

# **ROTEL***hifi*

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AM / FM STEREO RECEIVER

# **RX-950AX**

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# **TECHNICAL MANUAL**

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**THE ROTEL CO., LTD.**

1-36-8, OHOKAYAMA, MEGURO-KU, TOKYO 152, JAPAN

**ROTEL ELECTRONICS CO., LTD.**

3F-2, NO.35, FU HSING NORTH ROAD, TAIPEI, TAIWAN, REPUBLIC OF CHINA

MN20001998

# Specifications

## RX-950AX

### AMPLIFIER SECTION

Continuous Power Output...50 watts\* per channel, min.  
RMS both channels driven into  
8 ohms from 20 to 20,000 Hz  
with no more than 0.03 % total  
harmonic distortion.

DIN Power Output.....85 watts per channel (1 kHz, 4  
ohms, 1 % THD)

Total Harmonic Distortion..No more than 0.03 % (contin-  
(20 to 20kHz from CD) uous rated power output)

Intermodulation Distortion...No more than 0.03 % (contin-  
(60 Hz: 7 kHz = 4:1) uous rated power output)

Output: Speaker.....4 ohms minimum

Headphone.....8 – 2,000 ohms

Damping Factor.....100 (20 to 20,000 Hz, 8 ohms)

Input Sensitivity/ Impedance:

PHONO.....2.5 mV/ 47 kohms

CD, AV/TAPE 1,2.....150 mV/ 20 kohms

Overload Level (THD 0.5% 1 kHz):

PHONO.....200 mV

CD, AV/TAPE 1,2.....5 V

Frequency Response:

PHONO.....20 to 20,000 Hz +/- 0.3 dB  
(RIAA STD)

CD, AV/TAPE 1,2.....20 to 20,000 Hz +0 dB,- 1 dB

Tone Control:

BASS..... +/- 6.0 dB (100 Hz)

TREBLE..... +/- 6.0 dB (10 kHz)

Signal-to-Noise Ratio (IHF, A network):

PHONO.....82 dB

CD, AV/TAPE 1,2.....100 dB

### FM TUNER SECTION

Usable Sensitivity.....10.8 dBf/ 0.95 uV (75 ohms)

50 dB Quieting Sensitivity:

Mono.....14.8 dBf/ 1.5 uV (75 ohms)

Stereo.....37.2 dBf/ 20 uV (75 ohms)

Signal-to-Noise Ratio (at 65 dBf):

Mono.....80 dB

Stereo.....75 dB

Harmonic Distortion (at 65 dBf):

1 kHz.....0.07% (mono), 0.25% (stereo)

Frequency Response.....30 to 15,000 Hz +/- 1.0 dB

Capture Ratio.....1.0 dB

Alternate Channel Selectivity:

( +/- 400 kHz).....63 dB

Spurious Response Ratio...95 dB

Image Response Ratio.....45 dB

IF Response Ratio.....95 dB

AM Suppression Ratio.....58 dB

Stereo Separation:

100 Hz/1 kHz/10 kHz.....43 dB/ 46 dB/ 38 dB

Subcarrier Product Ratio...60 dB

Antenna Input.....75 ohms unbalanced

### AM TUNER SECTION

Sensitivity.....350 uV/ m

Selectivity.....35 dB

Signal-to-Noise Ratio.....55 dB

Image Response Ratio.....40 dB

IF Response Ratio.....60 dB

Antenna.....Loop Antenna

### MISCELLANEOUS

Power Requirement.....120 V/ 60 Hz, 220 V/ 50 Hz,  
240 V/ 50 Hz (dependinh on  
destinations)

Power Consumption.....280 watts

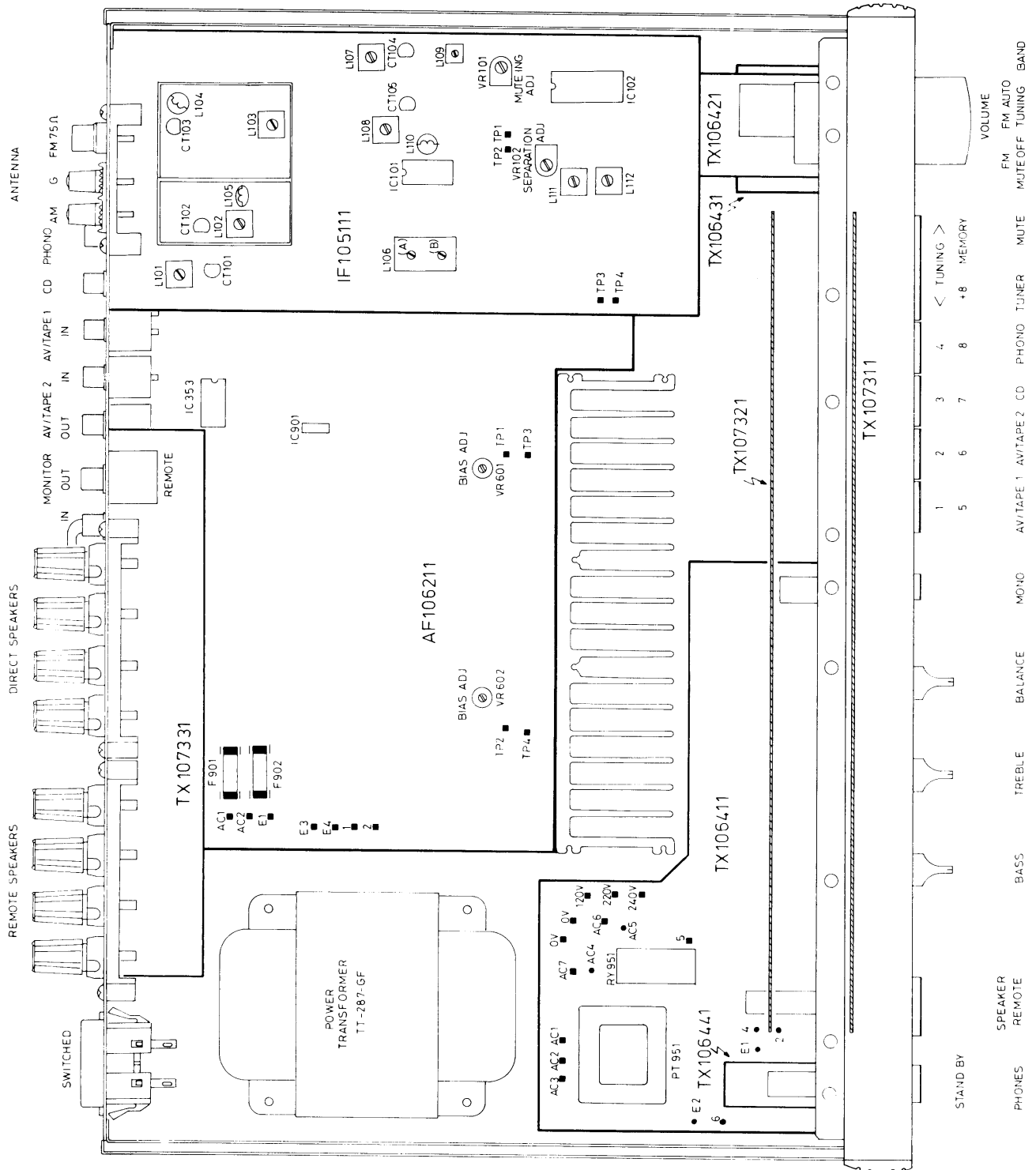
Dimension (overall).....440 (W) x 121 (H) x 340 (D)mm  
17-3/8" x 4-13/16" x 13-3/8"

Weight (net).....9.0 kg/ 19.8 lbs

● Specifications and design subject to possible modifica-  
tion without notice.

● \*Measured pursuant to the Federal Trade Commis-  
sion's Trade Regulation Rule or, Power Claims for  
Amplifiers (applicable to the U.S.A. only).

# Chassis Layout



## FM IF and RF Alignment

Instruments: FM Signal Generator (400Hz,100% Modulated), THD Analyzer, Oscilloscope, AC VTVM, DC Voltmeter, Tuning Meter.

Terminated : DC Voltmeter---Between TP3 and TP4 on IF-105111 P.C.B.

Tuning Meter---Between TP1 and TP2 on IF-105111 P.C.B.

| Step | Generator                                                                   |           | Tuning Dial Setting | Adjust       | Adjust for                                           |
|------|-----------------------------------------------------------------------------|-----------|---------------------|--------------|------------------------------------------------------|
|      | Coupling                                                                    | Frequency |                     |              |                                                      |
| 1    | No use                                                                      |           | 87.5 MHz            | L104         | 1.6V +/- 0.1 reading on DC Voltmeter                 |
| 2    |                                                                             |           | 108 MHz             | CT103        | 9V +/- 0.2V reading on DC Voltmeter                  |
| 3    | Repeat steps 1 and 2 unit no further improvement is noticed.                |           |                     |              |                                                      |
| 4    | Antenna terminal                                                            | 90 MHz    | 90 MHz              | L101,102     | Maximum reading on AC VTVM.                          |
| 5    |                                                                             |           |                     | L103         | Adjusting balance of wave form                       |
| 6    |                                                                             | 105 MHz   | 105 MHz             | CT101, CT102 | Maximum reading on AC VTVM.                          |
| 7    | Repeat steps 4,5 and 6 unit no further improvement is noticed. (Muting OFF) |           |                     |              |                                                      |
| 8    | Antenna terminal 1mV input                                                  | 90 MHz    | 90 MHz              | L106(A)      | Adjust center on Tuning Meter                        |
| 9    |                                                                             |           |                     | L106(B)      | Minimum reading on THD Analyzer                      |
| 10   | Repeat steps 8 and 9 unit no further improvement is noticed (Muting OFF)    |           |                     |              |                                                      |
| 11   | Antenna terminal 5uV input                                                  | 90 MHz    | 90 MHz              | VR101        | Muting Level (Muting ON)                             |
| 12   | Antenna terminal 1mV input                                                  | 90 MHz    | 90 MHz              | VR231        | Signal Indicator Level 3th LED light On (Muting OFF) |

## FM MPX Alignment

Instruments: FM Stereo Generator, AC VTVM, Oscilloscope,  
Frequency Countor, and THD Analyzer.

| Step | Generator                     |                                            | Tuning Dial Setting | Adjust | Adjust for      |
|------|-------------------------------|--------------------------------------------|---------------------|--------|-----------------|
|      | Coupling                      | Frequency                                  |                     |        |                 |
| 1    | Antenna terminal<br>1mV input | 98 MHz<br>Pilot--10%<br>1 kHz--90%<br>Mod. | 98 MHz              | VR102  | Beas separation |

## MW IF and RF Alignment

Instruments: AM Signal Generator (400Hz,30% Modulated), AC VTVM,  
Oscilloscope, DC Voltmeter.

Terminated : DC Voltmeter---Between TP3 and TP4(E) on IF-105111 P.C.B.

| Step | Generator                                                    |           | Tuning Dial Setting             | Adjust | Adjust for                           |
|------|--------------------------------------------------------------|-----------|---------------------------------|--------|--------------------------------------|
|      | Coupling                                                     | Frequency |                                 |        |                                      |
| 1    | No use                                                       |           | 530 kHz<br>(531 kHz)<br>Europe  | L108   | About 1.5V+/-0.1V<br>on DC Voltmeter |
| 2    |                                                              |           | 1600 kHz<br>(1602kHz)<br>Europe | CT105  | About 10V+/-0.2V<br>on DC Voltmeter  |
| 3    | Repeat steps 1 and 2 unit no further improvement is noticed. |           |                                 |        |                                      |
| 4    | Test loop<br>radiate<br>signal<br>into loop<br>antenna       | 450 kHz   | 530 kHz                         | L109   | Maximum reading<br>on AC VTVM.       |
| 5    |                                                              | 600 kHz   | 600 kHz                         | L107   |                                      |
| 6    |                                                              | 1400 kHz  | 1400 kHz                        | CT104  |                                      |
| 7    | Repeat steps 4 to 6 unit no further improvement is noticed.  |           |                                 |        |                                      |

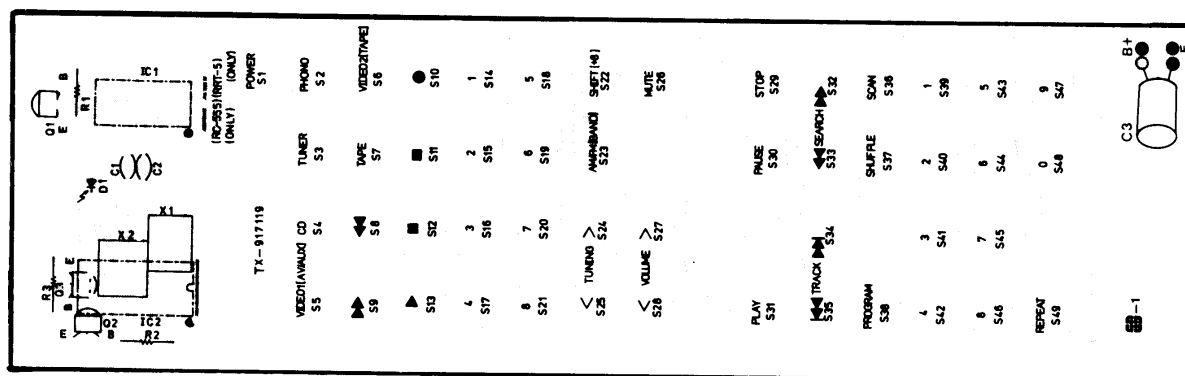
## Power Amplifier Bias Adjustment

Instruments: DC milli-voltmeter

Notes: Prior to Bias Adjustment, run about 5 minutes with rated output (8 ohm) and warm up Power Transistor and Heat Sink.  
Set Volume control to minimum.

| Step | Coupling  |            | Adjust | Adjust for                     |
|------|-----------|------------|--------|--------------------------------|
|      | Plus Lead | Minus Lead |        |                                |
| 1    | TP3       | TP1        | VR601  | DC milli-voltmeter reads 2.5mV |
| 2    | TP4       | TP2        | VR602  |                                |

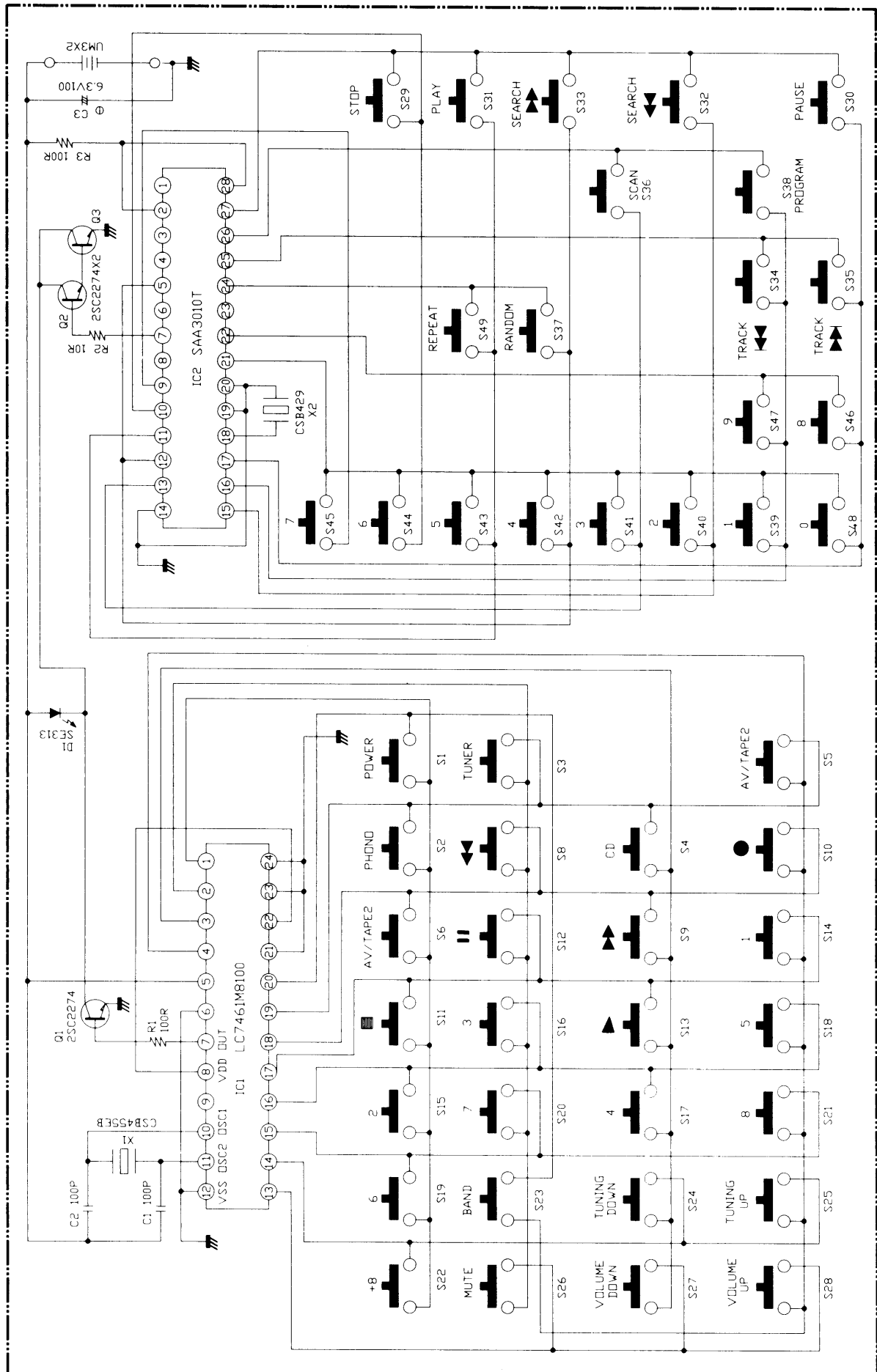
## REMOTE CONTROL HANDSET



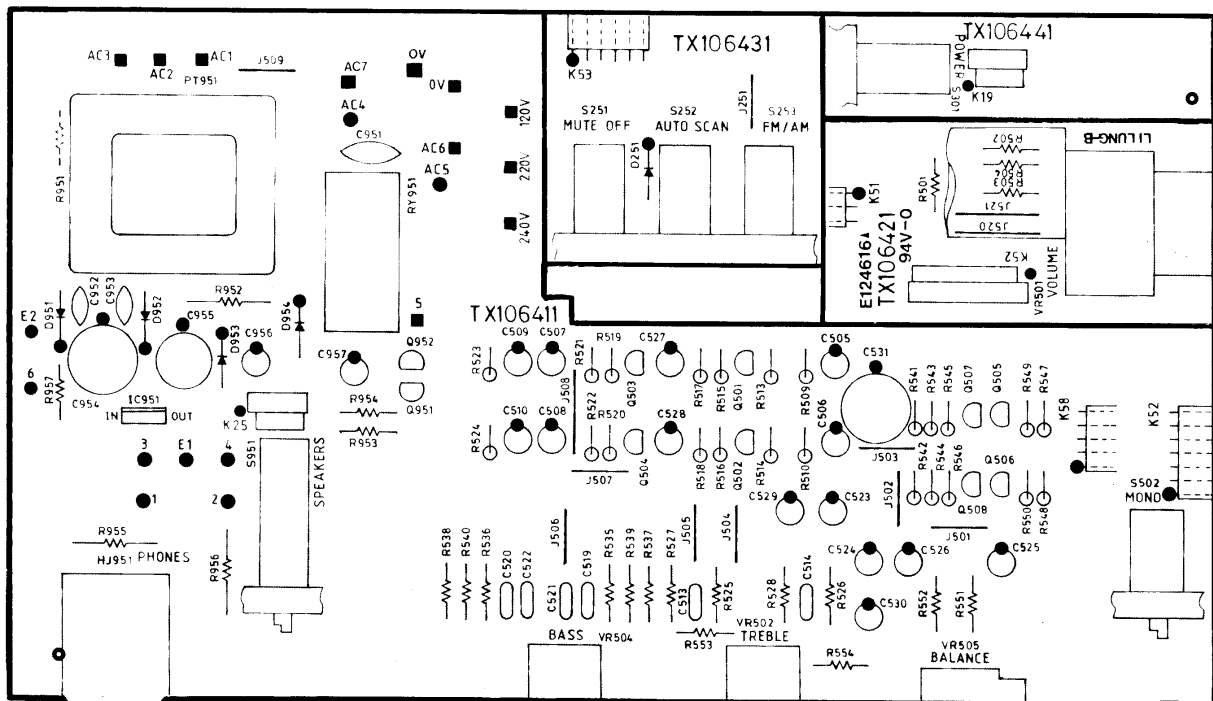
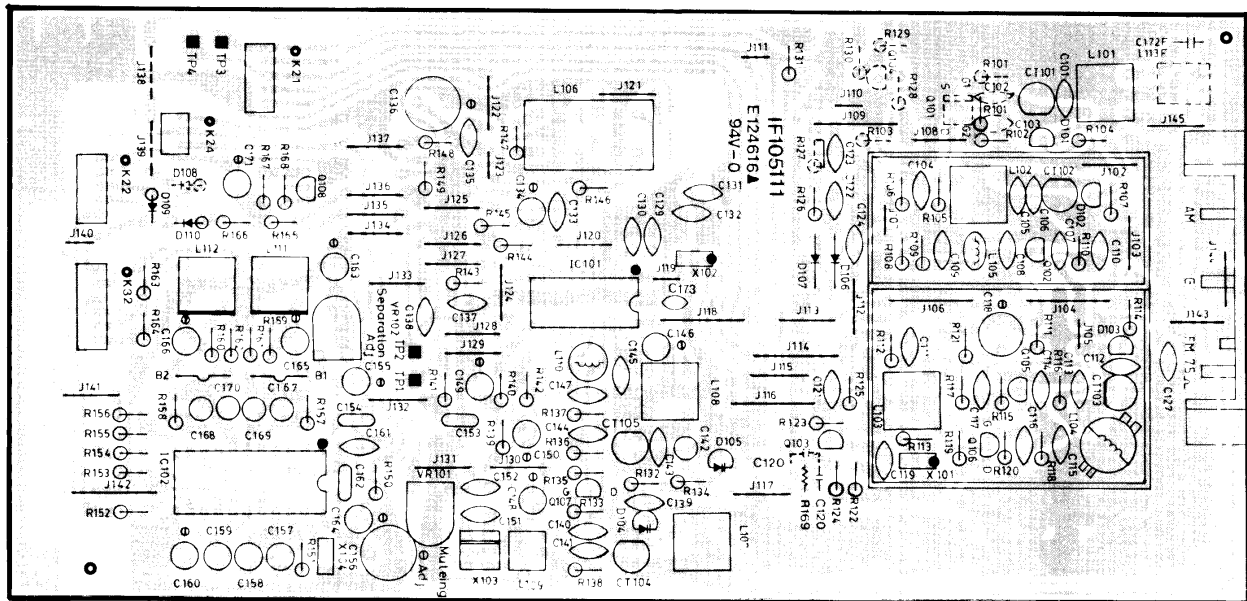
# Schematic Diagram

## REMOTE CONTROL HANDSET

SCHEMATIC DIAGRAM RR-905

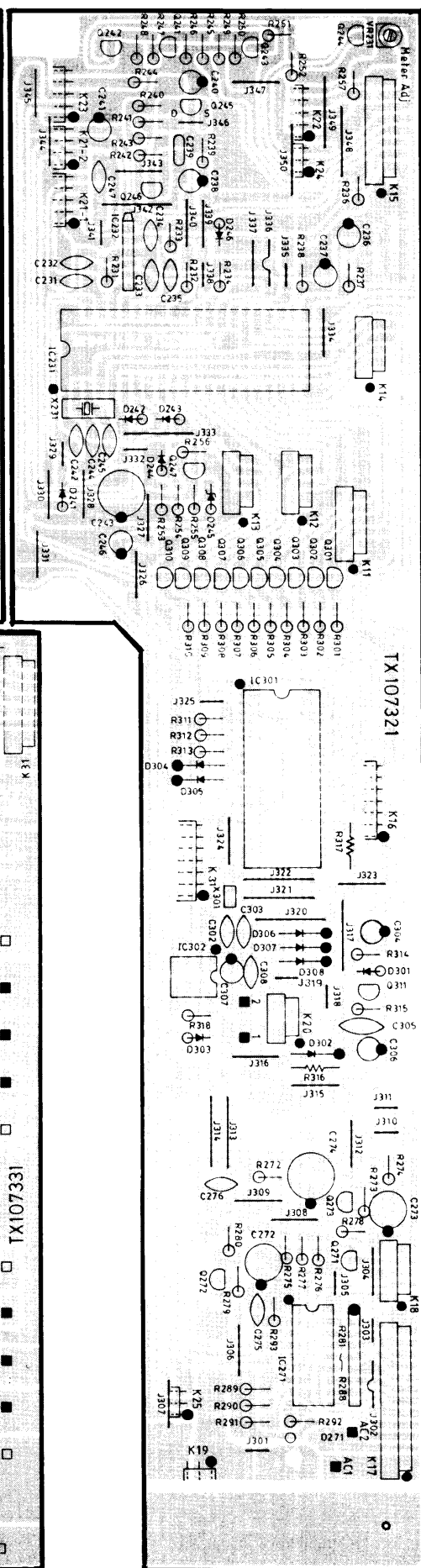
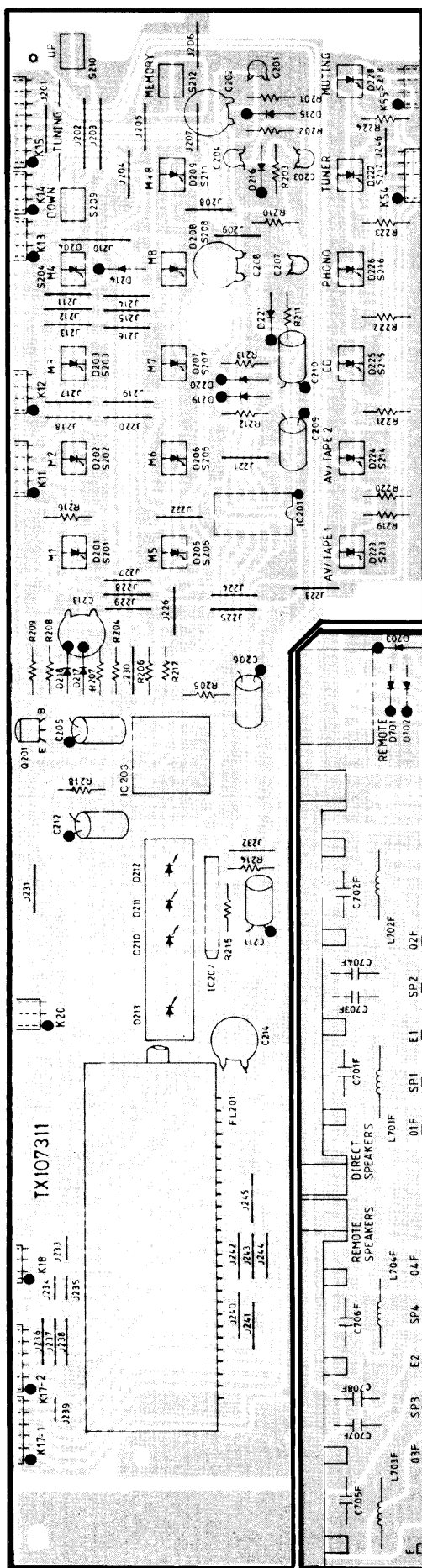


# Printed Circuit Boards

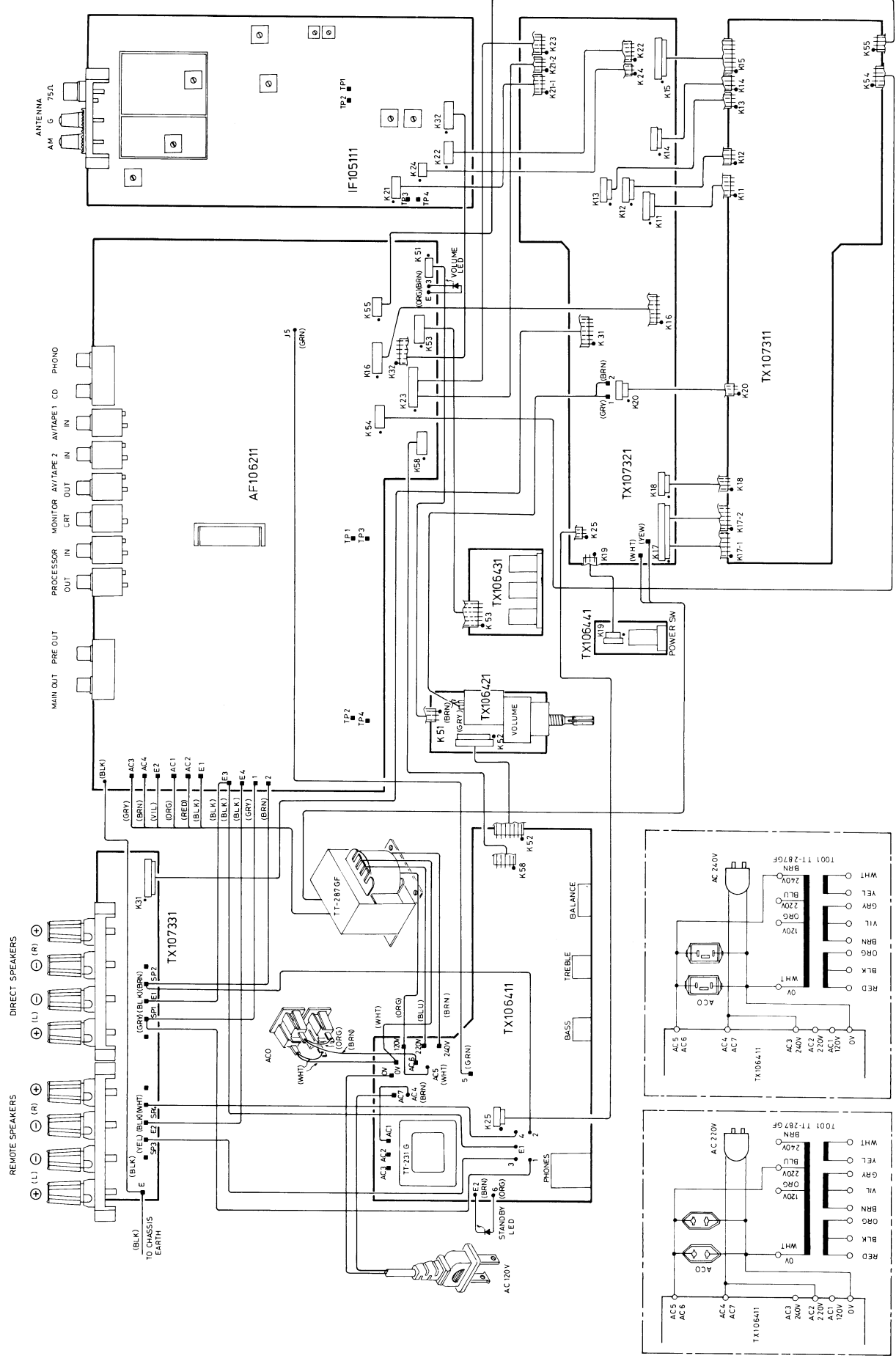








# Wiring Diagram

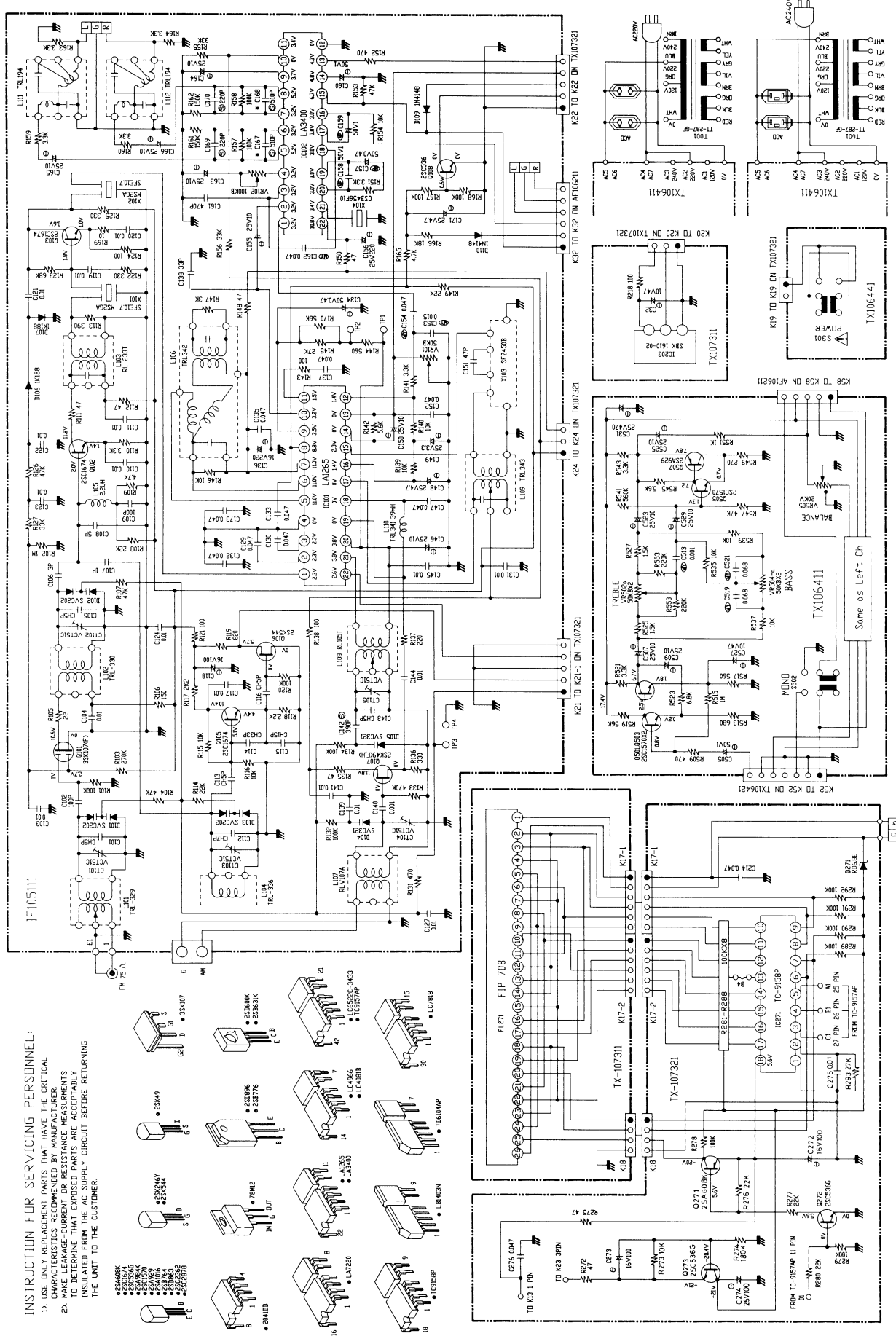


## Schematic Diagram

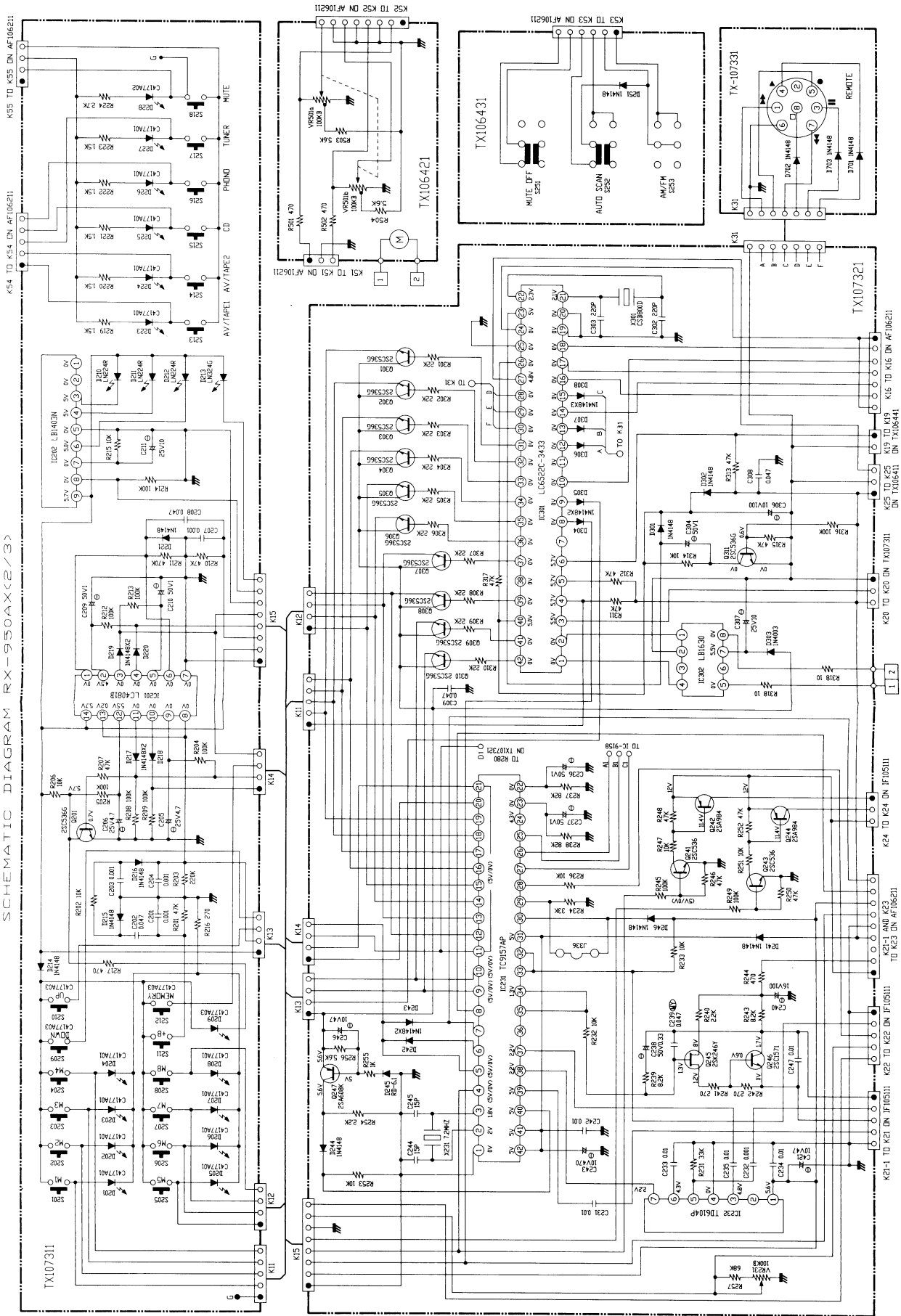
## SCHEMATIC DIAGRAM RX-950A X(1/3)

INSTRUCTION FOR SERVICING PERSONNEL:

- 1). USE ONLY REPLACEMENT PARTS THAT HAVE THE CRITICAL CHARACTERISTICS RECOMMENDED BY MANUFACTURER.
- 2). MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE AC SUPPLY CIRCUIT BEFORE RETURNING THE UNIT TO THE CUSTOMER.



# SCHEMATIC DIAGRAM RX-950AX(2/3)





Parts List

NOTE:THE COMPONENTS IDENTIFIED BY Δ MARK ARE FOR SAFETY.REPLACE ONLY WITH ORIGINAL PARTS.DO NOT SUBSTITUTE.

| SYMBOL    |  |  | PARTS NO.  |  |  | DESCRIPTION           |  |  | SYMBOL     |  |  | PARTS NO.  |  |  | DESCRIPTION                   |  |  | SYMBOL    |  |  | PARTS NO.  |  |  | DESCRIPTION              |  |  |
|-----------|--|--|------------|--|--|-----------------------|--|--|------------|--|--|------------|--|--|-------------------------------|--|--|-----------|--|--|------------|--|--|--------------------------|--|--|
| R101      |  |  | IF105111   |  |  | P.C.B. ASSEMBLY       |  |  | CT103      |  |  | CF00000184 |  |  | CAP. FILM TRIMMER VCT51A      |  |  | IC401     |  |  | IC00001292 |  |  | IC N2M2041DD             |  |  |
| R102      |  |  | RD41003823 |  |  | R. CARBON 100K 1/4W J |  |  | CT104, 105 |  |  | CF00000159 |  |  | CAP. FILM TRIMMER VCT51C      |  |  | R601, 602 |  |  | RD41001826 |  |  | R. CARBON 1K 1/4W J      |  |  |
| R103      |  |  | RD41004827 |  |  | R. CARBON 1M 1/4W J   |  |  | VR102      |  |  | RV20000181 |  |  | R. SEMI-FIXED 50KB            |  |  | R603, 604 |  |  | RD4701823  |  |  | R. CARBON 4.7K 1/4W J    |  |  |
| R104      |  |  | RD47003828 |  |  | R. CARBON 270K 1/4W J |  |  | R351-354   |  |  | R355, 356  |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R605, 606 |  |  | RD4702827  |  |  | R. CARBON 47K 1/4W J     |  |  |
| R105      |  |  | RD4702827  |  |  | R. CARBON 47K 1/4W J  |  |  | R357, 358  |  |  | R359, 360  |  |  | CAP. ELEC. 100uF 16V          |  |  | R607, 608 |  |  | RD4700820  |  |  | R. CARBON 470 1/4W J     |  |  |
|           |  |  | RD42209822 |  |  | R. CARBON 22 1/4W J   |  |  | R361, 362  |  |  | RD44702827 |  |  | CAP. ELEC. 0.01uF 50V         |  |  | R609, 610 |  |  | RD42202827 |  |  | R. CARBON 22K 1/4W J     |  |  |
|           |  |  | RD41500820 |  |  | R. CARBON 150 1/4W J  |  |  | R363       |  |  | RD41003823 |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R613, 614 |  |  | RD4709822  |  |  | R. CARBON 47 1/4W J      |  |  |
| R106      |  |  | RD4702827  |  |  | R. CARBON 47K 1/4W J  |  |  | R365       |  |  | RD41001826 |  |  | CAP. CERAMIC 0.047uF 50V      |  |  | R615, 616 |  |  | RD48200828 |  |  | R. CARBON 820 1/4W J     |  |  |
| R107      |  |  | RD42202827 |  |  | R. CARBON 22K 1/4W J  |  |  | R366-368   |  |  | RD42203820 |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R617, 618 |  |  | RD42200820 |  |  | R. CARBON 220 1/4W J     |  |  |
| R108      |  |  | RD4701823  |  |  | R. CARBON 4.7K 1/4W J |  |  | R369       |  |  | RD41001826 |  |  | CAP. ELEC. 0.47uF 50V         |  |  | R619, 620 |  |  | RD42200820 |  |  | R. CARBON 220 1/4W J     |  |  |
| R109      |  |  | RD43301825 |  |  | R. CARBON 3.3K 1/4W J |  |  | R370       |  |  | RD41003823 |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R621, 622 |  |  | RD46800828 |  |  | R. CARBON 680 1/4W J     |  |  |
| R110      |  |  | RD43301825 |  |  | R. CARBON 3.3K 1/4W J |  |  | R371       |  |  | RD41003823 |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R623, 624 |  |  | RD4702827  |  |  | R. CARBON 47K 1/4W J     |  |  |
| R111, 112 |  |  | RD44709822 |  |  | R. CARBON 47 1/4W J   |  |  | R372       |  |  | RD41003823 |  |  | CAP. CERAMIC 0.047uF 50V      |  |  | R625, 626 |  |  | RD4700820  |  |  | R. CARBON 470 1/4W J     |  |  |
| R113      |  |  | RD41390822 |  |  | R. CARBON 390 1/4W J  |  |  | R373-378   |  |  | RD42203820 |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R627, 628 |  |  | RD41000822 |  |  | R. CARBON 100 1/4W J     |  |  |
| R114      |  |  | RD42202827 |  |  | R. CARBON 22K 1/4W J  |  |  | R379, 380  |  |  | RD42202827 |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R629, 630 |  |  | RD43300821 |  |  | R. CARBON 330 1/4W J     |  |  |
| R115, 116 |  |  | RD41002820 |  |  | R. CARBON 10K 1/4W J  |  |  | R381       |  |  | RD46800828 |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R631, 632 |  |  | RD45609823 |  |  | R. CARBON 56 1/4W J      |  |  |
| R117, 118 |  |  | RD42201823 |  |  | R. CARBON 2.2K 1/4W J |  |  | R382       |  |  | RD41001826 |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R633, 634 |  |  | RD46801821 |  |  | R. CARBON 6.8K 1/4W J    |  |  |
| R119      |  |  | RD48200828 |  |  | R. CARBON 820 1/4W J  |  |  | R383       |  |  | RD46800828 |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R635, 636 |  |  | RD41801820 |  |  | R. CARBON 1.8K 1/4W J    |  |  |
| R120      |  |  | RD41003823 |  |  | R. CARBON 100K 1/4W J |  |  | R384       |  |  | RD41001826 |  |  | CAP. ELEC. 4.7uF 25V          |  |  | R637, 638 |  |  | RM11000920 |  |  | R. METAL FILM 100 J 1/2W |  |  |
| R121      |  |  | RD41000822 |  |  | R. CARBON 100 1/4W J  |  |  | R385       |  |  | RD41001826 |  |  | CAP. ELEC. 10uF 25V           |  |  | R641, 640 |  |  | RM10009820 |  |  | R. METAL FILM 100 J 1/2W |  |  |
| R122      |  |  | RD43300821 |  |  | R. CARBON 330 1/4W J  |  |  | R386       |  |  | RD42202827 |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R643, 644 |  |  | RM10228226 |  |  | R. METAL FILM 0.22 J 2W  |  |  |
| R123      |  |  | RD46802825 |  |  | R. CARBON 68K 1/4W J  |  |  | R387       |  |  | RD41001826 |  |  | CAP. CERAMIC 0.047uF 50V      |  |  | R645, 646 |  |  | RD13902820 |  |  | R. CARBON 39K 1/4W J     |  |  |
| R124      |  |  | RD41000822 |  |  | R. CARBON 100 1/4W J  |  |  | R388       |  |  | RD41001826 |  |  | CAP. ELEC. 4.7uF 25V          |  |  | R647, 648 |  |  | RD11202829 |  |  | R. CARBON 12K 1/4W J     |  |  |
| R125      |  |  | RD43300821 |  |  | R. CARBON 330 1/4W J  |  |  | R389       |  |  | RD41003823 |  |  | CAP. MYLAR 47K 3 50V          |  |  | R649, 650 |  |  | RM1009120  |  |  | R. METAL FILM 10 J 1W    |  |  |
| R126      |  |  | RD4702827  |  |  | R. CARBON 47K 1/4W J  |  |  | R390       |  |  | RD42201823 |  |  | CAP. ELEC. 10uF 25V           |  |  | R651-654  |  |  | RM10228226 |  |  | R. METAL FILM 0.22 J 2W  |  |  |
| R127      |  |  | RD43302829 |  |  | R. CARBON 33K 1/4W J  |  |  | R391       |  |  | RD42202827 |  |  | CAP. NON-POLARIZED 0.47uF 50V |  |  | R655      |  |  | RD42201823 |  |  | R. CARBON 2.2K 1/4W J    |  |  |
| R128      |  |  | RD45601824 |  |  | R. CARBON 5.6K 1/4W J |  |  | R392       |  |  | RD41001826 |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R656      |  |  | RD41502827 |  |  | R. CARBON 15K 1/4W J     |  |  |
| R129      |  |  | RD41000822 |  |  | R. CARBON 100 1/4W J  |  |  | R393       |  |  | RD41001826 |  |  | CAP. NON-POLARIZED 1uF 50V    |  |  | R657      |  |  | RD41001826 |  |  | R. CARBON 1K 1/4W J      |  |  |
| R130      |  |  | RD4700820  |  |  | R. CARBON 470 1/4W J  |  |  | R394       |  |  | RD42201823 |  |  | CAP. MYLAR 47K 3 50V          |  |  | R658      |  |  | RD41004827 |  |  | R. CARBON 1M 1/4W J      |  |  |
| R131      |  |  | RD43300821 |  |  | R. CARBON 330 1/4W J  |  |  | R395       |  |  | RD41001826 |  |  | CAP. ELEC. 10uF 25V           |  |  | R659      |  |  | RD42200820 |  |  | R. CARBON 22 1/4W J      |  |  |
| R132      |  |  | RD41003823 |  |  | R. CARBON 100K 1/4W J |  |  | R396       |  |  | RD42202827 |  |  | CAP. CERAMIC 0.01uF 50V       |  |  | R660      |  |  | RD41801820 |  |  | R. CARBON 1.8K 1/4W J    |  |  |
| R133      |  |  | RD41703823 |  |  | R. CARBON 170K 1/4W J |  |  | R397-392   |  |  | RD41001826 |  |  | CAP. ELEC. 10uF 25V           |  |  | C601, 602 |  |  | RD41502827 |  |  | R. CARBON 15K 1/4W J     |  |  |
| R134      |  |  | RD44709822 |  |  |                       |  |  |            |  |  |            |  |  |                               |  |  |           |  |  |            |  |  |                          |  |  |

Parts List

NOTE: THE COMPONENTS IDENTIFIED BY  $\Delta$  MARK ARE FOR SAFETY. REPLACE ONLY WITH ORIGINAL PARTS. DO NOT SUBSTITUTE.

| SYMBOL                    | PARTS NO.   | DESCRIPTION                         |
|---------------------------|-------------|-------------------------------------|
| R909                      | CE01005258  | CAP. ELEC. 100uF 25V                |
| R910                      | CE02203164  | CAP. ELEC. 220uF 16V                |
| R913                      | CE04703255  | CAP. ELEC. 470uF 25V                |
| R914                      | CE01005258  | CAP. ELEC. 100uF 25V                |
| R915                      | CE04703255  | CAP. ELEC. 470uF 25V                |
| R916                      | CE01005258  | CAP. ELEC. 100uF 25V                |
| R902-905                  | DL10000020  | DIODE KBL-02 $\Delta$               |
| D906                      | DL10000068  | DIODE IN4003                        |
| D907                      | DD20000223  | DIODE RD-20E                        |
| D908                      | DD20000181  | DIODE RD-15E                        |
| D909                      | DD20000041  | DIODE 6-2E                          |
| IC901                     | IC00000974  | IC NJM78M12                         |
| F901, 902                 | FU25000041  | FUSE 125V 6A UL/CSA $\Delta$        |
| F903, 904                 | FU23000219  | FUSE 250V 16.3A S $\Delta$          |
| F903, 904                 | FU25000090  | FUSE 250V 1.5A UL/CSA $\Delta$      |
| Q901                      | FU23000311  | FUSE 250V T1.6A S $\Delta$          |
| Q901                      | TR300000431 | TRANSISTOR 2SC1570 (E, F)           |
| Q902, 903                 | TR300000080 | TRANSISTOR 2SD863 (E, F)            |
| Q904                      | TR100000059 | TRANSISTOR 2SB764 (E, F)            |
| TX-106411 P.C.B. ASSEMBLY |             |                                     |
| R509, 510                 | RD14700828  | R, CARBON 47K 1/4W J                |
| R513, 514                 | RD16000826  | R, CARBON 680 1/4W J                |
| R515, 516                 | RD11004825  | R, CARBON 1M 1/4W J                 |
| R517, 518                 | RD15600829  | R, CARBON 560 1/4W J                |
| R519, 520                 | RD15602826  | R, CARBON 56K 1/4W J                |
| R521, 522                 | RD13301823  | R, CARBON 3.3K 1/4W J               |
| R523, 524                 | RD16801820  | R, CARBON 6.8K 1/4W J               |
| R525, 526                 | RD21501829  | R, CARBON 1.5K 1/4W J               |
| R527, 528                 | RD21501829  | R, CARBON 1.5K 1/4W J               |
| R535-540                  | RD21002825  | R, CARBON 10K 1/4W J                |
| R541, 542                 | RD15603820  | R, CARBON 560K 1/4W J               |
| R543, 544                 | RD13301823  | R, CARBON 3.3K 1/4W J               |
| R545, 546                 | RD13301823  | R, CARBON 3.3K 1/4W J               |
| R547, 548                 | RD13301823  | R, CARBON 3.3K 1/4W J               |
| R549, 550                 | RD12700825  | R, CARBON 27K 1/4W J                |
| R551, 552                 | RD21001821  | R, CARBON 1K 1/4W J                 |
| R553, 554                 | RD22202826  | R, CARBON 220K 1/4W J               |
| C505, 506                 | CE01007504  | CAP. ELEC. 1uF 50V                  |
| C507-510                  | CE01006251  | CAP. ELEC. 10uF 25V                 |
| C513, 514                 | CM011010429 | CAP. MYLAR 10uF J 50V               |
| C518-522                  | CM06809424  | CAP. MYLAR 683 J 50V                |
| C523-526                  | CE01006251  | CAP. ELEC. 10uF 25V                 |
| C527, 528                 | CE04706107  | CAP. ELEC. 47uF 10V                 |
| C529, 530                 | CE01006251  | CAP. ELEC. 10uF 25V                 |
| C531                      | CE74705645  | CAP. ELEC. 470uF 25V                |
| O501-506                  | TR300000509 | TRANSISTOR 2SC1570 (G, H)           |
| Q507, 508                 | TR10000102  | TRANSISTOR 2SA929 (F, G, H)         |
| R502                      | RV10001541  | R, VARIABLE 4TR-2774 20KBx2         |
| R504                      | RV10001541  | R, VARIABLE 4TR-2774 20KBx2         |
| R505                      | RV10001670  | R, VARIABLE 4TR-2877 20KBx1         |
| S502                      | SH11000331  | 1 KEY PUSH SW 4TR-2664              |
| R952                      | RM92200121  | R, METAL FILM 220 J 1W              |
| R953                      | RD15602826  | R, CARBON 56K 1/4W J                |
| R954                      | RD21003829  | R, CARBON 10K 1/4W J                |
| R955, 956                 | RM93300123  | R, METAL FILM 330 J 1W              |
| R957                      | RD13301823  | R, CARBON 3.3K 1/4W J               |
| C951                      | CK00000035  | SPARK KILLER 0.715uF F472W $\Delta$ |
| C952, 953                 | CE01009256  | CAP. CERAMIC 0.01uF 250V $\Delta$   |
| C954                      | CE04705358  | CAP. ELEC. 470uF 35V                |
| C955                      | CE04705358  | CAP. ELEC. 470uF 35V                |
| C956                      | CE01006251  | CAP. ELEC. 10uF 25V                 |
| C957                      | CE02205107  | CAP. ELEC. 22uF 10V                 |
| D951, 952                 | DD10000068  | DIODE IN4003                        |
| D953                      | DD10000100  | DIODE IN4148                        |
| D954                      | DD10000068  | DIODE IN4003                        |
| IC951                     | IC000000615 | IC NJM78M05                         |
| Q951                      | TR300000327 | TRANSISTOR 2SC536G                  |

| SYMBOL                    | PARTS NO.   | DESCRIPTION                         |
|---------------------------|-------------|-------------------------------------|
| R952                      | TR300000121 | TRANSISTOR 2SC2274 (E, F)           |
| Q951                      | JH00000135  | HEAD PHONE JACK C-3399#1            |
| H951                      | JH00000135  | HEAD PHONE JACK C-3399#1            |
| RY951                     | LY000000265 | RELAY VS24MC-NK $\Delta$            |
| PT951                     | TX43006098  | POWER TRANSFORMER TT-231-G $\Delta$ |
| TX-106421 P.C.B. ASSEMBLY |             |                                     |
| R501, 502                 | RD24700825  | R, CARBON 470 1/4W J                |
| R503, 504                 | RD25001526  | R, CARBON 50K 1/4W J                |
| VR501                     | RV100001255 | R, VARIABLE C-4170B15 50KBx2        |
| TX-106431 P.C.B. ASSEMBLY |             |                                     |
| D251                      | DD10000100  | DIODE IN4148                        |
| S251-253                  | SH13000449  | 3 KEY PUSH SW 4TR-2876              |
| TX-106441 P.C.B. ASSEMBLY |             |                                     |
| S301                      | SH11000227  | 1 KEY PUSH SW 4TR-2306              |
| TX-107311 P.C.B. ASSEMBLY |             |                                     |
| R201                      | RD54702824  | R, CARBON 47K 1/4W J                |
| R202                      | RD51002827  | R, CARBON 10K 1/4W J                |
| R203                      | RD52203828  | R, CARBON 220K 1/4W J               |
| R204, 205                 | RD51003820  | R, CARBON 100K 1/4W J               |
| R206                      | RD51002827  | R, CARBON 10K 1/4W J                |
| R207                      | RD54702824  | R, CARBON 47K 1/4W J                |
| R208, 209                 | RD51003820  | R, CARBON 100K 1/4W J               |
| R210                      | RD54702824  | R, CARBON 47K 1/4W J                |
| R211                      | RD54703828  | R, CARBON 470K 1/4W J               |
| R212-214                  | RD51003820  | R, CARBON 100K 1/4W J               |
| R215                      | RD51002827  | R, CARBON 10K 1/4W J                |
| R216                      | RD52700824  | R, CARBON 270 1/4W J                |
| R217                      | RD54703827  | R, CARBON 470 1/4W J                |
| R218                      | RD51003820  | R, CARBON 100 1/4W J                |
| R219-224                  | RD52701828  | R, CARBON 2.7K 1/4W J               |
| C201                      | CC41010439  | CAP. CERAMIC 0.001uF 50V            |
| C202                      | CC45009456  | CAP. CERAMIC 0.047uF 50V            |
| C203, 204                 | CC41010439  | CAP. CERAMIC 0.001uF 50V            |
| C205, 206                 | CE04707252  | CAP. ELEC. 4.7uF 25V                |
| C207                      | CC41010439  | CAP. CERAMIC 0.001uF 50V            |
| C208                      | CC45009456  | CAP. CERAMIC 0.047uF 50V            |
| C209, 210                 | CE01007504  | CAP. ELEC. 1uF 50V                  |
| C211                      | CE01006251  | CAP. ELEC. 10uF 25V                 |
| C212                      | CE04706107  | CAP. ELEC. 47uF 10V                 |
| C213, 214                 | CC45009456  | CAP. CERAMIC 0.047uF 50V            |
| D210-212                  | DD40000095  | LED IN324R                          |
| D213                      | DD40000101  | LED IN324G                          |
| D214-221                  | DD10000100  | DIODE IN4148                        |
| IC201                     | IC000002340 | IC TC4081BP                         |
| IC202                     | IC00000925  | IC LB1403N                          |
| IC203                     | IC000002030 | IC SBX1610-02                       |
| Q201                      | TR300000327 | TRANSISTOR 2SC536G                  |
| FL201                     | SS40000460  | FL TUBE F1P7D8                      |
| S201-208                  | SH60000185  | KEY BOARD SW WITH LED               |
| S201-208                  | SH60000185  | C-4177A01 RED                       |
| S209, 210                 | SH600002023 | KEY BOARD SW C-4177A03              |
| S211                      | SH60000185  | KEY BOARD SW WITH LED               |
| S212                      | SH600002023 | KEY BOARD SW WITH LED               |
| S213-217                  | SH60000197  | KEY BOARD SW WITH LED               |
| S218                      | SH60000185  | KEY BOARD SW WITH LED               |
| S218                      | SH60000185  | C-4177A01 RED                       |
| TX-107321 P.C.B. ASSEMBLY |             |                                     |
| R231                      | RD43302829  | R, CARBON 33K 1/4W J                |

| SYMBOL    | PARTS NO.   | DESCRIPTION                    |
|-----------|-------------|--------------------------------|
| R232, 233 | RD41002820  | R, CARBON 10K 1/4W J           |
| R234      | RD43302829  | R, CARBON 33K 1/4W J           |
| R236      | RD41002820  | R, CARBON 10K 1/4W J           |
| R237, 238 | RD48202825  | R, CARBON 82K 1/4W J           |
| R239      | RD48201821  | R, CARBON 8.2K 1/4W J          |
| R240      | RD42201823  | R, CARBON 2.2K 1/4W J          |
| R243      | RD48201821  | R, CARBON 270 1/4W J           |
| R244      | RD44700820  | R, CARBON 470 1/4W J           |
| R245      | RD41003823  | R, CARBON 100K 1/4W J          |
| R246      | RD44702827  | R, CARBON 47K 1/4W J           |
| R247      | RD41002820  | R, CARBON 10K 1/4W J           |
| R248      | RD44702827  | R, CARBON 47K 1/4W J           |
| R249      | RD41003823  | R, CARBON 100K 1/4W J          |
| R250      | RD44702827  | R, CARBON 47K 1/4W J           |
| R251      | RD41002820  | R, CARBON 10K 1/4W J           |
| R252      | RD44702827  | R, CARBON 47K 1/4W J           |
| R253      | RD41002820  | R, CARBON 10K 1/4W J           |
| R254      | RD42201821  | R, CARBON 2.2K 1/4W J          |
| R255      | RD41001826  | R, CARBON 1K 1/4W J            |
| R256      | RD45001824  | R, CARBON 50K 1/4W J           |
| R257      | RD46802825  | R, CARBON 68K 1/4W J           |
| R272      | RD44705822  | R, CARBON 47 1/4W J            |
| R273      | RD41002820  | R, CARBON 10K 1/4W J           |
| R274      | RD41803827  | R, CARBON 180K 1/4W J          |
| R275      | RD44705822  | R, CARBON 47 1/4W J            |
| R276, 277 | RD42202827  | R, CARBON 22K 1/4W J           |
| R278, 279 | RD41003823  | R, CARBON 100K 1/4W J          |
| R280      | RD42202827  | R, CARBON 22K 1/4W J           |
| R281-288  | RM31003080  | AB104J/R48-104-8K              |
| R289-292  | RD41003823  | R, CARBON 100K 1/4W J          |
| R293      | RD42202827  | R, CARBON 22K 1/4W J           |
| C231      | CC41010439  | CAP. CERAMIC 0.001uF 50V       |
| C232      | CC41009462  | CAP. CERAMIC 0.01uF 50V        |
| C233-235  | CE01007503  | CAP. ELEC. 1uF 50V             |
| C236, 237 | CE01338505  | CAP. ELEC. 0.33uF 50V          |
| C238      | CE01338505  | CAP. ELEC. 0.33uF 50V          |
| C239      | CM04709426  | CAP. MYLAR 473 J 50V           |
| C240      | CE41005166  | CAP. ELEC. 100uF 16V           |
| C241      | CE44706106  | CAP. ELEC. 47uF 10V            |
| C242      | CC41009462  | CAP. CERAMIC 0.01uF 50V        |
| C243      | CE04705103  | CAP. ELEC. 470uF 10V           |
| C244, 245 | CC41512433  | CAP. CERAMIC 15P 50V           |
| C246      | CE44706106  | CAP. ELEC. 47uF 10V            |
| C247      | CC41009462  | CAP. CERAMIC 0.01uF 50V        |
| C272, 273 | CE41005166  | CAP. ELEC. 100uF 25V           |
| C274      | CE01005258  | CAP. ELEC. 100uF 25V           |
| C275      | CC41009462  | CAP. CERAMIC 0.01uF 50V        |
| C276      | CC45009456  | CAP. CERAMIC 0.047uF 50V       |
| D241-244  | DD80000021  | DIODE IN4148                   |
| D245      | DD20000107  | DIODE RD-3.6E                  |
| D246      | DD80000021  | DIODE IN4148                   |
| Q241      | TR300000327 | TRANSISTOR 2SC536G             |
| Q242      | TR10000140  | TRANSISTOR 2SA984K (E, F)      |
| Q243      | TR10000140  | TRANSISTOR 2SA984K (E, F)      |
| Q244      | TR50000127  | TRANSISTOR 2SC246-Y            |
| Q245      | TR50000127  | TRANSISTOR 2SC246-Y            |
| Q246      | TR30000108  | TRANSISTOR 2SC1571 (E, F)      |
| Q247      | TR10000126  | TRANSISTOR 2SA608K (F, G)      |
| Q271      | TR10000126  | TRANSISTOR 2SA608K (F, G)      |
| Q272, 273 | TR300000327 | TRANSISTOR 2SC536G             |
| IC231     | IC00001346  | IC TC9157AP                    |
| IC232     | IC00000482  | IC TD6104P                     |
| IC271     | IC000000901 | IC TC9158P                     |
| D271      | DD20000065  | DIODE RD-6.8E                  |
| VR231     | RV200000363 | R, SEMI-FIXED 30KB             |
| X231      | DD600000040 | CRYSTAL OSCILLATOR HC4907.2MHz |
| R301-310  | RD12202825  | R, CARBON 22K 1/4W J           |

| SYMBOL    | PARTS NO.   | DESCRIPTION                                    |
|-----------|-------------|------------------------------------------------|
| R311-313  | RD44702827  | R, CARBON 47K 1/4W J                           |
| R314      | RD41002820  | R, CARBON 10K 1/4W J                           |
| R315      | RD44702827  | R, CARBON 47K 1/4W J                           |
| R316      | RD51003820  | R, CARBON 100K 1/4W J                          |
| R317      | RD44702827  | R, CARBON 47K 1/4W J                           |
| R318      | RD41009825  | R, CARBON 10 1/4W J                            |
| C302, 303 | CC32211432  | CAP. ELEC. 1uF 50V                             |
| C304      | CE41007503  | CAP. CERAMIC 0.1uF 50V                         |
| C305      | CC01008458  | CAP. CERAMIC 0.1uF 50V                         |
| C306      | CE41005105  | CAP. ELEC. 100uF 10V                           |
| C307      | CE01006251  | CAP. ELEC. 10uF 25V                            |
| C308      | CE45009456  | CAP. CERAMIC 0.047uF 50V                       |
| D301, 302 | DD80000021  | DIODE IN4148                                   |
| D303      | DD10000068  | DIODE IN4003                                   |
| D304-308  | DD80000021  | DIODE IN4148                                   |
| IC301     | IC000001759 | IC LC6522C-3433                                |
| IC302     | IC000001760 | IC LB1630                                      |
| X301      | LF000000294 | CERAMIC FILTER 800C9B                          |
| OTHERS    |             |                                                |
| D701-703  | TX-107331   | P.C.B. ASSEMBLY                                |
|           | DD800000021 | DIODE IN4148                                   |
|           | AB00000249  | BOTTOM BOARD 3TMM-6                            |
|           | AB00000274  | BOTTOM BOARD (E) 4TTL-25                       |
|           | AF10000230  | FRONT CHASSIS 2TQV-2                           |
|           | AW00002001  | CHASSIS BODY 1TQV-4                            |
|           | AR100000566 | PRINTED REAR CHASSIS TRP-610                   |
|           | LB07068000  | AM LOOP ANT. WITH HOLDER TFL-345               |
|           | PT28707103  | POWER TRANSISTOR TT-287-GF $\Delta$            |
|           | BU00000803  | RUBBER BUSH 4TR-2544 15F                       |
|           | FT00000229  | PLASTIC FOOT (BK) 4TSH-19#2                    |
|           | PN00000080  | JUMPER PIN 4TR-2185#1 P-18                     |
|           | SB00000728  | IFV SHIELD PLATE 4TQV-7                        |
|           | SP100005346 | IF P.C.B. SUPPORT (R)                          |
|           | CD00000218  | 4TTL-26AH3                                     |
|           | CD00000218  | AC CORD SPT-2 AWG#18                           |
|           | CD00000292  | 4TR-670#4 (C, U, A, J) $\Delta$                |
|           | CD00000048  | AC POWER CORD UP-401F                          |
|           | CD00000048  | 4TR-2631#1 H05VV-F (D) $\Delta$                |
|           | CD00000085  | AC POWER CORD 4TR-1037 (H, E, K2) $\Delta$     |
|           | CD00000115  | AC POWER CORD C-2504A (K1) $\Delta$            |
|           | NP000001949 | AC POWER CORD C-3763-T (G) $\Delta$            |
|           | NP000001974 | NAME STICKER AC-120V (C)                       |
|           | NP000001962 | NAME STICKER AC-240V                           |
|           | NP000001998 | NAME STICKER AC-230V                           |
|           | NP000002012 | 4TR-2828#5 TNP-389                             |
|           | NP000001950 | NAME STICKER AC-100V                           |
|           | SC00000131  | 4TR-2828#2 TNP-382                             |
|           | SC000000039 | AC CORD STOPPER SR-5N-4 $\Delta$               |
|           | SC000000027 | (A, K1)                                        |
|           | SA000001450 | AC CORD STOPPER SR-6W-4 $\Delta$               |
|           | SA000001796 | (D)                                            |
|           | SA000001980 | AC CORD STOPPER SR-4N-4 $\Delta$               |
|           |             | AC OUTLET SOCKET S-16519 $\Delta$              |
|           |             | AC OUTLET SOCKET S-16536#1 (C, U, A, J)        |
|           |             | AC OUTLET SOCKET S-16536#1 (E, D, K2) $\Delta$ |
|           |             | AC OUTLET SOCKET                               |



| SYMBOL     | PARTS NO. | DESCRIPTION                     |
|------------|-----------|---------------------------------|
| AH20000590 |           | S2-7411-110/120 (K1,G) $\Delta$ |
| AA10000984 |           | HEAT SINKER BOARD 3TTM-7#3      |
| AW00000629 |           | FRONT PANEL 2TQV-1 TFP-665      |
|            |           | PANEL WINDOW 4TQA-7#2           |
| BU00001145 |           | POWER RING W/LED 4TQF-13        |
|            |           | 14x14                           |
| BU00001157 |           | PUSH BUTTON RING 4TQF-14        |
|            |           | 5x10                            |
| BU00001169 |           | KNOB RING 4TQF-17 39F           |
| BU00001212 |           | PUSH BUTTON RING                |
|            |           | PR4-09A00T 5x20                 |
| BU00001250 |           | PUSH BUTTON RING 4TQS-5         |
|            |           | 2 KEY                           |
| KB20002681 |           | POWER BUTTON 4TQF-15 14x14      |
| KB20002693 |           | PUSH BUTTON 4TQF-16 5x10        |
| KB20002759 |           | PUSH BUTTON PR4-13A00T 5x20     |
| KB20002851 |           | TACT BUTTON 2TQU-4 17 KEY       |
| OM10001284 |           | ORNAMENTAL SIDE BOARD           |
|            |           | 4TR-2797#3                      |
| OM70000065 |           | PUSH BUTTON CONNECTOR           |
|            |           | 4TTL-15                         |
| OM70000260 |           | ACRYLIC LEVER 4TQT-5            |
| SN00000179 |           | BUTTON SPRING 4TR-1988A#2       |
| AG00000299 |           | REMOTE CONTROL HANDSET          |
|            |           | RR-905                          |
| AU00001225 |           | TOP COVER POLY 3TUV-6#6         |
| KB10001722 |           | KNOB 4TQF-18 13F                |
| KB10001795 |           | KNOB 33F 3TQU-5                 |
| KB20002693 |           | PUSH BUTTON 4TQF-16 5x10        |
| OM10001466 |           | FL ORNAMENTAL PLATE 4TQV-5      |
|            |           | TFP-666                         |
| DD40000095 |           | LED SEL1124R                    |
| SR00000882 |           | UPPER COVER SPACER 4TR-2418     |
| MN10002884 |           | OWNER'S MANUAL RX-950AX         |
| PL00001051 |           | STYROL SIDE MOULDING            |
|            |           | 2TR-2800 TZ-183                 |
| SA00001383 |           | 300 OHM ANT. PLUG C-4220A00     |
|            |           | YAE21-0001 (C,U,A,J)            |
| SA00000263 |           | CONVERSION PLUG S-I6115/        |
|            |           | S-I6110 (H1,H3,H4)              |
| TN10004013 |           | INSIDE CARTON (NON M.IT)        |
|            |           | 4TR-2845#4 (A,H2,H4,E1)         |
| TN10003938 |           | INSIDE CARTON 4TR-2845#2        |

| SYMBOL | PARTS NO.  | DESCRIPTION                 |
|--------|------------|-----------------------------|
|        |            | REMOTE CONTROL HANDSET      |
|        |            | TX917119 P.C.B. ASSEMBLY    |
| R1     | RD21000828 | R,CARBON 100 1/4W J         |
| R2     | RD21002825 | R,CARBON 10K 1/4W J         |
| R3     | RD21000828 | R,CARBON 100 1/4W J         |
| C1,C2  | CC31011435 | CAP,CERAMIC 100P 50V        |
| C3     | CE01005064 | CAP,ELEC. 100uF 6.3V        |
| D1     | DD40001178 | INFRARED EMITTING DIODE     |
|        |            | SE313A                      |
| Q1-Q3  | TR30000121 | TRANSISTOR 2SC2274 (E,F)    |
| X1     | LF00000312 | CERAMIC FILTER CSB455EB     |
| X2     | LF00000336 | CERAMIC FILTER CSB429PB     |
| IC1    | IC00001840 | IC LC7461M-8100             |
| IC2    | IC00002170 | IC SAA3010T                 |
|        | AB00000638 | BOTTOM COVER 1TST-2#2       |
|        | AU00001304 | UPPER COVER 1TST-1#2        |
|        | KB20002620 | RUBBER BUTTON 4TTJ-5#14     |
|        |            | 27 KEY                      |
|        | KB20002619 | RUBBER BUTTON 4TTJ-5#13     |
|        |            | 21 KEY                      |
|        | OM10001491 | ALUM. BUTTON PLATE 4TSJ-4#4 |
|        | LG00000127 | BATTERY TERMINAL 4TTJ-9     |
|        | OM70000200 | FILTER BAORD 3TST-3         |
|        | SN00000260 | BATTERY SPRING 4TTJ-8       |
|        | NP00001986 | NAME PLATE 4TTJ-12#9        |
|        | SP30000264 | BATTERY COVER 4TTJ-3#1      |
|        | TN10003926 | COSMETIC CASE 4TTJ-10#20    |