q513. The signal passes through a low-pass filter and goes to pin 6 of mixer IC503: UPC1037GR. The 10MHz chopper output from DDS1 is input to pin 8 of the mixer and the 8.83MHz signal is output from pin 3.

The output signal passes through buffer Q514. Unwanted components are removed by a ceramic filter consisting of CF500 and CF501. The resulting signal passes through amplifier Q515, buffer Q516, and a low-pass filter, and is output to the RF unit as the CAR signal.

TS-570D

## CIRCUIT DESCRIPTION



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Fig. 2 PLL block diagram

## CIRCUIT DESCRIPTION

### ■ DDS Circuit Configuration

The DDS IC has been developed with standard cells to implement a high-speed operation circuit and large-capacity ROM at a low cost.

### 1) IC configuration

The IC consists of the following components:

Two 28 bit registers for setting frequency data, one 28 bit frequency shift register for addition to the frequency register, a 23 bit parallel signal input section for frequency modulation with a parallel signal, and a data entry and selection section.

Frequency modulation section comprised of a 28 bit adder that adds frequency data and frequency modulation data.

Phase data operation section that adds data from the frequency modulation section with the 28 bit phase data register.

SIN-ROM that converts phase data to sine data.

### 2) Frequency/shift data setting

Using serial signals synchronized with clock pulses, a total of 30 bits (2 bits that specify the destination to which data are set and 28 bits for frequency data) are set in three internal registers.

### 3) Frequency register selection

The data set in the two frequency registers are selected by the SLAB input of the DDS IC. This pin handles the TXC signal. This function eliminates the need for the TS-570D microprocessor to set frequency data for each transmission and reception.

### 4) Frequency data selection

The SPSL input of the DDS IC selects whether to use the data in the internal frequency shift register or the data from parallel input as frequency modulation data.

### 5) Frequency modulation

The MDEN input of the DDS IC enables or disables frequency modulation. When frequency modulation is enabled, frequency data is added, and the result is input to the phase data operation section.

### 6) Phase data operation

The target frequency phase data is output by accumulating 28 bit frequency data in the 28 bit phase accumulator.

$$F_{out} = F_s / 2^{28} \cdot D_{sum}$$

$F_s$  : DDS IC input frequency/2

$D_{sum}$  : Frequency data+Frequency modulation data

If  $2^{28}$  is set for  $D_{sum}$  when  $1/8 F_s$  is output, the phase data must be increased by  $\pi/8$ .

A 28 bit absolute value operation has been used here, but a 28 bit signed operation can also be used, assuming that the MSB is a sign. If complement data of 8000000 to FFFFFFFF (hex) is set, the phase moves in the negative direction for the positive data.

### 7) SIN-ROM

Phase data from the phase data operation section is converted to sine data of 0000 to FFFF (hex) in the 16 bit offset binary format.

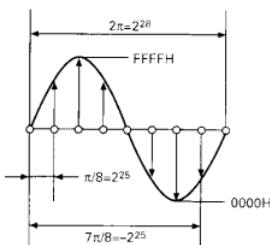


Fig. 3

# TS-570D

## CIRCUIT DESCRIPTION

### ■ Local Signals (LO1 and CAR)

#### 1) LO1

Table 2 lists the DDS2 frequency configuration. DDS2 varies from 540 to 1040kHz. When the display frequency is 490 or 990kHz (for example, 13.99MHz, 14.49MHz), 540kHz is output. When the display frequency increases, the DDS2 frequency increases by the amount of change. When the frequency reaches 1440kHz, the frequency is switched to 540kHz. When the frequency increases to 500kHz (and 1MHz), the frequency returns to 540kHz. (Figure 4)

By changing the 500kHz band in synchronization with the display frequency, the 500kHz comparison PLL circuit is locked and LO1 is generated.

As shown in Table 2, DDS2 (LO1) frequency configuration, the frequency is shifted according to the offset (IF filter setting), RIT, XIT, production mode carrier correction value, and IF shift.

#### 2) CAR

Table 3 lists the DDS1 frequency configuration. The 8.83MHz CAR frequency is generated by the chopper circuit. The DDS1 output frequency is 1.17MHz. The CAR frequency is shifted according to the offset (IF filter setting) correction, carrier correction value, IF shift, CW pitch, and FSK tone.

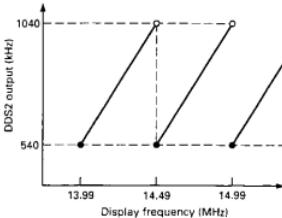


Fig. 4

Component	DDS2 (1Hz)															
	LSB		USB		CW		CW-R		FSK		FSK-R		AM		FM	
	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX
540kHz~1040kHz																
Offset	-1.5k	-1.5k	+1.5k	+1.5k	+0.7k	+0.7k	-0.7k	-0.7k	-85	-85	+85	+85	0	0	0	0
WIDE (2.4k)	-1.5k	-1.5k	+1.5k	+1.5k	+0.4k	+0.4k	-0.4k	-0.4k	-85	-85	+85	+85	0	0	0	0
NAR (1800)	-1.5k	-1.5k	+1.5k	+1.5k	0	0	0	0	-85	-85	+85	+85	0	0	0	0
NAR (500/270)	-1.5k	-1.5k	+1.5k	+1.5k	0	0	0	0	-85	-85	+85	+85	0	0	0	0
CW pitch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FSK tone (H)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FSK tone (L)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FSK shift (M)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FSK shift (S)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RIT	+ (RIT)	-	+ (RIT)	-	+ (RIT)	-	+ (RIT)	-	+ (RIT)	-	+ (RIT)	-	+ (RIT)	-	+ (RIT)	-
XIT	-	+ (XIT)	-	+ (XIT)	-	+ (XIT)	-	+ (XIT)	-	+ (XIT)	-	+ (XIT)	-	+ (XIT)	-	+ (XIT)
CAR suppression	+ (CAR L)	- (CAR L)	+ (CAR U)	+ (CAR U)	-	-	-	-	-	-	-	-	-	-	-	-
IF shift	- (IF S)	-	+ (IF S)	-	+ (IF S)	-	- (IF S)	-	- (IF S)	-	+ (IF S)	-	-	-	-	-

Table 2 DDS2 (LO1) frequency configuration

## CIRCUIT DESCRIPTION

Component	DDS1 (CAR)															
	LSB		USB		CW		CW-R		FSK		FSK-R		AM		FM	
	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX	RX	TX
BASE	1.17MHz (AM RX, FM RX : OFF)															
Offset	+1.5k	+1.5k	-1.5k	-1.5k	-0.7k	-0.7k	+0.7k	+0.7k	+85	+85	-85	-85	OFF	0	OFF	0
NAR (1800)	+1.5k	+1.5k	-1.5k	-1.5k	-0.4k	-0.4k	+0.4k	+0.4k	+85	+85	-85	-85	OFF	0	OFF	0
NAR (500/270)	+1.5k	+1.5k	-1.5k	-1.5k	0	0	0	0	+85	+85	-85	-85	OFF	0	OFF	0
CW pitch	-	-	-	-	-[PITCH]	-	*[PITCH]	-	-	-	-	-	-	-	-	-
FSK tone (H)	-	-	-	-	-	-	-	-	+2.125k	-	-2.125k	-	-	-	-	-
FSK tone (L)	-	-	-	-	-	-	-	-	+1.445k	-	-1.445k	-	-	-	-	-
FSK shift (M)	-	-	-	-	-	-	-	-	-	0	-	0	-	-	-	-
FSK shift (S)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RIT/XIT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CAR suppression	+[CAR LI]	+[CAR LI]	-[CAR LI]	-[CAR LI]	-	-	-	-	-	-	-	-	-	-	-	-
IF shift	+[IF S]	-	-[IF S]	-	-[IF S]	-	+[IF S]	-	+[IF S]	-	-[IF S]	-	-	-	-	-

Table 3 DDS1 (CAR) frequency configuration

## Receiver Circuit Configuration

Figure 5 is a block diagram of the receiver circuit.

The receiver utilizes double conversion with the first IF of 73.05MHz and the second IF of 8.83MHz (triple conversion in FM with the third IF of 455kHz).

The signal coming from the antenna connector passes through the ANT1/ANT2 switching relay, ATIN/THRU switching relay, transmit/receive relay and image filter, and goes to the TX-RX unit. The signal passes through the about-20dB attenuator and IF trap low-pass filter and goes to the 10-part band-pass filter (low-pass filter if the frequency is lower than 1.7MHz). If the frequency is 1.7MHz or higher, the signal passes through a high-pass filter and then a band-pass filter to reduce interference of a strong medium wave output station.

If PRE-AMP is ON, the signal passing through each band-pass filter passes through the low-band and high-band pre-amplifiers. The low-band (21.5MHz or lower) pre-amplifier is a parallel amplifier Q17, Q18: 2SK520x2 with NFB. The high-band (21.5MHz or higher) pre-amplifier is a dual-gate MOS FET Q25: 3SK131 to provide the optimum characteristics for each band. If PRE-AMP is OFF, the pre-amplifiers are bypassed and the dynamic range is boosted.

The signal then passes through the IF trap low-pass filter and is mixed with LO1 by the first mixer Q5 to Q8: 2SK520x4 to produce the first IF of 73.05MHz. The resulting signal passes through two MCFs (XF1) and AGC amplifier Q12: 3SK131, and is mixed with LO2 (64.22MHz) by the second mixer Q10, Q13: 2SK520x2 to produce the second IF of 8.83MHz. The

second IF signal output from the mixer is divided into two signals: one passes through the buffer amplifier and goes to the NB amplifier. The other signal enters the IF amplifier Q11: 3SK131. The AGC is controlled and noise is blanked by the NB in Q11.

The second IF signal passes through the 8.83MHz IF filter. One of THRU, 6kHz, 2.4kHz, and optional bandwidth frequency (1.8kHz, 500Hz, or 270Hz) can be selected for the IF filter.

The signal is then amplified by Q14: 2SC2412K and goes to the FM detection HIC IC7: KCD10 and SSB/AM/CW detection HIC IC15: KCD11. In FM mode, the signal is converted to the third IF of 455kHz by KCD10, passes through the limiter amplifier, and quadrature-detected. In modes other than FM, the signal is amplified by KCD11 and used for the AGC voltage. In SSB and CW, the signal is product-detected and in AM, envelope-detected and output. Each detection output is selected by IC9: BU4066BCFV for each mode and goes to the control unit.

In the control unit, the signal is amplified by IC503: NJM2100M, goes to CODEC IC IC504: AK4506-VS to convert it to a digital signal. The resulting signal is filtered by DSP IC507: ADSP2181KS-115, the volume is controlled, and the subtone is decoded. The signal is converted to an analog signal by the CODEC IC, passes through active filter IC505, IC506: NJM2100M, returns to the TX-RX unit, and amplified to the required level by AF amplifier IC8: LA4446.

## CIRCUIT DESCRIPTION

## ■ IF Filter Ratings (TX-RX Unit)

Item	XF1 : L71-0401-05	XF2 : L71-0266-05	XF3 : L71-0208-15
Nominal center frequency	73.05MHz	8830kHz	8830kHz
Pass bandwidth	$\pm 7.5\text{kHz}$ or more at 3dB	$\pm 3.0\text{kHz}$ or more at 6dB	$\pm 1.2\text{kHz}$ or more at 8dB
Attenuation bandwidth	$\pm 30\text{kHz}$ or less at 40dB	$\pm 13\text{kHz}$ or less at 50dB $\pm 16\text{kHz}$ or less at 60dB	$\pm 1.5\text{kHz}$ or less at 20dB $\pm 2.2\text{kHz}$ or less at 60dB $\pm 3.0\text{kHz}$ or less at 80dB
Ripple	1.0dB or less	1.0dB or less	2.0dB or less
Insertion loss	3.0dB or less	1.5dB or less	6.0dB or less
Guaranteed attenuation	70dB or more at $f_{o+}(500\text{--}1000\text{kHz})$ 70dB or more at $f_{o-}(200\text{--}1000\text{kHz})$	70dB or more at $f_{o\pm} \pm 1\text{MHz}$	80dB or more at $f_{o\pm} \pm 1\text{MHz}$
Center frequency deviation	Within $\pm 1.5\text{kHz}$ at 3dB	—	Within $\pm 150\text{Hz}$ at 6dB
Terminating impedance	$2\text{k}\Omega \pm 10\%$	$1850\Omega // 2\text{pF}$	$600\Omega \pm 5\% // 15\text{pF} \pm 5\%$

Item	CF1 : L72-0372-05	CF500, 501 : L72-0351-05
Nominal center frequency	455kHz	8830kHz
Pass bandwidth	$\pm 6\text{kHz}$ or more at 6dB	$\pm 50\text{kHz}$ or more at 3dB
Attenuation bandwidth	$\pm 13\text{kHz}$ or less at 50dB	35dB or more at $+455\text{kHz}$ 45dB or more at $+910\text{kHz}$
Ripple	3dB or less (Within $455 \pm 4\text{kHz}$ )	1.0dB or less
Insertion loss	6.0dB or less	6.0dB or less
Guaranteed attenuation	35dB or more at $f_{o\pm} 100\text{Hz}$	—
Terminating impedance	$2\text{k}\Omega$	$330\Omega$

## ■ Receiver Front-End

The signal input to the TX-RX unit passes through the attenuator switching circuit and the 30MHz low-pass filter. The signal of less than 1.705MHz passes through the low-pass filter and about-20dB attenuator (the attenuator can be disabled by using a short jumper). The signal of 1.705MHz or higher passes through the short wave broadcast band trap (E type only) and medium wave broadcast band trap and passes through the nine-part band-pass filter. A PIN diode for switching band-pass filters is used at the input side to improve inter modulation.

If PRE-AMP is off, D30 and D32 turn on, and the signal passing through each band-pass filter goes to the quad-balance type first mixer by Q5 to Q8: 2SK520x4. If PRE-AMP is on, D43 and D45 turn on, and the signal of less than 21.5MHz passes through parallel amplifier Q17, Q18: 2SK520x2. This amplifier uses NFB to suppress the low-band gain and improve strong signal input characteristics. When the frequency is 22MHz or higher, D51 and D52 turn on, sensitivity-oriented MOS FET amplifier Q25: 3SK131 is selected.

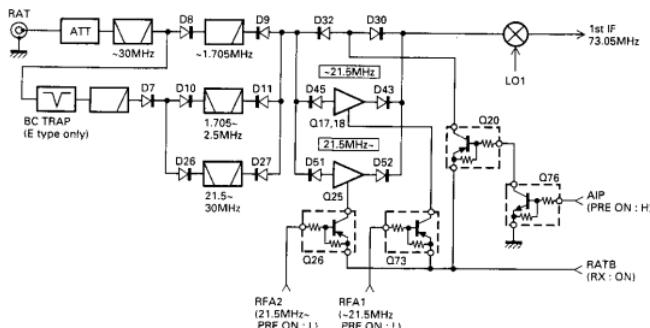


Fig. 6 Receiver front-end block diagram

## CIRCUIT DESCRIPTION

### Transmitter Circuit Configuration

Figure 9 is a block diagram of the transmitter circuit.

The audio signal from the microphone is AF-processed by the DSP in the control unit and enters CN15 (pin 4: MOD/ANO) of the TX-RX unit. The signal is split and directed to the SSB/AM and FM systems by IC12: BU4066BCFV.

In the SSB system, the signal is amplified by Q36 (2SC2712K(S)), balance-modulated with the CAR signal (8.83MHz) input from CN12 by IC2 ( $\mu$ PC1037GR), passes through Q38 (2SC2412K(S)), and enters the crystal filter. The SSB signal passing through the filter is amplified by Q29 (3SK131M). It is mixed with the LO2 signal (64.22MHz) from CN5 by Q27 and Q30 to produce a 73.05MHz signal. It is then mixed with the LO1 signal (78.08 to 103.05MHz) from CN2 by Q28, Q31 (3SK184(R)) to generate the desired signal. The signal passes through a band-pass filter, is amplified by Q35 (2SC2954) to produce the drive output, which is output from CN10 and goes to CN1 of the final unit.

The signal is amplified to 100W by Q1 to Q5. Harmonic components are attenuated by a low-pass filter. The signal passes through the forward/reflected wave detection circuit, AT voltage/current detection circuit, transmit/receive change relay K2, AT IN/THRU changeover relay K1, ANT 1/2 changeover relay K3, and is directed to the antenna connector.

In the AM mode, the signal is generated by breaking the balance of the carrier of SSB balance modulator IC2:  $\mu$ PC1037GR, and output through the same route as the SSB.

In the FM mode, the audio signal from the microphone connector is pre-emphasized and IDC-processed by the DSP in the control unit and goes to the TX-RX unit. The signal is separated from the SSB/AM system by IC12: BU4066BCFV, passes through W5, and enters the PLL unit to modulate LO2 (64.22MHz).

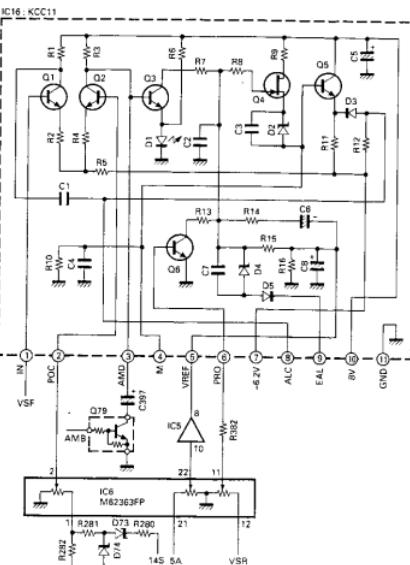
In the CW mode, the key input signal goes to IC5 in the control unit. The CKY signal output from IC6 switches Q24 and Q21 in the TX-RX unit to generate the CW signal.

### ■ ALC Circuit

The forward wave voltage (VSF) detected by the final unit is changed by a resistor and goes to the differential amplifier comprised of Q1 and Q2. When the VSF rises, the base voltage of Q1 rises, so the emitter voltage of Q1 and Q2 increases and the current flowing through the base of Q2 decreases, and thus the collector voltage of Q2 rises. When this voltage exceeds  $V_{BE} + V_E$  (about 2.4V) of Q3, the base current flows and the collector voltage to which ALC time constants C and R are connected drops.

The collector voltage change is shifted by Q4 and D2 and matched with the voltage for keying by Q5 and D3 to generate the ALC voltage. This ALC voltage lowers the second gate voltage of Q29 (3SK131(M)) of the TX-RX unit to activate the ALC.

In AM transmission, Q79 turns on and the ALC voltage is controlled by the average power. The reference voltage, V<sub>REF</sub>, for the ALC is set by the adjusted value from the microcomputer and output from IC6.



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## CIRCUIT DESCRIPTION

### ■ Power Control Circuit

Power is controlled by changing the base voltage (POC) of Q2 of the differential amplifier consisting of Q1 and Q2. The POC is set by the adjustment value from the microcomputer and output from IC6. As the base voltage (POC) of Q2 decreases, the emitter voltage of Q1 and Q2 decreases. This activates ALC and reduces the power even if the base voltage (VSF) of Q1 is low.

### ■ SWR Protection Circuit

When the reflected wave voltage (VSR) detected by the final unit rises, the PRO voltage output from IC6 increases, and Q6 turns on to reduce the voltage of the line of the ALC time constant circuit. The drive output decreases and the transmission power lowers. The PRO voltage is set according to the VSR by using the adjustment value from the microcomputer.

### 1) TX-AGC

The DSP controls the input level until it starts modulation. It is like AGC for the microphone amplifier. When the input level exceeds a certain level, the amplifier gain decreases to keep the modulator input level constant. This value is set to the ALC meter ZONE MAX, +2dB. In SSB, the ALC is suppressed to ZONE MAX, +2dB or less even if the MIC LEVEL is maximized or if the input level increases.

In FM, the level is suppressed so that it does not exceed the maximum occupation frequency bandwidth of about 4.4kHz.

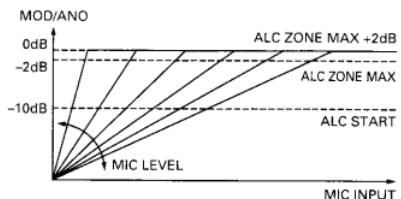


Fig. 11

### ■ Standby Control Timing

Standby control timing is determined by using software for the main CPU in the control unit. The control signals for the control unit are listed below. (See Figure 12 for each timing chart.)

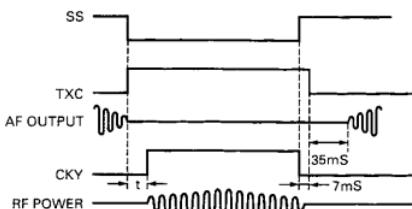
SS : Standby switch input signal. Active low.

KEY : Keying input signal from the keyer.  
Active low.

TXC : Transmit output signal. Active high.  
Same timing as TXB.

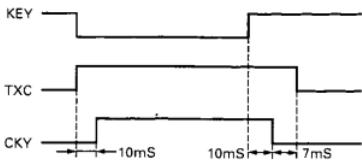
CKY : Output signal. Active high.

### With the SS line



Menu No.39	OFF	10ms
"LINEAR"	ON	25ms

### By full break-in



### By semi break-in

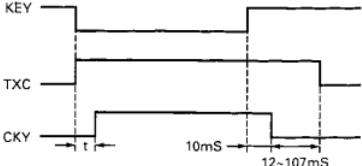


Fig. 12 Transmit/receive signal timing chart

## CIRCUIT DESCRIPTION

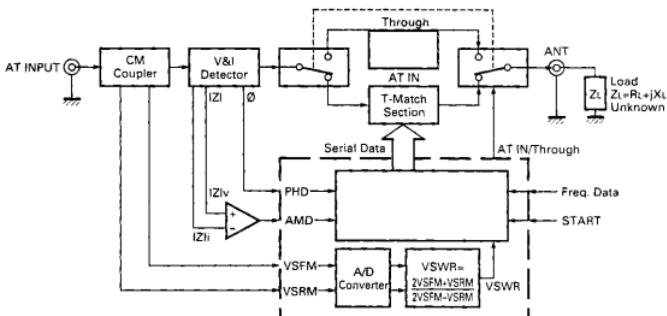


Fig. 16 AT control block diagram

## ■ IF Filter Switching

The IF filter bandwidth changes automatically as the mode changes. Its details are given below.

IF filter bandwidth	YK-88SN-1 (1800Hz)		YK-88C-1 (500Hz)		YK-88CN-1 (270Hz)
	CW (Hz)	FSK (Hz)	CW (Hz)	FSK (Hz)	CW (Hz)
2.4kHz	2.0k	1.5k	1.0k	1.0k	300 or more
Bandwidth of the installed filter	1.0k or less	1.0k or less	600 or less	500 or less	200 or less

## ■ Receive Band-Pass Filter Selection

The RF BPF signal from the control unit is sent to the TX-RX unit as serial data. The serial-to-parallel converter in the TX-RX unit converts serial data to parallel data and switches between band-pass filters.

## ■ Transmit Low-Pass Filter Selection

The LPF signal from the control unit is sent to the final unit as serial data. The serial-to-parallel converter in the final unit converts serial data to parallel data and switches between low-pass filters.

## ■ Electronic Keyer

The TS-570D uses a dedicated IC (IC3: UPD75004GB-746) to control the electronic keyer. The main CPU reports CH1 to CH3 switch operations to the electronic keyer IC (keyer microcomputer).

# TS-570D

## CIRCUIT DESCRIPTION

### ■ Band Data

Frequency (MHz)	RF BPF	LPF		VCO	PLL n	Frequency (MHz)		RF BPF	LPF		VCO	PLL n
			E type			Lower limit	Upper limit			E type		
0.030000	0.489999	1	1	A	15	13.990000	14.489999	8	5	5	B	43
0.490000	0.989999				16	14.490000	14.499999					44
0.990000	1.489999				17	14.500000	14.989999	9	6	6		45
1.490000	1.705000				18	14.990000	15.489999					46
1.705001	1.989999	2			19	15.490000	15.989999					47
1.990000	2.489999				20	15.990000	16.489999					48
2.490000	2.499999					16.490000	16.989999					49
2.500000	2.989999	3	2			16.990000	17.489999					50
2.990000	3.489999					17.490000	17.989999					51
3.490000	3.989999					17.990000	18.489999					52
3.990000	4.099999					18.490000	18.989999					53
4.100000	4.489999	4	3			18.990000	19.489999					54
4.490000	4.989999					19.490000	19.989999					55
4.990000	5.489999					19.990000	20.489999					56
5.490000	5.989999					20.490000	20.989999					57
5.990000	6.489999					20.990000	21.489999					58
6.490000	6.899999					21.490000	21.999999	10	7	7		58
6.900000	6.989999	5				21.500000	21.989999					59
6.990000	7.489999					21.990000	22.489999					60
7.490000	7.499999					22.490000	22.989999					61
7.500000	7.989999	6	5	4		22.990000	23.489999					C 62
7.990000	8.489999					23.490000	23.989999					63
8.490000	8.989999					23.990000	24.489999					64
8.990000	9.489999					24.490000	24.989999					65
9.490000	9.989999					24.990000	25.489999					66
9.990000	10.489999					25.490000	25.989999					67
10.490000	10.499999					25.990000	26.489999					68
10.500000	10.989999	7				26.490000	26.989999					69
10.990000	11.489999					26.990000	27.489999					70
11.490000	11.989999					27.490000	27.989999					71
11.990000	12.489999					27.990000	28.489999					72
12.490000	12.989999					28.490000	28.989999					73
12.990000	13.489999					28.990000	29.489999					74
13.490000	13.899999					29.490000	29.989999					75
13.900000	13.989999	8				29.990000	30.000000					

# TS-570D

## CIRCUIT DESCRIPTION

### Control Unit (DSP)

#### ■ Outline

The TS-570D uses the DSP to process audio signals the detection output of the conventional models. The processes are listed below. A block diagram of the DSP and a function block diagram of processes in the DSP are shown below for reference.

- Sidetone and beep generation
- Transmit/receive filter processing
- Voice equalizing processing
- Speech processing
- VOX processing
- Mic amplifier AGC processing
- CW tune function
- Noise and interference processing (noise reduction, beat cancel)
- CTCSS decoder

The DSP circuits are divided into an analog section that processes analog signals and a digital section that processes digital data. The analog section contains a buffer amplifier (IC503, IC505, IC506: NJM2100M) for CODEC input/output, and analog switch (IC502: BU4066BCFV). The digital section contains a clock dividing circuit which supplies clock signals to the CODEC and DSP. The CODEC (IC504: AK4506-VS) interfaces between the analog and digital sections.

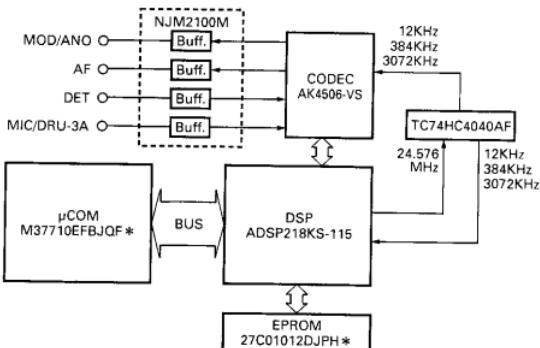


Fig. 17 DSP section block diagram

# TS-570D

## CIRCUIT DESCRIPTION

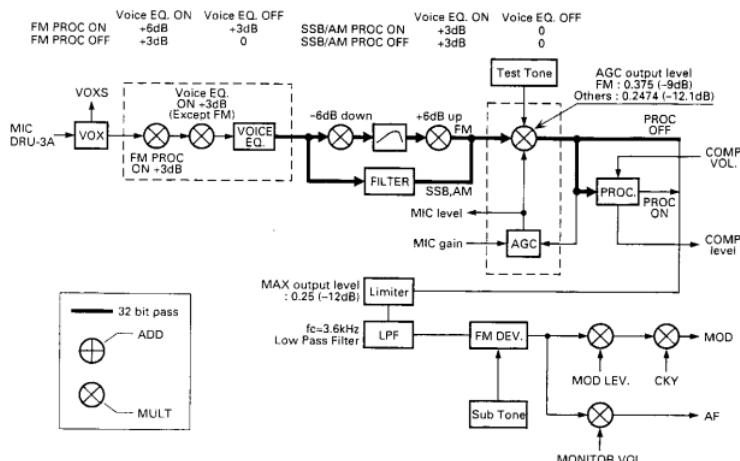


Fig. 18 DSP function block diagram (TX)

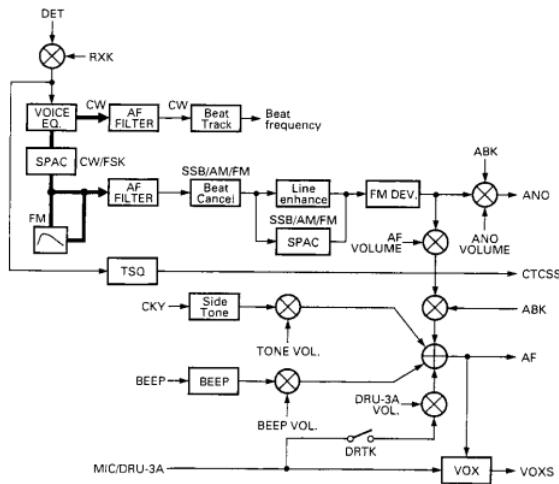


Fig. 19 DSP function block diagram (RX)

## CIRCUIT DESCRIPTION

### ■ Digital Unit

The digital unit consists of a DSP (IC507: ADSP2181KS-115), an EPROM (IC512: AM27C010-120DC), a clock dividing logic (IC508: TC74HC4040AF, IC511: TC7504F), and CODEC (IC504: AK4506-VS), which interfaces with the analog section.

The DSP is a 16-bit fixed-decimal DSP. It operates with the 12.288MHz clock, but the internal clock is 24.576MHz. The internal clock is output from pin 22 (CLKOUT) of the DSP to the clock dividing logic. The DSP IDMA (Internal Direct Memory Access) function is used to transfer commands between the DSP and microcomputer.

The clock dividing logic supplies 3072kHz, 384kHz, and 12kHz to the CODEC using clocks from the DSP. It also supplies the same clock to the DSP to synchronize with the CODEC.

The CODEC is a 16-bit  $\Delta\Sigma$  CODEC for audio equipment. There are two channels: R and L. The R channel is used for the microphone input signal and the L channel is used for the receive signal. The CODEC converts analog signals to digital signals or digital signals to analog signals based on the clock from the clock dividing logic with a 12kHz sampling frequency.

### ■ Flow of Transmit/Receive Signals

The flow of transmit/receive signals is explained below, together with the analog and digital units.

The flow of receive signals is explained first. The receive signal input from pin 6 (DET) of CN502 is amplified by IC503: NJM2100M. If a strong signal is input to DET, its amplitude is limited to prevent entering of signals which exceed the input range into the CODEC (IC504: AK4506-VS). It is then converted to digital data by the CODEC with the 12kHz sampling frequency. This data is transferred from the CODEC to the DSP serially, and operated by the DSP.

The digital data processed by the DSP is sent from the DSP to the CODEC serially and converted to an analog signal. The signal passes through the three-degree low-pass filter IC505 and IC506: NJM2100M to eliminate alias components. The resulting signal is output from pin 1 (AF) of W501, amplified by the AF amplifier (IC8: LA4446) in the TX-RX unit, and output to the speaker and headphone.

The flow of transmit signals is explained below. If the mode is SSB, FM, or AM, the signal from the microphone is input. The signal enters through CN503. The signal is amplified by amplifier IC501: NJM2100M, and goes to the analog switch (IC501: BU4066BCFV). The analog switch is used to switch between the microphone signal, the signal from the DRU, and packet signal. The signal passing through the analog switch is amplified by amplifier IC503: NJM2100M. If there is a strong signal, the amplitude is limited so that the signal exceeding the input range does not enter the CODEC. The CODEC then converts it to digital data with a 12kHz sampling frequency. The data is transferred from the CODEC to the DSP to carry out operations.

Digital data operated by the DSP is transferred from the DSP to the CODEC to convert it to an analog signal. The signal passes through the three-degree low-pass filter IC505: NJM2100M to eliminate alias components. The signal is output pin 4 (MOD/ANO) of CN502 to the TX-RX unit.

### ■ Sidetone Signal Flow

When the electronic keyer is pressed, the sidetone is output. The sidetone is processed by the DSP. Sidetone data, which is generated by the DSP, is added with digital data of the receive signal and is output to the speaker or headphone in the same process as the receive signal.

### ■ Beep Signal Flow

When pin 126 (BEEP) of the DSP goes high, the DSP processes and outputs beep data in the same process as the side tone. The DSP can set the frequency and volume of the beep produced with a command.

### ■ Digital Recording Unit (DRU) Recording and Playback

The DRU is controlled by the microcomputer. During the DRU recording, the microphone signal amplified by the amplifier (IC501: NJM2100M) is input to the DRU and recorded. During DRU playback, the playback signal is input to the CODEC by changing the analog switch (IC502: BU4066BCFV). When the DSP receives a "VOX ON and DRU playback" command from the microcomputer, VOXS data in the DSP goes high. When the microcomputer reads the data, it sets the transceiver to transmit mode. This transmit operation does not occur according to the playback sound level of the DRU. Even if no sound is recorded, the transceiver enters the transmit mode when a DRU playback command arrives with VOX ON.

# TS-570D

## CIRCUIT DESCRIPTION

### ■ VS-3 Audio Signal Flow

The audio signal output from the VS-3 is not processed by the DSP. The signal is amplified by the AF amplifier and output to the speaker or headphone. The VS-3 is controlled by the microcomputer.

### ■ Commands and Data Transferred to or from the Microcomputer

The commands sent from the microcomputer to the DSP and data sent from the DSP to the microcomputer to indicate the microcomputer and DSP processing are described below.

#### 1) DSP commands

Address (HEX)	Bit (HEX)	DSP-MCU	Accept	Function (Parameter)	
C+0			COM ← Clear	Parameter processing command (The DSP is cleared after the command is executed.)	
C: Command Area base pointer =0000	0 1 2 3 4 5 6 7 8 9 A		→	Receive mode TX filter Voice equalizer RX filter CW pitch Transmit mode AF VOL Noise/interference elimination mode SPAC correlation time FM subtone frequency	
C+1			Everytime	Flag 1	
	0 1 2 3 4 5 6 7 8			SIC	Sidetone ctl 0 : OFF, 1 : ON (Sidetone permission)
				DRTK	DRU-3A microphone 0 : OFF, 1 : ON (Switch the microphone gain for DRU)
				FDEV	FM deviation 0 : Narrow, 1 : Wide
				CWBT	CW tune 0 : OFF, 1 : ON
				STC	FM subtone 0 : OFF, 1 : ON
				PRC	Processor 0 : OFF, 1 : ON
				VOX	VOX 0 : OFF, 1 : ON
C+2			Everytime	Flag 1	
	0 1			LITRC	Line enhancer trace 0 : ON, 1 : OFF
				BCTR	Beat canceler trace 0 : ON, 1 : OFF
C+3	0-3	←	IRQ2	TX mode 0 : SSB 1 : SLEEP 2 : CW 3 : AM 4 : FM 5 : FSK 6 : SLEEP 7 : TEST	
C+4	0-3	←	IRQ2	RX mode 0 : SSB 1 : SLEEP 2 : CW 3 : AM 4 : FM 5 : FSK 6 : SLEEP 7 : TEST	
C+5	0-4	←	IRQ2	TX filter Band	
C+6	0-2	←	IRQ2	TX voice equalizer TX voice equalizing ON/OFF and selection	
C+7	0-4	←	IRQ2, MODE	RX SSB/AM filter 1 SSB/AM low cut	
C+8	0-4	←	IRQ2, MODE	RX SSB/AM filter 2 SSB/AM high cut	

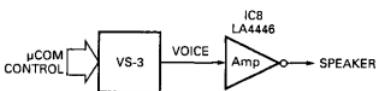


Fig. 20 VS-3 audio signal flow

## CIRCUIT DESCRIPTION

Address (HEX)	Bit (HEX)	DSP-MCU	Accept	Function (Parameter)
C+9	0~3 4~7	←	IRQ2 MODE	RX CW filter CW center CW bandwidth
C+A	0~1 2~3	←	IRQ2 MODE	RX FSK filter FSK bandwidth FSK center
C+B	0~3	←	IRQ2, MODE	CW pitch 400Hz~1000Hz, 50Hz step (13)
C+C	0~1 2 3 4	←	IRQ2, MODE	FSK setting FSK shift width 0 : 170Hz, 1 : 200Hz, 2 : 425Hz, 3 : 850Hz FSK tone 0 : Low, 1 : High FSK reverse 0 : Normal, 1 : Reverse FSK polarity 0 : Normal, 1 : Invert
C+D	0~5	←	IRQ2	FM subtone frequency (Hz) 0 : 067.0 1 : 071.9 2 : 074.4 3 : 077.0 4 : 079.7 5 : 082.5 6 : 085.4 7 : 088.5 8 : 091.5 9 : 094.8 10 : 097.4 11 : 100.0 12 : 103.5 13 : 107.2 14 : 110.9 15 : 114.8 16 : 118.8 17 : 123.0 18 : 127.3 19 : 131.8 20 : 136.5 21 : 141.3 22 : 146.2 23 : 151.4 24 : 156.7 25 : 162.2 26 : 167.9 27 : 173.8 28 : 179.9 29 : 186.2 30 : 192.8 31 : 203.5 32 : 210.7 33 : 218.1 34 : 225.7 35 : 233.6 36 : 241.8 37 : 250.3 38 : 1750.0
C+E	0~E	←	Everytime	Beep frequency $f = n \times 12000 + 2^{16} (0\text{Hz} \sim 6\text{kHz})$
C+F	0~E	←	Everytime	PROC compression level 0 : 0dB~S7FFF : 30dB ; semi log
C+10	0~7	←	IRQ2	AF VOL 0 : -∞dB~255 : 0dB : Func
C+11	0~E	←	Everytime	DRU-3A VOL 0 : -∞dB~S7FFF : 0dB : linear
C+12	0~E	←	Everytime	Sidetone VOL 0 : -∞dB~S7FFF : 0dB : linear
C+13	0~E	←	Everytime	Beep VOL 0 : -∞dB~S7FFF : 0dB : linear
C+14	0~E	←	Everytime	ANO VOL 0 : -∞dB~S7FFF : 0dB : linear
C+15	0~E	←	Everytime	MOD level 0 : -∞dB~S7FFF : 0dB : linear
C+16	0~E	←	Everytime	TX AF AGC gain : MIC 0 : -∞dB~S7FFF : 0dB : semi log
C+17	0~E	←	Everytime	TX AF AGC gain : DRU-3A 0 : -∞dB~S7FFF : 0dB : semi log
C+18	0~E	←	Everytime	TX AF AGC gain : ANI 0 : -∞dB~S7FFF : 0dB : semi log
C+19	0~E	←	Everytime	Monitor VOL 0 : -∞dB~S7FFF : 0dB : linear
C+1A	0~E	←	Everytime	VOX gain 0 : -∞dB~S7FFF : 0dB : semi log
C+1B	0 1 2	←	IRQ2	Noise/interference elimination mode setting 0 : OFF, 1 : ON Noise reduction (Adaptive filter : Line enhancer) Beat canceler (Adaptive filter) Noise reduction (SPAC)
C+1C	0~9	←	Every time	S-meter 0 : 0~1023 : Full
C+1D	0~3	←	IRQ2	SPAC correlation time 0 : 2msec 1 : 5msec 2 : 7.5msec 3 : 10msec 4 : 15msec 5 : 20msec 6 : 25msec

TS-570D

## CIRCUIT DESCRIPTION

Address (HEX)	Bit (HEX)	DSP-MCU	Accept	Function (Parameter)
C+1E	0~7	→	Updated at fs intervals	PROC compression level 0 : 0dB~S7FFF : 30dB : semi log
C+1F	0	→	Updated at fs intervals	Status VOXS 0 : OFF, 1 : ON CTCSS 1 : Det.
C+20	0~3	←	IRQ2	Adjustment mode 0 : Tone output, The other : Tone stop
C+21	0~E	←	Everytime	Test tone frequency 1 0 : OFF, 1 : $f = n \times 1200 + 2^{16}$ (0Hz~6kHz)
C+22	0~E	←	Everytime	Test tone frequency 1 0 : OFF, 1 : $f = n \times 1200 + 2^{16}$ (0Hz~6kHz)
C-23	0~F	→	Everytime	CW beat tracking : Error frequency 16 bits with a sign : $f = \pm n \times 3000 + 2^{15}$
C+24	0~2	←	IRQ2	RX voice equalizer RX voice equalizing ON/OFF and selection
C+25	0~F	←	Everytime	RF gain VOL 0 : -2dB~255 : 0dB : Func
C-26	0~E	→	Updated at fs intervals	CW beat tracking frequency 16 bits with a sign : $f = n \times 12000 + 2^{16}$
C+27	0~E	←	Everytime	Line enhancer tracking speed 0 : Default, 1 : Slow~S7FFF : Fast
C+28	0~E	←	Everytime	Beat canceler tracking speed 0 : Default, 1 : Slow~S7FFF : Fast
C+29				Reserve
C+2A				Reserve
C+2B				Reserve
C+2C				Reserve
C+2D				Reserve
C+2E				Reserve
C+2F				Reserve

## ■ Other Circuits in the Analog Unit

Several circuits in the analog unit have already been described in the section of the flow of transmit/receive signals. This section explains the other circuits.

### 1) Reference voltage circuit

Since the TS-570D does not have any negative power supply, it uses a 2.5V reference voltage, which is half the 5V power supply voltage, for operational amplifiers, to process analog signals linearly. The reference voltage circuit is shown below. 2.5V is produced by dividing the power supply voltage with R539 and R540. The voltage is supplied to the circuitry through a buffer amplifier IC506 : NJM2100M.

## 2) Pop sound mute circuit

The mute circuit shown below reduces the pop sound when the power switches off. If pin 23 (AMU) of CN3 is low, the mute circuit consisting of Q11, Q12; DTC143EK mutes the AF amplifier (IC8: LA446) and suppresses the pop sound when the power turns on.

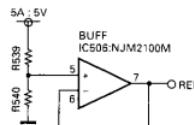
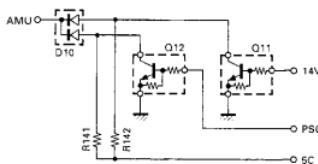


Fig. 21 Reference voltage circuit



**Fig. 22** Pop sound mute circuit

## CIRCUIT DESCRIPTION

### ■ New Functions

The DSP used in the TS-570D processes detected AF signals. The DSP has various functions for processing digital signals. This section describes the functions and other features.

#### 1) Transmission filter processing

Three types of filters are used for transmission: transmission sound quality setting filter, splatter filter, and speech processor filter. Each of the filters is outlined below.

- Transmission sound quality setting filter

Comprised of 8-degree IIR filters.

In SSB/AM, it consists of a band-pass filter, the band is specified by the bandwidth and low edge frequency.

In FM, it consists of a pre-emphasis filter.

- Splatter filter

This filter also functions as an FM splatter filter. It eliminates AF-AGC and limiter distortion.

SSB/AM/FM: 3.6kHz

- Speech processor filter

The input filter is IIR, and the output filter is FIR.

The bandwidth of this filter is linked with that of the transmission sound quality setting filter.

#### • Transmission sound quality setting filter degree/attenuation

Type	Comprise	Degree	Ripple (dB)	Attenuation (dB)
BPF	IIR	8	0	L : Simple attenuation H : 60
FM pre-emphasis	IIR	1+3	-	-
Splatter filter	IIR	6	0	Simple attenuation
PROC-IN : Low-LPF	IIR	6	0	20/45
PROC-IN : Mid-BPF	IIR	6	0	28/53
PROC-IN : Hi-BPF	IIR	6	0	30/60
PROC-OUT : Low-LPF	FIR	48	0.5	45
PROC-OUT : Mid-LPF	FIR	48	0.5	40/45
PROC-OUT : Hi-LPF	FIR	48	0.5	20/45/20

#### 2) Receive filter processing

Filters used for reception include a high-pass filter and a low-pass filter for slope tuning and a band-pass filter for CW/FSK mode. 10-degree IIR filters are used as the low-pass filter, high-pass filter, band-pass filter, delay equalizer, and deemphasis filter. They are outlined below.

- SSB, AM, FM

AF high-pass filter/low-pass filter for slope tuning

- CW, FSK

AF BPF

The delay equalizer improves the group delay characteristics. The maximum signal delay time is 30ms.

- FM

A de-emphasis filter is inserted before the slope tuning filter.

#### • Degree/attenuation

Mode	Type	Comprise	Degree	Ripple (dB)	Attenuation (dB)
SSB/AM	LPF	IIR	6	0	70
SSB/AM	HPF	IIR	1~4	0	Simple attenuation/70
CW/FSK	BPF	IIR	6~8	0	65
CW/FSK	Equalizer	IIR	2~4	All pass	All pass
FM	-	IIR	7	De-emphasis filter	-

#### • Band/setting code

Blank parts cannot be set. The CW low edge: 200Hz or higher

No.	SSB/AM Low cut	SSB/AM Hi cut	CW Center	CW Width	FSK BPF Center	FSK BPF Width
0	10 (0)	1.0k	400	50	2.2100k/1.3600k	250
1	50	1.1k	450	100	2.2250k/1.3750k	500
2	100	1.2k	500	200	2.3375k/1.4875k	1.0k
3	150	1.3k	550	300	2.5500k/1.7000k	1.5k
4	200	1.4k	600	400		
5	250	1.5k	650	600		
6	300	1.6k	700	1k		
7	350	1.7k	750	2k		
8	400	1.8k	800			
9	450	2.0k	850			
10	500	2.2k	900			
11	550	2.4k	950			
12	600	2.6k	1.0k			
13	650	2.8k				
14	700	3.0k				
15	750	3.2k				
16	800	3.4k				
17	850	3.6k				
18	900	4.0k				
19	950	4.4k				
20	1.0k	5.0k				
21	PKT-1					
22	PKT-2					
23	PKT-3					

# TS-570D

## CIRCUIT DESCRIPTION

### 3) Voice equalizing processing

A filter for voice equalizing processing is used to change the transmission sound quality. It consists of 32-tap FIR filters. The characteristics of the filters are shown below. To increase the voice equalizing effect, the input signal is increased by 3dB and then filtered when high boost, formant pass, or bass boost is set.

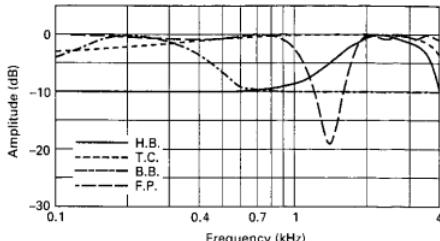


Fig. 23

	TX	RX
0	Flat 0dB	Flat 0dB
1	Hi boost (H.B.) 2.2kHz peak	Hi boost (H.B.) 2.2kHz peak
2	Formant pass (F.P.) Suppress 1.2kHz to 1.6kHz.	Formant pass (F.P.) Suppress 1.2kHz to 1.6kHz.
3	Bass boost (B.B.) 200Hz peak	Bass boost (B.B.) 200Hz peak
4	Conventional (T.C.) Emphasize 600Hz or higher by 3dB.	Conventional (R.C.) Emphasize 1kHz or lower by 2dB.

### 4) Speech processor processing

Speech processor processing is carried out to improve the talk power in transmit mode. The band is divided into three parts to perform compression by suppressing the harmonic distortion. A double-precision band-pass filter, which is a IIR filter, is used for input, and a low-pass filter, which is a FIR filter, for output. The IN-BPF HI output level is increased by 3dB to emphasize the high-frequency range.

IN-BPF LOW : 200 or 500~800Hz

IN-BPF MID : 800~1600Hz

IN-BPF HI : 1600~3000Hz

OUT-LPF LOW : 800Hz

OUT-LPF MID : 1600Hz

OUT-LPF HI : 3000Hz

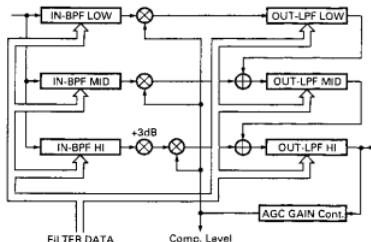


Fig. 24

### 5) VOX processing

The TS-570D does not have the anti-VOX function because the DSP correlates the receive tone signal and the signal from the microphone and carries out anti-VOX processing automatically. The signal from the microphone is stored in the buffer in the DSP and output with a delay time of 20ms to eliminate the blank time at the beginning.

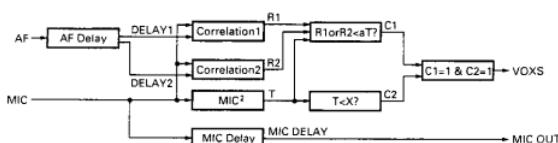


Fig. 25

# TS-570D

## CIRCUIT DESCRIPTION

### 6) Microphone amplifier AGC processing

The digital AGC processing is carried out for the signal from the microphone by the DSP. The microphone gain is managed by changing the maximum gain of the AGC. The attack time constant is set to a high value to prevent responding to any noise signals which are input momentarily. The limiter limits the upper limit of the accumulated value in the DSP according to the microphone gain setting.

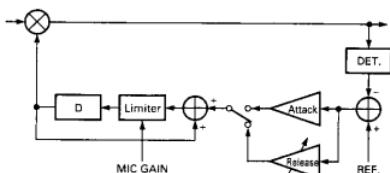


Fig. 26

### 7) CW tune function

When the conventional models performed CW zero-in, it receives CW receive tone and sidetone and performs tuning by changing the receive frequency manually so that there is no difference in the frequencies of the two tones. The TS-570D is designed to do it automatically. The DSP has an auto notch filter with the CW pitch frequency at the center. The auto notch filter converts the error data for automatic tracking to the beat to DDS frequency data and sends it to the microcomputer. The microcomputer adjusts the receive frequency automatically. The CW zero-in is carried by repeating this process. If the CW signal is weak or if there are several stations in the receive band, they cannot be tuned precisely.

### 8) CTCSS decode

The TS-570D is the first HF fixed model that has a CTCSS decoder which operates in FM mode. The microcomputer checks CTCSS decode by detecting the subtone in the receive signal using the DSP to turn the audio signal output on and off.

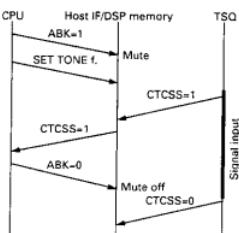


Fig. 27

### 9) Noise/interference processing

The noise/interference processing, SPAC, line enhancer, and beat cancel functions of the TS-570D are made possible by digital signal processing by the DSP. They are outlined below.

#### • SPAC (NR2)

SPAC stands for Speech Processing System by use of Auto Correlation function. It extracts periodical signals (target receive signals) using a self-correlation function and suppresses noise. SPAC improves the S/N effectively, but may produce noise because signals discontinue when periodical signals are extracted.

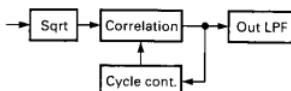


Fig. 28

#### • Line enhancer

The line enhancer emphasizes the periodical signal and suppresses noise using a 64-tap FIR adaptive filter. The convergence speed of the adaptive filter is changed in proportion to the signal strength meter level. If the signal strength meter level is high, the change of the tone is suppressed. The value of the delay adapted according to the mode is changed to achieve the optimum effect for each mode.

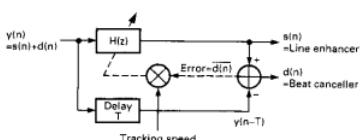


Fig. 29

#### • Beat cancel

The beat canceller suppresses beat interference by adding the periodical signals with reverse phases using the same 64-tap FIR adaptive filter as for the line enhancer. The FIR filter can suppress several beats. The convergence speed of the adaptive filter is set to the optimum value for producing the beat cancel effect. However, an audio signal may be canceled as it is regarded as a periodical signal.

# TS-570D

## DESCRIPTION OF COMPONENTS

**FINAL UNIT (X45-353X-XX) 0-10 : K,M2 2-71 : E,E2,E3**

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
Q1	2SC1971	Pre-drive amplifier	Wide-band amplification of HF band
Q2,3	2SC3133	Drive amplifier	Push-pull wide-band amplification of HF band
Q4,5	2SC2879	Final amplifier	Push-pull wide-band amplification of HF band
Q6	2SC3421(Y)	Final bias supply	Temperature compensation of final
Q7	FMC2	Switching	K1 (AT IN ↔ THRU) control
Q8	FMC2	Switching	K2 (TX ↔ RX) control
Q9	FMC2	Switching	K3 (ANT1 ↔ ANT2) control
Q10	DTC114EK	Switching	On when over voltage
Q11	DTC143TK	Switching	K4 (Power on ↔ off) control
Q12,13	DTD123EK	Switching	Fan motor control
Q14	2SC2714(Y)	Buffer amplifier	AT control voltage detection signal shaping
Q15	2SC2714(Y)	Buffer amplifier	AT control current detection signal shaping
Q16	DTC114EK	Switching	FEN logic inversion
IC1	TA7805S	Regulator	14S → 5A
IC2	TA7808S	Regulator	14S → 8A
IC3	TA75S393F	Comparator	Voltage/current amplitude comparison
IC4	SN74S74NS	D flip-flop	Voltage/current phase comparison
IC5	M54562P	Driver	LPF relay control
IC6	NJU3714G	Decoder	LPF control signal serial → parallel convert
IC7,8	μPD6345GS	Decoder	AT C control signal serial → parallel convert
IC9	μPD6345GS	Decoder	AT L control signal serial → parallel convert
IC10	TA7810S	Regulator	14S → 10A
D1	MA27T-B	Temperature compensation	Temperature sensing of pre-drive
D2	MA27-B	Temperature compensation	Temperature sensing of drive
D3,4	MA27-B	Temperature compensation	Temperature sensing of final
D5	ISS101	High-frequency rectification	Reflected waveform voltage detection
D6	ISS101	High-frequency rectification	Forward waveform voltage detection
D7	LFB01	Surge absorption	K1
D8	LFB01	Surge absorption	K2
D9	LFB01	Surge absorption	K3
D10,11	DSA301LA	Surge absorption	Lighting surge protection
D12	SG-5L(R)	Protection diode	Reverse connection protection
D13	ERZ-M10DK220	Surge absorption	Power surge protection
D14	02CZ18(X,Y)	Zener diode	Over voltage detection
D15	LFB01	Surge absorption	K4
D16	DAN202K	Switching	PSC and BOVR OR
D17	LFB01	Surge absorption	Fan
D18,20,22	ISS226	Clipper	AT control voltage detection signal shaping
D19,21,23	ISS226	Clipper	AT control current detection signal shaping
D24	ISS101	High-frequency rectification	AT control voltage amplitude signal detection
D25	ISS101	High-frequency rectification	AT control current detection signal detection
D26	DSA301LA	Surge absorption	Lighting surge protection
D101~601	LFB01	Surge absorption	LPF switching relay
D801~823	LFB01	Surge absorption	AT switching relay

**CONTROL UNIT (X53-369X-XX) 0-10 : K 0-21 : M2 2-71 : E 2-72 : E2 2-73 : E3**

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
Q1	DTC143EK	Switching	EEPROM write control
Q2	DTC143EK	Switching	Transmission control (KEY line)
Q3,4	DTC114EK	Switching	Multiplexer
Q5	DTA143EK	Switching	Backup judgement

## DESCRIPTION OF COMPONENTS

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
Q6	DTC143EK	Switching	AT-300 control (TT, TS)
Q7	DTA143EK	Switching	AT-300 control (TT, TS)
Q8	DTC143TK	Switching	Backup judgement
Q9	DTA143EK	Switching	AT-300 control (TT, TS)
Q10	DTA143EK	Switching	AT-300 control (TT, TS)
Q11, 12	DTC143EK	Switching	AT mute judgement
IC1	AT24C64N10SI27	EEPROM	Adjustment data saving
IC2	CAT35C102KI	EEPROM	Electronic keyer message memory
IC3	UPD75004GB-746	CPU	Electronic keyer control 4 bit microprocessor
IC4	PST9121NR	Reset	Reset signal generation
IC5	CXD1095O	Extended I/O	
IC6	M37710EFBJQF*	CPU	16 bit main microprocessor
IC7, 8	TC4052BF	Multiplexer	Analog signal input
IC9	NJM78L05UA	AVR	14S → 5V
IC10	NJM78L06UA	AVR	14V → 6V
IC11	NJM78L08UA	AVR	14S → 8V
IC501	NJM2100M	Amplifier	Microphone amplifier
IC502	BU4066BCFV	Analog switch	Input changeover
IC503	NJM2100M	Buffer amplifier	CODEC input
IC504	AK4506-VS	A/D, D/A	CODEC
IC505	NJM2100M	LPF/Buffer amplifier	CODEC output
IC506	NJM2100M	Bias/Buffer amplifier	CODEC output
IC507	ADSP2181KS-115	DSP IC	
IC508	TC74HC4040AF	Clock divider	
IC511	TC7504F	Inverter	Clock inversion
IC512	27C01012DJPHB	EPROM	DSP program saving
IC513	NJM78L05UA	AVR	14S → 5V
D1	1SS355	Protection diode	SS line
D2	1SS355	Protection diode	DOT line
D3	1SS355	Protection diode	DASH line
D4	1SS355	Protection diode	KEY line
D5	DAN202U	Switching (Reverse current prevention)	Lithium battery or DC 13.8V
D6	1SS356	Reverse current prevention	BK3 line
D7	1SS355	Reverse current prevention	SC line
D8	02CZ8.2(Y)	Voltage detection	Backup detection
D9	02CZ8.2(Y)	Voltage detection	AF mute detection
D10	DAN202U	Switching (Reverse current prevention)	Power switch off or DC down

## TX-RX UNIT (X57-500X-XX) : TX-RX 0-10 : K,M2 2-71 : E,E2,E3

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
Q1	DTA124EK	Switching	ATT changeover
Q2	2SD1757K(S)	Muting	On when TX, Off when RX
Q3	2SB1188(O, R)	Switching	On when RX, Off when TX
Q4	DTC143TK	Switching	On when RX, Off when TX
Q5~8	2SK520(K44)	RX 1st mixer	RF : 30kHz~30MHz, IF : 73.05MHz, LO1 : 73.08~103.05MHz
Q9	RU201	Buffer amplifier	NB
Q10,13	2SK520(K43)	RX 2nd mixer	IF1 : 73.05MHz, IF2 : 8.83MHz, LO2 : 64.22MHz
Q11	3SK131(M)	RX IF amplifier	IF2 : 8.83MHz
Q12	3SK131(M)	RX IF amplifier	IF1 : 73.05MHz
Q14	2SC2412K(S)	IF amplifier	IF2 : 8.83MHz
Q15	2SC2412K(S)	Switching	RF blanking
Q16	2SC3357	Amplifier	LO1

# TS-570D

## DESCRIPTION OF COMPONENTS

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
Q17,18	2SK520(K44)	RF amplifier	Pre-amplifier ( $f < 21.5\text{MHz}$ )
Q20	DTA124EK	Switching	On when pre-amplifier off
Q21	2SC2412K(S)	Waveform shaping	ALC keying
Q22	2SC2412K(S)	Buffer amplifier	Data output (ACC2 terminal)
Q24	FMC2	Switching	CKY control
Q25	3SK131(M)	RF amplifier	Pre-amplifier ( $f \geq 21.5\text{MHz}$ )
Q26	DTA143EK	Switching	On when pre-amplifier on ( $f \geq 21.5\text{MHz}$ )
Q27,30	3SK131(M)	TX 1st mixer	IF1 : 73.05MHz, IF2 : 8.83MHz, LO2 : 64.22MHz
Q28,31	3SK184(R)	TX 2nd mixer	RF : 30kHz~30MHz, IF : 73.05MHz, LO1 : 73.08~103.05MHz
Q29	3SK131(M)	TX if amplifier	IF2 : 8.83MHz
Q35	2SC2954	Drive amplifier	
Q36	2SC2412K(S)	Buffer amplifier	Balanced modulator input
Q37	DTC114EK	Switching	On when FM mode
Q38	2SC2412K(S)	Amplifier	Balanced modulator output
Q39	2SA1037K(R)	Switching	DC/DC converter
Q40,41	2SC2412K(S)	Switching	DC/DC converter
Q42	2SB1188(Q,R)	Switching	External control relay (On when TX)
Q49	2SD1624(S)	Power supply	Ripple filter
Q50	DTC114EK	Switching	Squelch control (ACC2 terminal)
Q51	DTC1437K	Switching	External control relay
Q52	DTC124EK	Switching	RX IF gain changeover (On when gain down)
Q57	DTC114EK	Switching	CAR muting (On when RX)
Q59	FMA5	Switching	On when SSB, FM, CW mode
Q61	FMA5	Switching	On when AM mode and power break
Q64	2SC2412K(S)	Muting	AF mute
Q65	DTC114EK	Muting	Modulation line mute
Q66	DTC114EK	Switching	On when except TX FM mode
Q67	DTC114EK	Switching	Forward waveform voltage time constant changeover
Q68	2SB1188(Q,R)	Switching	TXB
Q69	2SB1188(Q,R)	Switching	RXB
Q70	DTC114EK	Switching	Reflected waveform voltage time constant changeover
Q71	DTC1437K	Switching	On when TX
Q72	FMG3A	Switching	On when RX
Q73	DTA143EK	Switching	On when pre-amplifier on ( $f < 21.5\text{MHz}$ )
Q75	DTC114EK	Switching	RF blanking
Q76	DTC114EK	Switching	On when pre-amplifier off
Q77	DTC114EK	Switching	ATT changeover
Q78	DTC114EK	Switching	External control relay (On when TX)
Q79	DTC114EK	Switching	ALC time constant changeover (On when AM mode)
Q80	DTC124EK	Switching	AGC on/off (On when FM mode and TX)
Q81	DTC114EK	Switching	TX gain changeover
IC1	NJM2904M	DC amplifier	S-meter (Except: FM mode)
IC2	$\mu$ PC1037GR	Balanced modulator	SSB, AM modulation
IC3	BU2090FS	Extended I/O	Serial/parallel conversion (BPF changeover)
IC4	BU4066BCFV	Analog switch	AGC time constant and S-meter output changeover
IC5	NJM2902M	DC amplifier	TX gain, ALC meter and voltage, CAR balance
IC6	M62363FP	DAC	
IC7	KCD10	HIC	FM frequency conversion, detection, S-meter output
IC8	LA4446	AF amplifier	
IC9	BU4066BCFV	Analog switch	Detection output changeover
IC11	TC9174F	Extended I/O	Serial/parallel conversion
IC12	BU4066BCFV	Analog switch	Modulation input changeover
IC13	NJM2904M	DC amplifier	Forward and reflected waveform voltage
IC14	NJU3718G	Extended I/O	Serial/parallel conversion

## DESCRIPTION OF COMPONENTS

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
IC15	KCD11	HIC	SSB, CW, AM detection, s-meter output
IC16	KCC11	HIC	ALC, final protection
IC17	TC7508F	Buffer amplifier	
D1	LFB01	Relay surge absorption	ATT relay
D2.5	RLS245	Lighting surge absorption	
D3.4	V08(G)	Lighting surge absorption	
D6	RN731H	Switching	On when RX, Off when TX
D7	RN731H	Switching	On when RX (From 1.705MHz)
D8	RN731H	Switching	LPF switching (On when $f \leq 1.705\text{MHz}$ )
D9	LFB01	Switching	LPF switching (On when $f \leq 1.705\text{MHz}$ )
D10	RN731H	Switching	BPF switching (On when $1.705\text{MHz} < f \leq 2.5\text{MHz}$ )
D11	LFB01	Switching	BPF switching (On when $1.705\text{MHz} < f \leq 2.5\text{MHz}$ )
D12	RN731H	Switching	BPF switching (On when $2.5\text{MHz} < f < 4.1\text{MHz}$ )
D13	LFB01	Switching	BPF switching (On when $2.5\text{MHz} \leq f < 4.1\text{MHz}$ )
D14	RN731H	Switching	BPF switching (On when $4.1\text{MHz} \leq f < 6.9\text{MHz}$ )
D15	LFB01	Switching	BPF switching (On when $4.1\text{MHz} \leq f < 6.9\text{MHz}$ )
D16	RN731H	Switching	BPF switching (On when $6.9\text{MHz} \leq f < 7.5\text{MHz}$ )
D17	LFB01	Switching	BPF switching (On when $6.9\text{MHz} \leq f < 7.5\text{MHz}$ )
D18	RN731H	Switching	BPF switching (On when $7.5\text{MHz} \leq f < 10.5\text{MHz}$ )
D19	LFB01	Switching	BPF switching (On when $7.5\text{MHz} \leq f < 10.5\text{MHz}$ )
D20	RN731H	Switching	BPF switching (On when $10.5\text{MHz} \leq f < 13.9\text{MHz}$ )
D21	LFB01	Switching	BPF switching (On when $10.5\text{MHz} \leq f < 13.9\text{MHz}$ )
D22	RN731H	Switching	BPF switching (ON when $13.9\text{MHz} \leq f < 14.5\text{MHz}$ )
D23	LFB01	Switching	BPF switching (On when $13.9\text{MHz} \leq f < 14.5\text{MHz}$ )
D24	RN731H	Switching	BPF switching (On when $14.5\text{MHz} \leq f < 21.5\text{MHz}$ )
D25	LFB01	Switching	BPF switching (On when $14.5\text{MHz} \leq f < 21.5\text{MHz}$ )
D26	RN731H	Switching	BPF switching (On when $21.5\text{MHz} \leq f < 30.0\text{MHz}$ )
D27	LFB01	Switching	BPF switching (On when $21.5\text{MHz} \leq f < 30.0\text{MHz}$ )
D30	LFB01	Switching	On when pre-amplifier off
D31	MA110	Switching	AGC time constant
D32	LFB01	Switching	On when pre-amplifier off
D33	DAP236K	Switching	8.83MHz filter
D34	ISS312	Switching	8.83MHz filter TX/RX changeover
D35-37	DAP236K	Switching	8.83MHz filter
D38	LFB01	Switching	8.83MHz filter TX/RX changeover (On when RX)
D39	LFB01	Switching	8.83MHz filter TX/RX changeover (On when TX)
D40	DAP236K	Switching	8.83MHz filter
D41	ISS312	Switching	LO2
D42	DAP236K	Switching	8.83MHz filter
D43	RN731H	Switching	On when pre-amplifier on ( $f < 21.5\text{MHz}$ )
D44	ISS312	Switching	LO1
D45	LFB01	Switching	On when pre-amplifier on ( $f < 21.5\text{MHz}$ )
D46,47	DAP236K	Switching	8.83MHz filter
D48-50	MA110	Reverse current prevention	
D51	LFB01	Switching	On when pre-amplifier on ( $f \geq 21.5\text{MHz}$ )
D52	RN731H	Switching	On when pre-amplifier on ( $f \geq 21.5\text{MHz}$ )
D53,54	DAP236K	Switching	8.83MHz filter
D55	LFB01	Switching	On when TX
D56	RN739D	RF ATT	TX gain control
D57	B30-2001-05	LED	Voltage stability
D58	MA110	Voltage shift	
D61	LFB01	Switching	On when TX
D62	RB751H	Reverse current prevention	
D63	ISS226	Rectification	DC/DC convertor

# TS-570D

## DESCRIPTION OF COMPONENTS

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
D64	02CZ6.2(Y)	Zener diode	Voltage stabilization
D68	LFB01	Relay surge absorption	External control relay
D69,71	RB751H	Reverse current prevention	
D73	02CZ3.3(Y)	Zener diode	Voltage stabilization
D74	02CZ4.7(Y)	Zener diode	Voltage stabilization
D75	MA110	Reverse current prevention	
D76	1SS226	Clipper	On when FM large input
D77	02CZ6.2(Y)	Zener diode	Voltage stabilization
D82	LFB01	Switching	CAR TX/RX changeover (On when TX)
D85	MA110	Reverse current prevention	
D89~92	MA110	Reverse current prevention	
D95	MA110	Reverse current prevention	
D96	02CZ5.1(Y)	Zener diode	Voltage stabilization
D97	DAP236K	Switching	8.83MHz filter
D98	DAN202K	Switching	ON when FM mode and TX
D99,100	02CZ24(Y)	Zener diode	Surge absorption of power supply line
D101,102	MA110	Reverse current prevention	
D103,104	LFB01	Surge absorption	

### TX-RX UNIT (X57-500X-XX) : PLL 0-10 : K,M2 2-71 : E,E2,E3

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
Q500	2SC2714(Y)	X'tel OSC	20MHz
Q501~503	2SC2714(Y)	Buffer amplifier	20MHz
Q504	2SC2412K(S)	amplifier	20MHz
Q505	2SC3722K(R)	Active LPF	Comparison 20kHz (FM 5kHz)
Q506,507	2SC3722K(R)	Active filter	
Q508	DTC1431K	Switching	FM modulation input on/off
Q509	2SK1875(V)	VCO	L02
Q510	2SC2714(Y)	Buffer amplifier	64.22MHz
Q511	2SC2714(Y)	Amplifier	64.22MHz
Q512	2SC2412K(S)	Buffer amplifier	Chopper output (10MHz)
Q513	2SC2712(GR)	Buffer amplifier	D/A buffer
Q514	2SC2412K(S)	Buffer amplifier	
Q515	2SC2412K(S)	Amplifier	CAR
Q516	2SC2412K(S)	Buffer amplifier	CAR
Q517	2SC2412K(S)	Buffer amplifier	Chopper output (5MHz)
Q518	2SC2712(GR)	Buffer amplifier	D/A buffer
Q519	2SC2412K(S)	Buffer amplifier	Mixed input buffer (5.54~6.09MHz)
Q520	2SC2412K(S)	Buffer amplifier	20MHz
Q521	2SC2714(Y)	Tripled circuit	20MHz x 3 = 60MHz
Q522	2SC2714(Y)	Amplifier	PLL IC input (7.5~47.5MHz)
Q523	2SC2412K(S)	Buffer amplifier	PLL IC input (7.5~47.5MHz)
Q524	2SC3722K(R)	Active LPF	Comparison 500kHz
Q525,526	2SC3722K(R)	Active LPF	
Q527	DTC114EK	Switching	VCO A changeover
Q528	2SK1875(V)	VCO A	73.08~84.04MHz
Q529	DTC114EK	Switching	VCO B changeover
Q530	2SK1875(V)	VCO B 84.04~97.04MHz	
Q531	DTC114EK	Switching	VCO C changeover
Q532	2SK1875(V)	VCO C	97.04~103.05MHz
Q533	2SC2714(Y)	Buffer amplifier	Mixer input buffer (73.08~103.05MHz)
Q534	2SC2714(Y)	Amplifier	L01 output (73.08~103.05MHz)

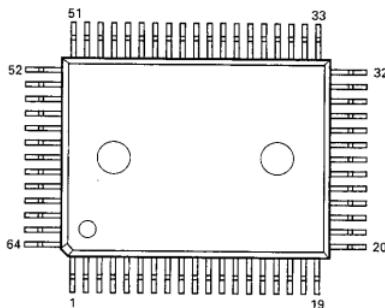
## DESCRIPTION OF COMPONENTS

Ref. No.	Parts No.	Use/Function	Operation/Condition/Compatibility
Q535	2SC2714(Y)	Buffer amplifier	LO1 output (73.08~103.05MHz)
Q543	2SC2714(Y)	Switching	VCO A BPF band changeover
Q544	2SC2412K(R)	Ripple filter	8V
Q545	2SC2714(Y)	Buffer amplifier	Mixer input buffer (65.54~66.04MHz)
Q546	2SC2714(Y)	Amplifier	LO2 output
Q800	2SC2714(Y)	Amplifier	NB
Q801	DTC114EK	Switching	NB on/off
Q802	2SC2714(Y)	Amplifier	NB
Q803	2SC2412K(S)	Amplifier	AGC, NB
Q804	2SC2714(Y)	Amplifier	NB
Q805	2SC2412K(S)	Switching	NB
Q806	2SC2714(Y)	Buffer amplifier	NB
Q807	DTA114EK	Switching	NB
IC500	MB86001PF	PLL	2~5 : Division ratio setting input    6 : 64 22MHz input, 9 : Lock voltage output    11 : Unlock output ('L' : Unlock), 15 : 20MHz input
IC501	F71022	DDS	CAR
IC502	F71022	DDS	LO1 (540~1040kHz)
IC503	UPC1037GR	Mixer	10.0~1.17 = 8.83MHz
IC504	UPC1037GR	Mixer	540~1040kHz → 5.54~6.04MHz
IC505	UPC1686G	Mixer	5.54~6.04MHz → 65.54~66.04MHz
IC506	SN76514N	Mixer	73.05~103.05MHz + 65.54~66.04MHz = 7.5~47.5MHz
IC507	MB86001PF	PLL	2~5 : Division ratio setting input    6 : 7.5~47.5MHz input 8,9 : Lock voltage output    11 : Unlock output ('L' : Unlock) 15 : 20MHz input
IC508	BU4S66	Inverter	
IC510	TC7508F	Buffer amplifier	
IC511	NJM78L08UA	AVR	14S → BV (LO1)
IC900	ADM232LAR	Level shift	RS-232 level shift
D500	1SV269	Vari-cap diode	LO2, VCO
D501	1SV269	Vari-cap diode	LO1, VCO A
D502	RLS135	Switching	LO1, VCO A output
D503	1SV269	Vari-cap diode	LO1, VCO B
D504	RLS135	Switching	LO1, VCO B output
D505	1SV269	Vari-cap diode	LO1, VCO C
D506	RLS135	Switching	LO1, VCO C output
D507	DAP202K	Reverse current prevention	Unlock signal detection
D508,509	MA110	Reverse current prevention	
D800	MA716	RF switch	Noise detection

## SEMICONDUCTOR DATA

## Extended I/O : CXD1095Q (Control Unit IC5)

## ■ Terminal connection diagram



## ■ Terminal function

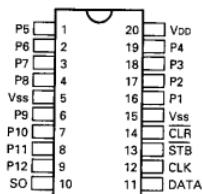
Pin	Name	Port	I/O	Details
1,2	NC			
3	M0	PB1	O	Microphone input switching "H": Normal microphone input, "L": Others
4	M1	PB2	O	Microphone input switching "H": Packet input, "L": Others
5	M2	PB3	O	Microphone input switching "H": DRU-3A input, "L": Others
6	DREN	PB4	O	Enable "H": DRU-3A serial parallel register through, "L": DRU-3A serial/parallel register latch
7	VEN1	PB5	O	Enable "L": TX-RX unit DAC register through, "H": TX-RX unit DAC register latch
8	REN1	PB6	O	Enable "H": TX-RX unit serial/parallel register through, "L": TX-RX unit serial/parallel register latch
9	REN2	PB7	O	Enable "L": TX-RX unit serial/parallel register through, "H": TX-RX unit serial/parallel register latch
10	Vss			GND
11	TYPE8	PC0	I	Destination "L": 50W, "H": 100W
12	TYPE9	PC1	I	Destination "L": Not general cover in TX, "H": General cover in TX
13	50WSW	PC2	I	Setting check "L": Without restriction, "H": Restriction on 50W
14~17	K3-K6	PC3~PC6	I	Key matrix
18	ULK	PC7	I	State check "L": PLL unlock, "H": Others, normal
19	NC			
20	PEN1	PD0	O	Enable "H": PLL1 register through, "L": PLL1 register latch
21	PEN2	PD1	O	Enable "H": PLL2 register through, "L": PLL2 register latch
22	DEN1	PD2	O	Enable "H": DDS1 register through, "L": DDS1 register latch
23	DEN2	PD3	O	Enable "H": DDS2 register through, "L": DDS2 register latch
24	BLANK	PD4	O	LCD driver control "H": Display goes off
25	Vss			GND
26	Vdd			5V
27	LEN1	PD5	O	Enable "H": LCD1 driver register through, "L": LCD1 driver register latch
28	LEN2	PD6	O	Enable "H": LCD2 driver register through, "L": LCD2 driver register latch
29	LEN3	PD7	O	Enable "H": LCD3 driver register through, "L": LCD3 driver register latch
30~32	IAD0~IAD2	D0~D2	I/O	Pseudo bus
33,34	NC			
35~39	IAD3~IAD7	D3~D7	I/O	Pseudo bus
40	CLR		I	
41	ODEN		I	
42	Vss			GND
43	WR		I	
44	RD		I	

## SEMICONDUCTOR DATA

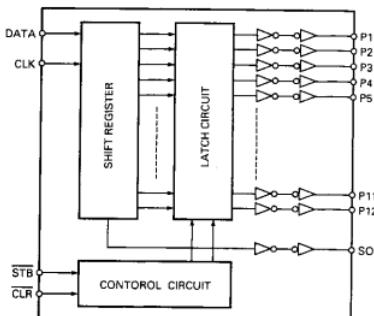
Pin	Name	Port	I/O	Details
45		CS	I	
46~48	IAD8~IAD10	A0~A2	I/O	Pseudo bus
49	TT0	PE0	O	External AT control "H": AT through request, "L": Others
50	TS0	PE1	O	External AT control "H": AT tuning request, "L": Others
51	NC			
52	TS1	PE2	I	External AT control "H": AT through end, "L": Others
53	TT1	PE3	I	External AT control "H": AT tuning end, "L": Others
54~56	TYPE0~TYPE2	PA0~PA2	I	Destination Unit destination setting
57		Vss		GND
58		Vdd		5V
59,60	TYPE3,TYPE4	PA3,PA4	I	Destination Unit destination setting
61	TYPE5	PA5	I	Destination Unit destination setting (Reserve)
62	TYPE6	PA6	I	Destination "L": 50MHz band installed, "H": 60MHz band not installed
63	TYPE7	PA7	I	Destination Unit destination setting (Reserve)
64	FEN	PB0	O	Enable "H": FFA unit serial/parallel register through, "L": FFA unit serial/parallel register latch

## Decoder : NJU3714G (Final Unit IC6)

## ■ Terminal connection diagram

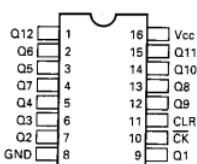


## ■ Block diagram



## Clock Divider : TC74HC4040AF (Control Unit IC508)

## ■ Terminal connection diagram

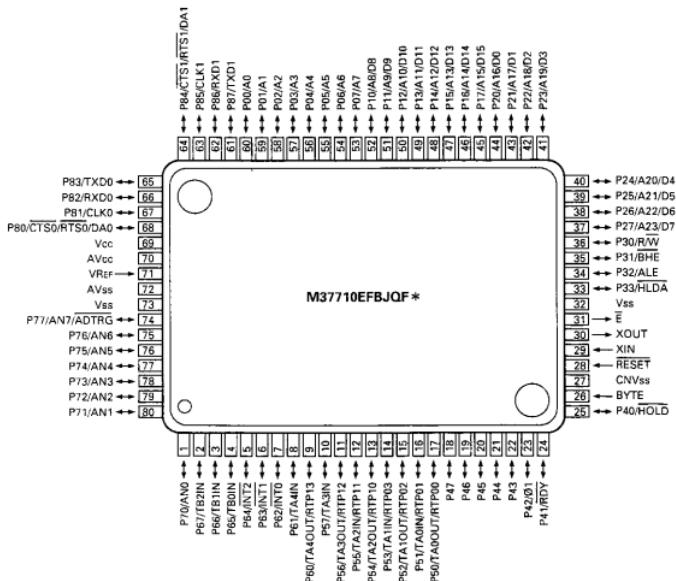


# TS-570D

## SEMICONDUCTOR DATA

CPU : M37710EFBJQF\* (Control Unit IC6)

### ■ Terminal connection diagram



### ■ Terminal function

Pin	Name	Port	I/O	Details
1	AN0	AN0	I	A/D Analog input switched by ADC1 and ADC2, IC7 x data input.
2	RENB	TB2in	I	Encoder Edge interrupt, Rotation direction check
3	RENA	TB1in	I	Encoder Edge interrupt, Rotation direction check
4	CENA	TB0in	I	Encoder Edge interrupt
5	PSW	INT2	I	interrupt "H" : Power switch interrupt, "L" : Normal
6	BOVR	INT1	I	interrupt "L" : Overvoltage interrupt, "L→H" : Power restore interrupt, "H" : Normal
7	BKC	INT0	I	interrupt "L" : Voltage drop interrupt, "L→H" : Power restore interrupt, "H" : Normal
8	MENB	TA4in	I	Encoder Main encoder input Two-phase pulse signal processing
9	MENA	TA4out	I	Encoder Main encoder input Two-phase pulse signal processing
10	CENB	P57	I	Encoder Click encoder input Rotation direction check
11	PCK	P56	O	Clock PLL/DDS serial clock
12	PDA	P55	O	Data PLL/DDS serial data
13	CLOCK	P54	I/O	Clock Common serial clock "L" : VS-3 is installed, "H" : Not installed
14	DATA	P53	O	Data Common serial data
15	SPD	TA1out	O	Electric key control PWM with 1/10 the frequency of WPM
16	VCS	P51	O	Chip select "L" : VS-3 is selected, "L→H" : Voice synthesis start, "H" : Others, normal
17	BEEP	TA4out	O	Beep control "H" : Beep output, "L" : Others, normal
18	CKY	P47	O	Transmitter circuit control "H" : Transmission output, "L" : Others
19	ABK	P46	O	Receiver circuit control "H" : DSP AF mute, "L" : Others
20	TXC	P45	O	Transmitter circuit control "H" : In transmission mode, "L" : Others

## SEMICONDUCTOR DATA

Pin	Name	Port	I/O	Details
21	RXK	P44	O	Receiver circuit control 'H' : DSP signal mute, 'L' : Others
22	NAR	P43	I	State check 'H' : VS-3 serial latch idle, 'L' : Others
23	SCL	P42	O	Clock EEPROM serial clock
24	SDA	P41	I/O	Data EEPROM serial data
25	EOM	P40	I	State check 'H' : DRU-3A message playback end, 'L' : Others
26	BYTE	I	I	Bus width switching input
27	CNVss	I	I	CNVss
28	RESET	I	I	Reset input
29	Xin	I	I	Clock input
30	Xout	O	I	Clock output
31	E	O	I	Enable output
32	Vss		I	Power input
33	SCK	P33	O	Clock Electric key microcomputer serial data clock
34	PKS	P32	I	Transmission request 'L' : Packet transmission request, 'H' : Normal
35	KYS	P31	I	Installation check 'H' : Paddle/electric key installed, 'L' : Others
36	DSPEN	P30	O	Bus control 'L' (H→L) : Data processing request, 'H' : Others, normal
37	RESET	P27	O	Reset 'L' : DSP Electric key, Expansion I/O, VS-3 reset, 'H' : Others, normal
38	IACK	P26	O	Bus control 'L' : Address latch, 'H' : Address through
39	IAL	P25	I	Bus control
40	PSC	P24	O	'H' : DSP chip select can be changed, 'L' : DSP chip select cannot be changed
41	IOCS	P23	O	Power control 'H' : Power ON, 'H'Z' : Power OFF
42	IS	P22	O	Chip select 'L' : Expansion I/O is selected, 'H' : Expansion I/O is not selected
43	IWR	P21	O	Chip select 'L' : DSP is selected, 'H' : DSP is not selected
44	IRD	P20	O	Bus control 'L' : Data writing, 'H' : When data is not written
45-49	IAD15~IAD11	P17~P13	I/O	Bus control 'L' : Data reading, 'H' : When data is not read
50-52	IAD10~IAD8	P12~P10	I/O	Pseudo bus Address/data multiplex when the DSP is accessed, Not used during expansion I/O access (The previous state is maintained)
53-60	IAD7~IAD0	P07~P00	I/O	Pseudo bus Address bus during expansion I/O access Address bus during expansion I/O access
61	KEY	P87	I	Data bus during expansion I/O access
62	MEA	P88	I	Transmission request 'L' : Transmission request from the keyer, 'H' : Normal
63	BSY	P85	I	Electric key control 'H' : Electric keyer microcomputer message playback, 'L' : Others, normal
64	SS	P84	I	Electric key control 'H' : Electric keyer microcomputer data cannot be set, 'L' : Others, normal
65	TXD	TXDO	O	Transmission request 'L' : Transmission request by the microphone PTT, 'H' : Normal
66	RXD	RXDO	I	UART data
67	RTS	P81	O	UART control
68	CTS	CTSO	I	UART control
69	Vcc		I	Power input
70	AVcc		I	Analog power input
71	Vref		I	Reference voltage input
72	AVss		I	Analog power input
73	Vss		I	Power input
74	AMD	P77	I	AT control check Amplitude difference check, 'L' : Request to reduce capacity, 'H' : Request to increase capacity
75	PHD	P76	I	AT control check Phase difference check, 'L' : Request to reduce capacity, 'H' : Request to increase capacity
76,77	ADC2,ADC1	P75,P74	O	Signal switching Multiplexer switching
78	AN3	AN3	I	A/D Analog input switched by ADC1 and ADC2, IC8 y data input
79	AN2	AN2	I	A/D Analog input switched by ADC1 and ADC2, IC8 x data input
80	AN1	AN1	I	A/D Analog input switched by ADC1 and ADC2, IC7 y data input

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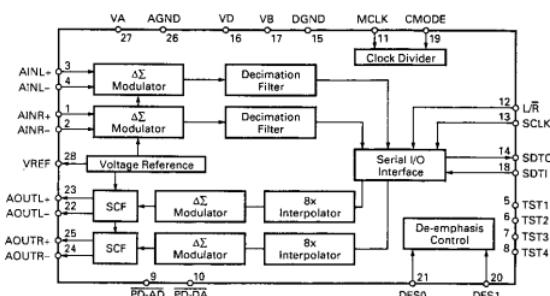
## SEMICONDUCTOR DATA

### A/D, D/A Converter : AK4506-VS (Control Unit IC504)

#### ■ Terminal connection diagram

AINR+	1	VREF
AINR-	2	VA
AINL+	3	AGND
AINL-	4	AOUTR+
TST1	5	AOUTL+
TST2	6	AOUTL-
TST3	7	DFS0
TST4	8	DEFS1
PD-AD	9	CMODE
PD-DA	10	SOTI
MCLK	11	VB
L/R	12	VD
SCLK	13	DGND
SDTO	14	

#### ■ Block diagram



#### ■ Terminal function

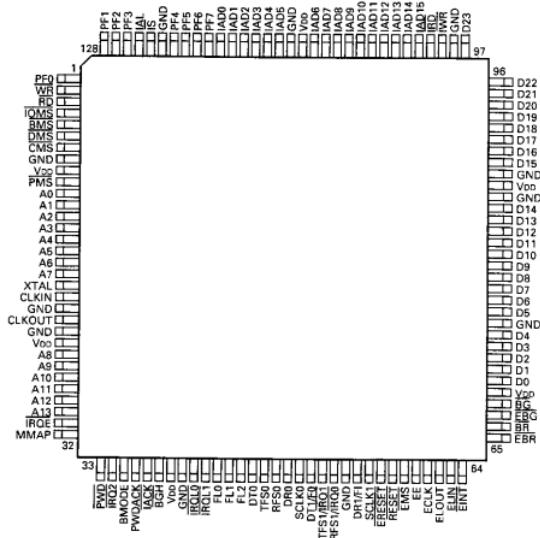
Pin No.	Name	I/O	Function
1	AINR+	I	Right-channel analog positive input pin
2	AINR-	I	Right-channel analog negative input pin
3	AINL+	I	Left-channel analog positive input pin
4	AINL-	I	Left-channel analog negative input pin
5	TST1	I	Test pin (Pulldown pin)
6	TST2	I	Open or connect to AGND.
7	TST3	O	Test pin
8	TST4	O	Open
9	PD AD	I	Power down pin. PD AD: ADC power down pin, PD DA: DAC power down pin
10	PD DA	I	When each pin is low, the corresponding part enters the power down mode. When the power turns on, resetting and calibration must be carried out. Resetting is performed by making both PD AD and PD DA low.
11	MCLK	I	Master clock input pin.
12	L/R	I	Input/output channel select pin. The fs clock is input. High: Left channel; Low: Right channel
13	SCLK	I	Serial data clock pin. One bit of data is output at a falling edge of the signal at this pin.
14	SDTO	O	Serial data output pin. Data is two's complement. The MSB is output first, and 16 bits are output by left justification. Goes low after 16 bits are output. Low when the power is down (PD AD: Low).
15	DGND	-	Digital unit ground pin
16	VD	-	Digital unit power supply pin (+5V)
17	VB	-	Silicon PCB power supply pin (+5V)
18	SDTI	I	Serial data input pin. Data is two's complement. The MSB is output first, and 16 bits are output by right justification.
19	CMODE	I	Master clock select pin (Pulldown pin) Low : MCLK=256fs, High : MCLK=384fs
20	DFS1	I	Deemphasis frequency select pin
21	DFS0	I	Supports three frequencies.
22	AOUTL-	O	Left-channel analog negative output pin
23	AOUTL+	O	Left-channel analog positive output pin
24	AOUTR-	O	Right-channel analog negative output pin
25	AOUTR+	O	Right-channel analog positive output pin
26	AGND	-	Analog ground pin
27	VA	-	Analog power supply pin (+5V)
28	VREF	O	Reference voltage output pin VA-3.0V Output according to the VA reference. The 10μF electrolytic capacitor and 0.1μF ceramic capacitor are connected between VREF and VA.

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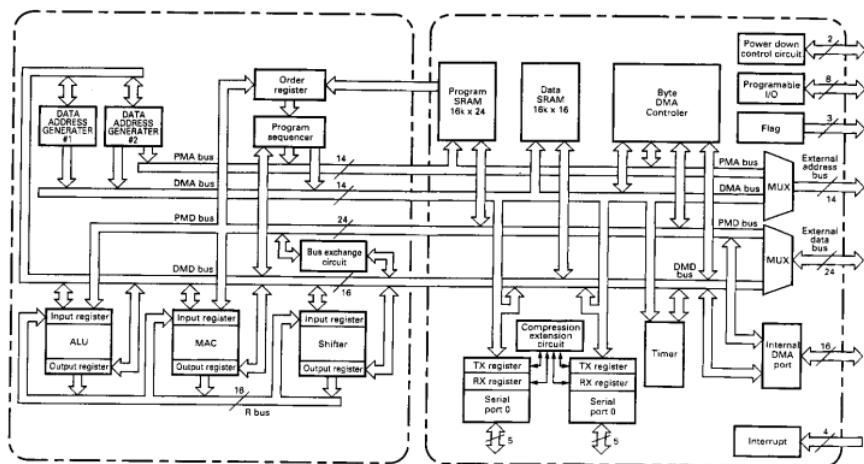
## SEMICONDUCTOR DATA

DSP : ADSP2181KS-115 (Control Unit |C507)

#### ■ Terminal connection diagram



## ■ Block diagram

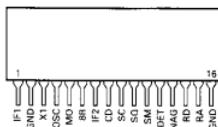


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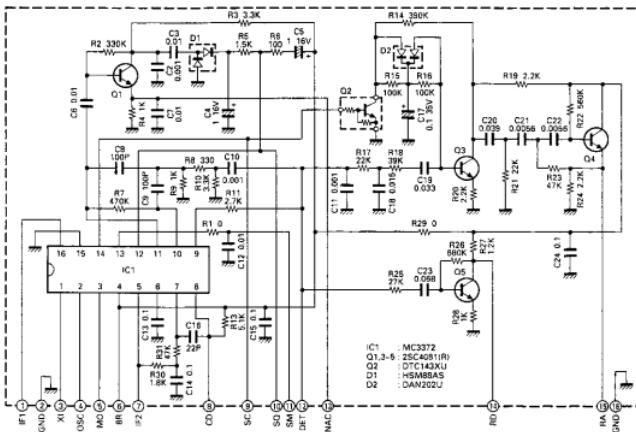
## SEMICONDUCTOR DATA

### HIC : KCD10 (TX-RX Unit IC7)

#### ■ Terminal connection diagram

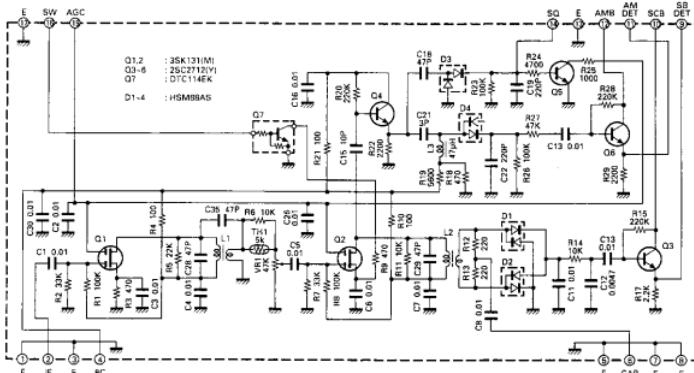


#### ■ Circuit diagram

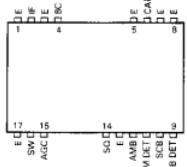


### HIC : KCD11 (TX-RX Unit IC15)

#### ■ Circuit diagram



#### ■ Terminal connection diagram

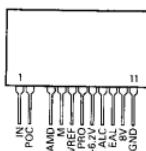


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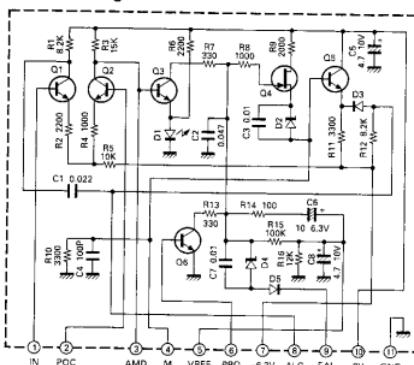
## SEMICONDUCTOR DATA

## HIC : KCC11 (TX-RX Unit IC16)

## ■ Terminal connection diagram



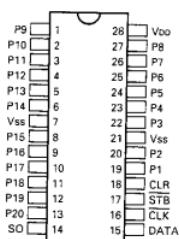
## ■ Circuit diagram



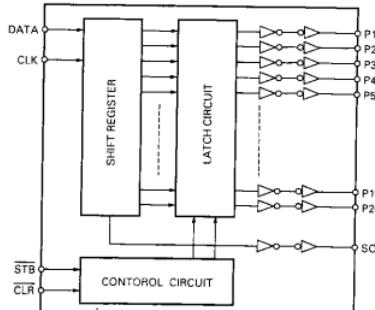
Q1-3,5,6 : 2SC2712(Y)  
 Q4 : 2SA1081(Y) or (YR)  
 R1 : R03.0M(B2)  
 R2 : R03.0M(B2)  
 R3 : R03.0M(B2)  
 R4 : R03.0M(B2)  
 R5 : R03.0M(B2)  
 R6 : R03.0M(B2)  
 R7 : R03.0M(B2)  
 R8 : R03.0M(B2)  
 R9 : R03.0M(B2)  
 R10 : R03.0M(B2)  
 R11 : R03.0M(B2)  
 R12 : R03.0M(B2)

## Extended I/O : NJU3718G (TX-RX Unit IC14)

## ■ Terminal connection diagram



## ■ Block diagram



## ■ Terminal function

Pin No.	Symbol	Function
1-6	P9-P14	Parallel convert data output
7	V <sub>SS</sub>	GND
8-13	P15-P20	Parallel convert data output
14	SO	Serial data output
15	DATA	Serial data input
16	CLK	Clock signal input
17	STB	Strobe signal input
18	CLR	Clear signal input
19,20	P1,P2	Parallel convert data output
21	V <sub>SS</sub>	GND
22-27	P3-P8	Parallel convert data output
28	V <sub>DD</sub>	Power supply (4.5-5.5V)

# TS-570D

## PARTS LSIT

\*New Parts.  $\Delta$  indicates safety critical components.

Parts without **Parts No.** are not supplied.

Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.

Teile ohne **Parts No.** werden nicht geliefert.

### TS-570D

#### FINAL UNIT (X45-353X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti- nation	Ref. No.	Address	New parts	Parts No.	Description	Desti- nation
<b>TS-570D</b>											
1	2A	*	A01-2117-02	METALLIC CABINET(UPPER)		54	1D		G13-1511-04	CUSHION (FINAL)	
2	2D	*	A01-2118-02	METALLIC CABINET(LOWER)		55	2E	*	H10-6602-02	FOAM PACKING MOLD (P)	
3	3A	*	A62-0459-03	PANEL ASSY		56	2F	*	H10-6603-02	FOAM PACKING MOLD (R)	
4	2D	B09-0355-05	CAP (COM)	E,E2,E3		57	2F		H20-1425-03	PROTECTION COVER	
5	2B	*	B38-0765-05	LCD ASSY	K	58	1E		H25-0029-04	BAG (FUSE,DIN)	
6	2C	B42-3243-04	S/NOLABEL		59	2E		H25-0079-04	BAG (MIC)		
7	2C	B42-3395-04	LABEL (FCC)		60	1E		H25-0096-04	BAG (LINE FILTER,BAND)	E,E2,E3	
8	3E	B44-2163-04	UPC CODE LABEL		61	2F	*	H25-0768-04	BAG (DC CORD)		
9	1F	B46-0310-03	WARRANTY CARD	E,E2,E3	62	3F	*	H52-0775-02	ITEM CARTON CASE		
9	1F	B46-0410-40	WARRANTY CARD	ACSY			*	H52-0569-03	OUTER CARTON CASE		
10	1F	*	B52-0608-00	SCHEMATIC DIAGRAM	ACSY	63	3D	J02-0440-04	FOOT (F)		
21	1F	B59-1034-00	INSTRUCTION CARD	ACSY	64	2A,2C	J02-0441-05	FOOT (SIDE)			
11	1E	*	B62-0623-00	INSTRUCTION MANUAL(ENGLISH)	E,E2,E3	65	2C,3D	J02-0442-04	FOOT (F)		
12	1F	*	B62-0624-00	INSTRUCTION MANUAL(GERMAN)	E,E2	66	3D	J02-0475-05	FOOT (BACK)		
13	1F	*	B62-0625-00	INSTRUCTION MANUAL(SPANISH)	E2	67	1C	J19-1458-05	HOLDER (TX-RX)		
14	1F	*	B62-0626-00	INSTRUCTION MANUAL(FRENCH)	E,E2,E3	68	3B	J31-0141-04	COLLAR (MIC)		
15	1F	*	B62-0650-00	INSTRUCTION MANUAL(ITALIAN)	E	69	1E	J61-0307-05	BAND (RAT-BP AT)		
16	1F	*	B62-0651-00	INSTRUCTION MANUAL(NETHERLAND)	E3	70	2B	K01-0420-05	HANDLE ASSY		
17	2C	*	B72-0159-04	MODEL NAME PLATE	K,M2	71	3A	*	K21-1103-03	KNOB (MAIN)	
17	2C	*	B72-1061-04	MODEL NAME PLATE	E,E2,E3	72	3B	*	K29-5095-03	KEYTOP (DSP)	
18	2D	E04-0167-05	RF COAXIAL CABLE RECEPTACLE		73	3A	*	K29-5096-03	KEYTOP (POWER)		
19	1E	E07-0751-05	DIN PLUG (7 PIN)	ACSY	74	3B	*	K29-5097-03	KEYTOP (10 KEY)		
20	1E	E07-1351-05	DIN PUUG (13 PIN)	ACSY	75	3A	*	K29-5098-04	KNOB (IN)		
23	2D	E23-0892-04	EARTH LUG (ANT)		76	3A	*	K29-5099-04	KNOB (OUT)		
24	1E	E30-3157-15	DC CORD	ACSY	77	3A	*	K28-5100-03	KNOB (RT MULTI)		
25	2B	E37-0499-05	FLAT CABLE (26PIN)		78	3B	*	K29-5110-03	KEYTOP (FUNC)		
26	1C	E37-0508-05	LEAD WIRE WITH CONNE. CTOR (2P)		79	3A	*	K29-5111-04	KNOB RING (MAIN)		
27	2B	E37-0532-05	FLAT CABLE		83			L79-1408-05	LINE FILTER	E,E2,E3	
28	2B	*	E37-0589-05	FLAT CABLE (16P)		80	2C	N15-1040-46	FLAT WASHER (GND)		
29	1B,1C	*	E37-0590-05	FLAT CABLE (16P)		A	2B	N32-2906-46	FLAT HEAD MACHIN SCREW (LCD)		
30	1C	*	E37-0591-05	FLAT CABLE (16P)		B	2B,3B	N32-3006-46	FLAT HEAD MACHIN SCREW (SLIP)		
31	1C	*	E37-0641-05	LEAD WIRE WITH MINIPIN PLUG		C	1A,3D	N33-3006-45	OVAL HEAD MACHIN SCREW (CASE)		
32	1B	*	E37-0642-05	LEAD WIRE WITH MINIPIN PLUG		D	10,2D	*	N33-3020-45	OVAL HEAD MACHIN SCREW (FAN)	
33	2B	*	E37-0843-05	LEAD WIRE WITH CONNECTOR (PHONE)		E	2C	N35-4010-46	BINDING HEAD MACHINE SCREW		
34	2B	*	E37-0844-05	LEAD WIRE WITH CONNECTOR		F	1C	N67-3010-46	PAN HEAD SEMI SCREW (FINAL)		
35	1C	*	E37-0845-05	LEAD WIRE WITH CONNECTOR (6P)		G	1D	N67-3005-46	BRAZER HEAD TAP/TITE SCREW		
36	1E	F05-2531-05	FUSE(BLADE,25A/32V)	ACSY	H	18,1C	N67-3008-46	BRAZER HEAD TAP/TITE SCREW			
37	1E	F06-4027-05	FUSE(BLADE,4A/32V)	ACSY	J	3A	N69-3005-45	TP HEAD MACHIN SCREW			
38	2C	F09-0436-15	FAN MOTOR					S50-1406-05	TACT SWITCH (MIC PTT)		
	*	F09-0453-05	CAP (ACC2)								
		F29-0014-05	INSULATING BUSH								
					E,E2,E3						
41	2B	G02-0575-04	FLAT SPRING (TX-RX IC)								
42	1C	G02-0709-04	FLAT SPRING (AVR)								
43	3A	*	G02-0800-04	FLAT SPRING (MAIN KNOB)							
44	2A,2D	G10-0676-04	FIBROUS SHEET (CASE)								
		G10-0687-04	FIBROUS SHEET (CASE)								
46	3A	G10-0732-04	FIBROUS SHEET								
47	2C	G10-0787-04	FIBROUS SHEET (PLU)								
48	2D	G13-0631-04	CUSHION								
		G13-0872-04	CUSHION (DRU-3A)								
		G13-1327-04	CUSHION								
53	1D	G13-1498-04	CUSHION (SP)								

#### FINAL UNIT (X45-353X-XX) 0-10 : K,M2 2-71 : E,E2,E3

C1			CX7FB1H103	CHIP C	0.010UF	K	
C2			CX7FB1E104K	CHIP C	0.10UF	K	
C3			CX7FB1H102K	CHIP C	1.00PF	K	
C4			CX7FS1H1821J	CHIP C	820PF	J	
C5			CX7FB1H103K	CHIP C	0.010UF	K	
C6			CX7FB1E104K	CHIP C	0.10UF	K	
C7,8			CX7FB1H102K	CHIP C	1.00PF	K	
C9,10			CX7FB1E104K	CHIP C	0.10UF	K	

## PARTS LIST

FINAL UNIT (X45-353X-XX)													
Ref. No.	Address	New parts	Parts No.	Description		Desti- nation	Ref. No.	Address	New parts	Parts No.	Description		Desti- nation
C11			CE04EW1E100M	ELECTRO	10UF	25WV	C105			DM9302H621J	MICA	820PF	J
C12,13			CK73FB1H103K	CHIP C	0.010UF	K	C106			CK73FB1H103K	CHIP C	0.010UF	K
C14			CK73FB1E104K	CHIP C	0.10UF	K	C107			CC73FS1H14561J	CHIP C	560PF	J
C15			CK73FB1H102K	CHIP C	1000PF	K	C201			CC45FSL2H651J	CERAMIC	560PF	J
C16			C90-2193-05	ELECTRO	39UF	25WV	C202			CC45FSL2H121J	CERAMIC	120PF	J
C17			CE04EW1E100M	ELECTRO	10UF	25WV	C203			CC45FSL2H1331J	CERAMIC	330PF	J
C18			CK73FB1E104K	CHIP C	0.10UF	K	C204			CC45FSL2H1391J	CERAMIC	390PF	J
C19			CC45FSL2H221J	CERAMIC	220PF	J	C205			CC45FSL2H2471J	CERAMIC	470PF	J
C20			CK73FB1E104K	CHIP C	0.10UF	K	C206-Z08			CC45FSL2H151J	CERAMIC	150PF	J
C21			CK73FB1H1472K	CHIP C	4700PF	K	C209			CK73FB1H103K	CHIP C	0.010UF	K
C22			CM73F2H102J	CHIP C	1000PF	J	C301			CC45FSL2H271J	CERAMIC	270PF	J
C23,24			C91-1004-05	CHIP C	6900PF	J	C302			CC45FSL2H151J	CERAMIC	150PF	J
C25			CK73FB1E104K	CHIP C	0.10UF	K	C303			CC45FSL2H271J	CERAMIC	270PF	J
C26			CK73FB1H102K	CHIP C	1000PF	K	C304			CC45FSL2H221J	CERAMIC	220PF	J
C27			CK73FB1H103K	CHIP C	0.010UF	K	C305			CC45FSL2H686UJ	CERAMIC	686PF	J
-28			CM73F2H2661J	CHIP C	560PF	J	C306			CC45FSL2H271J	CERAMIC	270PF	J
			CK73FB1E104K	CHIP C	0.10UF	K	C307			CK73FB1H103K	CHIP C	0.010UF	K
-30			CC45FSL2H151J	CERAMIC	150PF	J	C401			CC45FSL2H181J	CERAMIC	180PF	J
C31			CK73FB1E104K	CHIP C	0.10UF	K	C402			CC45FSL2H470J	CERAMIC	47PF	J
C32			CM73F2H122J	CHIP C	1200PF	J	C403			CC45FSL2H181J	CERAMIC	270PF	J
C33			C90-2194-05	ELECTRO	220UF	25WV	C404,405			CC45FSL2H151J	CERAMIC	150PF	J
C34			CK73FB1E104K	CHIP C	0.10UF	K	C406			CK73FB1H103K	CHIP C	0.010UF	K
C35			CC73FSL1H221J	CHIP C	220PF	J	C407			CC45FSL2H181J	CERAMIC	180PF	J
C36			CC73FC1H101J	CHIP C	100PF	J	C408			CC45FSL2H399U	CERAMIC	39PF	J
C37			CC45FC1H1030C	CERAMIC	3.0PF	C	C409			CC45FSL2H181J	CERAMIC	180PF	J
C38			CC73FC1H1560J	CHIP C	56PF	J	C409			CC45FSL2H331J	CERAMIC	330PF	J
C39			CC73FSL1H221J	CHIP C	220PF	J	C410,411			CC45FSL2H151J	CERAMIC	150PF	J
C40-42			CK73FB1H103K	CHIP C	0.010UF	K	C412			CK73FB1H103K	CHIP C	0.010UF	K
C43			CK73FC1H1060J	CHIP C	68PF	J	C413	*		CC45FSL2H050C	CERAMIC	5.0PF	C
C44			CC73FC1H121J	CHIP C	120PF	J	C415			CC45FSL2H121J	CERAMIC	120PF	J
C45			CC73FC1H1560J	CHIP C	56PF	J	C416	*		CC45FSL2H050C	CERAMIC	5.0PF	C
C46			C91-1075-05	CERAMIC	470PF	K	C501			CC45FSL2H101J	CERAMIC	100PF	J
C47			CK73FB1H103K	CHIP C	0.010UF	K	C502			CC45FSL2H470J	CERAMIC	47PF	J
C48			CK73FB1E104K	CHIP C	0.10UF	K	C503			CC45FSL2H221J	CERAMIC	220PF	J
C49			CE04EW1E102M	ELECTRO	1000UF	25WV	C504			CC45FSL2H150J	CERAMIC	15PF	J
C50-52			CK73FB1H103K	CHIP C	0.010UF	K	C505			CC45FSL2H121J	CERAMIC	120PF	J
C53			CK73FB1E104K	CHIP C	0.10UF	K	C506			CK73FB1H103K	CHIP C	0.010UF	K
			CK73FB1H102K	CHIP C	1000PF	J	C507			CC45FSL2H880J	CERAMIC	68PF	J
-57			CK73FB1E104K	CHIP C	0.10UF	K	C508			CC45FSL2H470J	CERAMIC	47PF	J
C60			CK73FB1E104K	CHIP C	0.10UF	K	C509			CC45FSL2H121J	CERAMIC	120PF	J
C81,62			CE04EW1E100M	ELECTRO	10UF	25WV	C504			CC45FSL2H100D	CERAMIC	10PF	D
C63			CE04EW1E102M	ELECTRO	1000UF	25WV	C505			CC45FSL2H102J	CERAMIC	12PF	J
C64,65			CK73FB1E104K	CHIP C	0.10UF	K	C506			CC45FSL2H980J	CERAMIC	68PF	J
C66			CK73FB1H103K	CHIP C	0.010UF	K	C507			CK73FB1H103K	CHIP C	0.010UF	K
C67			CE04EW1E1471M	ELECTRO	470UF	25WV	C508			CM9302H1560J	MICA	56PF	J
C88,74			CK73FB1H103K	CHIP C	0.010UF	K	C501-504	*		CK73FB1H103K	CHIP C	0.010UF	K
C75			CK73FB1H102K	CHIP C	1000PF	K	C510	*		CK73FB1H103K	CHIP C	0.010UF	K
C76			CE04EW1A470M	ELECTRO	47UF	10WV	C505	*		CK73FB1H103K	CHIP C	0.010UF	K
C77,78			CK73FB1H103K	CHIP C	0.010UF	K	C506	*		CK73FB1H103K	CHIP C	0.010UF	K
C79,80			CK73FB1H102K	CHIP C	1000PF	K	C507	*		CK73FB1H103K	CHIP C	0.010UF	K
C81-85			CK73FB1H103K	CHIP C	0.010UF	K	C508-515	*		CK73FB1H103K	CHIP C	0.010UF	K
C86-94			CK73FB1H102K	CHIP C	1000PF	K	C516	*		CK73FB1H103K	CHIP C	0.010UF	K
C95,96			CC45FSL2H221J	CERAMIC	220PF	J	C517	*		CK73FB1H103K	CHIP C	0.010UF	K
C97			CK73FB1E104K	CHIP C	0.10UF	K	C518-822	*		CK73FB1H103K	CHIP C	0.010UF	K
C99			CE04EW1E100M	ELECTRO	10UF	25WV	C523-869	*		CK73FB1H103K	CHIP C	0.010UF	K
C100			CK73FB1E104K	CHIP C	0.10UF	K	C530-869	*		CK73FB1H103K	CHIP C	0.010UF	K
C101			CM9302H1202J	MICA	820PF	J	C570-873	*		CK73FB1H103K	CHIP C	0.010UF	K
C102			CC45FSL2H1561J	CERAMIC	560PF	J	C574,875	*		CK73FB1H103K	CHIP C	0.010UF	K
C103			CM9302H1202J	MICA	1000PF	J	C576-878	*		CK73FB1H103K	CHIP C	0.010UF	K
C104			CC45FSL2H181J	CERAMIC	180PF	J	C590			CK73FB1H103K	CHIP C	0.010UF	K

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## PARTS LSIT

FINAL UNIT (X45-353X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C903			CE04KV1H470M	ELECTRO	47uF 50VW	L501			1280-05	COIL (6.5T)	
C951-954			CK73EF1C105Z	CHIP C	1.0uF Z	L502			1279-05	COIL (7.5T)	
TC1			C05-0030-15	TRIMMER CAPACITOR	20PF	L503			1015-48	SMALL FIXED INDUCTOR (100UH)	
TC2			C05-0031-15	TRIMMER CAPACITOR	10PF	L501			1282-05	COIL (4.5T)	
CN1			E04-0191-05	RF COAXIAL CABLE RECEPTACLE		L502			1281-05	COIL (5.5T)	
CN2			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		L803			1015-48	SMALL FIXED INDUCTOR (100UH)	
CN3,4			E40-5764-05	PIN CONNECTOR FOR INSIDE		L801,802			1264-05	TRIODAL COIL	
CN5			E40-3246-05	PIN CONNECTOR FOR INSIDE (FAN)		L803			1263-05	TRIODAL COIL	
CN6			E40-3240-05	PIN CONNECTOR FOR INSIDE (SP)		L804	*	*	14476-05	COIL (7.5T)	
						L805-807	*	*	14474-05	COIL (1.5T)	
CNB			E23-0898-05	TERMINAL							
CN10-12			E23-0899-05	TERMINAL		L808	*	*	14489-05	COIL (0.5T)	
CN13			E40-3237-05	PIN CONNECTOR FOR INSIDE (SP)		L809	*	*	14469-05	COIL (3.5T)	
CN14,15			E04-0194-05	RF COAXIAL CABLE RECEPTACLE		L810-832			1015-48	SMALL FIXED INDUCTOR (100UH)	
CN80*			E40-3300-05	PIN CONNECTOR FOR INSIDE (PHONE)		T101			0104-05	TRIODAL CORE	
						T102			0104-05	TRIODAL CORE	
J801			E11-0438-05	PHONE JACK							
W1	1C	*	E37-0594-05	LEAD WIRE WITH CONNECTOR		L701			0107-05	TRIODAL CORE	
W4	1C		E37-0198-05	LEAD WIRE WITH MINIPIN PLUG		L702			0107-05	TRIODAL CORE	
F1			F53-0093-05	FUSE (5A/125V)		L701			0108-05	TRIODAL CORE	
F2			F06-4027-05	FUSE BLADE (4A/32V)		L702			0108-05	TRIODAL CORE	E.E2.E3
A1,2			J13-0410-05	FUSE HOLDER		T401			0108-05	TRIODAL CORE	E.E2.E3
L2			L40-1015-48	SMALL FIXED INDUCTOR (100UH)		T402			0108-05	TRIODAL CORE	
L3			L40-3395-48	SMALL FIXED INDUCTOR (3.0UH)		T404			0108-05	TRIODAL CORE	
L4			L39-0481-05	TRIODAL COIL		T405			0108-05	TRIODAL CORE	
L5-7			L33-0699-05	CHOKE COIL		T801,802			0119-05	TRIODAL CORE	
L8			L39-1257-05	TRIODAL COIL		T803			0119-05	TRIODAL CORE	
L9			L33-0617-15	CHOKE COIL		R1			RK73FB2A331J	CHIP R 330 J 1/10W	
L10			L40-4795-48	SMALL FIXED INDUCTOR (4.7UH)		R2			RK73FB2A681J	CHIP R 680 J 1/10W	
L11,12			L33-0699-05	CHOKE COIL		R3			RK73FB2A101J	CHIP R 100 J 1/10W	
L13			L39-0482-05	TRIODAL COIL		R4.5			RK73FB2A9R8J	CHIP R 6.8 J 1/10W	
L14			L33-0617-15	CHOKE COIL		R6			R92-1221-05	CHIP R 82 J 1/4W	
L15			L33-0651-05	CHOKE COIL		R7			R92-1242-05	CHIP R 6.8 J 1/4W	
L16			L39-1252-15	TRIODAL COIL		R8			R92-1243-05	CHIP R 8.2 J 1/4W	
L17			L40-2221-33	SMALL FIXED INDUCTOR		R9			RK73FB2A331J	CHIP R 330 J 1/10W	
L18			L39-0480-15	TRIODAL COIL		R10			R92-1319-15	CHIP R 100 J 1W	
L19			L40-2221-33	SMALL FIXED INDUCTOR		R11,12			R02-0696-05	CHIP R 33 J 1/4W	
L20			L39-0496-05	TRIODAL COIL		R13			R92-1318-05	CHIP R 100 J 1W	
L21			L39-0415-25	TRIODAL COIL		R14.17			S15ACB3A5R6J	FL-PROOF RS 5.6 J 1W	
L22,23			L40-2785-48	SMALL FIXED INDUCTOR (270NH)		R18.19			S15ACB3A18J	FL-PROOF RS 15 J 1W	
L24,25			L79-0558-05	FILTER		R20			RK73FB2A391J	CHIP R 390 J 1/10W	
L26			L40-1001-12	SMALL FIXED INDUCTOR	E.E2.E3	R21,22			S15ACB3A4R7J	FL-PROOF RS 4.7 J 1W	
L27			L40-1015-48	SMALL FIXED INDUCTOR (100UH)		R23			RK73FB2A4R7J	CHIP R 4.7 J 1/10W	
L28,29			L40-1005-48	SMALL FIXED INDUCTOR (10UH)		R24			R92-0686-05	CHIP R 33 J 1/2W	
L30-32			L40-1001-12	SMALL FIXED INDUCTOR		R25			R92-1212-05	CHIP R 27 J 1/2W	
L101			L39-1259-05	TRIODAL COIL		R26,27			R92-1213-05	CHIP R 100 J 1/2W	
L102			L39-1260-05	TRIODAL COIL		R28			RK73FB2A470J	CHIP R 47 J 1/10W	
L103			L40-1015-48	SMALL FIXED INDUCTOR (100UH)		R29-32			RK73FB2A104J	CHIP R 100K J 1/10W	
L201			L39-1224-05	TRIODAL COIL		R33			RK73FB2A102J	CHIP R 1.0K J 1/10W	
L202			L39-1225-05	TRIODAL COIL		R34			R92-1292-05	CHIP R 68 J 1W	
L203			L40-1015-48	SMALL FIXED INDUCTOR (100UH)		R35			R92-1288-05	CHIP R 58 J 1W	
L301			L39-1266-05	TRIODAL COIL		R36,37			RK73FB2A102J	CHIP R 1.0K J 1/10W	
L302			L39-1258-05	TRIODAL COIL		R38,39			RK73FB2A181J	CHIP R 180 J 1/10W	
L303			L40-1015-48	SMALL FIXED INDUCTOR (100UH)		R40,41			RK73FB2A103J	CHIP R 10K J 1/10W	
L401			L39-1221-05	TRIODAL COIL		R42,43			RK73FB2A563J	CHIP R 56K J 1/10W	
L402			L39-1220-05	TRIODAL COIL		R44,45			RK73FB2A103J	CHIP R 10K J 1/10W	
L403			L40-1015-48	SMALL FIXED INDUCTOR	E.E2.E3	R46			RK73FB2A101J	CHIP R 100 J 1/10W	
L404			L39-1221-05	TRIODAL COIL		R47			RK73FB2A121J	CHIP R 120 J 1/10W	
L405			L39-1220-05	TRIODAL COIL		R48			RK73FB2A101J	CHIP R 100 J 1/10W	
L406			L40-1015-48	SMALL FIXED INDUCTOR (100UH)		R49			RK73FB2A121J	CHIP R 120 J 1/10W	
						R50			RK73FB2A682J	CHIP R 8.2K J 1/10W	
						R51			RK73FB2A682J	CHIP R 6.8K J 1/10W	

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## PARTS LIST

FINAL UNIT (X45-353X-XX)  
CONTROL UNIT (X53-369X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti- nation	Ref. No.	Address	New parts	Parts No.	Description	Desti- nation
R52,53		RK73FB2A10J	CHIP R 10K	J 1/10W		Q11		DTC143TK	DIGITAL TRANSISTOR		
R54-56		RK73FB2A10J	CHIP R 100	J 1/10W	K,M2	Q12,13		DT0123EK	DIGITAL TRANSISTOR		
R57-60	*	R92-2569-05	JUMPER WIRE	0 OHM		Q14,15		2SC2714(Y)	TRANSISTOR		
R90,192		R92-1205-05	CHIP P 120	J 1/4W		Q16		DT0114EK	DIGITAL TRANSISTOR		
VR1		R12-6730-05	TRIMMING POT.	220		TH1		ST741L	TERMINATOR		
VR2		R12-6737-05	TRIMMING POT.	3.3K							
VR3		R12-6730-05	TRIMMING POT	220							
VR4		R12-6738-05	TRIMMING POT	4.7K							
W2,3		R92-0150-05	JUMPER REST	0 OHM							
K1		S51-2417-05	RELAY								
K2		S51-1429-05	RELAY								
K3		S51-2417-05	RELAY								
K4		S76-0141405	RELAY								
K101,102		S51-1420-05	RELAY		E,2,E3						
K201,202		S51-1420-05	RELAY								
K301,302		S51-1420-05	RELAY								
101,402		S51-1420-05	RELAY								
K403,404		S51-1420-05	RELAY								
K501,502		S51-1420-05	RELAY								
K601,602		S51-1420-05	RELAY								
K801-814	*	S76-0415-05	RELAY								
K815-821		S76-0415-05	RELAY								
K822,823	*	S76-0415-05	RELAY								
D1		MA27T-8	VARISTOR								
D2-4		MA27-B	VARISTOR								
D5,6		1SS101	DIODE								
D7-9		LF801	DIOD								
D10,11		DSA301LA	DIOD								
D12		SG-5LR	DIOD								
D13		ERZ-M10DK220	SURGE ABSORBER								
D14		02CZ18X,Y1	ZENER DIOD								
D15		LF801	DIOD								
D16		DAN202K	DIOD								
D17		LF801	DIOD								
D18-23		1SS226	DIOD								
D24,25		1SS101	DIOD								
D26		DSA301LA	DIOD								
Y101		LF801	DIOD								
D201		LF801	DIOD		E,2,E3						
D301		LF801	DIOD								
D401		LF801	DIOD								
D402		LF801	DIOD								
D501		LF801	DIOD								
D601		LF801	DIOD								
D801-823		LF801	DIOD								
I1		TA7805S	IC (VOLTAGE REGULATOR/+5V)								
I2		TA7808S	IC (REGULATOR)								
I3		TA75S39SF	IC								
I4		SN74S74NS	IC (FLIP-FLOP)								
I5	*	MS4562P	IC (500mA DARLINGTON)								
I6	*	NJU3714G	IC								
I7-9		UPD6495GS	IC								
I10	*	TA7810S	IC (REGULATOR)								
Q1		2SC1971	TRANSISTOR (PRI-DRIVAMP)								
Q2,3		2SC3133	TRANSISTOR (DRV AMP)								
Q4,5		2SC2679	TRANSISTOR (POWER AMP)								
Q6		2SC3421(Y)	TRANSISTOR								
Q7-9		FMC2	TRANSISTOR								
Q10		DTC114EK	DIGITAL TRANSISTOR								

## CONTROL UNIT (X53-369X-XX)

0-10 : K 0-21 : M2 2-71 : E 2-72 : E2 2-73 : E3

Ref. No.	Address	New parts	Parts No.	Description	Desti- nation
C1			CK73FB1H103K	CHIP C	0.010UF K
C2			C92-0009-05	CHIP-TAN	4.7UF 10WV
C3,4			CK73FB1H102K	CHIP C	1000PF K
C7			CK73FB1H103K	CHIP C	0.010UF K
C8			C92-0009-05	CHIP-TAN	4.7UF 10WV
C9			CK73FF1E1042	CHIP C	0.10UF Z
C10			CK73FB1H102K	CHIP C	1000PF K
C11			CK73FF1C105Z	CHIP C	1.0UF Z
C12			CK73FB1H103K	CHIP C	0.010UF K
C13			CK73FF1E1042	CHIP C	0.10UF Z
C14,15			C7C7FC1H1030J	CHIP C	33PF J
C16,17			CK73FB1H103K	CHIP C	0.010UF K
C18			CK73FF1E1042	CHIP C	0.10UF Z
C19			CK73FC1C105Z	CHIP C	1.0UF Z
C20,21			CK73FB1H103K	CHIP C	0.010UF K
C22,23			C92-0037-05	CHIP-ELE	10UF 16WV
C24-27			CK73FB1H102K	CHIP C	1000PF K
C28,29			CK73FF1E1042	CHIP C	0.10UF Z
C30			CK73FC1C105Z	CHIP C	1.0UF Z
C31,32			CK73FF1E1042	CHIP C	0.10UF Z
C33			C92-0040-05	CHIP-ELE	47UF 16WV
C38,37			CC73FC1H+22UJ	CHIP C	22PF J
C103			CK73FF1E1042	CHIP C	0.10UF Z
C104-107			CK73FB1H102K	CHIP C	1000PF K
C105,109			CK73FF1E1042	CHIP C	0.10UF Z
C110-118			CK73FB1H102K	CHIP C	1000PF K
C119			CK73FF1E1042	CHIP C	0.10UF Z
C120			CK73FB1H102K	CHIP C	1000PF K
C121-124			CK73FB1H103K	CHIP C	0.010UF K
C125			CK73FF1E1042	CHIP C	0.10UF Z
C126			CK73FB1H103K	CHIP C	0.10UF Z
C127,128			CK73FB1H102K	CHIP C	1000PF K
C129-134			CK73FB1H103K	CHIP C	0.10UF Z
C135-150			CK73FB1H102K	CHIP C	1000PF K
C151-154			CK73FC1H101J	CHIP C	100PF J
C155			CK73FF1E1042	CHIP C	0.10UF Z
C156			CK73FB1H102K	CHIP C	1000PF K
C158-162			CK73FB1H102K	CHIP C	1000PF K
C163-169			CK73FB1H102K	CHIP C	1000PF K
C170-172			CK73FF1E1042	CHIP C	0.10UF Z
C173-183			CK73FB1H102K	CHIP C	1000PF K
C184			CK73FF1E1042	CHIP C	0.10UF Z
C501			C92-0004-05	CHIP-TAN	1.0UF 16WV
C502,503			CK73GB1H102K	CHIP C	1000PF K
C504,505			CK73SB1H223K	CHIP C	0.022UF K
C506-509			CK73FF1E1042	CHIP C	0.10UF Z
C510			CC73GS1H221J	CHIP C	220PF J
C511,512			CK73FF1E1042	CHIP C	0.10UF Z
C513			CC73FC1H102J	CHIP C	1000PF J
C514			C92-0004-05	CHIP-TAN	1.0UF 16WV
C515			C92-0038-05	CHIP-ELE	22UF 16WV
C516			C90-2073-05	ELECTRO	8.8UF 16WV
C517			C92-0037-05	CHIP-ELE	10UF 16WV

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## PARTS LSIT

CONTROL UNIT (X53-368X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C518.519			CK73F1E104Z	CHIP C 0.10UF Z		CP1-7	*	R90-0754-05	MULTI-COMP R		
C520.521			CK73GB1H102K	CHIP C 1000PF K		CP8.9		R90-0749-05	MULTI-COMP R	47K x 4	
C522			C92-0037-05	CHIP-ELE 10UF 16WV		CP10	*	R90-0754-05	MULTI-COMP R		
C523.524			CK73F1E104Z	CHIP C 0.10UF Z		CP11		R90-0748-05	MULTI-COMP R	47K x 4	
C525-527			CK73GB1H562K	CHIP C 5600PF K		CP12		R90-0714-05	MULTI-COMP	10K x 4	
C528			CK73FB1H682K	CHIP C 8800PF K		CP13	*	R90-0754-05	MULTI-COMP R		
C530			CK73GB1H102K	CHIP C 1000PF K		CP506.511	*	R90-0754-05	MULTI-COMP R		
C531			CK73GB1H562K	CHIP C 5600PF K		R1		RK73FB2A102J	CHIP R 1.0K J	1/10W	
C532			C92-0037-05	CHIP-ELE 10UF 16WV		R2		RK73FB2A472J	CHIP R 4.7K J	1/10W	
C533			CK73GB1H103K	CHIP C 0.010UF K		R3		RK73FB2A104J	CHIP R 100K J	1/10W	
C534			CC73GCH1H101J	CHIP C 100PF J		R4		RK73FB2A155J	CHIP R 1.5M J	1/10W	
C535			C92-0037-05	CHIP-ELE 10UF 16WV		R5-7		RK73FB2A472J	CHIP R 4.7K J	1/10W	
C537			C92-0040-05	CHIP-ELE 47UF 16WV		R8		RK73FB2A473J	CHIP R 47K J	1/10W	
C538			CK73GB1H103K	CHIP C 0.010UF K		R9		RK73FB2A102J	CHIP R 1.0K J	1/10W	
C539			CK73GB1H102K	CHIP C 1000PF K		R10.11		RK73FB2A100J	CHIP R 10 J	1/10W	
C540			CK73FB1E104K	CHIP C 0.10UF K		R12		RK73FB2A554J	CHIP R 560K J	1/10W	
C541			CK73F1C105Z	CHIP C 1.0UF Z		R13		RK73FB2A103J	CHIP R 10K J	1/10W	
C542-544			C92-0507-05	CHIP-TAN 4.7UF 6.3W		R14		RK73FB2A102J	CHIP R 1.0K J	1/10W	
C546-549			C92-0507-05	CHIP-TAN 4.7UF 6.3W		R15		RK73FB2A473J	CHIP R 47K J	1/10W	
C550			C92-0040-05	CHIP-ELE 47UF 16WV		R16		RK73FB2A105J	CHIP R 1.0M J	1/10W	
C601			CK73FB1E104K	CHIP C 0.10UF K		R17		RK73FB2A070	CHIP R 0 OHM		
C602			CC73GS1H1471J	CHIP C 470PF J		R18		RK73FB2A473J	CHIP R 47K J	1/10W	
C603			CK73FB1E104K	CHIP C 0.10UF K		R19		RK73FB2A102J	CHIP R 1.0K J	1/10W	
C604			CC73GS1H1471J	CHIP C 470PF J		R21		RK73FB2A070	CHIP R 0 OHM		
C605			CK73FB1E104K	CHIP C 0.10UF K		R22		RK73FB2A102J	CHIP R 1.0K J	1/10W	
C606			CC73GSL1H471J	CHIP C 470PF J		R24		RK73FB2A102J	CHIP R 1.0K J	1/10W	M2.E3
C607			CK73FB1E104K	CHIP C 0.10UF K		R25		RK73FB2A102J	CHIP R 1.0K J	1/10W	E2.E3
C608			CC73GSL1H471J	CHIP C 470PF J		R26		RK73FB2A102J	CHIP R 1.0K J	1/10W	M2.E2
C609			CK73FB1E104K	CHIP C 0.10UF K		R27		RK73FB2A102J	CHIP R 1.0K J	1/10W	E
C610			CC73GSL1H471J	CHIP C 470PF J		R31.32		RK73FB2A102J	CHIP R 1.0K J	1/10W	
C611			CK73FB1E104K	CHIP C 0.10UF K		R33		RK73FB2A103J	CHIP R 10K J	1/10W	
C612			CC73GS1H1471J	CHIP C 470PF J		R34		RK73FB2A473J	CHIP R 47K J	1/10W	
C613.614			CC73GCH1H100	CHIP C 10PF D		R35		RK73FB2A472J	CHIP R 4.7K J	1/10W	
C615-617			CK73GB1H103K	CHIP C 0.010UF K		R36		RK73FB2A471J	CHIP R 470 J	1/10W	
C701-733			CC73GCH1H101J	CHIP C 100PF J		R37		RK73FB2A472J	CHIP R 4.7K J	1/10W	
CN1			E40-5736-05	PIN CONNECTOR FOR INSIDE (26P)		R38.39		RK73FB2A473J	CHIP R 47K J	1/10W	
CN2			E40-3252-05	PIN CONNECTOR FOR INSIDE (8P)		R41		RK73FB2A102J	CHIP R 1.0K J	1/10W	K.E2.E3
CN3			E40-5761-05	PIN CONNECTOR FOR INSIDE (26P)		R42		RK73FB2A473J	CHIP R 47K J	1/10W	
CN4.5			E40-5762-05	PIN CONNECTOR FOR INSIDE (16P)		R44		RK73FB2A473J	CHIP R 47K J	1/10W	
CN5			E40-3239-05	PIN CONNECTOR FOR INSIDE (4P)		R45		RK73FB2A104J	CHIP R 100K J	1/10W	
CN501	*		E02-2032-05	IC SOCKET (32P)		R46		RK73FB2A470J	CHIP R 47 J	1/10W	
CN502			E40-5762-05	PIN CONNECTOR FOR INSIDE (16P)		R47		RK73FB2A070	CHIP R 0 OHM		
CN503			E40-3247-05	PIN CONNECTOR FOR INSIDE (3P)		R101-103		RK73FB2A102J	CHIP R 1.0K J	1/10W	
W501	2B	*	E37-0646-05	LEAD WIRE WITH CONNECTOR		R104-109		RK73FB2A101J	CHIP R 100 J	1/10W	
CN7			J19-1570-05	HOLDER		R114-133		RK73FB2A101J	CHIP R 100 J	1/10W	
L1.2			L40-4705-48	SMALL FIXED INDUCTOR (47UH)		R135-138		RK73FB2A101J	CHIP R 100 J	1/10W	
L3.4			L40-1001-18	SMALL FIXED INDUCTOR		R138.140		RK73FB2A473J	CHIP R 47K J	1/10W	
L5.6			L40-1292-18	SMALL FIXED INDUCTOR		R141.142		RK73FB2A103J	CHIP R 10K J	1/10W	
L7			L40-1095-48	SMALL FIXED INDUCTOR (10UH)		R143.144		RK73FB2A104J	CHIP R 100K J	1/10W	
L6-10			L40-4705-48	SMALL FIXED INDUCTOR (47UH)		R147.148		RK73FB2A104J	CHIP R 100K J	1/10W	
L11			L40-1292-18	SMALL FIXED INDUCTOR		R501		RK73GB1J472J	CHIP R 4.7K J	1/16W	
L12			L40-4705-48	SMALL FIXED INDUCTOR (47UH)		R502.503		RK73GB1J102J	CHIP R 1.0K J	1/16W	
L501.502			L40-4705-48	SMALL FIXED INDUCTOR (47UH)		R504		RK73GB1J334J	CHIP R 330K J	1/16W	
L503			L40-1292-18	SMALL FIXED INDUCTOR		R505		RK73GB1J472J	CHIP R 4.7K J	1/16W	
L504			L40-1095-48	SMALL FIXED INDUCTOR (10UH)		R506		RK73GB1J393J	CHIP R 39K J	1/16W	
L505			L40-1001-18	SMALL FIXED INDUCTOR		R507.508		RK73GB1J222J	CHIP R 2.2K J	1/16W	
X1	*		L77-1681-05	CRYSTAL RESONATOR (4.5MHz)		R509		RK73GB1J334J	CHIP R 330K J	1/16W	
X2	*		L77-1580-05	CRYSTAL RESONATOR (11.052MHz)		R510		RK73GB1J223J	CHIP R 22K J	1/16W	
X501	*		L77-1679-05	CRYSTAL RESONATOR (12.268MHz)		R511		RK73GB1J182J	CHIP R 1.8K J	1/16W	
						R512.514		RK73GB1J103J	CHIP R 10K J	1/16W	

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## PARTS LIST

CONTROL UNIT (X53-369X-XX)  
TX-RX UNIT (X57-500X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R515			RK73GB1J102J	CHIP R 1.0K J 1/16W		03.4			DTC114EK	DIGITAL TRANSISTOR	
R516			RK73GB1J682J	CHIP R 6.8K J 1/16W		05			DTA143EK	DIGITAL TRANSISTOR	
R517,518			RK73GB1J103J	CHIP R 10K J 1/16W		06			DTCA143EK	DIGITAL TRANSISTOR	
R519			RK73GB1J274J	CHIP R 270K J 1/16W		07			DTA143EK	DIGITAL TRANSISTOR	
R520			RK73GB1J123J	CHIP R 12K J 1/16W		08			DTC143TK	DIGITAL TRANSISTOR	
R521-523			RK73GB1J102J	CHIP R 1.0K J 1/16W		09			DTCA143EK	DIGITAL TRANSISTOR	
R525			RK73GB1J100J	CHIP R 10K J 1/16W		010			DTA143EK	DIGITAL TRANSISTOR	
R528,529			RK73GB1J183J	CHIP R 18K J 1/16W		011,12			DTCA143EK	DIGITAL TRANSISTOR	
R530,531			RK73GB1J103J	CHIP R 10K J 1/16W							
R532,533			RK73GB1J183J	CHIP R 18K J 1/16W							
R534			RK73GB1J103J	CHIP R 10K J 1/16W							
R535-537			RK73GB1J153J	CHIP R 15K J 1/16W		C1.2			CK73FB1H103K	CHIP C 0.010UF K	
R538			RK73GB1J103J	CHIP R 10K J 1/16W		C3			CC73FC1H1470J	CHIP C 47PF J	
R539,540			RK73GB1J472J	CHIP R 4.7K J 1/16W		C4			CC73FH1H1070D	CHIP C 7.0PF D	
R541			RK73GB1J223J	CHIP R 22K J 1/16W		C5			CK73FB1E104Z	CHIP C 0.10UF Z	
R542			RK73GB1J101J	CHIP R 100 J 1/16W		C6			CC73FC1H103QJ	CHIP C 39PF J	
344			RK73GB1J681J	CHIP R 560 J 1/16W		C7			CK73FB1H182K	CHIP C 1800PF K	
,545-550			R92-0670-05	CHIP R 0.0HM		C8			CK73FC1C105J	CHIP C 1.0UF Z	
R553,555			R92-0670-05	CHIP R 0.0HM		C9			CK73EF1H104Z	CHIP C 0.10UF Z	
R556			RK73GB1J651J	CHIP R 560 J 1/16W		C10			CK73FE1H104Z	CHIP C 0.10UF Z	
R557			RK73GB1J882J	CHIP R 6.8K J 1/16W		C11			CK73FB1H1472K	CHIP C 4720PF K	
R558			RK73GB1J04J	CHIP R 100K J 1/16W		C12			CK73FB1H103K	CHIP C 0.010UF K	
R559-565			RK73GB1J223J	CHIP R 22K J 1/16W		C13			CK73FB1H182K	CHIP C 1800PF K	
R602,604			RK73GB1J473J	CHIP R 47K J 1/16W		C14			CE44W1E4R7M	ELECTRO 4.7UF 25WV	
R610			RK73GB1J473J	CHIP R 47K J 1/16W		C15			CK73FB1H103K	CHIP C 0.010UF K	
R612			RK73GB1J101J	CHIP R 100 J 1/16W		C16			CK73FB1H222K	CHIP C 2200PF K	
R613			RK73GB1J473J	CHIP R 47K J 1/16W		C17			CK73FB1H1472K	CHIP C 4700PF K	
R615			RK73GB1J473J	CHIP R 47K J 1/16W		C18			CK73FB1H222K	CHIP C 2200PF K	
R616			RK73GB1J101J	CHIP R 100 J 1/16W		C19			CK73FB1H103K	CHIP C 0.010UF K	
R619-621			RK73GB1J101J	CHIP R 100 J 1/16W		C20			CK73FF1C105Z	CHIP C 1.0UF Z	
R623,624			RK73GB1J473J	CHIP R 47K J 1/16W		C21			CK73FB1H103K	CHIP C 1.000PF K	
R625			RK73GB1J103J	CHIP R 10K J 1/16W		C22,23			CK73FB1H392K	CHIP C 3900PF K	
R626			RK73GB1J104J	CHIP R 100K J 1/16W		C24			CK73FF1E104Z	CHIP C 0.10UF Z	
D1-4			1S335			C25,26			CK73FB1H102K	CHIP C 1000PF K	
D5			DAN202U			C27			CK73FF1E104Z	CHIP C 0.10UF Z	
D6,7			1S335			C28			CK73FB1H561K	CHIP C 560PF K	
D8,9			02ZB2,2Y1			C29,30			CK73FB1H222K	CHIP C 2200PF K	
D10			DAN202U			C31			CK73FF1E104Z	CHIP C 0.10UF Z	
IC1			AT24C64N10Si27	IC (64kbit SERIAL EEPROM)		C32,33			CK73FB1H102Z	CHIP C 1000PF K	
IC2			CAT35C102K1	IC		C34			CK73FF1E104Z	CHIP C 0.10UF Z	
IC3			UPD750D4GB-746	IC (4bit MICROPROCESSOR)		C35			CK73FF1L271J	CHIP C 270PF J	
IC4			PS7121NR	IC		C36,37			CK73FB1H102K	CHIP C 1000PF K	
IC5			CXD10950	IC		C38			CK73FF1E104Z	CHIP C 0.10UF Z	
IC6	*		M37710FBJ0F*	IC (CPU)		C39,40			CK73FB1H102K	CHIP C 1000PF K	
IC7,8			TC4052F	IC (4CH MPX/DE-MPX)		C41			CK73FF1E104Z	CHIP C 0.10UF Z	
IC9			NJM78L05UA	IC (VOLTAGE REGULATOR/+5V)		C42,43			CK73FC1H100D	CHIP C 10PF D	
IC10			NJM78L06UA	IC (VOLTAGE REGULATOR/+6V)		C44			CK73FF1E104Z	CHIP C 0.10UF Z	
IC11			NJM78L08UA	IC (VOLTAGE REGULATOR/+8V)		C45,46			CK73FB1H102Z	CHIP C 1000PF K	
IC501			NJM2100M	IC (OP AMPLIFIER)		C47			CK73FF1E104Z	CHIP C 0.10UF Z	
IC502			BIA406BCFV	IC (ANALOG SWITCH X4)		C48			CK73FSL1H121J	CHIP C 120PF J	
IC503			NJM2100M	IC (OP AMPLIFIER)		C49,50			CK73FB1H102K	CHIP C 1000PF K	
IC504			AK4506-VS	IC (AD/DA-COVERTOR)		C51			CK73FF1E104Z	CHIP C 0.10UF Z	
IC505,506			NJM2100M	IC (OP AMPLIFIER)		C52,53			CK73FB1H102K	CHIP C 1000PF K	
IC507	*		ADSP2181KS-115	IC		C54			CK73FF1E104Z	CHIP C 0.10UF Z	
IC508			TC74HC4040AF	IC (BINAY COUNTER)		C55			CK73FB1H102Z	CHIP C 1000PF K	
IC511			TC7504F	IC (2CH NAND GATE)		C56,57			CK73FF1E104Z	CHIP C 0.10UF Z	
IC512	*		27C10120UPHB	IC		C58			CK73FF1E104Z	CHIP C 0.10UF Z	
IC513			NJM78L05UA	IC (VOLTAGE REGULATOR/+5V)		C59,60			CK73FB1H102K	CHIP C 1000PF K	
Q1,2			DTC143EK	DIGITAL TRANSISTOR		C61			CK73FF1E104Z	CHIP C 0.10UF Z	
						C62,63			CK73FB1H104QC	CHIP C 4.0PF C	
						C64			CK73FF1E104Z	CHIP C 0.10UF Z	

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## PARTS LSIT

TX-RX UNIT (X57-500X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C65,86		CK73FB1H102K	CHIP C	100PF K		C165		CK73FF1C47Z	CHIP C	0.47UF Z	
C67		CK73FF1E104Z	CHIP C	0.10UF Z		C166-168		CK73FF1E104Z	CHIP C	0.10UF Z	
C68		CC73FC1H1680J	CHIP C	68PF J		C169		CK73FB1H103K	CHIP C	0.010UF K	
C69		CK73FB1H391J	CHIP C	390PF K		C170		CK73FB1H471K	CHIP C	470PF K	
C70		CC73FS1L1H151J	CHIP C	150PF J		C171-173		CK73FB1H103J	CHIP C	0.010UF K	
C71		CK73FF1E104Z	CHIP C	0.10UF Z		C174		CE04EW1A101M	ELECTRO	100UF 10WV	
C72,73		CK73FB1H102K	CHIP C	100PF K		C175,176		CK73FB1H103K	CHIP C	0.010UF K	
C74		CK73FF1E104Z	CHIP C	0.10UF Z		C177,178		CE04EW1C100M	ELECTRO	100UF 16WV	
C75		CC73FO1H130J	CHIP C	33PF J		C179		CC73FS1L1H121J	CHIP C	120PF J	
C76,77		CC73FS1L1H221J	CHIP C	220PF J		C180		CC73FC1H1390J	CHIP C	38PF J	
C78		CK73FF1E104Z	CHIP C	0.10UF Z		C181		CK73FF1H47Z	CHIP C	0.047UF Z	
C79,80		CK73FB1H102K	CHIP C	100PF K		C182		CC73FC1H100D	CHIP C	10PF D	
C81		CK73FF1E104Z	CHIP C	0.10UF Z		C183		CK73FB1H471K	CHIP C	470PF K	
C89		CC73FC1H1680C	CHIP C	68PF C		C184-191		CK73FB1H103K	CHIP C	0.010UF K	
C90-92		CK73FF1E104Z	CHIP C	0.10UF Z		C192		CC73FC1H1010C	CHIP C	1.0PF C	
C93		CK73FB1H103K	CHIP C	0.010UF K		C193		CC73FC1H1050C	CHIP C	5.0PF C	
C94		CC73FC1H1680D	CHIP C	6.0PF D		C194		CK73FF1E104Z	CHIP C	0.10UF Z	
C95		CC73FC1H180J	CHIP C	18PF J		C195		CK73FB1H103K	CHIP C	0.010UF K	
C96-98		CK73FB1H103K	CHIP C	0.010UF K		C196,197		CC73FU1H080D	CHIP C	8.0PF D	
C98		CC73FC1H220J	CHIP C	22PF J		C198		CK73FB1H103K	CHIP C	0.010UF K	
C100		CC73FC1H1010C	CHIP C	1.0PF C		C199		CC73FC1H1010C	CHIP C	1.0PF C	
C101		CK73FB1H103J	CHIP C	0.010UF K		C200		CK73FB1H103K	CHIP C	0.010UF K	
C102,103		CK73FF1E104Z	CHIP C	0.10UF Z		C201		CC73FO1H200J	CHIP C	20PF J	
C104		CC73FC1H1680J	CHIP C	68PF J		C202		CC73FU1H080D	CHIP C	8.0PF D	
C105		CC73FS1L1H151J	CHIP C	150PF J		C203		CC73FO1H105C	CHIP C	0.5PF C	
C106		CC73FC1H1680J	CHIP C	68PF J		C204		CC73FU1H080D	CHIP C	8.0PF D	
C107		CK73FF1E104Z	CHIP C	0.10UF Z		C205,206		CK73FB1H103K	CHIP C	0.010UF K	
C108		CK73FB1H103K	CHIP C	0.010UF K		C207		CK73FB1E104K	CHIP C	0.10UF K	
C109		CC73FC1H1680C	CHIP C	5.0PF C		C208,213		CK73FB1H103K	CHIP C	0.010UF K	
C110		CC73FO1H1010C	CHIP C	1.0PF C		C215,216		CK73FB1H103K	CHIP C	0.010UF K	
C111		CK73FF1E104Z	CHIP C	0.10UF Z		C217		CK73FB1H471K	CHIP C	470PF K	
C112		CC73FC1H1010D	CHIP C	10PF D		C218-220		CK73FB1H103K	CHIP C	0.010UF K	
C113		CC73FB1H080C	CHIP C	2.0PF C		C221		CK73FB1I332K	CHIP C	330PF K	
C114-118		CK73FB1H103K	CHIP C	0.010UF K		C222		CK73FF1E104Z	CHIP C	0.10UF Z	
C119		CC73FC1H200C	CHIP C	2.0PF C		C223		CK73FB1E104K	CHIP C	0.10UF K	
C120		CC73FC1H1150J	CHIP C	15PF J		C224		CK73FB1H103K	CHIP C	0.010UF K	
C121		CC73FC1H1010D	CHIP C	10PF D		C225		CK73FF1E104Z	CHIP C	0.10UF Z	
C122		CC73FC1H1680C	CHIP C	3.0PF C		C226		CK73FB1H103K	CHIP C	0.010UF K	
C123		CC73FC1H1101J	CHIP C	100PF J		C236-239		CK73FF1E104Z	CHIP C	0.10UF Z	
C124		CK73FF1E104Z	CHIP C	0.10UF Z		C240		CE04EW1C100M	ELECTRO	10UF 16WV	
C125		CK73FB1H102K	CHIP C	100PF K		C241-242		CK73FF1E104Z	CHIP C	0.10UF Z	
C126,134		CK73FB1H103K	CHIP C	0.010UF K		C243		CE04EW1C100M	ELECTRO	10UF 16WV	
C135		CK73FF1E104Z	CHIP C	0.10UF Z		C244		CK73FF1E104Z	CHIP C	0.10UF Z	
C136		CK73FB1H471K	CHIP C	470PF K		C245		CC73FC1H1680C	CHIP C	5.0PF C	
C137		CC73FC1H103D	CHIP C	10PF D		C246,247		CK73FB1H103K	CHIP C	0.010UF K	
C138-141		CK73FB1H103K	CHIP C	0.010UF K		C248		CE04EW1C101M	ELECTRO	100UF 16WV	
C142		CC73FC1H1010D	CHIP C	10PF D		C249		CK73FB1H103K	CHIP C	0.010UF K	
C143,144		CK73FB1H103K	CHIP C	0.010UF K		C250		CK73FF1C105Z	CHIP C	1.0UF Z	
C145		CC73FC1H1010D	CHIP C	10PF D		C251,252		CK73FB1H103K	CHIP C	0.010UF K	
C146-148		CK73FB1H103K	CHIP C	0.010UF K		C253		CE04EW1E487M	ELECTRO	4.7UF 25WV	
C149		CC73FC1H200J	CHIP C	20PF J		C254		CK73FB1H103K	CHIP C	0.010UF K	
C150		CK73FB1H103K	CHIP C	0.010UF K		C255		CK73FF1C105Z	CHIP C	1.0UF Z	
C151		CK73FB1H471K	CHIP C	470PF K		C256		CK73FB1H103K	CHIP C	0.010UF K	
C152,153		CK73FB1H103K	CHIP C	0.010UF K		C257		CE04EW1C100M	ELECTRO	10UF 16WV	
C154		CC73FB1H207J	CHIP C	27PF J		C258		CE04EW1H487M	ELECTRO	4.7UF 25WV	
C155,156		CK73FB1H103K	CHIP C	0.010UF K		C259		CE04EW1H822M	ELECTRO	0.22UF 50WV	
C157-159		CK73FF1E104Z	CHIP C	0.10UF Z		C260		CE04EW1H010M	ELECTRO	1.0UF 50WV	
C162		CC73FC1H100D	CHIP C	10PF D		C261		CE04EW1H487M	ELECTRO	4.7UF 50WV	
C163		CK73FF1E104Z	CHIP C	0.10UF Z		C265,266		CC73FC1H101J	CHIP C	100PF J	
C164		CK73FB1H103K	CHIP C	0.010UF K		C267		CK73FB1H103K	CHIP C	0.010UF K	

## PARTS LIST

TX-RX UNIT (X57-5000-XX)											
Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C268			CE04EW1C470M	ELECTRO 47UF 16WV		C380			CK73FB1H104K	CHIP C 0.10UF K	
C269			CK73CH1H101J	CHIP C 100PF J		C381-394			CK73FB1H102K	CHIP C 1000PF K	
C270			CK73FB1H222K	CHIP C 2200PF K		C397			C92-003-05	CHIP-TAN 0.47UF 25WV	
C271			CK73FB1H103K	CHIP C 3320PF K		C398			CK73FB1E104Z	CHIP C 0.10UF Z	
C272			CE04EW1C470M	ELECTRO 47UF 16WV		C399			CK73CH1H1047U	CHIP C 47PF J	
C273			CK73FB1H101J	CHIP C 100PF J		C400			CK73FB1H103K	CHIP C 0.010UF K	
C274-275			CK73FB1H103K	CHIP C 0.010UF K		C407			C92-004-05	CHIP-TAN 1.0UF 16WV	
C276			CE04EW1C470M	ELECTRO 47UF 16WV		C408			CK73FB1H103K	CHIP C 0.010UF K	
C277			CK73FB1H103K	CHIP C 0.010UF K		C409			CK73FC1H100D	CHIP C 10PF D	
C295			CK73FB1H103K	CHIP C 0.010UF K		C410			CK73FC1H102C	CHIP C 2.0PF C	
C286			CK73FB1H222K	CHIP C 2200PF K		C411			CK73CH1H060D	CHIP C 6.0PF D	
C287			CK73FB1H103K	CHIP C 0.010UF K		C412			CK73FB1E104K	CHIP C 0.10UF K	
C288			CK73FB1H102K	CHIP C 1000PF K		C413-414			CK73FB1H103K	CHIP C 0.010UF K	
C289-290			CK73FB1H103K	CHIP C 0.010UF K		C415-416			CK73CH1H100D	CHIP C 10PF D	
C291			CK73FB1H102K	CHIP C 1000PF K		C417			CE04EW1C330M	ELECTRO 33UF 16WV	
C293-295			CK73FB1H103K	CHIP C 0.010UF K		C418			CK73FF1C105Z	CHIP C 1.0UF Z	
~296			CE04EW1C101M	ELECTRO 100UF 16WV		C419			CE04NW1H282M	ELECTRO 2.2UF 50WV	
:27			CK73FB1H103K	CHIP C 0.010UF K		C420-421			CE04FW1C220M	ELECTRO 22UF 16WV	
C296-302			CK73FB1H102K	CHIP C 1000PF K		C422-423			CK73FB1H333K	CHIP C 0.033UF K	
C303			CK73FB1H122K	CHIP C 1200PF K		C424			CK73FB1E104K	CHIP C 0.10UF K	
C304			CE04EW1H22M	ELECTRO 0.22UF 50WV		C425-430			CK73FS1H471U	CHIP C 470PF J	
C305			CK73FF1E104Z	CHIP C 0.10UF Z		C431			C92-0004-05	CHIP-TAN 1.0UF 16WV	
C307			CK73FC1H101J	CHIP C 100PF J		C450-455			CK73FB1H102K	CHIP C 1000PF K	
C308-309			CK73FB1H103K	CHIP C 0.010UF K		C458			CK73FC1H1040C	CHIP C 4.0PF C	
C310			CK73CH1H470J	CHIP C 47PF J		C460-461			CK73CH1H220J	CHIP C 22PF J	
C311			CK73CF1H1060J	CHIP C 36PF J		C500			CK73FB1H103K	CHIP C 0.010UF K	
C312			CK73FB1H103K	CHIP C 0.010UF K		C501			CK73CH1H390J	CHIP C 39PF J	
C313			CE04EW1E47M	ELECTRO 4.7UF 25WV		C502			CK73FB1H103K	CHIP C 0.010UF K	
C314			CK73FB1H102K	CHIP C 1000PF K		C503			CE04EW1C100M	ELECTRO 10UF 16WV	
C315			CK73FB1H103K	CHIP C 0.010UF K		C504			CK73FS1H151J	CHIP C 150PF J	
C316			CK73FF1E104Z	CHIP C 0.10UF Z		C505			CK73CH1H390J	CHIP C 39PF J	
C335,336			CK73FC1C105Z	CHIP C 1.0UF Z		C506			CK73CH1H100D	CHIP C 10PF D	
C342			CK73FB1E104K	CHIP C 0.10UF K		C507			CK73FB1H103K	CHIP C 0.010UF K	
C345,346			CK73FB1H103K	CHIP C 0.010UF K		C508			CK73CH1H050C	CHIP C 5.0PF C	
C349			CK73FB1H102K	CHIP C 1000PF K		C509,510			CK73FB1H103K	CHIP C 0.010UF K	
C360,351			CK73FB1H103K	CHIP C 0.010UF K		C511			CK73FB1H102K	CHIP C 1000PF K	
C352			CE04EW1C470M	ELECTRO 47UF 16WV		C512,513			CK73FB1H103K	CHIP C 0.010UF K	
C353			CK73FF1E104Z	CHIP C 0.10UF Z		C514			CK73FB1H102K	CHIP C 1000PF K	
:354			CK73FB1H103K	CHIP C 0.010UF K		C515			CK73FB1H103K	CHIP C 0.010UF K	
-355			CE04EW1C101M	ELECTRO 100UF 16WV		C516			C92-0036-05	CHIP-TAN 10UF 10WV	
C356			CE04EW1H20M	ELECTRO 47UF 16WV		C517			CK73FB1H103K	CHIP C 0.010UF K	
C357			CK73FB1H103K	CHIP C 0.010UF K		C518,519			CK73CH1H150J	CHIP C 15PF J	
C358			CE04EW1E45M	ELECTRO 4.7UF 25WV		C520			CK73FB1H103K	CHIP C 0.010UF K	
C359			CE04EW1C47M	ELECTRO 47UF 16WV		C521			CE04EW1A221M	ELECTRO 220UF 10WV	
C360,361			CK73FB1H103K	CHIP C 0.010UF K		C522			CK73FB1H103K	CHIP C 0.010UF K	
C362			CK73FB1H102K	CHIP C 1000PF K		C523			CK73FB1H333K	CHIP C 0.033UF K	
C364			CK73FF1E104Z	CHIP C 0.10UF Z		C524-525			C92-0004-05	CHIP-TAN 1.0UF 16WV	
C365			CE04EW1C100M	ELECTRO 10UF 16WV		C526			CE04DW1A101M	ELECTRO 100UF 10WV	
C366			CE04EW1C220M	ELECTRO 22UF 16WV		C527			CK73FB1H103K	CHIP C 0.010UF K	
C367			CK73FF1E104Z	CHIP C 0.10UF Z		C529			CK73FB1H103K	CHIP C 0.010UF K	
C369			CE04EW1C331M	ELECTRO 330UF 16WV		C530			C92-0003-05	CHIP-TAN 0.47UF 25WV	
C370			C92-0005-05	CHIP-TAN 2.2UF 6.3WV		C531			CE04EW1A221M	220UF 10WV	
C371			CK73CH1H101J	100PF J		C532-534			CK73FB1H102K	CHIP C 1000PF K	
C372			CK73FB1E104Z	CHIP C 0.10UF Z		C535			CK73CH1H101J	CHIP C 100PF J	
C377-379			CK73FB1H102K	CHIP C 1000PF K		C536,537			CK73CH1H070D	CHIP C 7.0PF D	
C380			CK73FF1E104Z	CHIP C 0.10UF Z		C538			CK73CH1H107D	CHIP C 7.0PF D	
C381,382			CK73FB1H102K	CHIP C 1000PF K		C539			CK73FB1H102K	CHIP C 1000PF K	
C383,384			CK73FB1H104K	CHIP C 0.10UF K		C540			CK73CH1H120J	CHIP C 12PF J	
C385			CK73FF1E104Z	CHIP C 0.10UF Z		C541			CK73CH1H108J	CHIP C 18PF J	
C386,388			CK73FB1H102K	CHIP C 1000PF K		C542			CK73FB1H102K	CHIP C 1000PF K	

# TS-570D

## PARTS LSIT

TX-RX UNIT (X57-500X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
C543			CC73FC1H100C	CHIP C 1.0PF C		C528			CC73FB1H102K	CHIP C 1000PF K	
C544-548			CK73FB1H102K	CHIP C 1000PF K		C529			CK73FB1H103K	CHIP C 0.010UF K	
C549			CC73FC1H1030J	CHIP C 33PF J		C530			CC73FC1H101J	CHIP C 100PF J	
C550			CC73FC1H1080J	CHIP C 8.0PF D		C531			CC73FC1H1050C	CHIP C 5.0PF C	
C551			CC73FC1H1680J	CHIP C 68PF J		C532			CC73FC1H1080C	CHIP C 0.5PF C	
C552			CK73FF1C1052	CHIP C 1.0UF Z		C533			CC73CH1H100D	CHIP C 10PF D	
C553-554			CK73FB1H103K	CHIP C 0.010UF K		C534			CC73CH1H080S	CHIP C 0.5PF C	
C555-556			CC73FC1H270J	CHIP C 27PF J		C535			CC73CH1H050J	CHIP C 5.0PF C	
C557			CC73FOH1H470J	CHIP C 47PF J		C537-641			CK73FB1H103K	CHIP C 0.010UF K	
C558			CC73CH1H270J	CHIP C 27PF J		C542			CC73CH1H101J	CHIP C 100PF J	
C559			CK73FB1H103K	CHIP C 0.010UF K		C543			CC73SL1H471J	CHIP C 470PF J	
C560,561			CC73FC1H270J	CHIP C 27PF J		C544			CK73FB1H103K	CHIP C 0.010UF K	
C562,563			CK73FB1H103K	CHIP C 0.010UF K		C545			CC73CH1H101J	CHIP C 100PF J	
C564,565			CC73FC1H270J	CHIP C 27PF J		C546-647			CK73FB1H103K	CHIP C 0.010UF K	
C566-568			CK73FB1H103K	CHIP C 0.010UF K		C548			CC73FOH1H20C	CHIP C 2.0PF C	
C569			C92-007-05	CHIP-TAN 2.2UF 20WV		C549			CC73FC1H1030J	CHIP C 3.0PF C	
C570			CK73FB1H102K	CHIP C 1000PF K		C550			CC73FC1H1020C	CHIP C 2.0PF C	
C571			CC73SL1H181J	CHIP C 180PF J		C551			CC73FC1H1050C	CHIP C 1.5PF C	
C572			CC73CH1H100D	CHIP C 10PF D		C552-553			CC73CH1H270J	CHIP C 21PF J	
C573			CC73SL1H221J	CHIP C 220PF J		C554			CK73FB1H103K	CHIP C 0.010UF K	
C574			CC73FOH1H220J	CHIP C 22PF J		C555			CC73FW1A221M	ELECTRO 220UF 10WV	
C575			CC73SL1H151J	CHIP C 150PF J		C556			CK73FB1H103K	CHIP C 0.010UF K	
C576,577			CK73FB1H103K	CHIP C 0.010UF K		C557			CE04EW1C470M	ELECTRO 470UF 16WV	
C578			CK73F1F1042	CHIP C 0.010UF Z		C558			CK73FB1H103K	CHIP C 0.010UF K	
C579			CK73FB1H103K	CHIP C 0.010UF K		C559-660			C92-004-05	CHIP-TAN 1.0UF 16WV	
C580			C92-0516-05	CHIP-TAN 4.7UF 16WV		C561			CK73FB1H103K	CHIP C 0.010UF K	
C581,585			CK73FB1H103K	CHIP C 0.010UF K		C562			CE04EW1C471M	ELECTRO 470UF 16WV	
C586			CK73FB1H471K	CHIP C 470PF K		C563			CE04EW1A221M	ELECTRO 220UF 10WV	
C587			CC73FC1H220J	CHIP C 220PF J		C564			CK73FB1H103K	CHIP C 0.010UF K	
C588			CK73FB1H471K	CHIP C 470PF K		C565			CC73FC1H1470J	CHIP C 47PF J	
C589			CK73FB1H103K	CHIP C 0.010UF K		C566			CC73FOH1H100D	CHIP C 10PF D	
C590,591			CC73FC1H270J	CHIP C 27PF J		C567			CK73FB1H102K	CHIP C 1000PF K	
C592-594			CK73FB1H103K	CHIP C 0.010UF K		C568-671			CC73FC1H120J	CHIP C 12PF J	
C595			C92-0007-05	CHIP-TAN 2.2UF 20WV		C569,673			CK73FB1H102K	CHIP C 1000PF K	
C596			CK73FB1H102K	CHIP C 1000PF K		C574			CC73FC1H1050C	CHIP C 5.0PF C	
C597			CC73FSL1H181J	CHIP C 180PF J		C575			CC73FC1H1270J	CHIP C 2.0PF J	
C598			CC73FC1H100D	CHIP C 10PF D		C577			CC73FC1H1000	CHIP C 10PF D	
C599			CC73FB1H221J	CHIP C 220PF J		C578,579			CK73FB1H102K	CHIP C 1000PF K	
C600			CC73FOH1H202J	CHIP C 22PF J		C580,681			CC73FC1H103J	CHIP C 16PF J	
C601			CK73FS1H151J	CHIP C 150PF J		C582			CC73FC1H120J	CHIP C 12PF J	
C602			CK73FF1E104Z	CHIP C 0.01UF Z		C583,584			CK73FB1H102K	CHIP C 1000PF K	
C603,604			CK73FB1H103K	CHIP C 0.010UF K		C585			CC73FC1H1050C	CHIP C 5.0PF C	
C605			CC73FOH1H101J	CHIP C 100PF J		C586			CC73FC1H240J	CHIP C 24PF J	
C606			CC73FOH1H330J	CHIP C 33PF J		C587			CK73FB1H102K	CHIP C 1000PF K	
C607			CC73FOH1H470J	CHIP C 47PF J		C588			CC73FC1H1100D	CHIP C 10PF D	
C608			CC73FSL1H151J	CHIP C 150PF J		C589			C92-0001-05	CHIP C 0.1UF 35WV	
C609			CC73FC1H1680J	CHIP C 58PF J		C590			CK73FB1H102K	CHIP C 1000PF K	
C610			CK73FB1H1101J	CHIP C 100PF J		C591,682			CC73FC1H1080D	CHIP C 8.0PF D	
C611			CC73FC1H270J	CHIP C 27PF J		C593			CC73FC1H120J	CHIP C 12PF J	
C612			CC73FSL1H121J	CHIP C 120PF J		C594,695			CK73FB1H102K	CHIP C 1000PF K	
C613			CC73FC1H1820J	CHIP C 82PF J		C596			CC73FC1H100D	CHIP C 10PF D	
C614			CK73FB1H1680J	CHIP C 68PF J		C597			CK73FB1H103K	CHIP C 0.010UF K	
C614-617			CK73FB1H103K	CHIP C 0.010UF K		C598-701			CK73FB1H102K	CHIP C 1000PF K	
C618			CK73FF1E104Z	CHIP C 0.01UF Z		C702			CK73FB1H103K	CHIP C 0.010UF K	
C619-521			CK73FB1H103K	CHIP C 0.010UF K		C703			CC73FC1H1050J	CHIP C 15PF J	
C622			CC73FC1H1050C	CHIP C 0.5PF C		C704			CC73FC1H100D	CHIP C 10PF D	
C623			CC73FC1H1060D	CHIP C 6.0PF D		C705			CC73FC1H1150J	CHIP C 15PF J	
C624			CC73FC1H1080D	CHIP C 8.0PF D		C706,707			CC73FC1H1010C	CHIP C 1.0PF C	
C625,626			CX73FB1H102K	CHIP C 1000PF K		C708,709			CC73FC1H1070D	CHIP C 7.0PF D	
C627			CK73FB1H103K	CHIP C 0.010UF K		C710			CC73FC1H1010C	CHIP C 1.0PF C	

## PARTS LIST

TX-RX UNIT (X57-500X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti- nation	Ref. No.	Address	New parts	Parts No.	Description	Desti- nation
C711-714			CK73FB1H102K	CHIP C 1000PF K		CN21		E40-3237-05		PIN CONNECTOR FOR INSIDE (2P)	
C715			CK73FB1H103K	CHIP C 0.010UF K		CNS00		E40-5764-05		PIN CONNECTOR FOR INSIDE (1P)	
C716			CC73FSL1H221J	CHIP C 220PF J		CNS01		E04-0154-05		RF COAXIAL CABLE RECEPTACLE	
C718-722			CC73FSL1H221J	CHIP C 220PF J		CNS02		E40-3237-05		PIN CONNECTOR FOR INSIDE (2P)	
C724			CC73FSL1H221J	CHIP C 220PF J		CNS03		E04-0154-05		RF COAXIAL CABLE RECEPTACLE	
C725			CK73FB1H103K	CHIP C 0.010UF K	J1			E06-0752-05		DIN SOCKET (7P)	
C755			CC73FC1H1003C	CHIP C 3.0PF C	J2	*	E56-0408-05			DIN SOCKET (3P)	
C756			C504EVW1A101M	ELECTRO 100UF 10WV	J3			E11-0414-05		PHONE JACK (3.5D)	
C758			CK73FB1H102K	CHIP C 1000PF K	J4			E11-0456-05		PHONE JACK (3.5D)	
C759			CK73FF1C105Z	CHIP C 1.0UF Z	J5			E11-0430-05		PHONE JACK	
C760,761			CC73FC1H10R5C	CHIP C 0.5PF C	J809	*	E58-0435-05			SUB SOCKET	
C762			CK73FB1H102K	CHIP C 1000PF K	W1	*	E37-0651-05			LEAD WIRE WITH CONNECTOR (NB)	
C763			CK73FB1H103K	CHIP C 0.010UF K	W2	*	E37-0649-05			LEAD WIRE WITH PLUG (L02)	
C764			CK73FB1H102K	CHIP C 1000PF K	W3	*	E37-0650-05			LEAD WIRE WITH PLUG (L01)	
C766-768			CK73FB1H102K	CHIP C 1000PF K	W4	*	E37-0652-15			LEAD WIRE WITH CONNECTOR (CAR)	
C769-772			CC73FSL1H221J	CHIP C 220PF J	W5	*	E37-0653-05			LEAD WIRE WITH CONNECTOR (FMM)	
C773			CK73FB1H103K	CHIP C 0.010UF K	W6	*	E37-0654-05			LEAD WIRE WITH CONNECTOR (AF)	
C774			CC73FC1H1003C	CHIP C 5.0PF C	W450	*	E37-0655-05			LEAD WIRE WITH CONNECTOR (VU)	
C775			CC73FC1H103U	CHIP C 33PF J							
C776			CC73FC1H106U	CHIP C 68PF J							
C777			CC73EC1H1202J	CHIP C 2000PF J	A500,501	F10-2062-04				SHIELDING CASE (DS1)	
C778-785			CC73FC1H147U	CHIP C 47PF J	A502	F10-2092-04				SHIELDING CASE (VC02)	
C786			CC73FC1H115U	CHIP C 15PF J	A503	F11-1086-14				SHIELDING COVER (WC02)	
C787,788			CK73TB1E104K	CHIP C 0.10UF K	A505	* F10-2209-04				SHIELDING CASE (VC01)	
C800			CK73FB1H103K	CHIP C 0.010UF K	A505	* F10-2208-04				SHIELDING COVER (VC01)	
C801			CC73FD1H102D	CHIP C 7.0PF D	A504	* G13-1949-04				CUSHION (WC02)	
C802,803			CK73FB1H103K	CHIP C 0.010UF K	A507	* G13-1550-04				CUSHION (VC01)	
C804			C92-0001-05	CHIP-TAN 0.47UF 25WV	-						
C805-807			CK73FB1H103K	CHIP C 0.010UF K		J30-0545-05				SPACER (X1)	
C808			C92-0005-05	CHIP-TAN 0.47UF 25WV		J30-0564-05				SPACER (XF2)	
C809			CK73FB1H103K	CHIP C 0.010UF K		J37-0781-04				BOSS	
C810			CK73FB1H102K	CHIP C 1000PF K							
C811			CC73CH1H100D	CHIP C 10PF D	CD1	L79-1013-05				TUNING COIL (455KHZ)	
C812			CK73FB1H103K	CHIP C 0.010UF K	CF1	L72-0372-05				CERAMIC FILTER (455KHZ)	
C813-815			CK73FB1H103K	CHIP C 0.010UF K	CF500,501	L72-0351-05				CERAMIC FILTER (8.00MHz)	
C816			C92-0004-05	CHIP-TAN 1.0UF 16WV	L1	L40-2215-48				SMALL FIXED INDUCTOR (220uH)	
C817			C504EW1A101M	ELECTRO 100UF 10WV	L2	* L40-8881-15				SMALL FIXED INDUCTOR	E.E2,E3
C818,819			CC73FC1H147U	CHIP C 47PF J	L3	* L40-3991-15				SMALL FIXED INDUCTOR	E.E2,E3
C800-803			CK73FB1E105Z	CHIP C 1.0UF Z	L4	L40-2785-48				SMALL FIXED INDUCTOR (270nH)	
C804			CK73FB1H103K	CHIP C 0.010UF K	L5	L33-0695-05				CHOKE COIL (1MH)	
C905			CE04NW1C1470M	ELECTRO 47uF 16WV	L6	L40-4795-48				SMALL FIXED INDUCTOR (4.7uH)	
C906-913			CK73FB1H102K	CHIP C 1000PF K	L7,8	L33-0696-05				CHOKE COIL (1MH)	
TC1,2			C95-0344-05	TRIMMER CAPACITOR (30PF)	E.E2,E3						
TC500			C95-0344-05	TRIMMER CAPACITOR (30PF)		I9-11				L40-6891-14	
TC502-504			C95-0345-05	TRIMMER CAPACITOR (10PF)		I12,13				L40-1892-14	
			E18-0254-05	SOCKET		L14				L40-5891-14	
CN1,2			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		I15,16				L40-1292-14	
CN3,4			E04-0211-05	PIN CONNECTOR FOR INSIDE (2P)		L17				L40-3381-14	
CN5			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		L18,19				SMALL FIXED INDUCTOR	
CN7			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		L20-22				L40-4262-05	
CN8,9			E04-5059-05	PIN CONNECTOR FOR INSIDE (8P)		L23				L40-2792-14	
CN10			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		L24,25				L40-3382-14	
CN11			E04-5764-05	PIN CONNECTOR FOR INSIDE (16P)		L26				L40-2322-14	
CN12			E04-3238-05	PIN CONNECTOR FOR INSIDE (3P)		L27,28				SMALL FIXED INDUCTOR	
CN14			E04-3238-05	PIN CONNECTOR FOR INSIDE (3P)		L29-31				L34-4289-05	
CN15			E04-5764-05	PIN CONNECTOR FOR INSIDE (18P)		L32				L40-1292-14	
CN16			E04-5795-05	PIN CONNECTOR FOR INSIDE (8P)		L33,34				L40-2282-14	
CN17			E04-5747-05	PIN ASSY SOCKET (11P)		L35				L40-1232-14	
CN18			E04-5737-05	PIN CONNECTOR FOR INSIDE (26P)		L36,37				SMALL FIXED INDUCTOR	
CN19,20			E04-5487-05	PIN CONNECTOR FOR INSIDE (2P)		L41				L40-1015-48	
						L42,43				L40-785-48	
						L44				L19-0324-05	
										TRIDIOL COIL	

PARTS LSIT

TX-RX UNIT (X57-500X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti- nation	Ref. No.	Address	New parts	Parts No.	Description	Desti- nation
I45		L34-4413-05		COIL		I520		L40-1095-48		SMALL FIXED INDUCTOR (1UH)	
I46-48		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		I521		L40-1005-48		SMALL FIXED INDUCTOR (10UH)	
I49		L40-1085-48		SMALL FIXED INDUCTOR (100NH)		I522		L40-1015-48		SMALL FIXED INDUCTOR (100UH)	
I50.51		L34-4406-05		COIL		I523,524		L40-7225-48		SMALL FIXED INDUCTOR (2.2UH)	
I52		L33-0895-05		CHOKE COIL (1MH)		I525	*	L40-3305-48		SMALL FIXED INDUCTOR (30UH)	
I53		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		I526,527		L40-1095-48		SMALL FIXED INDUCTOR (10UH)	
I54		L34-4415-05		COIL		I528		L40-5695-48		SMALL FIXED INDUCTOR (5.6UH)	
I55		L34-0893-05		COIL		I529,530		L34-4406-05		COIL	
I56	*	L34-4461-05		COIL		I531		L40-1015-48		SMALL FIXED INDUCTOR (100UH)	
I57		L39-1255-05		TRODAL COIL		I532		L40-1095-48		SMALL FIXED INDUCTOR (10UH)	
I58		L40-5695-48		SMALL FIXED INDUCTOR (5.6UH)		I533		L34-4408-05		COIL	
I59		L40-4705-48		SMALL FIXED INDUCTOR (47UH)		I534		L34-4389-05		COIL	
I60		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		I535		L34-4408-05		COIL	
I61	*	L34-4445-05		COIL		I536		L40-3305-48		SMALL FIXED INDUCTOR (3.3UH)	
I62		L40-1005-48		SMALL FIXED INDUCTOR (10UH)		I537		L40-1595-48		SMALL FIXED INDUCTOR (1.5UH)	
I63		L40-3395-48		SMALL FIXED INDUCTOR (3.3UH)		I538		L40-2225-48		SMALL FIXED INDUCTOR (2.2UH)	
I64		L18-0224-05		TRODAL COIL		I539		L40-1005-48		SMALL FIXED INDUCTOR (10UH)	
I65		L39-1255-05		TRODAL COIL		I540		L40-1015-48		SMALL FIXED INDUCTOR (100UH)	
I66		L19-0324-05		TRODAL COIL		I542		L34-4424-05		COIL	
I67		L34-4284-05		COIL		I543		L34-2350-05		COIL	
I68		L34-4265-05		COIL		I544		L34-4424-05		COIL	
I69		L34-0943-05		COIL		I545		L34-2350-05		COIL	
I70	*	L34-4469-05		COIL		I546		L34-4424-05		COIL	
I71	*	L34-4465-05		COIL		I547		L34-2350-05		COIL	
I72		L34-4333-05		COIL		I548,549		L40-6885-48		SMALL FIXED INDUCTOR (680NH)	
I73		L39-1255-05		TRODAL COIL		I550		L40-3305-48		SMALL FIXED INDUCTOR (330NH)	
I74-75		L34-4332-05		COIL		I551		L40-1085-48		SMALL FIXED INDUCTOR (100NH)	
I77		L19-0324-05		TRODAL COIL		I551		L40-4705-48		SMALL FIXED INDUCTOR (47UH)	
I78-81		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		I563		L40-2285-48		SMALL FIXED INDUCTOR (220NH)	
I85		L40-1005-48		SMALL FIXED INDUCTOR (10UH)		I564		L40-1011-12		SMALL FIXED INDUCTOR	
I86		L19-0324-05		TRODAL COIL		I800		L40-5285-48		SMALL FIXED INDUCTOR (820NH)	
I87		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		I801		L40-4705-48		SMALL FIXED INDUCTOR (47UH)	
I88		L40-1021-13		SMALL FIXED INDUCTOR		I802	*	L34-4468-05		COIL	
I89		L31-0695-05		CHOKE COIL (1MH)		I803	*	L34-4483-05		COIL	
I90		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		I804		L33-0695-05		CHOKE COIL (1MH)	
I91		L40-1005-48		SMALL FIXED INDUCTOR (10UH)		I900		L40-4705-48		SMALL FIXED INDUCTOR (47UH)	
I92		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		I901-904		L40-1015-48		SMALL FIXED INDUCTOR (100UH)	
I97-100		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		X1		L77-1322-15		CRYSTAL RESONATOR (8.37MHz)	
I101		L40-1095-48		SMALL FIXED INDUCTOR (1UH)		X500		L77-1521-15		CRYSTAL RESONATOR (20.0MHz)	
I105,106		L33-0895-05		CHOKE COIL (1MH)		X51		L71-0401-05		MCF (73.05MHz)	
I107		L40-1001-12		SMALL FIXED INDUCTOR		XF2		L71-0266-05		MCF (8.83MHz)	
I108		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		XF3		L71-0208-15		CRYSTAL FILTER (8.83MHz)	
I109		L40-1011-15		SMALL FIXED INDUCTOR		-		N30-2604-46		PAN HEAD MACHIN SCREW	
I110		L40-2285-48		SMALL FIXED INDUCTOR (220NH)		-		N30-3008-46		PAN HEAD MACHIN SCREW	
I111		L34-4409-05		COIL		-		N87-2606-46		PAN HEAD MACHIN SCREW	
I112		L40-1095-48		SMALL FIXED INDUCTOR (10UH)							
I500		L40-1015-48		SMALL FIXED INDUCTOR (10UH)		CP500-503		R90-0721-05		MULTI-COMP	4.7K X 16
I501		L40-1005-48		SMALL FIXED INDUCTOR (10UH)		R1		RK73EB29560J		CHIP R	56 J 1/BW
I502		L40-4795-48		SMALL FIXED INDUCTOR (4.7UH)		R2		RK73EB28471J		CHIP R	470 J 1/BW
I503,504		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		R3		RK73FB2A472J		CHIP R	4.7K J 1/10W
I505		L40-4705-48		SMALL FIXED INDUCTOR		R4		RK73FB2A101J		CHIP R	100 J 1/10W
I506		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		R5		RK73FB2A222J		CHIP R	2.2K J 1/10W
I507		L34-4424-05		COIL		R6		RK73FB2A472J		CHIP R	4.7K J 1/10W
I508		L34-2353-05		COIL		R7		RK73FB2A181J		CHIP R	180 J 1/10W
I509		L40-2285-48		SMALL FIXED INDUCTOR (220NH)		R8		RK73FB2A471J		CHIP R	470 J 1/10W
I509		L40-2285-48		SMALL FIXED INDUCTOR (220NH)		R9		RK73FB2A560J		CHIP R	56 J 1/10W
I510,511		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		R11		RK73EB2B121J		CHIP R	120 J 1/BW
I512,513		L40-1005-48		SMALL FIXED INDUCTOR (10UH)		R12		RK73FB2A330J		CHIP R	33 J 1/10W
I514,515		L40-1015-48		SMALL FIXED INDUCTOR (100UH)		R13		RK73EB2B121J		CHIP R	120 J 1/BW
I517,518		L40-2270-48		SMALL FIXED INDUCTOR (22UH)		R14		RK73FB2A330J		CHIP R	33 J 1/10W
I519		L40-1005-48		SMALL FIXED INDUCTOR (10UH)							

## PARTS LIST

TX-RX UNIT (X57-500X-XX)															
Ref. No.	Address	New parts	Parts No.	Description			Desti- nation	Ref. No.	Address	New parts	Parts No.	Description			Desti- nation
R15			RK73FB2A121J	CHIP R	120	J	1/8W	R86			RK73FB2A331J	CHIP R	330	J	1/10W
R16			RK73FB2A330J	CHIP R	33	J	1/10W	R89			RK73FB2A270J	CHIP R	27	J	1/10W
R17			RK73FB2A121J	CHIP R	120	J	1/8W	R90			RK73FB2A220J	CHIP R	22	J	1/10W
R18			RK73FB2A330J	CHIP R	33	J	1/10W	R91			RK73FB2A103J	CHIP R	10K	J	1/10W
R19			RK73FB2A121J	CHIP R	120	J	1/8W	R92			RK73FB2A102J	CHIP R	1.0K	J	1/10W
R20			RK73FB2A330J	CHIP R	33	J	1/10W	R93			RK73FB2A152J	CHIP R	1.5K	J	1/10W
R21			RK73FB2A121J	CHIP R	120	J	1/8W	R94			RK73FB2A220J	CHIP R	22	J	1/10W
R22			RK73FB2A330J	CHIP R	33	J	1/10W	R95			RK73FB2A102J	CHIP R	1.0K	J	1/10W
R23			RK73FB2A121J	CHIP R	120	J	1/8W	R96			RK73FB2A471J	CHIP R	470	J	1/10W
R24			RK73FB2A330J	CHIP R	33	J	1/10W	R97			R92-0670-05	CHIP R	0 OHM		
R25			RK73FB2A121J	CHIP R	120	J	1/8W	R98			RK73FB2A102J	CHIP R	10K	J	1/10W
R26			RK73FB2A330J	CHIP R	33	J	1/10W	R99			RK73FB2A221J	CHIP R	220	J	1/10W
R27			RK73FB2A121J	CHIP R	120	J	1/8W	R100			RK73FB2A100J	CHIP R	10	J	1/10W
R28			RK73FB2A330J	CHIP R	33	J	1/10W	R101			RK73FB2A562J	CHIP R	5.6K	J	1/10W
R29			RK73FB2A121J	CHIP R	120	J	1/8W	R102			RK73FB2A223J	CHIP R	22K	J	1/10W
R32			RK73FB2A472J	CHIP R	4.7K	J	1/10W	R103			RK73FB2A221J	CHIP R	220	J	1/10W
R33			RK73FB2A100J	CHIP R	10	J	1/10W	R104			RK73FB2A470J	CHIP R	47	J	1/10W
R34			RK73FB2A681J	CHIP R	880	J	1/10W	R105			RK73FB2A391J	CHIP R	390	J	1/10W
75 J,37			RK73FB2A562J	CHIP R	5.6K	J	1/10W	R107			RK73FB2A102J	CHIP R	1.0K	J	1/10W
RK73FB2A100J	CHIP R	10	J	1/10W	R108			RK73FB2A152J	CHIP R	1.5K	J	1/10W			
R38,39			RK73FB2A122J	CHIP R	1.2K	J	1/10W	R109			RK73FB2A101J	CHIP R	100	J	1/10W
R40			RK73FB2A101J	CHIP R	100	J	1/10W	R111			RK73FB2A473J	CHIP R	47K	J	1/10W
R41			RK73FB2A122J	CHIP R	1.2K	J	1/10W	R112			RK73FB2A560J	CHIP R	56	J	1/10W
R42			RK73FB2A474J	CHIP R	470K	J	1/10W	R113			RK73FB2A4471J	CHIP R	470	J	1/10W
R43			RK73FB2A101J	CHIP R	100	J	1/10W	R114			RK73FB2A680J	CHIP R	68	J	1/10W
R44			RK73FB2A223J	CHIP R	22K	J	1/10W	R115			RK73FB2A102J	CHIP R	1.0K	J	1/10W
R45,46			RK73FB2A101J	CHIP R	100	J	1/10W	R116-118			RK73FB2A101J	CHIP R	100	J	1/10W
R47,48			RK73FB2A100J	CHIP R	10	J	1/10W	R120			RK73FB2A233J	CHIP R	22K	J	1/10W
R49			RK73FB2A471J	CHIP R	470	J	1/10W	R121			RK73FB2A473J	CHIP R	47K	J	1/10W
R50			RK73FB2A122J	CHIP R	1.2K	J	1/10W	R122			RK73FB2A682J	CHIP R	6.8K	J	1/10W
R52			RK73FB2A681J	CHIP R	680	J	1/10W	R123			RK73FB2A330J	CHIP R	33	J	1/10W
R54			R92-0670-05	CHIP R	0 OHM			R124,125			RK73FB2A473J	CHIP R	47K	J	1/10W
R55			RK73FB2A682J	CHIP R	820	J	1/10W	R126			RK73FB2A330J	CHIP R	33	J	1/10W
R56			R92-0570-05	CHIP R	0 OHM			R127,128			RK73FB2A221J	CHIP R	220	J	1/10W
R57-59			RK73FB2A222J	CHIP R	2.2K	J	1/10W	R129			RK73FB2A102J	CHIP R	1.0K	J	1/10W
R60,61			RK73FB2A682J	CHIP R	6.8K	J	1/10W	R130			RK73FB2A221J	CHIP R	220	J	1/10W
R62			RK73FB2A151J	CHIP R	150	J	1/10W	R131			RK73FB2A152J	CHIP R	1.5K	J	1/10W
R63			RK73FB2A103J	CHIP R	10K	J	1/10W	R132			RK73FB2A330J	CHIP R	33	J	1/10W
R64			RK73FB2A471J	CHIP R	470	J	1/10W	R133			RK73FB2A102J	CHIP R	1.0K	J	1/10W
R65			RK73FB2A101J	CHIP R	100	J	1/10W	R134			RK73FB2A101J	CHIP R	100	J	1/10W
R66			RK73FB2A222J	CHIP R	2.2K	J	1/10W	R135			RK73FB2A222J	CHIP R	2.2K	J	1/10W
R67			RK73FB2A333J	CHIP R	33K	J	1/10W	R136			RK73FB2A101J	CHIP R	100	J	1/10W
R68			RK73FB2A04J	CHIP R	100K	J	1/10W	R137			RK73FB2A151J	CHIP R	150	J	1/10W
R69			RK73FB2A271J	CHIP R	270	J	1/10W	R138			RK73FB2A223J	CHIP R	22K	J	1/10W
R70			RK73FB2A104J	CHIP R	100K	J	1/10W	R139			RK73FB2A104J	CHIP R	100K	J	1/10W
R71			RK73FB2A332J	CHIP R	3.3K	J	1/10W	R140			RK73FB2A393J	CHIP R	38K	J	1/10W
R72			RK73FB2A472J	CHIP R	4.7K	J	1/10W	R141			RK73FB2A473J	CHIP R	47K	J	1/10W
R73			R92-0570-05	CHIP R	0 OHM			R142			RK73FB2A331J	CHIP R	330	J	1/10W
R74			RK73FB2A102J	CHIP R	1.0K	J	1/10W	R143			RK73FB2A151J	CHIP R	150	J	1/10W
R75			RK73FB2A471J	CHIP R	470	J	1/10W	R144			RK73FB2A680J	CHIP R	68	J	1/10W
R76			RK73FB2A101J	CHIP R	100	J	1/10W	R145			RK73FB2A330J	CHIP R	33	J	1/10W
R77			RK73FB2A151J	CHIP R	150	J	1/10W	R146			RK73FB2A151J	CHIP R	150	J	1/10W
R78			RK73FB2A101J	CHIP R	100	J	1/10W	R147			RK73FB2A223J	CHIP R	22K	J	1/10W
R79			RK73FB2A823J	CHIP R	82K	J	1/10W	R148			RK73FB2A331J	CHIP R	330	J	1/10W
R80			RK73FB2A472J	CHIP R	4.7K	J	1/10W	R149			RK73FB2A330J	CHIP R	33	J	1/10W
R81,82			RK73FB2A102J	CHIP R	1.0K	J	1/10W	R150			R92-0670-05	CHIP R	0 OHM		
R83			RK73FB2A273J	CHIP R	27K	J	1/10W	R151			RK73FB2A330J	CHIP R	33	J	1/10W
R84			RK73FB2A102J	CHIP R	1.0K	J	1/10W	R152			RK73FB2A330J	CHIP R	39	J	1/10W
R85			RK73FB2A103J	CHIP R	10K	J	1/10W	R153			R92-0670-05	CHIP R	0 OHM		
R86,87			RK73FB2A101J	CHIP R	100	J	1/10W	R154			RK73FB2A333J	CHIP R	33K	J	1/10W

# TS-570D

## PARTS LSIT

TX-RX UNIT (X57-500X-X)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
R155			RK73FB2A102J	CHIP R 1.0K J 1/10W		R240			RK73FB2A104J	CHIP R 0 OHM	
R156			RK73FB2A330J	CHIP R 33 J 1/10W		R241			RK73FB2A104J	CHIP R 100K J 1/10W	
R157			RK73FB2A332J	CHIP R 3.3K J 1/10W		R242			RK73FB2A472J	CHIP R 4.7K J 1/10W	
R158			RK73FB2A331J	CHIP R 330 J 1/10W		R243			RK73FB2A227J	CHIP R 2.7K J 1/10W	
R159			RK73FB2A330J	CHIP R 33 J 1/10W		R244,245			RK73FB2A233J	CHIP R 22K J 1/10W	
R160			RK73FB2A102J	CHIP R 1.0K J 1/10W		R246,247			RK73FB2A104J	CHIP R 100K J 1/10W	
R161			RK73FB2A881J	CHIP R 680 J 1/10W		R248			RK73FB2A247J	CHIP R 47K J 1/10W	
R162			RK73FB2A473J	CHIP R 47K J 1/10W		R249,250			RK73FB2A104J	CHIP R 100K J 1/10W	
R163			RQ2-070-05	CHIP R 0 OHM		R251			RK73FB2A224J	CHIP R 220K J 1/10W	
R164			RK73FB2A331J	CHIP R 330 J 1/10W		R252			RK73FB2A104J	CHIP R 100K J 1/10W	
R165			RK73FB2A151J	CHIP R 150 J 1/10W		R253			RK73FB2A71J	CHIP R 470 J 1/10W	
R166			RK73FB2A880J	CHIP R 68 J 1/10W		R254			RK73FB2A103J	CHIP R 10K J 1/10W	
R167			RK73FB2A101J	CHIP R 100 J 1/10W		R255			RK73FB2A273J	CHIP R 27K J 1/10W	
R168			RK73FB2A561J	CHIP R 560 J 1/10W		R256			RQ2-070-05	CHIP R 0 OHM	
R169			RK73FB2A681J	CHIP R 680 J 1/10W		R260			RK73FB2A103J	CHIP R 10K J 1/10W	
R170			RK73FB2A330J	CHIP R 33 J 1/10W		R261			RK73FB2A181J	CHIP R 180 J 1/10W	
R171			RK73FB2A333J	CHIP R 33K J 1/10W		R266			RK73FB2A472J	CHIP R 4.7K J 1/10W	
R172			RK73FB2A102J	CHIP R 1.0K J 1/10W		R271			RK73FB2A101J	CHIP R 100 J 1/10W	
R173			RK73FB2A472J	CHIP R 4.7K J 1/10W		R275			RK73FB2A563J	CHIP R 56K J 1/10W	
R174-176			RK73FB2A103J	CHIP R 10K J 1/10W		R278			RK73FB2A153J	CHIP R 15K J 1/10W	
R177			RK73FB2A101J	CHIP R 100 J 1/10W		R279			RQ2-070-05	CHIP R 0 OHM	
R178			RK73FB2A472J	CHIP R 4.7K J 1/10W		R280			RK73FB2A221J	CHIP R 220 J 1/10W	
R179			RK73FB2A223J	CHIP R 22K J 1/10W		R281			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R180			RK73FB2A273J	CHIP R 27K J 1/10W		R282			RK73FB2A272J	CHIP R 2.7K J 1/10W	
R181			RK73FB2A101J	CHIP R 100 J 1/10W		R293,284			RK73FB2A101J	CHIP R 100 J 1/10W	
R182			RK73FB2A682J	CHIP R 6.8K J 1/10W		R295,296			RK73FB2A103J	CHIP R 10K J 1/10W	
R191			RK73FB2A222J	CHIP R 2.2K J 1/10W		R297			RK73FB2A224J	CHIP R 220K J 1/10W	
R192			RK73FB2A102J	CHIP R 1.0K J 1/10W		R298			RQ2-070-05	CHIP R 0 OHM	
R193			RK73FB2A561J	CHIP R 560 J 1/10W		R299			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R194			RK73FB2A222J	CHIP R 2.2K J 1/10W		R300			RK73FB2A683J	CHIP R 68K J 1/10W	
R195			RK73FB2A560J	CHIP R 56 J 1/10W		R291			RK73FB2A103J	CHIP R 10K J 1/10W	
R196-198			RK73FB2A330J	CHIP R 33 J 1/10W		R292			RK73FB2A101J	CHIP R 100 J 1/10W	
R199			RK73FB2A101J	CHIP R 100 J 1/10W		R301			RK73FB2A470J	CHIP R 47 J 1/10W	
R200			RK73FB2A802J	CHIP R 82 J 1/10W		R317			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R201			RK73FB2A101J	CHIP R 100 J 1/10W		R319			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R202-205			RK73FB2A103J	CHIP R 10K J 1/10W		R323			RQ2-070-05	CHIP R 0 OHM	
R207			RK73FB2A103J	CHIP R 10K J 1/10W		R324			RK73FB2A103J	CHIP R 10K J 1/10W	
R208,209			RK73FB2A101J	CHIP R 100 J 1/10W		R326			RK73FB2A103J	CHIP R 10K J 1/10W	
R210			RK73FB2A104J	CHIP R 100K J 1/10W		R327			RK73FB2A104J	CHIP R 100K J 1/10W	
R211			RK73FB2A332J	CHIP R 3.3K J 1/10W		R328,329			RK73FB2A222J	CHIP R 2.2K J 1/10W	
R212			RK73FB2A473J	CHIP R 47K J 1/10W		R330-333			RK73FB2A104J	CHIP R 100K J 1/10W	
R213			RK73FB2A224J	CHIP R 220K J 1/10W		R334			RK73FB2A101J	CHIP R 100 J 1/10W	
R214			RK73FB2A331J	CHIP R 33 J 1/10W		R335			RK73FB2A473J	CHIP R 4.7K J 1/10W	
R215			RK73FB2A184J	CHIP R 180K J 1/10W		R336			RK73FB2A271J	CHIP R 270 J 1/10W	
R216			RK73FB2A333J	CHIP R 39K J 1/10W		R337			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R217			RK73FB2A104J	CHIP R 100K J 1/10W		R338			RQ2-070-05	CHIP R 0 OHM	
R218			RK73FB2A224J	CHIP R 220K J 1/10W		R339			RK73FB2A101J	CHIP R 100 J 1/10W	
R219			RK73FB2A222J	CHIP R 2.2K J 1/10W		R340			RK73FB2A103J	CHIP R 10K J 1/10W	
R220			RK73FB2A803J	CHIP R 82K J 1/10W		R341			RK73FB2A273J	CHIP R 27K J 1/10W	
R221,222			RK73FB2A102J	CHIP R 1.0K J 1/10W		R343			RK73FB2A472J	CHIP R 4.7K J 1/10W	
R223			RK73FB2A331J	CHIP R 330 J 1/10W		R344			RK73FB2A103J	CHIP R 10J J 1/10W	
R224			RK73FB2A104J	CHIP R 100K J 1/10W		R345			RK73FB2A104J	CHIP R 10K J 1/10W	
R225-229			RK73FB2A103J	CHIP R 10K J 1/10W		R346,347			RK73FB2A477J	CHIP R 4.7 J 1/10W	
R230			RK73FB2A222J	CHIP R 2.2K J 1/10W		R348			RK73FB2A183J	CHIP R 18K J 1/10W	
R231			RK73FB2A474J	CHIP R 470K J 1/10W		R350			RK73FB2A332J	CHIP R 3.3K J 1/10W	
R233			RK73FB2A224J	CHIP R 220K J 1/10W		R351			RK73FB2A103J	CHIP R 10K J 1/10W	
R234			RK73FB2A102J	CHIP R 1.0K J 1/10W		R352			RK73FB2A473J	CHIP R 47K J 1/10W	
R237			RK73FB2A391J	CHIP R 390 J 1/10W		R353			RK73FB2A334J	CHIP R 330K J 1/10W	
R238			RK73FB2A101J	CHIP R 100 J 1/10W		R354			RK73FB2A224J	CHIP R 220K J 1/10W	
R239			RK73FB2A104J	CHIP R 100K J 1/10W		R355			RK73FB2A104J	CHIP R 100K J 1/10W	

## PARTS LIST

TX-RX UNIT (X57-500X-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
R356,357			RK73FB2A102J	CHIP R 1.0K J 1/10W		R513			RK73FB2A061J	CHIP R 680 J 1/10W	
R358			RK73FB2A101J	CHIP R 100 J 1/10W		R514			RK73FB2A101J	CHIP R 100 J 1/10W	
R359			R92-0870-05	CHIP R 0 OHM		R515			RK73FB2A071J	CHIP R 470 J 1/10W	
R360			RK73FB2A183J	CHIP R 18K J 1/10W		R516			RK73FB2A271J	CHIP R 270 J 1/10W	
R361-364			RK73FB2A101J	CHIP R 100 J 1/10W		R517			RK73FB2A184J	CHIP R 180K J 1/10W	
R365			RK73FB2A681J	CHIP R 680 J 1/10W		R518			RK73FB2A102J	CHIP R 10K J 1/10W	
R366			RK73FB2A103J	CHIP R 10K J 1/10W		R519			RK73FB2A123J	CHIP R 12K J 1/10W	
R367			RK73FB2A102J	CHIP R 1.0K J 1/10W		R520			RK73FB2A103J	CHIP R 10K J 1/10W	
R368			R92-0670-05	CHIP R 0 OHM		R521			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R369			RK73FB2A103J	CHIP R 10K J 1/10W		R522			RK73FB2A392J	CHIP R 3.9K J 1/10W	
R370			RK73FB2A564J	CHIP R 560K J 1/10W		R523			RK73FB2A202J	CHIP R 8.2K J 1/10W	
R371,372			RK73FB2A104J	CHIP R 100K J 1/10W		R524			RK73FB2A684J	CHIP R 580K J 1/10W	
R374			RK73FB2A104J	CHIP R 100K J 1/10W		R525			RK73FB2A182J	CHIP R 1.8K J 1/10W	
R375			RK73FB2A102J	CHIP R 1.0K J 1/10W		R526			RK73FB2A333J	CHIP R 33K J 1/10W	
R376			RK73FB2A681J	CHIP R 680 J 1/10W		R527			RK73FB2A104J	CHIP R 100K J 1/10W	
R378			RK73FB2A103J	CHIP R 10K J 1/10W		R528			RK73FB2A220J	CHIP R 22 J 1/10W	
R379-381			RK73FB2A104J	CHIP R 100K J 1/10W		R529-531			RK73FB2A472J	CHIP R 4.7K J 1/10W	
R382			RK73FB2A102J	CHIP R 1.0K J 1/10W		R532			RK73FB2A104J	CHIP R 100K J 1/10W	
R403			RK73FB2A333J	CHIP R 33K J 1/10W		R533			RK73FB2A331J	CHIP R 330 J 1/10W	
R404			RK73FB2A104J	CHIP R 100K J 1/10W		R534			RK73FB2A271J	CHIP R 270 J 1/10W	
R405			RK73FB2A152J	CHIP R 1.5K J 1/10W		R535,536			RK73FB2A472J	CHIP R 4.7K J 1/10W	
R406			RK73FB2A122J	CHIP R 1.2K J 1/10W		R537			RK73FB2A560J	CHIP R 56 J 1/10W	
R407			RK73FB2A282J	CHIP R 620 J 1/10W		R538			RK73FB2A471J	CHIP R 470 J 1/10W	
R408			RK73FB2A151J	CHIP R 150 J 1/10W		R539			RK73FB2A682J	CHIP R 68K J 1/10W	
R409			RK73FB2A182J	CHIP R 1.8K J 1/10W		R540			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R410			RK73FB2A392J	CHIP R 3.9K J 1/10W		R541			RK73FB2A331J	CHIP R 330 J 1/10W	
R411			RK73FB2A104J	CHIP R 100K J 1/10W		R542			RK73FB2A220J	CHIP R 22 J 1/10W	
R412			RK73FB2A392J	CHIP R 3.9K J 1/10W		R543			RK73FB2A101J	CHIP R 100 J 1/10W	
R413			RK73FB2A101J	CHIP R 100 J 1/10W		R547			RK73FB2A222J	CHIP R 2.2K J 1/10W	
R415			RK73FB2A747J	CHIP R 4.7K J 1/10W		R548,549			RK73FB2A561J	CHIP R 560 J 1/10W	
R416			R92-0870-05	CHIP R 0 OHM		R550			RK73FB2A223J	CHIP R 22K J 1/10W	
R417			RK73FB2A152J	CHIP R 15K J 1/10W		R551			RK73FB2A103J	CHIP R 10K J 1/10W	
R418			RK73FB2A101J	CHIP R 100 J 1/10W		R552			RK73FB2A101J	CHIP R 100 J 1/10W	
R420,421			RK73FB2A100J	CHIP R 10 J 1/10W		R553			RK73FB2A471J	CHIP R 470 J 1/10W	
R422			RK73FB2A102J	CHIP R 1.0K J 1/10W		R554			RK73FB2A103J	CHIP R 10K J 1/10W	
R423			RK73FB2A223J	CHIP R 22K J 1/10W		R555			RK73FB2A153J	CHIP R 15K J 1/10W	
R424			RK73FB2A102J	CHIP R 1.0K J 1/10W		R556			RK73FB2A221J	CHIP R 220 J 1/10W	
R425			RK73FB2A333J	CHIP R 33K J 1/10W		R557			RK73FB2A101J	CHIP R 100 J 1/10W	
R426			RK73FB2A223J	CHIP R 22K J 1/10W		R558			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R427			RK73FB2A124J	CHIP R 120K J 1/10W		R559			RK73FB2A681J	CHIP R 680 J 1/10W	
R428			RK73FB2A104J	CHIP R 100K J 1/10W		R560			RK73FB2A104J	CHIP R 0 OHM	
R429			RK73FB2A273J	CHIP R 27K J 1/10W		R561			RK73FB2A101J	CHIP R 160 J 1/10W	
R430,431			R92-0870-05	JUMPER REST 0 OHM		R562			RK73FB2A332J	CHIP R 3.3K J 1/10W	
R432			RK73FB2A560J	CHIP R 56 J 1/10W		R563,564			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R433,434			RK73FB2A103J	CHIP R 10K J 1/10W		R565			RK73FB2A221J	CHIP R 220 J 1/10W	
R435			RK73FB2A563J	CHIP R 56K J 1/10W		R566			RK73FB2A101J	CHIP R 100 J 1/10W	
R436			RK73FB2A153J	CHIP R 15K J 1/10W		R567			RK73FB2A680J	CHIP R 68 J 1/10W	
R450-455			RK73FB2A101J	CHIP R 100 J 1/10W		R568			RK73FB2A821J	CHIP R 820 J 1/10W	
R456-461			RK73FB2A333J	CHIP R 33D J 1/10W		R569			RK73FB2A680J	CHIP R 68 J 1/10W	
R600			RK73FB2A103J	CHIP R 10K J 1/10W		R570			RK73FB2A103J	CHIP R 10K J 1/10W	
R501			RK73FB2A223J	CHIP R 22K J 1/10W		R571			RK73FB2A222J	CHIP R 2.2K J 1/10W	
R502			RK73FB2A223J	CHIP R 2.2K J 1/10W		R572			RK73FB2A331J	CHIP R 330 J 1/10W	
R503			RD140CB2C1G1	RD 100 J 1/6W		R573,574			RK73FB2A101J	CHIP R 10C J 1/10W	
R504			RD140CB2C100J	RD 10 J 1/6W		R575			RK73FB2A471J	CHIP R 470 J 1/10W	
R505,506			RK73FB2A473J	CHIP R 47K J 1/10W		R576			RK73FB2A470J	CHIP R 47 J 1/10W	
R507-508			RK73FB2A101J	CHIP R 100 J 1/10W		R577			RK73FB2A220J	CHIP R 22 J 1/10W	
R509			RK73FB2A102J	CHIP R 1.0K J 1/10W		R578			RK73FB2A222J	CHIP R 2.2K J 1/10W	
R510			RK73FB2A681J	CHIP R 680 J 1/10W		R579,580			RK73FB2A561J	CHIP R 560 J 1/10W	
R511			RK73FB2A101J	CHIP R 100 J 1/10W		R581			RK73FB2A223J	CHIP R 22K J 1/10W	
R512			RK73FB2A471J	CHIP R 470 J 1/10W		R582			RK73FB2A103J	CHIP R 10K J 1/10W	

# TS-570D

## PARTS LSIT

TX-RX UNIT (X57-5000-XX)

Ref. No.	Address	New parts	Parts No.	Description	Desti- nation	Ref. No.	Address	New parts	Parts No.	Description	Desti- nation
R583			RK73FB2A101J	CHIP R 100 J 1/10W		R653			RK73FB2A223J	CHIP R 22K J 1/10W	
R584			RK73FB2A471J	CHIP R 470 J 1/10W		R654			RK73FB2A103J	CHIP R 10K J 1/10W	
R585			RK73FB2A103J	CHIP R 10K J 1/10W		R655			RK73FB2A561J	CHIP R 560 J 1/10W	
R586			RK73FB2A153J	CHIP R 15K J 1/10W		R656,657			RK73FB2A330J	CHIP R 33 J 1/10W	
R587			RK73FB2A221J	CHIP R 220 J 1/10W		R658			RK73FB2A562J	CHIP R 5.6K J 1/10W	
R588			RK73FB2A101J	CHIP R 100 J 1/10W		R659			RK73FB2A103J	CHIP R 10K J 1/10W	
R589			RK73FB2A102J	CHIP R 1.3K J 1/10W		R660			RK73FB2A101J	CHIP R 100 J 1/10W	
R590			RK73FB2A681J	CHIP R 580 J 1/10W		R661			RK73FB2A221J	CHIP R 220 J 1/10W	
R591			R92-0670-05	0 OHM		R662			RK73FB2A471J	CHIP R 470 J 1/10W	
R592			RK73FB2A101J	CHIP R 100 J 1/10W		R663			RK73FB2A100J	CHIP R 10 J 1/10W	
R593			RK73FB2A439J	CHIP R 390 J 1/10W		R664			RK73FB2A471J	CHIP R 470 J 1/10W	
R594			RK73FB2A223J	CHIP R 22K J 1/10W		R665			RK73FB2A332J	CHIP R 3.3K J 1/10W	
R595			RK73FB2A103J	CHIP R 10K J 1/10W		R666,667			RK73FB2A447J	CHIP R 4.7K J 1/10W	
R596,597			RK73FB2A101J	CHIP R 100 J 1/10W		R668			RK73FB2A447J	CHIP R 47 J 1/10W	
R598			RK73FB2A471J	CHIP R 470 J 1/10W		R669			RK73FB2A447J	CHIP R 470 J 1/10W	
R599			RK73FB2A102J	CHIP R 10K J 1/10W		R671			RK73FB2A101J	CHIP R 100 J 1/10W	
R600,601			RK73FB2A103J	CHIP R 10K J 1/10W		R672-578			RK73FB2A101J	CHIP R 100 J 1/10W	
R602			RK73FB2A101J	CHIP R 100 J 1/10W		R688,689			RK73FB2A103J	CHIP R 1.6K J 1/10W	
R603			RK73FB2A471J	CHIP R 470 J 1/10W		R690			RK73FB2A152J	CHIP R 1.5K J 1/10W	
R604			RK73FB2A333J	CHIP R 33K J 1/10W		R691			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R605			RK73FB2A682J	CHIP R 6.8K J 1/10W		R700			R92-0670-05	0 OHM	
R606			RK73FB2A150J	CHIP R 15 J 1/10W		R701			RK73FB2A331J	CHIP R 330 J 1/10W	
R607			RK73FB2A221J	CHIP R 220 J 1/10W		R702			RK73FB2A180J	CHIP R 18 J 1/10W	
R608,609			RK73FB2A4470J	CHIP R 47 J 1/10W		R703			RK73FB2A331J	CHIP R 330 J 1/10W	
R610			RK73FB2A471J	CHIP R 470 J 1/10W		R704			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R611-613			R92-0670-05	0 OHM		R705			RK73FB2A330J	CHIP R 33 J 1/10W	
R614			RK73FB2A101J	CHIP R 100 J 1/10W		R706			RK73FB2A330J	CHIP R 39K J 1/10W	
R615			RK73FB2A122J	CHIP R 1.2K J 1/10W		R707			RK73FB2A4470J	CHIP R 47 J 1/10W	
R616			RK73FB2A331J	CHIP R 330 J 1/10W		R708			RK73FB2A472J	CHIP R 4.7K J 1/10W	
R617			RK73FB2A101J	CHIP R 700 J 1/10W		R709			RK73FB2A103J	CHIP R 13K J 1/10W	
R618			RK73FB2A822J	CHIP R 82K J 1/10W		R710			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R619			RK73FB2A272J	CHIP R 2.7K J 1/10W		R711			RK73FB2A4471J	CHIP R 470 J 1/10W	
R620			RK73FB2A471J	CHIP R 470 J 1/10W		R712			RK73FB2A330J	CHIP R 33 J 1/10W	
R621			RK73FB2A101J	CHIP R 100 J 1/10W		R713			RK73FB2A101J	CHIP R 100 J 1/10W	
R622,623			RK73FB2A472J	CHIP R 4.7K J 1/10W		R714			RK73FB2A682J	CHIP R 6.8K J 1/10W	
R624			RK73FB2A101J	CHIP R 100 J 1/10W		R715			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R625			RK73FB2A681J	CHIP R 580 J 1/10W		R716			RK73FB2A4471J	CHIP R 470 J 1/10W	
R626			RK73FB2A02J	CHIP R 1.0K J 1/10W		R717			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R627			RK73FB2A83J	CHIP R 18K J 1/10W		R718			RK73FB2A331J	CHIP R 330 J 1/10W	
R628			RK73FB2A22J	CHIP R 1.2K J 1/10W		R719			RK73FB2A220J	CHIP R 22 J 1/10W	
R629			RK73FB2A102J	CHIP R 1.0K J 1/10W		R720			RK73FB2A883J	CHIP R 68K J 1/10W	
R630			RK73FB2A883J	CHIP R 68K J 1/10W		R721			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R631			RK73FB2A101J	CHIP R 1.8K J 1/10W		R722-725			RK73FB2A331J	CHIP R 330 J 1/10W	
R632			RK73FB2A151J	CHIP R 150 J 1/10W		R726			RK73FB2A221J	CHIP R 220 J 1/10W	
R633			RK73FB2A02J	CHIP R 1.0K J 1/10W		R727			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R634			RK73FB2A221J	CHIP R 220 J 1/10W		R728			RK73FB2A103J	CHIP R 1.0K J 1/10W	
R635			RK73FB2A101J	CHIP R 100 J 1/10W		R729			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R636			RK73FB2A472J	CHIP R 4.7K J 1/10W		R730			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R637			RK73FB2A271J	CHIP R 270 J 1/10W		R731			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R638			RK73FB2A332J	CHIP R 3.3K J 1/10W		R732			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R639			RK73FB2A101J	CHIP R 100 J 1/10W		R733			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R640			RK73FB2A472J	CHIP R 4.7K J 1/10W		R734			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R641			RK73FB2A271J	CHIP R 270 J 1/10W		R735			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R642			RK73FB2A332J	CHIP R 3.3K J 1/10W		R736			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R643			RK73FB2A101J	CHIP R 100 J 1/10W		R737			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R644			RK73FB2A882J	CHIP R 6.8K J 1/10W		R738			RK73FB2A152J	CHIP R 1.5K J 1/10W	
R645			RK73FB2A271J	CHIP R 270 J 1/10W		R739			RK73FB2A333J	CHIP R 33K J 1/10W	
R646			RK73FB2A332J	CHIP R 3.3K J 1/10W		R740			RK73FB2A883J	CHIP R 68K J 1/10W	
R647			RK73FB2A101J	CHIP R 100 J 1/10W		R741			RK73FB2A103J	CHIP R 10K J 1/10W	
R648			RK73FB2A682J	CHIP R 5.8K J 1/10W		R742			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R649			RK73FB2A271J	CHIP R 270 J 1/10W		R743			RK73FB2A152J	CHIP R 1.5K J 1/10W	
R650			RK73FB2A332J	CHIP R 3.3K J 1/10W		R744			RK73FB2A333J	CHIP R 33K J 1/10W	
R651			RK73FB2A101J	CHIP R 100 J 1/10W		R745			RK73FB2A221J	CHIP R 220 J 1/10W	
R652			RK73FB2A471J	CHIP R 470 J 1/10W		R746			RK73FB2A103J	CHIP R 10K J 1/10W	

## PARTS LIST

TX-RX UNIT (X57-500X-XX)					
Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
VR1		R12-5711-05	VARIABLE R	4.7K	
VR2		R12-6707-05	VARIABLE R	1.0K	D68
VR3		R12-6717-05	VARIABLE R	47K	D69
VR4.5		R12-6713-05	VARIABLE R	10K	D71
VR8		R12-6740-05	VARIABLE R	10K	D73
VR9		R12-6703-05	VARIABLE R	220	D74
VR40	*	R31-0615-05	VARIABLE R		D75
VR41,452	*	R31-0612-05	VARIABLE R		D76
K1		S51-1428-05	RELAY		D77
K2		S51-1420-05	RELAY		D82
O1		LF801	DIODE		D85
O2		RLS245	DIODE		D89-92
O3,4		V08GJ	DIODE		D95
O5		RLS245	DIODE		D96
O6-8		RN731H	DIODE		D97
O9		LF801	DIODE		D98
O10		RN731H	DIODE		* D99,100
O11		LF801	DIODE		D101,102
O12		RN731H	DIODE		D103,104
O13		LF801	DIODE		D500,501
O14		RN731H	DIODE		D502
O15		LF801	DIODE		D503
O16		RN731H	DIODE		D504
O17		LF801	DIODE		D505
O18		RN731H	DIODE		D506
O19		LF801	DIODE		D507
O20		RN731H	DIODE		D508,509
O21		LF801	DIODE		D800
O22		RN731H	DIODE		IC1
O23		LF801	DIODE		IC2
O24		RN731H	DIODE		IC3
O25		LF801	DIODE		IC4
O26		RN731H	DIODE		IC5
O27		LF801	DIODE		IC6
O30		LF801	DIODE		IC7
O31		MA110	DIODE (or 1SS355)		IC8
O32		LF801	DIODE		IC9
O33		DA236K	DIODE		IC11
O34		1SS312	DIODE		IC12
O35-37		DA236K	DIODE		IC13
O38,39		LF801	DIODE		IC14
O40		DAP236K	DIODE		IC15
O41		1SS312	DIODE		IC16
O42		DAP236K	DIODE		IC17
O43		RN731H	DIODE		IC500
O44		1SS312	DIODE		IC501,502
O45		UR801	DIODE		IC503,504
O46,47		DAP236K	DIODE		IC505
O48-50		MA110	DIODE (or 1SS355)		IC506
O51		LF801	DIODE		IC507
O52		RN731H	DIODE		IC508
O53,54		DAP236K	DIODE		IC510
O55		UR801	DIODE		IC511
O56		RN739D	DIODE		IC500
O57		B30-2001-05	LED		Q1
O58		MA110	DIODE (or 1SS355)		Q2
O61		LF801	DIODE		Q3
O62		RB51H	DIODE		Q4
O63		1SS225	DIODE		Q5-8
					Q9
					RU201

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## PARTS LSIT

TX-RX UNIT (X57-500X-XX)  
LCD ASSY (B38-0765-05)

Ref. No.	Address	New parts	Parts No.	Description	Desti-nation	Ref. No.	Address	New parts	Parts No.	Description	Desti-nation
010		2SK520(K43)	3SK131(M)	FET		0543		2SC2714(Y)	2SC2714(R)	TRANSISTOR	
011,12		3SK131(M)		FET		0544		2SC2714(R)	2SC2714(Y)	TRANSISTOR	
013		2SK520(K43)		FET		0545,546		2SC2714(Y)	2SC2714(Y)	TRANSISTOR	
014,15		2SC2412(KS)		TRANSISTOR		0800		2SC2714(Y)	2SC2714(Y)	TRANSISTOR	
016		2SC3357		TRANSISTOR		0801		DTC114EK	DTC114EK	DIGITAL TRANSISTOR	
017,18		2SK520(K44)		FET		0802		2SC2714(Y)	2SC2714(Y)	TRANSISTOR	
020		DTA124EK		DIGITAL TRANSISTOR		0803		2SC2412(KS)	2SC2412(KS)	TRANSISTOR	
021,22		2SC2412(KS)		TRANSISTOR		0804		2SC2714(Y)	2SC2714(Y)	TRANSISTOR	
024		FMC2		TRANSISTOR		0805		2SC2412(KS)	2SC2412(KS)	TRANSISTOR	
025		3SK131(M)		FET		0806		2SC2714(Y)	2SC2714(Y)	TRANSISTOR	
026		DTA143EK		DIGITAL TRANSISTOR		0807		DTA114EK	DTA114EK	DIGITAL TRANSISTOR	
027		3SK131(M)		FET		TH1		157-502-53002	157-502-53002	THERMISTOR (5K)	
028		3SK184(R)		FET		TH2		157-501-53009	157-501-53009	THERMISTOR (500)	
029,30		3SK131(M)		FET		TH3		157-302-53008	157-302-53008	THERMISTOR (3K)	
031		3SK184(R)		FET		TH4		157-102-53003	157-102-53003	THERMISTOR (1K)	
035		2SC2954		TRANSISTOR		TH5		157-502-53002	157-502-53002	THERMISTOR (5K)	
036		2SC2412(KS)		TRANSISTOR		TH6		157-102-53003	157-102-53003	THERMISTOR (1K)	
037		DTC114EK		DIGITAL TRANSISTOR		TH7		157-103-55001	157-103-55001	THERMISTOR (10K)	
038		2SC2412(KS)		TRANSISTOR		TH8		157-102-53003	157-102-53003	THERMISTOR (1K)	
039		2SA1037(KR)		TRANSISTOR							
040,41		2SC2412(KS)		TRANSISTOR							
Q42		2SB1180L(R)		TRANSISTOR		C1		CK73FB1H103K	CK73FB1H103K	CHIP C	0.010UF K
Q49		2SD1624(S)		TRANSISTOR		C2-10		CK73FB1H102K	CK73FB1H102K	CHIP C	1.000PF K
Q50		DTC114EK		DIGITAL TRANSISTOR		C11		CK73FF1E104Z	CK73FF1E104Z	CHIP C	0.100UF Z
Q51		DTC143TK		DIGITAL TRANSISTOR		C12-21		CK73FB1H103K	CK73FB1H103K	CHIP C	0.010UF K
Q52		DTC124EK		DIGITAL TRANSISTOR		C22	*	C92-9672-05	C92-9672-05	CHIP TAN	22UF 16WV
Q57		DTC114EK		DIGITAL TRANSISTOR		C23-26		CK73FB1H103K	CK73FB1H103K	CHIP C	0.010UF K
Q59		FMA5		TRANSISTOR		C27		CK73FS11H681J	CK73FS11H681J	CHIP C	680PF J
Q61		FMA5		TRANSISTOR		C28-40		CK73FB1HXXXX	CK73FB1HXXXX	CHIP C	
Q64		2SC2412(KS)		TRANSISTOR		C41	*	C92-0677-05	C92-0677-05	CHIP TAN	22UF 25WV
Q65-67		DTC114EK		DIGITAL TRANSISTOR		C42		CK73FB1H103K	CK73FB1H103K	CHIP C	0.010UF K
Q68,69		2SB1180L(R)		TRANSISTOR		C43		CK73FB1H223K	CK73FB1H223K	CHIP C	0.022UF K
Q70		DTC114EK		DIGITAL TRANSISTOR		CNI	*	E40-5880-08	E40-5880-08	CONNECTOR (26P)	
Q71		DTC143EK		DIGITAL TRANSISTOR		CN2		E40-3247-05	E40-3247-05	CONNECTOR (3P)	
Q72		FMG3A		TRANSISTOR		CN3	*	E29-1161-08	E29-1161-08	RUBBER CONNECTOR	
Q73		DTA143EK		DIGITAL TRANSISTOR		CN4,5	*	E29-1162-08	E29-1162-08	RUBBER CONNECTOR	
Q75-79		DTC114EK		DIGITAL TRANSISTOR		J1		E06-0958-15	E06-0958-15	MIC CONNECTOR (8P)	
Q80		DTC124EK		DIGITAL TRANSISTOR		L1		L40-1292-18	L40-1292-18		
Q81		DTC114EK		DIGITAL TRANSISTOR		R1-37		RK73FB2AXXXJ	RK73FB2AXXXJ	CHIP R	
Q500-503		2SC2714(Y)		TRANSISTOR		R28,39		R92-0659-05	R92-0659-05	CHIP R	10 J 1/2W
Q504		2SC2412(KS)		TRANSISTOR		R40		RK73FB2A100J	RK73FB2A100J	CHIP R	10 J 1/10W
Q505-507		2SC2722(KR)		TRANSISTOR		R41		RK73FB2A102J	RK73FB2A102J	CHIP R	1.8K J 1/10W
Q508		DTC143TK		DIGITAL TRANSISTOR		SW3-50		S70-0447-05	S70-0447-05	TACT SWITCH	
Q509		2SK1676(V)		FET		D1-15		1S355	1S355	DIODE	
Q510,511		2SC2714(Y)		TRANSISTOR		I1		MSM5256GS-BK	MSM5256GS-BK	IC (LCD DRIVER)	
Q512		2SC2412(KS)		TRANSISTOR		I2		NJU6432BFE1	NJU6432BFE1	IC	
Q513		2SC2712(GR)		TRANSISTOR		I3		NJU3715G	NJU3715G	IC (SER PARA CHANGEOVER)	
Q514-517		2SC2412(KS)		TRANSISTOR		LCD1	*	B30-0779-08	B30-0779-08	LCD ELEMENT	
Q518		2SC2712(GR)		TRANSISTOR		PL1-6	*	B30-2163-08	B30-2163-08	LAMP	
Q519,520		2SC2412(KS)		TRANSISTOR		Q1		ZSA1641S,T1	ZSA1641S,T1	TRANSISTOR	
Q521,522		2SC2714(Y)		TRANSISTOR		Q2		ZSC2712(Y)	ZSC2712(Y)	TRANSISTOR	
Q523		2SC2412(KS)		TRANSISTOR		Q3		ZSA1621(Y)	ZSA1621(Y)	TRANSISTOR	
Q524-526		2SC3722(KR)		TRANSISTOR		Q4-6	*	DTC123EK	DTC123EK	TRANSISTOR	
Q527		DTC114EK		DIGITAL TRANSISTOR		Q7		DTC144EK	DTC144EK	TRANSISTOR	
Q528		ZSK1875(V)		FET		SW1					
Q529		DTC114EK		DIGITAL TRANSISTOR		SW2	*	W02-1901-05	W02-1901-05	ENCODER (MULTI/CH)	
Q530		ZSK1875(V)		FET			*	W02-1902-05	W02-1902-05	ENCODER (R/T/X/T)	
Q531		DTC114EK		DIGITAL TRANSISTOR							
Q532		ZSK1875(V)		FET							
Q533-535		ZSC2714(Y)		TRANSISTOR							

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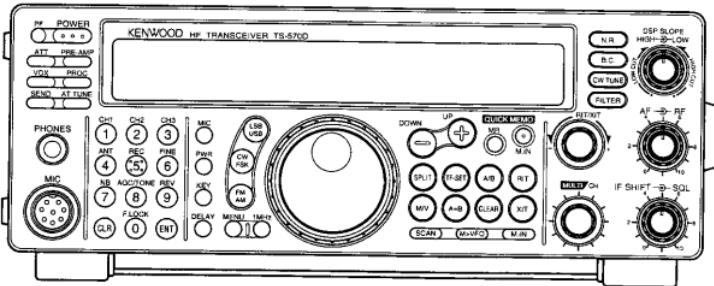
## ADJUSTMENT

### Preparation

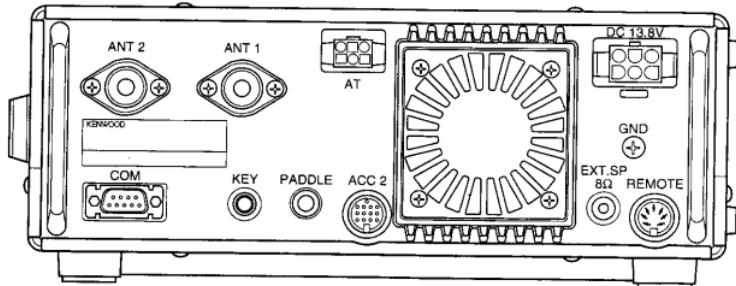
Unless otherwise specified, knobs and switches should be set as follows.

POWER .....	ON	SQL VR .....	0	AF VR .....	0
ATT .....	OFF	PRE-AMP .....	ON	RF VR .....	MAX
AGC .....	FAST	IF SHIFT .....	Center	PROC .....	OFF
NB .....	OFF	DSP SLOPE .....	Center		

### Front Panel



### Rear Panel



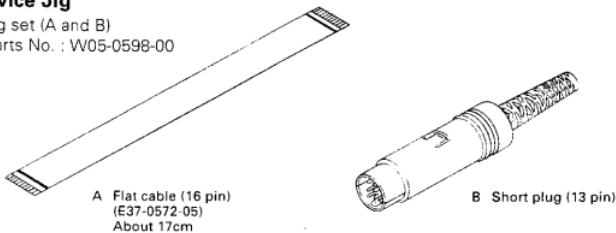
# TS-570D

## ADJUSTMENT

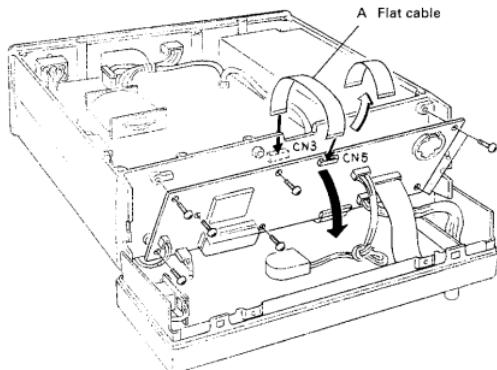
### Service Jig

Jig set (A and B)

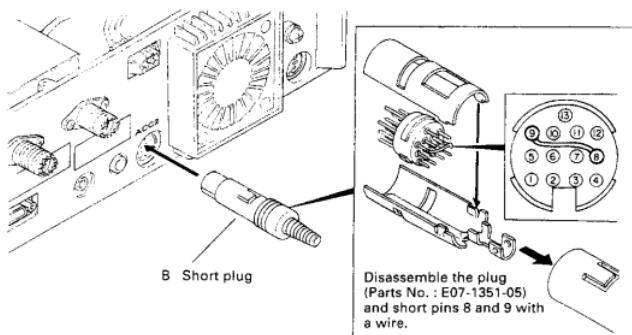
Parts No. : W05-0598-00



### How to Use the Flat Cable



### How to Use the Short Plug



# ADJUSTMENT

## Service Adjustment Mode

### ■ Outline

1. The transceiver is adjusted by the normal method and by a method using the service adjustment mode (automatic adjustment).
2. There are adjustment items of menu numbers 00 to 51 in the service adjustment mode. All adjustment data are saved in the EEPROM.
3. When the service adjustment mode is entered, data is read from the EEPROM and placed in the CPU RAM, so it can be modified.
4. The EEPROM is updated only when data is written in Menu No. 51.

### ■ Operation Procedure

#### 1) Entering the service adjustment mode

1. Before turning the power on, insert the adjustment jig into the ACC2 socket.
2. Hold down the [N.R.J] key and [LSB/USB] key and turn the [POWER] switch on. The display (LCD) shows "ADJUST" and then the adjustment mode menu.
3. After "ADJUST" appears, remove the short plug from the ACC2. (The transmitter cannot be adjusted without removing it.)

## Service Adjustment Mode Menu

Menu No.	Function	Description
00	AGC	AGC reference voltage (14.1MHz USB)
01	ALC	ALC reference voltage (14.2MHz USB)
02	SSB SQL threshold	(14.1MHz USB)
03	S-meter (SSB)	Start level (S1) setting (14.1MHz USB)
04		S9 level setting (14.1MHz USB)
05		S9+60dB (full scale) level setting (14.1MHz USB)
06	FM SQL threshold	(29.1MHz FM)
07	S-meter (FM)	Start level (S1) setting (29.1MHz FM)
08		Full scale level setting (29.1MHz FM)
09~15	Not use	
16	SQL VR center	SQL VR center voltage reading (14.1MHz)
17	IF SHIFT center	IF SHIFT center voltage reading (14.1MHz)
18	100W protection setting	Read data at the 100W point on the RF meter (14.2MHz USB)
19	50W protection setting	Read data at the 50W point on the RF meter (14.2MHz USB)
20	25W protection setting	Read data at the 25W point on the RF meter (14.2MHz USB)
21	10W protection setting	Read data at the 10W point on the RF meter (14.2MHz USB)
22	5W protection setting	Read data at the 5W point on the RF meter (14.2MHz USB)
23	TGC setting	1.8MHz band (100W) (1.840MHz USB) 3.5MHz band (100W) (3.5MHz USB) 7MHz band (100W) (7.0MHz USB) 10MHz band (100W) (10.1MHz USB) 14MHz band (100W) (14.2MHz USB) 18MHz band (100W) (18.068MHz USB) 21MHz band (100W) (21.0MHz USB) 25MHz band (100W) (24.89MHz USB) 28MHz band (100W) (29.89MHz USB)
24		
25		
26		
27		
28		
29		
30		
31		

### 2) Menu number selection

When the [MULTI/CH] control is turned, the menu number changes.

### 3) Changing the setting data

Setting data can be changed by using the [UP] or [DOWN] key on the transceiver or the microphone.

### 4) Writing data

Press the [UP] or [DOWN] key on the transceiver or the microphone with MENU No.51 to write data.

### 5) Canceling the service adjustment mode

When the [CLR] key is pressed, the normal VFO mode display returns.

### Notes:

1. The transceiver can transmit signals in the receiver adjustment mode. If a microphone is connected to the transceiver, take special care not to press the PTT key.
2. If the power is switched off during adjustment in the adjustment mode, the adjustment mode is canceled.

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## ADJUSTMENT

Menu No.	Function	Description
32	Not use	
33	TGC setting	14MHz band (50W) (14.2MHz USB)
34		14MHz band (25W) (14.2MHz USB)
35		14MHz band (10W) (14.2MHz USB)
36		14MHz band (5W) (14.2MHz USB)
37	ALC meter voltage reading	Start level setting (14.2MHz USB)
38		Maximum zone level setting (14.2MHz USB)
39	CAR level setting	CW (14.2MHz CW) AM (14.2MHz AM)
40		(20.69MHz FM)
41	FM maximum deviation	USB (14.2MHz USB)
42	SSB CAR shift compensation	LSB (14.2MHz LSB)
43		USB (14.2MHz USB)
44	SSB CAR suppression	LSB (14.2MHz LSB)
45		USB (14.2MHz USB)
46	SWR protection voltage setting	(14.2MHz CW)
47	HF band SWR=3.0 reading	For display in TX (1.840MHz CW)
48	Not use	
49	Check sum display	Sum of ROM's data (14.1MHz)
50	All LCD segments light	Display checking
51	Writing into EEPROM	

### Display Check

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. All reset	1) DC IN : DC 13.8V Pushing [A=B] key down, [POWER] - ON				Front panel	LCD	After displaying "HELLO", the display is reset as follows; DISP f.: 14.000.00 MODE : USB ANT : 1 METER : ALC PRE AMP	Display should be normal. Should be at the reset frequency.
2. All LCD segments light	1) Menu No. : 50	ACC2 Jig (Short plug)					Check	All LCD segments light.

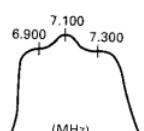
### PLL Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Reference oscillation (20MHz)	1) Display f. : 14.750MHz MODE : AM	f. counter	TX-RX (PLL)	TP505	TX-RX (PLL)	TC500	20.000.000MHz	±20Hz
2. 60MHz	1) Display f. : 14.750MHz MODE : AM	Oscilloscope		TP506		L529 L530	Repeat for MAX.	
3. 65MHz BPF	1) Display f. : 14.750MHz MODE : AM			TP503		L533 L534 L535	Repeat for MAX.	

## ADJUSTMENT

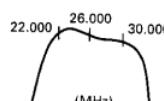
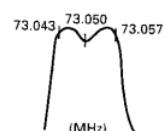
Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Lock voltage VCO1A	1) Display f. : 30kHz MODE : AM 2) Display f. : 10.980MHz	DC V.M	TX-RX (PLL)	TP501	TX-RX (PLL)	TC502	2.0V	±0.05V
5. Lock voltage VCO1B	1) Display f. : 10.990MHz MODE : AM 2) Display f. : 23.980MHz				TX-RX (PLL)	TC503	2.0V	±0.05V
6. Lock voltage VCO1C	1) Display f. : 23.990MHz MODE : AM 2) Display f. : 29.990MHz				TX-RX (PLL)	TC504	2.0V	±0.05V
7. LO2 VCO2 voltage	1) Display f. : 14.100MHz MODE : AM	RF V.M		TP504			Check	6.5V or less
8. LO1 level	1) Display f. : 14.100MHz MODE : AM				CN503		Check	3.0~6.0V
9. LO2 level	Measurement condition : 50Ω terminated				CN501			0~+4dBm
10. CAR level	1) Display f. : 14.100MHz MODE : AM	Oscilloscope		CN502			Check	1.0Vp-p±0.2

## Receiver Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. AGC voltage	1) Menu No. : 00 (14.100MHz USB)	DC V.M	TX-RX (RF)	TP2	Front panel	UP or DOWN key	2.9V	±0.03V
• Writing data : After item 1 has been adjusted; 1) Menu No. : 51 2) [UP] or [DOWN] key : Push once time 3) [CLR] key : Push once time.								
2. BPF	1) Display f. : 7.000MHz MODE : FM PRE AMP : ON Spectrum analyzer setting Center f. : 7.100MHz Frequency span : 2MHz Output : -20dBm XdB/DIV : 2dB RBW : 30kHz VBW : 10kHz	Tracking generator Spectrum analyzer	Rear panel TX-RX (RF)	ANT CN7	TX-RX (RF)	L20 L21 L22	Repeat adjustment 2 or 3 times until the level is maximized and the waveform becomes flat.	
	2) Display f. : 14.000MHz Spectrum analyzer setting Center f. : 14.000MHz Frequency span : 5MHz					L29 L30 L31	Repeat adjustment 2 or 3 times until the level is maximized and the waveform becomes flat.  Note : If dip point appear, first turn TC2 (RF) and adjust to L29,30,31.	

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## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. RF AMP	1) Display f. : 22.000MHz MODE : FM PRE AMP : ON Spectrum analyzer setting Center f. : 26.000MHz Frequency span : 20MHz Output : -20dBm XdB/DIV : 2dB RBW : 30kHz VBW : 10kHz	Tracking generator Spectrum analyzer	Rear panel TX-RX (RF)	ANT CN7	TX-RX (RF)	L67 L68	Repeat adjustment 2 or 3 times until the level is maximized and within the range of waveform.  Note : If dip point appear, first turn TC2 (RF) and adjust to L67,68.	
4. MCF (73MHz)	1) Display f. : 14.000MHz MODE : USB AGC : OFF Spectrum analyzer setting Center f. : 73.050MHz Frequency span : 70kHz ATT : 10dB Output : -20dBm XdB/DIV : 2dB RBW/VBW : 1kHz	Tracking generator Spectrum analyzer	TX-RX (RF) CN4	CN3	TX-RX (RF) L45 L54 L50 L51 L111	Repeat adjustment 2 or 3 times until the level is maximized and the waveform becomes flat.  1) Turn L45 and L54 to adjust to the 73.05MHz peak. (Repeat twice) 2) Turn L50, L51, and L111 to make a symmetrical waveform. 3) Make the waveform flat using L45 and L54.		
5. Trap initialize setting E,E2,E3	1) Set the TC2 position as shown right.				TX-RX (RF)	TC2	Turn TC2 180° from the default position.	 Face the concave part of the knob downwards.
6. IF AMP	1) Display f. : 14.100MHz MODE : USB AGC : FAST PRE AMP : ON AF output : 0.63V/8Ω SSG frequency : 14.101MHz SSG output : -113dBm	SSG AF V.M Oscilloscope DM, SP	Rear panel	ANT	TX-RX (RF) EXT.SP	L55 L56 L61 IC15's L1,L2	Repeat adjustment 2 or 3 times until the AF output is maximized.	
7. RX MIX balance	1) Display f. : 100kHz MODE : USB PRE AMP : ON SSG output : OFF				VR1	Noise MIN		
8. IF GAIN	1) Display f. : 14.100MHz MODE : USB AGC : FAST PRE AMP : ON SSG frequency : 14.101MHz SSG output : -105dBm  2) SSG output : -115dBm  3) SSG output : -105dBm		Front panel	AF VR	AF output : 0.63V			
			TX-RX (RF) VR1	IC16's	AF output : 0.4V	±0.05V		
					Check	AF output : 0.63V±0.05V		
9. Trap E,E2,E3	1) Display f. : 15.200MHz MODE : USB AGC : FAST PRE AMP : ON SSG frequency : 15.201MHz SSG output : -113dBm  2) Display f. : 11.700MHz SSG frequency : 11.701MHz		TX-RX (RF)	TC2	AF output : MIN	There must be a dip point.		
				TC1				

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
10. NB	1) Display f.: 14.100MHz MODE : USB AGC : FAST PRE AMP : ON SSG frequency : 14.101MHz SSG output : -103dBm	DC V.M SSG AF V.M Oscilloscope DM, SP	TX-RX (PLL) Rear panel ANT EXT.SP	TP801	TX-RX (PLL)	L802 L803	Voltage MIN	
	2) [NB] key : ON/OFF	Noise G.			ANT		Adjust output of noise generator to S1 and S9, and check each.	Noise should disappear when NB is ON.
• Item 11 to 16 below are adjusted in the adjustment mode. To terminate the adjustment menu in the middle, save your settings with Menu No. 51.								
11. SSB SQL threshold	1) Menu No. : 02 (14.100MHz USB) SSG output : OFF	SSG AF V.M Oscilloscope DM, SP	Rear panel EXT SP	ANT	Front panel	UP or DOWN key	1 push	
12. SSB S-meter S1	1) Menu No. : 03 (14.100MHz USB) SSG frequency : 14.101MHz SSG output : -107dBm							
S9	2) Menu No. : 04 (14.100MHz USB) SSG output : -81dBm							
Full scale	3) Menu No. : 05 (14.100MHz USB) SSG output : -21dBm							
13. FM SQL threshold	1) Menu No. : 06 (29.100MHz FM) SSG frequency : 29.100MHz SSG output : OFF							
14. FM S-meter S1	1) Menu No. : 07 (29.100MHz FM) SSG frequency : 29.100MHz SSG output : -117dBm MOD : 1kHz/3kHz							
Full scale	2) Menu No. : 08 (29.100MHz FM) SSG output : -95dBm MOD : 1kHz/3kHz							
15. SQL VR center voltage	1) Menu No. : 16 (14.100MHz USB) SSG frequency : Anything SSG output : OFF						SQL VR : Center 1 push	
16. IF SHIFT VR center voltage	1) Menu No. : 17 (14.100MHz USB) SSG frequency : Anything SSG output : OFF						IF SHIFT VR : Center 1 push	
• Writing data : After items 11 to 16 have been adjusted; 1) Menu No. : 51 2) [UP] or [DOWN] key : Push once time 3) [CLR] key : Push once time.								
Display "rEAdy" → "run" → "good" (if "nG" is displayed, enter data again.)								

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## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
17. S/N	1) Display f. : Below AF VR : 0.63V/8Ω SSG frequency : Below However, USB : +1kHz LSB : -1kHz	SSG AF V.M Oscilloscope Distortion meter DM. SP	Rear panel	ANT EXT.SP				
	Frequency MODE 550kHz AM SSG output SSG MOD DEV 1.550MHz AM -77dBm 1kHz 60% S/N measurement 10dB or more 1.800MHz LSB -119dBm OFF OFF MAX sensitivity measurement 0.63V/8Ω or more 3.550MHz LSB -119dBm OFF OFF 7.100MHz LSB -119dBm OFF OFF 10.100MHz USB -119dBm OFF OFF ← PRE AMP : OFF Sensitivity down 5~15dB. 14.100MHz USB -119dBm OFF OFF 21.100MHz USB -119dBm OFF OFF 24.800MHz USB -123dBm OFF OFF 28.800MHz USB -123dBm OFF OFF 29.800MHz FM -119dBm 1kHz 3kHz ← SINAD sensitivity 12dB SINAD or more measurement							
18. ATT	1) Display f. : 14.300MHz MODE : USB AGC : FAST PRE AMP : ON SSG frequency : 14.301MHz SSG output : -113dBm	SSG AF V.M Oscilloscope DM. SP	Rear panel	ANT EXT.SP	Front panel	ATT key	1) Adjust the AF output to 1V. 2) 1 push the [ATT] key. 3) SSG output : -93dBm	AF output down. AF output : 1V±3dB
19. VS-3 (Option)	1) Connect the VS-3 to CN16 on the TX-RX unit. AF VR : MIN [PF] key : 1 push	VS-3	TX-RX (RF)	CN16	Front panel	PF key	1 push	The displayed frequency can be heard vocally.
20. DRU-3A (Options)	1) Connect the DRU-3A to CN17 on the TX-RX unit. Connect a microphone to the MIC jack. [REC] key : 1 push	DRU-3A Microphone	TX-RX (RF) Front panel	CN17 MIC	Front panel	CH1 key	Hold down [CH1], and talk into the microphone. Press the [CH1] key again.	Can be recorded for about 15 seconds. The recorded voice must be played back.

### Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. ALC voltage	1) Menu No. : 01 (14.100MHz USB) Transmit	DC V.M	TX-RX (RF)	TP1	Front panel	UP or DOWN key	2.7V	±0.03V
	• Writing data : After item 1 has been adjusted; 1) Menu No. : 51 2) [UP] or [DOWN] key : Push once time 3) [CLR] key : Push once time. 4) [SPLIT] key : Push once time.						Display "rEAdy" → "run" → "good" (if "nG" is displayed, enter data again.)	
2. Final idling current	1) Display f. : 14.200MHz MODE : USB Final unit VR1, 2 : MIN Transmit	DC. A	Rear panel	DC IN	Final		{First adjust VR1 and VR2 for minimum)=A VR1 A+250mA VR2 (A+250mA)+250mA}	

## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
3. TX AMP	1) Display f. : 14.200MHz MODE : CW Connect to CN10 a 50Ω dummy load. Transmit	50Ω dummy Oscilloscope	TX-RX (RF)	CN10	TX-RX (RF)	L69,70 L71,72 L74,75 L76 VR3	Repeat 2 or 3 times for DRV output MAX	Reference value 2.5Vp-p or more
4. NULL	1) Display f. : 3.500MHz MODE : CW Transmit	Power meter DC V.M (Oscilloscope)	Rear panel Final	ANT CN12	Final	TC1	MIN	Reference value 0.5V or less
5. Power frequency characteristic	1) Initialize	Power meter	Rear panel	ANT	Final	VR3	Full counterclock-wide (VR MIN)	
	2) Menu No. : 18 (14.200MHz USB) Transmit				Front panel	UP or DOWN key	100W	±5.0W
	3) Writing data with Menu No. 51. [CLR] key : Push once time (Adjustment mode terminated)							
	4) Display f. : 29.699MHz MODE : CW Transmit				Final	VR3	Power MAX	95W or more
6. 14MHz TGC	1) Menu No. 27 (14.200MHz USB) Transmit	Power meter	Rear panel	ANT	Front panel	UP or DOWN key	Setting data : 050	
	2) Writing data with Menu No. 51.				TX-RX (RF)	VR9	100W	±3.0W
					Front panel	UP or DOWN key	1 push	
• Item 7 to 17 below are adjusted in the adjustment mode. To terminate the adjustment menu in the middle, save your settings with Menu No. 51.								
7. Power 100W	1) Menu No. : 18 (14.200MHz USB) Transmit	Power meter	Rear panel	ANT	Front panel	UP or DOWN key	100W	±5.0W
	2) Menu No. : 19 (14.200MHz USB) Transmit						50W	±2.5W
	3) Menu No. : 20 (14.200MHz USB) Transmit						25W	±1.0W
	4) Menu No. : 21 (14.200MHz USB) Transmit						10W	±1.0W
	5) Menu No. : 22 (14.200MHz USB) Transmit						5W	±1.0W
8. TGC 1.9MHz	1) Menu No. : 23 (1.840MHz USB) Transmit						100W K,M2,E,E3 10W E2	±5W K,M2,E,E3 ±1.0W E2
	2) Menu No. : 24 (3.500MHz USB) Transmit						100W	±5W
7.0MHz	3) Menu No. : 25 (7.00MHz USB) Transmit							Note : Skip 14MHz
	4) Menu No. : 26 (10.100MHz USB) Transmit							

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## **ADJUSTMENT**

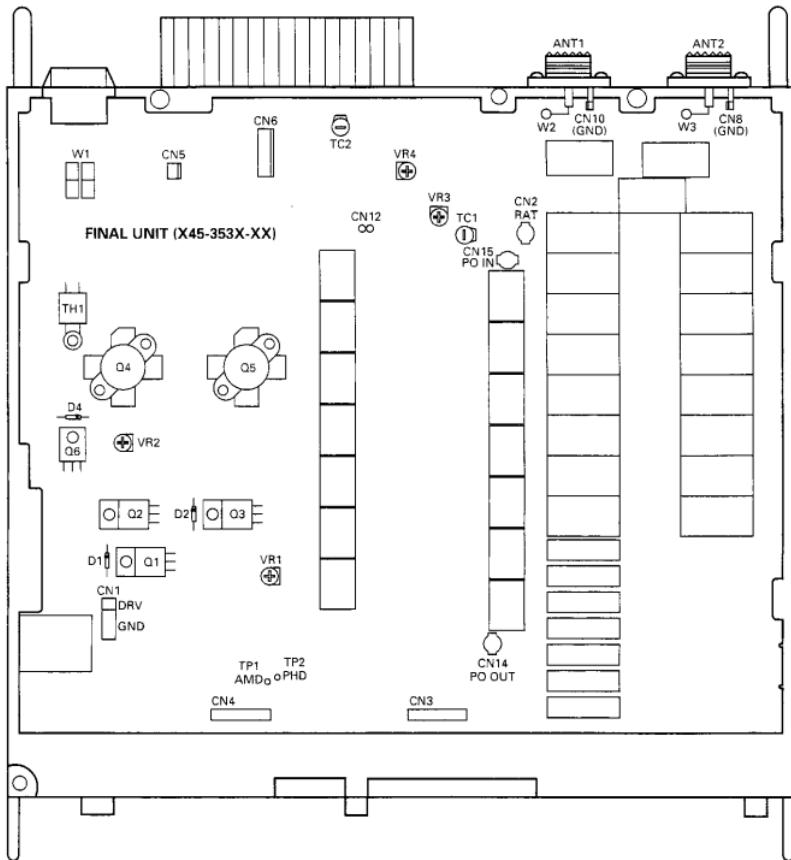
## ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
15. SSB carrier suppression USB	1) Menu No. : 44 (14.200MHz USB) Transmit	Power meter Oscilloscope	Rear panel	ANT	TX-RX (RF)	VR4 VR5	Carrier level MIN	60dB or less  (Repeat check both LSB and USB.)
LSB	2) Menu No. : 45 (14.200MHz LSB) Transmit							
16. SWR protection	1) Menu No. : 46 (14.200MHz CW) Transmit	150Ω dummy Through type power meter	Front panel	UP or DOWN key	40W	±1.0W	1 push	J. mult. 044
17. SWR meter (SWR : 3.0)	1) Menu No. : 47 (1.840MHz CW) Transmit	150Ω dummy						
• Writing data: After items 7 to 17 have been adjusted;								
	1) Menu No. : 51							
	2) [UP] or [DOWN] key : Push once time							Display "rEAdy" → "run" → "good" (If "nG" is displayed, enter data again.)
	3) [CLR] key : Push once time.							
18. Spurious	1) Display f. : 24.900MHz MODE : CW Transmit	Power meter Spectrum analyzer	Rear panel	ANT	TX-RX (RF)	VR2	±1.650MHz Spurious level MIN	60dB or less
19. AT amplitude	1) Display f. : 29.690MHz MODE : CW Transmit Power : 10W	Power meter Oscilloscope	Rear panel	ANT	Final	VR4	Turn the VR to the point where the waveform on the oscilloscope changes from high to low. (Threshold point)	
20. AT phase	1) Display f. : 29.690MHz MODE : CW Transmit Power : 10W							
21. MIC sensitivity SSB	1) Display f. : 14.200MHz MODE : USB AG : 1kHz/5mV Transmit	Power meter AG VTVM	Rear panel	ANT	MIC	Check	90W or more	
FM	1) Display f. : 29.000MHz MODE : FM AG : 1kHz/3mV <b>E,E2,E3</b> 1kHz/5mV <b>K,M2</b> Transmit	Power meter Linear detector	Rear panel	ANT				
	2) AG : 1kHz/30mV <b>E,E2,E3</b> 1kHz/50mV <b>K,M2</b> Transmit	AG VTVM Oscilloscope	Front panel	MIC			DEV : ±2.7~3.3kHz	DEV : ±4.0~5.0kHz
22. Transmit frequency characteristic	1) Display f. : 14.200MHz MODE : USB/LSB AG : 1kHz/5mV 400Hz/5mV 2.6kHz/5mV Transmit	Power meter AG AF V.M	Rear panel	ANT			Set AG to 1.0kHz and turn the [MULTI/CH] knob to set to 50W. Change the AG frequency and measure the difference between the power levels at 1.0kHz and at another frequency. Take a measurement for each USB and LSB.	Within 6dB

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## ADJUSTMENT

### Adjustment Points (Top)



VR1,2 : Final idling current

VR3 : Power frequency characteristic

VR4 : AT amplitude

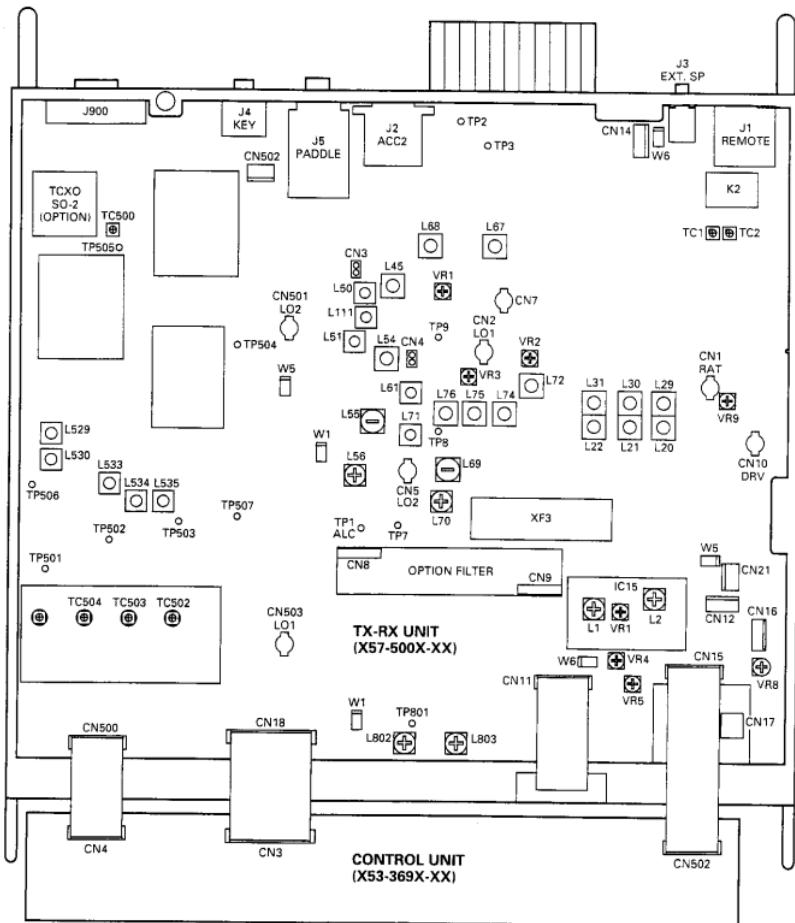
TC1 : NULL

TC2 : AT phase

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## **ADJUSTMENT**

#### **Adjustment Points (Bottom)**



TC1.2 : Trap E-E2-E3

TC2 : Trap initialize setting E.E2.E3

#### TC500 : Reference oscillation

#### TC502 : Lock voltage (VCO 1A)

### TC503 : Lock voltage (VCO1B)

| 20-22 29-31 : BPE

L45-50,51,54,111 : MCE (73MHz)

L55,56,61 : IF AMF

L67,68 : RF AMP

L69~72,74~76:

L529,530 : 60MHz

L533~535 : 65MHz BPF

L802,803 : NB

VR1 : BY MIX license

VR1: RX MIX B  
VR2: Serious

VR2 : SPURBUS

VR4 : SSB carrier

VB4 : SSB carrier suppression (US8)

VR9 : 14MHz TGC

#### **IC15's VR1 : IF GAIN**

IC15's L1,2 : IF AMP

\*VR8 : VS-3 voice output level

## TERMINAL FUNCTION

CN No.	Pin No.	Name	I/O	Function
<b>FINAL UNIT (X45-353X-XX)</b>				
CN1	Coaxial	DRV	I	Drive input
CN2	Coaxial	RAT	O	RX signal output
CN3	1	GND	-	GND
	2	TT	O	AT-300 control signal
	3	TS	O	AT-300 control signal
	4	PSC	I	Power supply relay control signal
	5	BOVR	O	Over voltage detection signal
	6	THV	O	Thermal protect detection voltage
	7	PHD	O	Phase compare detection signal
	8	AMD	O	Amplitude compare detection signal
	9	14V	O	13.8V (Usually)
	10	14S	O	13.8V (When power switch on)
	11	10A	O	10V
	12	8A	O	8A
	13	UDA	I	Final unit serial data
	14	UCK	I	Final unit serial clock
	15	FEN	I	Final unit enable
	16	GND	-	GND
CN4	1	GND	-	GND
	2	GND	-	GND
	3	SPG	-	Speaker GND
	4	SP	I	Speaker input
	5	14AG	-	AF amplifier GND
	6	14AF	O	AF amplifier 14V
	7	14S	O	14V when power switch on
	8	14S	O	14V when power switch on
	9	8A	O	Analog 8V
	10	8A	O	Analog 8V
	11	5A	O	Analog 5V
	12	TXB	I	TX 8V
	13	VSF	O	Forward waveform detection voltage
	14	VSR	O	Reflected waveform detection voltage
	15	GND	-	GND
	16	GND	-	GND
CN5	1	FAN+		Fan motor drive +
	2	FAN-		Fan motor drive -
CN6	1	14S	O	13.8V
	2	AGND	-	Analog GND
	3	TT	O	AT-300 control
	4	TS	I	AT-300 control
	5	GND	-	GND
CN13	1	SP	O	Speaker output
	2	SPG	-	Speaker GND
CN14	Coaxial		O	Filter detection circuit (Relay)
CN15	Coaxial		I	Filter detection circuit (Relay)
<b>CONTROL UNIT (X53-369X-XX)</b>				
CN1	1	GND	-	GND
	2	NC		NC
	3	SS	I	Standby switch
	4	MD	I	MIC down signal
	5	MU	I	MIC up signal
	6	BLANK	O	LED goes off control signal
	7	8A	O	MIC 8V
	8	GND	-	GND
	9	5A	O	5V
	10	LDA	O	LCD serial data
	11	LCK	O	LCD serial clock
	12	LEN1	O	LCD enable (IIC1)
	13	LEN2	O	LCD enable (IIC2)
	14	LEN3	O	LCD enable (IIC3)
	15	K0	I	Key input 0
	16	K1	I	Key input 1

CN No.	Pin No.	Name	I/O	Function
CN2	17	K2	I	Key input 2
	18	K3	I	Key input 3
	19	5C	O	Usually 5V (For power switch)
	20	PSW	I	Power switch input signal
	21	CENA	I	MULTI/CH encoder pulse A
	22	CENB	I	MULTI/CH encoder pulse B
	23	RENA	I	RIT/XIT encoder pulse A
	24	RENB	I	RIT/XIT encoder pulse B
	25	PB	O	LCD lamp (10V)
	26	GND	-	GND
	1	VA	O	Volume power supply (5V)
	2	VAF	I	AF VR analog voltage
	3	VRF	I	RF VR analog voltage
	4	VSFT	I	SHIFT VR analog voltage
	5	VSQI	I	SQL VR analog voltage
	6	VHC	I	HC VR analog voltage
	7	VLC	I	LC VR analog voltage
	8	GND	-	GND
CN3	1	TXC	O	TX control signal
	2	NC		NC
	3	CKY	O	Keying signal
	4	KEY	I	Key down signal
	5	KYS	I	Key jack judgement signal
	6	PKS	I	Standby switch when PKD input
	7	RCK	O	TX-RX unit serial clock
	8	RDA	O	TX-RX unit serial data
	9	REN1	O	TX-RX unit IC11 enable
	10	NC		NC
	11	VEN	O	TX-RX unit IC6 enable
	12	SS	I	Standby switch
	13	ALM	I	ALC meter input
	14	SM	I	S-meter input
	15	VFSM	I	Forward waveform detection voltage
	16	VSRM	I	Reflected waveform detection voltage
	17	REN2	O	TX-RX unit IC14 enable
	18	TXD	I	RX data from personal computer
	19	RXD	O	Data TX to personal computer
	20	CTS	O	Data transmit inhibit signal to personal computer
	21	RTS	I	Data transmit inhibit signal from personal computer
	22	5C	O	Usually 5V
	23	AMU	O	AF mute signal
	24	DOT	I	Electronic keyer dot signal
	25	DASH	I	Electronic keyer dash signal
	26	GND	-	GND
CN4	1	GND	-	GND
	2	VCS	O	VS-3 voice synthesizer start signal
	3	NAR	I	*H- Data input enable to VS-3
	4	RST	O	VS-3 reset signal
	5	FSQL	I	FM SQL signal
	6	NC		NC
	7	NC		NC
	8	GND	-	GND
	9	DEN2	O	DDS IC enable (CAR)
	10	DEN1	O	DDS IC enable (LO1)
	11	ULK	I	Unlock detection
	12	PEN2	O	PLL IC enable (LO2)
	13	PEN1	O	PLL IC enable (LO1)
	14	PDA	O	PLL serial data
	15	PCK	O	PLL serial clock
	16	GND	-	GND
CN5	1	GND	-	GND
	2	FEN	I	Final unit enable
	3	UCK	I	Final unit serial clock
	4	UDA	I	Final unit serial data

## TERMINAL FUNCTION

CN No.	Pin No.	Name	I/O	Function	CN No.	Pin No.	Name	I/O	Function
CN6	5	8A	O	8A	CN12	1	CAR	I	CAR input (8.83MHz)
	6	10A	O	LCD lamp 10V (Relay)		2	GND	-	GND
	7	14S	O	13.8V (When power switch on)		3	NC	-	NC
	8	14V	O	13.8V (Usually)	CN14	1	PH1	O	Audio output for headphone
	9	AMD	I	Amplitude compare detection signal		2	PH2	I	Audio input when headphone through
	10	PHD	I	Phase compare detection signal		3	PHG	-	GND
	11	THV	I	Thermal protect detection voltage	CN15	1	GND	-	GND
	12	BOVR	I	Over voltage detection signal		2	NC	-	NC
	13	PSC	O	Power supply relay control		3	GND	-	GND
	14	TS	I	AT-300 control signal		4	MOD/AND	I/O	Modulation input/RX AF output
	15	TT	I	AT-300 control signal		5	BIAS	I	Bias voltage
	16	GND	-	GND		6	DET	O	Detection output
	1	5D	O	5V (Encoder power supply)		7	GND	-	GND
	2	MENB	I	Main encoder pulse B		8	DRO	O	Relay
	3	MENA	I	Main encoder pulse A		9	GND	-	GND
CN502	1	GND	-	GND		10	DRM	I	DRU-3A MIC signal input
	2	NC	-	NC		11	GND	-	GND
	3	GND	-	GND		12	ANI	O	TX signal input
	4	MOD/AND	O/I	Modulation output/RX AF input		13	GND	-	GND
	5	BIAS	O	Bias voltage		14	DREN	I	Relay
	6	DET	I	Detection input		15	EOM	O	Relay
	7	GND	-	GND		16	GND	-	GND
	8	DRO	I	DRU playback signal input	CN16	1	VO	I	VS-3 voice signal input
	9	GND	-	GND		2	5C	O	VS-3 power supply (5V)
	10	DRM	O	DRU-3A MIC signal		3	E	-	GND
	11	GND	-	GND		4	NAR	I	'H' : Data input enable to VS-3
	12	ANI	O	TX signal output		5	RST	O	VS-3 reset signal
	13	GND	-	GND		6	VCS	O	VS-3 voice synthesize start signal
	14	DREN	O	DRU enable		7	VDT	O	VS-3 data
	15	EOM	I	End of message signal (End : 'H')		8	VCK	O	VS-3 clock
	16	GND	-	GND	CN17	1	GND	-	GND
CN503	1	MIC	I	MIC signal		2	DRMG	-	DRU-3A MIC GND
	2	MSG	-	MIC GND		3	DRM	O	DRU-3A MIC signal
	3	MCG	-	GND		4	DRO	I	DRU playback signal
	1	TX-RX UNIT (X57-500-XX) : TX-RX				5	5C	O	DRU power supply (5V)
	2	IN	I	MCF adjustment signal input		6	GND	-	GND
	2	GND	-	GND		7	EOM	I	End of message signal (End : 'H')
	1	OUT	O	MCF adjustment signal output		8	OVF	I	Overflow signal (Overflow : 'L')
	2	GND	-	GND		9	DREN	O	DRU enable
	1	LO2	I	LO2 input (73.08~103.05MHz)		10	SD	O	DRU serial data
	2	CKY	O	LO2 input (64.22MHz)		11	SCK	O	DRU clock
	1	KEY	O	BPF adjustment signal output	CN18	1	TXC	I	TX control signal
	2	KEY	O	Option filter		2	NC	-	NC
	3	KYS	O	Option filter		3	CKY	I	Keying signal
	4	KEY	O	Drive output		4	KEY	O	Key down signal
CN11	1	GND	-	GND		5	KYS	O	Key jack judgement signal
	2	GND	-	GND		6	PKS	O	Standby switch when PKD input
	3	SPG	-	Speaker GND		7	RCK	I	TX-RX unit serial clock
	4	SP	O	Speaker output signal		8	RDA	I	TX-RX unit serial data
	5	14AG	-	AF amplifier GND		9	REN1	I	TX-RX unit IC11 enable
	6	14AF	I	AF amplifier 14V		10	NC	-	NC
	7	14S	I	14V when power switch on		11	VEN	I	TX-RX unit IC6 enable
	8	14S	I	14V when power switch on		12	SS	O	Standby switch
	9	8A	I	Analog 8V		13	ALM	O	ALC meter output
	10	8A	I	Analog 8V		14	SM	O	S-meter output
	11	5A	I	Analog 5V		15	VSM	O	Forward waveform detection voltage
	12	TXB	O	TX 8V		16	VSRM	O	Reflected waveform detection voltage
	13	VSF	I	Forward waveform detection voltage		17	REN2	I	TX-RX unit IC14 enable
	14	VSR	I	Reflected waveform detection voltage		18	TXD	O	RX data from personal computer (Relay)
	15	GND	-	GND		19	RXD	I	TX data to personal computer (Relay)
	16	GND	-	GND		20	CTS	I	Data transmit inhibit signal to personal computer (Relay)

# TS-570D

## TERMINAL FUNCTION

CN No.	Pin No.	Name	I/O	Function
	24	DOT	O	Electronic keyer dot signal
	25	DASH	O	Electronic keyer dash signal
	26	GND	-	GND
CN19				Short jumper for medium frequency band ATT selection
CN20				Short jumper for medium frequency band ATT selection
CN21	1	AF	I	Audio input
	2	GND	-	GND
W1	1	NBI	I	NB IF signal (8.83MHz)
	2	NBG	I	NB IF signal GND
W5	1	FMM	I	FM modulation MIC signal
	2	FMG	I	FM modulation MIC signal GND
W6	1	SP	I	Speaker signal
	2	SPG	I	Speaker signal GND
J1	1	SPO	O	Speaker signal
	2	COM	I	External equipment control relay common terminal
	3	SS	I	Standby switch
	4	MKE	I	External equipment control relay close terminal
	5	BRK	I	External equipment control relay open terminal
	6	ALC	I	External ALC input
	7	RL	O	TX 14V output
J2	1	NC	I	NC
	2	RTK	I	RTTY signal
	3	ANO	O	RX AF output
	4	ANOG	I	RX AF output GND
	5	PSQ	O	Squelch control output
	6	SM	O	S-meter output
	7	NC	-	NC
	8	GND	-	GND
	9	PKS	I	Standby switch when PKD input
	10	NC	-	NC
	11	PKD	I	TX signal input
	12	GND	-	GND
	13	SS	I	Standby switch
J3	1			External speaker GND
	2		O	External speaker audio output
	3		I	Audio input when external speaker disconnect
J4	1	GND	-	GND
	2	GND	-	GND
	3	KYS	I	Key jack judgement signal
	4	NC	-	NC
	5	KEY	I	Key down signal
J5	1	GND	-	GND
	2	NC	-	NC
	3	NC	-	NC
	4	NC	-	NC
	5	DASH	I	Electronic keyer dash signal
	6	DOT	I	Electronic keyer dot signal
	7	NC	-	NC
	8	NC	-	NC
	9	NC	-	NC
	10	KEY	I	Key down signal
	11	KYS	I	Key jack judgement signal

### TX-RX UNIT (X57-500X-XX) : PLL

CN500	1	GND	-	GND
	2	PCK	I	PLL serial clock
	3	PDA	I	PLL serial data
	4	PEN1	I	PLL IC enable (LO1)

CN No.	Pin No.	Name	I/O	Function
	5	PEN2	I	PLL IC enable (LO2)
	6	ULK	O	Unlock detection output
	7	DEN1	I	DDS IC enable (LO1)
	8	DEN2	I	DDS IC enable (CAR)
	9	GND	-	GND
	10	NC	-	NC
	11	NC	-	NC
	12	FSQL	O	FM SQL signal
	13	RST	I	VS-3 reset signal
	14	NAR	O	"H": Data input enable to VS-3
	15	VCS	I	VS-3 voice synthesizer start signal
	16	GND	-	GND
CN501	Coaxial	LO2	O	LO2 output
CN502	1	CAR	O	CAR output
	2	GND	-	GND
CN503	Coaxial	LO1	O	LO1 output
J900	1	GND	-	GND
	2	NC	-	NC
	3	TXD	I	RX data from personal computer
	4	RXD	O	TX data from TS-570
	5	NC	-	NC
	6	NC	-	NC
	7	CTS	O	Data transmit inhibit signal from TS-570
	8	RTS	I	Data transmit inhibit signal from personal computer
	9	NC	-	NC

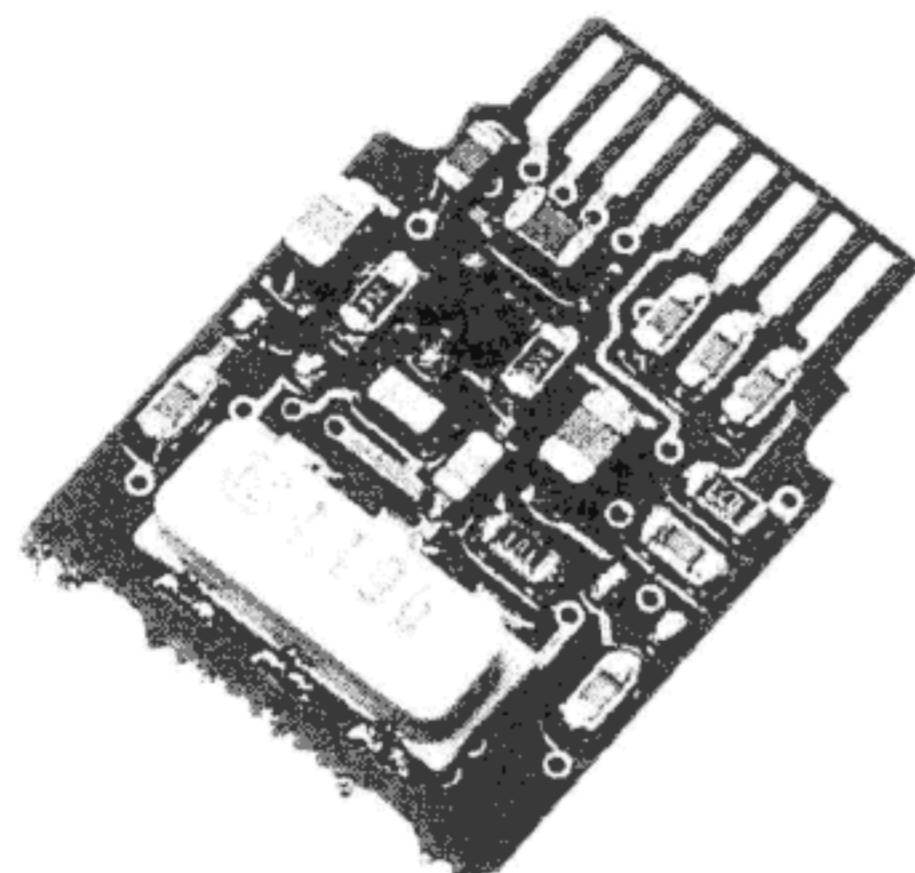
### LCD ASSY (B38-0765-05)

CN1	1	GND	-	GND
	2	PB	I	LCD lamp (10V)
	3	REN2	O	RIT/XIT encoder pulse B
	4	RENA	O	RIT/XIT encoder pulse A
	5	CENB	O	MULTI/CH encoder pulse B
	6	CENA	O	MULTI/CH encoder pulse A
	7	PSW	O	Power switch output signal
	8	5C	I	Usually 5V (For power switch)
	9	K3	O	Key output 3
	10	K2	O	Key output 2
	11	K1	O	Key output 1
	12	K0	O	key output 0
	13	LEN3	I	LCD enable (IC3)
	14	LEN2	I	LCD enable (IC2)
	15	LEN1	I	LCD enable (IC1)
	16	LCK	I	LCD serial clock
	17	LDA	I	LCD serial data
	18	5A	I	5V
	19	GND	-	GND
	20	8A	I	MIC 8V
	21	BLANK	I	LED goes off control signal
	22	MU	O	MIC up signal
	23	MD	O	MIC down signal
	24	SS	O	Standby switch
	25	NC	-	NC
	26	GND	-	GND
CN2	1	MIC	O	MIC signal output
	2	MSG	O	MIC GND
	3	MCG	O	GND
J1	1	MIC	I	MIC signal input
	2	SS	I	Standby switch
	3	MD	I	MIC down signal
	4	MU	I	MIC up signal
	5	8M	O	MIC 8V
	6	NC	-	NC
	7	MSG	O	MIC GND
	8	MCG	O	GND

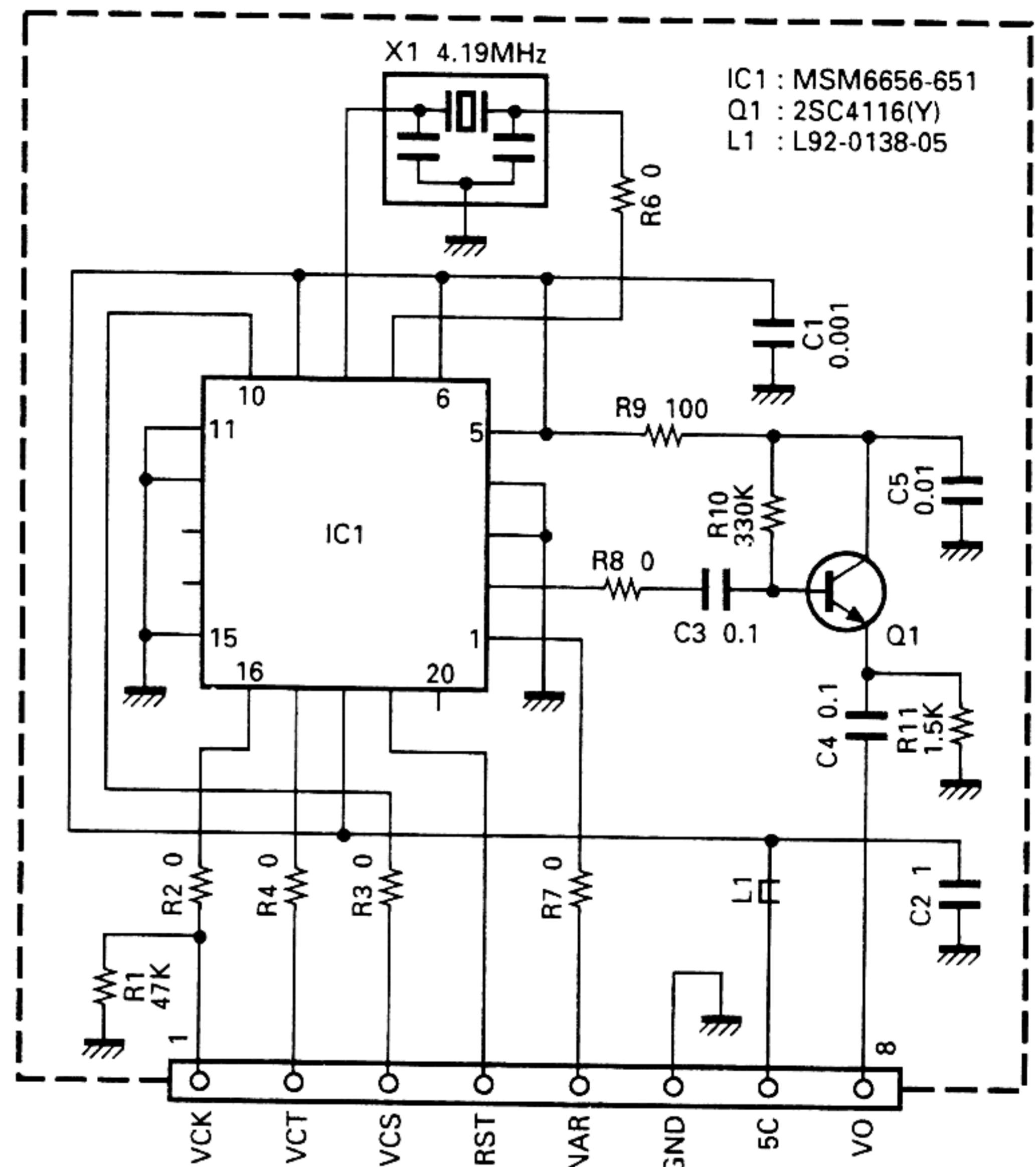
# TS-570D

# **VS-3 (VOICE SYNTHESIZER UNIT) / DRU-3A (DIGITAL RECORDING UNIT)**

## **VS-3 External View**

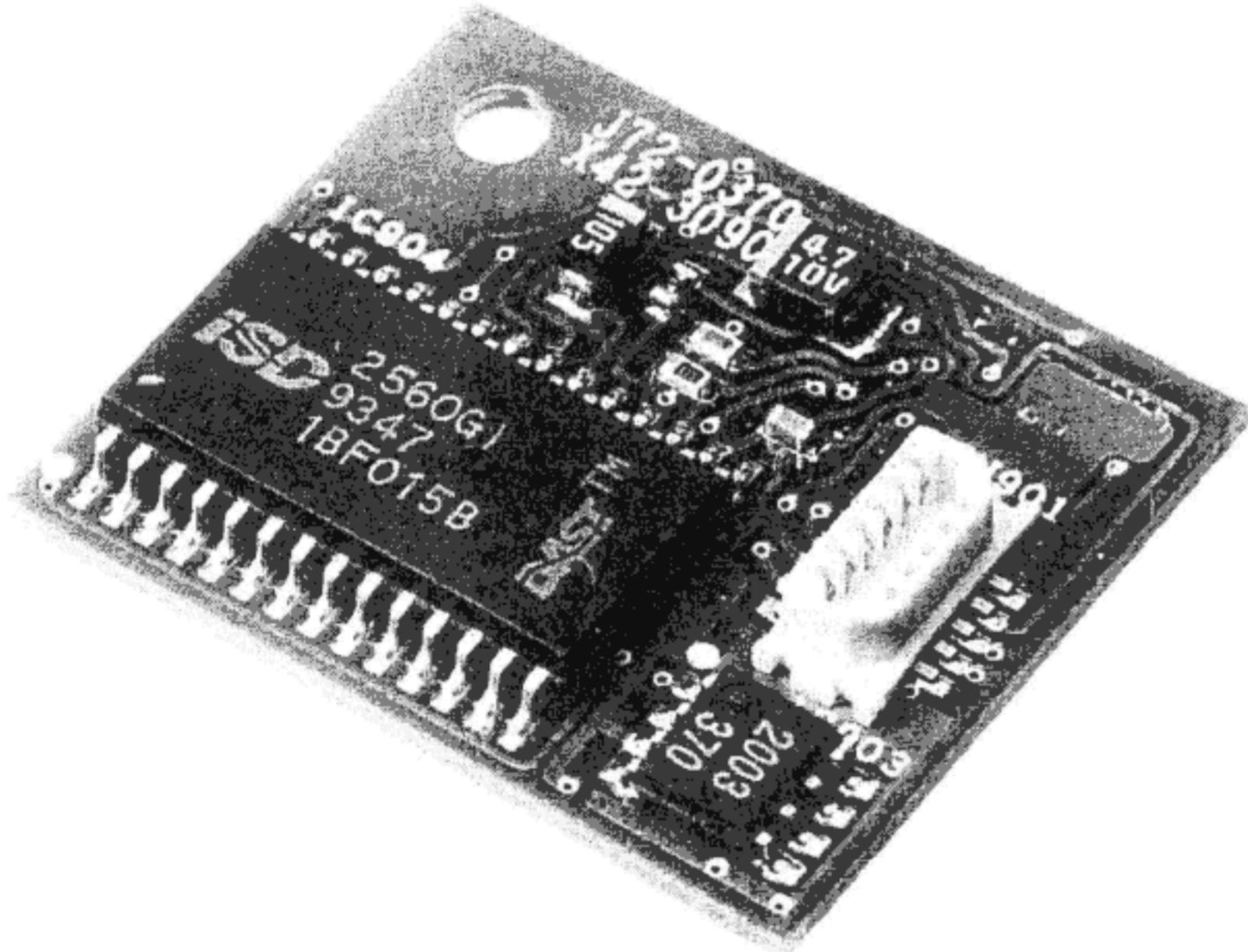


## VS-3 Circuit Diagram



## **DRU-3A External View**

**Note :** Without shielding cover



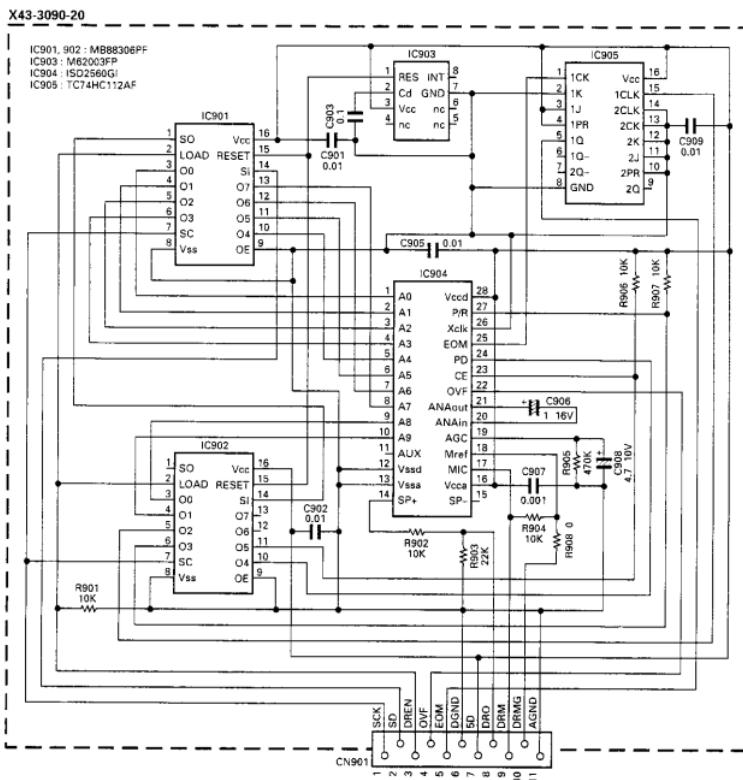
DRU-3A Parts List

<b>Ref. No.</b>	<b>New parts</b>	<b>Parts No.</b>	<b>Description</b>				
C901,902		CK73FB1H103K	CHIP C	0.010UF	K		
C903		CK73FF1E104Z	CHIP C	0.1UF	Z		
C905		CK73GB1H103K	CHIP C	0.010UF	K		
C906		C92-0004-05	TAN C	1.0UF	16WV		
C907		CK73GB1H102K	CHIP C	1000PF	K		
C908		C92-0009-05	TAN C	4.7UF	10WV		
C909		CK73GB1H103K	CHIP C	1000PF	K		
CN901		E40-5748-05	PIN CONNECTOR (11P)				
700	*	F10-2241-04	SHIELDING COVER				
701	*	F10-2242-04	SHIELDING COVER				
R901,902		RK73GB1J103J	CHIP R	10K	J	1/16W	
R903		RK73GB1J223J	CHIP R	22K	J	1/16W	
R904		RK73GB1J103J	CHIP R	10K	J	1/16W	
R905		RK73GB1J474J	CHIP R	470K	J	1/16W	
R906,907		RK73GB1J103J	CHIP R	10K	J	1/16W	
R908		R92-1252-05	CHIP R	0 OHM			
IC901,902		MB88306PF	IC				
IC903		M62003FP	IC				
IC904		ISD2560GI	IC				
IC905		TC74HC112AF	IC				

# TS-570D

## DRU-3A (DIGITAL RECORDING UNIT)

### DRU-3A Circuit Diagram



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# TS-570D

## SPECIFICATIONS

Item		Rating	
Mode	J3E (LSB, USB), A1A (CW), A3E (AM), F3E (FM), F1D (FSK)		
Number of memory channels	100		
Antenna impedance	50Ω (With Antenna Tuner 16.7 to 150Ω)		
Supply voltage	DC 13.8V ± 15%		
Grounding method	Negative ground		
Current	Transmit (Max.) Receive (No signal)	20.5A 2A	
Usable temperature range	-10°C to +50°C (+14°F to +122°F)		
Frequency stability (-10°C to +50°C)	Within ±10PPM		
Frequency accuracy (At room temperature)	Within ±10PPM		
Dimensions [W x H x D] (Projections included)	270 x 96 x 270 mm/10.6 x 3.8 x 10.6 in (281 x 107 x 314 mm/11.1 x 4.2 x 12.4 in)		
Weight	Approx. 6.8kg (15 lbs)		
TRANSMITTER	Frequency range	160m band 80m band 40m band 30m band 20m band 17m band 15m band 12m band 10m band	1.8¹ to 2.0³MHz 3.5 to 4.0³MHz 7.0 to 7.3³MHz 10.1 to 10.15MHz 14.0 to 14.35MHz 18.068 to 18.168MHz 21.0 to 21.45MHz 24.89 to 24.99MHz 28.0 to 29.7MHz
	Output power²	SSB, CW, FSK, FM	Max. 100W Min. 5W
		AM	Max. 25W Min. 5W
	Modulation	SSB FM AM	Balanced Reactance Low level
	Spurious emissions		-50dB or less
	Carrier suppression		40dB or more
	Unwanted sideband suppression (Modulation frequency 1.0kHz)		40dB or more
	Maximum frequency deviation (FM)	Wide Narrow	±5kHz or less ±2.5kHz or less
	XIT shift frequency range		±9.99kHz
Microphone impedance		8Ω	

\*1 1.81MHz : Europe, France, Holland; 1.83MHz : Belgium, Spain

\*2 1.85MHz : Belgium, France, Holland, Spain

\*3 3.8MHz : Europe, Belgium, France, Holland, Spain

\*4 7.1MHz : Europe, Belgium, France, Holland, Spain

\*5 Belgium, Spain : 10W fixed on 160m band

# TS-570D

## SPECIFICATIONS

Item			Rating
Circuit type			Double conversion superheterodyne FM only : Triple conversion superheterodyne
Frequency range			500kHz to 30MHz
Intermediate frequency			1st : 73.05MHz, 2nd : 8.83MHz, 3rd : 455kHz (FM only)
RECEIVER	Sensitivity	SSB, CW, FSK (At 10dB (S+N)/N)	500kHz to 1.705MHz 4µV or less 1.705MHz to 24.5MHz 0.2µV or less 24.5MHz to 30MHz 0.1µV or less
		AM (At 10dB (S+N)/N)	500kHz to 1.705MHz 31.6µV or less 1.705MHz to 24.5MHz 2µV or less 24.5MHz to 30MHz 1.3µV or less
		FM (At 12dB SINAD)	28MHz to 30MHz 0.25µV or less
	Selectivity	SSB, CW, FSK	-6dB : 2.2kHz, -60dB : 4.4kHz
		AM	-6dB : 4kHz, -50dB : 20kHz
		FM	-6dB : 12kHz, -50dB : 25kHz
	Image rejection (1.8MHz to 30MHz)		
	1st IF rejection (1.8MHz to 30MHz)		
	RIT shift frequency range		
	Squelch sensitivity	SSB, CW, FSK, AM	500kHz to 1.705MHz 20µV or less 1.705MHz to 30MHz 2µV or less FM 28MHz to 30MHz 0.25µV or less
Audio output (8Ω, 10% distortion)			1.5W or more
Audio output impedance			8Ω

Specifications are subject to change without notice or obligation due to ongoing technological developments.

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