

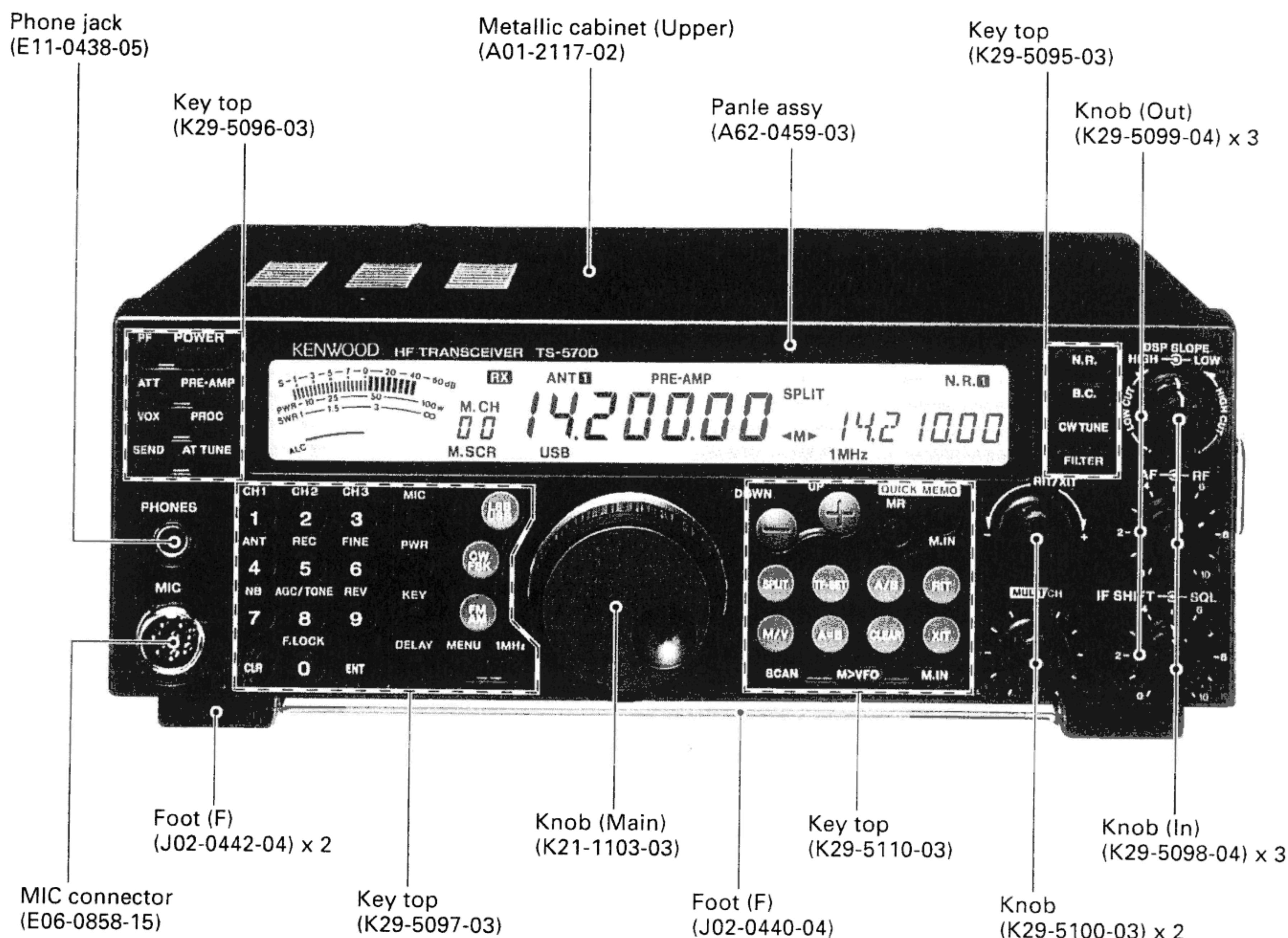
HF TRANSCEIVER

# TS-570D

## SERVICE MANUAL

# KENWOOD

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## CONTENTS

|                                   |    |
|-----------------------------------|----|
| CIRCUIT DESCRIPTION .....         | 2  |
| DESCRIPTION OF COMPONENTS .....   | 30 |
| SEMICONDUCTOR DATA .....          | 36 |
| PARTS LIST .....                  | 44 |
| EXPLODED VIEW .....               | 61 |
| PACKING .....                     | 63 |
| ADJUSTMENT .....                  | 64 |
| TERMINAL FUNCTION .....           | 78 |
| PC BOARD VIEWS / CIRCUIT DIAGRAMS |    |
| LCD ASSY (B38-0765-05) .....      | 81 |

|                                       |     |
|---------------------------------------|-----|
| FINAL UNIT (X45-353X-XX) (B/2) .....  | 84  |
| TX-RX UNIT (X57-500X-XX) (B/2) .....  | 84  |
| FINAL UNIT (X45-353X-XX) (A/2) .....  | 85  |
| CONTROL UNIT (X53-369X-XX) .....      | 93  |
| TX-RX UNIT (X57-500X-XX) (A/2) .....  | 101 |
| BLOCK DIAGRAM .....                   | 113 |
| LEVEL DIAGRAM .....                   | 115 |
| VS-3 (VOICE SYNTHESIZER UNIT) .....   | 117 |
| DRU-3A (DIGITAL RECORDING UNIT) ..... | 117 |
| SPECIFICATIONS .....                  | 119 |

# 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

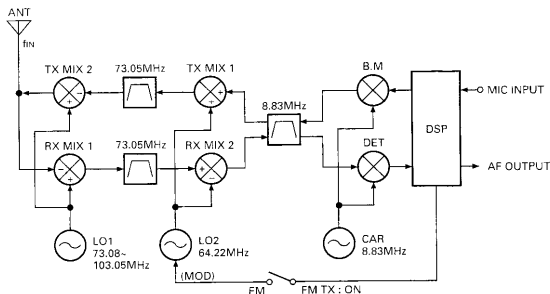


Fig. 1 Frequency configuration

## 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>STD</sub>. (See the PLL block diagram in Figure 2.)

**■ Reference Signal Generation Circuit**

The reference frequency f<sub>STD</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**

Q502: 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.

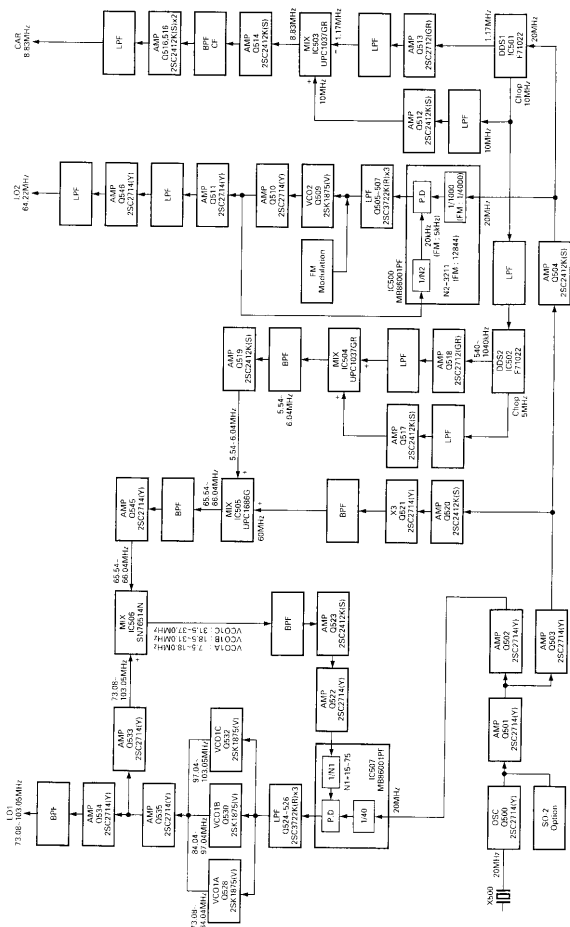
DDS2 sweeps the 540 to 1040kHz digital signal in 10 or 1Hz steps. LO1 covers 73.08 to 103.05MHz in 10 or 1Hz steps and is output as LO1 to the RF unit.

**■ 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.

## CIRCUIT DESCRIPTION



**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 SPSEL 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.

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

$F_s$  : DDS IC input frequency/2

$Dsum$  : Frequency data + Frequency modulation data

If  $2^{25}$  is set for  $Dsum$  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.

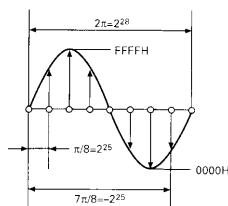


Fig. 3

## 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.

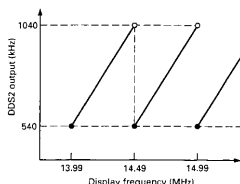


Fig. 4

| 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     |
| BASE            | 540kHz-1040kHz |          |          |          |         |        |         |        |         |        |         |        |        |        |        |        |
| Offset          | WIDE (2.4k)    |          |          |          |         |        |         |        |         |        |         |        |        |        |        |        |
|                 | -1.5k          | -1.5k    | +1.5k    | +1.5k    | +0.7k   | +0.7k  | -0.7k   | -0.7k  | -85     | -85    | +85     | +85    | 0      | 0      | 0      | 0      |
|                 | -1.5k          | -1.5k    | +1.5k    | +1.5k    | +0.4k   | +0.4k  | -0.4k   | -0.4k  | -85     | -85    | +85     | +85    | 0      | 0      | 0      | 0      |
|                 | -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 U)       | -(CAR U) | +(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          | WIDE (2.4k)                  | +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-S) |         |     |    |     |   |
| FSK tone (L)    | -                            | -        | -       | -       | -       | -     | -       | -     | +1.445k | -        | -       | -1.445k  | -       | -   | -  | -   | - |
|                 |                              |          |         |         |         |       |         |       |         |          |         | -(FSK-S) |         |     |    |     |   |
| FSK shift (M)   | -                            | -        | -       | -       | -       | -     | -       | -     | -       | 0        | -       | 0        | -       | -   | -  | -   | - |
| FSK shift (S)   | -                            | -        | -       | -       | -       | -     | -       | -     | -       | -        | -       | -(FSK-S) | -       | -   | -  | -   | - |
| RIT/XIT         | -                            | -        | -       | -       | -       | -     | -       | -     | -       | -        | -       | -        | -       | -   | -  | -   | - |
|                 |                              |          |         |         |         |       |         |       |         | -(FSK-S) |         | -(FSK-S) |         |     |    |     |   |
| CAR suppression | +ICAR LI                     | +ICAR LI | +ICAR U | +ICAR U | -       | -     | -       | -     | -       | -        | -       | -        | -       | -   | -  | -   | - |
| IF shift        | -(IF S)                      | -        | -(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             | $\pm 7.5$ kHz or more at 3dB                                         | $\pm 3.0$ kHz or more at 6dB                                 | $\pm 1.2$ kHz or more at 6dB                                                                    |
| Attenuation bandwidth      | $\pm 30$ kHz or less at 40dB                                         | $\pm 13$ kHz or less at 50dB<br>$\pm 16$ kHz or less at 60dB | $\pm 1.5$ kHz or less at 20dB<br>$\pm 2.2$ kHz or less at 60dB<br>$\pm 3.0$ 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 fo+(500~1000kHz)<br>70dB or more at fo-(200~1000kHz) | 70dB or more at fo $\pm$ 1MHz                                | 80dB or more at fo $\pm$ 1MHz                                                                   |
| Center frequency deviation | Within $\pm 1.5$ kHz at 3dB                                          | —                                                            | Within $\pm 150$ Hz at 6dB                                                                      |
| Terminating impedance      | 2k $\Omega$ $\pm$ 10%                                                | 1850 $\Omega$ // 2pF                                         | 600 $\Omega$ $\pm$ 5% // 15pF $\pm$ 5%                                                          |

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

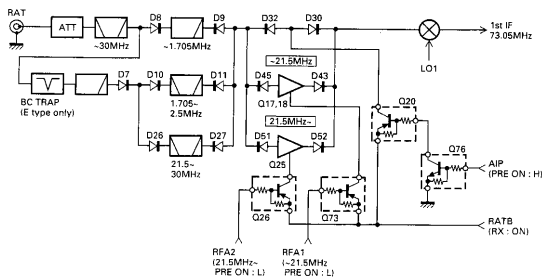


Fig. 6 Receiver front-end block diagram

## 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,  $V_{REF}$ , for the ALC is set by the adjusted value from the microcomputer and output from IC6.

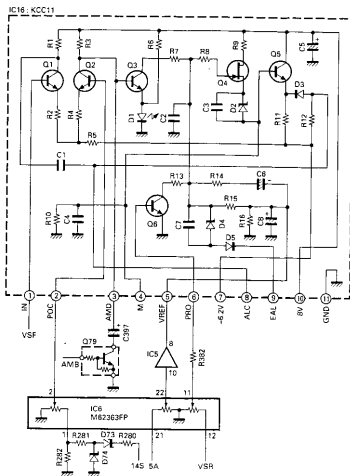


Fig. 10 ALC, Power control, SWR protection circuits

## 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.

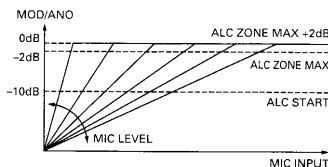


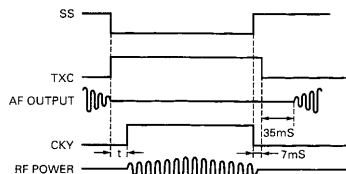
Fig. 11

### ■ 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.)

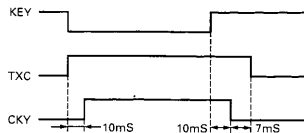
- SS : Standby switch input signal. Active low.
- KEY : Keying input signal from the keyer.  
Active low.
- TXC : Transmit output signal. Active high.  
Same timing as TXB.
- CKY : Output signal. Active high.

#### With the SS line



#### By full break-in

|            |     |      |
|------------|-----|------|
| Menu No.39 | OFF | 10mS |
| "LINEAR"   | ON  | 25mS |



#### By semi break-in

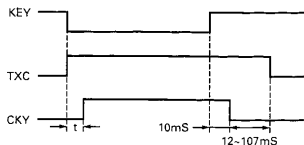


Fig. 12 Transmit/receive signal timing chart

## CIRCUIT DESCRIPTION

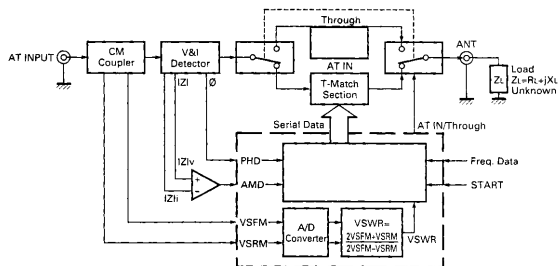


Fig. 16 AT control block diagram

### 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).

## CIRCUIT DESCRIPTION

## ■ Band Data

| Frequency (MHz) |             | RF BPF | LPF |        | VCO | PLL n     | Frequency (MHz) |             | RF BPF | LPF |        | VCO | PLL n |
|-----------------|-------------|--------|-----|--------|-----|-----------|-----------------|-------------|--------|-----|--------|-----|-------|
| Lower limit     | Upper limit |        |     | E type |     |           | Lower limit     | Upper limit |        |     | E type |     |       |
| 0.030000        | 0.489999    | 1      | 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   |        |     |        |     | 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    |        |     |        | 21  | 16.490000 | 16.989999       | 49          |        |     |        |     |       |
| 2.500000        | 2.989999    |        |     |        | 22  | 16.990000 | 17.489999       | 50          |        |     |        |     |       |
| 2.990000        | 3.489999    | 3      | 2   | 2      | 23  | 17.490000 | 17.989999       | 51          |        |     |        |     |       |
| 3.490000        | 3.989999    |        |     |        | 24  | 17.990000 | 18.489999       | 52          |        |     |        |     |       |
| 3.990000        | 4.099999    |        |     |        | 25  | 18.490000 | 18.989999       | 53          |        |     |        |     |       |
| 4.100000        | 4.489999    |        |     |        | 26  | 18.990000 | 19.489999       | 54          |        |     |        |     |       |
| 4.490000        | 4.989999    | 4      | 3   | 3      | 27  | 19.490000 | 19.989999       | 55          |        |     |        |     |       |
| 4.990000        | 5.489999    |        |     |        | 28  | 19.990000 | 20.489999       | 56          |        |     |        |     |       |
| 5.490000        | 5.989999    |        |     |        | 29  | 20.490000 | 20.989999       | 57          |        |     |        |     |       |
| 5.990000        | 6.489999    |        |     |        | 30  | 20.990000 | 21.489999       | 58          |        |     |        |     |       |
| 6.490000        | 6.899999    | 5      |     |        | 31  | 21.490000 | 21.989999       | 59          |        |     |        |     |       |
| 6.900000        | 6.989999    |        |     |        | 32  | 21.990000 | 22.489999       | 60          |        |     |        |     |       |
| 6.990000        | 7.489999    |        |     |        | 33  | 22.490000 | 22.989999       | 61          |        |     |        |     |       |
| 7.490000        | 7.499999    |        |     |        | 34  | 22.990000 | 23.489999       | 62          |        |     |        |     |       |
| 7.500000        | 7.989999    | 6      | 5   | 4      | 35  | 23.490000 | 23.989999       | 63          |        |     |        |     |       |
| 7.990000        | 8.489999    |        |     |        | 36  | 23.990000 | 24.489999       | 64          |        |     |        |     |       |
| 8.490000        | 8.989999    |        |     |        | 37  | 24.490000 | 24.989999       | 65          |        |     |        |     |       |
| 8.990000        | 9.489999    |        |     |        | 38  | 24.990000 | 25.489999       | 66          |        |     |        |     |       |
| 9.490000        | 9.989999    | 7      |     |        | 39  | 25.490000 | 25.989999       | 67          |        |     |        |     |       |
| 9.990000        | 10.489999   |        |     |        | 40  | 25.990000 | 26.489999       | 68          |        |     |        |     |       |
| 10.490000       | 10.499999   |        |     |        | 41  | 26.490000 | 26.989999       | 69          |        |     |        |     |       |
| 10.500000       | 10.989999   |        |     |        | 42  | 26.990000 | 27.489999       | 70          |        |     |        |     |       |
| 10.990000       | 11.489999   | 8      |     | B      | 37  | 27.490000 | 27.989999       | 71          |        |     |        |     |       |
| 11.490000       | 11.989999   |        |     |        | 38  | 27.990000 | 28.489999       | 72          |        |     |        |     |       |
| 11.990000       | 12.489999   |        |     |        | 39  | 28.490000 | 28.989999       | 73          |        |     |        |     |       |
| 12.490000       | 12.989999   |        |     |        | 40  | 28.990000 | 29.489999       | 74          |        |     |        |     |       |
| 12.990000       | 13.489999   |        |     |        | 41  | 29.490000 | 29.989999       | 75          |        |     |        |     |       |
| 13.490000       | 13.899999   |        |     |        | 42  | 29.990000 | 30.000000       |             |        |     |        |     |       |
| 13.900000       | 13.989999   |        |     |        |     |           |                 |             |        |     |        |     |       |
|                 |             |        |     |        |     |           |                 |             |        |     |        |     |       |

## 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.

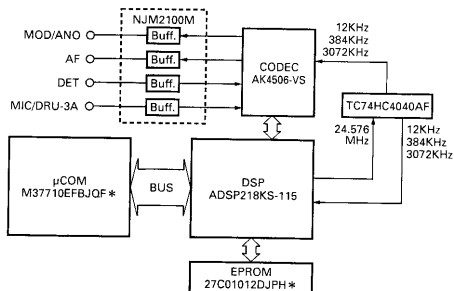


Fig. 17 DSP section block diagram

## CIRCUIT DESCRIPTION

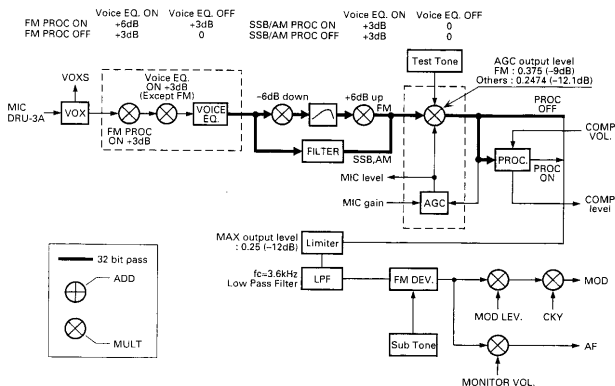


Fig. 18 DSP function block diagram (TX)

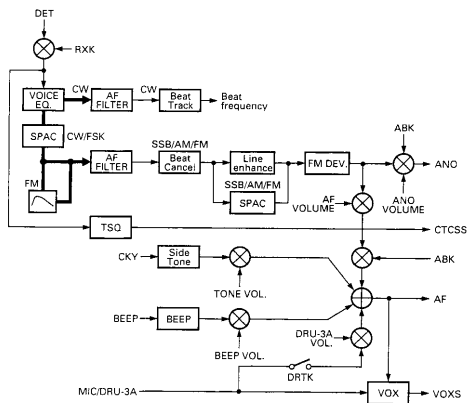


Fig. 19 DSP function block diagram (RX)

## 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.

## 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.

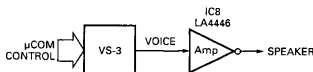


Fig. 20 VS-3 audio signal flow

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

## CIRCUIT DESCRIPTION

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

## CIRCUIT DESCRIPTION

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

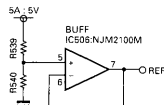


Fig. 21 Reference voltage circuit

#### 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 : LA4446) and suppresses the pop sound when the power turns on.

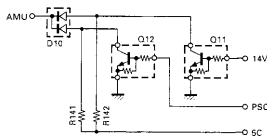


Fig. 22 Pop sound mute circuit

## 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.

## 2) Transmission sound quality setting filter degree/attenuation

| Type              | Comprise | Degree | Ripple (dB) | Attenuation (dB)               |
|-------------------|----------|--------|-------------|--------------------------------|
| BPF               | IIR      | 8      | 0           | L: Simple attenuation<br>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-3PF  | 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.

## 3) 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      | Deemphasis filter | -                     |

## 4) 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          |               |           |          |                 |               |

## 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.

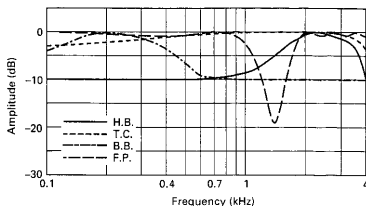


Fig. 23

|   | 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

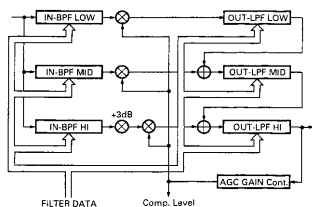


Fig. 24

### 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.

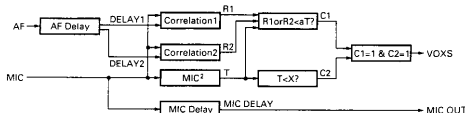


Fig. 25

## 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.

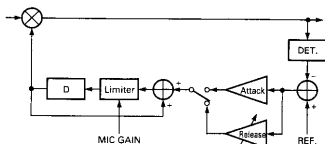


Fig. 26

### 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.

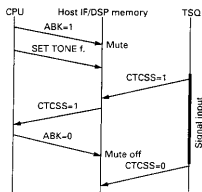


Fig. 27

### 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.

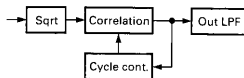


Fig. 28

#### • 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.

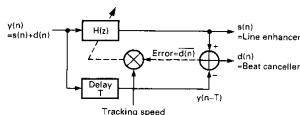


Fig. 29

#### • Beat cancel

The beat canceler 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.

## 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        | 25C1971        | Pre-drive amplifier          | Wide-band amplification of HF band                        |
| Q2,3      | 25C3133        | Drive amplifier              | Push-pull wide-band amplification of HF band              |
| Q4,5      | 25C2879        | Final amplifier              | Push-pull wide-band amplification of HF band              |
| Q6        | 25C3421(Y)     | Final bias supply            | Temperature compensation of final                         |
| Q7        | FMC2           | Switching                    | K1 (AT IN $\leftrightarrow$ THRU) control                 |
| Q8        | FMC2           | Switching                    | K2 (TX $\leftrightarrow$ RX) control                      |
| Q9        | FMC2           | Switching                    | K3 (ANT1 $\leftrightarrow$ ANT2) control                  |
| Q10       | DTC114EK       | Switching                    | On when over voltage                                      |
| Q11       | DTC143TK       | Switching                    | K4 (Power on $\leftrightarrow$ off) control               |
| Q12,13    | DTD123EK       | Switching                    | Fan motor control                                         |
| Q14       | 25C2714(Y)     | Buffer amplifier             | AT control voltage detection signal shaping               |
| Q15       | 25C2714(Y)     | Buffer amplifier             | AT control current detection signal shaping               |
| Q16       | DTC114EK       | Switching                    | FEN logic inversion                                       |
| IC1       | TA7805S        | Regulator                    | 14S $\rightarrow$ 5A                                      |
| IC2       | TA7808S        | Regulator                    | 14S $\rightarrow$ 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 $\rightarrow$ parallel convert  |
| IC7,8     | $\mu$ PD6345GS | Decoder                      | AT C control signal serial $\rightarrow$ parallel convert |
| IC9       | $\mu$ PD6345GS | Decoder                      | AT L control signal serial $\rightarrow$ parallel convert |
| IC10      | TA7810S        | Regulator                    | 14S $\rightarrow$ 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        | 1SS101         | High-frequency rectification | Reflected waveform voltage detection                      |
| D6        | 1SS101         | 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 | 1SS226         | Clipper                      | AT control voltage detection signal shaping               |
| D19,21,23 | 1SS226         | Clipper                      | AT control current detection signal shaping               |
| D24       | 1SS101         | High-frequency rectification | AT control voltage amplitude signal detection             |
| D25       | 1SS101         | 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       | DTC143EK       | 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 key message memory               |
| IC3      | UPD75004GB-746 | CPU                                    | Electronic key control 4 bit microprocessor |
| IC4      | PST9121NR      | Reset                                  | Reset signal generation                     |
| IC5      | CXD1095Q       | 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    | BU4068BCFV     | 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    | TC7S04F        | 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       | 1SS355         | Reverse current prevention             | BKC line                                    |
| D7       | 1SS355         | Reverse current prevention             | 5C line                                     |
| D8       | 02C28.2(Y)     | Voltage detection                      | Backup detection                            |
| D9       | 02C28.2(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(Q,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                                                    |

## DESCRIPTION OF COMPONENTS

| Ref. No. | Parts No.    | Use/Function       | Operation/Condition/Compatibility                      |
|----------|--------------|--------------------|--------------------------------------------------------|
| Q17,18   | 2SK520(K44)  | RF amplifier       | Pre-amplifier (f < 21.5MHz)                            |
| 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 ≥ 21.5MHz)                            |
| Q26      | DTA143EK     | Switching          | On when pre-amplifier on (f ≥ 21.5MHz)                 |
| 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      | DTA114EK     | 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      | DTA114EK     | Switching          | Squelch control (ACC2 terminal)                        |
| Q51      | DTA143TK     | Switching          | External control relay                                 |
| Q52      | DTA124EK     | Switching          | RX IF gain changeover (On when gain down)              |
| Q57      | DTA114EK     | 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      | DTA114EK     | Muting             | Modulation line mute                                   |
| Q66      | DTA114EK     | Switching          | On when except TX FM mode                              |
| Q67      | DTA114EK     | Switching          | Forward waveform voltage time constant changeover      |
| Q68      | 2SB1188(Q,R) | Switching          | TXB                                                    |
| Q69      | 2SB1188(Q,R) | Switching          | RXB                                                    |
| Q70      | DTA114EK     | Switching          | Reflected waveform voltage time constant changeover    |
| Q71      | DTA143EK     | Switching          | On when TX                                             |
| Q72      | FMG3A        | Switching          | On when RX                                             |
| Q73      | DTA143EK     | Switching          | On when pre-amplifier on (f < 21.5MHz)                 |
| Q75      | DTA114EK     | Switching          | RF blanking                                            |
| Q76      | DTA114EK     | Switching          | On when pre-amplifier off                              |
| Q77      | DTA114EK     | Switching          | ATT changeover                                         |
| Q78      | DTA114EK     | Switching          | External control relay (On when TX)                    |
| Q79      | DTA114EK     | Switching          | ALC time constant changeover (On when AM mode)         |
| Q80      | DTA124EK     | Switching          | AGC on/off (On when FM mode and TX)                    |
| Q81      | DTA114EK     | Switching          | TX gain changeover                                     |
| IC1      | NJM2904M     | DC amplifier       | S-meter (Except FM mode)                               |
| IC2      | μPC1037GR    | 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                        | A.L.C. final protection                                           |
| IC17     | TC7S08F     | 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 $2.5\text{MHz} \leq f < 4.1\text{MHz}$ )   |
| 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      | 1SS312      | 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      | 1SS312      | Switching                  | LO2                                                               |
| D42      | DAP236K     | Switching                  | 8.83MHz filter                                                    |
| D43      | RN731H      | Switching                  | On when pre-amplifier on ( $f < 21.5\text{MHz}$ )                 |
| D44      | 1SS312      | 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      | 1SS226      | Rectification              | DC/DC converter                                                   |

## DESCRIPTION OF COMPONENTS

| Ref. No. | Parts No.  | Use/Function               | Operation/Condition/Compatibility     |
|----------|------------|----------------------------|---------------------------------------|
| D64      | 02C26.2(Y) | Zener diode                | Voltage stabilization                 |
| D68      | LF801      | Relay surge absorption     | External control relay                |
| D69,71   | RB751H     | Reverse current prevention |                                       |
| D73      | 02C23.3(Y) | Zener diode                | Voltage stabilization                 |
| D74      | 02C24.7(Y) | Zener diode                | Voltage stabilization                 |
| D75      | MA110      | Reverse current prevention |                                       |
| D76      | 1SS226     | Clipper                    | On when FM large input                |
| D77      | 02C26.2(Y) | Zener diode                | Voltage stabilization                 |
| D82      | LF801      | 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      | 02C25.1(Y) | Zener diode                | Voltage stabilization                 |
| D97      | DAP236K    | Switching                  | 8.83MHz filter                        |
| D98      | DAN202K    | Switching                  | ON when FM mode and TX                |
| D99,100  | 02C224(Y)  | Zener diode                | Surge absorption of power supply line |
| D101,102 | MA110      | Reverse current prevention |                                       |
| D103,104 | LF801      | Surge absorption           |                                       |

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

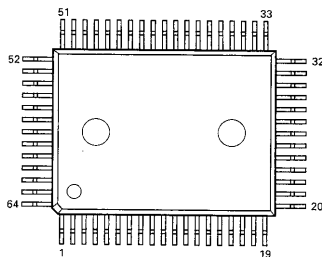
| Ref. No. | Parts No.   | Use/Function     | Operation/Condition/Compatibility    |
|----------|-------------|------------------|--------------------------------------|
| Q500     | 25C2714(Y)  | X'tal OSC        | 20MHz                                |
| Q501-503 | 25C2714(Y)  | Buffer amplifier | 20MHz                                |
| Q504     | 25C2412K(S) | amplifier        | 20MHz                                |
| Q505     | 25C3722K(R) | Active LPF       | Comparison 20kHz (FM 5kHz)           |
| Q506,507 | 25C3722K(R) | Active filter    |                                      |
| Q508     | DTC143TK    | Switching        | FM modulation input on/off           |
| Q509     | 25K1875(V)  | VCO              | LO2                                  |
| Q510     | 25C2714(Y)  | Buffer amplifier | 64.22MHz                             |
| Q511     | 25C2714(Y)  | Amplifier        | 64.22MHz                             |
| Q512     | 25C2412K(S) | Buffer amplifier | Chopper output (10MHz)               |
| Q513     | 25C2712(GR) | Buffer amplifier | D/A buffer                           |
| Q514     | 25C2412K(S) | Buffer amplifier |                                      |
| Q515     | 25C2412K(S) | Amplifier        | CAR                                  |
| Q516     | 25C2412K(S) | Buffer amplifier | CAR                                  |
| Q517     | 25C2412K(S) | Buffer amplifier | Chopper output (5MHz)                |
| Q518     | 25C2712(GR) | Buffer amplifier | D/A buffer                           |
| Q519     | 25C2412K(S) | Buffer amplifier | Mixer input buffer (5.54-6.09MHz)    |
| Q520     | 25C2412K(S) | Buffer amplifier | 20MHz                                |
| Q521     | 25C2714(Y)  | Tripled circuit  | 20MHz x 3 = 60MHz                    |
| Q522     | 25C2714(Y)  | Amplifier        | PLL IC input (7.5-47.5MHz)           |
| Q523     | 25C2412K(S) | Buffer amplifier | PLL IC input (7.5-47.5MHz)           |
| Q524     | 25C3722K(R) | Active LPF       | Comparison 500kHz                    |
| Q525,526 | 25C3722K(R) | Active LPF       |                                      |
| Q527     | DTC114EK    | Switching        | VCO A changeover                     |
| Q528     | 25K1875(V)  | VCO A            | 73.08-84.04MHz                       |
| Q529     | DTC114EK    | Switching        | VCO B changeover                     |
| Q530     | 25K1875(V)  | VCO B            | 84.04-97.04MHz                       |
| Q531     | DTC114EK    | Switching        | VCO C changeover                     |
| Q532     | 25K1875(V)  | VCO C            | 97.04-103.05MHz                      |
| Q533     | 25C2714(Y)  | Buffer amplifier | Mixer input buffer (73.08-103.05MHz) |
| Q534     | 25C2714(Y)  | Amplifier        | LO1 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,<br>9 : Lock voltage output    11 : Unlock output ("L" : Unlock),<br>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<br>8.9 : Lock voltage output    11 : Unlock output ("L" : Unlock)<br>15 : 20MHz input |
| IC508    | BU4S66      | Inverter                   |                                                                                                                                                   |
| IC510    | TC7S08F     | Buffer amplifier           |                                                                                                                                                   |
| IC511    | NJM78L08UA  | AVR                        | 14S → 8V (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                                                                                                                                   |

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

#### ■ Terminal connection diagram



#### ■ Terminal function

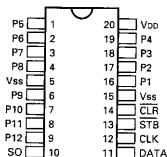
| Pin   | Name      | Port    | I/O | Details                                                                                                 |
|-------|-----------|---------|-----|---------------------------------------------------------------------------------------------------------|
| 1,2   | NC        |         |     |                                                                                                         |
| 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~K0     | 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

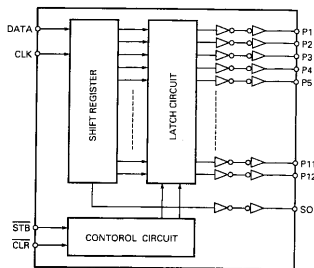
| Pin   | Name        | Port    | I/O | Details                                                                                             |
|-------|-------------|---------|-----|-----------------------------------------------------------------------------------------------------|
| 45    |             | CS      | I   |                                                                                                     |
| 46~48 | IAD8~IAD10  | A0~A2   | I/O | Pseudo bus                                                                                          |
| 49    | TTO         | PE0     | O   | External AT control 'H': AT through request, 'L': Others                                            |
| 50    | TSO         | PE1     | O   | External AT control 'H': AT tuning request, 'L': Others                                             |
| 51    | NC          |         |     |                                                                                                     |
| 52    | TSI         | PE2     | I   | External AT control 'H': AT through end, 'L': Others                                                |
| 53    | TTI         | 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': 50MHz 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

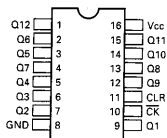


## ■ Block diagram



## Clock Divider : TC74HC4040AF (Control Unit IC508)

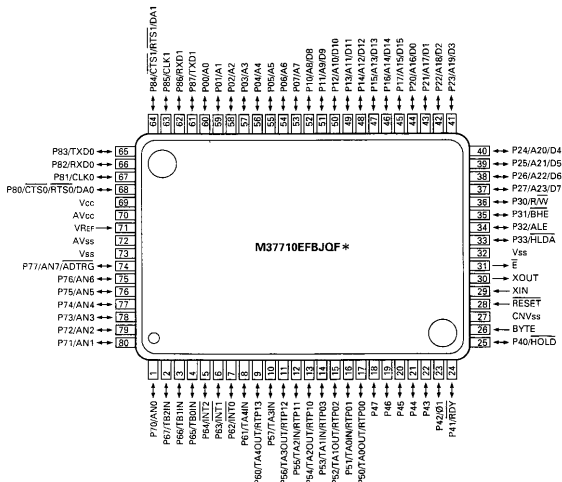
## ■ Terminal connection diagram



## 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  | TB0n   | 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/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                                    |

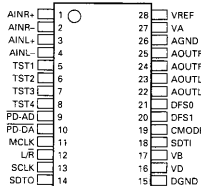
## SEMICONDUCTOR DATA

| 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   | Bus width switching input                                                                                                           |
| 27    |             | CNVss   | I   | CNVss                                                                                                                               |
| 28    |             | RESET   | I   | Reset input                                                                                                                         |
| 29    |             | Xin     | I   | Clock input                                                                                                                         |
| 30    |             | Xout    | O   | Clock output                                                                                                                        |
| 31    |             | E       | O   | Enable output                                                                                                                       |
| 32    |             | Vss     |     | 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 "H": DSP chip select can be changed, "L": DSP chip select cannot be changed                                             |
| 40    | PSC         | P24     | O   | Power control "H": Power ON, "HIZ": Power OFF                                                                                       |
| 41    | IOCS        | P23     | O   | Chip select "L": Expansion I/O is selected, "H": Expansion I/O is not selected                                                      |
| 42    | IS          | P22     | O   | Chip select "L": DSP is selected, "H": DSP is not selected                                                                          |
| 43    | IWR         | P21     | O   | Bus control "L": Data writing, "H": When data is not written                                                                        |
| 44    | IRD         | P20     | O   | Bus control "L": Data reading, "H": When data is not read                                                                           |
| 45-49 | IAD15-IAD11 | P17-P13 | I/O | Pseudo bus Address/data multiplex when the DSP is accessed, Not used during expansion I/O access (The previous state is maintained) |
| 50-52 | IAD10-IAD8  | P12-P10 | I/O | Pseudo bus Address/data multiplex when the DSP is accessed, Address bus during expansion I/O access                                 |
| 53-60 | IAD7-IAD0   | P07-P00 | I/O | Pseudo bus Address/data multiplex when the DSP is accessed, Data bus during expansion I/O access                                    |
| 61    | KEY         | P87     | I   | Transmission request "L": Transmission request from the keyer, "H": Normal                                                          |
| 62    | MEA         | P86     | I   | Electric key control "H": Electric keyer microcomputer message playback, "L": Others, normal                                        |
| 63    | BSY         | P85     | I   | Electric key control "H": Electric keyer microcomputer data cannot be set, "L": Others, normal                                      |
| 64    | SS          | P84     | I   | Transmission request "L": Transmission request by the microphone PTT, "H": Normal                                                   |
| 65    | TXD         | TXDO    | O   | UART data                                                                                                                           |
| 66    | RXD         | RXDO    | I   | UART data                                                                                                                           |
| 67    | RTS         | P81     | O   | UART control                                                                                                                        |
| 68    | CTS         | CTSO    | I   | UART control                                                                                                                        |
| 69    |             | Vcc     |     | Power input                                                                                                                         |
| 70    |             | AVcc    |     | Analog power input                                                                                                                  |
| 71    |             | Vref    |     | Reference voltage input                                                                                                             |
| 72    |             | AVss    |     | Analog power input                                                                                                                  |
| 73    |             | Vss     |     | 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                                                                        |

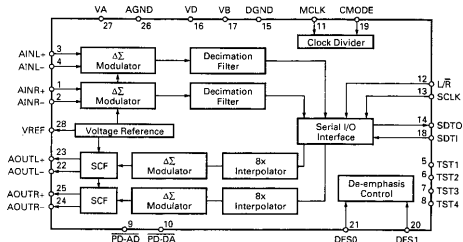
## SEMICONDUCTOR DATA

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

#### ■ Terminal connection diagram



#### ■ Block diagram



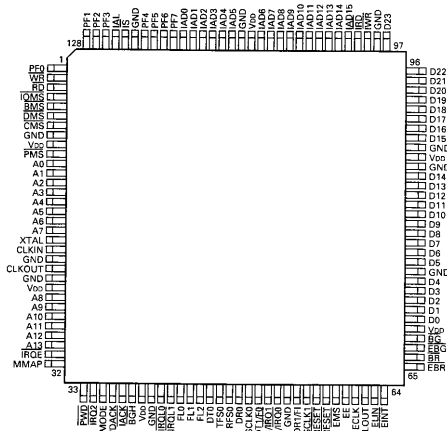
#### ■ Terminal function

| 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)<br>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<br>Output according to the VA reference. The 10μF electrolytic capacitor and 0.1μF ceramic capacitor are connected between VREF and VA.                                |

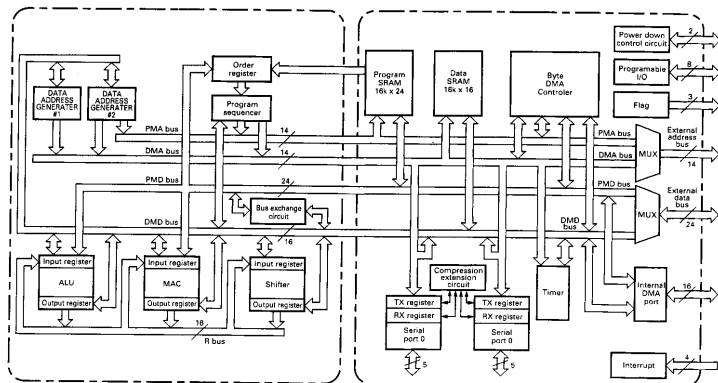
## SEMICONDUCTOR DATA

DSP : ADSP2181KS-115 (Control Unit IC507)

### ■ Terminal connection diagram



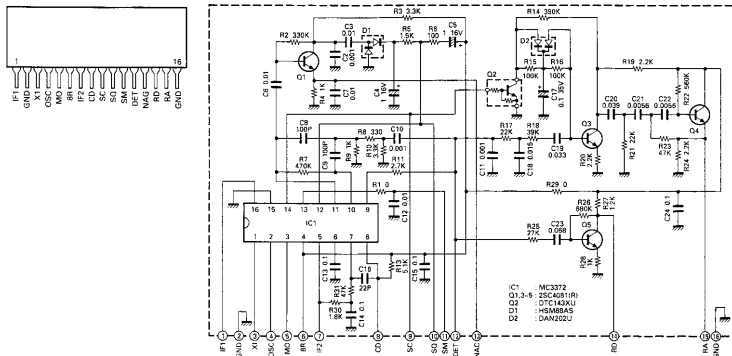
### ■ Block diagram



## SEMICONDUCTOR DATA

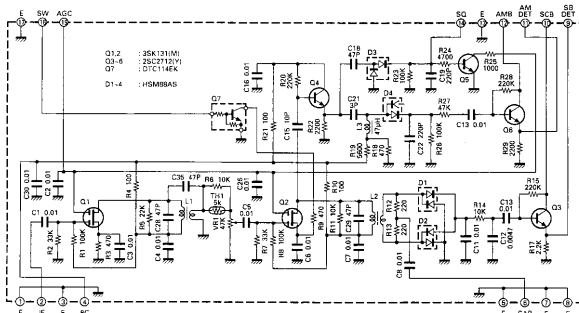
HIC : KCD10 (TX-RX Unit IC7)

■ Terminal connection diagram ■ Circuit diagram

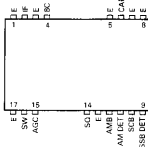


HIC : KCD11 (TX-RX Unit IC15)

■ Circuit diagram



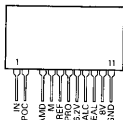
■ Terminal connection diagram



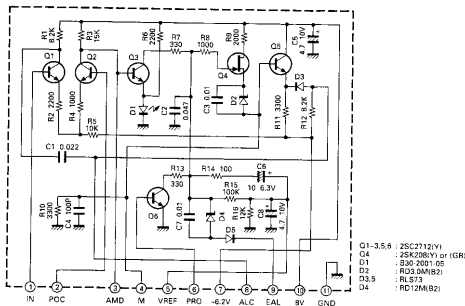
## SEMICONDUCTOR DATA

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

#### ■ Terminal connection diagram

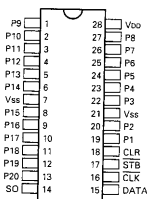


#### ■ Circuit diagram

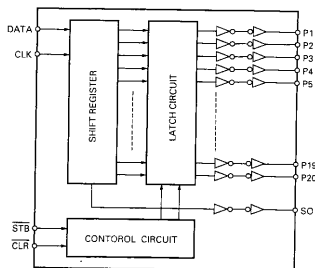


### Extended I/O : NJU3718G (TX-RX Unit IC14)

#### ■ Terminal connection diagram



#### ■ Block diagram



#### ■ Terminal function

| Pin No. | Symbol  | Function                     |
|---------|---------|------------------------------|
| 1-6     | P9-P14  | Parallel convert data output |
| 7       | Vss     | 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      | Vss     | GND                          |
| 22-27   | P3-P8   | Parallel convert data output |
| 28      | Vcc     | Power supply (4.5~5.5V)      |

# TS-570D

## PARTS LIST

\* New Parts. Δ 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                      | Destination |
|----------------|---------|-----------|-------------|----------------------------------|-------------|
| <b>TS-570D</b> |         |           |             |                                  |             |
| 1              | 2A      | *         | A01-2117-02 | METALLIC CABINET (UPPER)         | E,E2,E3     |
| 2              | 2D      | *         | A01-2118-02 | METALLIC CABINET (LOWER)         |             |
| 3              | 3A      | *         | A62-0459-03 | PANEL ASSY                       |             |
| 4              | 2D      |           | B09-0355-05 | CAP (COM)                        | K           |
| 5              | 2B      | *         | B38-0765-05 | LCD ASSY                         |             |
| 6              | 2C      |           | B42-3343-04 | S/NO LABEL                       |             |
| 7              | 2C      |           | B42-3395-04 | LABEL (FCC)                      | E,E2,E3     |
| 8              | 3E      |           | B44-2163-04 | UPC CODE LABEL                   |             |
| 9              | 1F      |           | B46-0310-03 | WARRANTY CARD ACSY               |             |
| 9              | 1F      |           | B46-0410-40 | WARRANTY CARD ACSY               | K           |
| 10             | 1F      | *         | B52-0608-00 | SCHEMATIC DIAGRAM ACSY           |             |
| 21             | 1F      |           | B59-1034-00 | INSTRUCTION CARD ACSY            |             |
| 11             | 1E      | *         | B62-0623-00 | INSTRUCTION MANUAL (ENGLISH)     | E,E2        |
| 12             | 1F      | *         | B62-0624-00 | INSTRUCTION MANUAL (GERMAN)      |             |
| 13             | 1F      | *         | B62-0625-00 | INSTRUCTION MANUAL (SPANISH)     |             |
| 14             | 1F      | *         | B62-0626-00 | INSTRUCTION MANUAL (FRENCH)      | E           |
| 15             | 1F      | *         | B62-0650-00 | INSTRUCTION MANUAL (ITALIAN)     |             |
| 16             | 1F      | *         | B62-0651-00 | INSTRUCTION MANUAL (NETHERLAND)  |             |
| 17             | 2C      | *         | B72-1059-04 | MODEL NAME PLATE                 | K,M2        |
| 17             | 2C      | *         | B72-1061-04 | MODEL NAME PLATE                 |             |
| 18             | 2D      |           | E04-0167-05 | R/ COAXIAL CABLE RECEPTACLE      |             |
| 19             | 1E      |           | E07-0751-05 | DIN PLUG (7 PIN) ACSY            | E,E2,E3     |
| 20             | 1E      |           | E07-1351-05 | DIN PLUG (13 PIN) ACSY           |             |
| 23             | 2D      |           | E23-0952-04 | EARTH LUG (ANT)                  |             |
| 24             | 1E      |           | E30-3157-15 | DC CORD                          | ACSY        |
| 25             | 2B      |           | E37-0499-05 | FLAT CABLE (26PIN)               |             |
| 26             | 1C      |           | E37-0508-05 | LEAD WIRE WITH CONNE CTOR (2P)   |             |
| 27             | 2B      |           | E37-0532-05 | FLAT CABLE                       | E,E2,E3     |
| 28             | 2B      |           | E37-0589-05 | FLAT CABLE (16P)                 |             |
| 29             | 1B,1C   | *         | E37-0590-05 | FLAT CABLE (16P)                 |             |
| 30             | 1C      | *         | E37-0591-05 | FLAT CABLE (16P)                 | E,E2,E3     |
| 31             | 1C      | *         | E37-0641-05 | LEAD WIRE WITH MINIPIN PLUG      |             |
| 32             | 1B      | *         | E37-0642-05 | LEAD WIRE WITH MINIPIN PLUG      |             |
| 33             | 2B      | *         | E37-0643-05 | LEAD WIRE WITH CONNECTOR (PHONE) | E,E2,E3     |
| 34             | 2B      | *         | E37-0644-05 | LEAD WIRE WITH CONNECTOR         |             |
| 35             | 1C      | *         | E37-0645-05 | LEAD WIRE WITH CONNECTOR (6P)    |             |
| 36             | 1E      |           | F05-2531-05 | FUSE (BLADE 25A/32V)             | ACSY        |
| 37             | 1E      |           | F06-4027-05 | FUSE (BLADE 4A/32V)              |             |
| 38             | 2C      | *         | F09-0436-15 | FAN MOTOR                        |             |
| -              | -       |           | F09-0453-05 | CAP (ACC2)                       | E,E2,E3     |
| -              | -       |           | F29-0014-05 | INSULATING BUSH                  |             |
| 41             | 2B      |           | G02-0575-04 | FLAT SPRING (TX-RX IC)           |             |
| 42             | 1C      |           | G02-0709-04 | FLAT SPRING (AVR)                | E,E2,E3     |
| 43             | 3A      | *         | G02-0900-04 | FLAT SPRING (MAIN KNOB)          |             |
| 44             | 2A,2D   |           | G10-0676-04 | FIBROUS SHEET (CASE)             |             |
| -              | -       |           | G10-0687-04 | FIBROUS SHEET (CASE)             | E,E2,E3     |
| 46             | 3A      |           | G10-0732-04 | FIBROUS SHEET                    |             |
| 47             | 2C      |           | G10-0787-04 | FIBROUS SHEET (PLU)              |             |
| 48             | 2D      |           | G13-0631-04 | CUSHION                          | E,E2,E3     |
| -              | -       |           | G13-0872-04 | CUSHION (DRU 3A)                 |             |
| -              | -       |           | G13-1327-04 | CUSHION                          |             |
| 53             | 1D      |           | G13-1486-04 | CUSHION (SP)                     | E,E2,E3     |

L : Scandinavia

Y : PX (Far East, Hawaii)

Y : AAFES (Europe)

K : USA

T : England

X : Australia

P : Canada

E : Europe

M : Other Areas

| Ref. No.                                            | Address | New parts | Parts No.     | Description                    | Destination |         |         |
|-----------------------------------------------------|---------|-----------|---------------|--------------------------------|-------------|---------|---------|
| 54                                                  | 1D      |           | G13-1511-04   | CUSHION (FINAL)                | E,E2,E3     |         |         |
| 55                                                  | 2E      | *         | H10-6602-02   | FOAM PACKING MOLD (F)          |             |         |         |
| 56                                                  | 2F      | *         | H10-6603-02   | FOAM PACKING MOLD (R)          |             |         |         |
| 57                                                  | 2F      |           | H20-1425-03   | PROTECTION COVER               |             |         |         |
| 58                                                  | 1E      |           | H25-0029-04   | BAG (FUSE,DIN)                 |             |         |         |
| 59                                                  | 2E      |           | H25-0079-04   | BAG (MIC)                      |             |         |         |
| 62                                                  | 1E      |           | H25-0096-04   | BAG (LINE FILTER,BAND)         |             |         |         |
| 60                                                  | 1E      |           | H25-0708-04   | BAG (DC CORD)                  |             |         |         |
| 61                                                  | 2F      | *         | H52-0775-02   | ITEM CARTON CASE               |             |         |         |
| 62                                                  | 3F      | *         | H62-0689-03   | OUTER CARTON CASE              |             |         |         |
| 63                                                  | 3D      |           | J02-0440-04   | FOOT (F)                       | E,E2,E3     |         |         |
| 64                                                  | 2A,2C   |           | J02-0441-05   | FOOT (SIDE)                    |             |         |         |
| 65                                                  | 2C,3D   |           | J02-0442-04   | FOOT (F)                       |             |         |         |
| 66                                                  | 3D      |           | J02-0475-05   | FOOT (BACK)                    |             |         |         |
| 67                                                  | 1C      |           | J19-1458-05   | HOLDER (TX-RX)                 |             |         |         |
| 68                                                  | 3B      |           | J31-0141-04   | COLLAR (MIC)                   |             |         |         |
| -                                                   |         |           | J61-0307-05   | BAND (RAT-6P AT)               |             |         |         |
| 69                                                  | 1E      |           | J61-0307-05   | BAND                           |             | ACSY    |         |
| 70                                                  | 2B      |           | K01-0420-05   | HANDLE ASSY                    |             | E,E2,E3 |         |
| 71                                                  | 3A      | *         | K21-1103-03   | KNOB (MAIN)                    |             |         |         |
| 72                                                  | 3B      | *         | K29-5095-03   | KEYTOP (DSP)                   |             |         |         |
| 73                                                  | 3A      | *         | K29-5096-03   | KEYTOP (POWER)                 |             |         |         |
| 74                                                  | 3B      | *         | K29-5097-03   | KEYTOP (10 KEY)                |             |         |         |
| 75                                                  | 3A      | *         | K29-5098-04   | KNOB (INI)                     |             |         |         |
| 76                                                  | 3A      | *         | K29-5099-04   | KNOB (OUT)                     |             |         |         |
| 77                                                  | 3A      | *         | K29-5100-03   | KNOB (RIT,MULTI)               |             |         |         |
| 78                                                  | 3B      | *         | K29-5110-03   | KEYTOP (FUNC)                  |             |         |         |
| 79                                                  | 3A      | *         | K29-5111-04   | KNOB RING (MAIN)               |             |         |         |
| 83                                                  |         |           | L79-1408-05   | LINE FILTER                    | ACSY        | E,E2,E3 |         |
| 80                                                  | 2C      |           | N15-1040-46   | FLAT WASHER (GND)              | E,E2,E3     |         |         |
| A                                                   | 2B      |           | N32-2806-46   | FLAT HEAD MACHIN SCREW (ICD)   |             |         |         |
| B                                                   | 2B,3B   |           | N32-3006-46   | FLAT HEAD MACHIN SCREW (SUB PI |             |         |         |
| C                                                   | 1A,3D   | *         | N33-3006-45   | OVAL HEAD MACHIN SCREW (CASE)  |             |         |         |
| D                                                   | 1D,2D   | *         | N33-3020-45   | OVAL HEAD MACHIN SCREW (FAN)   |             |         |         |
| E                                                   | 2C      |           | N35-4010-46   | BINDING HEAD MACHINE SCREW     |             |         |         |
| F                                                   | 1C      |           | N67-3010-46   | PAN HEAD SEMS SCREW (FINAL)    |             |         |         |
| G                                                   | 1D      |           | N87-3006-46   | BRAZIER HEAD TAPITTE SCREW     |             |         |         |
| H                                                   | 1B,1C   |           | N87-3008-46   | BRAZIER HEAD TAPITTE SCREW     |             |         |         |
| J                                                   | 3A      |           | N80-3006-45   | TP HEAD MACHIN SCREW           |             |         |         |
|                                                     |         |           | S50-1406-05   | TACT SWITCH (MIC PTT)          | E,E2,E3     |         |         |
| MIC                                                 | 2E      |           | T91-0352-15   | MICROPHONE                     |             | ACSY    |         |
| SP                                                  | 1D      |           | T07-0252-15   | LOUDSPEAKER (FULLRANGE)        |             |         |         |
| 81                                                  | 2B      |           | W02-1836-05   | ENCODER (MAIN)                 |             | E,E2,E3 |         |
| BAT                                                 | 3B      |           | W09-0873-05   | LITHIUM CELL (3V/220mAh)       |             |         |         |
| FINAL UNIT (X45-353X-XX) 0-10 : K,M2 2-71 : E,E2,E3 |         |           |               |                                |             |         |         |
| C1                                                  |         |           | CK73FB1H103K  | CHIP C 0.010UF K               |             |         | E,E2,E3 |
| C2                                                  |         |           | CK73FB1E104K  | CHIP C 0.10UF K                |             |         |         |
| C3                                                  |         |           | CK73FB1H102K  | CHIP C 1000PF K                |             |         |         |
| C4                                                  |         |           | CK73FSL1H821J | CHIP C 820PF J                 |             |         | E,E2,E3 |
| C5                                                  |         |           | CK73FB1H103K  | CHIP C 0.010UF K               |             |         |         |
| C6                                                  |         |           | CK73FB1E104K  | CHIP C 0.10UF K                |             |         |         |
| C7,8                                                |         |           | CK73FB1H102K  | CHIP C 1000PF K                | E,E2,E3     |         |         |
| C8,10                                               |         |           | CK73FB1E104K  | CHIP C 0.10UF K                |             |         |         |
|                                                     |         |           |               |                                |             |         |         |

## PARTS LIST

FINAL UNIT (X45-353X-XX)

| Ref. No. | Address | New parts | Parts No.     | Description         | Destination | Ref. No. | Address | New parts | Parts No.     | Description      | Destination |
|----------|---------|-----------|---------------|---------------------|-------------|----------|---------|-----------|---------------|------------------|-------------|
| C11      |         |           | CE04EW1E100M  | ELECTRO 10UF 25WV   |             | C105     |         |           | GM93D2H621J   | 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     |         |           | CK73FSL2H661J | CHIP C 560PF J   |             |
| C15      |         |           | CK73FB1H102K  | CHIP C 1000PF K     |             | C201     |         |           | CC45FSL2H661J | CERAMIC 560PF J  |             |
| C16      |         |           | C90-2193-05   | ELECTRO 39UF 25WV   |             | C202     |         |           | CC45FSL2H121J | CERAMIC 120PF J  |             |
| C17      |         |           | CE04EW1E100M  | ELECTRO 10UF 25WV   |             | C203     |         |           | CC45FSL2H331J | 330PF J          |             |
| C18      |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             | C204     |         |           | CC45FSL2H331J | CERAMIC 330PF J  |             |
| C19      |         |           | CK45FSL2H221J | CERAMIC 220PF J     |             | C205     |         |           | CC45FSL2H471J | CERAMIC 470PF J  |             |
| C20      |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             | C206-208 |         |           | CC45FSL2H151J | CERAMIC 150PF J  |             |
| C21      |         |           | CK73FB1H472K  | 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 8600PF 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     |         |           | CC45FSL2H660J | CERAMIC 66PF J   |             |
| C28      |         |           | CM73F2H561J   | CHIP C 560PF J      |             | C306     |         |           | CC45FSL2H271J | CERAMIC 270PF J  |             |
| C30      |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             | C307     |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             |
| C31      |         |           | CC45FSL2H151J | CERAMIC 150PF J     |             | C401     |         |           | CC45FSL2H151J | CERAMIC 180PF J  | E,E2,E3     |
| C32      |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             | C402     |         |           | CC45FSL2H470J | CERAMIC 470PF J  | E,E2,E3     |
| C33      |         |           | CM73F2H22J    | CHIP C 1200PF J     |             | C403     |         |           | CC45FSL2H271J | CERAMIC 270PF J  | E,E2,E3     |
| C34      |         |           | C90-2194-05   | ELECTRO 220UF 25WV  |             | C404,405 |         |           | CC45FSL2H151J | CERAMIC 150PF J  | E,E2,E3     |
| C35      |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             | C406     |         |           | CK73FB1H103K  | CHIP C 0.010UF K | E,E2,E3     |
| C36      |         |           | CK73FSL1H221J | CHIP C 220PF J      |             | C407     |         |           | CC45FSL2H181J | CERAMIC 180PF J  |             |
| C37      |         |           | CK73FCH1H101J | CHIP C 100PF J      |             | C408     |         |           | CC45FSL2H390J | CERAMIC 39PF J   |             |
| C38      |         |           | CC45FCH2H030C | CERAMIC 3.0PF C     |             | C409     |         |           | CC45FSL2H181J | CERAMIC 180PF J  | K,M2        |
| C39      |         |           | CK73FCH1H560J | CHIP C 56PF J       |             | C409     |         |           | CC45FSL2H331J | CERAMIC 330PF J  | E,E2,E3     |
| C40-42   |         |           | CK73FSL1H221J | CHIP C 220PF J      |             | C410,411 |         |           | CC45FSL2H151J | CERAMIC 150PF J  |             |
| C43      |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             | C412     |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             |
| C44      |         |           | CK73FCH1H660J | CHIP C 66PF J       |             | C413     | *       |           | CC45FSL2H050C | CERAMIC 5.0PF C  | K,M2        |
| C45      |         |           | CK73FCH1H121J | CHIP C 120PF J      |             | C415     |         |           | CC45FSL2H121J | CERAMIC 120PF J  | K,M2        |
| C46      |         |           | CK73FCH1H560J | CHIP C 56PF J       |             | C416     | *       |           | CC45FSL2H050C | CERAMIC 5.0PF C  | E,E2,E3     |
| C47      |         |           | C91-1075-05   | CERAMIC 470PF K     |             | C501     |         |           | CC45FSL2H101J | CERAMIC 100PF J  |             |
| C48      |         |           | CK73FB1E104K  | CHIP C 0.010UF K    |             | C502     |         |           | CC45FSL2H470J | CERAMIC 47PF J   |             |
| C49      |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             | C503     |         |           | CC45FSL2H221J | CERAMIC 220PF J  |             |
| C50-52   |         |           | CE04EW1E102M  | ELECTRO 1000UF 25WV |             | C504     |         |           | CC45FSL2H150J | CERAMIC 15PF J   |             |
| C53      |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             | C505     |         |           | CC45FSL2H121J | CERAMIC 120PF J  |             |
| C54      |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             | C506     |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             |
| C55-57   |         |           | CK73FB1H102K  | CHIP C 1000PF K     |             | C601     |         |           | CC45FSL2H660J | CERAMIC 66PF J   |             |
| C56      |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             | C602     |         |           | CC45FSL2H470J | CERAMIC 47PF J   |             |
| C57      |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             | C603     |         |           | CC45FSL2H121J | CERAMIC 120PF J  |             |
| C61,62   |         |           | CE04EW1E100M  | ELECTRO 10UF 25WV   |             | C604     |         |           | CC45FSL2H100D | CERAMIC 10PF D   |             |
| C63      |         |           | CE04EW1E102M  | ELECTRO 1000UF 25WV |             | C605     |         |           | CC45FSL2H120J | CERAMIC 12PF J   |             |
| C64,65   |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             | C606     |         |           | CC45FSL2H660J | CERAMIC 66PF J   |             |
| C66      |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             | C607     |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             |
| C67      |         |           | CE04EW1E1047M | ELECTRO 470UF 25WV  |             | C800     |         |           | GM93D2H660J   | MICA 56PF J      |             |
| C68,74   |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             | C801-804 | *       |           | C91-3115-05   | HV C 10PF 2KV    |             |
| C75      |         |           | CK73FB1H102K  | CHIP C 1000PF K     |             | C805     | *       |           | C91-3115-05   | HV C 18PF 2KV    |             |
| C76      |         |           | CE04EW1A470M  | ELECTRO 47UF 10WV   |             | C806     | *       |           | C91-3115-05   | HV C 30PF 2KV    |             |
| C77,78   |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             | C807-811 | *       |           | C91-3123-05   | HV C 150PF 3KV   |             |
| C79,80   |         |           | CK73FB1H102K  | CHIP C 1000PF K     |             | C812-815 | *       |           | C91-3115-05   | HV C 10PF 2KV    |             |
| C81,85   |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             | C816     | *       |           | C91-3116-05   | HV C 18PF 2KV    |             |
| C86-94   |         |           | CK73FB1H102K  | CHIP C 1000PF K     |             | C817     | *       |           | C91-3116-05   | HV C 39PF 2KV    |             |
| C95,96   |         |           | CC45FSL2H221J | CERAMIC 220PF J     |             | C818-822 | *       |           | C91-3123-05   | HV C 150PF 3KV   |             |
| C97      |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             | C823-869 |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             |
| C99      |         |           | CE04EW1E100M  | ELECTRO 10UF 25WV   |             | C835-869 |         |           | CK73FB1H102K  | CHIP C 0.010UF K |             |
| C100     |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             | C870-873 | *       |           | C91-3115-05   | HV C 10PF 2KV    |             |
| C101     |         |           | GM93D2H621J   | MICA 820PF J        |             | C874,875 | *       |           | CK73FB1H103K  | CHIP C 0.010UF K |             |
| C102     |         |           | CC45FSL2H561J | CERAMIC 560PF J     |             | C876-878 | *       |           | C91-3115-05   | HV C 10PF 2KV    |             |
| C103     |         |           | GM93D2H162J   | MICA 1600PF J       |             | C901     |         |           | CK73FB1E104K  | CHIP C 0.10UF K  |             |
| C104     |         |           | CC45FSL2H161J | CERAMIC 160PF J     |             | C902     |         |           | CK73FCH1H100D | CHIP C 10PF D    |             |

# TS-570D

## PARTS LIST

FINAL UNIT (X45-353X-XX)

| Ref. No. | Address | New parts | Parts No.    | Description                      | Destination | Ref. No. | Address | New parts | Parts No.    | Description                  | Destination |
|----------|---------|-----------|--------------|----------------------------------|-------------|----------|---------|-----------|--------------|------------------------------|-------------|
| C503     |         |           | CE04FW1H470M | ELECTRO 47UF 50WV                |             | L501     |         |           | L34-1280-05  | COIL (6.5T)                  |             |
| C951-954 |         |           | CK3FE1C105Z  | CHIP C 1.0UF Z                   |             | L502     |         |           | L34-1279-05  | COIL (7.5T)                  |             |
| T01      |         |           | C05-0030-15  | TRIMMER CAPACITOR 20PF           |             | L503     |         |           | L40-1015-48  | SMALL FIXED INDUCTOR (100UH) |             |
| T02      |         |           | C05-0031-15  | TRIMMER CAPACITOR 10PF           |             | L601     |         |           | L34-1282-05  | COIL (4.5T)                  |             |
|          |         |           |              |                                  |             | L602     |         |           | L34-1281-05  | COIL (5.5T)                  |             |
| CN1      |         |           | E04-0191-05  | RF COAXIAL CABLE RECEPTACLE      |             |          |         |           |              |                              |             |
| CN2      |         |           | E04-0154-05  | RF COAXIAL CABLE RECEPTACLE      |             | L603     |         |           | L40-1015-48  | SMALL FIXED INDUCTOR (100UH) |             |
| CN3,4    |         |           | E40-5764-05  | PIN CONNECTOR FOR INSIDE         |             | L601,602 |         |           | L39-1264-05  | TROIDAL COIL                 |             |
| CN5      |         |           | E40-3246-05  | PIN CONNECTOR FOR INSIDE (FAN)   |             | L603     |         |           | L39-1263-05  | TROIDAL COIL                 |             |
| CN6      |         |           | E40-3240-05  | PIN CONNECTOR FOR INSIDE (SP)    |             | L804     |         | *         | L34-4476-05  | COIL (7.5T)                  |             |
|          |         |           |              |                                  |             | L805-807 |         | *         | L34-4474-05  | COIL (1.5T)                  |             |
| CN8      |         |           | E23-0986-05  | TERMINAL                         |             |          |         |           |              |                              |             |
| CN10-12  |         |           | E23-0986-05  | TERMINAL                         |             | L808     |         | *         | L34-4469-05  | COIL (0.5T)                  |             |
| CN13     |         |           | E40-3237-05  | PIN CONNECTOR FOR INSIDE (SP)    |             | L809     |         | *         | L34-4469-05  | COIL (3.5T)                  |             |
| CN14,15  |         |           | E04-0154-05  | RF COAXIAL CABLE RECEPTACLE      |             | L610-832 |         |           | L40-1015-48  | SMALL FIXED INDUCTOR (100UH) |             |
| CN9D1    |         |           | E40-3303-05  | PIN CONNECTOR FOR INSIDE (PHONE) |             | T101     |         |           | L92-0104-05  | TROIDAL CORE                 |             |
|          |         |           |              |                                  |             | T102     |         |           | L92-0104-05  | TROIDAL CORE                 |             |
| J901     |         |           | E11-0438-05  | PHONE JACK                       |             |          |         |           |              |                              |             |
| W1       | 1C      | *         | E37-0594-05  | LEAD WIRE WITH CONNECTOR         |             | T201     |         |           | L92-0107-05  | TROIDAL CORE                 |             |
| W4       | 1C      |           | E37-0198-05  | LEAD WIRE WITH MINIPIN PLUG      |             | T202     |         |           | L92-0107-05  | TROIDAL CORE                 |             |
| F1       |         |           | F53-0093-05  | FUSE (5A/125V)                   |             | T301     |         |           | L92-0108-05  | TROIDAL CORE                 |             |
| F2       |         |           | F06-0027-05  | FUSE BLADE (4A/32V)              |             | T302     |         |           | L92-0108-05  | TROIDAL CORE                 |             |
|          |         |           |              |                                  |             | T401     |         |           | L92-0108-05  | TROIDAL CORE                 | E.E2.E3     |
| A1,2     |         |           | J13-0410-05  | FUSE HOLDER                      |             | T402     |         |           | L92-0108-05  | TROIDAL CORE                 | E.E2.E3     |
| L2       |         |           | L40-1015-48  | SMALL FIXED INDUCTOR (100UH)     |             | T404     |         |           | L92-0108-05  | TROIDAL CORE                 |             |
| L3       |         |           | L40-3396-48  | SMALL FIXED INDUCTOR (3.3UH)     |             | T405     |         |           | L92-0108-05  | TROIDAL CORE                 |             |
| L4       |         |           | L39-0481-05  | TROIDAL COIL                     |             | T801,802 |         |           | L92-0119-05  | TROIDAL CORE                 |             |
| L5-7     |         |           | L33-0699-05  | CHOKE COIL                       |             | T803     |         |           | L92-0119-05  | TROIDAL CORE                 |             |
| L8       |         |           | L39-1257-05  | TROIDAL COIL                     |             |          |         |           |              |                              |             |
| L9       |         |           | L33-0617-15  | CHOKE COIL                       |             | R1       |         |           | RK73FB2A331J | CHIP R 330 J 1/10W           |             |
| L10      |         |           | L40-4795-48  | SMALL FIXED INDUCTOR (4.7UH)     |             | R2       |         |           | RK73FB2A881J | CHIP R 680 J 1/10W           |             |
| L11,12   |         |           | L33-0699-05  | CHOKE COIL                       |             | R3       |         |           | RK73FB2A101J | CHIP R 100 J 1/10W           |             |
| L13      |         |           | L39-0462-05  | TROIDAL COIL                     |             | R4,5     |         |           | RK73FB2A681J | CHIP R 6.8 J 1/10W           |             |
| L14      |         |           | L33-0617-15  | CHOKE COIL                       |             |          |         |           | R92-1221-05  | CHIP R 6.2 J 1/4W            |             |
| L15      |         |           | L33-0651-05  | CHOKE COIL                       |             | R7       |         |           | R92-1242-05  | CHIP R 8.2 J 1/4W            |             |
| L16      |         |           | L39-1252-15  | TROIDAL 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      |         |           | L39-3480-15  | TROIDAL COIL                     |             | R10      |         |           | R92-1318-05  | CHIP R 100 J 1W              |             |
| L19      |         |           | L40-2221-33  | SMALL FIXED INDUCTOR             |             | R11,12   |         |           | R92-0696-05  | CHIP R 33 J 1/4W             |             |
| L20      |         |           | L39-0496-05  | TROIDAL COIL                     |             | R13      |         |           | R92-1318-05  | CHIP R 100 J 1W              |             |
| L21      |         |           | L39-0415-25  | TROIDAL COIL                     |             | R14-17   |         |           | RS14CB3A586J | FL-PROOF RS 5.6 J 1W         |             |
| L22,23   |         |           | L40-2785-48  | SMALL FIXED INDUCTOR (270NH)     |             | R18,19   |         |           | RS14CB3A150J | FL-PROOF RS 15 J 1W          |             |
| L24,25   |         |           | L79-0558-05  | FILTER                           | E.E2.E3     | R20      |         |           | RK73FB2A391J | CHIP R 390 J 1/10W           |             |
| L26      |         |           | L40-1001-12  | SMALL FIXED INDUCTOR             |             | R21,22   |         |           | RS14CB3A487J | FL-PROOF RS 4.7 J 1W         |             |
| L27      |         |           | L40-1015-48  | SMALL FIXED INDUCTOR (100UH)     |             | R23      |         |           | RK73FB2A487J | 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  | TROIDAL COIL                     |             | R26,27   |         |           | R92-1213-05  | CHIP R 100 J 1/2W            |             |
| L102     |         |           | L39-1260-05  | TROIDAL 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  | TROIDAL COIL                     |             | R33      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W          |             |
| L202     |         |           | L39-1225-05  | TROIDAL COIL                     |             | R34      |         |           | R92-1292-05  | CHIP R 68 J 1W               |             |
| L203     |         |           | L40-1015-48  | SMALL FIXED INDUCTOR (100UH)     |             | R35      |         |           | R92-1289-05  | CHIP R 5.6 J 1W              |             |
| L301     |         |           | L39-1266-05  | TROIDAL COIL                     |             | R36,37   |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W          |             |
| L302     |         |           | L39-1258-05  | TROIDAL COIL                     |             | R38,39   |         |           | RK73FB2A191J | 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  | TROIDAL COIL                     | E.E2.E3     | R42,43   |         |           | RK73FB2A563J | CHIP R 56K J 1/10W           |             |
| L402     |         |           | L39-1220-05  | TROIDAL COIL                     | E.E2.E3     | 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  | TROIDAL COIL                     |             | R47      |         |           | RK73FB2A121J | CHIP R 120 J 1/10W           |             |
| L405     |         |           | L39-1220-05  | TROIDAL 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      |         |           | RK73FB2A822J | CHIP R 8.2K J 1/10W          |             |
|          |         |           |              |                                  |             | R51      |         |           | RK73FB2A682J | CHIP R 6.8K J 1/10W          |             |

## PARTS LIST

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

| Ref. No. | Address | New parts | Parts No.     | Description                | Destination | Ref. No.                                        | Address | New parts | Parts No.     | Description         | Destination |
|----------|---------|-----------|---------------|----------------------------|-------------|-------------------------------------------------|---------|-----------|---------------|---------------------|-------------|
| R62.53   |         |           | RK73FB2A103J  | CHIP R 10K J 1/10W         | K,M2        | Q11                                             |         |           | DT143TK       | DIGITAL TRANSISTOR  |             |
| R64.56   |         |           | RK73FB2A101J  | CHIP R 100 J 1/10W         |             | Q12.13                                          |         |           | DT0123K       | DIGITAL TRANSISTOR  |             |
| R67.60   |         |           | R92-2569-05   | JUMPER WIRE 0 OHM          |             | Q14.15                                          |         |           | 2SC2714(Y)    | TRANSISTOR          |             |
| R901.902 |         | *         | R92-1205-05   | CHIP R 120 J 1/4W          |             | Q16                                             |         |           | DT0114EK      | DIGITAL TRANSISTOR  |             |
| VR1      |         |           | R12-6730-05   | TRIMMING POT. Z20          |             | TH1                                             |         |           | 5TF41L        | TERMISTOR           |             |
| VR2      |         |           | R12-6737-05   | TRIMMING POT. 3.3K         | E,E2,E3     | CONTROL UNIT (X53-369X-XX)                      |         |           |               |                     |             |
| VR3      |         |           | R12-6730-05   | TRIMMING POT. Z20          |             | 0-10 : K 0-21 : M2 2-71 : E 2-72 : E2 2-73 : E3 |         |           |               |                     |             |
| VR4      |         |           | R12-6738-05   | TRIMMING POT. 4.7K         |             | C1                                              |         |           | DK73FB1H103K  | CHIP C 0.010UF K    |             |
| W2.3     |         |           | R92-0150-05   | JUMPER REST 0 OHM          |             | C2                                              |         |           | C92-0009-05   | CHIP-TAN 4.7UF 10WV |             |
| X1       |         |           | S51-2417-05   | RELAY                      |             | C3.4                                            |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| X2       |         |           | S51-1425-05   | RELAY                      | E,E2,E3     | C7                                              |         |           | DK73FB1H103K  | CHIP C 0.010UF K    |             |
| X3       |         |           | S51-2417-05   | RELAY                      |             | C8                                              |         |           | C92-0009-05   | CHIP-TAN 4.7UF 10WV |             |
| X4       |         |           | S76-0414-05   | RELAY                      |             | C9                                              |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| X101.102 |         |           | S51-1420-05   | RELAY                      |             | C10                                             |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| X201.202 |         |           | S51-1420-05   | RELAY                      |             | C11                                             |         |           | DK73FF1C105Z  | CHIP C 1.0UF Z      |             |
| X301.302 |         |           | S51-1420-05   | RELAY                      | E,E2,E3     | C12                                             |         |           | DK73FB1H103K  | CHIP C 0.010UF K    |             |
| X403.404 |         |           | S51-1420-05   | RELAY                      |             | C13                                             |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| X501.502 |         |           | S51-1420-05   | RELAY                      |             | C14.15                                          |         |           | CC73FCH1H330J | CHIP C 33PF J       |             |
| X801.802 |         |           | S51-1420-05   | RELAY                      |             | C16.17                                          |         |           | DK73FB1H103K  | CHIP C 0.010UF K    |             |
| X801-814 |         | *         | S76-0419-05   | RELAY                      |             | C18                                             |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| X815-821 |         | *         | S76-0415-05   | RELAY                      | E,E2,E3     | C19                                             |         |           | DK73FF1C105Z  | CHIP C 1.0UF Z      |             |
| X822.823 |         | *         | S76-0419-05   | RELAY                      |             | C20.21                                          |         |           | DK73FB1H103K  | CHIP C 0.010UF K    |             |
| Q1       |         |           | MA27T-8       | VARISTOR                   |             | C22.23                                          |         |           | C92-0037-05   | CHIP-ELE 10UF 16WV  |             |
| Q2.4     |         |           | MA27-B        | VARISTOR                   |             | C24-27                                          |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| Q5.6     |         |           | 1SS101        | DIODE                      |             | C28.29                                          |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| Q7.9     |         |           | 1F801         | DIORD                      | E,E2,E3     | C30                                             |         |           | DK73FF1C105Z  | CHIP C 1.0UF Z      |             |
| Q10.11   |         |           | OSA301LA      | DIORD                      |             | C31.32                                          |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| Q12      |         |           | SG-5UR1       | DIORD                      |             | C33                                             |         |           | C92-0040-05   | CHIP-ELE 47UF 16WV  |             |
| Q13      |         |           | ER2-M100KX220 | SURGE ABSORBER             |             | C36.37                                          |         |           | CC73FCH1H220J | CHIP C 22PF J       |             |
| Q14      |         |           | Q2C218K(Y)    | ZENER DIORD                |             | C103                                            |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| Q15      |         |           | 1F801         | DIORD                      | E,E2,E3     | C104-107                                        |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| Q16      |         |           | DAN202K       | DIORD                      |             | C108.109                                        |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| Q17      |         |           | 1F801         | DIORD                      |             | C110-118                                        |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| Q18-23   |         |           | 1SS226        | DIORD                      |             | C119                                            |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| Q24.25   |         |           | 1SS101        | DIORD                      |             | C120                                            |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| Q26      |         |           | DSA301LA      | DIORD                      | E,E2,E3     | C121-124                                        |         |           | DK73FB1H103K  | CHIP C 0.010UF K    |             |
| Q101     |         |           | 1F801         | DIORD                      |             | C125                                            |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| Q201     |         |           | 1F801         | DIORD                      |             | C126                                            |         |           | DK73FB1H103K  | CHIP C 0.010UF K    |             |
| Q301     |         |           | 1F801         | DIORD                      |             | C127.128                                        |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| Q401     |         |           | 1F801         | DIORD                      |             | C129.134                                        |         |           | DK73FB1H103K  | CHIP C 0.010UF K    |             |
| Q402     |         |           | 1F801         | DIORD                      | E,E2,E3     | C135-150                                        |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| Q501     |         |           | 1F801         | DIORD                      |             | C151-154                                        |         |           | CC73FCH1H101J | CHIP C 100PF J      |             |
| Q601     |         |           | 1F801         | DIORD                      |             | C155                                            |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| Q801-823 |         |           | 1F801         | DIORD                      |             | C156                                            |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| IC1      |         |           | TA7805S       | IC (VOLTAGE REGULATOR +5V) |             | C158-162                                        |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| IC2      |         |           | TA7805S       | IC (REGULATOR)             | E,E2,E3     | C163-169                                        |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| IC3      |         |           | TA75S39F      | IC                         |             | C170-172                                        |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| IC4      |         |           | SN74S4ANS     | IC (FLIP-FLOP)             |             | C173-183                                        |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| IC5      |         | *         | M54862P       | IC (500mA DARLINGTON)      |             | C184                                            |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| IC6      |         | *         | NJU3714G      | IC                         |             | C501                                            |         |           | C92-0004-05   | CHIP-TAN 0.1UF 16WV |             |
| IC7-9    |         |           | UPD6845GS     | IC                         | E,E2,E3     | C502.503                                        |         |           | DK73FB1H102K  | CHIP C 1.000PF K    |             |
| IC10     |         | *         | TA7810S       | IC (REGULATOR)             |             | C504.505                                        |         |           | DK73FB1H102K  | CHIP C 0.022UF K    |             |
| Q1       |         |           | 2SC1971       | TRANSISTOR (PWR-DRIVAMP)   |             | C506-509                                        |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| Q2.3     |         |           | 2SC1933       | TRANSISTOR (DRIV AMP)      |             | C510                                            |         |           | CC73GSL1H221J | CHIP C 220PF J      |             |
| Q4.5     |         |           | 2SC2879       | TRANSISTOR (POWER AMP)     |             | C511.512                                        |         |           | DK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| Q6       |         |           | 2SC3421(Y)    | TRANSISTOR                 | E,E2,E3     | C513                                            |         |           | CC73FCH1H102J | CHIP C 1.000PF J    |             |
| Q7-9     |         |           | FMC2          | TRANSISTOR                 |             | C514                                            |         |           | C92-0004-05   | CHIP-TAN 0.1UF 16WV |             |
| Q10      |         |           | DT0114EK      | DIGITAL TRANSISTOR         |             | C515                                            |         |           | C92-0038-05   | CHIP-ELE 22UF 16WV  |             |
|          |         |           |               |                            |             | C516                                            |         |           | C90-2073-05   | ELECTRO 8.8UF 16WV  |             |
|          |         |           |               |                            |             | C517                                            |         |           | C92-0037-05   | CHIP-ELE 1.0UF 16WV |             |

## PARTS LSIT

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

| Ref. No. | Address | New parts | Parts No.     | Description                    | Destination | Ref. No.  | Address | New parts | Parts No.    | Description         | Destination |
|----------|---------|-----------|---------------|--------------------------------|-------------|-----------|---------|-----------|--------------|---------------------|-------------|
| C518-519 |         |           | CK73FF1E104Z  | 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 |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z                |             | CP11      |         |           | R90-0749-05  | MULTI-COMP R        | 47K x 4     |
| C525-527 |         |           | CK73GB1H562K  | CHIP C 5600PF K                |             | CP12      |         |           | R90-0714-05  | MULTI-COMP R        | 10K x 4     |
| C528     |         |           | CK73FB1H682K  | CHIP C 6800PF 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     |         |           | CK73GCH1H101J | 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    |         |           | RK73FB2A103J | CHIP R 10 J 1/10W   |             |
| C540     |         |           | CK73FB1E104K  | CHIP C 0.10UF K                |             | R12       |         |           | RK73FB2A564J | CHIP R 560K J 1/10W |             |
| C541     |         |           | CK73FF1C105Z  | CHIP C 1.0UF Z                 |             | R13       |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             |
| C542-544 |         |           | C92-0507-05   | CHIP-TAN 4.7UF 6.3WV           |             | R14       |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| C546-549 |         |           | C92-0507-05   | CHIP-TAN 4.7UF 6.3WV           |             | 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       |         |           | R92-0670-05  | CHIP R 0 OHM        |             |
| C602     |         |           | CK73GSL1H471J | 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     |         |           | CK73GSL1H471J | CHIP C 470PF J                 |             | R21       |         |           | R92-0670-05  | CHIP R 0 OHM        |             |
| C605     |         |           | CK73FB1E104K  | CHIP C 0.10UF K                |             | R22       |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| C606     |         |           | CK73GSL1H471J | 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 | E.E2.E3     |
| C608     |         |           | CK73GSL1H471J | CHIP C 470PF J                 |             | R26       |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| C609     |         |           | CK73FB1E104K  | CHIP C 0.10UF K                |             | R27       |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| C610     |         |           | CK73GSL1H471J | CHIP C 470PF J                 |             | R31,32    |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W | M2.E2<br>E  |
| C611     |         |           | CK73FB1E104K  | CHIP C 0.10UF K                |             | R33       |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             |
| C612     |         |           | CK73GSL1H471J | CHIP C 470PF J                 |             | R34       |         |           | RK73FB2A473J | CHIP R 47K J 1/10W  |             |
| C613,614 |         |           | CK73GCH1H1000 | 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 |         |           | CK73GCH1H101J | 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 |             |
| 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  |             |
| CN6      |         |           | 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       |         |           | R92-0670-05  | 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  |             |
|          |         |           | 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     |         |           | L40-1001-19   | SMALL FIXED INDUCTOR           |             | R139,140  |         |           | 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 |             |
| L8-10    |         |           | 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       |         | *         | L77-1661-05   | CRYSTAL RESONATOR (4.51MHZ)    |             | R509      |         |           | RK73GB1J334J | CHIP R 330K J 1/16W |             |
| X2       |         | *         | L77-1660-05   | CRYSTAL RESONATOR (11.0592MHZ) |             | R510      |         |           | RK73GB1J223J | CHIP R 22K J 1/16W  |             |
| X501     |         | *         | L77-1679-05   | CRYSTAL RESONATOR (12.268MHZ)  |             | R511      |         |           | RK73GB1J162J | CHIP R 1.6K J 1/16W |             |
|          |         |           |               |                                |             | R512-514  |         |           | RK73GB1J103J | CHIP R 10K J 1/16W  |             |

## 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          |             | Q3.4                                              |         |           | DTC114EK      | DIGITAL TRANSISTOR |             |
| R516      |         |           | RK73GB1J682J    | CHIP R 6.8K J 1/16W          |             | Q5                                                |         |           | DTA143EK      | DIGITAL TRANSISTOR |             |
| R517,518  |         |           | RK73GB1J103J    | CHIP R 10K J 1/16W           |             | Q6                                                |         |           | DTC143EK      | DIGITAL TRANSISTOR |             |
| R519      |         |           | RK73GB1J274J    | CHIP R 27K J 1/16W           |             | Q7                                                |         |           | DTA143EK      | DIGITAL TRANSISTOR |             |
| R520      |         |           | RK73GB1J123J    | CHIP R 12K J 1/16W           |             | Q8                                                |         |           | DTC143TK      | DIGITAL TRANSISTOR |             |
| R521-523  |         |           | RK73GB1J102J    | CHIP R 1.0K J 1/16W          |             | Q9                                                |         |           | DTC143EK      | DIGITAL TRANSISTOR |             |
| R525      |         |           | RK73GB1J100J    | CHIP R 10 J 1/16W            |             | Q10                                               |         |           | DTA143EK      | DIGITAL TRANSISTOR |             |
| R528,529  |         |           | RK73GB1J183J    | CHIP R 18K J 1/16W           |             | Q11,12                                            |         |           | DTC143EK      | DIGITAL TRANSISTOR |             |
| R530,531  |         |           | RK73GB1J103J    | CHIP R 10K J 1/16W           |             | TX-RX UNIT (X57-500X-XX) 0-10: K,M2 2-71: E,E2,E3 |         |           |               |                    |             |
| R532,533  |         |           | RK73GB1J183J    | CHIP R 18K J 1/16W           |             | C1.2                                              |         |           | CK73FB1H103K  | CHIP C 0.010UF K   |             |
| R534      |         |           | RK73GB1J103J    | CHIP R 10K J 1/16W           |             | C3                                                |         |           | CK73FCH1H470J | CHIP C 47PF J      |             |
| R535-537  |         |           | RK73GB1J153J    | CHIP R 15K J 1/16W           |             | C4                                                |         |           | CK73FCH1H070D | CHIP C 7.0PF 0     |             |
| R538      |         |           | RK73GB1J103J    | CHIP R 10K J 1/16W           |             | C5                                                |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z    |             |
| R539,540  |         |           | RK73GB1J472J    | CHIP R 47K J 1/16W           |             | C6                                                |         |           | CK73FCH1H39J  | CHIP C 39PF J      |             |
| R541      |         |           | RK73GB1J223J    | CHIP R 22K J 1/16W           |             | C7                                                |         |           | CK73FB1H182K  | CHIP C 1800PF K    |             |
| R542      |         |           | RK73GB1J101J    | CHIP R 100 J 1/16W           |             | C8                                                |         |           | CK73FF1C105Z  | CHIP C 1.0UF Z     |             |
| 344       |         |           | RK73GB1J561J    | CHIP R 560 J 1/16W           |             | C9                                                |         |           | CK73FB1H103K  | CHIP C 0.010UF Z   |             |
| R545-550  |         |           | R92-0670-05     | CHIP R 0 OHM                 |             | C10                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| R553-555  |         |           | R92-0670-05     | CHIP R 0 OHM                 |             | C11                                               |         |           | CK73FB1H472K  | CHIP C 4700PF K    |             |
| R556      |         |           | RK73GB1J561J    | CHIP R 560 J 1/16W           |             | C12                                               |         |           | CK73FB1H103K  | CHIP C 0.010UF K   |             |
| R557      |         |           | RK73GB1J682J    | CHIP R 6.8K J 1/16W          |             | C13                                               |         |           | CK73FB1H182K  | CHIP C 1800PF K    |             |
| R558      |         |           | RK73GB1J104J    | CHIP R 100K J 1/16W          |             | C14                                               |         |           | CE64EW1E4R7M  | ELECTRO 4.7UF 25WV |             |
| R559-565  |         |           | RK73GB1J223J    | CHIP R 22K J 1/16W           |             | C15                                               |         |           | CK73FB1H103K  | CHIP C 0.010UF K   |             |
| R602-604  |         |           | RK73GB1J472J    | CHIP R 47K J 1/16W           |             | C16                                               |         |           | CK73FB1H222K  | CHIP C 2200PF K    |             |
| R610      |         |           | RK73GB1J473J    | CHIP R 47K J 1/16W           |             | C17                                               |         |           | CK73FB1H472K  | CHIP C 4700PF K    |             |
| R612      |         |           | RK73GB1J101J    | CHIP R 100 J 1/16W           |             | C18                                               |         |           | CK73FB1H222K  | CHIP C 2200PF K    |             |
| R613      |         |           | RK73GB1J473J    | CHIP R 47K J 1/16W           |             | C19                                               |         |           | CK73FB1H103K  | CHIP C 0.010UF K   |             |
| R615      |         |           | RK73GB1J473J    | CHIP R 47K J 1/16W           |             | C20                                               |         |           | CK73FF1C105Z  | CHIP C 1.0UF Z     |             |
| R616      |         |           | RK73GB1J101J    | CHIP R 100 J 1/16W           |             | C21                                               |         |           | CK73FB1H102K  | CHIP C 1000PF K    |             |
| R618-621  |         |           | RK73GB1J101J    | CHIP R 100 J 1/16W           |             | C22,23                                            |         |           | CK73FB1H392K  | CHIP C 3900PF K    |             |
| R623,624  |         |           | RK73GB1J473J    | CHIP R 47K J 1/16W           |             | C24                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| R625      |         |           | RK73GB1J103J    | CHIP R 10K J 1/16W           |             | C25,26                                            |         |           | CK73FB1H102K  | CHIP C 1000PF K    |             |
| R626      |         |           | RK73GB1J104J    | CHIP R 100K J 1/16W          |             | C27                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| D1-4      |         |           | 1S3355          |                              |             | C28                                               |         |           | CK73FB1H561K  | CHIP C 560PF K     |             |
| D5        |         |           | DAN202U         |                              |             | C29,30                                            |         |           | CK73FB1H222K  | CHIP C 2200PF K    |             |
| D6,7      |         |           | 1S3355          |                              |             | C31                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| D8,9      |         |           | 02C28 2(Y)      |                              |             | C32,33                                            |         |           | CK73FB1H102K  | CHIP C 1000PF K    |             |
| 710       |         |           | DAN202U         |                              |             | C34                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| IC1       |         |           | AT24C04AN10S127 | IC (64bit SERIAL EEPROM)     |             | C35                                               |         |           | CK73FSL1H271J | CHIP C 270PF J     |             |
| IC2       |         |           | CAT35C102K1     | IC                           |             | C36,37                                            |         |           | CK73FB1H102K  | CHIP C 1000PF K    |             |
| IC3       |         |           | UPD75004GB-746  | IC (4bit MICROPROCESSOR)     |             | C38                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| IC4       |         |           | PS19121NR       | IC                           |             | C39,40                                            |         |           | CK73FB1H102K  | CHIP C 1000PF K    |             |
| IC5       |         |           | CXD1095Q        | IC                           |             | C41                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| IC6       |         |           | M377108FBJ0F*   | IC (CPU)                     |             | C42,43                                            |         |           | CK73FCH1H100D | CHIP C 10PF D      |             |
| IC7,8     |         |           | TC4052BF        | IC (4CH MPX/DE-MPX)          |             | C44                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| IC9       |         |           | NJM78L05UA      | IC (VOLTAGE REGULATOR (+5V)) |             | C45,46                                            |         |           | CK73FB1H102K  | CHIP C 1000PF K    |             |
| IC10      |         |           | NJM78L06UA      | IC (VOLTAGE REGULATOR (+6V)) |             | C47                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| IC11      |         |           | NJM78L08UA      | IC (VOLTAGE REGULATOR (+8V)) |             | C48                                               |         |           | CK73FSL1H121J | CHIP C 120PF J     |             |
| IC501     |         |           | NJM2100M        | IC (OP AMPLIFIER)            |             | C49,50                                            |         |           | CK73FB1H102K  | CHIP C 1000PF K    |             |
| IC502     |         |           | BU4668BCV       | IC (ANALOG SWITCH X4)        |             | C51                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| IC503     |         |           | NJM2100M        | IC (OP AMPLIFIER)            |             | C52,53                                            |         |           | CK73FB1H102K  | CHIP C 1000PF K    |             |
| IC504     |         |           | AK4506-VS       | IC (AD/DA-CONVERTOR)         |             | C54                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| IC505,506 |         |           | NJM2100M        | IC (OP AMPLIFIER)            |             | C55                                               |         |           | CK73FCH1H820J | CHIP C 82PF J      |             |
| IC507     |         |           | ADSP2161KS-115  | IC                           |             | C56,57                                            |         |           | CK73FB1H102K  | CHIP C 1000PF K    |             |
| IC508     |         |           | TC74HC4040AF    | IC (BINARY COUNTER)          |             | C58                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| IC511     |         |           | TC7504F         | IC (2CH NAND GATE)           |             | C59,60                                            |         |           | CK73FB1H102K  | CHIP C 1000PF K    |             |
| IC512     |         |           | 27C010120JPHB   | IC                           |             | C61                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |
| IC513     |         |           | NJM78L05UA      | IC (VOLTAGE REGULATOR (+5V)) |             | C62,63                                            |         |           | CK73FCH1H040C | CHIP C 4.0PF C     |             |
| Q1.2      |         |           | DTC143EK        | DIGITAL TRANSISTOR           |             | C64                                               |         |           | CK73FE1E104Z  | CHIP C 0.10UF Z    |             |

## PARTS LSIT

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

| Ref. No. | Address | New parts | Parts No.     | Description      | Destination | Ref. No. | Address | New parts | Parts No.     | Description         | Destination |
|----------|---------|-----------|---------------|------------------|-------------|----------|---------|-----------|---------------|---------------------|-------------|
| C65-86   |         |           | CK73FB1H102K  | CHIP C 1000PF K  |             | C165     |         |           | CK73FC1047Z   | CHIP C 0.47UF Z     |             |
| C67      |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z  |             | C166-168 |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| C68      |         |           | CK73FCH1H080J | CHIP C 68PF J    |             | C169     |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C69      |         |           | CK73FB1H391K  | CHIP C 390PF K   |             | C170     |         |           | CK73FB1H471K  | CHIP C 470PF K      |             |
| C70      |         |           | CK73FSL1H151J | CHIP C 150PF J   |             | C171-173 |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C71      |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z  |             | C174     |         |           | CE04EW1A101M  | ELECTRO 100UF 10WV  |             |
| C72-73   |         |           | CK73FB1H102K  | CHIP C 1000PF K  |             | C175-176 |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C74      |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z  |             | C177-178 |         |           | CE04EW1C100M  | ELECTRO 10UF 16WV   |             |
| C75      |         |           | CK73FCH1H030J | CHIP C 33PF J    |             | C179     |         |           | CK73FSL1H121J | CHIP C 120PF J      |             |
| C76-77   |         |           | CK73FSL1H221J | CHIP C 220PF J   |             | C180     |         |           | CK73FCH1H390J | CHIP C 39PF J       |             |
| C78      |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z  |             | C181     |         |           | CK73FE1H473Z  | CHIP C 0.047UF Z    |             |
| C79-80   |         |           | CK73FB1H102K  | CHIP C 1000PF K  |             | C182     |         |           | CK73FB1H100D  | CHIP C 10PF D       |             |
| C81      |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z  |             | C183     |         |           | CK73FB1H471K  | CHIP C 470PF K      |             |
| C89      |         |           | CK73FCH1H020C | CHIP C 2.0PF C   |             | C184-191 |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C90-92   |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z  |             | C192     |         |           | CK73FCH1H010C | CHIP C 1.0PF C      |             |
| C93      |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             | C193     |         |           | CK73FCH1H050C | CHIP C 5.0PF C      |             |
| C94      |         |           | CK73FCH1H060D | CHIP C 6.8PF D   |             | C194     |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| C95      |         |           | CK73FCH1H180J | CHIP C 18PF J    |             | C195     |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C96-98   |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             | C196-197 |         |           | CK73FSL1H080D | CHIP C 8.0PF D      |             |
| C99      |         |           | CK73FCH1H220J | CHIP C 22PF J    |             | C198     |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C100     |         |           | CK73FCH1H010C | CHIP C 1.0PF C   |             | C199     |         |           | CK73FCH1H010C | CHIP C 1.0PF C      |             |
| C101     |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             | C200     |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C102-103 |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z  |             | C201     |         |           | CK73FCH1H200J | CHIP C 20PF J       |             |
| C104     |         |           | CK73FCH1H080J | CHIP C 68PF J    |             | C202     |         |           | CK73FSL1H080D | CHIP C 8.0PF D      |             |
| C105     |         |           | CK73FSL1H151J | CHIP C 150PF J   |             | C203     |         |           | CK73FCH1H060C | CHIP C 0.5PF C      |             |
| C106     |         |           | CK73FCH1H080J | CHIP C 68PF J    |             | C204     |         |           | CK73FSL1H080D | 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     |         |           | CK73FCH1H050C | CHIP C 5.0PF C   |             | C208-213 |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C110     |         |           | CK73FCH1H010C | 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     |         |           | CK73FCH1H100D | CHIP C 10PF D    |             | C218-220 |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C113     |         |           | CK73FCH1H020C | CHIP C 2.0PF C   |             | C221     |         |           | CK73FB1H332K  | CHIP C 3300PF K     |             |
| C114-118 |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             | C222     |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| C119     |         |           | CK73FCH1H020C | CHIP C 2.0PF C   |             | C223     |         |           | CK73FB1E104K  | CHIP C 0.10UF K     |             |
| C120     |         |           | CK73FCH1H150J | CHIP C 15PF J    |             | C224     |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C121     |         |           | CK73FCH1H100D | CHIP C 10PF D    |             | C225     |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z     |             |
| C122     |         |           | CK73FCH1H030C | CHIP C 3.0PF C   |             | C226     |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C123     |         |           | CK73FCH1H101J | 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 1000PF 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     |         |           | CK73FCH1H050C | CHIP C 5.0PF C      |             |
| C137     |         |           | CK73FCH1H100D | 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     |         |           | CK73FCH1H100D | CHIP C 10PF D    |             | C249     |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C143-144 |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             | C250     |         |           | CK73FF1C106Z  | CHIP C 1.0UF Z      |             |
| C145     |         |           | CK73FCH1H100D | CHIP C 10PF D    |             | C251-252 |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |
| C146-148 |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             | C253     |         |           | CE04EW1E4R7M  | ELECTRO 4.7UF 25WV  |             |
| C149     |         |           | CK73FCH1H200J | 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     |         |           | CK73FCH1H270J | CHIP C 27PF J    |             | C258     |         |           | CE04EW1H4R7M  | ELECTRO 4.7UF 50WV  |             |
| C155-156 |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             | C259     |         |           | CE04EW1H2R2M  | ELECTRO 0.22UF 50WV |             |
| C157-158 |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z  |             | C260     |         |           | CE04EW1H100M  | ELECTRO 1.0UF 50WV  |             |
| C162     |         |           | CK73FCH1H100D | CHIP C 10PF D    |             | C261     |         |           | CE04EW1H4R7M  | ELECTRO 4.7UF 50WV  |             |
| C163     |         |           | CK73FF1E104Z  | CHIP C 0.10UF Z  |             | C265-266 |         |           | CK73FCH1H101J | CHIP C 100PF J      |             |
| C164     |         |           | CK73FB1H103K  | CHIP C 0.010UF K |             | C267     |         |           | CK73FB1H103K  | CHIP C 0.010UF K    |             |

## PARTS LIST

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

| Ref. No. | Address | New parts | Parts No.     | Description          | Destination | Ref. No. | Address | New parts | Parts No.     | Description          | Destination |
|----------|---------|-----------|---------------|----------------------|-------------|----------|---------|-----------|---------------|----------------------|-------------|
| C268     |         |           | CE04EW1C470M  | ELECTRO 47UF 16WV    |             | C380     |         |           | OK73FB1H104K  | CHIP C 0.10UF K      |             |
| C269     |         |           | OK73FB1H101J  | CHIP C 100PF J       |             | C391-394 |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             |
| C270     |         |           | OK73FB1H222K  | CHIP C 2200PF K      |             | C397     |         |           | C92-0003-05   | CHIP-TAN 0.47UF 25WV |             |
| C271     |         |           | OK73FB1H332K  | CHIP C 3300PF K      |             | C398     |         |           | OK73FB1E104Z  | CHIP C 0.10UF Z      |             |
| C272     |         |           | CE04EW1C470M  | ELECTRO 47UF 16WV    |             | C399     |         |           | CC73FCH1H470J | CHIP C 47PF J        |             |
| C273     |         |           | CC73FCH1H101J | CHIP C 100PF J       |             | C400     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C274,275 |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C407     |         |           | C92-0004-05   | CHIP-TAN 1.0UF 16WV  |             |
| C276     |         |           | CE04EW1C470M  | ELECTRO 47UF 16WV    |             | C408     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C277     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C409     |         |           | CC73FCH1H100D | CHIP C 10PF D        |             |
| C295     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C410     |         |           | CC73FCH1H020C | CHIP C 2.0PF C       |             |
| C286     |         |           | OK73FB1H222K  | CHIP C 2200PF K      |             | C411     |         |           | CC73FCH1H060D | CHIP C 6.0PF D       |             |
| C287     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C412     |         |           | OK73FB1E104K  | CHIP C 0.10UF K      |             |
| C288     |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             | C413,414 |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C289,290 |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C415,416 |         |           | CC73FCH1H100D | CHIP C 10PF D        |             |
| C291     |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             | C417     |         |           | CE04EW1C330M  | ELECTRO 33UF 16WV    |             |
| C293-295 |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C418     |         |           | OK73FF1C105Z  | CHIP C 1.0UF Z       |             |
| C296     |         |           | CE04EW1C101M  | ELECTRO 100UF 16WV   |             | C419     |         |           | CE04NW1H2R2M  | ELECTRO 2.2UF 50WV   |             |
| C297     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C420,421 |         |           | CE04EW1C220M  | ELECTRO 22UF 16WV    |             |
| C298-302 |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             | C422,423 |         |           | OK73FB1H333K  | CHIP C 0.033UF K     |             |
| C303     |         |           | OK73FB1H122K  | CHIP C 1200PF K      |             | C424     |         |           | OK73FB1E104K  | CHIP C 0.10UF K      |             |
| C304     |         |           | CE04EW1H2R2M  | ELECTRO 0.22UF 50WV  |             | C425-430 |         |           | CC73FSL1H471J | CHIP C 470PF J       |             |
| C305     |         |           | OK73FF1E104Z  | CHIP C 0.10UF Z      |             | C431     |         |           | C92-0004-05   | CHIP-TAN 1.0UF 16WV  |             |
| C307     |         |           | CC73FCH1H101J | CHIP C 100PF J       |             | C450-455 |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             |
| C308,309 |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C459     |         |           | CC73FCH1H080C | CHIP C 4.0PF C       |             |
| C310     |         |           | CC73FCH1H470J | CHIP C 47PF J        |             | C460,461 |         |           | CC73FCH1H220J | CHIP C 22PF J        |             |
| C311     |         |           | CC73FCH1H060J | CHIP C 36PF J        |             | C500     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C312     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C501     |         |           | CC73FCH1H390J | CHIP C 39PF J        |             |
| C313     |         |           | CE04EW1E47M   | ELECTRO 4.7UF 25WV   |             | C502     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C314     |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             | C503     |         |           | CE04EW1C100M  | ELECTRO 10UF 16WV    |             |
| C315     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C504     |         |           | CC73FSL1H151J | CHIP C 150PF J       |             |
| C316     |         |           | OK73FF1E104Z  | CHIP C 0.10UF Z      |             | C505     |         |           | CC73FCH1H390J | CHIP C 39PF J        |             |
| C335,336 |         |           | OK73FF1C105Z  | CHIP C 1.0UF Z       |             | C506     |         |           | CC73FCH1H100D | CHIP C 10PF D        |             |
| C342     |         |           | OK73FB1E104K  | CHIP C 0.10UF K      |             | C507     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C345,346 |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C508     |         |           | CC73FCH1H050C | CHIP C 5.0PF C       |             |
| C349     |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             | C509,510 |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C350,351 |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C511     |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             |
| C352     |         |           | CE04EW1C470M  | ELECTRO 47UF 16WV    |             | C512,513 |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C353     |         |           | OK73FF1E104Z  | CHIP C 0.10UF Z      |             | C514     |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             |
| C354     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C515     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C355     |         |           | CE04EW1C101M  | ELECTRO 100UF 16WV   |             | C516     |         |           | C92-0536-05   | CHIP-TAN 10UF 10WV   |             |
| C356     |         |           | CE04EW1C470M  | ELECTRO 47UF 16WV    |             | C517     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C357     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C518,519 |         |           | CC73FCH1H150J | CHIP C 15PF J        |             |
| C358     |         |           | CE04EW1E47M   | ELECTRO 4.7UF 25WV   |             | C520     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C359     |         |           | CE04EW1C471M  | ELECTRO 470UF 16WV   |             | C521     |         |           | CE04EW1A221M  | ELECTRO 220UF 10WV   |             |
| C360,361 |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             | C522     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C362     |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             | C523     |         |           | OK73FB1H333K  | CHIP C 0.033UF K     |             |
| C364     |         |           | OK73FF1E104Z  | CHIP C 0.10UF Z      |             | C524,525 |         |           | C92-0004-05   | CHIP-TAN 1.0UF 16WV  |             |
| C365     |         |           | CE04EW1C100M  | ELECTRO 10UF 16WV    |             | C526     |         |           | CE04EW1A101M  | ELECTRO 100UF 10WV   |             |
| C366     |         |           | CE04EW1C220M  | ELECTRO 22UF 16WV    |             | C527     |         |           | OK73FB1H103K  | CHIP C 0.010UF K     |             |
| C367     |         |           | OK73FF1E104Z  | CHIP C 0.10UF Z      |             | C529     |         |           | OK73FB1H103K  | 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  | ELECTRO 220UF 10WV   |             |
| C371     |         |           | CC73FCH1H101J | CHIP C 100PF J       |             | C532-534 |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             |
| C372     |         |           | OK73FF1E104Z  | CHIP C 0.10UF Z      |             | C535     |         |           | CC73FCH1H101J | CHIP C 100PF J       |             |
| C377-379 |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             | C536,537 |         |           | CC73FCH1H070D | CHIP C 7.0PF D       |             |
| C380     |         |           | OK73FF1E104Z  | CHIP C 0.10UF Z      |             | C538     |         |           | CC73FCH1H070D | CHIP C 7.0PF D       |             |
| C381,382 |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             | C539     |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             |
| C383,384 |         |           | OK73FB1E104K  | CHIP C 0.10UF K      |             | C540     |         |           | CC73FCH1H120J | CHIP C 12PF J        |             |
| C385     |         |           | OK73FF1E104Z  | CHIP C 0.10UF Z      |             | C541     |         |           | CC73FCH1H180J | CHIP C 18PF J        |             |
| C386-389 |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             | C542     |         |           | OK73FB1H102K  | CHIP C 1000PF K      |             |

## PARTS LSIT

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

| Ref. No. | Address | New parts | Parts No.     | Description | Destination | Ref. No. | Address  | New parts | Parts No.     | Description | Destination |      |
|----------|---------|-----------|---------------|-------------|-------------|----------|----------|-----------|---------------|-------------|-------------|------|
| C543     |         |           | CC73FCH1H010C | CHIP C      | 1.0PF       | C        | C526     |           | CK73FB1H102K  | CHIP C      | 1000PF      | K    |
| C544-548 |         |           | CK73FB1H102K  | CHIP C      | 1000PF      | K        | C629     |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K    |
| C549     |         |           | CC73FCH1H330J | CHIP C      | 33PF        | J        | C630     |           | CC73FCH1H101J | CHIP C      | 100PF       | J    |
| C550     |         |           | CC73FCH1H080D | CHIP C      | 8.0PF       | D        | C531     |           | CC73FCH1H050C | CHIP C      | 5.0PF       | C    |
| C551     |         |           | CC73FCH1H680J | CHIP C      | 68PF        | J        | C632     |           | CC73FCH1H050C | CHIP C      | 0.5PF       | C    |
| C552     |         |           | CK73FF1C105Z  | CHIP C      | 1.0UF       | Z        | C633     |           | CC73FCH1H100D | CHIP C      | 10PF        | D    |
| C553-554 |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C634     |           | CC73FCH1H050C | CHIP C      | 0.5PF       | C    |
| C555-556 |         |           | CC73FCH1H270J | CHIP C      | 27PF        | J        | C635     |           | CC73FCH1H050C | CHIP C      | 5.0PF       | C    |
| C557     |         |           | CC73FCH1H470J | CHIP C      | 47PF        | J        | C537-641 |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K    |
| C558     |         |           | CC73FCH1H270J | CHIP C      | 27PF        | J        | C642     |           | CC73FCH1H101J | CHIP C      | 100PF       | J    |
| C559     |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C643     |           | CC73FSL1H471J | CHIP C      | 470PF       | J    |
| C560-561 |         |           | CC73FCH1H270J | CHIP C      | 27PF        | J        | C644     |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K    |
| C562-563 |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C645     |           | CC73FCH1H101J | CHIP C      | 100PF       | J    |
| C564-565 |         |           | CC73FCH1H270J | CHIP C      | 27PF        | J        | C646-647 |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K    |
| C566-568 |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C648     |           | CC73FCH1H020C | CHIP C      | 2.0PF       | C    |
| C569     |         |           | C92-0007-05   | CHIP-TAN    | 2.2UF       | 20WV     | C649     |           | CC73FCH1H030C | CHIP C      | 3.0PF       | C    |
| C570     |         |           | CK73FB1H102K  | CHIP C      | 1800PF      | K        | C650     |           | CC73FCH1H020C | CHIP C      | 2.0PF       | C    |
| C571     |         |           | CC73FSL1H181J | CHIP C      | 180PF       | J        | C651     |           | CC73FCH1H195C | CHIP C      | 1.5PF       | C    |
| C572     |         |           | CC73FCH1H100D | CHIP C      | 10PF        | D        | C652-653 |           | CC73FCH1H270J | CHIP C      | 27PF        | J    |
| C573     |         |           | CC73FSL1H221J | CHIP C      | 220PF       | J        | C654     |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K    |
| C574     |         |           | CC73FCH1H220J | CHIP C      | 22PF        | J        | C655     |           | C6046W1A221M  | ELECTRO     | 220UF       | 10WV |
| C575     |         |           | CC73FSL1H151J | CHIP C      | 150PF       | J        | C656     |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K    |
| C576-577 |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C657     |           | C6046W1A270M  | ELECTRO     | 47UF        | 16WV |
| C578     |         |           | CK73FF1E104Z  | CHIP C      | 0.10UF      | Z        | C658     |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K    |
| C579     |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C658-660 |           | C92-0004-05   | CHIP-TAN    | 1.0UF       | 16WV |
| C580     |         |           | C92-0516-05   | CHIP-TAN    | 4.7UF       | 16WV     | C661     |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K    |
| C581-585 |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C662     |           | C6046W1A271M  | ELECTRO     | 470UF       | 16WV |
| C586     |         |           | CK73FB1H471K  | CHIP C      | 470PF       | K        | C663     |           | C6046W1A221M  | ELECTRO     | 220UF       | 10WV |
| C587     |         |           | CC73FCH1H220J | CHIP C      | 22PF        | J        | C664     |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K    |
| C588     |         |           | CK73FB1H471K  | CHIP C      | 470PF       | K        | C665     |           | CC73FCH1H470J | CHIP C      | 47PF        | J    |
| C589     |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C666     |           | CC73FCH1H100D | CHIP C      | 10PF        | D    |
| C590-591 |         |           | CC73FCH1H270J | CHIP C      | 27PF        | J        | C667-588 |           | CK73FB1H102K  | CHIP C      | 1000PF      | K    |
| C592-594 |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C669-671 |           | CC73FCH1H120J | CHIP C      | 12PF        | J    |
| C595     |         |           | C92-0007-05   | CHIP-TAN    | 2.2UF       | 20WV     | C672-573 |           | CK73FB1H102K  | CHIP C      | 1000PF      | K    |
| C596     |         |           | CK73FB1H102K  | CHIP C      | 1000PF      | K        | C674     |           | CC73FCH1H050C | CHIP C      | 5.0PF       | C    |
| C597     |         |           | CC73FSL1H181J | CHIP C      | 180PF       | J        | C675     |           | CC73FCH1H270J | CHIP C      | 27PF        | J    |
| C598     |         |           | CC73FCH1H100D | CHIP C      | 10PF        | D        | C677     |           | CC73FCH1H100D | CHIP C      | 10PF        | D    |
| C599     |         |           | CC73FSL1H221J | CHIP C      | 220PF       | J        | C678-579 |           | CK73FB1H102K  | CHIP C      | 1000PF      | K    |
| C600     |         |           | CC73FCH1H220J | CHIP C      | 22PF        | J        | C680-681 |           | CC73FCH1H180J | CHIP C      | 18PF        | J    |
| C601     |         |           | CC73FSL1H151J | CHIP C      | 150PF       | J        | C682     |           | CC73FCH1H120J | CHIP C      | 12PF        | J    |
| C602     |         |           | CK73FF1E104Z  | CHIP C      | 0.10UF      | Z        | C683-684 |           | CK73FB1H102K  | CHIP C      | 1000PF      | K    |
| C603-604 |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C685     |           | CC73FCH1H050C | CHIP C      | 5.0PF       | C    |
| C605     |         |           | CC73FCH1H101J | CHIP C      | 100PF       | J        | C686     |           | CC73FCH1H240J | CHIP C      | 24PF        | J    |
| C606     |         |           | CC73FCH1H330J | CHIP C      | 33PF        | J        | C687     |           | CK73FB1H102K  | CHIP C      | 1000PF      | K    |
| C607     |         |           | CC73FCH1H470J | CHIP C      | 47PF        | J        | C688     |           | CC73FCH1H100D | CHIP C      | 10PF        | D    |
| C608     |         |           | CC73FSL1H151J | CHIP C      | 150PF       | J        | C689     |           | C92-0001-05   | CHIP C      | 0.1UF       | 35WV |
| C609     |         |           | CC73FCH1H680J | CHIP C      | 58PF        | J        | C690     |           | CK73FB1H102K  | CHIP C      | 1000PF      | K    |
| C610     |         |           | CC73FCH1H101J | CHIP C      | 100PF       | J        | C691-692 |           | CC73FCH1H080D | CHIP C      | 8.0PF       | D    |
| C611     |         |           | CC73FCH1H270J | CHIP C      | 27PF        | J        | C693     |           | CC73FCH1H120J | CHIP C      | 12PF        | J    |
| C612     |         |           | CC73FSL1H121J | CHIP C      | 120PF       | J        | C694-695 |           | CK73FB1H102K  | CHIP C      | 1000PF      | K    |
| C613     |         |           | CC73FCH1H020J | CHIP C      | 82PF        | J        | C696     |           | CC73FCH1H100D | CHIP C      | 10PF        | D    |
| C614     |         |           | CC73FCH1H680J | CHIP C      | 58PF        | J        | C697     |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K    |
| C614-617 |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C698-701 |           | CK73FB1H102K  | CHIP C      | 1000PF      | K    |
| C618     |         |           | CK73FF1E104Z  | CHIP C      | 0.10UF      | Z        | C702     |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K    |
| C619-621 |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C703     |           | CC73FCH1H150J | CHIP C      | 15PF        | J    |
| C622     |         |           | CC73FCH1H050C | CHIP C      | 0.5PF       | C        | C704     |           | CC73FCH1H100D | CHIP C      | 10PF        | D    |
| C623     |         |           | CC73FCH1H080D | CHIP C      | 8.0PF       | D        | C705     |           | CC73FCH1H150J | CHIP C      | 15PF        | J    |
| C624     |         |           | CC73FCH1H080D | CHIP C      | 8.0PF       | D        | C706-707 |           | CC73FCH1H010C | CHIP C      | 1.0PF       | C    |
| C625-626 |         |           | CK73FB1H102K  | CHIP C      | 1000PF      | K        | C708-709 |           | CC73FCH1H070D | CHIP C      | 7.0PF       | D    |
| C627     |         |           | CK73FB1H103K  | CHIP C      | 0.010UF     | K        | C710     |           | CC73FCH1H010C | CHIP C      | 1.0PF       | C    |

## PARTS LIST

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

| Ref. No.  | Address | New parts | Parts No.     | Description                    | Destination | Ref. No.  | Address | New parts | Parts No.   | Description                    | Destination |
|-----------|---------|-----------|---------------|--------------------------------|-------------|-----------|---------|-----------|-------------|--------------------------------|-------------|
| C711-714  |         |           | CK73FB1H102K  | CHIP C 1000PF K                |             | CN21      |         |           | E40-3237-05 | PIN CONNECTOR FOR INSIDE (2P)  |             |
| C715      |         |           | CK73FB1H103K  | CHIP C 0.010UF K               |             | CN500     |         |           | E40-5764-05 | PIN CONNECTOR FOR INSIDE (16P) |             |
| C716      |         |           | CK73FSL1H221J | CHIP C 220PF J                 |             | CN501     |         |           | E04-0154-05 | RF COAXIAL CABLE RECEPTACLE    |             |
| C719-722  |         |           | CK73FSL1H221J | CHIP C 220PF J                 |             | CN502     |         |           | E40-3237-05 | PIN CONNECTOR FOR INSIDE (2P)  |             |
| C724      |         |           | CK73FSL1H221J | CHIP C 220PF J                 |             | CN503     |         |           | E04-0154-05 | RF COAXIAL CABLE RECEPTACLE    |             |
| C725      |         |           | CK73FB1H103K  | CHIP C 0.010UF K               |             | J1        |         |           | E06-0752-05 | DIN SOCKET (7P)                |             |
| C755      |         |           | CK73FCH1H030C | CHIP C 3.0PF C                 |             | J2        | *       |           | E56-0408-05 | DIN SOCKET (13P)               |             |
| C756      |         |           | CE04EW1A101M  | ELECTRO 100UF 10WV             |             | J3        |         |           | E11-0414-05 | PHONE JACK (3.5D)              |             |
| C758      |         |           | CK73FB1H102K  | CHIP C 1000PF K                |             | J4        |         |           | E11-0455-05 | PHONE JACK (3.5D)              |             |
| C759      |         |           | CK73F1C105Z   | CHIP C 1.0UF Z                 |             | J5        |         |           | E11-0438-05 | PHONE JACK                     |             |
| C760-761  |         |           | CK73FCH1H055C | CHIP C 0.5PF C                 |             | J900      | *       |           | 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 (LQ2)      |             |
| C764      |         |           | CK73FB1H102K  | CHIP C 1000PF K                |             | W3        | *       |           | E37-0650-05 | LEAD WIRE WITH PLUG (LQ1)      |             |
| C766-768  |         |           | CK73FB1H102K  | CHIP C 1000PF K                |             | W4        | *       |           | E37-0652-15 | LEAD WIRE WITH CONNECTOR (CAR) |             |
| C769-772  |         |           | CK73FSL1H221J | 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      |         |           | CK73FCH1H050C | CHIP C 5.0PF C                 |             | W450      | *       |           | E37-0655-05 | LEAD WIRE WITH CONNECTOR (VOL) |             |
| C775      |         |           | CK73FCH1H030U | CHIP C 33PF J                  |             | A500-501  |         |           | F10-2062-04 | SHIELDING CASE (JDS1)          |             |
| C776      |         |           | CK73FCH1H080U | CHIP C 88PF J                  |             | A502      |         |           | F10-2062-04 | SHIELDING CASE (VCC2)          |             |
| C777      |         |           | CK73FCH1H202J | CHIP C 2000PF J                |             | A503      |         |           | F11-1086-14 | SHIELDING COVER (VCC2)         |             |
| C778-785  |         |           | CK73FCH1H470J | CHIP C 47PF J                  |             | A505      | *       |           | F10-2203-04 | SHIELDING CASE (VCC1)          |             |
| C786      |         |           | CK73FCH1H150J | CHIP C 15PF J                  |             | A506      | *       |           | F10-2208-04 | SHIELDING COVER (VCC1)         |             |
| C787-788  |         |           | CK73FB1E104K  | CHIP C 0.10UF K                |             | F1        | 1C      |           | F53-0055-05 | FUSE (0.8A)                    |             |
| C800      |         |           | CK73FB1H103K  | CHIP C 0.010UF K               |             | A504      | *       |           | G13-1549-04 | CUSHION (VCC2)                 |             |
| C801      |         |           | CK73FCH1H070D | CHIP C 7.0PF D                 |             | A507      | *       |           | G13-1550-04 | CUSHION (VCC1)                 |             |
| C802-803  |         |           | CK73FB1H103K  | CHIP C 0.010UF K               |             | -         |         |           | J30-0545-05 | SPACER (X1)                    |             |
| C804      |         |           | C92-0003-05   | CHIP-TAN 0.47UF 25WV           |             | -         |         |           | J30-0564-05 | SPACER (X2)                    |             |
| C805-807  |         |           | CK73FB1H103K  | CHIP C 0.010UF K               |             | -         |         |           | J37-0781-04 | BOSS                           |             |
| C808      |         |           | C92-0003-05   | CHIP-TAN 0.47UF 25WV           |             | CD1       |         |           | L79-1013-05 | TUNING COIL (455KHZ)           |             |
| C809      |         |           | CK73FB1H103K  | CHIP C 0.010UF K               |             | CF1       |         |           | L72-0372-05 | CERAMIC FILTER (455KHZ)        |             |
| C810      |         |           | CK73FB1H102K  | CHIP C 1000PF K                |             | CF500-501 |         |           | L72-0351-05 | CERAMIC FILTER (8.00KMHZ)      |             |
| C811      |         |           | CK73FCH1H100D | CHIP C 10PF D                  |             | L1        |         |           | L40-2215-48 | SMALL FIXED INDUCTOR (220UH)   |             |
| C812      |         |           | CK73FB1H103K  | CHIP C 0.010UF K               |             | L2        | *       |           | L40-6891-15 | SMALL FIXED INDUCTOR           | E.E2.E3     |
| C813-815  |         |           | CK73FB1H103K  | CHIP C 0.010UF K               |             | L3        | *       |           | L40-3991-15 | SMALL FIXED INDUCTOR           | E.E2.E3     |
| C816      |         |           | C92-0004-05   | CHIP-TAN 1.0UF 16WV            |             | L4        |         |           | L40-2785-48 | SMALL FIXED INDUCTOR (270NH)   |             |
| C817      |         |           | CE04EW1A101M  | ELECTRO 100UF 10WV             |             | L5        |         |           | L33-0695-05 | CHOKE COIL (1MH)               |             |
| C818-819  |         |           | CK73FCH1H470J | CHIP C 47PF J                  |             | L6        |         |           | L40-4735-48 | SMALL FIXED INDUCTOR (4.7UH)   |             |
| C820-903  |         |           | CK73F1C105Z   | CHIP C 1.0UF Z                 |             | L7,8      |         |           | L33-0695-05 | CHOKE COIL (1MH)               |             |
| C804      |         |           | CK73FB1H103K  | CHIP C 0.010UF K               |             | L9-11     |         |           | L40-6891-14 | SMALL FIXED INDUCTOR           |             |
| C905      |         |           | CE04NW1C470M  | ELECTRO 47UF 16WV              |             | L12,13    |         |           | L40-1892-14 | SMALL FIXED INDUCTOR           |             |
| C906-913  |         |           | CK73FB1H102K  | CHIP C 1000PF K                |             | L14       |         |           | L40-5691-14 | SMALL FIXED INDUCTOR           |             |
| TC1.2     |         |           | C05-0344-05   | TRIMMER CAPACITOR (30PF)       | E.E2.E3     | L15,16    |         |           | L40-1282-14 | SMALL FIXED INDUCTOR           |             |
| TC500     |         |           | C05-0344-05   | TRIMMER CAPACITOR (30PF)       |             | L17       |         |           | L40-3391-14 | SMALL FIXED INDUCTOR           |             |
| TC502-504 |         |           | C05-0345-05   | TRIMMER CAPACITOR (10PF)       |             | L18,19    |         |           | L40-1092-14 | SMALL FIXED INDUCTOR           |             |
| -         |         |           | E18-0254-05   | SOCKET                         |             | L20-22    |         |           | L34-4767-05 | COIL                           |             |
| CN1.2     |         |           | E04-0154-05   | RF COAXIAL CABLE RECEPTACLE    |             | L23       |         |           | L40-2762-14 | SMALL FIXED INDUCTOR           |             |
| CN3.4     |         |           | E40-0211-05   | PIN CONNECTOR FOR INSIDE (2P)  |             | L24,25    |         |           | L40-3382-14 | SMALL FIXED INDUCTOR           |             |
| CN5       |         |           | E04-0154-05   | RF COAXIAL CABLE RECEPTACLE    |             | L26       |         |           | L40-2292-14 | SMALL FIXED INDUCTOR           |             |
| CN7       |         |           | E04-0154-05   | RF COAXIAL CABLE RECEPTACLE    |             | L27,28    |         |           | L40-2282-14 | SMALL FIXED INDUCTOR           |             |
| CN8.9     |         |           | E40-5059-05   | PIN CONNECTOR FOR INSIDE (5P)  |             | L29-31    |         |           | L34-4769-05 | COIL                           |             |
| CN10      |         |           | E04-0154-05   | RF COAXIAL CABLE RECEPTACLE    |             | L32       |         |           | L40-1292-14 | SMALL FIXED INDUCTOR           |             |
| CN11      |         |           | E40-5764-05   | PIN CONNECTOR FOR INSIDE (16P) |             | L33,34    |         |           | L40-2282-14 | SMALL FIXED INDUCTOR           |             |
| CN12      |         |           | E40-3238-05   | PIN CONNECTOR FOR INSIDE (3P)  |             | L35       |         |           | L40-1292-14 | SMALL FIXED INDUCTOR           |             |
| CN14      |         |           | E40-3238-05   | PIN CONNECTOR FOR INSIDE (3P)  |             | L36,37    |         |           | L40-2282-14 | SMALL FIXED INDUCTOR           |             |
| CN15      |         |           | E40-5764-05   | PIN CONNECTOR FOR INSIDE (16P) |             | L41       |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH)   |             |
| CN16      |         |           | E40-5785-05   | PIN CONNECTOR FOR INSIDE (8P)  |             | L42,43    |         |           | L40-2785-48 | SMALL FIXED INDUCTOR (270NH)   |             |
| CN17      |         |           | E40-5747-05   | PIN ASSY SOCKET (11P)          |             | L44       |         |           | L19-0324-05 | TRIDIAL COIL                   |             |
| CN18      |         |           | E40-5797-05   | PIN CONNECTOR FOR INSIDE (26P) |             |           |         |           |             |                                |             |
| CN19,20   |         |           | E40-5487-05   | PIN CONNECTOR FOR INSIDE (2P)  |             |           |         |           |             |                                |             |

## PARTS LIST

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

| Ref. No. | Address | New parts | Parts No.   | Description                  | Destination | Ref. No.  | Address | New parts | Parts No.    | Description                  | Destination |
|----------|---------|-----------|-------------|------------------------------|-------------|-----------|---------|-----------|--------------|------------------------------|-------------|
| L45      |         |           | L34-4413-05 | COIL                         |             | L520      |         |           | L40-1095-48  | SMALL FIXED INDUCTOR (10UH)  |             |
| L46-48   |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | L521      |         |           | L40-1005-48  | SMALL FIXED INDUCTOR (10UH)  |             |
| L49      |         |           | L40-1085-48 | SMALL FIXED INDUCTOR (100NH) |             | L522      |         |           | L40-1015-48  | SMALL FIXED INDUCTOR (100UH) |             |
| L50-51   |         |           | L34-4408-05 | COIL                         |             | L523,524  |         |           | L40-2205-48  | SMALL FIXED INDUCTOR (2.2UH) |             |
| L52      |         |           | L33-0695-05 | CHOKE COIL (1MH)             |             | L525      | *       |           | L40-3305-48  | SMALL FIXED INDUCTOR (33UH)  |             |
| L53      |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | L526,527  |         |           | L40-1005-48  | SMALL FIXED INDUCTOR (10UH)  |             |
| L54      |         |           | L34-4415-05 | COIL                         |             | L528      |         |           | L40-5695-48  | SMALL FIXED INDUCTOR (5.6UH) |             |
| L55      |         |           | L34-0943-05 | COIL                         |             | L529,530  |         |           | L34-4408-05  | COIL                         |             |
| L56      | *       |           | L34-4467-05 | COIL                         |             | L531      |         |           | L40-1015-48  | SMALL FIXED INDUCTOR (100UH) |             |
| L57      |         |           | L39-1255-05 | TROIDAL COIL                 |             | L532      |         |           | L40-1005-48  | SMALL FIXED INDUCTOR (10UH)  |             |
| L58      |         |           | L40-5695-48 | SMALL FIXED INDUCTOR (5.6UH) |             | L533      |         |           | L34-4408-05  | COIL                         |             |
| L59      |         |           | L40-4705-48 | SMALL FIXED INDUCTOR (47UH)  |             | L534      |         |           | L34-4399-05  | COIL                         |             |
| L60      |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | L535      |         |           | L34-4408-05  | COIL                         |             |
| L61      | *       |           | L34-4465-05 | COIL                         |             | L536      |         |           | L40-3395-48  | SMALL FIXED INDUCTOR (3.3UH) |             |
| L62      |         |           | L40-1005-48 | SMALL FIXED INDUCTOR (10UH)  |             | L537      |         |           | L40-1595-48  | SMALL FIXED INDUCTOR (1.5UH) |             |
| L63      |         |           | L40-3395-48 | SMALL FIXED INDUCTOR (3.3UH) |             | L538      |         |           | L40-2295-48  | SMALL FIXED INDUCTOR (2.2UH) |             |
| L64      |         |           | L19-0324-05 | TROIDAL COIL                 |             | L539      |         |           | L40-1005-48  | SMALL FIXED INDUCTOR (10UH)  |             |
| L65      |         |           | L39-1255-05 | TROIDAL COIL                 |             | L540      |         |           | L40-1015-48  | SMALL FIXED INDUCTOR (100UH) |             |
| L66      |         |           | L19-0324-05 | TROIDAL COIL                 |             | L542      |         |           | L34-4424-05  | COIL                         |             |
| L67      |         |           | L34-4264-05 | COIL                         |             | L543      |         |           | L34-2360-05  | COIL                         |             |
| L68      |         |           | L34-4265-05 | COIL                         |             | L544      |         |           | L34-4424-05  | COIL                         |             |
| L69      |         |           | L34-0943-05 | COIL                         |             | L545      |         |           | L34-2359-05  | COIL                         |             |
| L70      | *       |           | L34-4469-05 | COIL                         |             | L546      |         |           | L34-4424-05  | COIL                         |             |
| L71      | *       |           | L34-4265-05 | COIL                         |             | L547      |         |           | L34-2358-05  | COIL                         |             |
| L72      |         |           | L34-4333-05 | COIL                         |             | L548,549  |         |           | L40-6885-48  | SMALL FIXED INDUCTOR (680NH) |             |
| L73      |         |           | L39-1255-05 | TROIDAL COIL                 |             | L550      |         |           | L40-3365-48  | SMALL FIXED INDUCTOR (330NH) |             |
| L74-76   |         |           | L34-4333-05 | COIL                         |             | L551      |         |           | L40-1005-48  | SMALL FIXED INDUCTOR (100NH) |             |
| L77      |         |           | L19-0324-05 | TROIDAL COIL                 |             | L551      |         |           | L40-4705-48  | SMALL FIXED INDUCTOR (47UH)  |             |
| L78-81   |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | L563      |         |           | L40-2285-48  | SMALL FIXED INDUCTOR (220NH) |             |
| L85      |         |           | L40-1005-48 | SMALL FIXED INDUCTOR (10UH)  |             | L564      |         |           | L40-1011-12  | SMALL FIXED INDUCTOR         |             |
| L86      |         |           | L19-0324-05 | TROIDAL COIL                 |             | L800      |         |           | L40-8285-48  | SMALL FIXED INDUCTOR (820NH) |             |
| L87      |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | L801      |         |           | L40-4705-48  | SMALL FIXED INDUCTOR (47UH)  |             |
| L88      |         |           | L40-1021-13 | SMALL FIXED INDUCTOR         |             | L802      | *       |           | L34-4466-05  | COIL                         |             |
| L89      |         |           | L33-0695-05 | CHOKE COIL (1MH)             |             | L803      | *       |           | L34-4483-05  | COIL                         |             |
| L90      |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | L804      |         |           | L33-0695-05  | CHOKE COIL (1MH)             |             |
| L91      |         |           | L40-1005-48 | SMALL FIXED INDUCTOR (10UH)  |             | L900      |         |           | L40-4705-48  | SMALL FIXED INDUCTOR (47UH)  |             |
| L92      |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | L901-904  |         |           | L40-1015-48  | SMALL FIXED INDUCTOR (100UH) |             |
| L97-100  |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | X1        |         |           | L77-1302-15  | CRYSTAL RESONATOR (8.375MHZ) |             |
| L101     |         |           | L40-1095-48 | SMALL FIXED INDUCTOR (1UH)   |             | X500      |         |           | L77-1521-15  | CRYSTAL RESONATOR (20.0MHZ)  |             |
| L105-106 |         |           | L33-0695-05 | CHOKE COIL (1MH)             |             | XF1       |         |           | L77-0401-05  | MCF (73.05MHZ)               |             |
| L107     |         |           | L40-1001-12 | SMALL FIXED INDUCTOR         |             | XF2       |         |           | L71-0266-05  | MCF (8.83MHZ)                |             |
| L108     |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | XF3       |         |           | L71-0208-15  | CRYSTAL FILTER (8.83MHZ)     |             |
| L109     |         |           | L40-1011-15 | SMALL FIXED INDUCTOR         |             |           |         |           | N30-2604-45  | PAN HEAD MACHIN SCREW        |             |
| L110     |         |           | L40-2285-48 | SMALL FIXED INDUCTOR (220NH) |             |           |         |           | N30-3008-46  | PAN HEAD MACHIN SCREW        |             |
| L111     |         |           | L34-4408-05 | COIL                         |             |           |         |           | N87-2606-46  | PAN HEAD MACHIN SCREW        |             |
| L112     |         |           | L40-1095-48 | SMALL FIXED INDUCTOR (1UH)   |             |           |         |           | R90-0121-05  | MULTI-COMP 4.7K X 16         |             |
| L500     |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | CP500-503 |         |           | RK73EB2950J  | CHIP R 56 J 1/8W             |             |
| L501     |         |           | L40-1005-48 | SMALL FIXED INDUCTOR (10UH)  |             | R1        |         |           | RK73EB2947J  | CHIP R 470 J 1/8W            |             |
| L502     |         |           | L40-4795-48 | SMALL FIXED INDUCTOR (4.7UH) |             | R2        |         |           | RK73FB2A472J | CHIP R 4.7K J 1/10W          |             |
| L503,504 |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | R4        |         |           | RK73FB2A101J | CHIP R 100 J 1/10W           |             |
| L505     |         |           | L40-4705-48 | SMALL FIXED INDUCTOR         |             | R5        |         |           | RK73FB2A222J | CHIP R 2.2K J 1/10W          |             |
| L506     |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | R6        |         |           | RK73FB2A472J | CHIP R 4.7K J 1/10W          |             |
| L507     |         |           | L34-4424-05 | COIL                         |             | R7        |         |           | RK73FB2A181J | CHIP R 180 J 1/10W           |             |
| L508     |         |           | L34-2353-05 | COIL                         |             | R8        |         |           | RK73FB2A471J | CHIP R 470 J 1/10W           |             |
| L509     |         |           | L40-2285-48 | SMALL FIXED INDUCTOR (220NH) |             | R9        |         |           | RK73FB2A50J  | CHIP R 56 J 1/10W            |             |
| L510,511 |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | R11       |         |           | RK73EB29121J | CHIP R 120 J 1/8W            |             |
| L512,513 |         |           | L40-1005-48 | SMALL FIXED INDUCTOR (10UH)  |             | R12       |         |           | RK73FB2A330J | CHIP R 33 J 1/10W            |             |
| L514-516 |         |           | L40-1015-48 | SMALL FIXED INDUCTOR (100UH) |             | R13       |         |           | RK73EB29121J | CHIP R 120 J 1/8W            |             |
| L517,518 |         |           | L40-2205-48 | SMALL FIXED INDUCTOR (22UH)  |             | R14       |         |           | RK73FB2A330J | CHIP R 33 J 1/10W            |             |
| L519     |         |           | L40-1005-48 | SMALL FIXED INDUCTOR (10UH)  |             |           |         |           |              |                              |             |

## PARTS LIST

|          |         |           |              |                     |             | TX-RX UNIT (X57-500X-XX) |         |           |              |                     |             |
|----------|---------|-----------|--------------|---------------------|-------------|--------------------------|---------|-----------|--------------|---------------------|-------------|
| Ref. No. | Address | New parts | Parts No.    | Description         | Destination | Ref. No.                 | Address | New parts | Parts No.    | Description         | Destination |
| R15      |         |           | RK73FB2B121J | 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      |         |           | RK73FB2B121J | CHIP R 120 J 1/8W   |             | R90                      |         |           | RK73FB2A222J | CHIP R 22 J 1/10W   |             |
| R18      |         |           | RK73FB2A330J | CHIP R 33 J 1/10W   |             | R91                      |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             |
| R19      |         |           | RK73FB2B121J | 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      |         |           | RK73FB2B121J | 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      |         |           | RK73FB2B121J | 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      |         |           | RK73FB2B121J | CHIP R 120 J 1/8W   |             | R98                      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| R26      |         |           | RK73FB2A330J | CHIP R 33 J 1/10W   |             | R99                      |         |           | RK73FB2A221J | CHIP R 220 J 1/10W  |             |
| R27      |         |           | RK73FB2B121J | 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      |         |           | RK73FB2B121J | 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 680 J 1/10W  |             | R105                     |         |           | RK73FB2A391J | CHIP R 390 J 1/10W  |             |
| R5       |         |           | RK73FB2A562J | CHIP R 5.6K J 1/10W |             | R106                     |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| R6,37    |         |           | 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                     |         |           | RK73FB2A471J | 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                     |         |           | RK73FB2A223J | 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      |         |           | R92-0670-05  | CHIP R 0 OHM        |             | R127,128                 |         |           | RK73FB2A221J | CHIP R 220 J 1/10W  |             |
| R57,58   |         |           | 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      |         |           | RK73FB2A104J | 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                     |         |           | RK73FB2A333J | CHIP R 36K J 1/10W  |             |
| R72      |         |           | RK73FB2A472J | CHIP R 4.7K J 1/10W |             | R141                     |         |           | RK73FB2A473J | CHIP R 47K J 1/10W  |             |
| R73      |         |           | R92-0670-05  | 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      |         |           | RK73FB2A103J | CHIP R 1.0K J 1/10W |             | R152                     |         |           | RK73FB2A390J | 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  |             |

## PARTS LSIT

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

| Ref. No. | Address | New parts | Parts No.    | Description         | Destination | Ref. No. | Address | New parts | Parts No.    | Description         | Destination |
|----------|---------|-----------|--------------|---------------------|-------------|----------|---------|-----------|--------------|---------------------|-------------|
| R155     |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             | R240     |         |           | R92-0670-05  | 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     |         |           | RK73FB2A272J | CHIP R 2.7K J 1/10W |             |
| R159     |         |           | RK73FB2A330J | CHIP R 33 J 1/10W   |             | R244,245 |         |           | RK73FB2A223J | 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     |         |           | RK73FB2A681J | CHIP R 680 J 1/10W  |             | R248     |         |           | RK73FB2A473J | CHIP R 4.7K J 1/10W |             |
| R162     |         |           | RK73FB2A473J | CHIP R 47K J 1/10W  |             | R249,250 |         |           | RK73FB2A104J | CHIP R 100K J 1/10W |             |
| R163     |         |           | R92-0670-05  | 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     |         |           | RK73FB2A471J | CHIP R 470 J 1/10W  |             |
| R166     |         |           | RK73FB2A680J | 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     |         |           | R92-0670-05  | 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     |         |           | RK73FB2A161J | 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     |         |           | RK73FB2A103J | 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     |         |           | R92-0670-05  | 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  |             | R283,284 |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             |
| R182     |         |           | RK73FB2A682J | CHIP R 6.8K J 1/10W |             | R285,286 |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             |
| R191     |         |           | RK73FB2A222J | CHIP R 2.2K J 1/10W |             | R287     |         |           | RK73FB2A224J | CHIP R 220K J 1/10W |             |
| R192     |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             | R288     |         |           | R92-0670-05  | CHIP R 0 OHM        |             |
| R193     |         |           | RK73FB2A561J | CHIP R 560 J 1/10W  |             | R289     |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| R194     |         |           | RK73FB2A222J | CHIP R 2.2K J 1/10W |             | R290     |         |           | 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     |         |           | RK73FB2A820J | 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     |         |           | R92-0670-05  | 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 |         |           | RK73FB2A221J | 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 330 J 1/10W  |             | R335     |         |           | RK73FB2A473J | CHIP R 47K J 1/10W  |             |
| R215     |         |           | RK73FB2A184J | CHIP R 180K J 1/10W |             | R336     |         |           | RK73FB2A271J | CHIP R 270 J 1/10W  |             |
| R216     |         |           | RK73FB2A393J | CHIP R 39K J 1/10W  |             | R337     |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| R217     |         |           | RK73FB2A104J | CHIP R 100K J 1/10W |             | R338     |         |           | R92-0670-05  | 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     |         |           | RK73FB2A823J | 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 10K J 1/10W  |             |
| R224     |         |           | RK73FB2A104J | CHIP R 100K J 1/10W |             | R345     |         |           | RK73FB2A104J | CHIP R 100K J 1/10W |             |
| R225-229 |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             | R346,347 |         |           | RK73FB2A472J | CHIP R 4.7K J 1/10W |             |
| R230     |         |           | RK73FB2A223J | CHIP R 2.2K J 1/10W |             | R349     |         |           | 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 4.7K 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)

| 1X-RX UNIT (X57-500X-X) |         |           |              |                     |             |          |         |           |              |                     |             |
|-------------------------|---------|-----------|--------------|---------------------|-------------|----------|---------|-----------|--------------|---------------------|-------------|
| Ref. No.                | Address | New parts | Parts No.    | Description         | Destination | Ref. No. | Address | New parts | Parts No.    | Description         | Destination |
| R356-357                |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             | R513     |         |           | RK73FB2A681J | CHIP R 680 J 1/10W  |             |
| R358                    |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             | R514     |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             |
| R359                    |         |           | R92-0670-05  | CHIP R 0 OHM        |             | R515     |         |           | RK73FB2A471J | 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 1.0K 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                    |         |           | RK73FB2A556J | CHIP R 560K J 1/10W |             | R523     |         |           | RK73FB2A822J | CHIP R 8.2K J 1/10W |             |
| R371,372                |         |           | RK73FB2A104J | CHIP R 100K J 1/10W |             | R524     |         |           | RK73FB2A684J | CHIP R 680K 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 33K 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     |         |           | RK73FB2A556J | CHIP R 56K J 1/10W  |             |
| R407                    |         |           | RK73FB2A821J | CHIP R 820 J 1/10W  |             | R538     |         |           | RK73FB2A471J | CHIP R 470 J 1/10W  |             |
| R408                    |         |           | RK73FB2A151J | CHIP R 150 J 1/10W  |             | R539     |         |           | RK73FB2A682J | CHIP R 6.8K 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 33K 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  |             | R544     |         |           | RK73FB2A222J | CHIP R 2.2K J 1/10W |             |
| R415                    |         |           | RK73FB2A472J | CHIP R 4.7K J 1/10W |             | R545,549 |         |           | RK73FB2A556J | CHIP R 56K J 1/10W  |             |
| R416                    |         |           | R92-0670-05  | CHIP R 0 OHM        |             | R550     |         |           | RK73FB2A223J | CHIP R 22K J 1/10W  |             |
| R417                    |         |           | RK73FB2A153J | 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 22K 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     |         |           | R92-0670-05  | CHIP R 0 OHM        |             |
| R429                    |         |           | RK73FB2A273J | CHIP R 27K J 1/10W  |             | R561     |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             |
| R430,431                |         |           | R92-0150-05  | JUMPER RES 0 OHM    |             | R562     |         |           | RK73FB2A332J | CHIP R 3.3K J 1/10W |             |
| R432                    |         |           | RK73FB2A556J | CHIP R 56K 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 22K J 1/10W  |             |
| R435                    |         |           | RK73FB2A556J | 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 680 J 1/10W  |             |
| R450-455                |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             | R568     |         |           | RK73FB2A821J | CHIP R 820 J 1/10W  |             |
| R456-461                |         |           | RK73FB2A331J | CHIP R 33K J 1/10W  |             | R569     |         |           | RK73FB2A680J | CHIP R 680 J 1/10W  |             |
| R500                    |         |           | 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                    |         |           | RK73FB2A222J | CHIP R 2.2K J 1/10W |             | R572     |         |           | RK73FB2A331J | CHIP R 33K J 1/10W  |             |
| R503                    |         |           | RD14CB2C107J | RD 100 J 1/5W       |             | R573,574 |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             |
| R504                    |         |           | RD14CB2C100J | 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 |         |           | RK73FB2A556J | CHIP R 56K 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  |             |

## PARTS LIST

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

| Ref. No.  | Address | New parts | Parts No.    | Description         | Destination | Ref. No.  | Address | New parts | Parts No.    | Description         | Destination |
|-----------|---------|-----------|--------------|---------------------|-------------|-----------|---------|-----------|--------------|---------------------|-------------|
| R683      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             | R653      |         |           | RK73FB2A223J | CHIP R 22K J 1/10W  |             |
| R684      |         |           | RK73FB2A471J | CHIP R 470 J 1/10W  |             | R654      |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             |
| R685      |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             | R655      |         |           | RK73FB2A561J | CHIP R 56K J 1/10W  |             |
| R686      |         |           | RK73FB2A153J | CHIP R 15K J 1/10W  |             | R656, 657 |         |           | RK73FB2A330J | CHIP R 33 J 1/10W   |             |
| R687      |         |           | RK73FB2A221J | CHIP R 22K 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 1.0K J 1/10W |             | R660      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             |
| R690      |         |           | RK73FB2A681J | CHIP R 680 J 1/10W  |             | R661      |         |           | RK73FB2A471J | CHIP R 220 J 1/10W  |             |
| R691      |         |           | R92-0670-05  | CHIP R 0 OHM        |             | R662      |         |           | RK73FB2A471J | CHIP R 470 J 1/10W  |             |
| R692      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             | R663      |         |           | RK73FB2A103J | CHIP R 10 J 1/10W   |             |
| R693      |         |           | RK73FB2A39J  | CHIP R 390 J 1/10W  |             | R664      |         |           | RK73FB2A471J | CHIP R 470 J 1/10W  |             |
| R694      |         |           | RK73FB2A223J | CHIP R 22K J 1/10W  |             | R665      |         |           | RK73FB2A332J | CHIP R 3.3K J 1/10W |             |
| R695      |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             | R666, 667 |         |           | RK73FB2A472J | CHIP R 4.7K J 1/10W |             |
| R696, 587 |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             | R668      |         |           | RK73FB2A470J | CHIP R 47 J 1/10W   |             |
| R698      |         |           | RK73FB2A471J | CHIP R 470 J 1/10W  |             | R669      |         |           | RK73FB2A471J | CHIP R 470 J 1/10W  |             |
| R599      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             | R671      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             |
| R600, 601 |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             | R673-678  |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             |
| R602      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             | R696, 697 |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             |
| R603      |         |           | RK73FB2A471J | CHIP R 470 J 1/10W  |             | R698      |         |           | RK73FB2A152J | CHIP R 1.5K J 1/10W |             |
| R604      |         |           | RK73FB2A333J | CHIP R 33K J 1/10W  |             | R699      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| R605      |         |           | RK73FB2A682J | CHIP R 6.8K J 1/10W |             | R700      |         |           | R92-0670-05  | CHIP R 0 OHM        |             |
| R606      |         |           | RK73FB2A150J | CHIP R 15 J 1/10W   |             | R701      |         |           | RK73FB2A331J | CHIP R 330 J 1/10W  |             |
| R607      |         |           | RK73FB2A221J | CHIP R 22K J 1/10W  |             | R702      |         |           | RK73FB2A180J | CHIP R 18 J 1/10W   |             |
| R608, 609 |         |           | RK73FB2A470J | 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  | CHIP R 0 OHM        |             | R705      |         |           | RK73FB2A330J | CHIP R 33 J 1/10W   |             |
| R614      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             | R706      |         |           | RK73FB2A333J | CHIP R 33K J 1/10W  |             |
| R615      |         |           | RK73FB2A122J | CHIP R 1.2K J 1/10W |             | R707      |         |           | RK73FB2A470J | 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 100 J 1/10W  |             | R709      |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             |
| R618      |         |           | RK73FB2A822J | CHIP R 8.2K J 1/10W |             | R710      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| R619      |         |           | RK73FB2A272J | CHIP R 2.7K J 1/10W |             | R711      |         |           | RK73FB2A471J | 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  |             | R715      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             |
| R622, 623 |         |           | RK73FB2A472J | CHIP R 4.7K J 1/10W |             | R716      |         |           | RK73FB2A682J | CHIP R 6.8K J 1/10W |             |
| R624      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             | R717      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| R625      |         |           | RK73FB2A681J | CHIP R 680 J 1/10W  |             | R718      |         |           | RK73FB2A331J | CHIP R 330 J 1/10W  |             |
| R626      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             | R719      |         |           | RK73FB2A220J | CHIP R 22 J 1/10W   |             |
| R627      |         |           | RK73FB2A153J | CHIP R 15K J 1/10W  |             | R720      |         |           | RK73FB2A683J | CHIP R 68K J 1/10W  |             |
| R628      |         |           | RK73FB2A122J | CHIP R 1.2K J 1/10W |             | R721      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| R629      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             | R722-725  |         |           | RK73FB2A331J | CHIP R 330 J 1/10W  |             |
| R630      |         |           | RK73FB2A683J | CHIP R 68K J 1/10W  |             | R800      |         |           | RK73FB2A221J | CHIP R 220 J 1/10W  |             |
| R631      |         |           | RK73FB2A182J | CHIP R 1.8K J 1/10W |             | R801      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| R632      |         |           | RK73FB2A151J | CHIP R 15K J 1/10W  |             | R802      |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             |
| R633      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             | R803      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| R634      |         |           | RK73FB2A271J | CHIP R 27K J 1/10W  |             | R804      |         |           | R92-0670-05  | CHIP R 0 OHM        |             |
| R639      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             | R805      |         |           | RK73FB2A223J | CHIP R 22K J 1/10W  |             |
| R640      |         |           | RK73FB2A472J | CHIP R 4.7K J 1/10W |             | R806      |         |           | RK73FB2A333J | CHIP R 33K J 1/10W  |             |
| R641      |         |           | RK73FB2A271J | CHIP R 27K J 1/10W  |             | R807      |         |           | RK73FB2A683J | CHIP R 68K J 1/10W  |             |
| R642      |         |           | RK73FB2A332J | CHIP R 3.3K J 1/10W |             | R808, 809 |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             |
| R643      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             | R810      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| R644      |         |           | RK73FB2A682J | CHIP R 6.8K J 1/10W |             | R811      |         |           | RK73FB2A152J | CHIP R 1.5K J 1/10W |             |
| R645      |         |           | RK73FB2A271J | CHIP R 27K J 1/10W  |             | R812      |         |           | RK73FB2A333J | CHIP R 33K J 1/10W  |             |
| R646      |         |           | RK73FB2A332J | CHIP R 3.3K J 1/10W |             | R813      |         |           | RK73FB2A221J | CHIP R 220 J 1/10W  |             |
| R647      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             | R814      |         |           | RK73FB2A103J | CHIP R 10K J 1/10W  |             |
| R648      |         |           | RK73FB2A682J | CHIP R 6.8K J 1/10W |             | R815      |         |           | RK73FB2A102J | CHIP R 1.0K J 1/10W |             |
| R649      |         |           | RK73FB2A271J | CHIP R 27K J 1/10W  |             | R816      |         |           | RK73FB2A563J | CHIP R 56K J 1/10W  |             |
| R650      |         |           | RK73FB2A332J | CHIP R 3.3K J 1/10W |             | R817      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             |
| R651      |         |           | RK73FB2A101J | CHIP R 100 J 1/10W  |             | R818      |         |           | RK73FB2A681J | CHIP R 68K J 1/10W  |             |
| R652      |         |           | RK73FB2A471J | CHIP R 470 J 1/10W  |             | R819      |         |           | RK73FB2A682J | CHIP R 6.8K J 1/10W |             |

## PARTS LIST

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

| Ref. No.  | Address | New parts | Parts No.   | Description       | Destination | Ref. No.   | Address | New parts | Parts No.   | Description                    | Destination |
|-----------|---------|-----------|-------------|-------------------|-------------|------------|---------|-----------|-------------|--------------------------------|-------------|
| VR1       |         |           | R12-8711-05 | VARIABLE R 4.7K   |             | D64        |         |           | 02C26-2(Y)  | DIODE                          |             |
| VR2       |         |           | R12-8707-05 | VARIABLE R 1.0K   |             | D68        |         |           | LF801       | DIODE                          |             |
| VR3       |         |           | R12-8717-05 | VARIABLE R 47K    |             | D69        |         |           | R8751H      | DIODE                          |             |
| VR4.5     |         |           | R12-8713-05 | VARIABLE R 10K    |             | D71        |         |           | R8751H      | DIODE                          |             |
| VR8       |         |           | R12-8740-05 | VARIABLE R 10K    |             | D73        |         |           | 02C23-3(Z)  | ZENER                          |             |
| VR9       |         |           | R12-8703-05 | VARIABLE R 220    |             | D74        |         |           | 02C24-7(Y)  | ZENER                          |             |
| VR450     |         | *         | R31-0615-05 | VARIABLE R        |             | D75        |         |           | MA110       | DIODE (or 1SS355)              |             |
| VR451.452 |         | *         | R31-0612-05 | VARIABLE R        |             | D76        |         |           | 1SS225      | DIODE                          |             |
| K1        |         |           | SS1-1428-05 | RELAY             |             | D77        |         |           | 02C26-2(Y)  | ZENER                          |             |
| K2        |         |           | SS1-1420-05 | RELAY             |             | D82        |         |           | LF801       | DIODE                          |             |
| D1        |         |           | LF801       | DIODE             |             | D85        |         |           | MA110       | DIODE (or 1SS355)              |             |
| D2        |         |           | RLS245      | DIODE             |             | D89-92     |         |           | MA110       | DIODE (or 1SS355)              |             |
| D3.4      |         |           | V08(G)      | DIODE             |             | D95        |         |           | MA110       | DIODE (or 1SS355)              |             |
| D5        |         |           | RLS245      | DIODE             |             | D96        |         |           | 02C25-1(Y)  | ZENER                          |             |
| D6-8      |         |           | RN731H      | DIODE             |             | D97        |         |           | DAP236K     | DIODE                          |             |
| D9        |         |           | LF801       | DIODE             |             | D98        |         |           | DAN202K     | DIODE                          |             |
| D10       |         |           | RN731H      | DIODE             |             | D99-100    | *       |           | 02C24-7(Y)  | ZENER                          |             |
| D11       |         |           | LF801       | DIODE             |             | D101, 102  |         |           | MA110       | DIODE (or 1SS355)              |             |
| D12       |         |           | RN731H      | DIODE             |             | D103, 104  |         |           | LF801       | DIODE                          |             |
| D13       |         |           | LF801       | DIODE             |             | D500, 501  |         |           | 1SV269      | VARIABLE CAP                   |             |
| D14       |         |           | RN731H      | DIODE             |             | D502       |         |           | RLS135      | DIODE                          |             |
| D15       |         |           | LF801       | DIODE             |             | D503       |         |           | 1SV269      | VARIABLE CAP                   |             |
| D16       |         |           | RN731H      | DIODE             |             | D504       |         |           | RLS135      | DIODE                          |             |
| D17       |         |           | LF801       | DIODE             |             | D505       |         |           | 1SV269      | VARIABLE CAP                   |             |
| D18       |         |           | RN731H      | DIODE             |             | D506       |         |           | RLS135      | DIODE                          |             |
| D19       |         |           | LF801       | DIODE             |             | D507       |         |           | DAP202K     | DIODE                          |             |
| D20       |         |           | RN731H      | DIODE             |             | D508, 509  |         |           | MA110       | DIODE (or 1SS355)              |             |
| D21       |         |           | LF801       | DIODE             |             | D800       |         |           | MA716       | DIODE                          |             |
| D22       |         |           | RN731H      | DIODE             |             | IC1        |         |           | NJM2904M    | IC (OP AMP X2)                 |             |
| D23       |         |           | LF801       | DIODE             |             | IC2        |         |           | UPC1037GR   | IC (BALANCED MODULATOR)        |             |
| D24       |         |           | RN731H      | DIODE             |             | IC3        |         |           | BU2090FS    | IC (SHIFT/STORE REGISTER)      |             |
| D25       |         |           | LF801       | DIODE             |             | IC4        |         |           | BU4066BCFV  | IC (ANALOG SWITCH X4)          |             |
| D26       |         |           | RN731H      | DIODE             |             | IC5        |         |           | NJM2902M    | IC (OP AMP X4)                 |             |
| D27       |         |           | LF801       | DIODE             |             | IC6        |         |           | MS2363FP    | IC (8bit D/A CONVERTER)        |             |
| D30       |         |           | LF801       | DIODE             |             | IC7        |         |           | KCD10       | HIC                            |             |
| D31       |         |           | MA110       | DIODE (or 1SS355) |             | IC8        |         |           | LA4446      | IC (AF POWER AMPL)             |             |
| D32       |         |           | LF801       | DIODE             |             | IC9        |         |           | BU4066BCFV  | IC (ANALOG SWITCH X4)          |             |
| D33       |         |           | DAP236K     | DIODE             |             | IC11       |         |           | TC9174F     | IC (CMOS I/O EXTENSION)        |             |
| D34       |         |           | 1SS312      | DIODE             |             | IC12       |         |           | BU4066BCFV  | IC (ANALOG SWITCH X4)          |             |
| D35-37    |         |           | DAP236K     | DIODE             |             | IC13       |         |           | NJM2904M    | IC (OP AMP X2)                 |             |
| D38, 39   |         |           | LF801       | DIODE             |             | IC14       |         |           | NJU0719G    | IC (20BIT SERIAL-PARA CHANGER) |             |
| D40       |         |           | DAP236K     | DIODE             |             | IC15       | *       |           | KCD11       | HIC                            |             |
| D41       |         |           | 1SS312      | DIODE             |             | IC16       | *       |           | KCD11       | HIC                            |             |
| D42       |         |           | DAP236K     | DIODE             |             | IC17       |         |           | TC7S08F     | IC (2CH AND GATE)              |             |
| D43       |         |           | RN731H      | DIODE             |             | IC500      |         |           | MB86001PF   | IC (PLL FREQUENCY SYNTHESIZER) |             |
| D44       |         |           | 1SS312      | DIODE             |             | IC501, 502 |         |           | F71022      | IC (DDS)                       |             |
| D45       |         |           | LF801       | DIODE             |             | IC503, 504 |         |           | UPC1037GR   | IC (BALANCED MODULATOR)        |             |
| D46, 47   |         |           | DAP236K     | DIODE             |             | IC505      |         |           | UPC1886G    | IC (MX)                        |             |
| D48-50    |         |           | MA110       | DIODE (or 1SS355) |             | IC506      |         |           | SN76514N    | IC (MIXER)                     |             |
| D51       |         |           | LF801       | DIODE             |             | IC507      |         |           | MB86001PF   | IC (PLL FREQUENCY SYNTHESIZER) |             |
| D52       |         |           | RN731H      | DIODE             |             | IC508      |         |           | BU4566      | IC (ANALOG SWITCH)             |             |
| D53, 54   |         |           | DAP236K     | DIODE             |             | IC510      |         |           | TC7S08F     | IC (2CH AND GATE)              |             |
| D55       |         |           | LF801       | DIODE             |             | IC511      |         |           | NJM78L08UA  | IC (VOLTAGE REGULATOR +RV)     |             |
| D56       |         |           | RN739D      | DIODE             |             | IC900      |         |           | ADM232LAR   | IC (RS-232C DRIVERS/RECEIVERS) |             |
| D57       |         |           | B30-2001-05 | LED               |             | Q1         |         |           | DTA124EK    | DIGITAL TRANSISTOR             |             |
| D58       |         |           | MA110       | DIODE (or 1SS355) |             | Q2         |         |           | 2SD175(KIS) | TRANSISTOR                     |             |
| D61       |         |           | LF801       | DIODE             |             | Q3         |         |           | 2SB1180(LR) | TRANSISTOR                     |             |
| D62       |         |           | R8751H      | DIODE             |             | Q4         |         |           | DTA143TK    | DIGITAL TRANSISTOR             |             |
| D63       |         |           | 1SS225      | DIODE             |             | Q5-8       |         |           | 2SK520K441  | PET                            |             |
|           |         |           |             |                   |             | Q9         |         |           | RU201       | TRANSISTOR                     |             |

## PARTS LSIT

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

| Ref. No. | Address | New parts | Parts No.    | Description        | Destination | Ref. No. | Address | New parts | Parts No.     | Description        | Destination |
|----------|---------|-----------|--------------|--------------------|-------------|----------|---------|-----------|---------------|--------------------|-------------|
| Q10      |         |           | 2SK520(K43)  | FET                |             | Q543     |         |           | 2SC2714(Y)    | TRANSISTOR         |             |
| Q11,12   |         |           | 3SK131(M)    | FET                |             | Q544     |         |           | 2SC2412(K)    | TRANSISTOR         |             |
| Q13      |         |           | 2SK520(K43)  | FET                |             | Q545,546 |         |           | 2SC2714(Y)    | TRANSISTOR         |             |
| Q14,15   |         |           | 2SC2412(K)   | TRANSISTOR         |             | Q600     |         |           | 2SC2714(Y)    | TRANSISTOR         |             |
| Q16      |         |           | 2SC3357      | TRANSISTOR         |             | Q801     |         |           | DTC114EK      | DIGITAL TRANSISTOR |             |
| Q17,18   |         |           | 2SK520(K44)  | FET                |             | Q802     |         |           | 2SC2714(Y)    | TRANSISTOR         |             |
| Q20      |         |           | DTA124EK     | DIGITAL TRANSISTOR |             | Q803     |         |           | 2SC2412(K)    | TRANSISTOR         |             |
| Q21,22   |         |           | 2SC2412(K)   | TRANSISTOR         |             | Q804     |         |           | 2SC2714(Y)    | TRANSISTOR         |             |
| Q24      |         |           | FM2          | TRANSISTOR         |             | Q805     |         |           | 2SC2412(K)    | TRANSISTOR         |             |
| Q25      |         |           | 3SK131(M)    | FET                |             | Q806     |         |           | 2SC2714(Y)    | TRANSISTOR         |             |
| Q26      |         |           | DTA143EK     | DIGITAL TRANSISTOR |             | Q807     |         |           | DTA114EK      | DIGITAL TRANSISTOR |             |
| Q27      |         |           | 3SK131(M)    | FET                |             | TH1      |         |           | 157-502-53002 | THERMISTOR (5K)    |             |
| Q28      |         |           | 3SK184(R)    | FET                |             | TH2      |         |           | 157-501-53009 | THERMISTOR (500)   |             |
| Q28,30   |         |           | 3SK131(M)    | FET                |             | TH3      |         |           | 157-302-53008 | THERMISTOR (3K)    |             |
| Q31      |         |           | 3SK184(R)    | FET                |             | TH4      |         |           | 157-102-53003 | THERMISTOR (1K)    |             |
| Q35      |         |           | 2SC2954      | TRANSISTOR         |             | TH5      |         |           | 157-502-53002 | THERMISTOR (5K)    |             |
| Q36      |         |           | 2SC2412(K)   | TRANSISTOR         |             | TH6      |         |           | 157-102-53003 | THERMISTOR (1K)    |             |
| Q37      |         |           | DTC114EK     | DIGITAL TRANSISTOR |             | TH7      |         |           | 157-103-55001 | THERMISTOR (10K)   |             |
| Q38      |         |           | 2SC2412(K)   | TRANSISTOR         |             | TH8      |         |           | 157-102-53003 | THERMISTOR (1K)    |             |
| Q39      |         |           | 2SA1037(K)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q40,41   |         |           | 2SC2412(K)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q42      |         |           | 2SB1188(Q,R) | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q49      |         |           | 2SD1824(S)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q50      |         |           | DTC114EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q51      |         |           | DTC143TK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q52      |         |           | DTC124EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q57      |         |           | DTC114EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q59      |         |           | FMA5         | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q61      |         |           | FMA5         | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q64      |         |           | 2SC2412(K)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q65-67   |         |           | DTC114EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q68,69   |         |           | 2SB1188(Q,R) | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q70      |         |           | DTC114EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q71      |         |           | DTC143EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q72      |         |           | FMG3A        | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q73      |         |           | DTA143EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q75-79   |         |           | DTC114EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q80      |         |           | DTC124EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q81      |         |           | DTC114EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q500-503 |         |           | 2SC2714(Y)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q504     |         |           | 2SC2412(K)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q505-507 |         |           | 2SC3722(K)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q508     |         |           | DTC143TK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q509     |         |           | 2SK1875(V)   | FET                |             |          |         |           |               |                    |             |
| Q510,511 |         |           | 2SC2714(Y)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q512     |         |           | 2SC2412(K)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q513     |         |           | 2SC2712(G)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q514-517 |         |           | 2SC2412(K)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q518     |         |           | 2SC2712(G)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q519,520 |         |           | 2SC2412(K)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q521,522 |         |           | 2SC2714(Y)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q523     |         |           | 2SC2412(K)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q524-526 |         |           | 2SC3722(K)   | TRANSISTOR         |             |          |         |           |               |                    |             |
| Q527     |         |           | DTC114EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q528     |         |           | 2SK1875(V)   | FET                |             |          |         |           |               |                    |             |
| Q529     |         |           | DTC114EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q530     |         |           | 2SK1875(V)   | FET                |             |          |         |           |               |                    |             |
| Q531     |         |           | DTC114EK     | DIGITAL TRANSISTOR |             |          |         |           |               |                    |             |
| Q532     |         |           | 2SK1875(V)   | FET                |             |          |         |           |               |                    |             |
| Q533-535 |         |           | 2SC2714(Y)   | TRANSISTOR         |             |          |         |           |               |                    |             |

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

|        |  |   |              |                          |         |      |       |
|--------|--|---|--------------|--------------------------|---------|------|-------|
| C1     |  |   | CK73FB1H103K | CHIP C                   | 0.010UF | K    |       |
| C2-10  |  |   | CK73FB1H102K | CHIP C                   | 1000PF  | K    |       |
| C11    |  |   | CK73FE1E104Z | CHIP C                   | 0.10UF  | Z    |       |
| C12-21 |  |   | CK73FB1H103K | CHIP C                   | 0.010UF | K    |       |
| C22    |  | * | C92-0672-05  | CHIP TAN                 | 22UF    | 16WV |       |
| C23-26 |  |   | CK73FB1H103K | CHIP C                   | 0.010UF | K    |       |
| C27    |  |   | CC73FL1H881J | CHIP C                   | 680PF   | J    |       |
| C28-40 |  |   | CK73FB1HXXXJ | CHIP C                   |         |      |       |
| C41    |  | * | C92-0677-05  | CHIP TAN                 | 22UF    | 25WV |       |
| C42    |  |   | CK73FB1H103K | CHIP C                   | 0.010UF | K    |       |
| C43    |  |   | CK73FB1H223K | CHIP C                   | 0.022UF | K    |       |
| CN1    |  | * | E40-5880-08  | CONNECTOR (26P)          |         |      |       |
| CN2    |  |   | E40-3247-05  | CONNECTOR (3P)           |         |      |       |
| CN3    |  | * | E29-1161-08  | RUBBER CONNECTOR         |         |      |       |
| CN4,5  |  | * | E29-1162-08  | RUBBER CONNECTOR         |         |      |       |
| JI     |  |   | E06-0858-15  | MIC CONNECTOR (8P)       |         |      |       |
| L1     |  |   | L40-1292-18  |                          |         |      |       |
| R1-37  |  |   | RK73F82AXXXJ | CHIP R                   |         |      |       |
| R38,39 |  |   | R92-0699-05  | CHIP R                   | 10      | J    | 1/2W  |
| R40    |  |   | RK73F82A100J | CHIP R                   | 10      | J    | 1/10W |
| R41    |  |   | RK73F82A182J | CHIP R                   | 1.8K    | J    | 1/10W |
| SW3-50 |  |   | S70-0447-05  | TACT SWITCH              |         |      |       |
| D1-15  |  |   | 1SS355       | DIODE                    |         |      |       |
| IC1    |  |   | MSM5285GS-BK | IC (LCD DRIVER)          |         |      |       |
| IC2    |  |   | NJUB4328FE1  | IC                       |         |      |       |
| IC3    |  |   | NJUB3715G    | IC (SER PARA CHANGEOVER) |         |      |       |
| LCD1   |  | * | B38-0779-08  | LCD ELEMENT              |         |      |       |
| PL1-6  |  | * | B30-2163-08  | LAMP                     |         |      |       |
| Q1     |  |   | ZSA1641(S,T) | TRANSISTOR               |         |      |       |
| Q2     |  |   | ZSC2712(Y)   | TRANSISTOR               |         |      |       |
| Q3     |  |   | ZSA1162(Y)   | TRANSISTOR               |         |      |       |
| Q4-6   |  | * | DTC123EK     | TRANSISTOR               |         |      |       |
| Q7     |  |   | DTC144EK     | TRANSISTOR               |         |      |       |
| SW1    |  | * | W02-1901-05  | ENCODER (MULTI-CH)       |         |      |       |
| SW2    |  | * | W02-1902-05  | ENCODER (RIT/XIT)        |         |      |       |

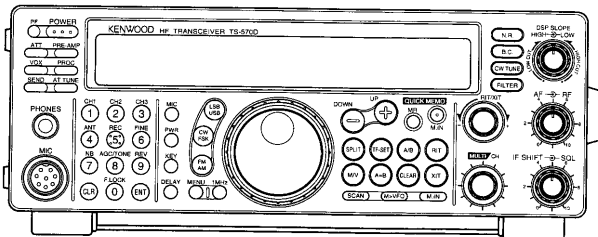
## ADJUSTMENT

### Preparation

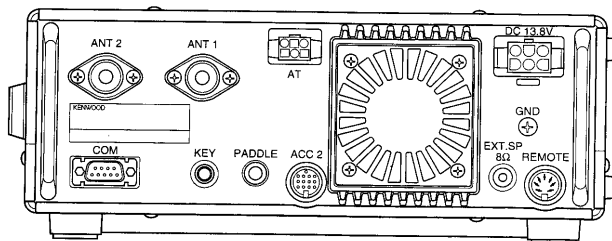
Unless otherwise specified, knobs and switches should be set as follows.

|             |      |                 |        |             |     |
|-------------|------|-----------------|--------|-------------|-----|
| 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



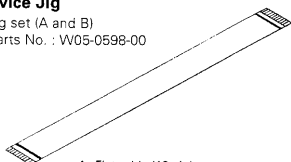
### Rear Panel



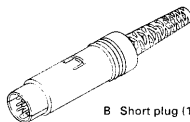
## ADJUSTMENT

### Service Jig

Jig set (A and B)  
Parts No. : W05-0598-00

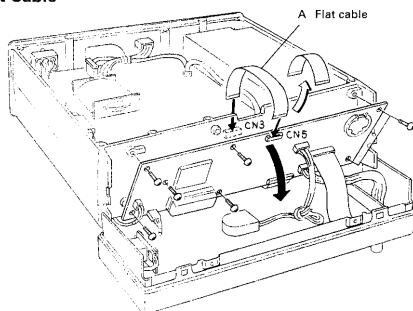


A Flat cable (16 pin)  
(E37-0572-05)  
About 17cm

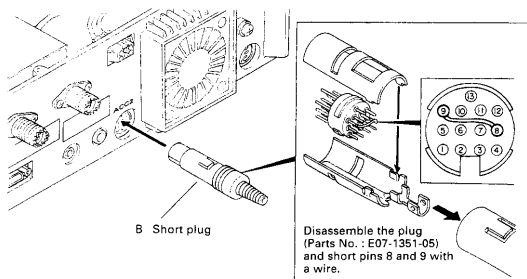


B Short plug (13 pin)

### 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.] 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.)

## 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.

## 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)                         |
| 24       |                         | 3.5MHz band (100W) (3.5MHz USB)                           |
| 25       |                         | 7MHz band (100W) (7.0MHz USB)                             |
| 26       |                         | 10MHz band (100W) (10.1MHz USB)                           |
| 27       |                         | 14MHz band (100W) (14.2MHz USB)                           |
| 28       |                         | 18MHz band (100W) (18.068MHz USB)                         |
| 29       |                         | 21MHz band (100W) (21.0MHz USB)                           |
| 30       |                         | 25MHz band (100W) (24.89MHz USB)                          |
| 31       |                         | 28MHz band (100W) (29.69MHz USB)                          |

## 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)                          |
| 40       |                                | AM (14.2MHz AM)                          |
| 41       | FM maximum deviation           | (29.69MHz FM)                            |
| 42       | SSB CAR shift compensation     | USB (14.2MHz USB)                        |
| 43       |                                | LSB (14.2MHz LSB)                        |
| 44       | SSB CAR suppression            | USB (14.2MHz USB)                        |
| 45       |                                | LSB (14.2MHz LSB)                        |
| 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<br>Pushing [A=B] key down,<br>[POWER] : ON |                       |      |          | Front panel | LCD   | After displaying "HELLO", the display is reset as follows;<br>DISP f. : 14.000.00<br>MODE : USB<br>ANT : 1<br>METER : ALC<br>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.                                     |

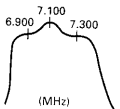
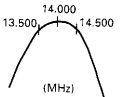
## PLL Section

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

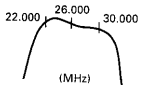
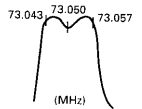
## ADJUSTMENT

| Item                  | Condition                                                                               | Measurement    |             |          | Adjustment  |             |        | Specifications/Remarks |
|-----------------------|-----------------------------------------------------------------------------------------|----------------|-------------|----------|-------------|-------------|--------|------------------------|
|                       |                                                                                         | Test-equipment | Unit        | Terminal | Unit        | Parts       | Method |                        |
| 4. Lock voltage VCO1A | 1) Display f.: 30kHz<br>MODE : AM                                                       | DC V.M         | TX-RX (PLL) | TP501    | TX-RX (PLL) | TC502       | 2.0V   | $\pm 0.05V$            |
|                       | 2) Display f.: 10.980MHz                                                                |                |             |          |             |             | Check  | 6.5V or less           |
| 5. Lock voltage VCO1B | 1) Display f.: 10.990MHz<br>MODE : AM                                                   |                |             |          |             | TX-RX (PLL) | TC503  | $\pm 0.05V$            |
|                       | 2) Display f.: 23.980MHz                                                                |                |             |          |             |             | Check  | 6.5V or less           |
| 6. Lock voltage VCO1C | 1) Display f.: 23.990MHz<br>MODE : AM                                                   |                |             |          |             | TX-RX (PLL) | TC504  | $\pm 0.05V$            |
|                       | 2) Display f.: 29.990MHz                                                                |                |             |          |             |             | Check  | 6.5V or less           |
| 7. LO2 VCO2 voltage   | 1) Display f.: 14.100MHz<br>MODE : AM                                                   |                |             | TP504    |             |             | Check  | 3.0~6.0V               |
| 8. LO1 level          | 1) Display f.: 14.100MHz<br>MODE : AM<br>Measurement condition : 50 $\Omega$ terminated | RF V.M         |             | CN503    |             |             | Check  | 0~+3dBm                |
| 9. LO2 level          |                                                                                         |                |             | CN501    |             |             |        | 0~+4dBm                |
| 10. CAR level         | 1) Display f.: 14.100MHz<br>MODE : AM                                                   | Oscilloscope   |             | CN502    |             |             | Check  | 1.0Vp $\pm 0.2$        |

## Receiver Section

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

## ADJUSTMENT

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

## ADJUSTMENT

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

## ADJUSTMENT

| Item                                               | Condition                                                                                                                  | Measurement                                          |             |          | Adjustment  |                     |                                                                                      | Specifications/Remarks                        |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-------------|----------|-------------|---------------------|--------------------------------------------------------------------------------------|-----------------------------------------------|
|                                                    |                                                                                                                            | Test-equipment                                       | Unit        | Terminal | Unit        | Parts               | Method                                                                               |                                               |
| 17. S/N                                            | 1) Display f. : Below<br>AF VR : 0.63V/8Ω<br>SSG frequency : Below<br>However, USB : +1kHz<br>LSB : -1kHz                  | SSG                                                  | Rear panel  | ANT      |             |                     |                                                                                      |                                               |
|                                                    |                                                                                                                            | AF V.M<br>Oscilloscope<br>Distortion meter<br>DM. SP |             | EXT.SP   |             |                     |                                                                                      |                                               |
|                                                    | Frequency      MODE      SSG output      SSG MOD      DEV                                                                  |                                                      |             |          |             |                     |                                                                                      |                                               |
|                                                    | 550kHz      AM      -77dBm      1kHz      60%                                                                              |                                                      |             |          |             |                     | S/N measurement                                                                      | 10dB or more                                  |
|                                                    | 1.550MHz      AM      -77dBm      1kHz      60%                                                                            |                                                      |             |          |             |                     |                                                                                      |                                               |
|                                                    | 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                                                                          |                                                      |             |          |             |                     |                                                                                      |                                               |
|                                                    | 14.100MHz      USB      -119dBm      OFF      OFF                                                                          |                                                      |             |          |             |                     | ← PRE AMP : OFF                                                                      | Sensitivity down 5~15dB.                      |
| 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 seisitivity | 12dB SINAD or more measurement                                                       |                                               |
| 18. ATT                                            | 1) Display f. : 14.300MHz<br>MODE : USB<br>AGC : FAST<br>PRE AMP : ON<br>SSG frequency : 14.301MHz<br>SSG output : -113dBm | SSG                                                  | Rear panel  | ANT      | Front panel | ATT key             | 1) Adjust the AF output to 1V.<br>2) 1 push the [ATT] key.<br>3) SSG output : -93dBm | AF output down.<br>AF output : 1V±3dB         |
|                                                    |                                                                                                                            | AF V.M<br>Oscilloscope<br>DM. SP                     |             | EXT.SP   |             |                     |                                                                                      |                                               |
| 19. VS-3 (Option)                                  | 1) Connect the VS-3 to CN16 on the TX-RX unit.<br>AF VR : MIN<br>[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 (Option)                                | 1) Connect the DRU-3A to CN17 on the TX-RX unit.<br>Connect a microphone to the MIC jack.<br>[REC] key : 1 push            | DRU-3A                                               | TX-RX (RF)  | CN17     | Front panel | CH1 key             | Hold down [CH1], and talk into the microphone.                                       | Can be recorded for about 15 seconds.         |
|                                                    |                                                                                                                            | Microphone                                           | Front panel | MIC      |             |                     | Press the [CH1] key again.                                                           | 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<br>(14.100MHz USB)<br>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;<br>1) Menu No. : 51<br>2) [UP] or [DOWN] key : Push once time      Display "rEAdy" → "run" → "good" (If "nG" is displayed, enter data again.)<br>3) [CLR] key : Push once time.<br>4) [SPLIT] key : Push once time. |                                                                                |                |            |          |             |                |                                          |                        |
| 2. Final idling current                                                                                                                                                                                                                                              | 1) Display f.: 14.200MHz<br>MODE : USB<br>Final unit VR1 : 2 : MIN<br>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<br>MODE : CW<br>Connect to CN10 a 50Ω dummy load.<br>Transmit      | 50Ω dummy Oscilloscope                   | TX-RX (RF)          | CN10        | TX-RX (RF)  | L69,70<br>L71,72<br>L74,75<br>L76<br>VR3 | Repeat 2 or 3 times for DRV output MAX | Reference value 2.5Vp-p or more         |
| 4. NULL                                                                                                                                        | 1) Display f. : 3.500MHz<br>MODE : CW<br>Transmit                                            | Power meter<br><br>DC V.M (Oscilloscope) | Rear panel<br>Final | ANT<br>CN12 | Final       | TC1                                      | MIN                                    | Reference value 0.5V or less            |
| 5. Power frequency characteristic                                                                                                              | 1) Initialize                                                                                | Power meter                              | Rear panel          | ANT         | Final       | VR3                                      | Full counterclockwise (VR MIN)         |                                         |
|                                                                                                                                                | 2) Menu No. : 18<br>(14.200MHz USB)<br>Transmit                                              |                                          |                     |             | Front panel | UP or DOWN key                           | 100W                                   | ±5.0W                                   |
|                                                                                                                                                | 3) Writing data with Menu No. 51.<br>(CLR) key : Push once time (Adjustment mode terminated) |                                          |                     |             |             |                                          |                                        |                                         |
|                                                                                                                                                | 4) Display f. : 29.699MHz<br>MODE : CW<br>Transmit                                           |                                          |                     |             | Final       | VR3                                      | Power MAX                              | 95W or more                             |
| 6. 14MHz TGC                                                                                                                                   | 1) Menu No. 27<br>(14.200MHz USB)<br>Transmit                                                | Power meter                              | Rear panel          | ANT         | Front panel | UP or DOWN key                           | Setting data : 050                     |                                         |
|                                                                                                                                                |                                                                                              |                                          |                     |             | TX-RX (RF)  | VR9                                      | 100W                                   | ±3.0W                                   |
|                                                                                                                                                | 2) Writing data with Menu No. 51.                                                            |                                          |                     |             | 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<br><br>50W<br><br>25W<br><br>10W<br><br>5W                                                                                       | 1) Menu No. : 18<br>(14.200MHz USB)<br>Transmit                                              | Power meter                              | Rear panel          | ANT         | Front panel | UP or DOWN key                           | 100W                                   | ±5.0W                                   |
|                                                                                                                                                | 2) Menu No. : 19<br>(14.200MHz USB)<br>Transmit                                              |                                          |                     |             |             |                                          | 50W                                    | ±2.5W                                   |
|                                                                                                                                                | 3) Menu No. : 20<br>(14.200MHz USB)<br>Transmit                                              |                                          |                     |             |             |                                          | 25W                                    | ±1.0W                                   |
|                                                                                                                                                | 4) Menu No. : 21<br>(14.200MHz USB)<br>Transmit                                              |                                          |                     |             |             |                                          | 10W                                    | ±1.0W                                   |
|                                                                                                                                                | 5) Menu No. : 22<br>(14.200MHz USB)<br>Transmit                                              |                                          |                     |             |             |                                          | 5W                                     | ±1.0W                                   |
| 8. TGC 1.9MHz<br><br>3.5MHz<br><br>7.0MHz<br><br>10MHz                                                                                         | 1) Menu No. : 23<br>(1.840MHz USB)<br>Transmit                                               |                                          |                     |             |             |                                          | 100W <b>K,M2,E,E3</b><br>10W <b>E2</b> | ±5W <b>K,M2,E,E3</b><br>±1.0W <b>E2</b> |
|                                                                                                                                                | 2) Menu No. : 24<br>(3.500MHz USB)<br>Transmit                                               |                                          |                     |             |             |                                          | 100W                                   | ±5W                                     |
|                                                                                                                                                | 3) Menu No. : 25<br>(7.00MHz USB)<br>Transmit                                                |                                          |                     |             |             |                                          |                                        | Note : Skip 14MHz                       |
|                                                                                                                                                | 4) Menu No. : 26<br>(10.100MHz USB)<br>Transmit                                              |                                          |                     |             |             |                                          |                                        |                                         |

# TS-570D

## ADJUSTMENT

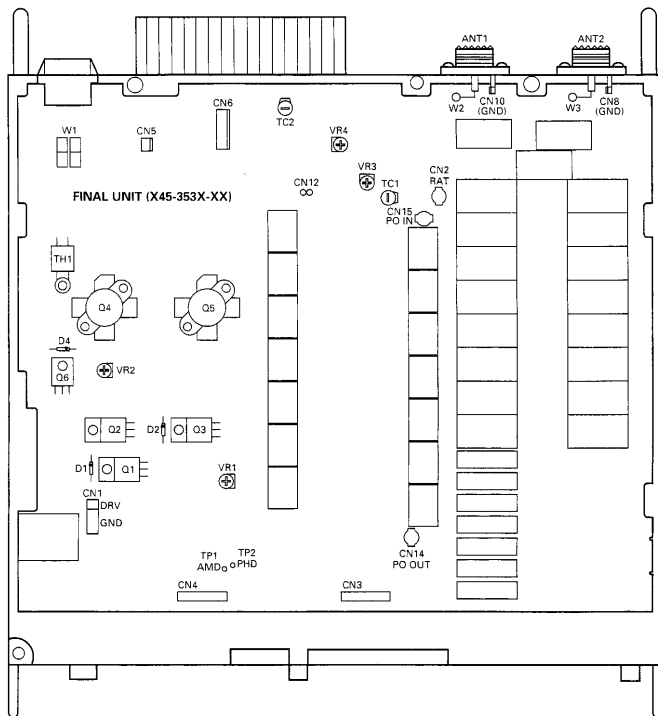
| Item                            | Condition                                       | Measurement                       |            |          | Adjustment  |                |                                             | Specifications/Remarks                                                                    |
|---------------------------------|-------------------------------------------------|-----------------------------------|------------|----------|-------------|----------------|---------------------------------------------|-------------------------------------------------------------------------------------------|
|                                 |                                                 | Test-equipment                    | Unit       | Terminal | Unit        | Parts          | Method                                      |                                                                                           |
| 8. TGC<br>18MHz                 | 5) Menu No. : 28<br>(18.068MHz USB)<br>Transmit | Power meter                       | Rear panel | ANT      | Front panel | UP or DOWN key | 100W                                        | ±5W                                                                                       |
| 21MHz                           | 6) Menu No. : 29<br>(21.000MHz USB)<br>Transmit |                                   |            |          |             |                |                                             |                                                                                           |
| 25MHz                           | 7) Menu No. : 30<br>(24.890MHz USB)<br>Transmit |                                   |            |          |             |                |                                             |                                                                                           |
| 28MHz                           | 8) Menu No. : 31<br>(29.690MHz USB)<br>Transmit |                                   |            |          |             |                |                                             |                                                                                           |
| 9. Power TGC<br>50W             | 1) Menu No. : 33<br>(14.200MHz USB)<br>Transmit |                                   |            |          |             |                | 50W                                         | ±2.5W                                                                                     |
| 25W                             | 2) Menu No. : 34<br>(14.200MHz USB)<br>Transmit |                                   |            |          |             |                | 25W                                         | ±1.0W                                                                                     |
| 10W                             | 3) Menu No. : 35<br>(14.200MHz USB)<br>Transmit |                                   |            |          |             |                | 10W                                         | ±1.0W                                                                                     |
| 5W                              | 4) Menu No. : 36<br>(14.200MHz USB)<br>Transmit |                                   |            |          |             |                | 5W                                          | ±1.0W                                                                                     |
| 10. ALC meter<br>Start point    | 1) Menu No. : 37<br>(14.200MHz USB)<br>Transmit |                                   |            |          |             |                | 1 push                                      |                                                                                           |
| Zone MAX                        | 2) Menu No. : 38<br>(14.200MHz USB)<br>Transmit |                                   |            |          |             |                |                                             |                                                                                           |
| 11. CW carrier<br>level         | 1) Menu No. : 39<br>(14.200MHz CW)<br>Transmit  | Power meter<br>Linear<br>detector |            |          |             |                | ALC meter zone<br>MAX                       |                                                                                           |
| 12. AM carrier<br>level         | 1) Menu No. : 40<br>(14.200MHz AM)<br>Transmit  |                                   |            |          |             |                |                                             |                                                                                           |
| 13. FM MAX<br>deviation         | 1) Menu No. : 41<br>(29.690MHz FM)<br>Transmit  |                                   |            |          |             |                | ±4.5kHz<br>According to the<br>larger +, -. | ±0.1kHz                                                                                   |
| 14. SSB carrier<br>point<br>USB | 1) Menu No. : 42<br>(14.200MHz USB)<br>Transmit | Power meter<br>Oscilloscope       |            |          |             |                | Waveform cross                              | OK<br> |
| LSB                             | 2) Menu No. : 43<br>(14.200MHz LSB)<br>Transmit |                                   |            |          |             |                |                                             | NG<br> |

## ADJUSTMENT

| Item                                                                                                                                                                                                                                     | Condition                                                                                                  | Measurement                                                  |                           |            | Adjustment                                                                                                                                                                                                                  |                |                                                                                                                | Specifications/Remarks                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
|                                                                                                                                                                                                                                          |                                                                                                            | Test-equipment                                               | Unit                      | Terminal   | Unit                                                                                                                                                                                                                        | Parts          | Method                                                                                                         |                                                      |
| 15. SSB carrier suppression<br>USB<br>LSB                                                                                                                                                                                                | 1) Menu No. : 44<br>(14.200MHz USB)<br>Transmit<br><br>2) Menu No. : 45<br>(14.200MHz LSB)<br>Transmit     | Power meter<br>Oscilloscope                                  | Rear panel                | ANT        | TX-RX (RF)                                                                                                                                                                                                                  | VR4<br>VR5     | Carrier level MIN                                                                                              | 60dB or less<br><br>(Repeat check both LSB and USB.) |
| 16. SWR protection                                                                                                                                                                                                                       | 1) Menu No. : 46<br>(14.200MHz CW)<br>Transmit                                                             | 150Ω dummy<br>Through type power meter                       |                           |            | Front panel                                                                                                                                                                                                                 | UP or DOWN key | 40W                                                                                                            | ±1.0W<br><br><i>Default. 044</i>                     |
| 17. SWR meter (SWR : 3.0)                                                                                                                                                                                                                | 1) Menu No. : 47<br>(1.840MHz CW)<br>Transmit                                                              | 150Ω dummy                                                   |                           |            |                                                                                                                                                                                                                             |                | 1 push                                                                                                         |                                                      |
| • Writing data : After items 7 to 17 have been adjusted:<br>1) Menu No. : 51<br>2) [UP] or [DOWN] key : Push once time      Display "rEAdy" → "run" → "good" (If "nG" is displayed, enter data again.)<br>3) [CLR] key : Push once time. |                                                                                                            |                                                              |                           |            |                                                                                                                                                                                                                             |                |                                                                                                                |                                                      |
| 18. Spurious                                                                                                                                                                                                                             | 1) Display f. : 24.900MHz<br>MODE : CW<br>Transmit                                                         | Power meter<br>Spectrum analyzer                             | Rear panel                | ANT        | TX-RX (RF)                                                                                                                                                                                                                  | VR2            | ±1.650MHz<br>Spurious level MIN                                                                                | 60dB or less                                         |
| 19. AT amplitude                                                                                                                                                                                                                         | 1) Display f. : 29.690MHz<br>MODE : CW<br>Transmit<br>Power : 10W                                          | Power meter<br>Oscilloscope                                  | Rear panel                | ANT        | Final                                                                                                                                                                                                                       | VR4            | Turn the VR to the point where the waveform on the oscilloscope changes from high to low.<br>(Threshold point) |                                                      |
| 20. AT phase                                                                                                                                                                                                                             | 1) Display f. : 29.690MHz<br>MODE : CW<br>Transmit<br>Power : 10W                                          |                                                              | Final                     | TP1        |                                                                                                                                                                                                                             |                |                                                                                                                |                                                      |
|                                                                                                                                                                                                                                          |                                                                                                            |                                                              |                           | TP2        |                                                                                                                                                                                                                             | TC2            | Turn the VC to the point where the waveform on the oscilloscope changes from high to low.                      |                                                      |
| 21. MIC sensitivity<br>SSB                                                                                                                                                                                                               | 1) Display f. : 14.200MHz<br>MODE : USB<br>AG : 1kHz/5mV<br>Transmit                                       | Power meter<br>AG<br>VTVM                                    | Rear panel<br>Front panel | ANT<br>MIC |                                                                                                                                                                                                                             |                | Check                                                                                                          | 90W or more                                          |
| FM                                                                                                                                                                                                                                       | 1) Display f. : 29.000MHz<br>MODE : FM<br>AG : 1kHz/3mV <b>E,E2,E3</b><br>1kHz/5mV <b>K,M2</b><br>Transmit | Power meter<br>Linear detector<br>AG<br>VTVM<br>Oscilloscope | Rear panel<br>Front panel | ANT<br>MIC |                                                                                                                                                                                                                             |                |                                                                                                                | DEV : ±2.7~3.3kHz                                    |
|                                                                                                                                                                                                                                          | 2) AG : 1kHz/30mV <b>E,E2,E3</b><br>1kHz/50mV <b>K,M2</b><br>Transmit                                      |                                                              |                           |            |                                                                                                                                                                                                                             |                |                                                                                                                | DEV : ±4.0~5.0kHz                                    |
| 22. Transmit frequency characteristic                                                                                                                                                                                                    | 1) Display f. : 14.200MHz<br>MODE : USB/LSB<br>AG : 1kHz/5mV<br>400Hz/5mV<br>2.6kHz/5mV<br>Transmit        | Power meter<br>AG<br>AF V.M                                  | Rear panel<br>Front panel | ANT<br>MIC | Set AG to 1.0kHz and turn the [MULTI/CH] knob to set to 50W.<br>Change the AG frequency and measure the difference between the power levels at 1.0kHz and at another frequency.<br>Take a measurement for each USB and LSB. |                |                                                                                                                |                                                      |

## ADJUSTMENT

### Adjustment Points (Top)



VR1,2 : Final idling current  
 VR3 : Power frequency characteristic  
 VR4 : AT amplitude  
 TC1 : NULL  
 TC2 : AT phase

\*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 BV                                |
|                                   | 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 (IC1)                     |
|                                   | 13      | LEN2  | O   | LCD enable (IC2)                     |
|                                   | 14      | LEN3  | O   | LCD enable (IC3)                     |
|                                   | 15      | K0    | I   | Key input 0                          |
|                                   | 16      | K1    | I   | Key input 1                          |

| CN No. | Pin No. | Name | I/O | Function                                            |
|--------|---------|------|-----|-----------------------------------------------------|
|        | 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                                                 |
| CN2    | 1       | 5A   | 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  | O   | RX data from personal computer                      |
|        | 19      | RXD  | O   | TX data to personal computer                        |
|        | 20      | CTS  | O   | Data transmit/inhibit signal to personal computer   |
| CN4    | 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                                                 |
|        | 1       | GND  | -   | GND                                                 |
|        | 2       | VCS  | O   | VS-3 voice synthesize start signal                  |
|        | 3       | NAR  | O   | "H" Data input enable to VS-3                       |
|        | 4       | RST  | O   | VS-3 reset signal                                   |
| CN5    | 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                                     |
| CN5    | 15      | PCK  | O   | PLL serial clock                                    |
|        | 16      | GND  | -   | GND                                                 |
|        | 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                                                    |                         |
|-----------------------------------------|---------|---------|------|--------------------------------------|--------|---------------------------|---------|-----|-------------------------------------------------------------|-------------------------|
| CN5                                     | 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                         | PHG     | -   | 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/ANO | 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                                            |                         |
|                                         | CN6     | 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                     |
|                                         |         | 4       | GND  | -                                    |        | GND                       | 10      | DRM | I                                                           | DRU-3A MIC signal input |
| CN502                                   | 1       | GND     | -    | GND                                  |        | 11                        | GND     | -   | GND                                                         |                         |
|                                         | 2       | NC      | -    | NC                                   |        | 12                        | ANI     | O   | TX signal input                                             |                         |
|                                         | 3       | GND     | -    | GND                                  |        | 13                        | GND     | -   | GND                                                         |                         |
|                                         | 4       | MOD/ANO | O/I  | Modulation output/RX AF input        |        | 14                        | DREN    | I   | Relay                                                       |                         |
|                                         | 5       | BIAS    | O    | Bias voltage                         |        | 15                        | EOM     | O   | Relay                                                       |                         |
|                                         | 6       | DET     | I    | Detection input                      |        | 16                        | GND     | -   | GND                                                         |                         |
|                                         | 7       | GND     | -    | GND                                  | CN16   | 1                         | VO      | I   | VS-3 voice signal input                                     |                         |
|                                         | 8       | DRO     | I    | DRU playback signal input            |        | 2                         | 5C      | O   | VS-3 power supply (5V)                                      |                         |
|                                         | 9       | GND     | -    | GND                                  |        | 3                         | E       | -   | GND                                                         |                         |
|                                         | 10      | DRM     | O    | DRU-3A MIC signal                    |        | 4                         | NAR     | I   | "H" : Data input enable to VS-3                             |                         |
|                                         | 11      | GND     | -    | GND                                  |        | 5                         | RST     | O   | VS-3 reset signal                                           |                         |
|                                         | 12      | ANI     | O    | TX signal output                     |        | 6                         | VCS     | O   | VS-3 voice synthesize start signal                          |                         |
|                                         | 13      | GND     | -    | GND                                  |        | 7                         | VDT     | O   | VS-3 data                                                   |                         |
|                                         | 14      | DREN    | O    | DRU enable                           |        | 8                         | VCK     | O   | VS-3 clock                                                  |                         |
|                                         | 15      | EOM     | I    | End of message signal (End : "H")    | CN17   | 1                         | GND     | -   | GND                                                         |                         |
|                                         | 16      | GND     | -    | GND                                  |        | 2                         | DRMG    | -   | DRU-3A MIC GND                                              |                         |
| CN503                                   | 1       | MIC     | I    | MIC signal                           |        | 3                         | DRM     | O   | DRU-3A MIC signal                                           |                         |
|                                         | 2       | MSG     | -    | MIC GND                              |        | 4                         | DRO     | I   | DRU playback signal                                         |                         |
|                                         | 3       | MCG     | -    | GND                                  |        | 5                         | 5C      | O   | DRU power supply (5V)                                       |                         |
| <b>TX-RX UNIT (X57-500X-XX) : TX-RX</b> |         |         |      |                                      |        | 6                         | GND     | -   | GND                                                         |                         |
| CN1                                     | Coaxial | RAT     | I    | RX signal input                      |        | 7                         | EOM     | I   | End of message signal (End : "H")                           |                         |
| CN2                                     | Coaxial | LO1     | I    | LO1 input (73.08~103.05MHz)          |        | 8                         | OVF     | I   | Overflow signal (Overflow : "L")                            |                         |
| CN3                                     | 1       | IN      | I    | MCF adjustment signal input          |        | 9                         | DREN    | O   | DRU enable                                                  |                         |
|                                         | 2       | GND     | -    | GND                                  |        | 10                        | SD      | O   | DRU serial data                                             |                         |
| CN4                                     | 1       | OUT     | O    | MCF adjustment signal output         |        | 11                        | SCK     | O   | DRU clock                                                   |                         |
|                                         | 2       | GND     | -    | GND                                  | CN18   | 1                         | TXC     | I   | TX control signal                                           |                         |
| CN5                                     | Coaxial | LO2     | I    | LO2 input (64.22MHz)                 |        | 2                         | NC      | -   | NC                                                          |                         |
| CN7                                     | Coaxial |         | O    | BPF adjustment signal output         |        | 3                         | CKY     | I   | Keying signal                                               |                         |
| CN8                                     |         |         |      | Option filter                        |        | 4                         | KEY     | O   | Key down signal                                             |                         |
| CN9                                     |         |         |      | Option filter                        |        | 5                         | KYS     | O   | Key jack judgement signal                                   |                         |
| CN10                                    | Coaxial | DRV     | O    | Drive output                         |        | 6                         | PKS     | O   | Standby switch when PKD input                               |                         |
|                                         |         |         |      |                                      |        | 7                         | RCK     | I   | TX-RX unit serial clock                                     |                         |
| CN11                                    | 1       | GND     | -    | GND                                  |        | 8                         | RDA     | I   | TX-RX unit serial data                                      |                         |
|                                         | 2       | GND     | -    | GND                                  |        | 9                         | REN1    | I   | TX-RX unit IC11 enable                                      |                         |
|                                         | 3       | SPG     | -    | Speaker GND                          |        | 10                        | NC      | -   | NC                                                          |                         |
|                                         | 4       | SP      | O    | Speaker output signal                |        | 11                        | VEN     | I   | TX-RX unit IC6 enable                                       |                         |
|                                         | 5       | 14AG    | -    | AF amplifier GND                     |        | 12                        | SS      | O   | Standby switch                                              |                         |
|                                         | 6       | 14AF    | I    | AF amplifier 14V                     |        | 13                        | ALM     | O   | ALC meter output                                            |                         |
|                                         | 7       | 14S     | I    | 14V when power switch on             |        | 14                        | SM      | O   | S-meter output                                              |                         |
|                                         | 8       | 14S     | I    | 14V when power switch on             |        | 15                        | V5FM    | O   | Forward waveform detection voltage                          |                         |
|                                         | 9       | 8A      | I    | Analog 8V                            |        | 16                        | V5RM    | O   | Reflected waveform detection voltage                        |                         |
|                                         | 10      | 8A      | I    | Analog 8V                            |        | 17                        | REN2    | I   | TX-RX unit IC14 enable                                      |                         |
|                                         | 11      | 5A      | I    | Analog 5V                            |        | 18                        | TXD     | I   | RX data from personal computer (Relay)                      |                         |
|                                         | 12      | TXB     | O    | TX 8V                                |        | 19                        | RXD     | I   | TX data to personal computer (Relay)                        |                         |
|                                         | 13      | V5F     | I    | Forward waveform detection voltage   |        | 20                        | CTS     | I   | Data transmit inhibit signal to personal computer (Relay)   |                         |
|                                         | 14      | V5R     | I    | Reflected waveform detection voltage |        | 21                        | RTS     | O   | Data transmit inhibit signal from personal computer (Relay) |                         |
|                                         | 15      | GND     | -    | GND                                  |        | 22                        | 5C      | I   | Usually 5V                                                  |                         |
|                                         | 16      | GND     | -    | GND                                  |        | 23                        | AMU     | I   | AF mute signal                                              |                         |

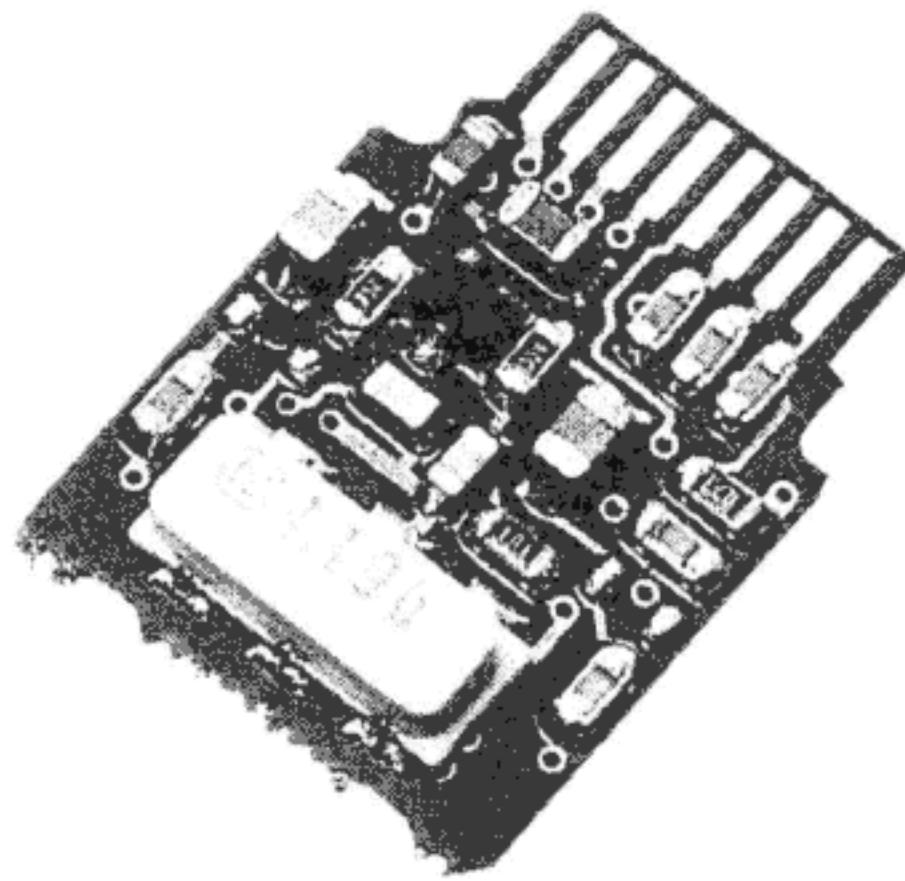
## TERMINAL FUNCTION

| 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  | O   | 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   | -   | NC                                                   |
|                                       | 2       | RTK  | I   | RTTY signal                                          |
|                                       | 3       | ANO  | O   | RX AF output                                         |
|                                       | 4       | ANOG | O   | 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                            |
| <b>TX-RX UNIT (X57-500X-XX) : PLL</b> |         |      |     |                                                      |
| CN500                                 | 1       | GND  | -   | GND                                                  |
|                                       | 2       | PCK  | I   | PLL serial clock                                     |
|                                       | 3       | PDA  | I   | PLL serial data                                      |
|                                       | 4       | PEN1 | I   | PLL IC enable (LO1)                                  |

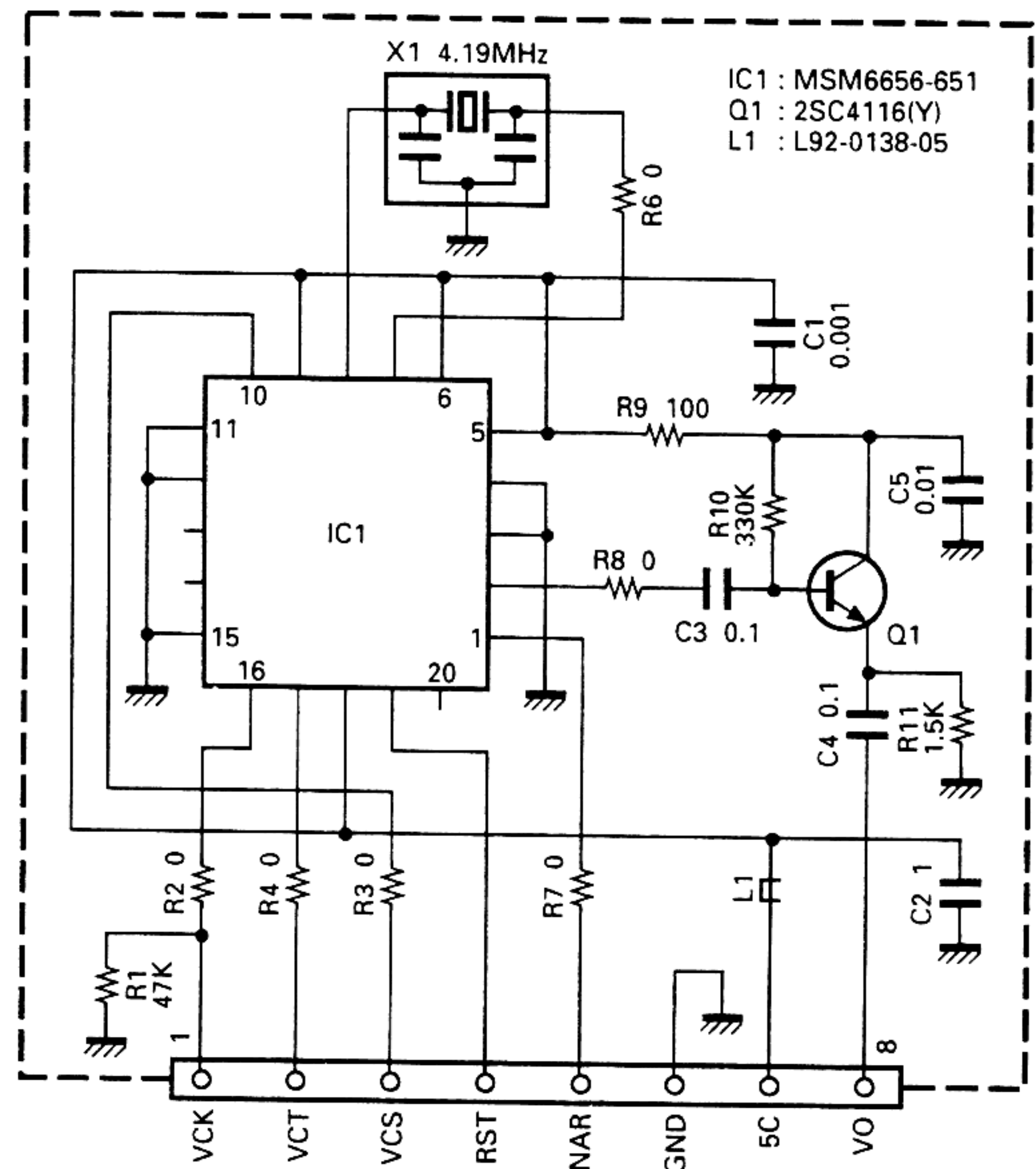
| CN No.                        | Pin No. | Name  | I/O | Function                                            |
|-------------------------------|---------|-------|-----|-----------------------------------------------------|
|                               | 5       | PEN2  | I   | PLL IC enable (LO2)                                 |
|                               | 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 synthesize 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                                                  |
| <b>LCD ASSY (B38-0765-05)</b> |         |       |     |                                                     |
| CN1                           | 1       | GND   | -   | GND                                                 |
|                               | 2       | PB    | I   | LCD lamp (10V)                                      |
|                               | 3       | RENB  | 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   | I   | 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   | I   | MIC GND                                             |
|                               | 8       | MCG   | I   | GND                                                 |

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

**VS-3 External View**

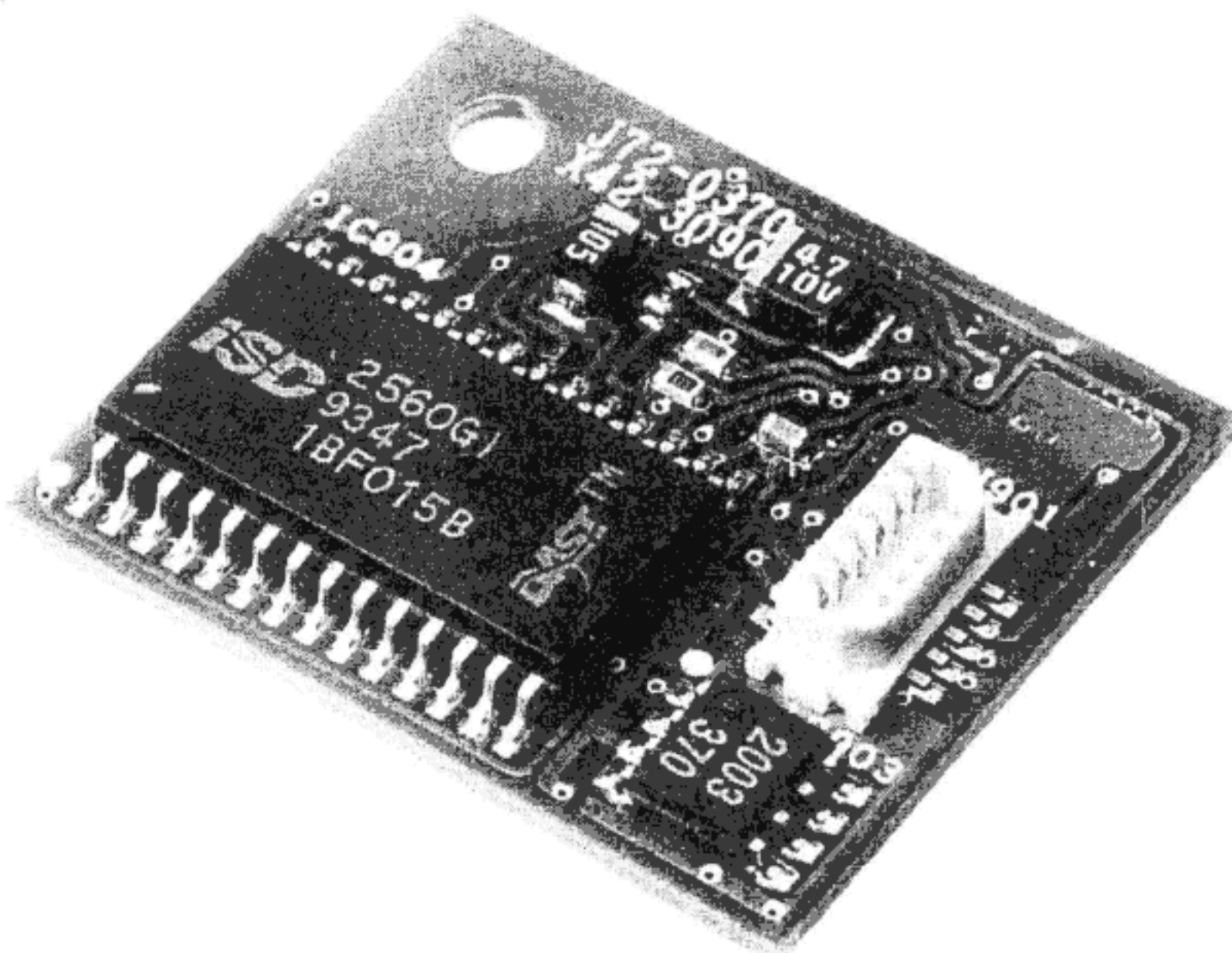


**VS-3 Circuit Diagram**



**DRU-3A External View**

**Note :** Without shielding cover



**DRU-3A Parts List**

| Ref. No.  | New parts | Parts No.    | Description         |
|-----------|-----------|--------------|---------------------|
| 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                  |

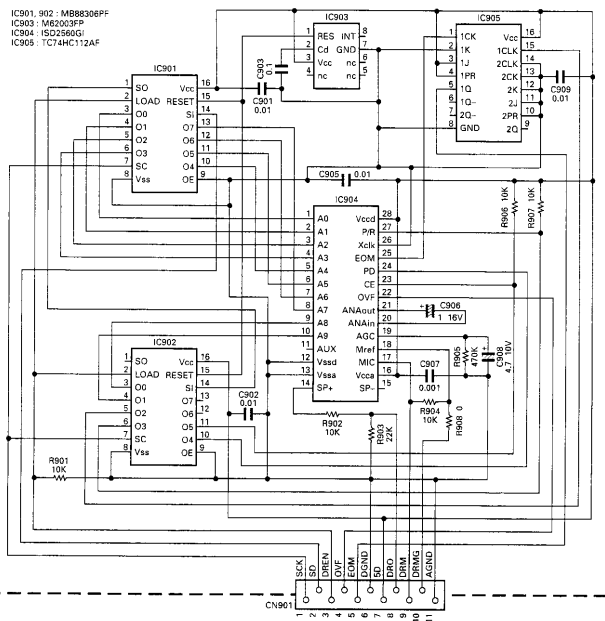
# TS-570D

## DRU-3A (DIGITAL RECORDING UNIT)

### DRU-3A Circuit Diagram

X43-3090-20

IC901, 902 : MB88306PF  
IC903 : M62003FP  
IC904 : ISD2560G1  
IC905 : TC74HC112AF



## SPECIFICATIONS

| Item        |                                                             | Rating                                                                              |                                            |
|-------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------|
| GENERAL     | 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.)                                                                     | 20.5A                                      |
|             |                                                             | Receive (No signal)                                                                 | 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]<br>(Projections included)            | 270 x 96 x 270 mm/10.6 x 3.8 x 10.6 in<br>(281 x 107 x 314 mm/11.1 x 4.2 x 12.4 in) |                                            |
|             | Weight                                                      | Approx. 6.8kg (15 lbs)                                                              |                                            |
|             | Frequency range                                             | 160m band                                                                           | 1.8 <sup>1)</sup> to 2.0 <sup>2)</sup> MHz |
| TRANSMITTER |                                                             | 80m band                                                                            | 3.5 to 4.0 <sup>3)</sup> MHz               |
|             |                                                             | 40m band                                                                            | 7.0 to 7.3 <sup>4)</sup> MHz               |
|             |                                                             | 30m band                                                                            | 10.1 to 10.15 MHz                          |
|             |                                                             | 20m band                                                                            | 14.0 to 14.35 MHz                          |
|             |                                                             | 17m band                                                                            | 18.068 to 18.168 MHz                       |
|             |                                                             | 15m band                                                                            | 21.0 to 21.45 MHz                          |
|             |                                                             | 12m band                                                                            | 24.89 to 24.99 MHz                         |
|             |                                                             | 10m band                                                                            | 28.0 to 29.7 MHz                           |
|             | Output power <sup>5)</sup>                                  | SSB, CW, FSK, FM                                                                    | Max. 100W                                  |
|             |                                                             |                                                                                     | Min. 5W                                    |
|             |                                                             | AM                                                                                  | Max. 25W                                   |
|             |                                                             |                                                                                     | Min. 5W                                    |
|             | Modulation                                                  | SSB                                                                                 | Balanced                                   |
|             |                                                             | FM                                                                                  | Reactance                                  |
|             |                                                             | AM                                                                                  | 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                                                                                | ±5kHz or less                              |
|             |                                                             | Narrow                                                                              | ±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                                                                           |
|----------|------------------------------------|-------------------|----------------------------------------------------------------------------------|
| RECEIVER | Circuit type                       |                   | Double conversion superheterodyne<br>FM only : Triple conversion superheterodyne |
|          | Frequency range                    |                   | 500kHz to 30MHz                                                                  |
|          | Intermediate frequency             |                   | 1st : 73.05MHz, 2nd : 8.83MHz, 3rd : 455kHz (IFM only)                           |
|          | Sensitivity                        | SSB, CW, FSK      | 500kHz to 1.705MHz                                                               |
|          |                                    | (At 10dB (S+N)/N) | 4μV or less                                                                      |
|          |                                    |                   | 1.705MHz to 24.5MHz                                                              |
|          |                                    |                   | 0.2μV or less                                                                    |
|          |                                    |                   | 24.5MHz to 30MHz                                                                 |
|          |                                    |                   | 0.13μV or less                                                                   |
|          | AM                                 |                   | 500kHz to 1.705MHz                                                               |
|          |                                    | (At 10dB (S+N)/N) | 31.6μV or less                                                                   |
|          |                                    |                   | 1.705MHz to 24.5MHz                                                              |
|          |                                    |                   | 2μV or less                                                                      |
|          | FM (At 12dB SINAD)                 |                   | 24.5MHz to 30MHz                                                                 |
|          |                                    |                   | 1.3μV or less                                                                    |
|          | Selectivity                        | SSB, CW, FSK      | 28MHz to 30MHz                                                                   |
|          |                                    |                   | 0.25μV or less                                                                   |
|          |                                    |                   | -6dB : 2.2kHz, -60dB : 4.4kHz                                                    |
|          | AM                                 |                   | -6dB : 4kHz, -50dB : 20kHz                                                       |
|          |                                    | FM                | -6dB : 12kHz, -50dB : 25kHz                                                      |
|          | Image rejection (1.8MHz to 30MHz)  |                   | 70dB or more                                                                     |
|          | 1st IF rejection (1.8MHz to 30MHz) |                   | 70dB or more                                                                     |
|          | RIT shift frequency range          |                   | ±9.9kHz                                                                          |
|          | Squelch sensitivity                | SSB, CW, FSK, AM  | 500kHz to 1.705MHz                                                               |
|          |                                    |                   | 20μV or less                                                                     |
|          |                                    |                   | 1.705MHz to 30MHz                                                                |
|          | FM                                 |                   | 2μV or less                                                                      |
|          |                                    |                   | 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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# TS-570D TS-570D

## CIRCUIT DESCRIPTION

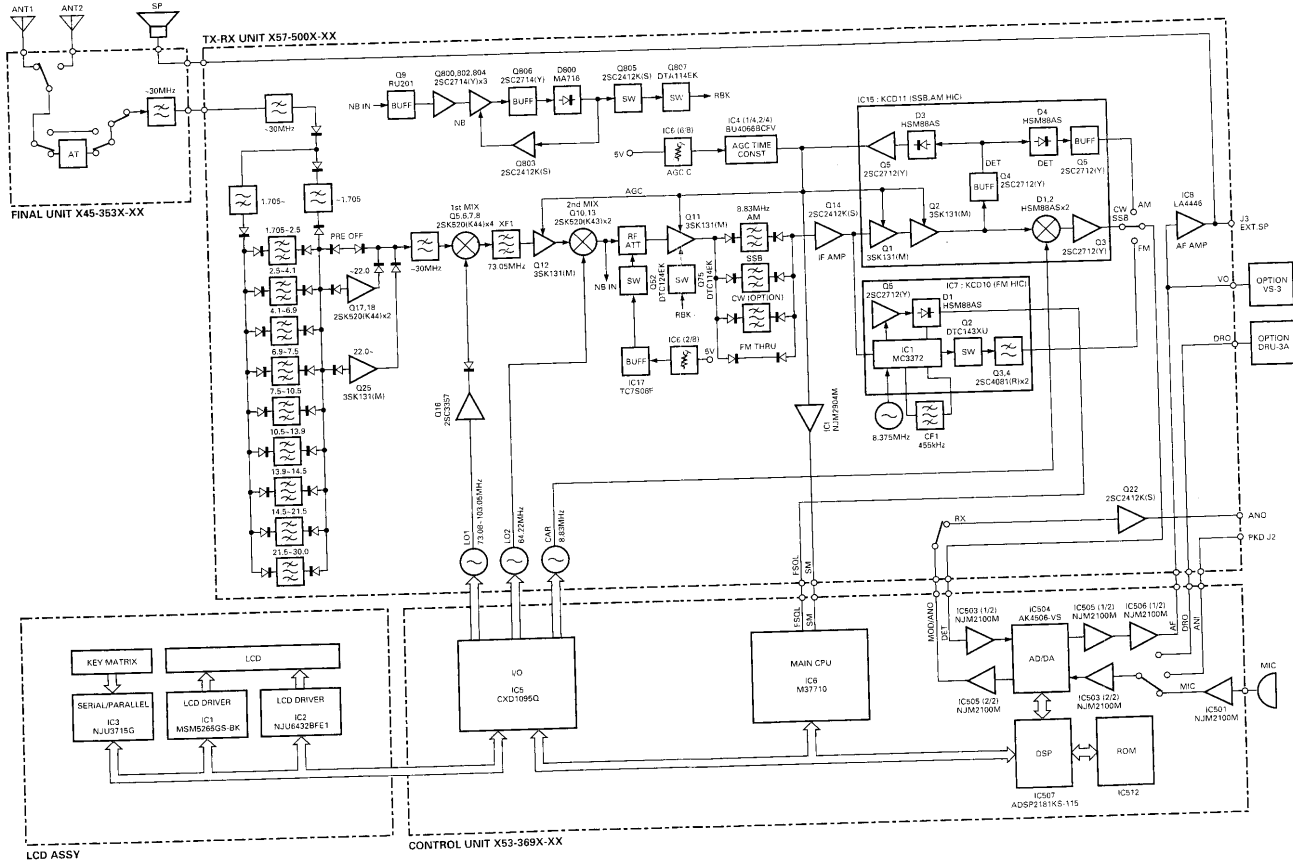


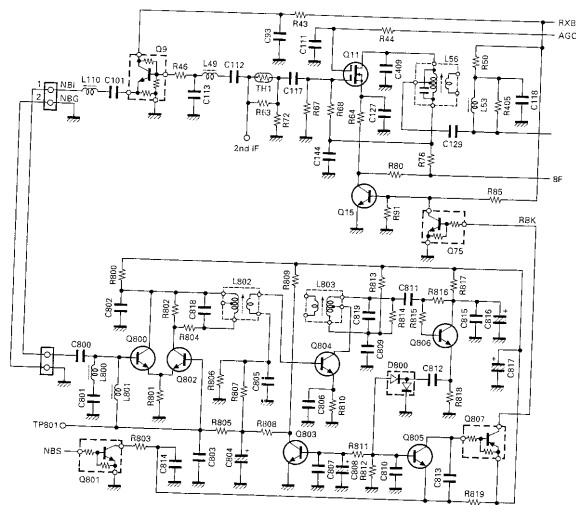
Fig. 5 Receiver section block diagram

## TS-570D

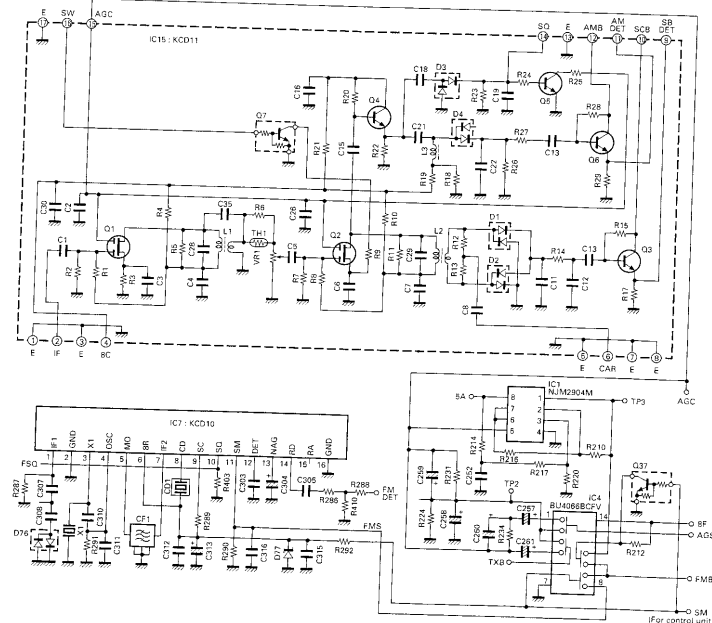
### CIRCUIT DESCRIPTION

### ■ AGC Circuit

The part of the IF signal amplified by IC15: KCD11 is envelope-detected for the AGC to control the AGC voltage. The AGC voltage is applied to the first and second amplifiers in IC15, the first IF amplifier Q12: 3SK131, and the second IF amplifier Q11: 3SK131. The time constant is changed by analog switch IC4: BU4066BCFV.

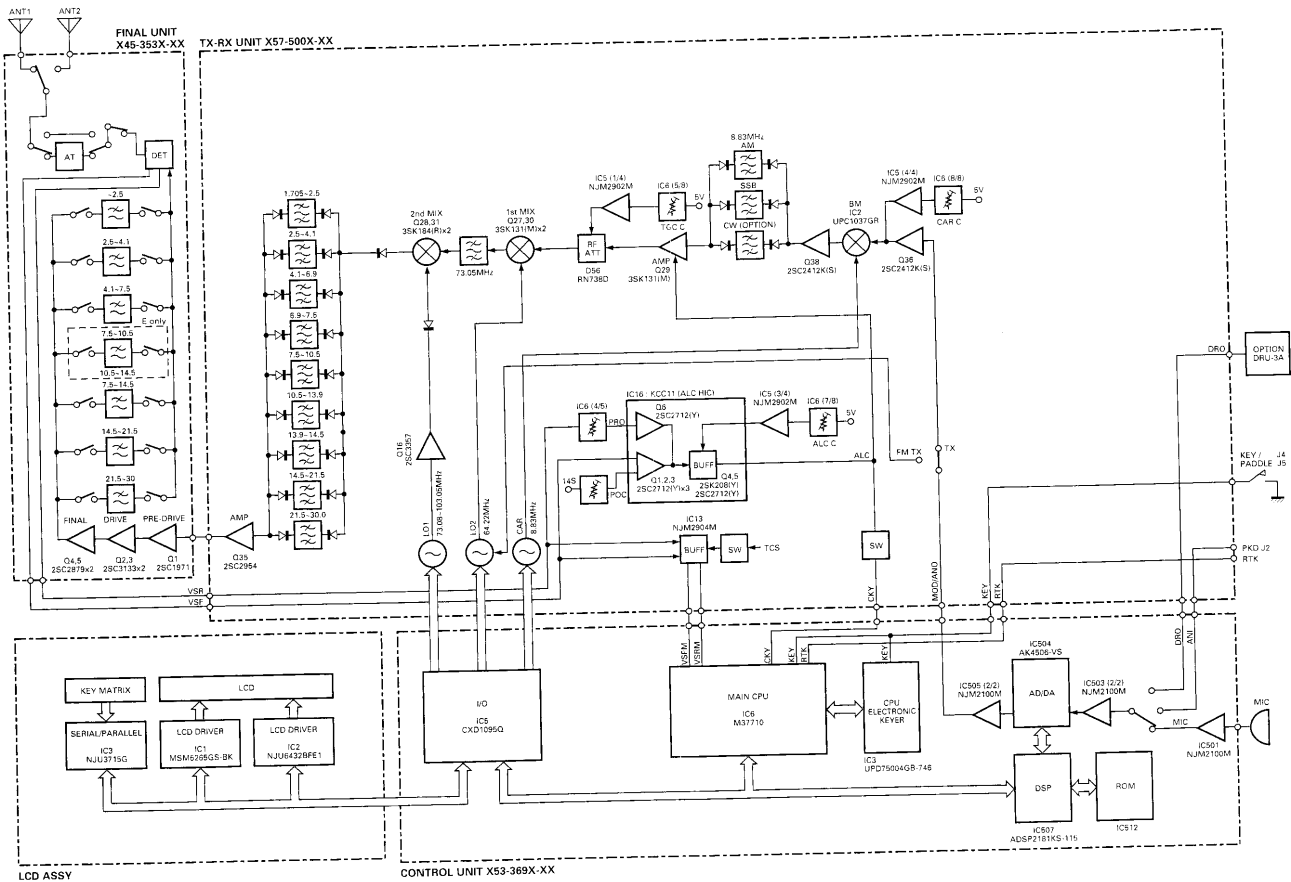


**Fig. 8 AGC and S-meter circuits**



# TS-570D TS-570D

## CIRCUIT DESCRIPTION



**Fig. 9 Transmitter section block diagram**

## CIRCUIT DESCRIPTION

### ■ Various Control Circuits by the Digital-to-Analog Converter

The circuits whose signal level was varied directly with a volume control or adjusted with a semi-fixed volume can be controlled by a microcomputer by using an eight-channel digital-to-analog converter.

The digital-to-analog converter (M62363FP) is a ladder-type variable attenuator having independent eight-channel inputs. It is used to output an output voltage by entering a fixed voltage or used as a volume by entering the control signal directly. The table below lists controls in each channel.

| Ch No. | Input pin No. | Output pin No. | Signal name | Control                                               | Output destination                  |
|--------|---------------|----------------|-------------|-------------------------------------------------------|-------------------------------------|
| 1      | 1             | 2              | POC         | Reference voltage or power control                    | IC16 ALC circuit differential input |
| 2      | 4             | 3              | IFATT1      | 21.5 to 30MHz IF gain reduction                       | IC17 AND gate                       |
| 3      | 9             | 10             | NC          | Not used                                              |                                     |
| 4      | 12            | 11             | PRO         | Reflected wave protection adjustment                  | IC16 protection input               |
| 5      | 13            | 14             | TGC         | Gain corrector between bands and during power control | IC5 operational amplifier           |
| 6      | 16            | 15             | AGC         | AGC reference voltage adjustment                      | AGC circuit                         |
| 7      | 21            | 22             | ALC         | ALC reference voltage adjustment                      | IC5 operational amplifier           |
| 8      | 24            | 23             | CAR         | CAR level adjustment                                  | IC2 balanced modulator              |

Table 4 Digital-to-analog converter control

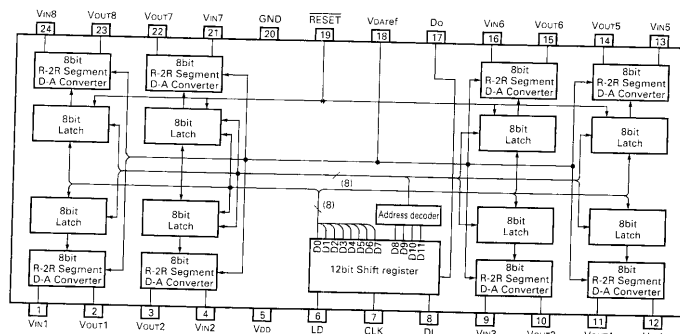


Fig. 13 M62363FP block diagram

# TS-570D

# TS-570D

## CIRCUIT DESCRIPTION

### Digital Control

#### ■ Overview

The TS-570D digital control circuit has multiple chips centered around the main CPU (IC6: M377010EFB), and consists of an electronic keyer microcomputer (IC3: UPD75004GB-746), an extended I/O (IC5: CXD10950) and DSP (IC507: ADSP2181KS-115). A block diagram of digital control is shown below.

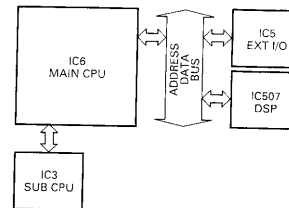


Fig. 14 Digital control section block diagram

#### ■ Address Control Circuit

The main CPU operates in the single-chip mode using the internal ROM and RAM. It transfers data from or to the extended I/O and DSP through external address and data buses.

#### ■ Encoder Circuit

The main encoder is a magnetic rotary encoder, and the MULTI and RIT encoders are contact-type rotary encoders.

The encoder pulses are read and processed directly by the main CPU.

#### ■ System Reset and RAM Backup

The voltage monitor circuit (Q5, Q8, D6, R8) monitors the power supply voltage. If the voltage drops, the circuit outputs a low signal to the INT0 port of the main CPU to stop operation. At the same time, D6 switches the RAM backup power to a lithium battery.

If the power supply voltage becomes normal, a high signal is input to the INT0 port, the main CPU is initialized by the reset signal generation IC (IC4: PST9121NR) after the time constant set by C12 and C13, and the operation resumes.

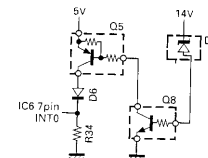


Fig. 15 Reset, backup circuits

#### ■ Analog Signal Input

The main CPU incorporates a four-channel analog-to-digital (A/D) converter and a multiplexer (IC7 and IC8: TC4052BF) for entering 16-channel analog signals. Incoming analog signals are converted to digital values by the main CPU, which are used as digital data.

#### ■ Display

The TS-570D uses a positive LCD and a semi-transparent display. The LCD is lighted with half a duty by the LCD driver.

#### ■ PLL and DDS Data

The TS-570D has two PLLs and two DDSs in the PLL unit of the TX-RX unit. The main CPU sends data to the PLL ICs and DDS ICs according to the displayed frequency. The PLL ICs output unlock (UNL) signals. If one of the PLLs unlocks, the display shows that the PLL is unlocked.

#### ■ AT Control

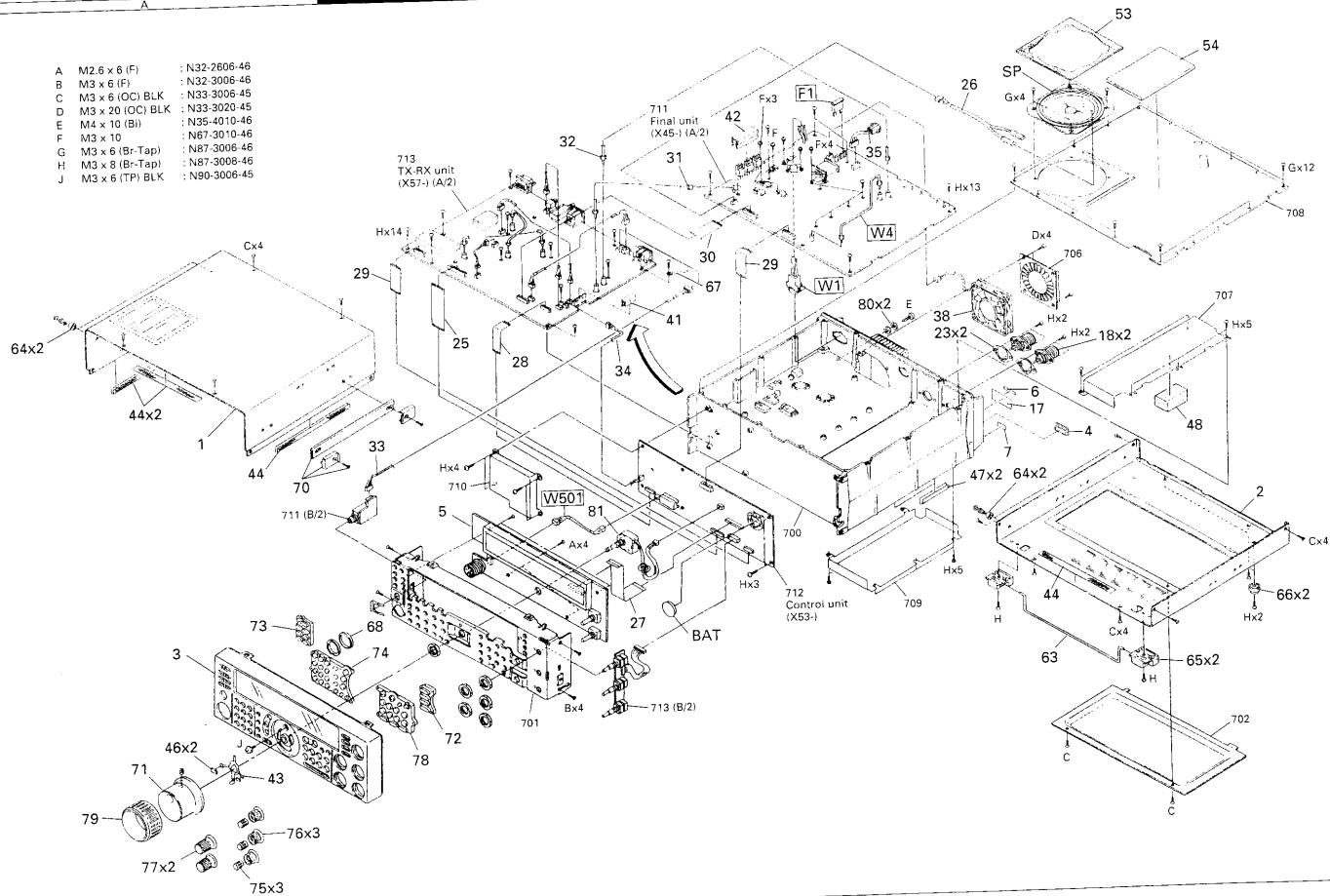
The AT controlled by entering amplitude difference data (AMD) and phase difference data (PHD) to the main CPU, controlling the serial/parallel converter in the final unit, and changing the C capacity. The main CPU stores the serial/parallel converter data in each band, and whenever the frequency changes, the CPU outputs the data automatically to optimize antenna matching. The details of control of AMD terminal input and PMD terminal input are given below.

When AMD input is low, the CO count decreases.  
When AMD input is high, the CO count increases.  
When PMD input is low, the CI count decreases.  
When PMD input is high, the CI count increases.

# TS-570D TS-570D

## EXPLODED VIEW

- |   |                  |               |
|---|------------------|---------------|
| A | M2.6 x 6 (F)     | : N32-2606-46 |
| B | M3 x 6 (F)       | : N32-3006-46 |
| C | M3 x 6 (OC) BLK  | : N33-3006-45 |
| D | M3 x 20 (OC) BLK | : N33-3020-45 |
| E | M4 x 10 (BI)     | : N35-4010-46 |
| F | M3 x 10          | : N67-3010-46 |
| G | M3 x 6 (Br-Tap)  | : N87-3006-46 |
| H | M3 x 8 (Br-Tap)  | : N87-3008-46 |
| J | M3 x 6 (TP) BLK  | : N90-3006-45 |



Parts with the exploded numbers larger than 700 are not supplied.

## PACKING

TS-570D

TS-570D

## ADJUSTMENT

### Required Test Equipment

#### 1. DC Voltmeter (DC V.M)

- 1) Input resistance : More than 1M $\Omega$
  - 2) Voltage range : 1.5 to 1000V AC/DC
- Note :** A high-precision multimeter may be used. However, accurate readings can not be obtained for high-impedance circuits.

#### 2. DC Ammeter

- 1) Current range : 100mA, 1.5A, 15A, high-precision ammeter may be used.

#### 3. RF VTVM (RF V.M)

- 1) Input impedance : 1M $\Omega$  and less than 3pF, min.
- 2) Voltage range : 10mV to 300V
- 3) Frequency range : 10kHz to 500MHz

#### 4. AF Voltmeter (AF V.M)

- 1) Frequency range : 50Hz to 10kHz
- 2) Input resistance : 1M $\Omega$  or greater
- 3) Voltage range : 10mV to 30V

#### 5. AF Generator (AG)

- 1) Frequency range : 200Hz to 5kHz
- 2) Output : 1mV or less to 1V, low distortion

#### 6. AF Dummy Load (DM, SP)

- 1) Impedance : 8 $\Omega$
- 2) Dissipation : 3W or greater

#### 7. Oscilloscope

Requires high sensitivity, and external synchronization capability (150MHz or greater).

#### 8. Sweep Generator (Sweep G.)

- 1) Center frequency : 50kHz to 90MHz
- 2) Frequency deviation : Maximum  $\pm 35$ kHz
- 3) Output voltage : 100mV or greater

#### 9. Standard Signal Generator (SSG)

- 1) Frequency range : 50kHz to 50MHz
- 2) Output :  $-133$ dBm/0.05 $\mu$ V to 7dBm/500mV
- 3) Output impedance : 50 $\Omega$
- 4) AM and FM modulation can be possible

**Note :** Generator must be frequency stable.

#### 10. Frequency Counter (f. counter)

- 1) Minimum input voltage : 50mV
- 2) Frequency range : 150MHz or greater

#### 11. Noise Generator (Noise G.)

Must generate ignition noise containing harmonics beyond 30MHz

#### 12. RF Dummy Load

- 1) Impedance : 150 $\Omega$  and 50 $\Omega$
- 2) Dissipation : 150W or greater

#### 13. Linear Detector

- 1) Frequency range : 30MHz

#### 14. Power Meter

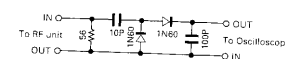
- 1) Impedance : 50 $\Omega$
- 2) Dissipation : 300W continuous or greater
- 3) Frequency limits : 60MHz or greater

#### 15. Spectrum Analyzer

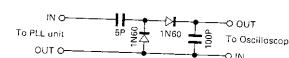
- 1) Frequency range : 100kHz to 110MHz or greater
- 2) Bandwidth : 1kHz to 3MHz

#### 16. Detector

- 1) For adjustment of BPF



- 2) For adjustment of PLL/VCO BPF



#### 17. Directional Coupler

#### 18. Monitor Receiver

R-1000 class

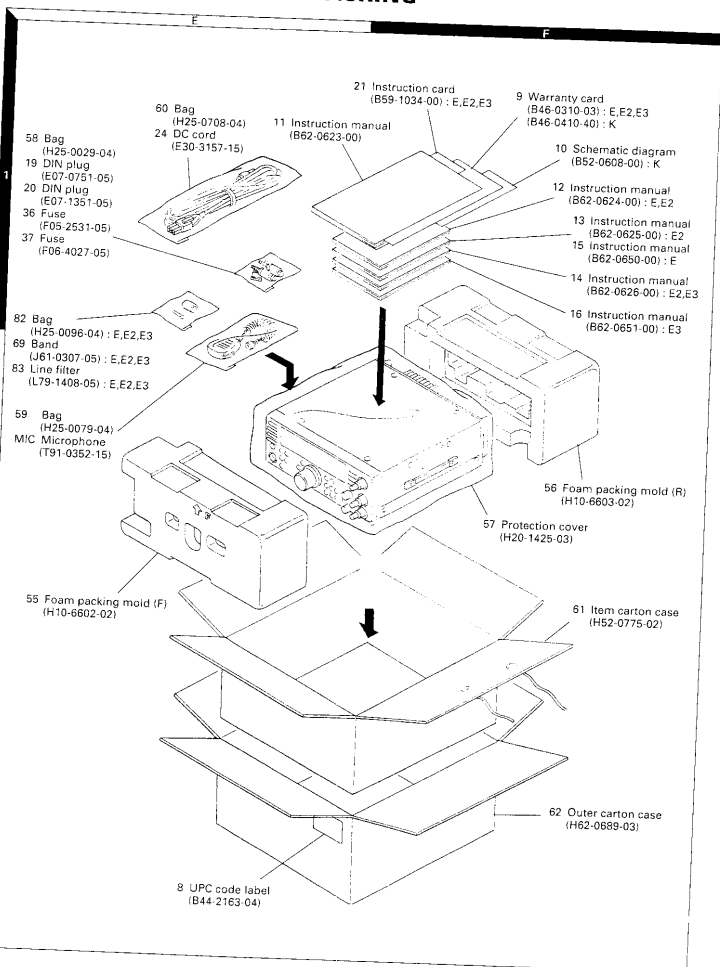
#### 19. Microphone

MC-43S or MC-60S8

#### 20. Tracking Generator

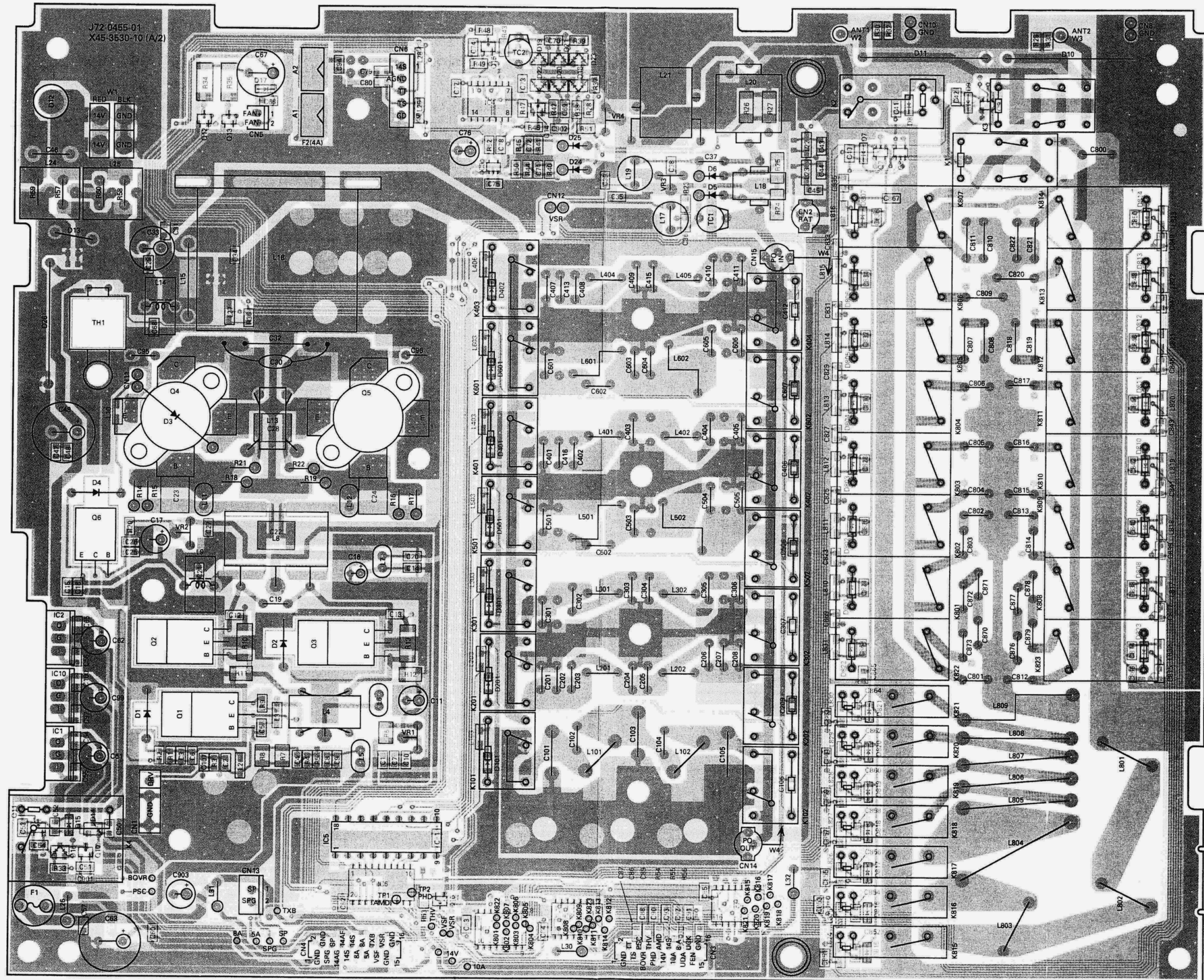
#### 21. Distortion Meter

#### 22. Double Signal Pad (50 $\Omega$ )

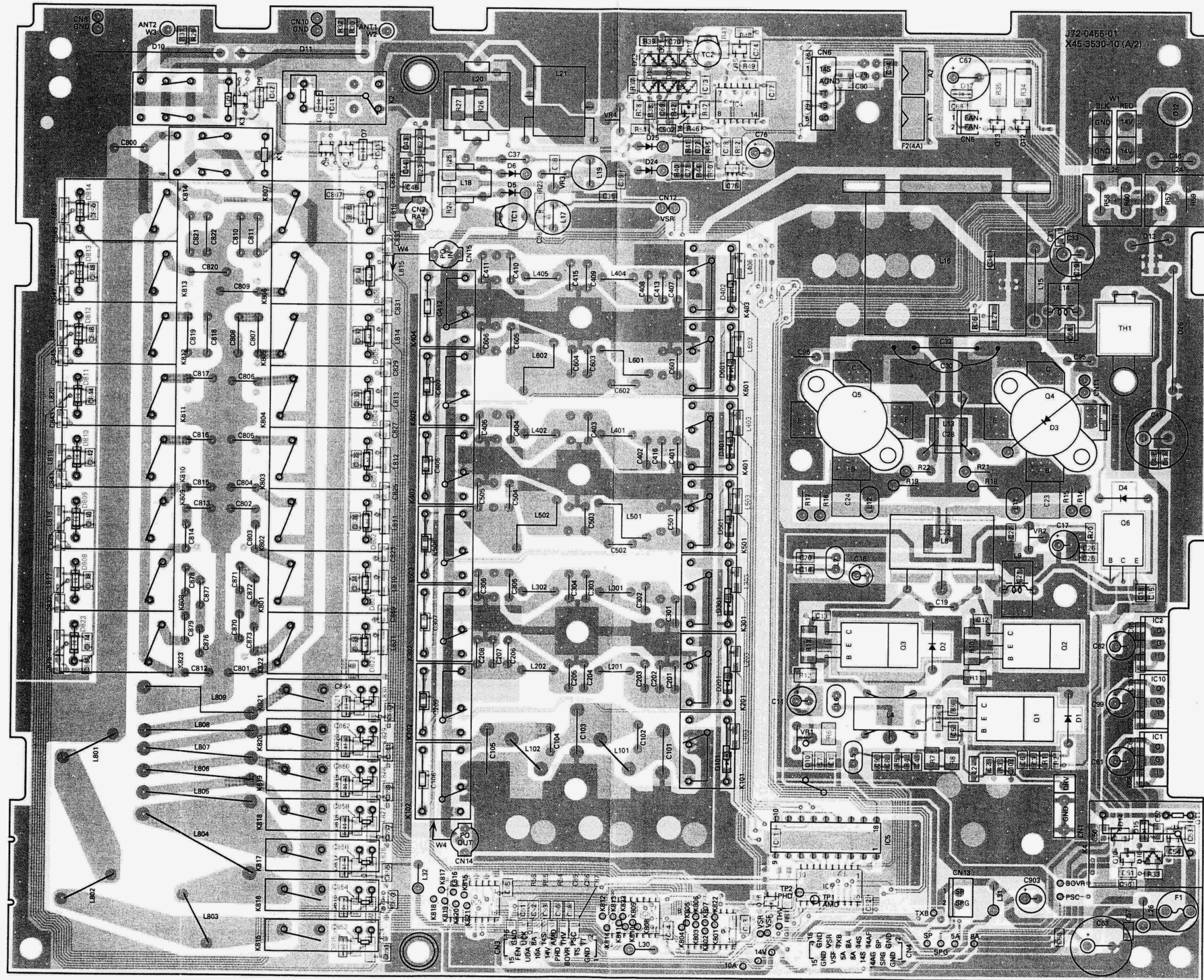


# TS-570D PC BOARD VIEWS

FINAL UNIT (X45-353X-XX) (A/2) Component side view 0-10 : K,M2 2-71 : E,E2,E3

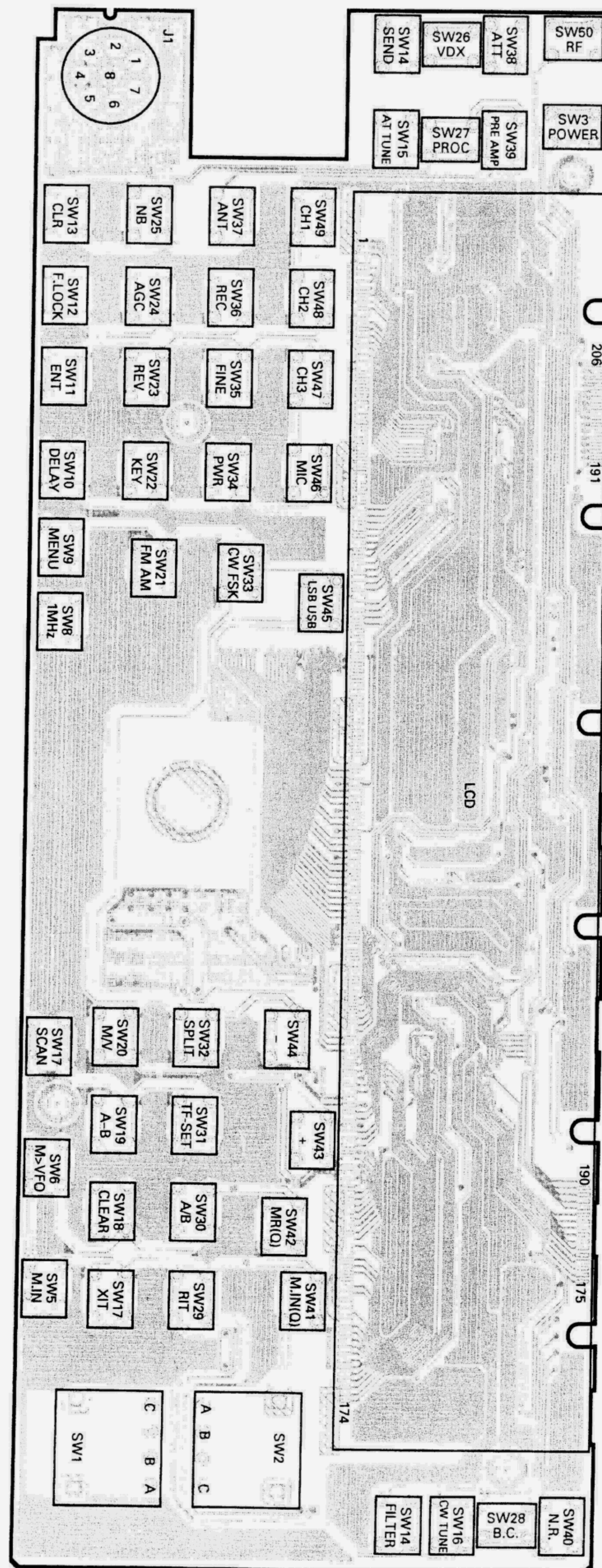


FINAL UNIT (X45-353X-XX) (A/2) Foil side view 0-10 : K,M2 2-71 : E,E2,E3

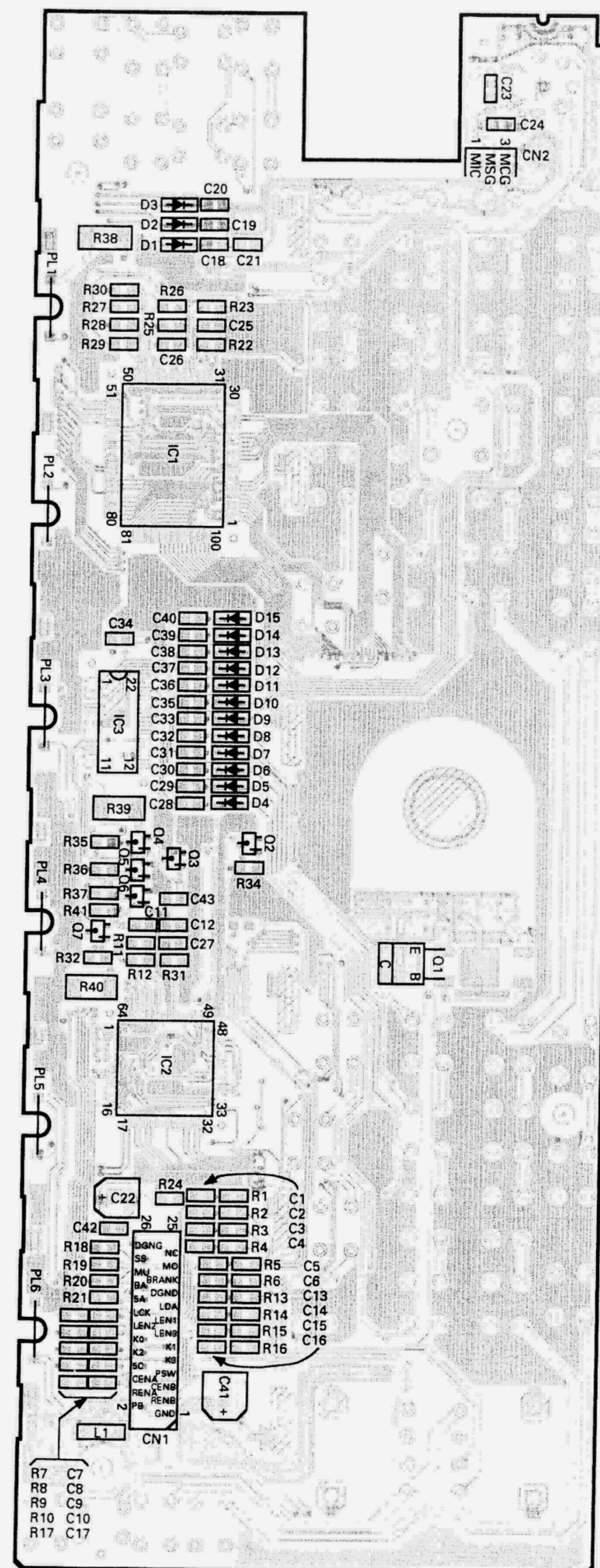


Component side  
Foil side

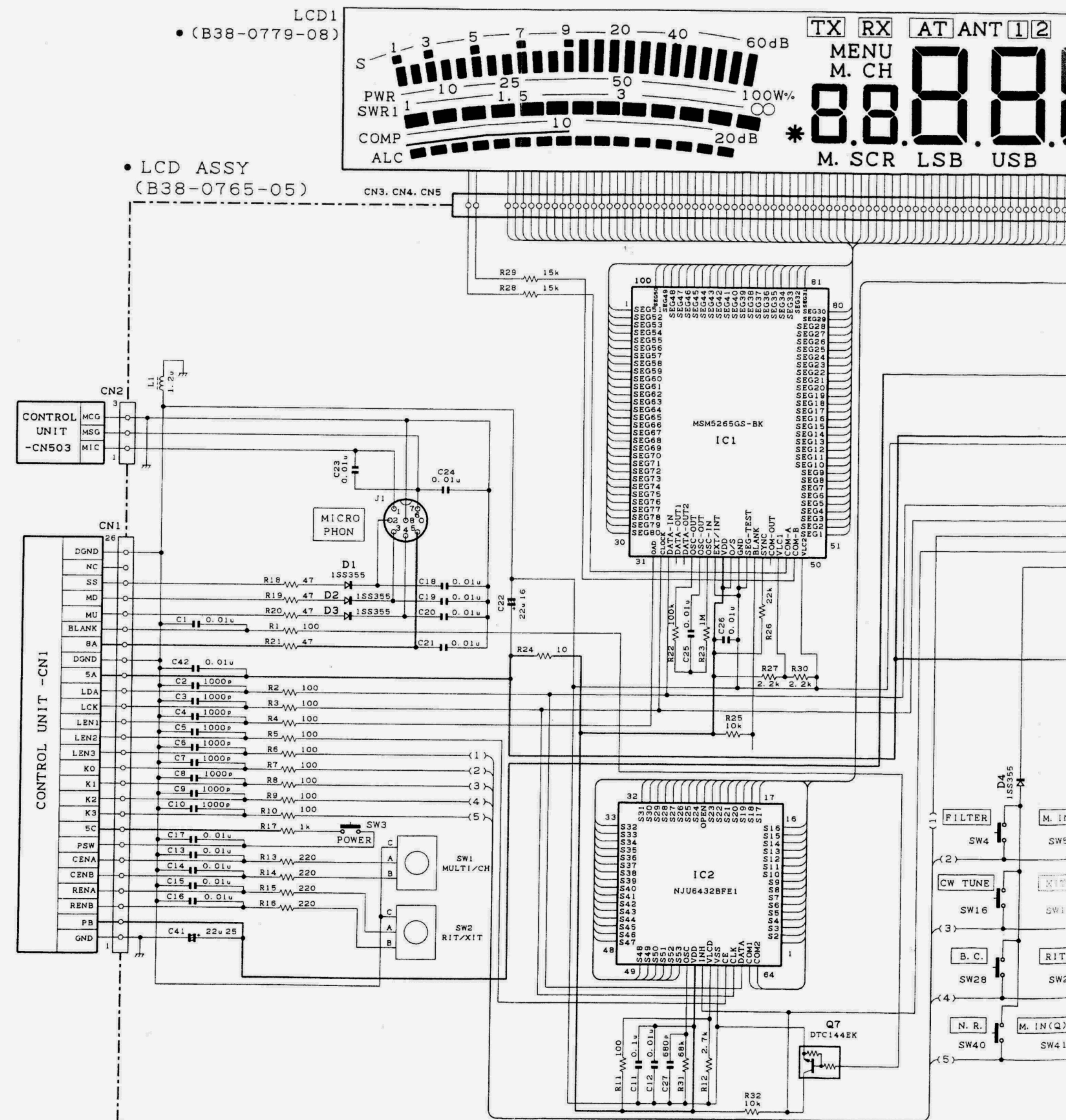
LCD ASSY (B38-0765-05)  
Component side view



LCD ASSY (B38-0765-05)  
Foil side view



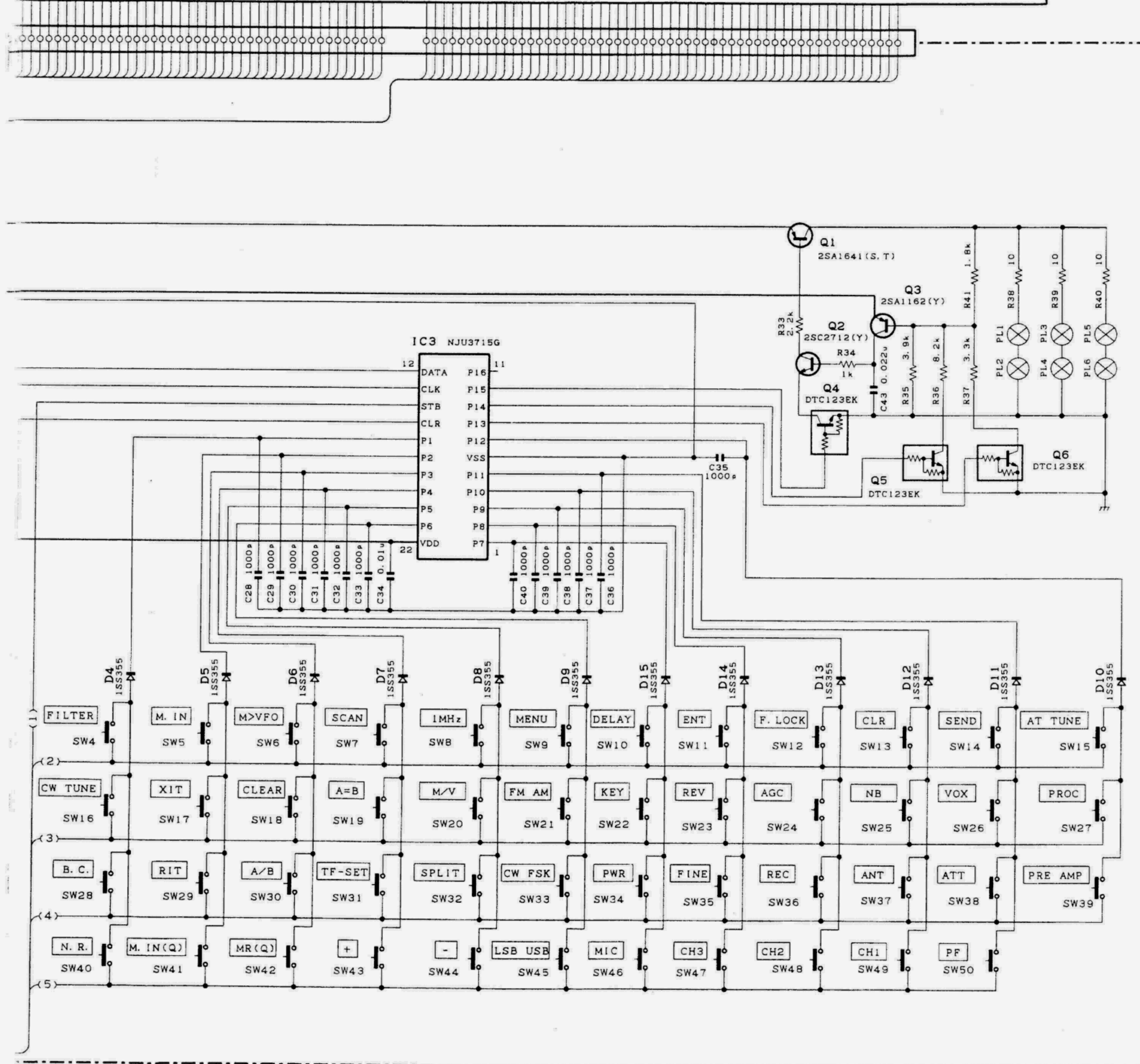
LCD ASSY (B38-0765-05)



# PC BOARD VIEWS / CIRCUIT DIAGRAM TS-570D

AT ANT 1 2 ATT PRE-AMP VOX PROC NB FAST TX EQ. N. R. 1 2  
 SPLIT RIT XIT BEAT CANCEL  
 A B M  
 LSB USB CW R FSK FM AM F. LOCK FINE 1MHz T CTCSS CTRL

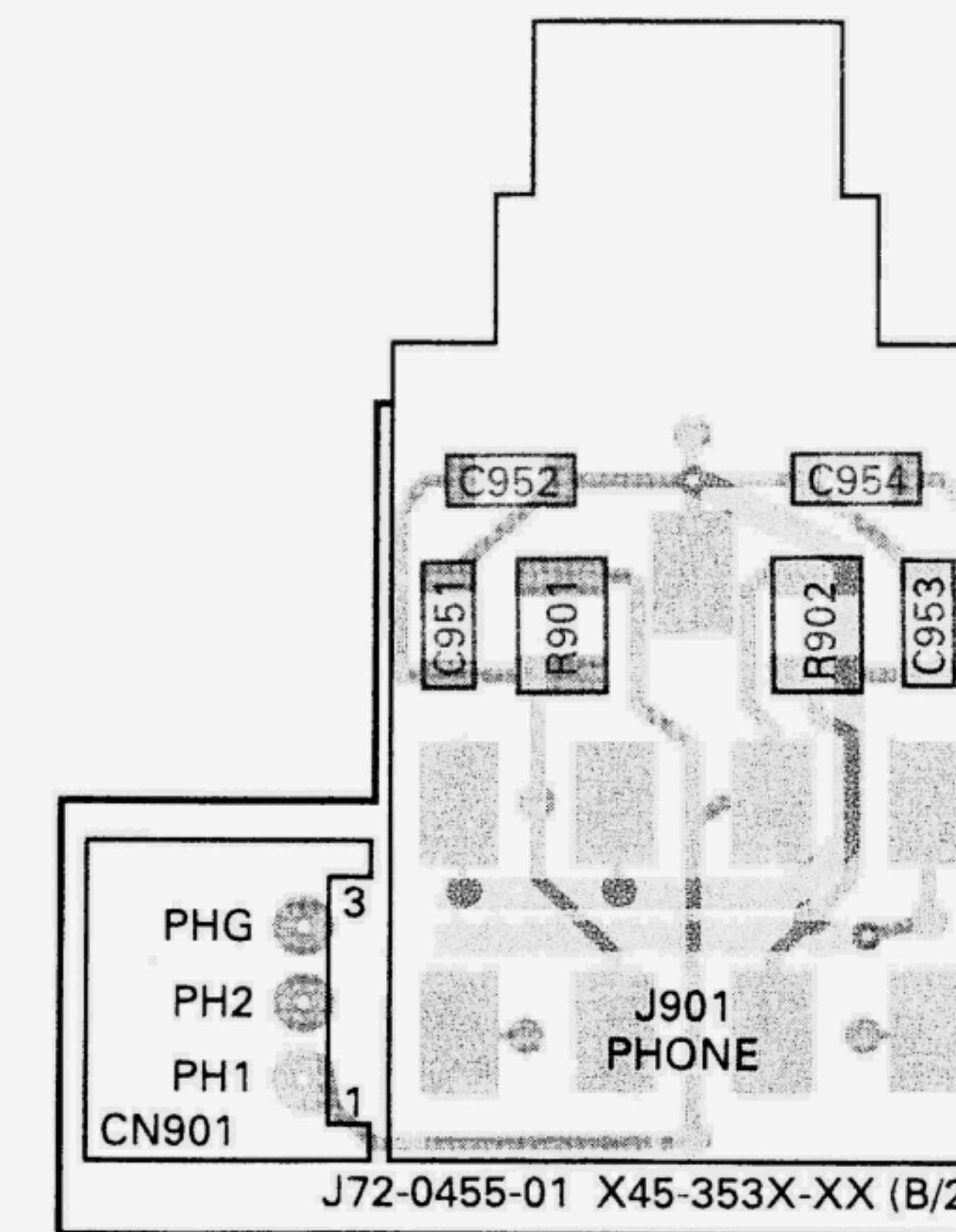
IC1 : MSM5265GS-BK  
 IC2 : NJU6432BFE1  
 IC3 : NJU3715G  
 Q1 : 2SA1641 (S, T)  
 Q2 : 2SC2712 (Y)  
 Q3 : 2SA1162 (Y)  
 Q4-6 : DTC123EK  
 Q7 : DTC144EK  
 D1-15 : 1SS3355



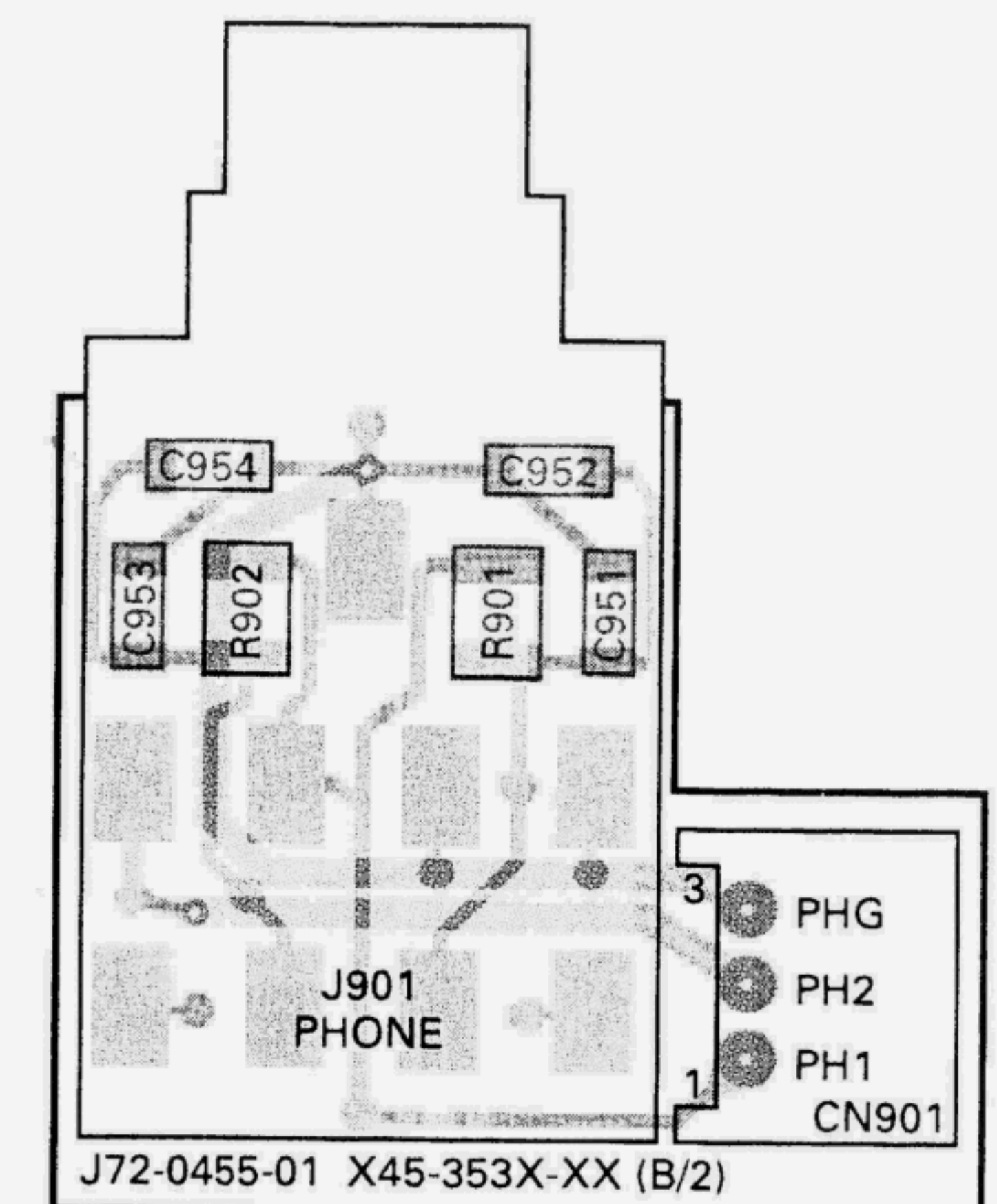
FINAL UNIT (X45-353X-XX) (B/2) : PHONE

0-10 : K,M2 2-71 : E,E2,E3

Component side view



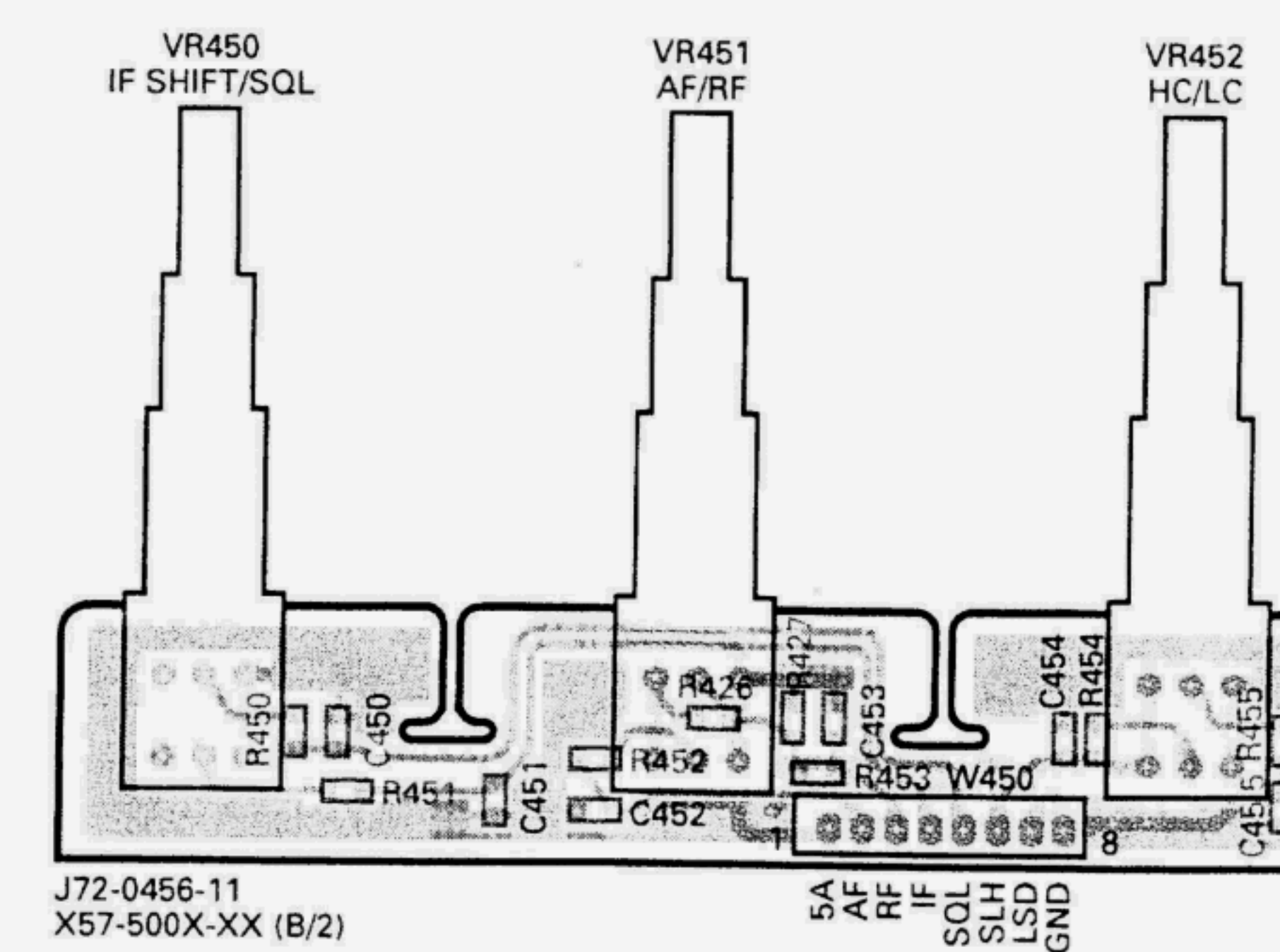
Foil side view



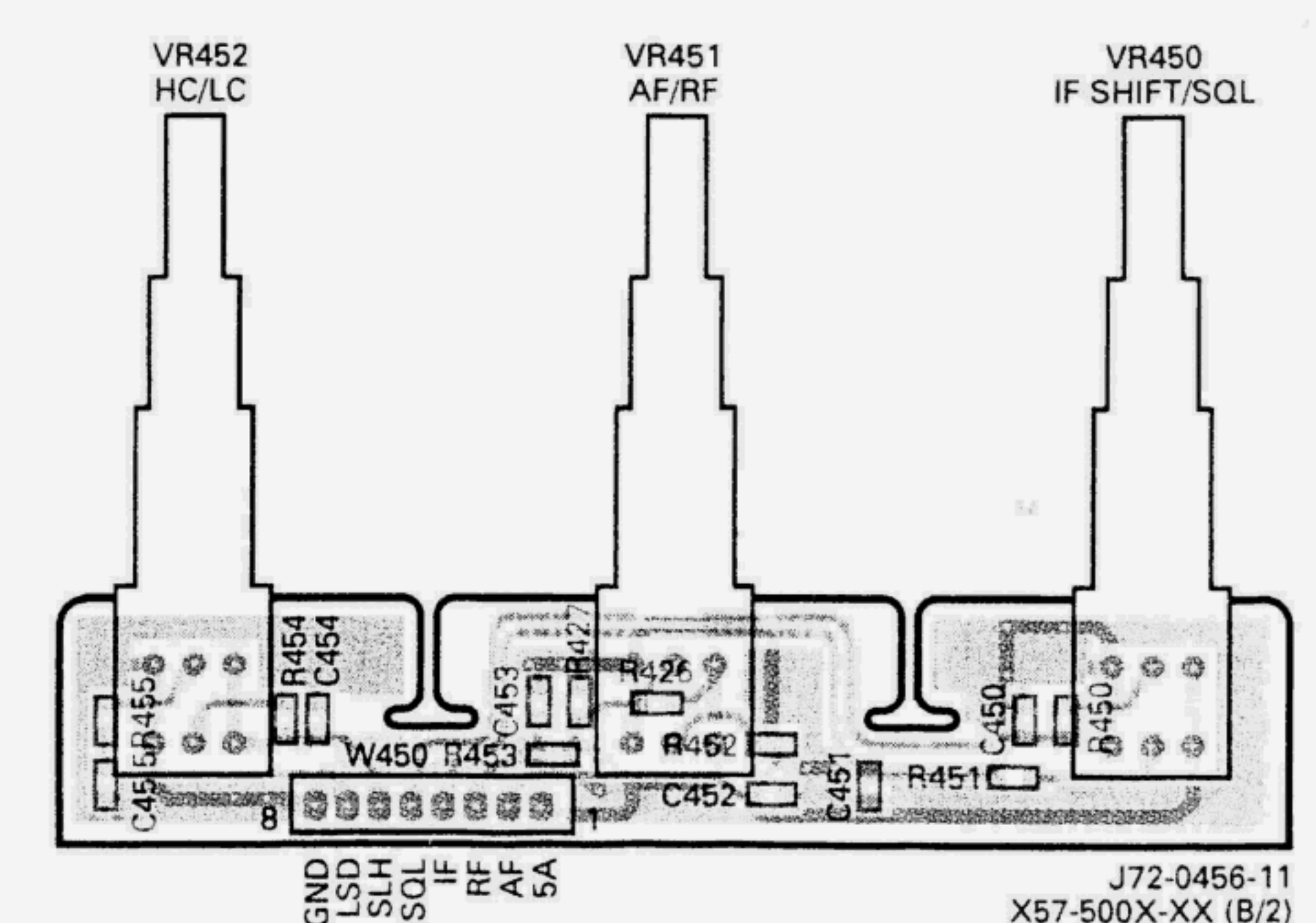
TX-RX UNIT (X57-500X-XX) (B/2) : VOLUME

0-10 : K,M2 2-71 : E,E2,E3

Component side view



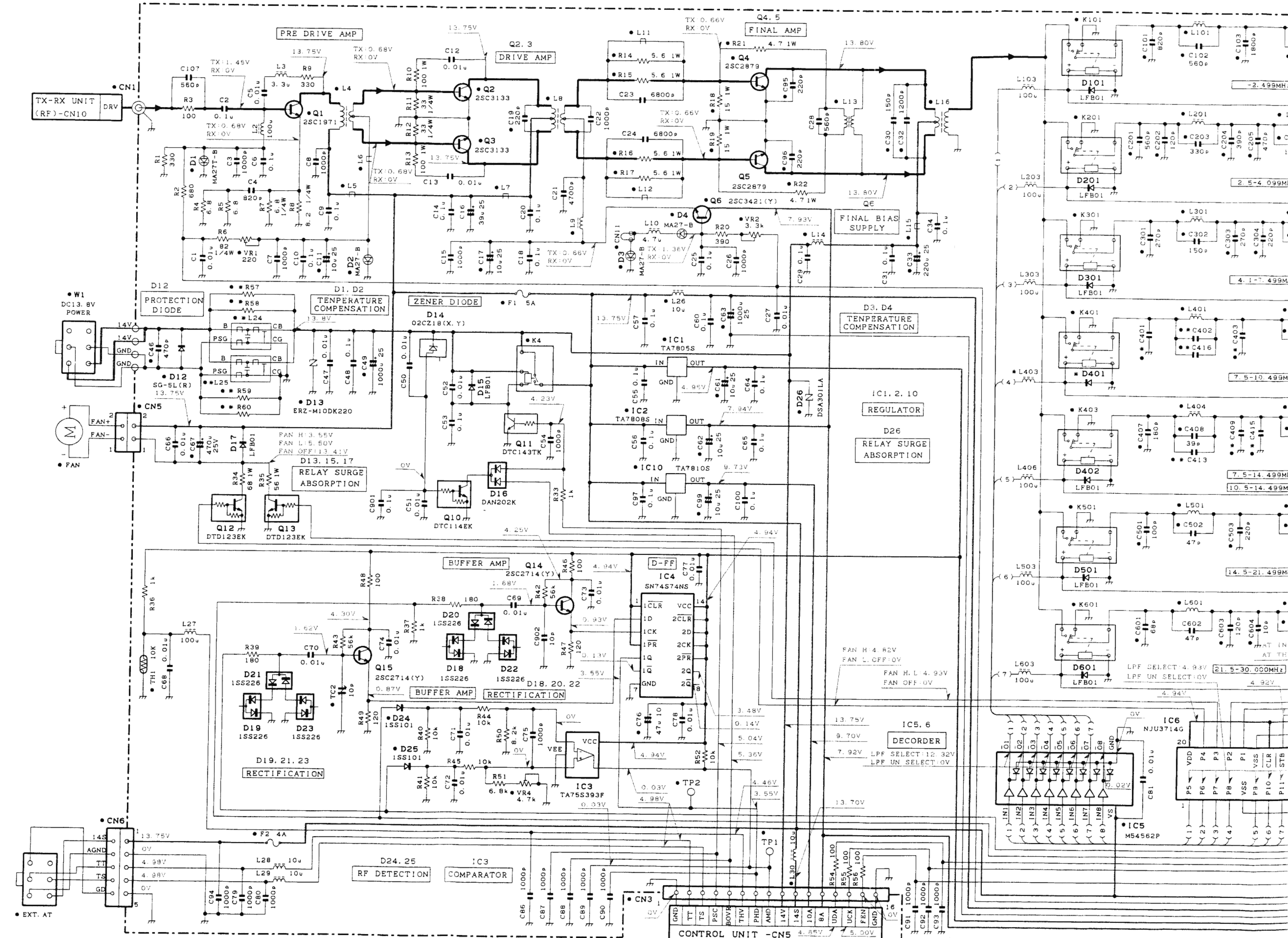
Foil side view



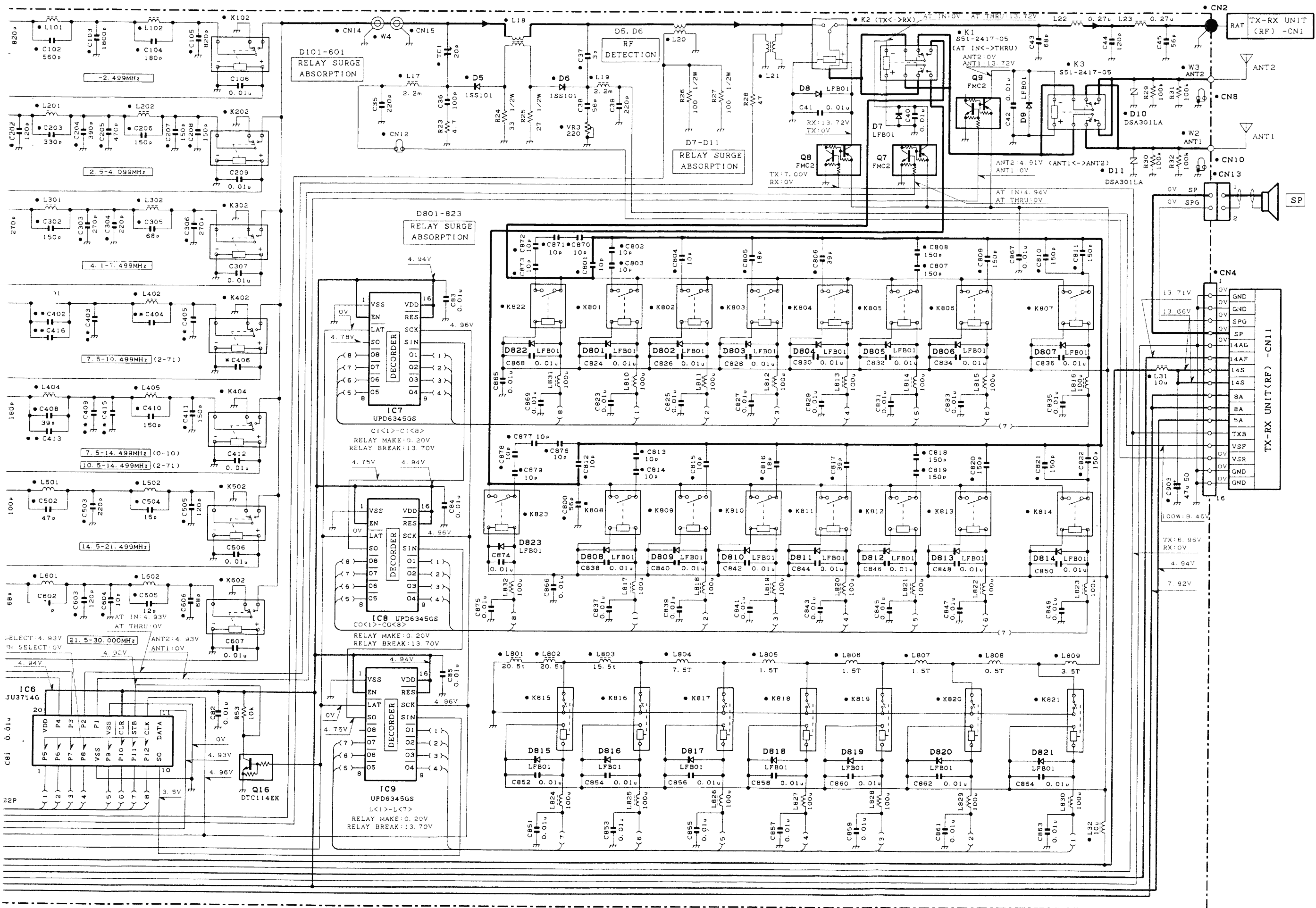
Component side  
 Foil side

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

FINAL UNIT (X45-353\*-\*\*)(A/2)

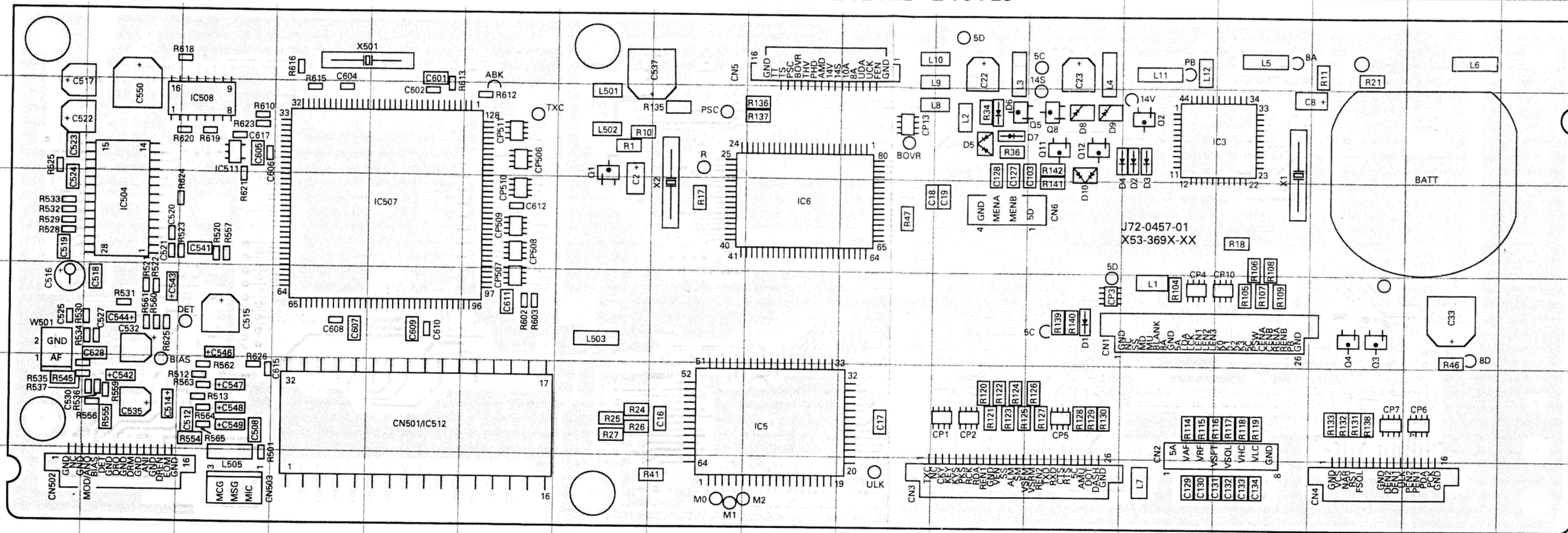


# CIRCUIT DIAGRAM TS-570D



## TS-570D PC BOARD VIEWS

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



| Ref. No. | Address | Ref. No. | Address |
|----------|---------|----------|---------|
| IC3      | 3M      | Q8       | 3L      |
| IC5      | 6I      | Q11      | 3L      |
| IC6      | 4I      | Q12      | 3L      |
| IC504    | 4B      | D1       | 5L      |
| IC507    | 4E      | D2       | 3M      |
| IC508    | 3C      | D3       | 3M      |
| IC511    | 3C      | D4       | 3M      |
| IC512    | 6E      | D5       | 3K      |
| Q1       | 3G      | D6       | 3K      |
| Q2       | 3M      | D7       | 3K      |
| Q3       | 5O      | D8       | 3L      |
| Q4       | 5O      | D9       | 3L      |
| Q5       | 3K      | D10      | 3L      |

Component side

|           |  |
|-----------|--|
| Pattern 1 |  |
| Pattern 2 |  |
| Pattern 3 |  |
| Pattern 4 |  |

Foil side

**CONT**

R5331  
R5321  
R5291  
R5281  
C516  
W501  
2 GNI  
1 AF  
R535  
R537  
CNS02

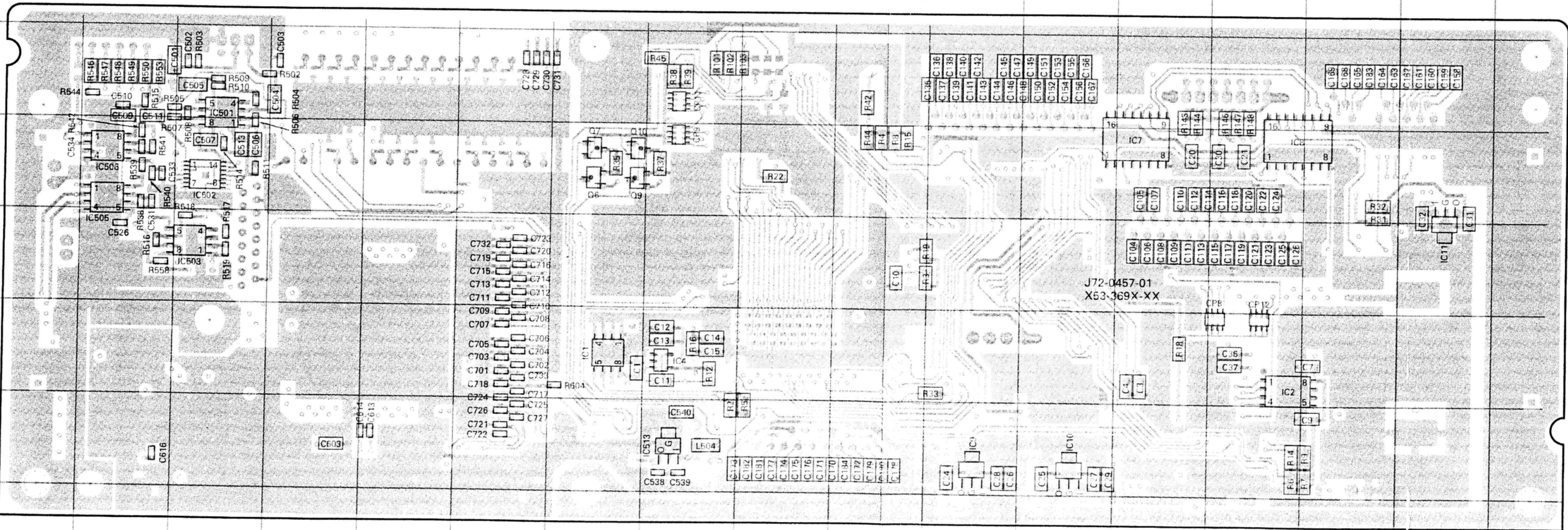
DTA  
DTA  
DTA  
DTC  
DTC  
DTC  
DTC  
DTC  
DTC  
DTD

TA7!

NJU:

95

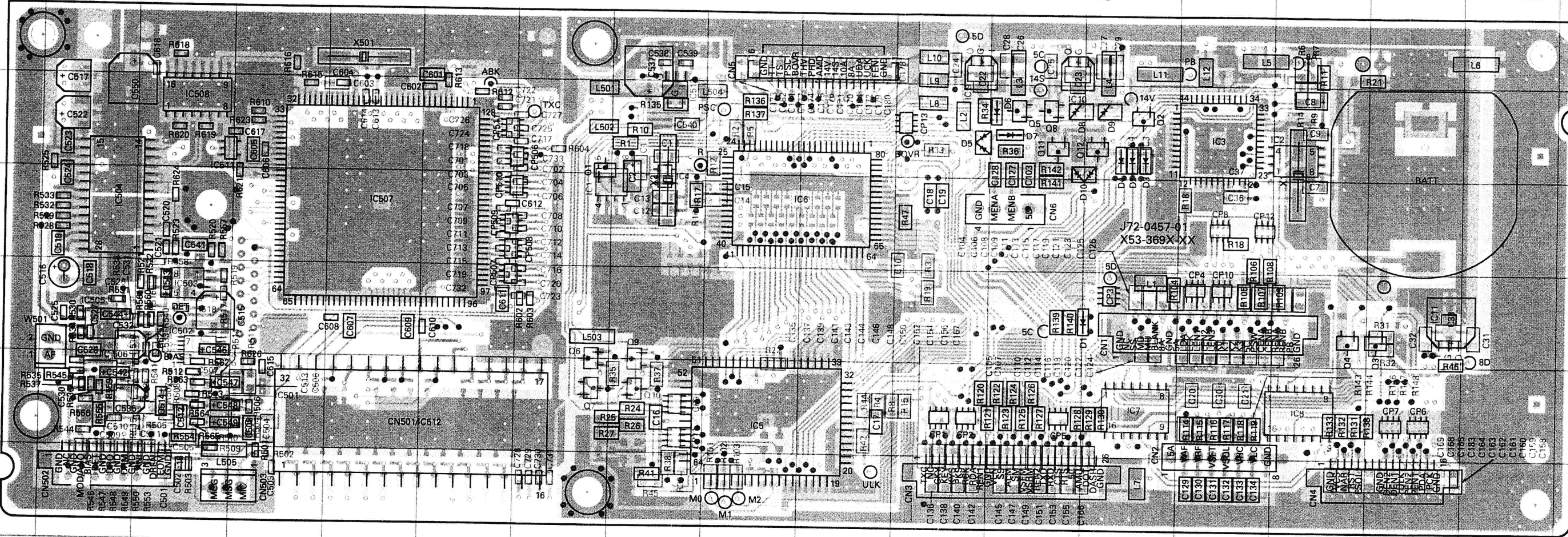
**CONTROL UNIT (X53-369X-XX) Foil side view** 0-10 : K 0-21 : M2 2-71 : E 2-72 : E2 2-73 : E3



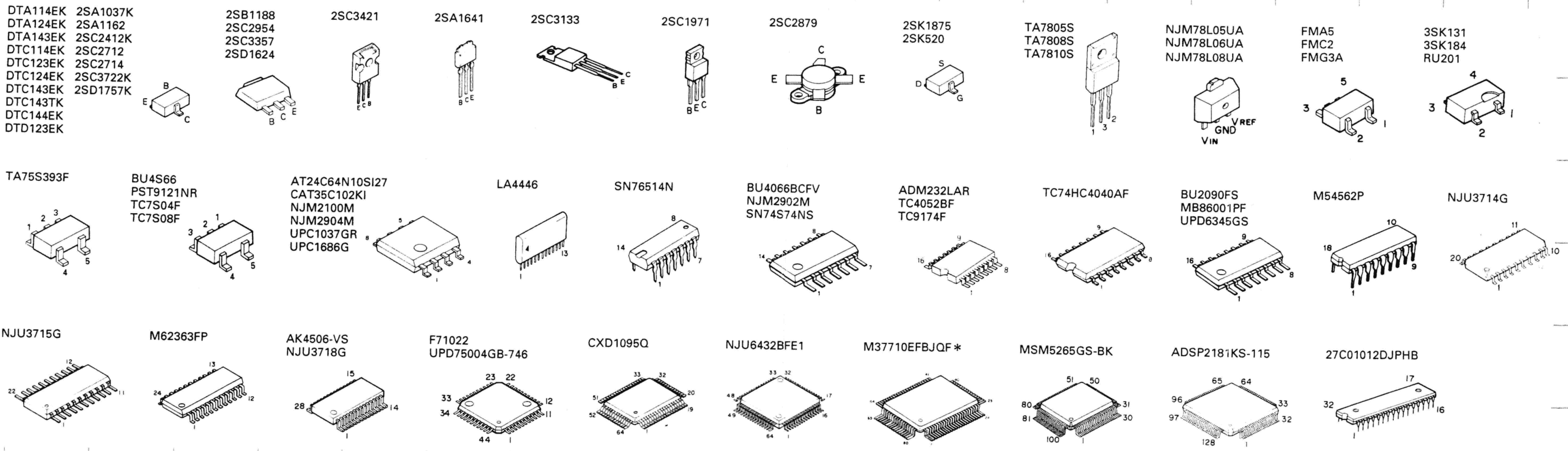
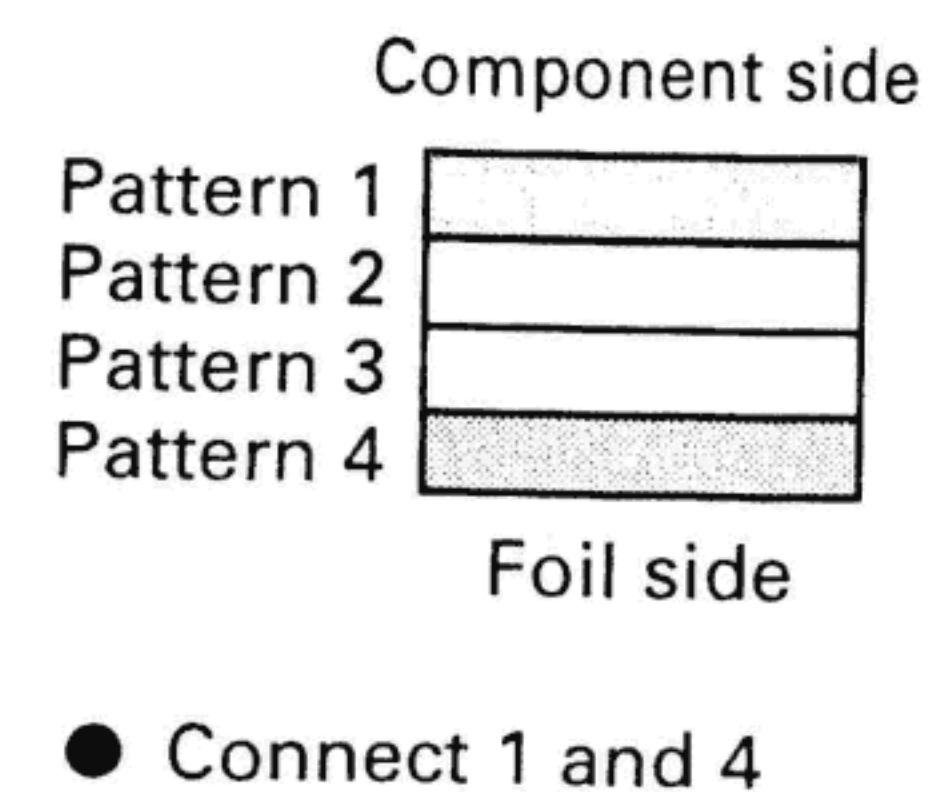
| Ref. No. | Address | Ref. No. | Address |
|----------|---------|----------|---------|
| IC1      | 12G     | IC502    | 10C     |
| IC2      | 12N     | IC503    | 11C     |
| IC4      | 12H     | IC505    | 10B     |
| IC7      | 10M     | IC506    | 10B     |
| IC8      | 10N     | IC513    | 13H     |
| IC9      | 13K     | D6       | 10G     |
| IC10     | 13L     | D7       | 10G     |
| IC11     | 11P     | D9       | 10G     |
| IC501    | 9C      | D10      | 10G     |

Diagram illustrating the cross-section of a 4-layer PCB. The layers are labeled on the left as Pattern 1, Pattern 2, Pattern 3, and Pattern 4. The top surface is labeled 'Component side' and the bottom surface is labeled 'Foil side'. Pattern 4 is shaded, indicating it is the bottom foil layer.

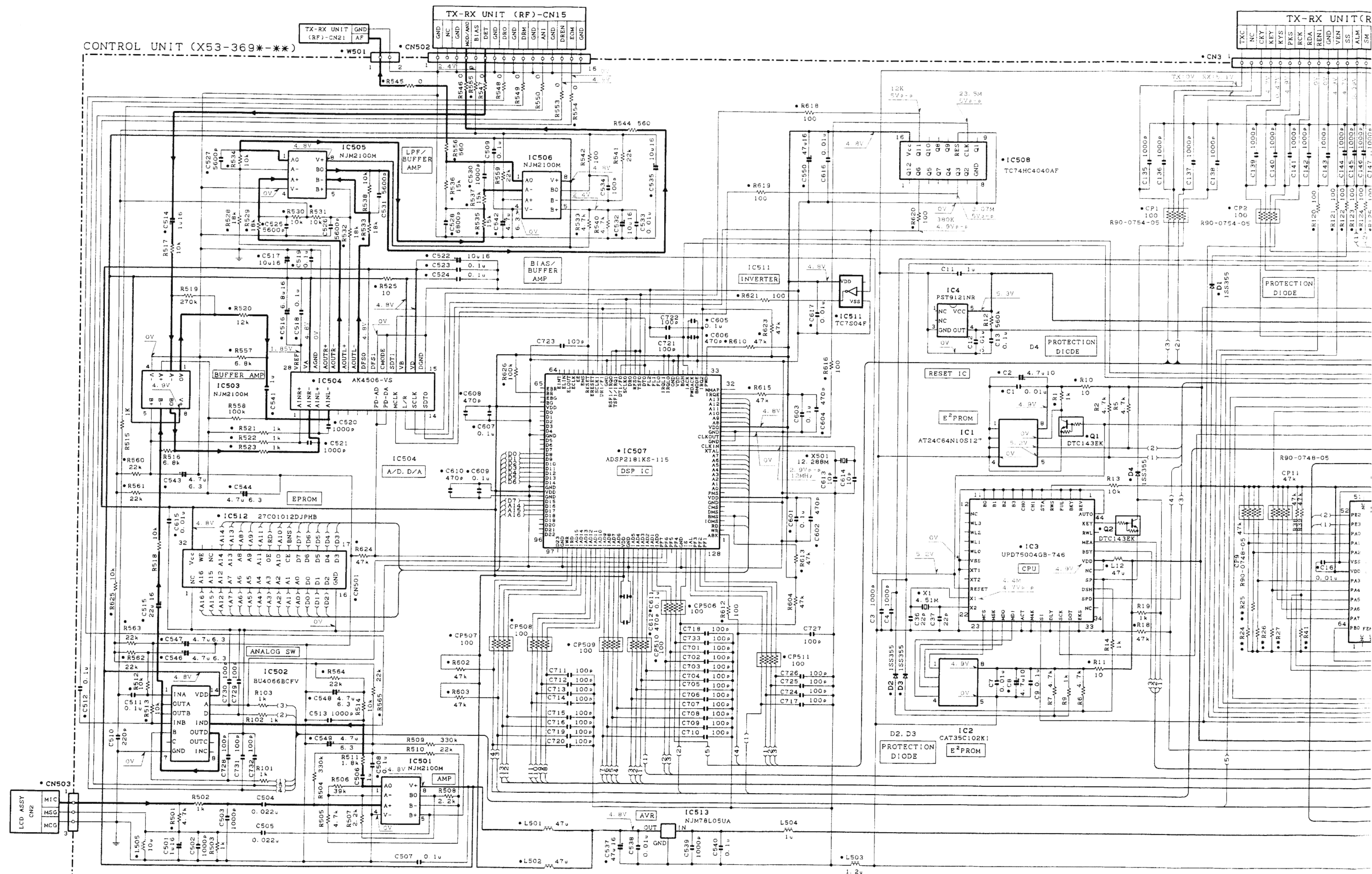
CONTROL UNIT (X53-369X-XX) Component side view + Foil side 0-10 : K 0-21 : M2 2-71 : E 2-72 : E2 2-73 : E3



| Ref. No. | Address | Ref. No. | Address |
|----------|---------|----------|---------|
| IC1      | 4Z      | Q1       | 3Z      |
| IC2      | 3AH     | Q2       | 3AF     |
| IC3      | 3AG     | Q3       | 5AI     |
| IC4      | 3AA     | Q4       | 5AH     |
| IC5      | 6AB     | Q5       | 3AE     |
| IC6      | 4AB     | Q6       | 5Z      |
| IC7      | 6AF     | Q7       | 6Z      |
| IC8      | 6AI     | Q8       | 3AE     |
| IC9      | 2AD     | Q9       | 5AA     |
| IC10     | 2AE     | Q10      | 10AA    |
| IC11     | 5AI     | Q11      | 3AE     |
| IC501    | 6V      | Q12      | 3AF     |
| IC502    | 5V      | D1       | 5AE     |
| IC503    | 5V      | D2       | 3AF     |
| IC504    | 4U      | D3       | 3AF     |
| IC505    | 5U      | D4       | 3AF     |
| IC506    | 6U      | D5       | 3AD     |
| IC507    | 4X      | D6       | 3AE     |
| IC508    | 3V      | D7       | 3AE     |
| IC511    | 3V      | D8       | 3AE     |
| IC512    | 6X      | D9       | 3AF     |
| IC513    | 3AA     | D10      | 4AE     |

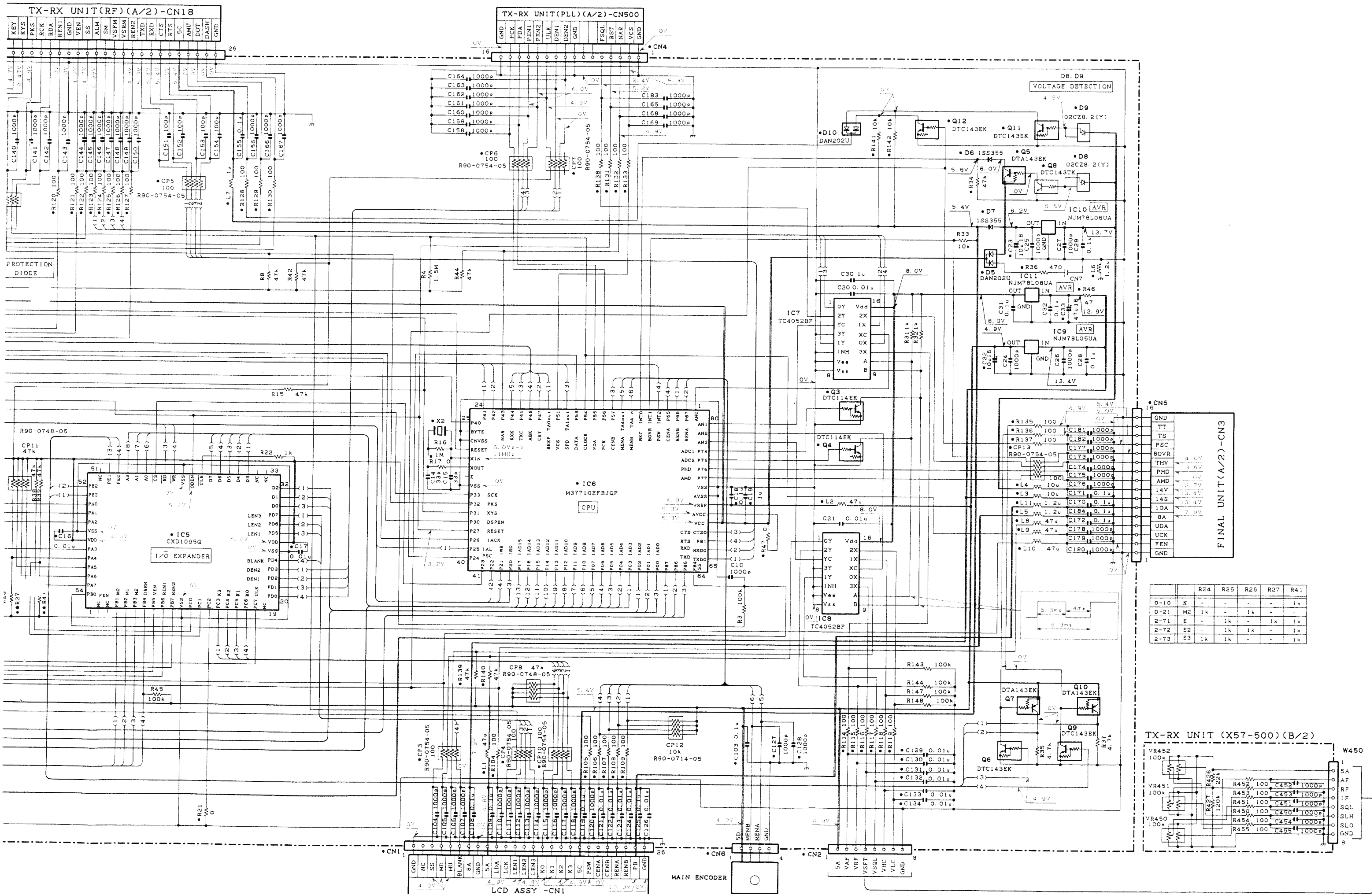


# CONTROL UNIT (X53-369X-XX) 0-10 : K 0-21 : M2 2-71 : E 2-72 : E2 2-73 : E3



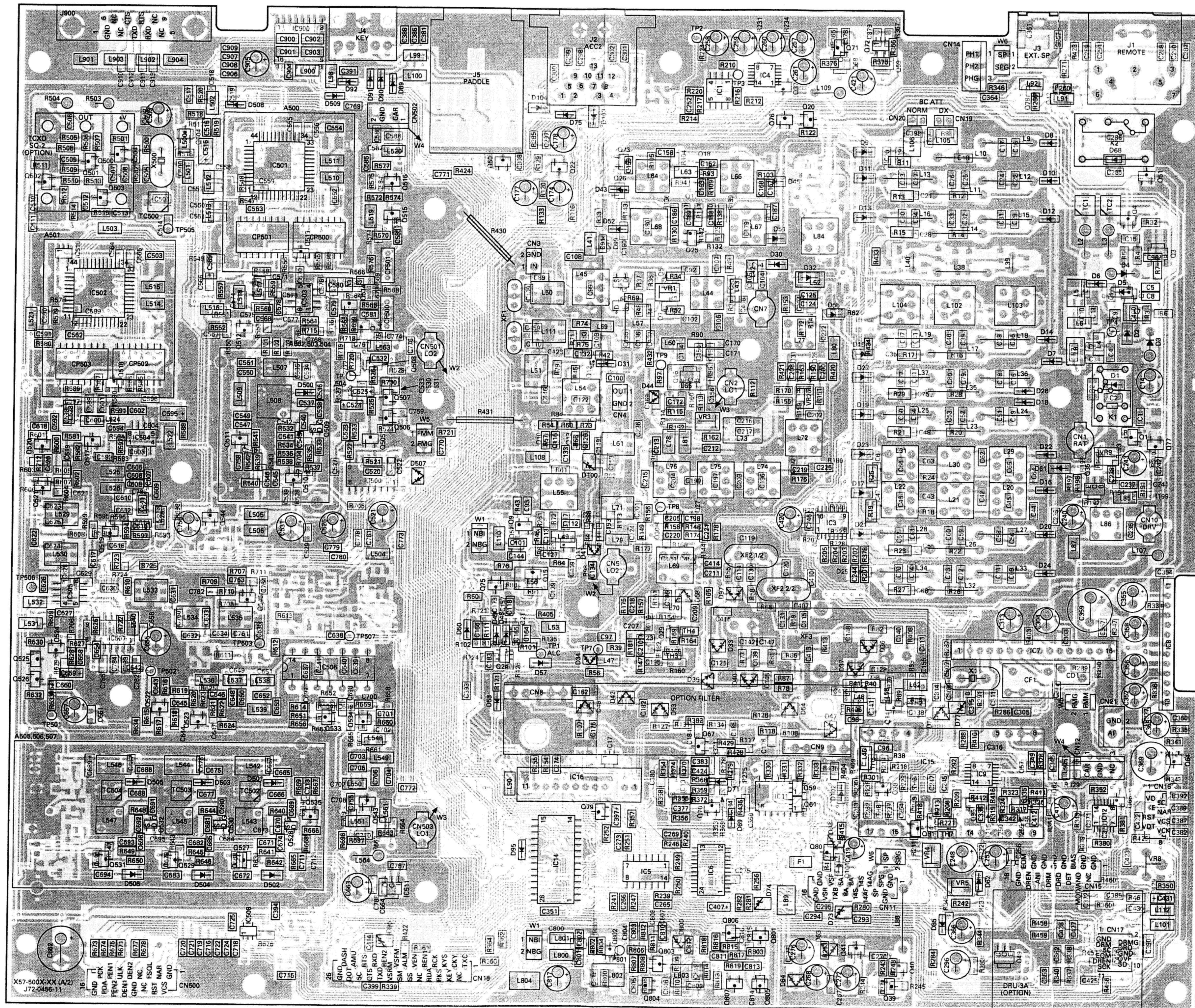
D1-4.6.7 1SS355 Q1.2.6.9.11.12 DTC143EK IC1 AT24C64N10S127 IC5 CXD1095Q IC10 NJM78L06UA IC504 AK4506-VS IC511 TC7504F  
 D5.10 DAN202U Q3.4 DTC144EK IC2 CAT35C102K1 IC6 M37710EFBJQP IC11 NJM78L08UA IC507 ADSP218KS-115 IC512 27C01012DJPHB  
 D8 02CZ8.2(Y) Q5.7.10 DTA143EK IC3 UPD75004GB-746 IC7.8 TC4052B IC501 NJM2100M IC508 TC74HC4040AF  
 D9 02CZ9.1(Y) Q8 DTC143TK IC4 PST9121NR IC9.513 NJM78L05UA IC502 BU4066BCFV

## CIRCUIT DIAGRAM TS-570D

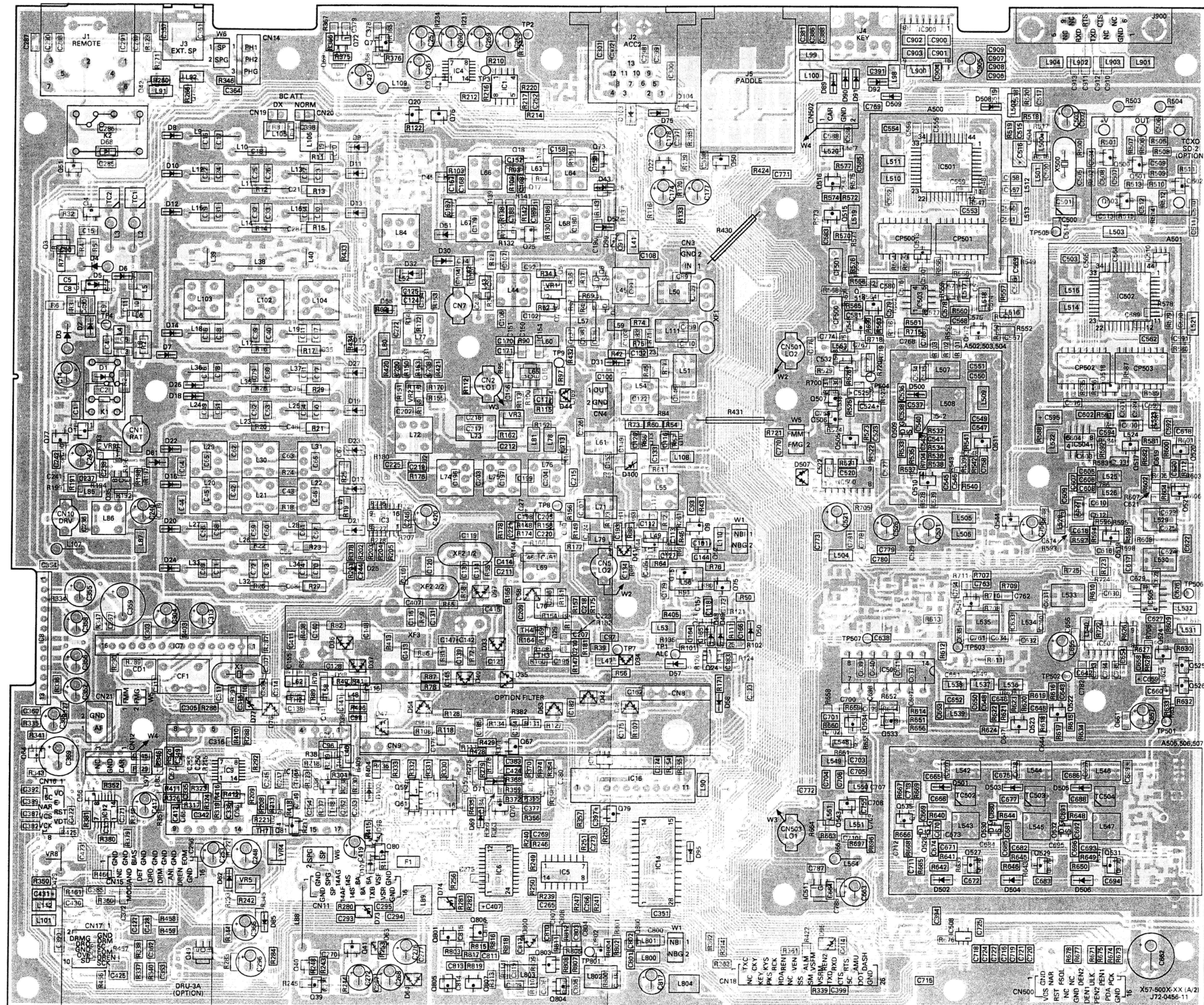


# TS-570D PC BOARD VIEWS

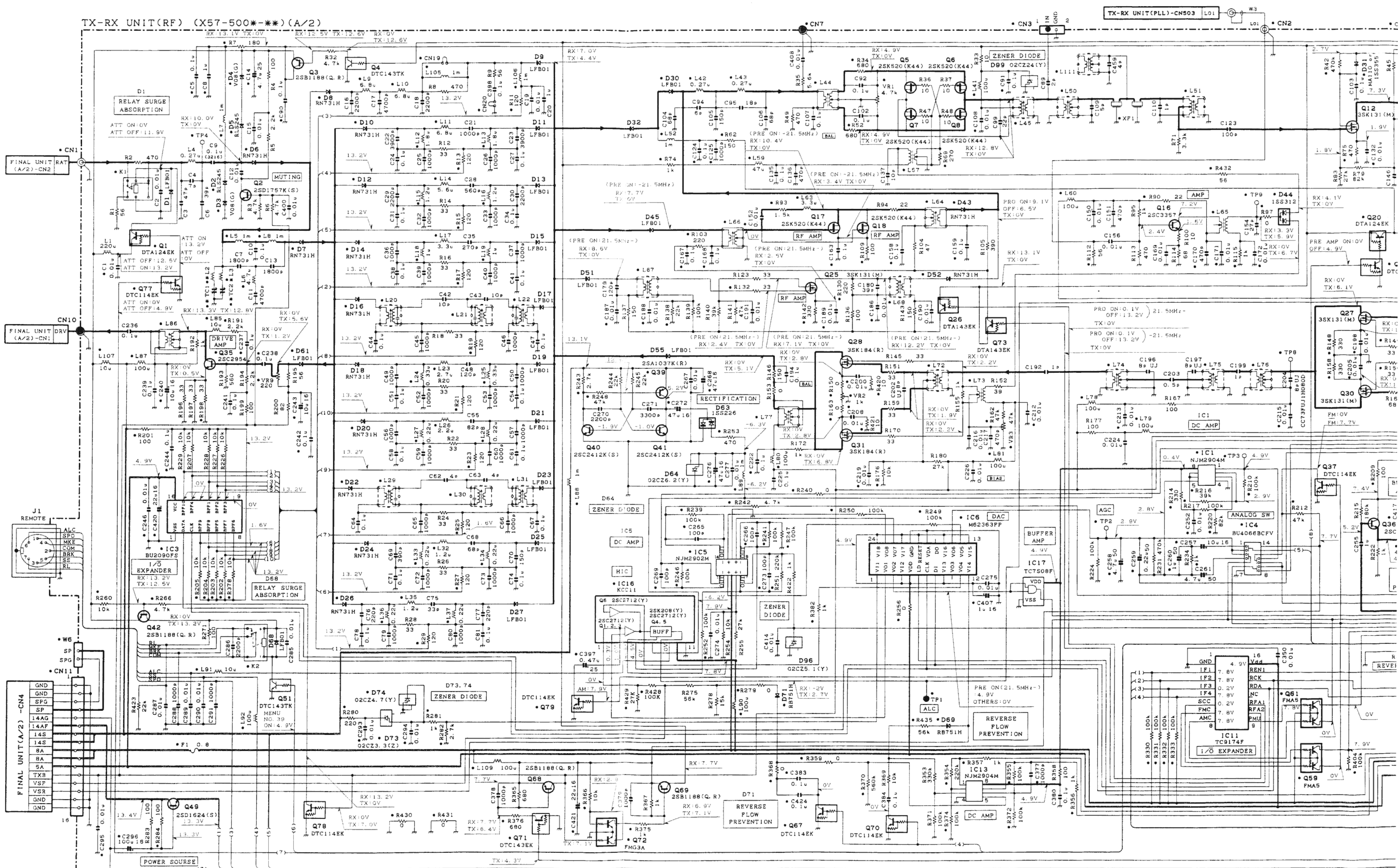
TX-RX UNIT (X57-500X-XX) (A/2) Component side view 0-10 : K,M2 2-71 : E,E2,E3



TX-RX UNIT (X57-500X-XX) (A/2) Foil side view 0-10 : K,M2 2-71 : E,E2,E3

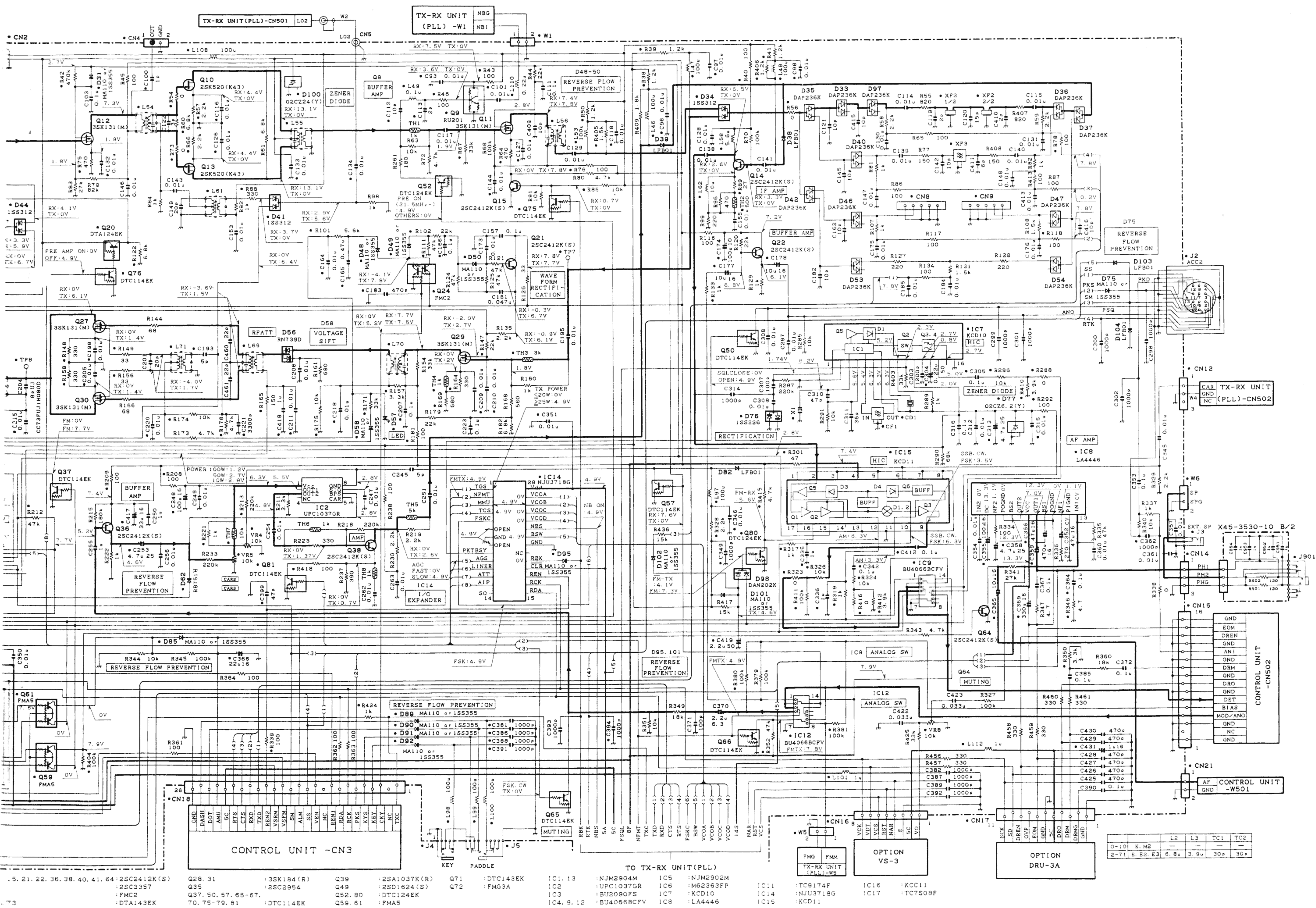


TX-RX UNIT (X57-500X-XX) : RF 0-10 : K,M2 2-71 : E,E2,E3



|                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                           |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| D1, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 30, 32, 38, 39, 45, 51, 55, 61, 68, 82, 103, 104, D2, 5, D3, 4 | D6-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 43, 52, D31, 48-50, 58, 75, 85, 89, 90-92, 95, 101, 102, D4, 1, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24, D25, D26, D27, D28, D29, D30, D31, D32, D33, D34, D35, D36, D37, D38, D39, D40, D41, D42, D43, D44, D45, D46, D47, D48, D49, D50, D51, D52, D53, D54, D55, D56, D57, D58, D59, D60, D61, D62, D63, D64, D65, D66, D67, D68, D69, D70, D71, D72, D73, D74, D75, D76, D77, D78, D79, D80, D81, D82, D83, D84, D85, D86, D87, D88, D89, D90, D91, D92, D93, D94, D95, D96, D97, D98, D99, D100, D101, D102, D103, D104, D105, D106, D107, D108, D109, D110, D111, D112, D113, D114, D115, D116, D117, D118, D119, D120, D121, D122, D123, D124, D125, D126, D127, D128, D129, D130, D131, D132, D133, D134, D135, D136, D137, D138, D139, D140, D141, D142, D143, D144, D145, D146, D147, D148, D149, D150, D151, 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D982, D983, D984, D985, D986, D987, D988, D989, D990, D991, D992, D993, D994, D995, D996, D997, D998, D999, D1000 | D1, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 30, 32, 38, 39, 45, 51, 55, 61, 68, 82, 103, 104, D2, 5, D3, 4 |
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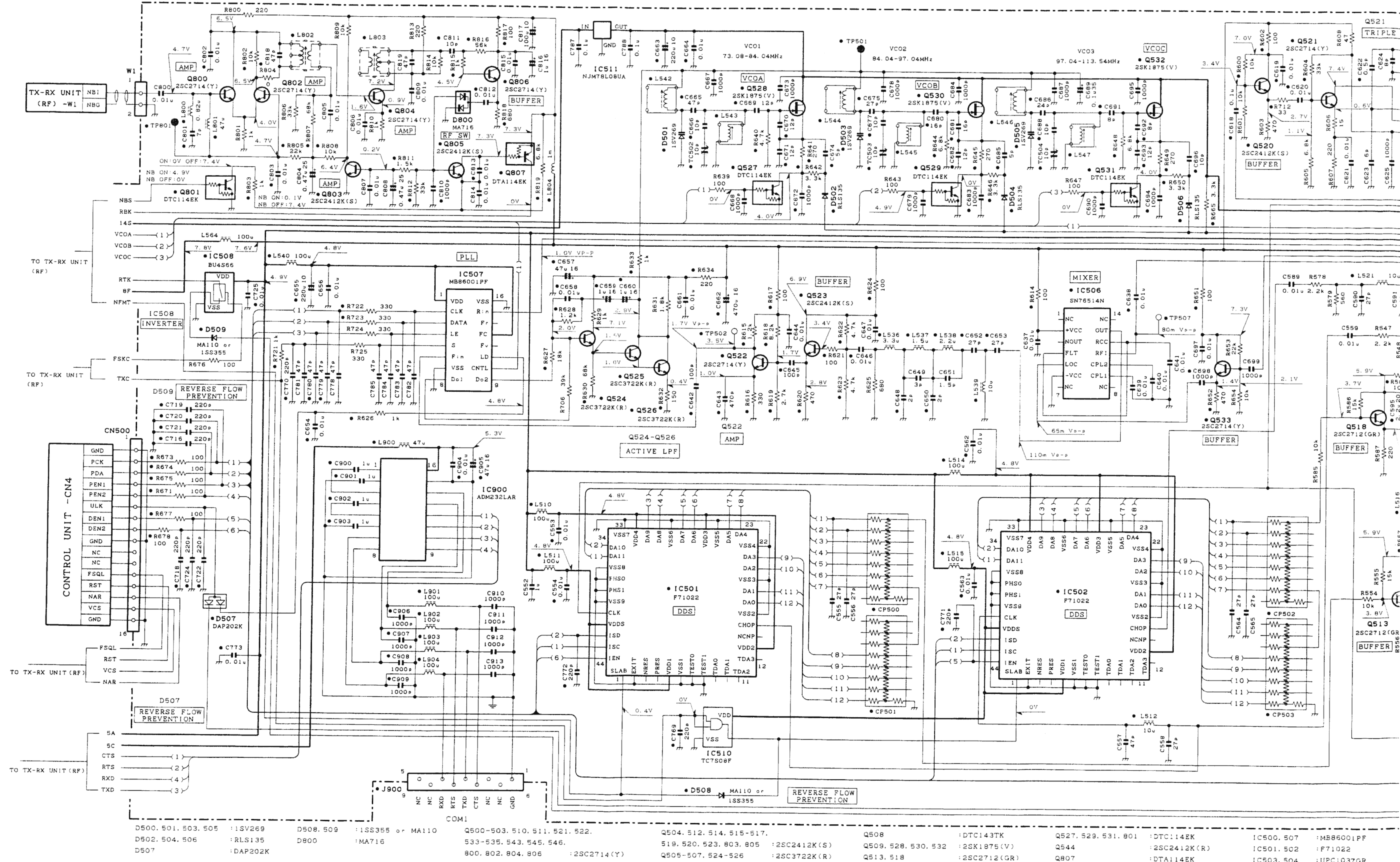
# CIRCUIT DIAGRAM TS-570D

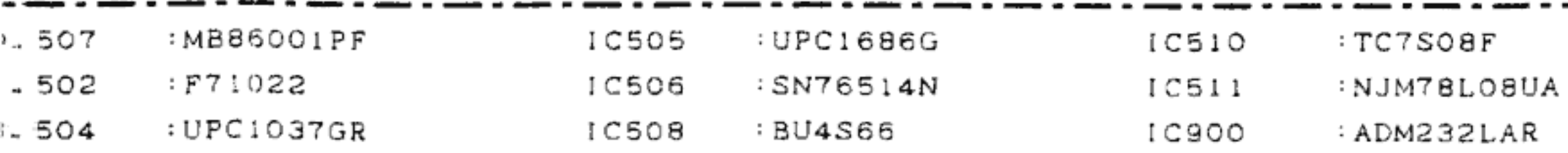


# TS-570D CIRCUIT DIAGRAM

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

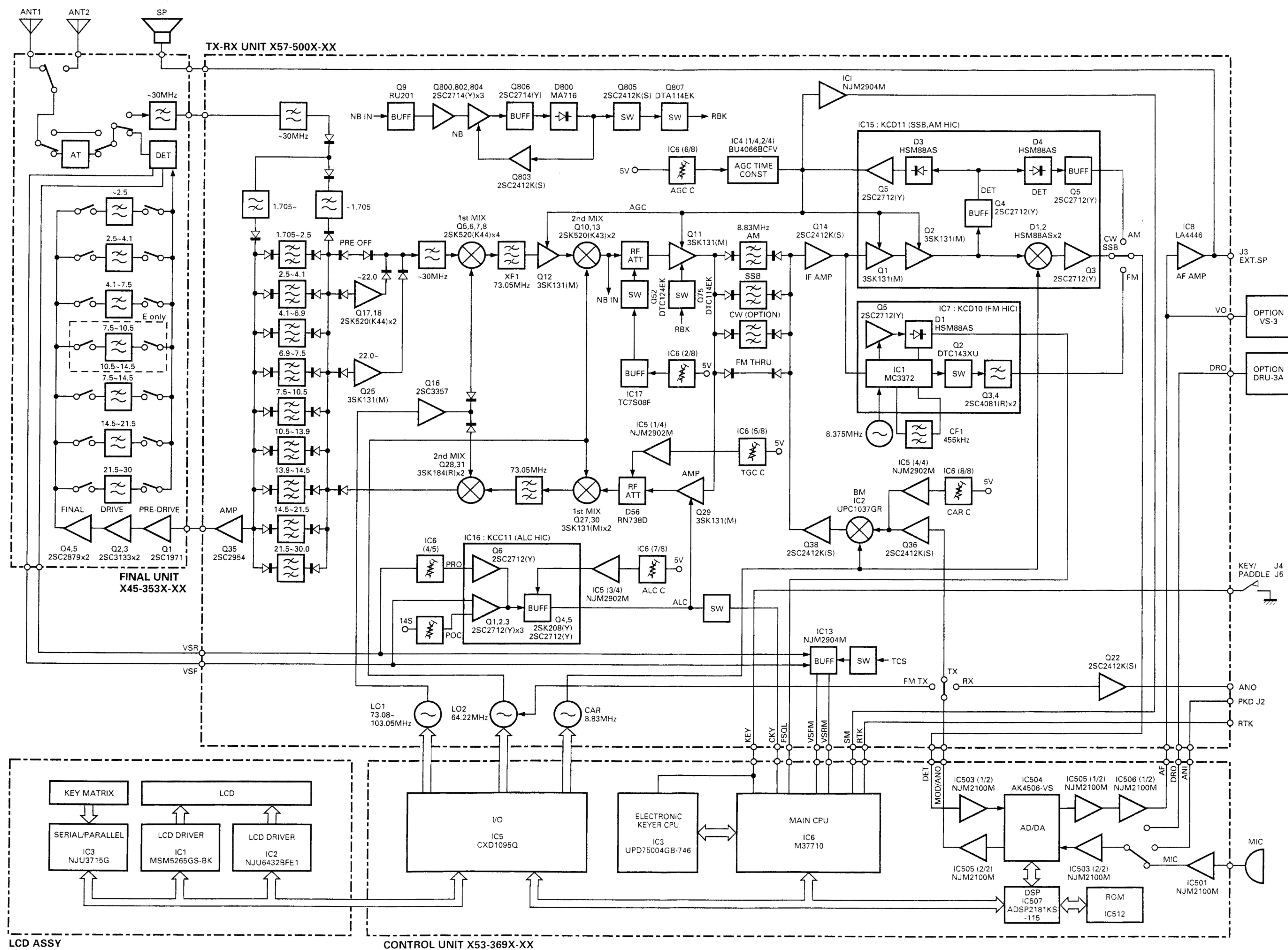
TX-RX UNIT(PLL) (X57-500\*-\*) (A/2)





# TS-570D TS-570D

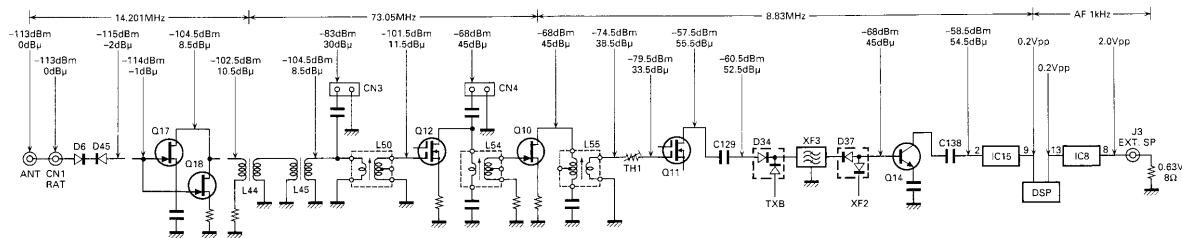
## BLOCK DIAGRAM



# TS-570D TS-570D

## LEVEL DIAGRAM

### Receiver Section

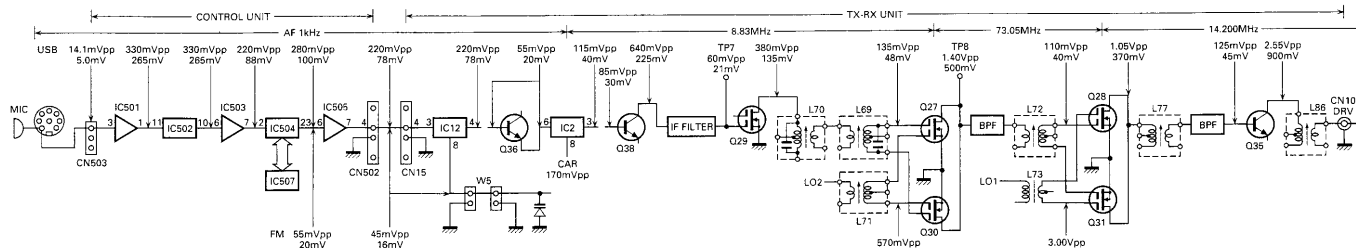


### ■ Measurement condition

Frequency : 14.200MHz  
PRE AMP : ON  
ANT input : -113dBm  
AF output : 0.63V/8 $\Omega$ , 1kHz

The figures shown are signal generator output required for a constant audio output with a constant AF gain control setting. Set the AF gain control for 0.63V/8 $\Omega$  audio output at -13dBm signal generator input at 14 201MHz. To measure signal generator output connect a 0.01 $\mu$ F capacitor between the signal generator and the check point.

### Transmitter Section



### ■ Measurement condition

MIC input : 1kHz/5mV  
PWR : 100W  
MIC level : ALC zone maximum  
Audio frequency section is measured by the AF voltmeter or Oscilloscope.  
Radio frequency section is measured by the RF voltmeter or Oscilloscope.

