

# NRD-515 ALL WAVE RECEIVER

SERVICE MANUAL



**JRC**

*Japan Radio Co., Ltd.*

ALL WAVE RECEIVER  
MODEL NRD-515  
SERVICE MANUAL

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## 1. PRECAUTION FOR CHECK AND MAINTENANCE

This all wave receiver is composed of five units: chassis, front panel, rear panel, receiver and synthesizer units. The front panel unit has a die-cast frame and printed circuit board attached at the frame.

The circuit board also serves as a mother board.

Both the receiver unit and synthesizer unit each consist of a plug-in type unit, which is connected to the mother board located in the front panel unit, by means of plug-in connectors of the unit and mother board.

The power supply circuit comprises a power transformer incorporated in the chassis unit and an AVR (automatic voltage regulator) circuits located in the rear panel unit and provides required supply voltages to other circuits.

### 1) REMOVING THE UPPER COVER AND LOWER COVER OF CASE

Refer to Figure 1 in Appendix.

Remove four black setscrews at right and left side, which secure the upper cover.

Also remove four black setscrew, which secure the lower cover at right and left side.

Then, remove both the upper and lower cover.

### 2) DEMOUNTING THE RECEIVER UNIT

First remove the upper cover according to Procedure 1. 1).

Then, disconnect 8 pin plugs marked "A", "B", --, "H" and square connector P11 (parts number) from the receiver unit. (Each plug mark locates at the top end of associated cable.)

Furthermore, remove seven setscrews marked "\*" in Figure 4 in Appendix. Slide out the receiver unit backward from the front panel frame.

3) DEMOUNTING THE SYNTHESIZER UNIT

First remove the lower cover according to Procedure 1. 1).

Then, disconnect five pin plugs marked "B", "E", "H", "I" and "J" and square connectors P29 through P31 from the synthesizer unit.

Furthermore, remove seven setscrews marked "\*" in Figure 3, Appendix.

Slide out the synthesizer unit backward from the front panel frame.

4) DEMOUNTING THE FRONT PANEL UNIT

Remove the upper and lower covers and demount the receiver unit and synthesizer unit according to steps 1) through 3) in Section 1.

Then, remove a square connector P8 attached at the printed circuit board of the panel and remove three setscrews, which secure the panel frame to the chassis and are marked "Δ" in Figure 6, Appendix.

Furthermore, remove other four screws, which secure both sides of the panel frame.

Take out the panel.

5) PRECAUTIONS FOR CHECK AND MAINTENANCE

a. Great care must be taken not to enter any solder or wire cut pieces into the set, when uncovering the case.

b. Do not rotate any core of transformer and coil, any trimmer capacitor and any semifixed variable resistors, unreasonably, unless necessary.

- c. Both the receiver unit and synthesizer unit handle high-frequency signals in the VHF band and therefore require high-class techniques and suited measuring instruments to them, for adjustment and checks.
- d. The synthesizer unit contains circuits operating, interrelated with each other and should, therefore, be checked in sequency.
- e. The pulse generator mounted on the front panel has been finely adjusted.  
Do not uncover, unreasonably.
- f. The shield cases are removed from the unit such as receiver unit and synthesizer unit to check the circuits.  
When remounting the upper and lower shield cases at both sides of the board, take care of their orientations not to mount them with wrong orientations.
- g. Never forget to turn off the power switch before connecting and disconnecting the plugs and connectors.
- h. Be sure both the short plug "P35" at the receiver unit and the other short plug "P37" of the synthesizer unit have been inserted into respective jacks.

## 2. MAINTENANCE PROCEDURE

### 1) CLEANING

Softly wipe the panel surface, control knobs on the panel, and upper and lower covers of the case with a soft cloth or cloth impregnated with silicone oil to clean them.

Remove dust and trash from the interior of the equipment with use of a brush or by means of a cleaner.

Since no gear mechanism has been employed, there is no need to lubricate, at all.

Check the setscrews of the control knobs on the panel for looseness. If loose, tighten the setscrew, using a 4mm-hex screw-driver.

### 2) REPLACING THE PILOT LAMP

If the pilot lamp for illumination of the S-meter should be burnt out, follow the procedure below.

Remove the upper cover in accordance with step 1) in Section 1.

Then, loosen the setscrew marked "a" in Figure 6 Appendix, which secures the lamp holder, and take out the holder.

Replace with a furnished lamp of 12V, 2W in rating, BA7S/13 base type.

### 3) REPLACING THE FUSE

When the power fuse is blown, thoroughly investigate the cause of fuse blow. After repair for the cause, replace it.

The fuse holder holds the fuse and also serves as a holder of the voltage selector mounted on the rear panel.

Counterclockwise rotate the cap of the holder to take out the fuse and replace with a new glass fuse of 1A in rating, furnished to the equipment. The cap is marked "A" in Figure 3-2 of the instruction manual.

#### 4) REPLACING THE PARTS

Any IC, transistor or diode will be damaged with only an instantaneous short, shock etc. Great care must be taken of them upon checks. See if any resistor, capacitor, coil, transformer, or the like has discolored or burnt out.

If necessary for replacement, replace with one has the same value, withstanding voltage, tolerance, temperature coefficient and dimensions. In particular, every variable resistor mounted on the panel is frequently rotated in use and hence tends to often become defective.

Carefully check the variable resistors.

When replacing the parts, use a soldering iron of 20W, approx.

### 3. CHECK AND ADJUSTMENT PROCEDURE

#### 1) PREPARATION

The following measuring instruments and tools are required for checking and adjusting the equipment.

##### a. Required measuring instruments:

##### (1) Standard signal generator, SSG

Frequency range	100KHz to 50MHz
Impedance	75 ohms/50 ohms
Output level	-20 to +120dBuV
Modulation	0 to 80% at 400Hz

- (2) Radio frequency voltmeter, RF VV  
 Frequency range 0 to 200MHz  
 Input impedance High  
 Voltage range 1mV to 10V rms
- (3) Frequency counter, f counter  
 Frequency range 0 to 200MHz  
 Input impedance High  
 Sensitivity 25mV rms or lower  
 Input level 25mV to 10V rms  
 Resolution 1Hz  
 Stability  $5 \times 10^{-8}$ /day
- (4) Digital voltmeter, DIGI VM  
 Voltage range 20mV to 2V DC  
 Input impedance High
- (5) AF oscillator, CR OSC  
 Frequency 1kHz  
 Output impedance 600 ohms  
 Output level -70 to +20dBm
- (6) Level meter, LM  
 Frequency range 0 to 30kHz  
 Input level -70 to +40dBm  
 Input impedance 600 ohms/10k ohms
- (7) Circuit tester  
 Voltage range 0 to 300V AC 0 to 30V DC  
 Current range 0 to 1000mA DC  
 Resistance range 0 to 1M ohm
- (8) VHF SSG  
 Frequency range 50 to 150MHz  
 Impedance 75 ohms/50 ohms  
 Output level -20 to +120dBuV



Modulation 0 to 80%, 400Hz

(9) Oscilloscope  
Display Two channel type  
Frequency range 0 to 200MHz  
Voltage range 10mV to 50V DC and  
AC (p-p)

(10) Distortion meter, DM  
Frequency range 0 to 30kHz  
Input level -70 to +40dBm  
Distortion range 0 to 30%  
Input impedance 600 ohms/10k ohm

b. Required tools

- (1) "+" screw-driver for 3mm-screws
- (2) "-" screw-driver of 3mm wide at tip
- (3) "-" screw-driver of 1mm wide at edge for watch
- (4) "-" adjusting rod of 1mm wide at tip, made of bakelite or teflon.
- (5) "-" adjusting rod of 2.5mm wide at tip, made of bakelite or teflon
- (6) Hex screw-driver for 4mm-screw
- (7) Long-nosed pincers, cutting nipper, pincette, gauze
- (8) Soldering irons, 20W and 60W
- (9) coiled solder, paste

PC-board extension board is not needed.

c. Others

- (1) AF output transformer (4-ohm to 600-ohm, 5W) is necessary
- (2) When connecting the f counter or oscilloscope to each unit, insert a 10-to-1 probe of the oscilloscope for 200MHz use between the f counter or oscilloscope and the unit.
- (3) Variable power transformer (0 to 130V AC or 0 to 300V AC, 2A) is required.

2) CHECKING THE POWER SUPPLY CIRCUIT

Adjust the variable power transformer shown in Figure 8 of Appendix so that each power supply voltage is set to specified value.

Connect the circuit tester or digital voltmeter to each of the check points TP1 through TP8 shown in Figure 5 of Appendix and check the voltage and load current there.

Typical voltages are given below.

Between TP1 and TP2	19V AC
Between TP3 and TP4	8.7V AC
Between TP5 and TP9 (earth)	+15V DC
Between TP6 and TP9 (earth)	+15V DC
Between TP7 and TP9 (earth)	+5V DC
Between TP8 and TP9 (earth)	+9.2V DC

Refer to Figure 8 of Appendix.

NOTE: Correctly set the voltage selector to the power line voltage. The selector is located on the rear panel.

Also refer to Paragraph 3.3.4 in the instruction manual.

3) CHECKING AND ADJUSTING THE SYNTHESIZER UNIT

a. Lock indicators

When the loop 1 circuit and digital VFO circuit are released from the phase lock state, the respective lock indicators CD16 and CD2 illuminate. Each indicator consists of a red light-emitting diode (LED).

Once the indicator LED illuminate, the receiver goes into the mute state.

At the time of lockout, the S-meter pointer will greatly deflect.

Figure 3 in Appendix shows the location of the indicator LED CD16 and CD2.

They serve for location of trouble, as listed in Table 3-1, below.

Table 3-1 Lock Indicators Information

LOCK INDICATOR		LOCATION OF TROUBLE
CD16 LED for LOOP 1	CD2 LED for DIGITAL VFO	
ON	ON	1kHz-reference signal circuit
ON	OFF	500kHz-reference signal circuit
ON	ON	AF(38MHz-VCXO) circuit
ON	ON	UP/DOWN counter circuit
ON	OFF	Second local oscillator (70MHz XO) circuit
ON	OFF	PBT (5MHz VCXO) circuit
ON	OFF	65MHz generator circuit
ON	OFF	VFO mixer circuit
ON	OFF	Panel VFO switch set to EXT.

- NOTE 1. The indicator LED CD2 will illuminate for a short time instantaneously, when the value of operating frequency below the MHz-digit is changed from 000.0kHz to 999.9kHz or vice versa.
2. The other indicator LED CD16 will illuminate for a short time instantaneously, when turning the MHz-selector switch and also when the operating frequency is switched as denoted in NOTE 1.
  3. Case marked "\*" where no external VFO has been connected.

The check points location is shown in Appendix 3.

- b. 10MHz-reference oscillator circuit, 10MHz XO
  - (1) Connect the frequency counter to TP15 of the synthesizer unit.  
Set the trimmer CV1 to get 10000.000kHz. The trimmer is located in the shield case of the synthesizer unit.
  - (2) Connect the frequency counter to TP16 and verify that the output of 500kHz is provided.
  - (3) Connect the frequency counter to TP17 and verify that the output of 1kHz is provided.
  - (4) The output levels at TP15 through TP17 should be equal to the standard TTL level of 4V p-p, approximately.

c. PBT circuit, 5MHz VCXO

- (1) Connect the frequency counter to TP19 of the synthesizer unit.
- (2) Set the panel MODE switch to CW and PBT control to the mid position.  
Adjust the semi-fixed variable resistor RV3 located in the shield case of the synthesizer unit, so that a reading of 5000.000kHz is obtained.
- (3) Turn the panel MODE switch to AM.  
Adjust the semi-fixed variable resistor RV4 for a reading of 5000.000kHz.  
The control voltage at TP20 should be 5.6V DC, typical.
- (4) Disconnect the frequency counter from TP19 and instead connect the radio frequency voltmeter. Verify that the output level is more than 0.25V rms.
- (5) Reconnect the radio frequency voltmeter from TP19 to TP18 and verify that the output level is more than 0.4V rms.

d. BFO circuit

The BFO circuit mixes the output of the 5MHz VCXO with that of the 5.455MHz VCXO to provide BFO signal.

- (1) Connect the frequency counter to TP30 of the synthesizer unit.

Panel control settings:

MODE switch ----- CW

BFO & BC TUNE ----- Mid position

PBT control ----- Mid position

Adjust RV5 through RV8 for readings of frequency as listed in Table 3-2.

NOTE: The control voltage at TP36 with the MODE switch set to CW should be 5.6V DC, typical.

Table 3-2

MODE SWITCH	CONTROL	FREQUENCY
CW	RV8	455.00kHz
USB	RV5	456.50kHz
LSB	RV6	453.50kHz
RTTY	RV7	452.79kHz

(2) Disconnect the frequency counter from TP30 and instead connect the high frequency voltmeter.

Adjust the core of the transformer T18 located in the shield case, so that the output level is at maximum.

The output level should be more than 0.35V rms.

e.  $\Delta F$  circuit, 38MHz VCXO

(1) Panel control settings:

MODE switch ----- AM

$\Delta F$  switch ----- ON

$\Delta F$  control ----- Mid position

Connect the radio frequency voltmeter to TP11. Adjust the cores of the transformers T1 and T2 located in the shield case, so that a maximum reading of the output level is obtained.

The output level should be more than 0.1V rms.

The control voltage at TP10 should be 6.4V DC, typical.

- (2) Disconnect the radio frequency voltmeter from TP11 and instead connect the frequency counter.

Adjust the semi-fixed variable resistor RV2 located in the shield case so that a reading of 38MHz is obtained.

- (3) Return the panel ΔF switch to OFF and adjust the semi-fixed variable resistor RV1 for a reading of 38MHz.

f. Digital VFO circuit, LOOP 2

- (1) Panel control settings:

MODE switch	-----	AM
ΔF switch	-----	OFF
Frequency dial	--	XX.9999MHz
VFO switch	-----	INT

- (2) Connect the digital voltmeter to TP9. Adjust the core of the coil L28 located in the shield case, so that a reading of 10.5V DC is obtained.

- (3) Connect the frequency counter to TP13 and verify that the reading on the counter is 3.4549MHz ± 30Hz.

- (4) Set the frequency dial for a reading of XX.0000MHz.

Verify that

Voltage at TP9 ----- over 3.0V DC  
Frequency at TP13 ----- 2.455MHz  $\pm$  30Hz

- (5) Disconnect both the frequency counter and digital voltmeter and connect the radio frequency voltmeter to TP13.

Verify that the output level is more than 0.25V rms.

- (6) Disconnect the radio frequency voltmeter and connect it to TP32.

Verify that the output level is more than 0.05V rms.

g. Second local oscillator circuit, 70MHz XO

Since the oscillator output of 70MHz is in a drift cancel system, there is no need to fine adjust the frequency, so far as the frequency of oscillation is within a range of 70MHz  $\pm$  100Hz.

- (1) Connect the radio frequency voltmeter to TP31.

Adjust the core of the transformer T8 so that a maximum reading of the output level is obtained.

The output level should be more than 0.4V rms.

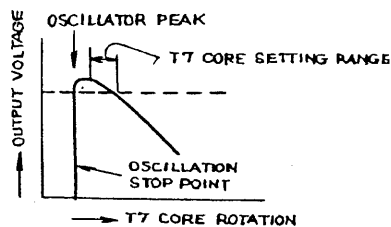
- (2) Disconnect the radio frequency voltmeter from TP31 and instead connect the frequency counter.



Adjust the trimmer CV2 located in the shield case so that a reading of 70MHz is obtained.

- (3) If the reading of 70MHz cannot be obtained by rotating the trimmer CV2 return to this trimmer to the initial position and then slightly rotate the core of the transformer T7 until a reading of 70MHz is obtained.

NOTE: If excessively rotate the core of the transformer T7 counterclockwise, the oscillator may stop oscillating or unstably oscillate.



#### 70MHz-XO adjustment

##### h. 65MHz generator circuit

- (1) Set the panel MODE switch to AM and VFO switch to EXT.
- (2) Connect the radio frequency voltmeter to TP34.

Adjust the cores of the transformers T9 through T12, so that the output level is at maximum. The output level should be more than 0.1V rms.

Then, disconnect the high frequency volt-  
meter from TP34 and instead connect the  
frequency counter.

Verify that a reading is 65MHz on the  
counter, to avoid setting to 70MHz or 75MHz.

i. VFO mixer circuit, 67.955MHz BPF

(1) Panel control settings:

MODE switch	-----	AM
VFO switch	-----	INT
$\Delta$ F switch	-----	OFF
Frequency	-----	XX.5000MHz

(2) Connect the radio frequency voltmeter to  
TP24.

Adjust the cores of the transformers T15  
through T17 so that the output level is at  
maximum.

The output level should be more than 0.1V  
rms.

(3) Disconnect the radio frequency voltmeter  
from TP24 and instead connect the frequency  
counter. Verify that the frequency is  
less than 67.955MHz  $\pm$ 100Hz.

(Do not set to 65MHz or 62.045MHz.)

j. LOOP 1 circuit

(1) Panel control settings:

MODE switch	-----	AM
VFO switch	-----	INT
$\Delta$ F switch	-----	OFF
Frequency	-----	15.000MHz

(2) Connect the radio frequency voltmeter to the base of TR12.

Adjust the core of the transformer T3 so that the output level is at maximum.

The output level is more than 0.5V rms.

(3) Connect the digital voltmeter to TP26 and the radio frequency voltmeter to TP29.

Set the trimmers CV1-V through CV3-V so that VCO control voltages specified in Table 3-3 are obtained at TP26 for different operating frequencies for reception,  $f_R$ .

Check the control voltages of VCO at the lower limits of frequency: 0.0000MHz, 10.0000MHz and 20.0000MHz.

Table 3-3

FREQUENCY $f_R$	CONTROL VOLTAGE at TP26	OUTPUT VOLTAGE at TP29	TRIMMER	VCO FREQUENCY
9.9999MHz	10.0V DC	0.4V rms or more	Set by CV1-V	+/- 80MHz
0.0000MHz	3.0VDC or more	0.4Vrms or more	For check	+/- 70MHz
19.9999MHz	10.5VDC	0.4Vrms or more	Set by CV2-V	+/- 90MHz
10.0000MHz	3.0VDC or more	0.4Vrms or more	for check	+/- 80MHz
29.9999MHz	10.5VDC	0.4Vrms or more	Set by CV3-V	+/- 100MHz
20.0000MHz	3.0VDC or more	0.4Vrms or more	for check	+/- 90MHz

k. UP/DOWN counter and frequency display circuit  
 Rotate the MHz-selector switch, TUNE dial, UP/DOWN switch, and LOCK switch on the front panel to check if the display operates normally. If the operation is abnormal, check the frequency information lines (BCD code) at the connectors J30 and J31, using the oscilloscope.

1. +12V line check

Check the voltage on the +12V line for the PLL loop.

Between IC33, Pin 1 and earth

----- +12V DC  $\pm 0.5V$ , typical

Between IC57, Pin 1 and earth

----- +12V DC  $\pm 0.5V$ , typical

4) CHECKING AND ADJUSTING THE RECEIVER UNIT

\* The location of the check terminals is shown in Figure 4 of Appendix.

To the receiver unit, the synthesizer unit supplies the first local oscillator output signal of 70.555 to 100.455MHz, second local oscillator signal of 70MHz, BFO signal, RF input filter switching information over four lines, and MUTE information.

Therefore, first check the synthesizer unit and then check the receiver unit.

If the synthesizer unit makes lockout, the MUTING circuit will operate to cease operation in the receiver unit.

When such even occurs, first check the synthesizer unit to investigate the cause of lockout. At the time of lockout, the S-meter pointer will greatly deflect.

a. AF amplifier circuit

(1) Panel control settings:

MODE switch ----- AM

RF GAIN control -- Fully counterclockwise

AF GAIN control --- Fully clockwise

(2) Connect the level meter to the rear panel SP jack through an AF output transformer of 4-ohm to 600-ohm.

Connect the CR oscillator to TP28 on the receiver unit.

Set the CR oscillator for a reading of 20dBm on the level meter. AT this time, the oscillator output level should be -45dBm, typical.

(3) Reconnect the level meter to the LINE OUT jack on the rear panel.

Set the AF GAIN control to the fully counter-clockwise position and the LINE ADJ semi-fixed variable resistor RV10 to the fully clockwise position.

Set the CR oscillator for a reading of 0dBm on the level meter.

At this time, the CR oscillator output level should be -24dBm, typical.

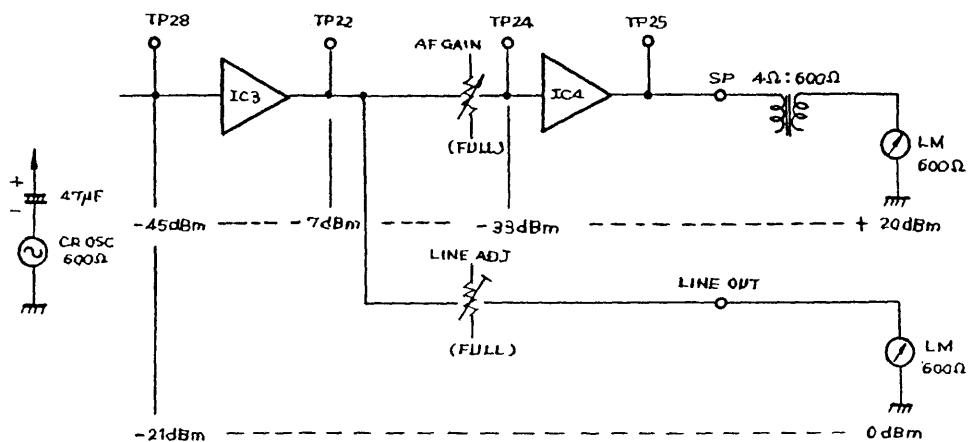


Figure 3-1 AF amplifier STAGE GAIN

b. BFO circuit

(1) Panel control settings:

MODE switch ----- CW  
BFO & BC TUNE control --- Mid position  
PBT control ----- Mid position

(2) Connect the radio frequency voltmeter to TP18.

Check the voltage applied to BFO.

The voltage should be more than 0.35V rms.

(3) If the BFO applied voltage is lower than the specified value, check the synthesizer unit according to Paragraph 3, 3) d.

c. Second local oscillator circuit

(1) Connect the radio frequency voltmeter to TP12.

Adjust the core of the transformer T7 located in the shield case, so that the output level is at maximum.

(2) Check the voltage applied to the second local oscillator, at TP12.

The voltage should be more than 1.0V rms.

(3) If the voltage applied to the second local oscillator is less than the specified value, check the synthesizer unit according to Paragraph 3, 3) g.

d. First local oscillator circuit

(1) Panel control settings:

MODE switch ----- AM

VFO switch ----- INT  
 $\Delta$ F switch ----- OFF

- (2) Connect the radio frequency voltmeter to TP7.  
 Set the TUNE dial to the operating frequencies  $f_R$ , as listed below and check the voltage applied to the first local oscillator at TP7.

FREQUENCY, $f_R$	FIRST LOCAL FREQ.	APPLIED VOLTAGE AT TP7
00.1000MHz	70.5550MHz	1.0V rms or higher
29.999MHz	100.4549MHz	1.0V rms or higher

- (3) If the applied voltage to the first local oscillator is less than the specified value, check the synthesizer unit according to Paragraph 3, 3), j.

e. First mixer circuit

- (1) Connect the radio frequency voltmeter to TP8.  
 Set the TUNE dial to 00.1000MHz.
- (2) Adjust the semi-fixed variable resistor located in the shield case, so that a minimum reading is obtained on the radio frequency voltmeter (for the balance adjustment of first mixer). The reading on radio frequency voltmeter should be less than 0.05V rms.

f. First IF and second IF amplifier circuits

(1) Panel control settings:

MODE switch	-----	AM
BANDWIDTH switch	----	2.4kHz
AF switch	-----	OFF
VFO switch	-----	INT
NB switch	-----	OFF
ATT switch	-----	OFF
AGC switch	-----	OFF
RF GAIN control	----	Fully clockwise position
Frequency	-----	7.104MHz, $f_R$

(2) Connect the radio frequency voltmeter to TP17 and the standard signal generator to the ANT connector located on the rear panel, after setting the signal generator to 7.104MHz, 10dBuV, not modulated.

(3) Adjust the cores of the transformers T4, T3 and T2 (70.455MHz) and transformers T14, T6 and T5 (455kHz) so that a maximum reading is obtained on the voltmeter.

(4) Change the output level of the standard signal generator to 0dBuV and reconnect the radio frequency voltmeter to TP15. Adjust the cores of the transformers T8 and T9 (NB amplifier) so that a maximum reading is obtained on the radio frequency voltmeter.

The reading on the voltmeter should be more than 0.04V rms.

NOTE: Figure 7 in Appendix shows the stage gains of the NRD-515. Refer to it.



g. RF input filter circuit

(1) RF input filter switching circuit check

Examine that the input filters can be switched when changing the operating frequency  $f_R$  for reception, according to Table 3-5.

Table 3-5

FREQUENCY CHANGE $f_R$ , MHz	INPUT FILTER SWITCHING
from 00.5999 to 00.6000	from 600kHz LPF to BC TUNE
from 01.5999 to 01.6000	from BC TUNE to 1.6-3MHz BPF
from 02.9999 to 03.0000	from 1.6-3MHz BPF to 3-5MHz BPF
from 04.9999 to 05.0000 (from 05.0999 to 05.1000)	from 3-5MHz BPF to 5-9MHz BPF
from 08.9999 to 09.0000	from 5-9MHz BPF to 9-17MHz BPF
from 16.9999 to 17.0000	from 9-17MHz BPF to 17-30MHz BPF
from 29.9999 to 00.0000	from 17-30MHz BPF to 600kHz LPF

Any one of paired filter switching diodes CD1 through CD14 become conductive to select filters corresponding.

In addition, IC1 provides an output with low level corresponding to each filter.

(2) RF input filter circuit check

Panel control settings:

MODE switch ----- AM  
VFO switch ----- INT  
ATT switch ----- OFF  
AGC switch ----- OFF  
RF GAIN control ---- Fully clockwise position

Connect the standard signal generator to the ANT connector on the rear panel, after setting its output level to 70dBuV not modulated.

Connect the radio frequency voltmeter to TP6, after setting to 5mVrms constant.

Set the TUNE dial to operating frequencies  $f_R$ , as listed in Table 3-6.

Check the filters frequency responses with changing the frequency and level of the standard signal generator.

NOTE: Disconnect the pin plug "H" from J21 before the check.

Table 3-6

RF INPUT FILTER	FREQUENCY $f_R$	SPECIFICATIONS
600kHz LPF	00.5200MHz	9dB or lower at 150kHz, 0dB at 600kHz, 40dB or more at 683kHz
BC TUNE	00.6000MHz	Spec. as denoted in Paragraph 3, 4), g, (3).
1.6-3MHz BPF	02.5200MHz	3dB or lower at 1.6MHz, 50dB or higher at 1.4MHz, 5dB or lower at 3.1MHz, 45dB or higher at 4MHz
3-5MHz BPF (3-5.1MHz BPF)	03.5200MHz	5dB or lower at 3MHz, 55dB or higher at 2.5MHz, 4dB or lower at 5.1MHz, 40dB or higher at 6.4MHz
5-9MHz BPF (5.1-9MHz BPF)	05.5200MHz	4dB or lower at 4.8MHz, 40dB or higher at 3.5MHz, 4dB or lower at 9.2MHz, 40dB or higher at 12.2MHz

RF INPUT FILTER	FREQUENCY $f_R$	SPECIFICATIONS
9-17MHz BPF	09.5200MHz	3dB or lower at 8.5MHz, 13dB or higher at 7MHz, 35dB or higher at 6.5MHz, 4dB or lower at 17.4MHz, 45dB or higher at 19.7MHz
17-30MHz BPF	17.5200MHz	0dB at 16MHz, 13dB or higher at 14MHz, 40dB or higher at 13MHz, 3dB or lower at 30.5 MHz, 40dB or higher at 37.5MHz

(3) BC TUNE circuit of 600kHz to 1599.9kHz

Panel control settings:

MODE switch ----- AM  
 BANDWIDTH switch ----- 6kHz  
 $\Delta F$  switch ----- OFF  
 VFO switch ----- INT  
 NB switch ----- OFF  
 ATT switch ----- OFF  
 AGC switch ----- OFF  
 RF GAIN control ----- Fully clockwise  
 position

Connect the radio frequency voltmeter to TP17 and the standard signal generator to ANT connector located on the rear panel, after setting the generator for output of 10dBuV, not modulated. Connect the digital voltmeter to TP30.

Set the BFO & BC TUNE control for reading of 2.8V DC.

Set the TUNE dial to an operating frequency  $f_R$  of 600kHz and the signal generator to the same frequency.

Adjust the cores of the transformers T16 and T17 so that a maximum reading is obtained on the radio frequency voltmeter.

Again set the TUNE dial to a frequency  $f_R$  of 1599.9kHz and the signal generator to the same frequency.

Turn the BFO & BC TUNE control to check if the tuning is accomplished.

h. 455kHz second IF filter circuit

(1) Panel control settings:

MODE switch	-----	AM
VFO switch	-----	INT
NB switch	-----	OFF
AGC switch	-----	OFF
RF GAIN control	-----	Fully clockwise position

(2) Connect the radio frequency voltmeter to TP17 after setting to a reference of 0.1V rms.

Connect the standard signal generator to TP13 after setting to 455kHz, not modulated.

Check the frequency responses of the filters with switching the BANDWIDTH SWITCH on the panel.

(3) There is no need to adjust the tuning transformers T10 and T11 of the 2.4kHz bandwidth mechanical filter.

Table 3-7

BANDWIDTH SWITCH	6dB-BANDWIDTH	60dB-BANDWIDTH	RIPPLE IN BAND	INSERTION LOSS
6kHz	4kHz or more	10kHz or less	Less than 6dB	Less than 8dB
2.4kHz	2kHz or more	6kHz or less	Less than 6dB	Less than 8dB
* 0.6kHz	0.5kHz or more	3kHz or less	Less than 6dB	Less than 8dB
* AUX (0.3kHz)	0.26kHz or more	2kHz or less	Less than 6dB	Less than 8dB

NOTE: Mark "\*" indicates options.

i. AGC and S-meter circuit

(1) Panel control settings:

MODE switch ----- AM  
 BANDWIDTH switch --- 2.4kHz  
 ΔF switch ----- OFF  
 VFO switch ----- INT  
 NB switch ----- OFF  
 ATT switch ----- OFF  
 AGC switch ----- FAST  
 RF GAIN control ---- Fully clockwise position  
 Frequency ----- 7.104MHz,  $f_R$

(2) Connect the radio frequency voltmeter to TP17 and the standard signal generator to the ANT connector on the rear panel, after setting to 7.104MHz and 30%-modulation with 400Hz.

(3) Set the signal generator output level to 60dBuV. Adjust the core of the transformer T15 so that a minimum reading is obtained on the voltmeter.

- (4) Connect the level meter to the SP jack on the rear panel through the AF output transformer of 4-ohm to 600-ohm.

Set the AF GAIN control for a reading of 20dBm on the level meter.

- (5) Adjust the semi-fixed variable resistor RV7 so that a reading of 0.8V-rms is obtained on the radio frequency voltmeter.

- (6) With changing the signal generator output level from 10dBuV to 100dBuV, check if the AF output level remains within a variation range of 10dBm. If, at this time, the output level varies in excess of 10dBm or the speaker produces a distorted sound, adjust the semi-fixed variable resistor RV6 so that the AF output level varies within a range of 10dBm and no distorted sound is heard.

- (7) S-meter adjustment

Set off the output of the standard signal generator.

Adjust the semi-fixed variable resistor RV5 so that the S-meter pointer indicates S1 on its scale.

Then, set the signal generator output level to 100dBuV.

Adjust the semi-fixed variable resistor RV8 so that the S-meter pointer deflects to S9 plus 60dB.

- (8) RF GAIN variable range adjustment

Panel control settings.

MODE switch	-----	USB
AGC switch	-----	OFF

Set the standard signal generator output level to 0dBuV, not modulated.

Set the AF GAIN control to an AF output level of 20dBm.

Then, fully counterclockwise rotate the RF GAIN control. Set the standard signal generator output level to 80dBuV.

Adjust the semi-fixed variable resistor RV11 for an AF output level of 20dBm.

NOTE: At this time, the S-meter point should not deflect out of scale.

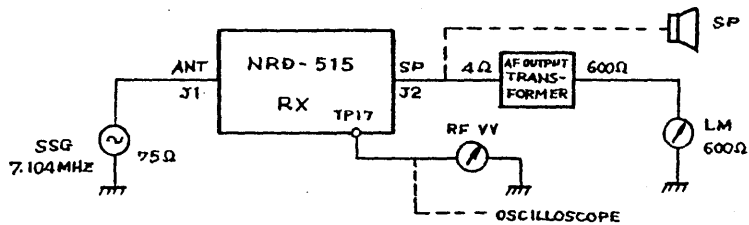


Figure 3-2

j. Monitor circuit

- (1) In succession to step(8) in Paragraph i., follow the procedure below.

Set the RF GAIN control to the fully clockwise position.

Set the MONITOR switch to ON and the standard signal generator output level to 0dBuV, not modulated.

Adjust the AF GAIN control so that the output level is 20dBm.

- (2) Disconnect the "P35" short plug from the receiver unit.  
Set the MONITOR control on the rear panel to the fully counterclockwise position.  
Set the signal generator output level to 120dBuV.  
Verify that the AF output level is less than 20dBm.
- (3) Set the standard signal generator output level to approximately 50dBuV.  
Verify that the AF output level is smoothly variable with rotation of the MONITOR control.
- (4) Insert the "P35" short plug into J35.

5) OVERALL

a. Sensitivity checking

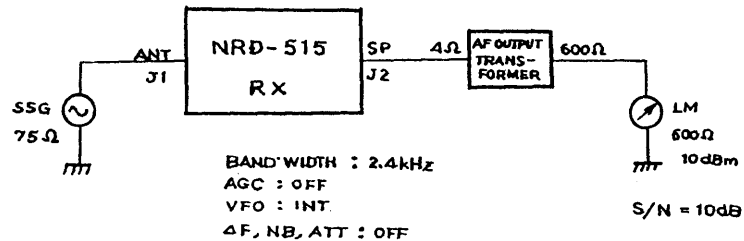


Figure 3-3 Sensitivity measuring circuit



- (1) Connect measuring instruments as shown in Figure 3-3. Adjust the RF GAIN control and AF GAIN control to check the sensitivity, after setting the standard signal generator as follows:

SSB, CW ----- Not modulated  
AM ----- 30%-modulation with 400Hz  
Frequency ----- Frequencies under check

(1)-1 A3 sensitivity measurement

Set the panel MODE switch to AM and the standard signal generator to provide an output of about 10dBuV modulated at a 30-% degree, 400Hz.

Set the TUNE dial of the receiver to a receiving frequency to be checked.

Adjust both the RF GAIN and AF GAIN controls for an AF output level of about 10dBm.

- A. Switch off the modulation upon the signal generator. Adjust the AF GAIN control and set to an AF output level of 0dBm.
- B. Switch on the modulation upon the signal generator. Clockwise rotate the RF GAIN control within a range, where no distortion appears everywhere at the AF output.  
Adjust the standard signal generator output level so that the AF output level is 10dBm.

Repeat the above two operations A and B two or three times in such manner as to satisfy the above requirements within a range where no distortion appears at the AF output, with a possibly low output level of the standard signal generator and with a possibly high RF GAIN control a maximum clockwise position.

When the AF output level provides  $S/N = 10\text{dB}$  wherein  $S = 10\text{dBm}$  with 30%-modulation at 400Hz and  $N = 0\text{dBm}$  without modulation, the output level of the standard signal generator indicates the A3 sensitivity.

(1)-2 SSB and CW sensitivity measurement

Set the panel MODE switch to USB or LSB or CW. Set the standard signal generator to an output level of about  $0\text{dBuV}$  without modulation.

Set the TUNE of the receiver to a receiving frequency to be checked.

Adjust both RF GAIN and AF GAIN controls for AF output level of about  $10\text{dBm}$ .

The AF output frequency is set to about  $1500\text{Hz}$  for the case of the SSB mode and to about  $1000\text{Hz}$  with rotation of the BFO & BC TUNE control for the case of CW mode.

C. Switch off the standard signal generator output. Adjust AF GAIN control for an AF output level of  $0\text{dBm}$ .

D. Switch on the standard signal generator output. Clockwise rotate the RF GAIN control within a range, where no distortion appears at the AF output.

Adjust the standard signal generator output level so that an AF output level of  $10\text{dBm}$  is obtained.

Repeat the above operations C and D two or three times in such manner: Within a range where no distortion appears everywhere at the AF output, meet the above requirements with a possibly low output level of the standard signal generator and with a possibly high RF GAIN control, a maximum clockwise position.

When the AF output level in above adjustment provides  $S/N = 10\text{dB}$ , wherein  $S = 10\text{dBm}$  without modulation and  $N = 0\text{dBm}$  without output of the standard signal generator, its output level indicates the sensitivity in the SSB or CW mode.

(2) Specifications of sensitivity

Table 3-8

FREQUENCY $f_R$	MODE	
	SSB/CW	AM
1.6 to 30MHz	0.5uV (-6dBuV) or lower	2uV (6dBuV) or lower
100 to 1600kHz	2uV (6dBuV) or lower	6uV (16dBuV) or lower

b. Overall distortion factor check

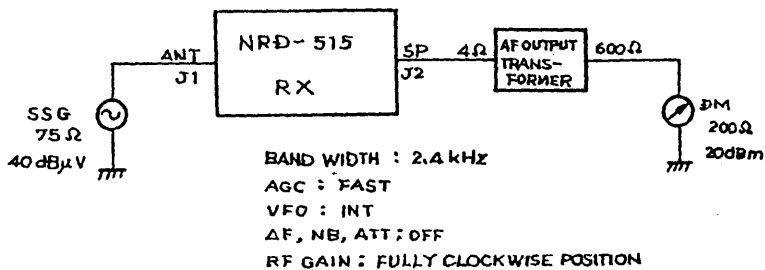


Figure 3-4

(1) Connect measuring instruments as shown in Figure 3-4.

Set the panel MODE switch to AM and panel TUNE dial to 7.104MHz.

Set the standard signal generator to 7.104MHz, 30%-modulation with 400Hz.

Adjust the AF GAIN control for an AF output level of 20dBm.

Verify that the distortion factor at the AF output is less than 5% in this condition.

(2) Set the panel MODE switch to USB and change the standard signal generator in the non-modulation mode.

Set the AF GAIN control for an AF output of 20dBm.

Verify that the distortion factor at the AF output is less than 5% in this condition.

#### 4. TROUBLESHOOTING

If a trouble should happen, refer to the table below and check.

Possible troubles are listed in this table, except those resulting from any mis-operation and wrong connections.

NOTE: When receiving a broadcast (BC) in 600kHz to 1600kHz, set the TUNE dial to desired frequency for reception and tune by means of the BFO & BC TUNE control.

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
1	No operating frequency changeable by rotating panel MHz-control	1) MHz-switch S10 defective 2) Defective IC in synthesizer unit 3) Poor contact of connector J10, P10.	1) Replace the switch S10. 2) Replace IC: IC5, IC6, IC12, IC13, IC8, IC10, etc. 3) Replace the connector J10, P10.
2	No operating frequency changeable if quickly rotating TUNE dial	Defective pulse generator (PG) A1	Replace the pulse generator A1.
3	No operating frequency changeable in UP mode by rotating TUNE dial; satisfactory in DOWN mode	1) Defective pulse generator A1 2) Defective IC(s) in synthesizer unit	1) Replace pulse generator A1. 2) Replace IC: IC9, IC7, etc. Replace defective IC: IC1 through IC6 in UP/DOWN counter circuit.
4	No operating frequency changeable by rotating TUNE dial	1) Defective pulse generator A1 2) Defective IC in synthesizer unit	1) Replace pulse generator A1. 2) Replace the defective IC among IC9, IC7, IC8, IC1 through IC6.

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
5.	Erratic display of operating frequency, if rotating TUNE dial	Defective IC in synthesizer unit	Replace the defective IC among IC1 through IC6.
6	No operating frequency changeable quickly by means of UP/DOWN switch	1) Defective UP/DOWN switch S12 2) Defective IC in synthesizer unit	1) Replace the switch S12. 2) Replace IC such as IC18 and IC19.
7	No attenuator workable by means of panel ATT switch	1) Defective ATT switch S3 2) Defective relay in receiver unit 3) Defective attenuator resistor	1) Replace ATT switch S3. 2) Replace relay: K1, K2. 3) Replace defective resistor: R1 through R3.
8	No mode changeable by turning panel MODE switch	1) Defective MODE switch S9 2) Defective detector switching circuit in receiver unit 3) Defective BFO circuit in synthesizer unit	1) Replace switch S9. 2) Replace defective parts: transistor TR30 and IC2. 3) Replace defective parts: IC59, IC60, IC44, IC46, transistor TR26, etc.

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
9	No selectivity changeable by means of BANDWIDTH switch	1) Defective BANDWIDTH switch S5 2) Defective IF filter switching circuit in receiver unit	1) Replace switch S5. 2) Replace defective parts: coils L75 through L78, diodes CD40 through CD47.
10	No time constant changeable by turning AGC switch	1) Defective AGC switch S6 2) Defective AGC switching circuit in receiver unit	1) Replace switch S6. 2) Replace defective diodes: CD62, CD63, etc.
11	Fine tuning not possible by means of $\Delta F$ control	1) Defective $\Delta F$ switch S8 2) Defective $\Delta F$ control RV7 3) Defective $\Delta F$ circuit in synthesizer unit	1) Replace switch S8. 2) Replace variable resistor RV7. 3) Replace defective IC: IC37, I38, etc.
12	No PBT workable by means of PBT control (PBT satisfactory in other than AM mode)	1) Defective PBT control RV6 2) Defective PBT circuit in synthesizer circuit	1) Replace variable resistor RV6. 2) Replace defective parts: IC44, IC45, TR10, CD10 etc.

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
13	No BC TUNE workable by rotating BFO & BC TUNE control (BC TUNE satisfactory in band of 600kHz to 1599.9kHz only)	1) Defective BFO & BC TUNE control RV5. 2) Defective BC TUNE circuit in receiver unit	1) Replace variable resistor RV5. 2) Replace defective parts: diodes CD3, CD4, CD75 through CD82, transformers T16, T17, etc.
14	No NB workable with NB switch set to ON	1) Defective NB switch S2 2) Poor adjustment of NB level control in receiver unit 3) Defective NB circuit in receiver unit	1) Replace switch S2. 2) Readjust semi-fixed resistor RV2. 3) Replace defective transistor: TR10 through TR17, TR32, etc.
15	No change in sound level by means of AF GAIN control	1) Defective AF GAIN control RV2 2) Defective AF amplifier circuit system in receiver unit	1) Replace variable resistor RV2. 2) Repair connector P5, J5 being in poor contact. Replace defective parts associated with IC3 and IC4.
16	S-meter dead or its pointer not deflecting	1) Defective S-meter M1 2) Defective AGC circuit in receiver unit	1) Replace S-meter M1. 2) Adjust as denoted in Paragraph 3, 4) i.



NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
		3) Defective S-meter amplifier circuit in receiver unit	3) Replace defective parts: transistor TR31, semi-fixed resistors RV5, RV8, etc.
17	Not possible to receive with S-meter pointer largely deflecting	1) Loop 1 circuit being in lockout 2) Digital VFO circuit being in lockout 3) Defective MUTE circuit in receiver unit	1) Check as denoted in Paragraph 3, 3) a. 2) Check as denoted in Paragraph 3, 3) a. 3) Replace defective transistors TR27 through TR29, etc.
18	No sound from speaker, while S-meter pointer deflecting depending on input signal	1) Defective AF amplifier circuit in receiver unit 2) Defective detector circuit in receiver unit	1) Check as denoted in Paragraph 3, 4) a. 2) Replace defective parts: diodes CD54 through CD58, IC2, etc.
19	No RF input filter changeable in receiver unit	1) Defective RF input filter switching circuit in receiver unit 2) Defective filter selector IC in synthesizer unit	1) Check as denoted in Paragraph 3), 4 g, (1). 2) Replace IC61-PROM.

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
20	Lock indicator illuminating in synthesizer unit	1) Defective reference oscillator circuit in synthesizer unit 2) Defective digital VFO circuit 3) Defective loop 1 circuit 4) Defective other associated circuits	1) According to Paragraph 3, 3) a. 2) Same as 1) 3) Same as 1) 4) Same as 1)
21	No +5V-supply voltage	1) Defective IC9 in power supply circuit 2) Defective diode CD2 in power supply circuit 3) Defective power transformer T1 4) +5V-power line load being shorted	1) Replace IC9. 2) Replace diode CD2. 3) Replace power transformer T1. 4) Disconnect connector P29 from synthesizer unit and repair the shorted section.
22	No +15V-supply voltage	1) Defective IC7 or IC8 in power supply circuit 2) Defective diode CD1 in power supply circuit	1) Replace IC7 or IC8. 2) Replace diode CD1.

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
		3) Defective power transformer T1 4) +15V-power line load being shorted	3) Replace T1. 4) Disconnect connector P29 from synthesizer unit and connector P11 from receiver unit. Repair shorted section.
23	No +12V-supply voltage in synthesizer unit	1) Defective IC33 2) Defective IC57	1) Replace IC33. 2) Replace IC57.
24	No external VFO output	1) Defective relay K1 in synthesizer unit 2) Defective parts: transistors TR6, TR7 and IC39, IC40, etc.	1) Replace K1. 2) Replace defective parts.
25	Not possible to receive in any band	1) Defective RF input filter circuit 2) Defective Loop 1 circuit 3) Defective digital VFO circuit 4) Defective IC61 in synthesizer unit	1) According to Paragraph 3, 4), g. 2) According to Paragraph 3, 3), j. 3) According to Paragraph 3, 3), e, f. 4) Replace IC61-PROM.

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
26	Not possible to receive in any frequency ranges at each band (MHz).	Defective digital VFO circuit	According to Paragraph 3, 3), e, f.
27	Operating frequency jump during search by means of TUNE dial	1) Defective pulse generator A1 2) Defective up/down counter of IC1 through IC6 in synthesizer unit 3) Defective digital VFO circuit	1) Replace A1. 2) Replace defective IC: IC1 through IC6. 3) According to Paragraph 3, 3), e & f.
28	Receiver sound tone varying due to vibration	1) Poor contact of relay K1 in synthesizer unit 2) Defective digital VFO circuit 3) Defective Loop 1 circuit 4) Defective 10MHz, 5MHz, 70MHz, BFO circuit 5) Cut pieces of wire entering into circuits	1) Replace relay K1. 2) According to Paragraph 3, 3), e & f. 3) According to Paragraph 3, 3), j. 4) Replace defective parts. 5) Locate defective section and repair.

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
		denoted in steps 2) through 4), poor soldering, poor contact of connectors etc.	
29	Sound level of received signal changes due to vibration	<ol style="list-style-type: none"> <li>1) Poor contact of pin jacks, connectors, etc.</li> <li>2) Poor contact of relays K1 through K4 in receiver unit</li> <li>3) Cut pieces of wire entering into circuits in receiver unit, or poor soldering, etc.</li> <li>4) Level variation of voltage applied to first and second local oscillators</li> </ol>	<ol style="list-style-type: none"> <li>1) Repair the poor contact section.</li> <li>2) Replace defective relay.</li> <li>3) Locate defective section and repair.</li> <li>4) Repair defective section in local oscillator amplifiers in receiver unit or synthesizer unit.</li> </ol>
30	Received sound distorting for strong signal input; satisfactory for weak signal input	<ol style="list-style-type: none"> <li>1) Poor AGC circuit</li> <li>2) For input signal of more than 100dB, try to</li> </ol>	<ol style="list-style-type: none"> <li>1) According to Paragraph 3, 4), i.</li> <li>2) Use RF attenuator of 10dB or 20dB.</li> </ol>

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
		<p>add RF attenuator.</p> <p>3) For distortion in BC band, use RF attenuator.</p>	<p>3) Use RF attenuator of 10dB or 20dB.</p>
31	<p>Erratic noise in all bands, without connection of antenna</p>	<p>1) Defective AF amplifier circuit</p> <p>2) Defective IF amplifier circuit</p> <p>3) Defective RF input filter and IF filter switching diodes</p>	<p>1) Replace IC: IC3, IC4, etc.</p> <p>2) Replace defective transistor, etc.</p> <p>3) Replace defective diode.</p>
32	<p>Noise appearing in operating frequencies of 1.6MHz and 5MHz (or 5.1MHz) when changed frequency</p>	<p>Noise resulting from operation of relays K3 and K4 in receiver unit. This is not trouble.</p>	
33	<p>Unstable receiving condition due to lowering of AC power line voltage</p>	<p>1) Rear panel voltage selector being set to wrong position for actual AC line voltage</p> <p>2) Defective power transformer T1</p>	<p>1) Set the voltage selector to correct position, according to Paragraph 3.3.4 in instruction manual.</p> <p>2) Check according to Paragraph 3, 2).</p>

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
		3) Defective +5V/+15V power line	If the transformer T1 is defective, replace. 3) Check according to Paragraph 3, 2). If necessary, replace defective parts.
34	Not possible to receive in other modes than AM	1) Defective detector switching circuit in receiver unit 2) Defective BFO circuit in synthesizer unit	1) Replace defective parts: IC2, TR30, etc. 2) Check according to Paragraph 3, 3), d. Replace defective parts.
35	Not possible to receive in higher frequency bands only	1) Defective RF input filter circuit 2) Defective Loop 1 circuit, VCO circuit	1) According to Paragraph 3, 4), g. 2) According to Paragraph 3, 3), j.
36	Unstable condition of reception due to temperature change	1) Defective up/down counter circuit 2) Defective Loop 1 circuit	1) Replace defective IC: IC1 through IC6, IC8, IC10 through IC17, etc. 2) According to Paragraph 3, 3), j.

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
		3) Defective digital VFO circuit 4) Unstable oscillation of 10MHz, 5MHz, 70MHz, BFO circuits	3) According to Paragraph 3, 3), e, f. 4) Replace defective parts.
37	Indistinct, trembling, or unclear receiver sound in SSB and CW modes	1) Defective digital VFO circuit 2) Defective Loop 1 circuit	1) According to Paragraph 3, 3), e, f. 2) According to Paragraph 3, 3), j.
38	Slight drift of operating frequency	1) Frequency drift in BFO circuit 2) Oscillation frequency drift in $\Delta F$ circuit 3) Oscillation frequency drift in 10MHz circuit 4) Oscillation frequency drift in PBT circuit	1) Readjust according to Paragraph 3, 3), d. 2) Readjust according to Paragraph 3, 3), e. 3) Readjust according to Paragraph 3, 3), b. 4) Readjust according to Paragraph 3, 3), c.
39	Unstable operating frequency	1) Oscillation frequency drift in $\Delta F$ circuit 2) Oscillation	1) According to Paragraph 3, 3), e. 2) According to



NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
		<p>frequency drift in 70MHz circuit</p> <p>3) Oscillation frequency drift in PBT circuit</p> <p>4) Oscillation frequency drift in BFO circuit</p> <p>5) Unstable frequency of oscillation in 10MHz</p>	<p>Paragraph 3, 3), g.</p> <p>3) According to Paragraph 3, 3), c.</p> <p>4) According to Paragraph 3, 3) d.</p> <p>5) According to Paragraph 3, 3), b.</p>
40	<p>Previous operating frequency being cancelled when turning on power switch upon lapse of 4 to 5 minutes once turning off power switch after use for a while</p>	<p>1) Poor capacitance or short circuit in capacitor C283 (C318) in synthesizer unit</p> <p>2) Poor backward current blocking performance of diode CD24 in synthesizer unit</p> <p>3) Defective IC: IC1 through IC8, IC10 through IC31 in up/down counter circuit</p>	<p>1) Replace capacitor C283 (C318).</p> <p>2) Replace diode CD24.</p> <p>3) Replace defective IC.</p> <p>NOTE: There is a means for backup with battery. Refer to Paragraph 5.6(6) in instruction manual.</p>

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
41	Much radio interference in received sound signal.	1) Arrester diodes CD83 through CD86 conducting in response to excessively large input signal from nearby broadcasting station or radio station, causing receiver sound to be distorted  2) Distortion in RF stage; radio interference not reduced with open arrester diodes in receiver unit	1) Make the arrester diodes open, so far as there is no possibility that RF input circuit is burnt out. Also use RF attenuator of 10dB or 20dB.  2) Also use RF attenuator of 10dB or 20dB. Use narrow IF filter. Use PBT.
42	Operating frequency becoming erratical even in MANUAL mode when connecting memory unit	1) Incorrect wiring of connector J4 on rear panel, short between pins, etc.  2) Defective cable connection to connector P4 of memory unit  3) Defective IC: IC9 through IC14 in memory unit	1) Repair the connector J4.  2) Repair the cable.  3) Replace defective IC.

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
43	Operating frequency in MHz-digit becoming erratic when connecting TX connector	1) Incorrect wiring of connector J3 on rear panel, short between pins, etc. 2) Defective cable connection to connector P3.	1) Repair the connector J3 wiring. 2) Repair the cable.
44	Monitor sound distorted while monitoring own station's transmitted wave	1) Poor adjustment of monitor control on rear panel 2) Excessively large input to ANT connector 3) Poor muting by means of monitor control on rear panel	1) Refer Paragraph 5.5 in instruction manual and readjust monitor control optimally. 2) Monitor control is capable of muting down to 120dBuV or more. However, for ANT input of more than 100dBuV, interlock with attenuator to reduce input level. 3) Disconnect shorting plug P35 of receiver unit.

NO.	SYMPTOM	POSSIBLE TROUBLE	REMEDY
			Repair mute circuit of TR7 if necessary.
45	Not possible to perform transceive operation from receiver	1) No VFO output from receiver  2) Defective VFO switching circuit in transmitter  3) Poor input/output level of VFO	1) Repair defective connectors P3 and P18. Replace defective relay K1 in synthesizer unit.  2) Repair, if defective.  3) Repair, if defective.
46	Not possible to perform transceive operation from transmitter	1) No VFO output from transmitter  2) Defective VFO switching circuit in receiver  3) Poor input/output level of VFO.	1) Repair transmitter, if defective.  2) Repair connector P17, relay K1, etc. in synthesizer unit, if necessary.  3) Repair VFO.

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		CHASSIS & PANEL		CFQ-608A	1
PARTS NO	PARTS NAME	TYPE	DISCRIP-TION	REMARKS	CODE
A1	PULSE GEN.	CPA-94			CPA-94
C9	CAP, FXD	CE DD36B471K500V02	500V 470PF		5CBAB00471
C10	R CAP, FXD	CE CK63YZ103PY500	500V10000P		5CBAD00031
C11	R CAP, FXD	EL ECE-A1ES100	25V10UF		5CEAA01348
5 C12	CTL CAP, FXD	CE DD36B471K500V02	500V 470PF		5CBAB00471
CD9	LED	TLR313			5TZAD00003
CD10	LED	TLR313			5TZAD00003
CD11	LED	TLR313			5TZAD00003
CD12	LED	TLR313			5TZAD00003
10 CD13	LED	TLR313			5TZAD00003
CD14	LED	TLR313			5TZAD00003
CD15	LED	TLG103	GREEN		5TZAD00023
CD16	LED	TLG103	GREEN		5TZAD00023
CD17	DIODE	1S34K			5TXAD00009
15 CD18	DIODE	1S34K			5TXAD00009
F1	FUSE	MF60-1A	1A		5ZFAD00014
IC1	IC	HD74LS47P			5DDAF00390
IC2	IC	HD74LS47P			5DDAF00390
IC3	IC	HD74LS47P			5DDAF00390
20 IC4	IC	HD74LS47P			5DDAF00390
IC5	IC	HD74LS47P			5DDAF00390
IC6	IC	HD74LS47P			5DDAF00390
J1	CONNECTOR	MR-4			5JAAN00004
J2	PIN JACK	P-8W/O	4P		5JJAJ00048
25 J3	CONNECTOR	H-6ZCJD00007			6ZCJD00007
J4	CONNECTOR	H-6ZCJD00008			6ZCJD00008
J5	CONNECTOR	PCN5-45ST-1.27DS			5JDAA00109
J6	CONNECTOR	PCN5-31ST-1.27DS			5JDAA00099
J7	JACK	S-G7850			5JJAL00007
J8	JACK	NEO MINI	6P		5JWCL00010
J9	JACK	PA-125	250V 6A		5JWAJ00007
J10	CONNECTOR	PCN5-31ST-1.27DS			5JDAA00099
M1	METER	H-6HMJD000080(SY-22	1200 OHM 2		6HMJD00080
P8	PLUG	H-6ZCJD00001	6P		6ZCJD00001
P11	CONNECTOR	HNC2-2.5S-10	10P		5JDAA00277

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET N
		CHASSIS & PANEL		CFQ-608A	2
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
P12	PIN PLUG	H-6ZCJD00002(TP-17 V)			6ZCJD0000
P13	PIN PLUG	H-6ZCJD00004			6ZCJD0000
P14	PIN PLUG	H-6ZCJD00004			6ZCJD0000
P15	PIN PLUG	H-6ZCJD00002(TP-17 V)			6ZCJD0000
5 P16	PIN PLUG	H-6ZCJD00004			6ZCJD0000
P17	PIN PLUG	H-6ZCJD00002(TP-17 V)			6ZCJD0000
P18	PIN PLUG	H-6ZCJD00002(TP-17 V)			6ZCJD0000
P21	PIN PLUG	H-6ZCJD00003(TP-17 V)			6ZCJD0000
P22	PIN PLUG	H-6ZCJD00003(TP-17 V)			6ZCJD0000:
10 P23	PIN PLUG	H-6ZCJD00003(TP-17 V)			6ZCJD0000:
P24	PIN PLUG				6ZZAB01849
P25	PIN PLUG				6ZZAB01849
P26	PIN PLUG				6ZZAB01849
P29	CONNECTOR	HNC1-2.5S-12	12P		5JDAA0027E
15 P30	CONNECTOR	HNC1-2.5S-12	12P		5JDAA00278
P31	CONNECTOR	HNC1-2.5S-12	12P		5JDAA00278
PC1	PCB	MPPC08303			MPPC08303
PL1	LAMP	AS05121	A12V2WBD 0 .16A		5WAAB00090
PLS1	HOLDER	AS0501			5ZJAD00017
20 R1	RESISTOR F XD	ERD-50TJ680	1/2W 68 OH M		5RDAA00807
R2	RESISTOR F XD	ERD-50TJ680	1/2W 68 OH M		5RDAA00807
R3	RESISTOR F XD	ERD-25VJ332	1/4W 3.3K OHM		5RDAA00981
R4	RESISTOR F XD	ERD-25VJ272	1/4W 2.7K OHM		5RDAA00979
R5	RESISTOR F XD	ERD-25VJ271	1/4W 270 O HM		5RDAA00955
25 R6	RESISTOR F XD	ERD-25VJ152	1/4W 1.5K OHM		5RDAA00973
R7	RESISTOR F XD	ERD-25VJ122	1/4W 1.2K OHM		5RDAA00971
R8	RESISTOR F XD	ERD-25VJ272	1/4W 2.7K OHM		5RDAA00979
R9	RESISTOR F XD	ERD-25VJ471	1/4W 470 O HM		5RDAA00961
R10	RESISTOR F XD	ERD-25VJ103	1/4W 10K O HM		5RDAA00993
R11	RESISTOR F XD	ERD-25VJ472	1/4W 4.7K OHM		5RDAA00985
R12	RESISTOR	IHR-1/8-4-471JB	1/8W 470 O HM X4		5RZAB00024
R13	RESISTOR	IHR-1/8-4-471JB	1/8W 470 O HM X4		5RZAB00024
R14	RESISTOR	IHR-1/8-4-471JB	1/8W 470 O HM X4		5RZAB00024
R15	RESISTOR	IHR-1/8-4-471JB	1/8W 470 O HM X4		5RZAB00024
35 R16	RESISTOR	IHR-1/8-4-471JB	1/8W 470 O HM X4		5RZAB00024

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		CHASSIS & PANEL		CFQ-608A	3
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
R17	RESISTOR	IHR-1/8-4-471JB	1/8W 470 O		5RZAB00024
R18	RESISTOR	IHR-1/8-4-471JB	HM X4 1/8W 470 O		5RZAB00024
R19	RESISTOR	IHR-1/8-4-471JB	HM X4 1/8W 470 O		5RZAB00024
R20	RESISTOR	IHR-1/8-4-471JB	HM X4 1/8W 470 O		5RZAB00024
5 R21	RESISTOR	IHR-1/8-4-471JB	HM X4 1/8W 470 O		5RZAB00024
R22	RESISTOR	IHR-1/8-4-471JB	HM X4 1/8W 470 O		5RZAB00024
R25	RESISTOR F	ERD-25VJ471	HM X4 1/4W 470 O		5RDAA00961
R26	XD RESISTOR F	ERD-25VJ103	HM 1/4W 10K O		5RDAA00993
R27	XD RESISTOR F	ERD-25VJ152	HM 1/4W 1.5K		5RDAA00973
10 R28	XD RESISTOR F	ERD-25VJ222	OHM 1/4W 2.2K		5RDAA00977
R29	RESISTOR F	ERD-25VJ152	1/4W 1.5K		5RDAA00973
R30	XD RESISTOR F	ERD-25VJ392	OHM 1/4W 3.9K		5RDAA00983
RV1	XD RESISTOR V	EVS-S2AS20A53	OHM 5K OHM		5RSAA00093
RV2	AR RESISTOR V	EVS-S2AS20A53	5K OHM		5RSAA00093
15 RV3	AR RESISTOR V	EVS-S2AS20A53	5K OHM		5RSAA00093
RV5	RESISTOR V	EVS-S2AS20B14	10K OHM		5RSAA00094
RV6	AR RESISTOR V	EVC-E0AS20B14			5RVAB00124
RV7	AR RESISTOR V	EVS-S2AS20B14	10K OHM		5RSAA00094
S1	SWITCH	M-2012E			5SAAB00030
20 S2	SWITCH	M-2012E			5SAAB00030
S3	SWITCH	M-2013E			5SAAB00111
S4	SWITCH	NSC-012-D-SR-CB-NB	GRAY		5SCAN00050
S5	SWITCH	SRN1014N L=20MM	1-1-4		5SEAB00111
S6	SWITCH	SRN1013N L=20MM	1-1-3		5SEAB00112
25 S8	SWITCH	M-2012E			5SAAB00030
S9	SWITCH	SRN1015N L=20MM	1-1-5		5SEAB00113
S10	SWITCH	H-6SEJD00097A			6SEJD00097
S11	SWITCH	NSC-012-D-SR-CB-NB	GRAY		5SCAN00050
S12	SWITCH	E-2018-B2C			5SZAT00037
S13	SWITCH	NSC-012-D-SR-CB-NB	GRAY		5SCAN00050
S14	SWITCH	S-I7221-04	100 117 22 0 240		5ZZEG00001
T1	TRANSFORME	H-6LVJD00074			6LVJD00074
TR1	R TRANSISTOR	2SC372GTM-Y			5TCAF00245

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		RECEIVER		CMA-105A	1
PARTS NO	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
C1	CAP,FXD	CE DD104SL560J50V02	50V 56PF		5CAAA01098
C2	R CAP,FXD	CE DD104SL220J50V02	50V 22PF		5CAAA01093
C3	R CAP,FXD	CE DD104SL820J50V02	50V 82PF		5CAAA01100
C4	R CAP,FXD	CE DD104SL820J50V02	50V 82PF		5CAAA01100
5 C5	R CAP,FXD	CE DD104SL330J50V02	50V 33PF		5CAAA01095
C6	CAP,FXD	PL CQ14SX7500J	150V 750PF		5CRAB00210
C7	STC CAP,FXD	PL CQ14SX7501J	150V 0.007 5UF		5CRAB00234
C8	STC CAP,FXD	CE DD110SL681J50V02	50V 680PF		5CAAA01110
C9	R CAP,FXD	PL CQ14SX1801J	150V 0.001		5CRAB00219
10 C10	STC CAP,FXD	CE DD112SL102J50V02	8UF 50V 1000PF		5CAAA01112
C11	R CAP,FXD	PL CQ14SX1101J	150V 0.001		5CRAB00214
C12	STC CAP,FXD	CE DD110SL681J50V02	1UF 50V 680PF		5CAAA01110
C13	R CAP,FXD	PL CQ14SX2401J	150V 0.002		5CRAB00222
C14	STC CAP,FXD	PL CQ14SX7500J	4UF 150V 750PF		5CRAB00210
15 C15	STC CAP,FXD	PL ECQ-M1H104KZ			5CRAA00123
C16	R CAP,FXD	CE DD109E103P50V02	50V 10000P F		5CBAB00301
C17	STC CAP,FXD	PL ECQ-M1H104KZ			5CRAA00123
C18	STC CAP,FXD	PL CQ14SX7501J	150V 0.007 5UF		5CRAB00234
C19	STC CAP,FXD	PL CQ14SX1201J	150V 0.001 2UF		5CRAB00215
20 C20	STC CAP,FXD	PL CQ14SX7501J	150V 0.007 5UF		5CRAB00234
C21	R CAP,FXD	PL CQ14SX5601J	150V 0.005		5CRAB00231
C22	STC CAP,FXD	PL CQ14SX5601J	6UF 150V 0.005		5CRAB00231
C23	STC CAP,FXD	PL CQ14SX4701J	6UF 150V 0.004		5CRAB00229
C24	STC CAP,FXD	PL CQ14SX5601J	7UF 150V 0.005		5CRAB00231
25 C25	STC CAP,FXD	CE DD109E103P50V02	6UF 50V 10000P F		5CBAB00301
C26	R CAP,FXD	CE DD109E103P50V02	50V 10000P F		5CBAB00301
C27	STC CAP,FXD	PL ECQ-M1H104KZ			5CRAA00123
C28	STC CAP,FXD	PL ECQ-M1H104KZ			5CRAA00123
C29	STC CAP,FXD	PL ECQ-M1H104KZ			5CRAA00123
C30	R CAP,FXD	CE DD109E103P50V02	50V 10000P F		5CBAB00301
C31	R CAP,FXD	CE DD109E103P50V02	50V 10000P F		5CBAB00301
C32	STC CAP,FXD	PL CQ14SX4701J	7UF 150V 0.004		5CRAB00229
C33	STC CAP,FXD	PL CQ14SX7501J	5UF 150V 0.007		5CRAB00234
C34	STC CAP,FXD	PL CQ14SX2001J	150V 0.002		5CRAB00220
35 C35	R CAP,FXD	CE DD112SL102J50V02	UF 50V 1000PF		5CAAA01112



## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		RECEIVER		CMA-105A	2
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
C36	CAP, FXD R	CE DD112SL102J50V02	50V 1000PF		5CAAA01112
C37	CAP, FXD STC	PL CQ14SX6200J	150V 620PF		5CRAB00208
C38	CAP, FXD STC	PL CQ14SX5100J	150V 510PF		5CRAB00206
C39	CAP, FXD STC	PL CQ14SX4701J	150V 0.004 7UF		5CRAB00229
5 C40	CAP, FXD R	CE DD112SL821J50V02	50V 820PF		5CAAA01111
C41	CAP, FXD STC	PL CQ14SX1801J	150V 0.001 8UF		5CRAB00219
C42	CAP, FXD R	CE DD107SL271J50V02	50V 270PF		5CAAA01116
C43	CAP, FXD STC	PL CQ14SX1801J	150V 0.001 8UF		5CRAB00219
C45	CAP, FXD STC	PL CQ14SX7500J	150V 750PF		5CRAB00210
10 C46	CAP, FXD STC	PL CQ14SX5100J	150V 510PF		5CRAB00206
C47	CAP, FXD R	CE DD109E103P50V02	50V 10000P F		5CBAB00301
C48	CAP, FXD R	CE DD109E103P50V02	50V 10000P F		5CBAB00301
C49	CAP, FXD R	CE DD109E103P50V02	50V 10000P F		5CBAB00301
C50	CAP, FXD STC	PL CQ14SX4300J	150V 430PF		5CRAB00204
15 C51	CAP, FXD STC	PL CQ14SX3901J	150V 0.003 9UF		5CRAB00227
C52	CAP, FXD R	CE DD107SL271J50V02	50V 270PF		5CAAA01116
C53	CAP, FXD R	CE DD110SL681J50V02	50V 680PF		5CAAA01110
C54	CAP, FXD STC	PL CQ14SX4300J	150V 430PF		5CRAB00204
C55	CAP, FXD STC	PL CQ14SX5100J	150V 510PF		5CRAB00206
20 C56	CAP, FXD R	CE DD107SL331J50V02	50V 330PF		5CAAA01106
C57	CAP, FXD R	CE DD112SL102J50V02	50V 1000PF		5CAAA01112
C58	CAP, FXD R	CE DD109SL471J50V02	50V 470PF		5CAAA01108
C59	CAP, FXD R	CE DD109SL561J50V02	50V 560PF		5CAAA01109
C60	CAP, FXD R	CE DD107SL221J50V02	50V 220PF		5CAAA01105
25 C61	CAP, FXD STC	PL CQ14SX1201J	150V 0.001 2UF		5CRAB00215
C62	CAP, FXD STC	PL CQ14SX4700J	150V 470PF		5CRAB00205
C63	CAP, FXD STC	PL CQ14SX3000J	150V 300PF		5CRAB00200
C64	CAP, FXD R	CE DD109E103P50V02	50V 10000P F		5CBAB00301
C65	CAP, FXD R	CE DD109E103P50V02	50V 10000P F		5CBAB00301
C66	CAP, FXD R	CE DD109E103P50V02	50V 10000P F		5CBAB00301
C67	CAP, FXD R	CE DD107SL271J50V02	50V 270PF		5CAAA01116
C68	CAP, FXD STC	PL CQ14SX3001J	150V 0.003 UF		5CRAB00224
C69	CAP, FXD R	CE DD106SL151J50V02	50V 150PF		5CAAA01103
C70	CAP, FXD STC	PL CQ14SX7500J	150V 750PF		5CRAB00210
35 C71	CAP, FXD R	CE DD107SL331J50V02	50V 330PF		5CAAA01106

## PARTS LIST

ORDER		TITLE	LIST NO.	SHEET NO	
		RECEIVER	CMA-105A	3	
PARTS NO	PARTS NAME	TYPE	DISCRIP-TION	REMARKS	CODE
C72	CAP, FXD PL CQ14SX3600J STC		150V 360PF		5CRAB0020
C73	R CAP, FXD CE DD106SL181J50V02		50V 180PF		5CAAA0110
C74	R CAP, FXD PL CQ14SX4300J STC		150V 430PF		5CRAB0020
C75	R CAP, FXD CE DD107SL271J50V02		50V 270PF		5CAAA0111
5 C76	R CAP, FXD PL CQ14SX7500J STC		150V 750PF		5CRAB0021
C77	R CAP, FXD CE DD109E103P50V02		50V 10000P		5CBAB0030
C78	R CAP, FXD CE DD109E103P50V02		50V 10000P		5CBAB0030
C79	R CAP, FXD CE DD109E103P50V02		50V 10000P		5CBAB0030
C80	R CAP, FXD CE DD109SL561J50V02		50V 560PF		5CAAA0110
10 C81	R CAP, FXD PL CQ14SX1201J STC		150V 0.001 2UF		5CRAB0021
C82	R CAP, FXD PL CQ14SX2000J STC		150V 200PF		5CRAB00196
C83	R CAP, FXD PL CQ14SX4300J STC		150V 430PF		5CRAB00204
C85	R CAP, FXD CE DD106SL151J50V02		50V 150PF		5CAAA01103
C86	R CAP, FXD CE DD106SL181J50V02		50V 180PF		5CAAA01104
15 C87	R CAP, FXD CE DD104SL560J50V02		50V 56PF		5CAAA01098
C88	R CAP, FXD CE DD107SL331J50V02		50V 330PF		5CAAA01106
C89	R CAP, FXD CE DD107SL221J50V02		50V 220PF		5CAAA01105
C90	R CAP, FXD CE DD107SL221J50V02		50V 220PF		5CAAA01105
C91	R CAP, FXD CE DD106SL181J50V02		50V 180PF		5CAAA01104
20 C92	R CAP, FXD PL CQ14SX2000J STC		150V 200PF		5CRAB00196
C93	R CAP, FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C94	R CAP, FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C95	R CAP, FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C96	R CAP, FXD CE DD104SL820J50V02		50V 82PF		5CAAA01100
25 C97	R CAP, FXD CE DD107SL271J50V02		50V 270PF		5CAAA01116
C98	R CAP, FXD CE DD104SL390J50V02		50V 39PF		5CAAA01096
C99	R CAP, FXD CE DD104SL820J50V02		50V 82PF		5CAAA01100
C100	R CAP, FXD CE DD104SL680J50V02		50V 68PF		5CAAA01099
C101	R CAP, FXD CE DD107SL221J50V02		50V 220PF		5CAAA01105
C102	R CAP, FXD CE DD104SL470J50V02		50V 47PF		5CAAA01097
C103	R CAP, FXD CE DD104SL330J50V02		50V 33PF		5CAAA01095
C104	R CAP, FXD CE DD104SL470J50V02		50V 47PF		5CAAA01097
C105	R CAP, FXD CE DD104SL680J50V02		50V 68PF		5CAAA01099
C106	R CAP, FXD CE DD104SL470J50V02		50V 47PF		5CAAA01097
35 C107	R CAP, FXD CE DD104SL330J50V02		50V 33PF		5CAAA01095

## PARTS LIST

ORDER		TITLE	LIST NO.	SHEET NO.	
		RECEIVER	CMA-105A	4	
PARTS NO	PARTS NAME	TYPE	DISCRIP-TION	REMARKS	CODE
C108	CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C109	R CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
C120	R CAP, FXD	EL ECE-A1ES100	F 25V10UF		5CEAA01348
C121	CTLT CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
5 C122	R CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
C123	R CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
C124	R CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
C131	R CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
C132	R CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
10 C133	R CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
C134	R CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
C150	R CAP, FXD	PL ECQ-M1H104KZ			5CRAA00123
C151	STC CAP, FXD	CE DD104SL560J50V02	50V 56PF		5CAAA01098
C152	R CAP, FXD	CE DD104SL220J50V02	50V 22PF		5CAAA01093
15 C153	R CAP, FXD	CE DD106SL151J50V02	50V 150PF		5CAAA01103
C154	R CAP, FXD	CE DD104SL470J50V02	50V 47PF		5CAAA01097
C155	R CAP, FXD	CE DD104SL330J50V02	50V 33PF		5CAAA01095
C156	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C157	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
20 C158	R CAP, FXD	CE DD104SL390J50V02	50V 39PF		5CAAA01096
C159	R CAP, FXD	CE DD104SL390J50V02	50V 39PF		5CAAA01096
C160	R CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
C161	R CAP, FXD	CE DD104SL220J50V02	F 50V 22PF		5CAAA01093
C162	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
25 C163	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C164	R CAP, FXD	CE DD104SL150J50V02	50V 15PF		5CAAA01091
C165	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C166	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C167	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C168	R CAP, FXD	CE DD107SL331J50V02	50V 330PF		5CAAA01106
C169	R CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
C170	R CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
C171	R CAP, FXD	CE DD107SL331J50V02	F 50V 330PF		5CAAA01106
C172	R CAP, FXD	CE DD109E103P50V02	F 50V 10000P		5CBAB00301
35 C173	R CAP, FXD	CE DD105E102P50V02	F 50V 1000PF		5CBAB00299

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		RECEIVER		CMA-105A	5
PARTS NO	PARTS NAME	TYPE	DISCRIP-TION	REMARKS	CODE
C174	CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C175	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C176	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C177	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
5 C178	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C179	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C180	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C181	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C182	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
10 C183	R CAP, FXD CTLT	EL ECE-A1ES100	25V10UF		5CEAA01348
C184	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C185	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C186	R CAP, FXD	CE DD104SL220J50V02	50V 22PF		5CAAA01093
C187	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
15 C188	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C189	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C190	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C200	R CAP, FXD	CE DD104SL470J50V02	50V 47PF		5CAAA01097
C201	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
20 C202	R CAP, FXD	CE DD107SL221J50V02	50V 220PF		5CAAA01105
C203	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C204	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C205	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C206	R CAP, FXD	CE DD107SL331J50V02	50V 330PF		5CAAA01106
25 C207	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C208	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C209	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C210	R CAP, FXD STC	PL ECQ-M1H104KZ			5CRAA00123
C211	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C212	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C213	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C214	R CAP, FXD CTLT	EL ECE-A1ES100	25V10UF		5CEAA01348
C215	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C216	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
35 C249	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301

## PARTS LIST

ORDER		TITLE	LIST NO.	SHEET NO	
		RECEIVER	CMA-105A	6	
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
C250	CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C251	R CAP,FXD	CE DD107SL221J50V02	50V 220PF		5CAAA0110
C252	R CAP,FXD	CE DD107SL221J50V02	50V 220PF		5CAAA0110
C253	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
5 C254	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C255	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C256	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C257	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C258	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
10 C259	R CAP,FXD STC	PL CQ14SX0620J	150V 62PF		5CRAB00184
C260	R CAP,FXD STC	PL CQ14SX0620J	150V 62PF		5CRAB00184
C261	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C266	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C271	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
15 C272	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C273	R CAP,FXD	CE DD107SL271J50V02	50V 270PF		5CAAA01116
C274	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C275	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C276	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
20 C277	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C278	R CAP,FXD	CE DD107SL271J50V02	50V 270PF		5CAAA01116
C279	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C280	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C281	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
25 C282	R CAP,FXD	CE DD107SL271J50V02	50V 270PF		5CAAA01116
C283	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C284	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C285	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C286	R CAP,FXD	CE DD107SL331J50V02	50V 330PF		5CAAA01106
C287	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB0030
C288	R CAP,FXD	CE DD105E222P50V02	50V 2200PF		5CBAB00291
C289	R CAP,FXD	CE DD105E222P50V02	50V 2200PF		5CBAB00291
C290	R CAP,FXD NTAL	TA 202L3502 105M3	35V 1UF		5CSAC00652
C291	R CAP,FXD	CE DD105SL101J50V02	50V 100PF		5CAAA01101
35 C292	R CAP,FXD	CE DD105E222P50V02	50V 2200PF		5CBAB00291

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		RECEIVER		CMA-105A	7
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
C293	CAP,FXD	CE DD105E222P50V02	50V 2200PF		5CBAB0029
C294	R CAP,FXD	TA 202L3502 105M3	35V 1UF		5CSAC0065
C295	NTAL CAP,FXD	CE DD104SL470J50V02	50V 47PF		5CAAA0109
C296	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
5 C297	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C298	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C299	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C300	R CAP,FXD	CE DD107SL221J50V02	50V 220PF		5CAAA01105
C301	R CAP,FXD	PL ECQ-M1H104KZ			5CRAA00123
10 C302	STC CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C303	R CAP,FXD	CE DD107SL331J50V02	50V 330PF		5CAAA01106
C304	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C305	R CAP,FXD	TA 202L2502 475M3	25V 4.7UF		5CSAC00653
C306	NTAL CAP,FXD	EL ECE-A1ES100	25V10UF		5CEAA01348
15 C307	CTL CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C308	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C309	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C310	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C311	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
20 C312	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C313	CTL CAP,FXD	EL ECE-A1ES100	25V10UF		5CEAA01348
C314	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C315	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C316	R CAP,FXD	EL ECE-A1ES100	25V10UF		5CEAA01348
25 C317	CTL CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C318	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C321	CTL CAP,FXD	EL ECE-A1ES471	25V470UF		5CEAA01354
C322	R CAP,FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C323	STC CAP,FXD	PL ECQ-M1H223KZ	50V 0.022U		5CRAA00147
C324	STC CAP,FXD	PL ECQ-M1H473KZ	50V 0.047U		5CRAA00149
C325	CTL CAP,FXD	EL ECE-A1ES100	25V10UF		5CEAA01348
C326	CTL CAP,FXD	EL ECE-A1ES101	25V100UF		5CEAA01349
C327	CTL CAP,FXD	EL ECE-A1ES470	25V47UF		5CEAA01322
C328	R CAP,FXD	CE RPE112F224Z50	50V 0.22UF		5CBAB00570
35 C329	R CAP,FXD	EL ECE-A1ES221	25V220UF		5CEAA01320
	CTL				

ORDER		TITLE		LIST NO.	SHEET NO.
		RECEIVER	CMA-105A		8
PARTS NO	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
C330	CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C331	R CAP, FXD NTAL	TA 202L2502 475M3	25V 4.7UF		5CSAC00653
C332	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C333	R CAP, FXD STC	PL ECQ-M1H333KZ	50V 0.033U		5CRAA00148
5 C334	R CAP, FXD STC	PL ECQ-M1H333KZ	50V 0.033U		5CRAA00148
C335	CAP, FXD	EL ECE-A1ES100	25V10UF		5CEAA01348
C336	CTLT CAP, FXD	EL ECE-A1ES330	25V33UF		5CEAA01321
C337	CTLT CAP, FXD STC	PL CQ14SX3301J	150V 0.003 3UF		5CRAB00225
C338	R CAP, FXD	EL ECE-A1ES470	25V47UF		5CEAA01322
10 C339	CTLT CAP, FXD CTLT	EL ECE-A1ES221	25V220UF		5CEAA01320
C340	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C341	R CAP, FXD CTLT	EL ECE-A1ES100	25V10UF		5CEAA01348
C345	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C346	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
15 C347	R CAP, FXD R	CE DD109E103P50V02	50V 10000P		5CBAB00301
C348	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C349	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C350	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C351	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
20 C352	R CAP, FXD R	CE DD109E103P50V02	50V 10000P		5CBAB00301
C353	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C354	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C355	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C357	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
25 C358	R CAP, FXD NTAL	TA 202L3502 105M3	35V 1UF		5CSAC00652
C359	R CAP, FXD NTAL	TA 202L3502 105M3	35V 1UF		5CSAC00652
C360	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C361	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C362	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C363	R CAP, FXD R	CE DD109E103P50V02	50V 10000P		5CBAB00301
C364	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C365	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C366	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C367	R CAP, FXD	TA 202L3502 105M3	35V 1UF		5CSAC00652
35 C368	NTAL CAP, FXD R	CE DD105E102P50V02	50V 1000PF		5CBAB00299

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		RECEIVER	CMA-105A		9
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
C369	CAP, FXD EL CTLT	ECE-A1ES330	25V33UF		5CEAA01321
CD1	DIODE	1S84H			5TXAE00007
CD2	DIODE	1S84H			5TXAE00007
CD3	DIODE	1S84H			5TXAE00007
5 CD4	DIODE	1S84H			5TXAE00007
CD5	DIODE	1S84H			5TXAE00007
CD6	DIODE	1S84H			5TXAE00007
CD7	DIODE	1S84H			5TXAE00007
CD8	DIODE	1S84H			5TXAE00007
10 CD9	DIODE	1S84H			5TXAE00007
CD10	DIODE	1S84H			5TXAE00007
CD11	DIODE	1S84H			5TXAE00007
CD12	DIODE	1S84H			5TXAE00007
CD13	DIODE	1S84H			5TXAE00007
15 CD14	DIODE	1S84H			5TXAE00007
CD17	DIODE	1S1588LB-10			5TXAD00248
CD18	DIODE	1S1588LB-10			5TXAD00248
CD19	DIODE	WZ-050	1/2W 5V 50 OMW		5TXAF00129
CD21	DIODE	10D2	200V 1A		5TXAG00001
CD22	DIODE	10D2	200V 1A		5TXAG00001
20 CD23	DIODE	10D2	200V 1A		5TXAG00001
CD30	DIODE	HZ3A			5TXAE00076
CD31	DIODE	1S1588LB-10			5TXAD00248
CD32	DIODE	1S2187			5TXAD00219
25 CD33	DIODE	1S1588LB-10			5TXAD00248
CD40	DIODE	1S1588LB-10			5TXAD00248
CD41	DIODE	1S1588LB-10			5TXAD00248
CD42	DIODE	1S1588LB-10			5TXAD00248
CD43	DIODE	1S1588LB-10			5TXAD00248
CD44	DIODE	1S1588LB-10			5TXAD00248
CD45	DIODE	1S1588LB-10			5TXAD00248
CD46	DIODE	1S1588LB-10			5TXAD00248
CD47	DIODE	1S1588LB-10			5TXAD00248
CD50	DIODE	HZ3A			5TXAE00076
35 CD51	DIODE	HZ3A			5TXAE00076



## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		RECEIVER	CMA-105A		10
PARTS NO	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
5	CD52	DIODE	1S1588LB-10		5TXAD00248
	CD53	DIODE	1S1588LB-10		5TXAD00248
	CD54	DIODE	1S34K		5TXAD00009
	CD55	DIODE	1S34K		5TXAD00009
	CD56	DIODE	1S34K		5TXAD00009
	CD57	DIODE	1S34K		5TXAD00009
	CD58	DIODE	1S34K		5TXAD00009
	CD60	DIODE	1S1588LB-10		5TXAD00248
	CD61	DIODE	1S1588LB-10		5TXAD00248
10	CD62	DIODE	1S1588LB-10		5TXAD00248
	CD63	DIODE	1S1588LB-10		5TXAD00248
	CD64	DIODE	WZ-050	1/2W 5V 50 OMW	5TXAF00129
	CD65	DIODE	WZ-050	1/2W 5V 50 OMW	5TXAF00129
	CD66	DIODE	1S1588LB-10		5TXAD00248
15	CD67	DIODE	1S1588LB-10		5TXAD00248
	CD68	DIODE	1S1588LB-10		5TXAD00248
	CD69	DIODE	1S1588LB-10		5TXAD00248
	CD70	DIODE	1S1588LB-10		5TXAD00248
	CD71	DIODE	1S1588LB-10		5TXAD00248
20	CD72	DIODE	1S1588LB-10		5TXAD00248
	CD73	DIODE	1S1588LB-10		5TXAD00248
	CD74	DIODE	1S1588LB-10		5TXAD00248
	CD75	DIODE	1SV100		5TXAA00307
	CD76	DIODE	1SV100		5TXAA00307
25	CD77	DIODE	1SV100		5TXAA00307
	CD78	DIODE	1SV100		5TXAA00307
	CD79	DIODE	1SV100		5TXAA00307
	CD80	DIODE	1SV100		5TXAA00307
	CD81	DIODE	1SV100		5TXAA00307
	CD82	DIODE	1SV100		5TXAA00307
	CD83	DIODE	MI301		5TXAR00004
	CD84	DIODE	MI301		5TXAR00004
	CD85	DIODE	MI301		5TXAR00004
	CD86	DIODE	MI301		5TXAR00004
35	CD87	DIODE	1SV100		5TXAA00307

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		RECEIVER	CMA-105A		11
PARTS NO	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
FL1	CRYSTAL CK	H-6XMJD00041	YF70.455D		6XMJD00041
FL2	FILTER	CLF-D6S	BW=6KHZ		5NRAD00001
FL3	FILTER	MF-455-10AZ121	2.2KHZ 1K OHM		5NMAA00006
IC1	IC	SN7445N			5DDAL00092
5 IC2	IC	TC40168P			5DDAE00061
IC3	IC	TA7140P			5DAAD00032
IC4	IC	MB3712			5DDAT00020
J11	CONNECTOR	HNC2-2.5P-10DS	10P		5JDAA00275
J12	PIN JACK	S-Q3063			5JJAL00016
10 J13	PIN JACK	S-Q3063			5JJAL00016
J14	PIN JACK	S-Q3063			5JJAL00016
J15	PIN JACK	S-Q3063			5JJAL00016
J16	PIN JACK	S-Q3063			5JJAL00016
J21	PIN JACK	S-Q3063			5JJAL00016
15 J23	PIN JACK	S-Q3063			5JJAL00016
J25	PIN JACK	S-Q3063			5JJAL00016
J27	CONNECTOR	CR23A-10SA-4DS			5JDAA00342
J35	CONNECTOR	HNC2-2.5P-2DS	2P		5JDAA00276
J36	CONNECTOR	HNC2-2.5P-2DS	2P		5JDAA00276
20 K1	RELAY	HB1E-DC12V	DC12V		5KLAD00330
K2	RELAY	HB1E-DC12V	DC12V		5KLAD00330
K3	RELAY	HB1E-DC12V	DC12V		5KLAD00330
K4	RELAY	HB1E-DC12V	DC12V		5KLAD00330
L1	COIL	SP0408-R33M	0.33UH		5LCAC00164
25 L2	COIL	SP0408-R22M	0.22UH		5LCAC00165
L3	COIL	LF4-8R2K	8.2UH		5LCAB00032
L4	COIL	LF1-120K	120UH		5LCAB00069
L5	COIL	LF1-150K	15UH		5LCAB00002
L6	COIL	LF1-100K	10UH		5LCAB00001
L7	COIL	LF1-471K	470UH		5LCAB00011
L8	COIL	LF1-150K	15UH		5LCAB00002
L9	COIL	LF1-100K	10UH		5LCAB00001
L10	COIL	LF1-100K	10UH		5LCAB00001
L11	COIL	LF1-471K	470UH		5LCAB00011
35 L12	COIL	LF1-471K	470UH		5LCAB00011

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		RECEIVER		CMA-105A	12
PARTS NO	PARTS NAME	TYPE	DISCRIP-TION	REMARKS	CODE
L13	COIL	LF1-100K	10UH		5LCAB0000
L14	COIL	LF1-101K	100UH		5LCAB0000
L15	COIL	LF4-8R2K	8.2UH		5LCAB0003
L16	COIL	LF1-220K	22UH		5LCAB0000
5 L17	COIL	LF1-220K	22UH		5LCAB0000
L18	COIL	LF1-100K	10UH		5LCAB0000
L19	COIL	LF4-3R3K	3.3UH		5LCAB00015
L20	COIL	LF4-2R2K	2.2UH		5LCAB00014
L22	COIL	LF1-101K	100UH		5LCAB00007
10 L23	COIL	LF1-101K	100UH		5LCAB00007
L24	COIL	LF4-4R7K	4.7UH		5LCAB00016
L25	COIL	LF4-6R8K	6.8UH		5LCAB00017
L26	COIL	LF4-8R2K	8.2UH		5LCAB00032
L27	COIL	LF4-5R6K	5.6UH		5LCAB00070
15 L28	COIL	LF4-1R8K	1.8UH		5LCAB00030
L29	COIL	LF4-1R2K	1.2UH		5LCAB00071
L31	COIL	LF1-101K	100UH		5LCAB00007
L32	COIL	LF1-101K	100UH		5LCAB00007
L33	COIL	LF4-2R7K	2.7UH		5LCAB00072
20 L34	COIL	LF4-2R7K	2.7UH		5LCAB00072
L36	COIL	LF4-010K	1UH		5LCAB00012
L37	COIL	SP0406-R82K	0.82UH		5LCAC00157
L39	COIL	LF1-101K	100UH		5LCAB00007
L40	COIL	LF1-101K	100UH		5LCAB00007
25 L41	COIL	LF4-1R5K	1.5UH		5LCAB00013
L42	COIL	LF4-1R8K	1.8UH		5LCAB00030
L44	COIL	SP0408-R56M	0.56UH		5LCAC00185
L45	COIL	TP0206-R27K	0.27UH		5LCAC00178
L46	COIL	SP0408-R33M	0.33UH		5LCAC00164
L48	COIL	LF1-101K	100UH		5LCAB00007
L49	COIL	LF1-101K	100UH		5LCAB00007
L50	COIL	LF4-010K	1UH		5LCAB00012
L51	COIL	LF4-2R2K	2.2UH		5LCAB00014
L52	COIL	LF4-1R8K	1.8UH		5LCAB00030
35 L53	COIL	TP0206-R39K	0.39UH		5LCAC00177

## PARIS LIST

ORDER		TITLE	LIST NO.	SHEET NO.	
		RECEIVER	CMA-105A	13	
PARTS NO	PARTS NAME	TYPE	DISCRIP-TION	REMARKS	CODE
L54	COIL	SP0408-R33M	0.33UH		5LCAC00164
L56	COIL	LF1-101K	100UH		5LCAB00007
L57	COIL	LF1-100K	10UH		5LCAB00001
L58	COIL	LF1-471K	470UH		5LCAB00011
L59	COIL	LF1-100K	10UH		5LCAB00001
L60	COIL	LF1-471K	470UH		5LCAB00011
L70	COIL	LF1-470K	47UH 130MA		5LCAB00005
L71	COIL	LF1-470K	47UH 130MA		5LCAB00005
L72	COIL	LF1-470K	47UH 130MA		5LCAB00005
L73	COIL	LF1-470K	47UH 130MA		5LCAB00005
L74	COIL	LF1-470K	47UH 130MA		5LCAB00005
L75	COIL	LF1-470K	47UH 130MA		5LCAB00005
L76	COIL	LF1-470K	47UH 130MA		5LCAB00005
L77	COIL	LF1-470K	47UH 130MA		5LCAB00005
L78	COIL	LF1-470K	47UH 130MA		5LCAB00005
L79	COIL	LF1-100K	10UH		5LCAB00001
L80	COIL	LF1-100K	10UH		5LCAB00001
L81	COIL	LF1-470K	47UH 130MA		5LCAB00005
L82	COIL	LF1-470K	47UH 130MA		5LCAB00005
L83	COIL	LF1-470K	47UH 130MA		5LCAB00005
L100	COIL	SP0408-R33M	0.33UH		5LCAC00164
L101	COIL	SP0408-R22M	0.22UH		5LCAC00165
L102	COIL	SP0408-R22M	0.22UH		5LCAC00165
L103	COIL	LF1-470K	47UH 130MA		5LCAB00005
L104	COIL	LF1-470K	47UH 130MA		5LCAB00005
L105	COIL	LF5-472K	4.7MH		5LCAB00025
L106	COIL	LF1-100K	10UH		5LCAB00001
L107	COIL	LF1-470K	47UH 130MA		5LCAB00005
L108	COIL	LF1-470K	47UH 130MA		5LCAB00005
L109	COIL	LF1-470K	47UH 130MA		5LCAB00005
L110	COIL	LF5-472K	4.7MH		5LCAB00025
L111	COIL	LF1-331K	330UH		5LCAB00010
L112	COIL	LF1-331K	330UH		5LCAB00010
L113	COIL	LF5-472K	4.7MH		5LCAB00025
L114	COIL	LF5-472K	4.7MH		5LCAB00025

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
	RECEIVER		CMA-105A		14
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
L115	COIL	LF5-472K	4.7MH		5LCAB00025
L117	COIL	LF5-472K	4.7MH		5LCAB00025
L121	COIL	LF1-471K	470UH		5LCAB00011
L122	COIL	LF1-471K	470UH		5LCAB00011
5 L123	COIL	LF1-471K	470UH		5LCAB00011
L124	COIL	LF5-472K	4.7MH		5LCAB00025
L125	COIL	LF5-472K	4.7MH		5LCAB00025
L126	COIL	LF1-470K	47UH 130MA		5LCAB00005
L127	COIL	LF1-470K	47UH 130MA		5LCAB00005
10 L128	COIL	LF1-470K	47UH 130MA		5LCAB00005
L129	COIL	SP0406-100K	10UH		5LCAC00018
L131	COIL	LF1-470K	47UH 130MA		5LCAB00005
L132	COIL	LF1-470K	47UH 130MA		5LCAB00005
L133	COIL	LF1-470K	47UH 130MA		5LCAB00005
15 L134	COIL	LF1-470K	47UH 130MA		5LCAB00005
L135	COIL	LF1-471K	470UH		5LCAB00011
L136	COIL	LF1-471K	470UH		5LCAB00011
L137	COIL	LF1-471K	470UH		5LCAB00011
L138	COIL	LF1-471K	470UH		5LCAB00011
20 L139	COIL	LF1-471K	470UH		5LCAB00011
P5	CONNECTOR	PCN5-45PT-1.27DS			5JDAA00211
P35	CONNECTOR	HNC-2.5S-SP	2P		5JDAA00336
P36	CONNECTOR	HNC-2.5S-SP	2P		5JDAA00336
PC1	PCB	MPPC07760D			MPPC07760D
25 R1	RESISTOR F XD	ERD-50TJ471	1/2W 470 O HM		5RDAA00827
R2	RESISTOR F XD	ERD-50TJ151	1/2W 150 O HM		5RDAA00815
R3	RESISTOR F XD	ERD-50TJ750	1/2W 75 OH M		5RDAA00808
R4	RESISTOR F XD	ERD-25VJ101	1/4W 100 O HM		5RDAA00945
R5	RESISTOR F XD	ERD-25VJ220	1/4W 22 OH M		5RDAA00929
R6	RESISTOR F XD	ERD-25VJ220	1/4W 22 OH M		5RDAA00929
R7	RESISTOR F XD	ERD-25VJ121	1/4W 120 O HM		5RDAA00947
R8	RESISTOR F XD	ERD-25VJ101	1/4W 100 O HM		5RDAA00945
R9	RESISTOR F XD	ERD-25VJ104	1/4W 100K OHM		5RDAA01017
R10	RESISTOR F XD	ERD-25VJ101	1/4W 100 O HM		5RDAA00945
35 R11	RESISTOR F XD	ERD-25VJ101	1/4W 100 O HM		5RDAA00945

## PARTS LIST

ORDER		TITLE	LIST NO.	SHEET NO.	
		RECEIVER	CMA-105A	15	
PARTS NO	PARTS NAME	TYPE	DISCRIP-TION	REMARKS	CODE
R12	RESISTOR F	ERD-25VJ101	1/4W 100 Ω		5RDAA0094
	XD		HM		
R13	RESISTOR F	ERD-25VJ101	1/4W 100 Ω		5RDAA0094
	XD		HM		
R14	RESISTOR F	ERD-25VJ101	1/4W 100 Ω		5RDAA0094
	XD		HM		
R15	RESISTOR F	EPD-25VJ122	1/4W 1.2K		5RDAA0097
	XD		OHM		
5 R16	RESISTOR F	ERD-25VJ122	1/4W 1.2K		5RDAA0097
	XD		OHM		
R17	RESISTOR F	ERD-50TJ101	1/2W 100 Ω		5RDAA0081
	XD		HM		
R18	RESISTOR F	ERD-50TJ101	1/2W 100 Ω		5RDAA0081
	XD		HM		
R19	RESISTOR F	ERD-50TJ470	1/2W 47 OHM		5RDAA0080
	XD		M		
R20	RESISTOR F	ERD-25VJ103	1/4W 10K Ω		5RDAA0099
	XD		HM		
10 R21	RESISTOR F	ERD-25VJ472	1/4W 4.7K		5RDAA0098
	XD		OHM		
R22	RESISTOR F	MOR-2B150 OHM J	2W 150 OHM		5RAAB0056
	XD				
R29	RESISTOR F	ERD-25VJ510	1/4W 51 OHM		5RDAA0093
	XD		M		
R30	RESISTOR F	ERD-25VJ101	1/4W 100 Ω		5RDAA0094
	XD		HM		
R31	RESISTOR F	ERD-25VJ100	1/4W 10 OHM		5RDAA0092
	XD		M		
15 R32	RESISTOR F	ERD-25VJ221	1/4W 220 Ω		5RDAA0095
	XD		HM		
R33	RESISTOR F	ERD-25VJ222	1/4W 2.2K		5RDAA0097
	XD		OHM		
R34	RESISTOR F	ERD-25VJ101	1/4W 100 Ω		5RDAA0094
	XD		HM		
R35	RESISTOR F	ERD-25VJ472	1/4W 4.7K		5RDAA0098
	XD		OHM		
R36	RESISTOR F	ERD-25VJ331	1/4W 330 Ω		5RDAA0095
	XD		HM		
20 R37	RESISTOR F	ERD-25VJ102	1/4W 1K OHM		5RDAA0096
	XD		M		
R38	RESISTOR F	ERD-25VJ101	1/4W 100 Ω		5RDAA0094
	XD		HM		
R39	RESISTOR F	ERD-25VJ153	1/4W 15K Ω		5RDAA0099
	XD		HM		
R40	RESISTOR F	ERD-25VJ472	1/4W 4.7K		5RDAA0098
	XD		OHM		
R41	RESISTOR F	ERD-25VJ102	1/4W 1K OHM		5RDAA0096
	XD		M		
25 R42	RESISTOR F	ERD-25VJ101	1/4W 100 Ω		5RDAA0094
	XD		HM		
R43	RESISTOR F	ERD-25VJ102	1/4W 1K OHM		5RDAA0096
	XD		M		
R44	RESISTOR F	ERD-25VJ102	1/4W 1K OHM		5RDAA0096
	XD		M		
R45	RESISTOR F	ERD-25VJ221	1/4W 220 Ω		5RDAA0095
	XD		HM		
R46	RESISTOR F	ERD-25VJ102	1/4W 1K OHM		5RDAA0096
	XD		M		
R47	RESISTOR F	ERD-25VJ332	1/4W 3.3K		5RDAA0098
	XD		OHM		
R48	RESISTOR F	ERD-25VJ331	1/4W 330 Ω		5RDAA0095
	XD		HM		
R49	RESISTOR F	ERD-25VJ5R1	1/4W 5.1 Ω		5RDAA0091
	XD		HM		
R50	RESISTOR F	ERD-25VJ330	1/4W 33 OHM		5RDAA0093
	XD		M		
R51	RESISTOR F	ERD-25VJ103	1/4W 10K Ω		5RDAA0099
	XD		HM		
35 R52	RESISTOR F	ERD-25VJ332	1/4W 3.3K		5RDAA0098
	XD		OHM		

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		RECEIVER		CMA-105A	16
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
R53	RESISTOR XD	F ERD-25VJ101	1/4W 100 Ω HM		5RDAA00945
R54	RESISTOR XD	F ERD-25VJ102	1/4W 1K Ω M		5RDAA00969
R55	RESISTOR XD	F ERD-25VJ101	1/4W 100 Ω HM		5RDAA00945
R56	RESISTOR XD	F ERD-25VJ680	1/4W 68 Ω M		5RDAA00941
5 R61	RESISTOR XD	F ERD-25VJ104	1/4W 100K OHM		5RDAA01017
R62	RESISTOR XD	F ERD-25VJ104	1/4W 100K OHM		5RDAA01017
R63	RESISTOR XD	F ERD-25VJ104	1/4W 100K OHM		5RDAA01017
R64	RESISTOR XD	F ERD-25VJ104	1/4W 100K OHM		5RDAA01017
R65	RESISTOR XD	F ERD-25VJ104	1/4W 100K OHM		5RDAA01017
10 R66	RESISTOR XD	F ERD-25VJ104	1/4W 100K OHM		5RDAA01017
R67	RESISTOR XD	F ERD-25VJ104	1/4W 100K OHM		5RDAA01017
R100	RESISTOR XD	F ERD-25VJ332	1/4W 3.3K OHM		5RDAA00981
R101	RESISTOR XD	F ERD-25VJ472	1/4W 4.7K OHM		5RDAA00985
R102	RESISTOR XD	F ERD-25VJ151	1/4W 150 Ω HM		5RDAA00949
15 R103	RESISTOR XD	F ERD-25VJ222	1/4W 2.2K OHM		5RDAA00977
R104	RESISTOR XD	F ERD-25VJ333	1/4W 33K Ω HM		5RDAA01005
R105	RESISTOR XD	F ERD-25VJ101	1/4W 100 Ω HM		5RDAA00945
R106	RESISTOR XD	F ERD-25VJ472	1/4W 4.7K OHM		5RDAA00985
R107	RESISTOR XD	F ERD-25VJ332	1/4W 3.3K OHM		5RDAA00981
20 R108	RESISTOR XD	F ERD-25VJ121	1/4W 120 Ω HM		5RDAA00947
R109	RESISTOR XD	F ERD-25VJ222	1/4W 2.2K OHM		5RDAA00977
R110	RESISTOR XD	F ERD-25VJ333	1/4W 33K Ω HM		5RDAA01005
R111	RESISTOR XD	F ERD-25VJ101	1/4W 100 Ω HM		5RDAA00945
R112	RESISTOR XD	F ERD-25VJ474	1/4W 470K OHM		5RDAA01033
25 R113	RESISTOR XD	F ERD-25VJ182	1/4W 1.8K OHM		5RDAA00975
R114	RESISTOR XD	F ERD-25VJ104	1/4W 100K OHM		5RDAA01017
R115	RESISTOR XD	F ERD-25VJ222	1/4W 2.2K OHM		5RDAA00977
R116	RESISTOR XD	F ERD-25VJ222	1/4W 2.2K OHM		5RDAA00977
R117	RESISTOR XD	F ERD-25VJ334	1/4W 330K OHM		5RDAA01029
R118	RESISTOR XD	F ERD-25VJ103	1/4W 10K Ω HM		5RDAA00993
R119	RESISTOR XD	F ERD-25VJ224	1/4W 220K OHM		5RDAA01025
R120	RESISTOR XD	F ERD-25VJ103	1/4W 10K Ω HM		5RDAA00993
R121	RESISTOR XD	F ERD-25VJ472	1/4W 4.7K OHM		5RDAA00985
R122	RESISTOR XD	F ERD-25VJ221	1/4W 220 Ω HM		5RDAA00953
35 P146	RESISTOR XD	F ERD-25VJ103	1/4W 10K Ω HM		5RDAA00993

ORDER		TITLE	LIST NO.	SHEET NO.	
		RECEIVER	CMA-105A	17	
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
R148	RESISTOR	F ERD-25VJ103	1/4W 10K 0		5RDAA00993
	XD		HM		
R150	RESISTOR	F ERD-25VJ152	1/4W 1.5K		5RDAA00973
	XD		OHM		
R151	RESISTOR	F ERD-25VJ152	1/4W 1.5K		5RDAA00973
	XD		OHM		
R158	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
5	R159	RESISTOR	F ERD-25VJ102	1/4W 1K OH	5RDAA00969
	XD		M		
	R160	RESISTOR	F ERD-25VJ102	1/4W 1K OH	5RDAA00969
	XD		M		
	R161	RESISTOR	F ERD-25VJ104	1/4W 100K	5RDAA01017
	XD		OHM		
	R162	RESISTOR	F ERD-25VJ331	1/4W 330 0	5RDAA00957
	XD		HM		
	R163	RESISTOR	F ERD-25VJ472	1/4W 4.7K	5RDAA00985
	XD		OHM		
10	R164	RESISTOR	F ERD-25VJ222	1/4W 2.2K	5RDAA00977
	XD		OHM		
	R165	RESISTOR	F ERD-25VJ101	1/4W 100 0	5RDAA00945
	XD		HM		
	R166	RESISTOR	F ERD-25VJ102	1/4W 1K OH	5RDAA00969
	XD		M		
	R167	RESISTOR	F ERD-25VJ104	1/4W 100K	5RDAA01017
	XD		OHM		
	R168	RESISTOR	F ERD-25VJ331	1/4W 330 0	5RDAA00957
	XD		HM		
15	R169	RESISTOR	F ERD-25VJ222	1/4W 2.2K	5RDAA00977
	XD		OHM		
	R170	RESISTOR	F ERD-25VJ101	1/4W 100 0	5RDAA00945
	XD		HM		
	R171	RESISTOR	F ERD-25VJ153	1/4W 15K 0	5RDAA00997
	XD		HM		
	R172	RESISTOR	F ERD-25VJ472	1/4W 4.7K	5RDAA00985
	XD		OHM		
	R173	RESISTOR	F ERD-25VJ221	1/4W 220 0	5RDAA00953
	XD		HM		
20	R174	RESISTOR	F ERD-25VJ102	1/4W 1K OH	5RDAA00969
	XD		M		
	R175	RESISTOR	F ERD-25VJ101	1/4W 100 0	5RDAA00945
	XD		HM		
	R176	RESISTOR	F ERD-25VJ153	1/4W 15K 0	5RDAA00997
	XD		HM		
	R177	RESISTOR	F ERD-25VJ472	1/4W 4.7K	5RDAA00985
	XD		OHM		
	R178	RESISTOR	F ERD-25VJ221	1/4W 220 0	5RDAA00953
	XD		HM		
25	R179	RESISTOR	F ERD-25VJ222	1/4W 2.2K	5RDAA00977
	XD		OHM		
	R180	RESISTOR	F ERD-25VJ102	1/4W 1K OH	5RDAA00969
	XD		M		
	R181	RESISTOR	F ERD-25VJ102	1/4W 1K OH	5RDAA00969
	XD		M		
	R182	RESISTOR	F ERD-25VJ102	1/4W 1K OH	5RDAA00969
	XD		M		
	R183	RESISTOR	F ERD-25VJ561	1/4W 560 0	5RDAA00963
	XD		HM		
	R184	RESISTOR	F ERD-25VJ561	1/4W 560 0	5RDAA00963
	XD		HM		
	R185	RESISTOR	F ERD-25VJ621	1/4W 620 0	5RDAA00964
	XD		HM		
	R186	RESISTOR	F ERD-25VJ621	1/4W 620 0	5RDAA00964
	XD		HM		
	R187	RESISTOR	F ERD-25VJ472	1/4W 4.7K	5RDAA00985
	XD		OHM		
	R188	RESISTOR	F ERD-25VJ472	1/4W 4.7K	5RDAA00985
	XD		OHM		
35	R189	RESISTOR	F ERD-25VJ103	1/4W 10K 0	5RDAA00993
	XD		HM		



## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO
		RECEIVER		CMA-105A	18
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
R190	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA0098
	XD		OHM		
R191	RESISTOR	F ERD-25VJ330	1/4W 33 OH		5RDAA0093
	XD		M		
R192	RESISTOR	F ERD-25VJ331	1/4W 330 0		5RDAA0095
	XD		HM		
R193	RESISTOR	F ERD-25VJ221	1/4W 220 0		5RDAA0095
	XD		HM		
R194	RESISTOR	F ERD-25VJ332	1/4W 3.3K		5RDAA0098
	XD		OHM		
R196	RESISTOR	F ERD-25VJ222	1/4W 2.2K		5RDAA0097
	XD		OHM		
R197	RESISTOR	F ERD-25VJ331	1/4W 330 0		5RDAA0095
	XD		HM		
R198	RESISTOR	F ERD-25VJ104	1/4W 100K		5RDAA0101
	XD		OHM		
R199	RESISTOR	F ERD-25VJ153	1/4W 15K 0		5RDAA0099
	XD		HM		
R200	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA0098
	XD		OHM		
R201	RESISTOR	F ERD-25VJ222	1/4W 2.2K		5RDAA0097
	XD		OHM		
R202	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA0096
	XD		M		
R203	RESISTOR	F ERD-25VJ223	1/4W 22K 0		5RDAA0100
	XD		HM		
R204	RESISTOR	F ERD-25VJ103	1/4W 10K 0		5RDAA0099
	XD		HM		
R205	RESISTOR	F ERD-25VJ105	1/4W 1M OH		5RDAA0104
	XD		M		
R206	RESISTOR	F ERD-25VJ101	1/4W 100 0		5RDAA0094
	XD		HM		
R207	RESISTOR	F HT1/4-5.1M OHM J			5RDAC0077
	XD				
R208	RESISTOR	F HM1/4-50M OHM K			5RDAC0157
	XD				
R209	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA0096
	XD		M		
R210	RESISTOR	F ERD-25VJ222	1/4W 2.2K		5RDAA0097
	XD		OHM		
R211	RESISTOR	F ERD-25VJ101	1/4W 100 0		5RDAA0094
	XD		HM		
R212	RESISTOR	F ERD-25VJ152	1/4W 1.5K		5RDAA0097
	XD		OHM		
R214	RESISTOR	F ERD-25VJ104	1/4W 100K		5RDAA0101
	XD		OHM		
R215	RESISTOR	F ERD-25VJ104	1/4W 100K		5RDAA0101
	XD		OHM		
R216	RESISTOR	F ERD-25VJ821	1/4W 820 0		5RDAA0096
	XD		HM		
R217	RESISTOR	F ERD-25VJ103	1/4W 10K 0		5RDAA0099
	XD		HM		
R218	RESISTOR	F ERD-25VJ153	1/4W 15K 0		5RDAA0099
	XD		HM		
R219	RESISTOR	F ERD-25VJ103	1/4W 10K 0		5RDAA0099
	XD		HM		
R220	RESISTOR	F ERD-25VJ101	1/4W 100 0		5RDAA0094
	XD		HM		
R221	RESISTOR	F ERD-25VJ682	1/4W 6.8K		5RDAA0098
	XD		OHM		
R222	RESISTOR	F ERD-25VJ222	1/4W 2.2K		5RDAA0097
	XD		OHM		
R223	RESISTOR	F ERD-25VJ100	1/4W 10 OH		5RDAA0092
	XD		M		
R225	RESISTOR	F ERD-25VJ333	1/4W 33K 0		5RDAA0100
	XD		HM		
R226	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA0096
	XD		M		
R227	RESISTOR	F ERD-25VJ333	1/4W 33K 0		5RDAA0100
	XD		HM		

ORDER		TITLE		LIST NO.	SHEET NO.
		RECEIVER		CMA-105A	19
PARTS NO	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
R228	RESISTOR F	ERD-25VJ223	1/4W 22K 0		5RDAA01001
	XD		HM		
R229	RESISTOR F	ERD-25VJ333	1/4W 33K 0		5RDAA01005
	XD		HM		
R230	RESISTOR F	ERD-25VJ331	1/4W 330 0		5RDAA00957
	XD		HM		
R231	RESISTOR F	ERD-25VJ222	1/4W 2.2K		5RDAA00977
	XD		OHM		
5 R232	RESISTOR F	ERD-25VJ103	1/4W 10K 0		5RDAA00993
	XD		HM		
R233	RESISTOR F	ERD-25VJ333	1/4W 33K 0		5RDAA01005
	XD		HM		
R234	RESISTOR F	ERD-25VJ332	1/4W 3.3K		5RDAA00981
	XD		OHM		
R235	RESISTOR F	ERD-25VJ101	1/4W 100 0		5RDAA00945
	XD		HM		
R240	RESISTOR F	ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
10 R241	RESISTOR F	ERD-25VJ471	1/4W 470 0		5RDAA00961
	XD		HM		
R242	RESISTOR F	ERD-25VJ101	1/4W 100 0		5RDAA00945
	XD		HM		
R243	RESISTOR F	ERD-25VJ101	1/4W 100 0		5RDAA00945
	XD		HM		
R245	RESISTOR F	ERD-25VJ222	1/4W 2.2K		5RDAA00977
	XD		OHM		
R246	RESISTOR F	ERD-25VJ222	1/4W 2.2K		5RDAA00977
	XD		OHM		
15 R247	RESISTOR F	ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R248	RESISTOR F	ERD-25VJ471	1/4W 470 0		5RDAA00961
	XD		HM		
R249	RESISTOR F	ERD-25VJ682	1/4W 6.8K		5RDAA00989
	XD		OHM		
R250	RESISTOR F	ERD-25VJ104	1/4W 100K		5RDAA01017
	XD		OHM		
R251	RESISTOR F	ERD-25VJ104	1/4W 100K		5RDAA01017
	XD		OHM		
20 R252	RESISTOR F	ERD-25VJ104	1/4W 100K		5RDAA01017
	XD		OHM		
R253	RESISTOR F	ERD-25VJ104	1/4W 100K		5RDAA01017
	XD		OHM		
R254	RESISTOR F	ERD-25VJ104	1/4W 100K		5RDAA01017
	XD		OHM		
R255	RESISTOR F	ERD-25VJ104	1/4W 100K		5RDAA01017
	XD		OHM		
R256	RESISTOR F	ERD-25VJ103	1/4W 10K 0		5RDAA00993
	XD		HM		
25 R257	RESISTOR F	ERD-25VJ104	1/4W 100K		5RDAA01017
	XD		OHM		
R258	RESISTOR F	ERD-25VJ681	1/4W 680 0		5RDAA00965
	XD		HM		
R259	RESISTOR F	ERD-25VJ103	1/4W 10K 0		5RDAA00993
	XD		HM		
RV1	RESISTOR V	RG06H2202	2K OHM		5RMAC00066
	AR				
RV2	RESISTOR V	RG06H2103	10K OHM		5RMAC00067
	AR				
RV5	RESISTOR V	RG06H2102	1K OHM		5RMAC00068
	AR				
RV6	RESISTOR V	RG06H2202	2K OHM		5RMAC00066
	AR				
RV7	RESISTOR V	RG06H2102	1K OHM		5RMAC00068
	AR				
RV8	RESISTOR V	RG06H2103	10K OHM		5RMAC00067
	AR				
RV9	RESISTOR V	RG06H2103	10K OHM		5RMAC00067
	AR				
35 RV10	RESISTOR V	RG06H2103	10K OHM		5RMAC00067
	AR				

ORDER		TITLE		LIST NO.	SHEET NO
		RECEIVER	CMA-105A		20
PARTS NO	PARTS NAME	TYPE	DISCRIP-TION	REMARKS	CODE
RV11	RESISTOR V	RG06H2102	1K OHM		5RMAC0006
T1	RF XFMR	H-6LHJD00227			6LHJD0022
T2	RF XFMR	H-6LHJD00172			6LHJD0017
T3	RF XFMR	H-6LHJD00172			6LHJD0017
5 T4	RF XFMR	H-6LHJD00172			6LHJD0017
T5	RF XFMR	1D-LD593-42 RED			6LJJD00007
T6	RF XFMR	1D-LD593-42 RED			6LJJD00007
T7	RF XFMR	H-6LHJD00172			6LHJD00172
T8	RF XFMR	1D-LD593-42 RED			6LJJD00007
10 T9	RF XFMR	1D-LD593-42 RED			6LJJD00007
T10	TRANSFORME (FL3)				6ZZAB01982
T11	R TRANSFORME (FL3)				6ZZAB01982
T14	RF XFMR	1D-LD593-42 RED			6LJJD00007
T15	RF XFMR	1D-LD593-42 RED			6LJJD00007
15 T16	RF XFMR	H-6LHJD00240			6LHJD00240
T17	RF XFMR	H-6LHJD00240			6LHJD00240
TP	CONNECTOR	PCN6-PEG			5JDA00186
TR1	TRANSISTOR	2SA495GTM-Y			5TAAG00090
TR3	TRANSISTOR	3SK45B			5TKAB00006
20 TR4	TRANSISTOR	2SK19TM-BL			5TKAA00061
TR5	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
TR6	TRANSISTOR	2SC382TM-W			5TCAF00262
TR7	TRANSISTOR	2SC1252			5TCAB00018
TR8	TRANSISTOR	2SC382TM-W			5TCAF00262
25 TR10	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
TR11	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
TR12	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR13	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR14	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR15	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR16	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR17	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR20	TRANSISTOR	3SK45B			5TKAB00006
TR21	TRANSISTOR	3SK45B			5TKAB00006
35 TR22	TRANSISTOR	2SC372GTMA-Y			5TCAF00290

ORDER		TITLE		LIST NO.	SHEET NO.
		RECEIVER	CMA-105A		21
PARTS NO.	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
TR23	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
TR24	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR25	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
TR26	TRANSISTOR	2SK19TM-Y			5TKAA00066
5 TR27	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR28	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR29	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR30	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR31	TRANSISTOR	2SC372GTM-Y			5TCAF00245
10 TR32	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR33	TRANSISTOR	U310			5TKAG00007
TR34	TRANSISTOR	U310			5TKAG00007
TRZ7	HEAT SINK	MC203A820			5ZKAE00065

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## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	1
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
A1	VCO	CGA-68			CGA-68
C1	CAP,FXD TA 202L3502 474M3		35V 0.47UF		5CSAC00654
C2	NTAL CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C3	R CAP,FXD PL ECQ-M1H102KZ		50V 0.001U		5CRAA00140
5	STC CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C5	R CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C6	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C7	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C8	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
10	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C10	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C11	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C12	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C13	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
15	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C15	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C16	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C17	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C18	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
20	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C20	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C21	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C22	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C23	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
25	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C25	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C26	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C27	RR CAP,FXD CE DD105E102P50V02		50V 1000PF		5CBAB00299
C31	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C32	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C33	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C34	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C35	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
C41	RR CAP,FXD CE DD109E103P50V02		50V 10000P		5CBAB00301
35	RR CAP,FXD EL ECE-A1ES100		25V10UF		5CEAA01348
	CTL				

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	2
PARTS NO	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
C43	CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C44	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBABC0301
C45	R CAP, FXD	EL ECE-A1ES100	25V10UF		5CEAA01348
C46	CTLT CAP, FXD	CE DD104SL330J50V02	50V 33PF		5CAAA01095
5 C47	R CAP, FXD	CE DD104SL050C50V02	50V 5PF		5CAAA01089
C48	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C49	R CAP, FXD	CE DD105SL121J50V02	50V 120PF		5CAAAG1102
C50	R CAP, FXD	CE DD104SL050C50V02	50V 5PF		5CAAA01089
C51	R CAP, FXD	CE DD106SL151J50V02	50V 150PF		5CAAA01103
10 C52	R CAP, FXD	CE DD104SL680J50V02	50V 68PF		5CAAA01099
C53	R CAP, FXD	CE DD105SL101J50V02	50V 100PF		5CAAA01101
C54	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C55	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C56	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
15 C57	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C58	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C59	R CAP, FXD	CE DD104SL180J50V02	50V 18PF		5CAAA01092
C60	R CAP, FXD	CE DD104SL050C50V02	50V 5PF		5CAAA01089
C61	R CAP, FXD	CE DD104SL390J50V02	50V 39PF		5CAAA01096
20 C62	R CAP, FXD	CE DD104SL120J50V02	50V 12PF		5CAAA01090
C63	R CAP, FXD	CE DD104SL150J50V02	50V 15PF		5CAAA01091
C64	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C65	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C66	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
25 C67	R CAP, FXD	CE DD107SL331J50V02	50V 330PF		5CAAA01106
C68	R CAP, FXD	CE DD104SL470J50V02	50V 47PF		5CAAA01097
C69	R CAP, FXD	CE DD107SL221J50V02	50V 220PF		5CAAA01105
C70	R CAP, FXD	CE DD105SL101J50V02	50V 100PF		5CAAA01101
C71	R CAP, FXD	CE DD105SL101J50V02	50V 100PF		5CAAA01101
C72	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C81	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C82	NTAL CAP, FXD	TA 202L2502 106M3	25V 10UF		5CSAC00655
C83	NTAL CAP, FXD	TA 202L3502 474M3	35V 0.47UF		5CSAC00654
C84	NTAL CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
35 C85	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	3
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
C86	CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C88	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C89	R CAP, FXD	CE DD105SL101J50V02	50V 100PF		5CAAA01101
C90	R CAP, FXD	CE DD104SL470J50V02	50V 47PF		5CAAA01097
5 C91	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C92	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C93	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C94	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C95	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
10 C96	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C97	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C98	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C99	R CAP, FXD	CE DD340-257XL101JZ50	50V 100PF		5CAAA01454
C100	R CAP, FXD	CE DD350-257VK101JZ50	50V 100PF		5CAAA01455
15 C101	R CAP, FXD	CE DD350-257VK101JZ50	50V 100PF		5CAAA01455
C102	R CAP, FXD	CE DD104SL150J50V02	50V 15PF		5CAAA01091
C103	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C104	R CAP, FXD	CE DD104SL010C50V02	50V 1PF		5CAAA00776
C105	R CAP, FXD	CE DD104SL180J50V02	50V 18PF		5CAAA01092
20 C111	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C112	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C113	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C114	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C115	R CAP, FXD	CE DD105SL101J50V02	50V 100PF		5CAAA01101
25 C116	R CAP, FXD	CE DD105SL101J50V02	50V 100PF		5CAAA01101
C121	R CAP, FXD	CE DD106CH470J50V02	50V 47PF		5CAAA00854
C122	R CAP, FXD	CE DD111CH221J50V02	50V 220PF		5CAAA01114
C123	R CAP, FXD	CE DD107CH101J50V02	50V 100PF		5CAAA00858
C124	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C125	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C126	R CAP, FXD	CE DD112UJ 471J50V02	50V 470PF		5CAAA01458
C127	R CAP, FXD	CE DD112UJ 471J50V02	50V 470PF		5CAAA01458
C128	R CAP, FXD	CE DD112UJ 471J50V02	50V 470PF		5CAAA01458
C129	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
35 C130	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	4
PARTS NO.	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
C131	CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C132	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C133	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C134	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
5 C135	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C136	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C137	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C138	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C141	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
10 C142	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C143	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C145	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C146	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C147	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
15 C148	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C149	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C150	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C151	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C152	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
20 C153	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C154	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C155	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C156	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C157	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
25 C158	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C159	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C160	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C161	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C162	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C163	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C164	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C165	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C166	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C171	R CAP, FXD	CE DD104SL050C50V02	50V 5PF		5CAAA01089
35 C172	R CAP, FXD	CE DD106SL151J50V02	50V 150PF		5CAAA01103



ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	5
PARTS NO	PARTS NAME	TYPE	DISCRIP-TION	REMARKS	CODE
C173	CAP, FXD	CE DD104SL220J50V02	50V 22PF		5CAAA01093
C174	R CAP, FXD	CE DD104SL820J50V02	50V 82PF		5CAAA01100
C175	R CAP, FXD	CE DD104SL820J50V02	50V 82PF		5CAAA01100
C176	R CAP, FXD	CE DD104SL330J50V02	50V 33PF		5CAAA01095
5 C177	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C178	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C179	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C180	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C181	R CAP, FXD	TA 202L2502 475M3	25V 4.7UF		5CSAC00653
10 C182	NTAL CAP, FXD	TA 202L2502 475M3	25V 4.7UF		5CSAC00653
C183	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C184	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C191	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C192	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
15 C193	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C194	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C195	R CAP, FXD	EL ECE-A1ES100	25V10UF		5CEAA01348
C196	CTLT CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C197	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
20 C198	R CAP, FXD	EL ECE-A1ES100	25V10UF		5CEAA01348
C199	NTAL CAP, FXD	TA 202L2502 475M3	25V 4.7UF		5CSAC00653
C201	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C202	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C211	R CAP, FXD	CE DD104SL100050V02	50V 10PF		5CAAA00830
25 C212	R CAP, FXD	CE DD104SL220J50V02	50V 22PF		5CAAA01093
C213	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C214	R CAP, FXD	CE DD104SL220J50V02	50V 22PF		5CAAA01093
C215	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C216	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C217	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C218	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C219	R CAP, FXD	CE DD104SL220J50V02	50V 22PF		5CAAA01093
C220	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C221	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
35 C222	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	6
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
C223	CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C224	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C225	R CAP, FXD	CE DD105CH270J50V02	50V 27PF		5CAAA00851
C226	R CAP, FXD	CE DD104SL010C50V02	50V 1PF		5CAAA00776
5 C227	R CAP, FXD	CE DD105CH270J50V02	50V 27PF		5CAAA00851
C228	R CAP, FXD	CE DD104SL020C50V02	50V 2PF		5CAAA00775
C229	R CAP, FXD	CE DD105CH270J50V02	50V 27PF		5CAAA00851
C230	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C231	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
10 C232	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C233	R CAP, FXD	CE DD104SL270J50V02	50V 27PF		5CAAA01094
C234	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C235	R CAP, FXD	CE DD105SL101J50V02	50V 100PF		5CAAA01101
C236	R CAP, FXD	CE DD104SL150J50V02	50V 15PF		5CAAA01091
15 C237	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C238	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C239	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C240	R CAP, FXD	CE DD105E102P50V02	50V 1000PF		5CBAB00299
C241	R CAP, FXD	CE DD104CH220J50V02	50V 22PF		5CAAA00850
20 C242	R CAP, FXD	CE DD104SL030C50V02	50V 3PF		5CAAA00774
C243	R CAP, FXD	CE DD104SL010C50V02	50V 1PF		5CAAA00776
C244	R CAP, FXD	CE DD104CH220J50V02	50V 22PF		5CAAA00850
C245	R CAP, FXD	CE DD104SL030C50V02	50V 3PF		5CAAA00774
C246	R CAP, FXD	CE DD104SL010C50V02	50V 1PF		5CAAA00776
25 C247	R CAP, FXD	CE DD104CH220J50V02	50V 22PF		5CAAA00850
C251	R CAP, FXD	CE DD109E103P50V02	50V 10000PF		5CBAB00301
C252	R CAP, FXD	CE DD350-257XL151J250	50V 150PF N2200		5CAAA01457
C253	R CAP, FXD	CE DD112UJ 471J50V02	50V 470PF		5CAAA01458
C254	R CAP, FXD	CE DD112UJ 471J50V02	50V 470PF		5CAAA01458
C255	R CAP, FXD	CE DD109E103P50V02	50V 10000PF		5CBAB00301
C256	R CAP, FXD	CE DD109E103P50V02	50V 10000PF		5CBAB00301
C257	R CAP, FXD	CE DD109E103P50V02	50V 10000PF		5CBAB00301
C258	R CAP, FXD	CE DD109E103P50V02	50V 10000PF		5CBAB00301
C259	R CAP, FXD	CE DD109E103P50V02	50V 10000PF		5CBAB00301
35 C260	R CAP, FXD	CE DD107SL331J50V02	50V 330PF		5CAAA01106

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	7
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
C261	CAP, FXD	CE DD107SL331J50V02	50V 330PF		5CAAA01106
C262	R CAP, FXD	CE DD107SL331J50V02	50V 330PF		5CAAA01106
C263	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C264	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
5 C265	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C266	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C267	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C268	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C269	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
10 C281	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C282	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C283	R CAP, FXD	TA 202L1002 476M3	10V 47UF		5CSAC00656
C284	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C285	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
15 C286	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C287	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C288	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C289	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C290	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
20 C291	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C292	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C293	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C294	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C295	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
25 C296	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C297	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C298	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C299	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C300	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C301	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C302	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C303	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C304	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
C305	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301
35 C306	R CAP, FXD	CE DD109E103P50V02	50V 10000P		5CBAB00301

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	8
PARTS NO.	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
C307	CAP, FXD R	CE DD109E103P50V02	50V 10000P		5CBAB0030
C308	CAP, FXD R	CE DD109E103P50V02	50V 10000P		5CBAB0030
C309	CAP, FXD R	CE DD109E103P50V02	50V 10000P		5CBAB0030
C310	CAP, FXD R	CE DD109E103P50V02	50V 10000P		5CBAB0030
5 C311	CAP, FXD R	CE DD109E103P50V02	50V 10000P		5CBAB0030
C312	CAP, FXD R	CE DD109E103P50V02	50V 10000P		5CBAB0030
C314	CAP, FXD R	CE DD109E103P50V02	50V 10000P		5CBAB0030
C315	CAP, FXD R	CE DD109E103P50V02	50V 10000P		5CBAB0030
C316	CAP, FXD NTAL	TA 202L2502 475M3	25V 4.7UF		5CSAC00653
10 C317	CAP, FXD R	CE DD104SL220J50V02	50V 22PF		5CAAA01093
C318	CAP, FXD NTAL	TA 202L1002 476M3	10V 47UF		5CSAC00656
CD1	DIODE	1S1588			5TXAD00040
CD2		TLR104	RED		5TZAD00021
CD3	DIODE	HZ3A			5TXAE00076
15 CD4	DIODE	1S1588			5TXAD00040
CD5	DIODE	FC51M			5TXAB00020
CD6	DIODE	FC51M			5TXAB00020
CD7	DIODE	FC52M			5TXAB00021
CD8	DIODE	1S1588LB-10			5TXAD00248
20 CD9	DIODE	10D2	200V 1A		5TXAG00001
CD10	DIODE	FC53M			5TXAB00022
CD11	DIODE	1S1588			5TXAD00040
CD12	DIODE	1S1588			5TXAD00040
CD13	DIODE	1S1588			5TXAD00040
25 CD14	DIODE	1S1588			5TXAD00040
CD15	DIODE	1S1588LB-10			5TXAD00248
CD16		TLR104	RED		5TZAD00021
CD17	DIODE	HZ3A-3			5TXAE00142
CD18	DIODE	FC53M			5TXAB00022
CD19	DIODE	1S2187			5TXAD00219
CD20	DIODE	1S2187			5TXAD00219
CD21	DIODE	1S2187			5TXAD00219
CD22	DIODE	1S2187			5TXAD00219
CD23	DIODE	1S1588LB-10			5TXAD00248
35 CD24	DIODE	1S1588			5TXAD00040

ORDER		TITLE		LIST NO.	SHEET NO
		SYNTHESIZER		CMG-62A	9
PARTS NO	PARTS NAME	TYPE	DISCRIP-TION	REMARKS	CODE
CD25	DIODE	1S1588LB-10			5TXAD0024
CD26	DIODE	1S1588LB-10			5TXAD0024
CD27	DIODE	1S1588LB-10			5TXAD0024
CV1	CAPACITOR VAR	DTM050D200	20PF		5CVAA00100
5 CV2	CAPACITOR VAR	DTM050D200	20PF		5CVAA00100
IC1	IC	TC4510BP			5DDAE00084
IC2	IC	TC4510BP			5DDAE00084
IC3	IC	TC4510BP			5DDAE00084
IC4	IC	TC4510BP			5DDAE00084
10 IC5	IC	TC4510BP			5DDAE00084
IC6	IC	TC4510BP			5DDAE00084
IC7	IC	TC4001BP			5DDAE00042
IC8	IC	TC4011BP			5DDAE00053
IC9	IC	TC4001BP			5DDAE00042
15 IC10	IC	TC4013BP			5DDAE00052
IC11	IC	TC4049BP			5DDAE00044
IC12	IC	TC4023BP			5DDAE00079
IC13	IC	TC4049BP			5DDAE00044
IC14	IC	HD74LS04P			5DDAF00278
20 IC15	IC	SN74LS244N			5DDAL00293
IC16	IC	SN74LS244N			5DDAL00293
IC17	IC	SN74LS244N			5DDAL00293
IC18	IC	TC4011BP			5DDAE00053
IC19	IC	TC4049BP			5DDAE00044
25 IC20	IC	TC4049BP			5DDAE00044
IC21	IC	SN74LS192N			5DDAL00118
IC22	IC	SN74LS192N			5DDAL00118
IC23	IC	SN74LS192N			5DDAL00118
IC24	IC	SN74LS192N			5DDAL00118
IC25	IC	SN74LS192N			5DDAL00118
IC26	IC	HD74LS00P			5DDAF00279
IC27	IC	HD74LS10P			5DDAF00288
IC28	IC	HD74LS00P			5DDAF00279
IC29	IC	HD74LS10P			5DDAF00288
35 IC30	IC	SN74H30N			5DDAL00085

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	10
PARTS NO	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
IC31	IC	SN74S74N			5DDAL00198
IC32	IC	MC1350P			5DDAS00011
IC33	IC	UA723HC			5DAAM00075
IC34	IC	MC4044P			5DDAS00002
5 IC35	IC	HD74LS26P			5DDAF00297
IC36	IC	TC4016BP			5DDAE00061
IC37	IC	TC4011BP			5DDAE00053
IC38	IC	TC4016BP			5DDAE00061
IC39	IC	HD74LS00P			5DDAF00279
10 IC40	IC	SN74LS196N			5DDAL00297
IC41	IC	HD7400P			5DDAF00110
IC42	IC	SN74LS390N			5DDAL00229
IC43	IC	SN74LS390N			5DDAL00229
IC44	IC	TC4016BP			5DDAE00061
15 IC45	IC	TC4049BP			5DDAE00044
IC46	IC	MC1350P			5DDAS00011
IC47	IC	HD74LS04P			5DDAF00278
IC48	IC	HD74LS20P			5DDAF00286
IC49	IC	SN74S74N			5DDAL00198
20 IC50	IC	SN74LS192N			5DDAL00118
IC51	IC	SN74LS192N			5DDAL00118
IC52	IC	HD74LS00P			5DDAF00279
IC53	IC	HD74LS26P			5DDAF00297
IC54	IC	MC4044P			5DDAS00002
25 IC55	IC	HD74LS26P			5DDAF00297
IC56	IC	TC4016BP			5DDAE00061
IC57	IC	UA723HC			5DAAM00075
IC58	IC	TA7045M			5DAAD00002
IC59	IC	TC4049BP			5DDAE00044
IC60	IC	TC4016BP			5DDAE00061
IC61	IC	H-6DDJD000002(UPB42 6D)			6DDJD000002
J17	PIN JACK	S-Q3063			5JJAL00016
J18	PIN JACK	S-Q3063			5JJAL00016
J22	PIN JACK	S-Q3063			5JJAL00016
35 J24	PIN JACK	S-Q3063			5JJAL00016

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	11
PARTS NO	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
J26	PIN JACK	S-Q3063			5JJAL00016
J29	CONNECTOR	HNC1-2.5P-12DS	12P		5JDAA00273
J30	CONNECTOR	HNC1-2.5P-12DS	12P		5JDAA00273
J31	CONNECTOR	HNC1-2.5P-12DS	12P		5JDAA00273
5 J37	CONNECTOR	HNC2-2.5P-2DS	2P		5JDAA00276
J38	CONNECTOR	HNC2-2.5P-2DS	2P		5JDAA00276
K1	RELAY	HB2E-DC12V			5KLAD00270
L1	COIL	LF1-100K	10UH		5LCAB00001
L2	COIL	LF1-100K	10UH		5LCAB00001
10 L3	COIL	LF1-100K	10UH		5LCAB00001
L4	COIL	LF1-100K	10UH		5LCAB00001
L5	COIL	LF1-100K	10UH		5LCAB00001
L6	COIL	LF1-100K	10UH		5LCAB00001
L7	COIL	LF1-100K	10UH		5LCAB00001
15 L8	COIL	LF1-100K	10UH		5LCAB00001
L9	COIL	LF1-100K	10UH		5LCAB00001
L10	COIL	LF1-100K	10UH		5LCAB00001
L11	COIL	LF1-100K	10UH		5LCAB00001
L12	COIL	LF1-100K	10UH		5LCAB00001
20 L13	COIL	LF1-100K	10UH		5LCAB00001
L14	COIL	LF1-100K	10UH		5LCAB00001
L15	COIL	LF1-100K	10UH		5LCAB00001
L16	COIL	LF1-100K	10UH		5LCAB00001
L17	COIL	LF1-100K	10UH		5LCAB00001
25 L18	COIL	LF1-100K	10UH		5LCAB00001
L19	COIL	LF1-470K	47UH 130MA		5LCAB00005
L20	COIL	LF4-4R7K	4.7UH		5LCAB00016
L21	COIL	SP0406-1R0K	1.0UH		5LCAC00173
L22	COIL	LF1-100K	10UH		5LCAB00001
L23	COIL	TP0206-R27K	0.27UH		5LCAC00178
L24	COIL	TP0206-R18K	0.18UH		5LCAC00250
L25	COIL	LF4-5R6K	5.6UH		5LCAB00070
L26	COIL	LF4-3R3K	3.3UH		5LCAB00015
L27	COIL	SP0406-100K	10UH		5LCAC00018
35 L28	COIL	JD-LD756-73			6LAJD00051

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	12
PARTS NO.	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
L29	COIL	SP0406-100K	10UH		5LCAC00018
L30	COIL	LF1-470K	47UH 130MA		5LCAB00005
L31	COIL	SP0406-6R8K	6.8UH		5LCAC00151
L32	COIL	LF1-120K	120UH		5LCAB00069
5 L33	COIL	LF1-100K	10UH		5LCAB00001
L34	COIL	LF1-470K	47UH 130MA		5LCAB00005
L35	COIL	LF1-100K	10UH		5LCAB00001
L36	COIL	LF1-220K	22UH		5LCAB00003
L41	COIL	SP0410-390K	39UH		5LCAC00393
10 L42	COIL	SP0410-470K	47UH		5LCAC00394
L43	COIL	LF1-470K	47UH 130MA		5LCAB00005
L44	COIL	LF1-470K	47UH 130MA		5LCAB00005
L45	COIL	LF4-1R0K			5LCAB00067
L46	COIL	LF1-100K	10UH		5LCAB00001
15 L47	COIL	LF1-100K	10UH		5LCAB00001
L48	COIL	LF1-100K	10UH		5LCAB00001
L49	COIL	LF1-100K	10UH		5LCAB00001
L50	COIL	LF1-100K	10UH		5LCAB00001
L51	COIL	LF1-100K	10UH		5LCAB00001
20 L52	COIL	SP0408-R33M	0.33UH		5LCAC00164
L53	COIL	SP0408-R22M	0.22UH		5LCAC00165
L54	COIL	LF4-2R2K	2.2UH		5LCAB00014
L55	COIL	LF1-100K	10UH		5LCAB00001
L56	COIL	LF4-2R2K	2.2UH		5LCAB00014
25 L57	COIL	LF1-100K	10UH		5LCAB00001
L60	COIL	LF1-470K	47UH 130MA		5LCAB00005
L61	COIL	SP0408-R68K	0.68UH		5LCAC00174
L62	COIL	LF1-100K	10UH		5LCAB00001
L63	COIL	LF1-100K	10UH		5LCAB00001
L64	COIL	LF1-100K	10UH		5LCAB00001
L65	COIL	SP0410-330K	33UH		5LCAC00225
L66	COIL	SP0410-330K	33UH		5LCAC00225
L67	COIL	LF1-470K	47UH 130MA		5LCAB00005
L68	COIL	LF1-331K	330UH		5LCAB00010
35 L69	COIL	LF1-471K	470UH		5LCAB00011



## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	13
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
L71	COIL	LF1-100K	10UH		5LCAB00001
L72	COIL	LF1-100K	10UH		5LCAB00001
L73	COIL	LF1-100K	10UH		5LCAB00001
L74	COIL	LF1-100K	10UH		5LCAB00001
L75	COIL	LF1-100K	10UH		5LCAB00001
L76	COIL	LF1-100K	10UH		5LCAB00001
L77	COIL	LF1-100K	10UH		5LCAB00001
L78	COIL	LF1-100K	10UH		5LCAB00001
L79	COIL	LF1-100K	10UH		5LCAB00001
L80	COIL	LF1-100K	10UH		5LCAB00001
L81	COIL	LF1-470K	47UH 130MA		5LCAB00005
P6	CONNECTOR	PCN5-31PT-1.27DS			5J0AA00112
P10	CONNECTOR	PCN5-31PT-1.27DS			5J0AA00112
P37	CONNECTOR	HNC-2.5S-SP	2P		5J0AA00336
P38	CONNECTOR	HNC-2.5S-SP	2P		5J0AA00336
PC1	PCB	MPPC07761D			MPPC07761D
R1	RESISTOR F	ERD-25VJ473	1/4W 47K 0 HM		5RDAAQ1009
R2	RESISTOR F	ERD-25VJ473	1/4W 47K 0 HM		5RDAA01009
R3	RESISTOR F	ERD-25VJ473	1/4W 47K 0 HM		5RDAA010Q9
R4	RESISTOR F	ERD-25VJ473	1/4W 47K 0 HM		5RDAA01009
R5	RESISTOR F	ERD-25VJ474	1/4W 470K OHM		5RDAA01033
R6	RESISTOR	IHR-1/8-6-473JA	47K OHM		5RZAB00016
R7	RESISTOR F	ERD-25VJ472	1/4W 4.7K OHM		5RDAA00985
R8	RESISTOR F	ERD-25VJ473	1/4W 47K 0 HM		5RDAA01009
R9	RESISTOR F	ERD-25VJ473	1/4W 47K 0 HM		5RDAA01009
R10	RESISTOR F	ERD-25VJ684	1/4W 680K OHM		5RDAA01037
R11	RESISTOR F	ERD-25VJ105	1/4W 1M OH M		5RDAA01041
R12	RESISTOR F	ERD-25VJ472	1/4W 4.7K OHM		5RDAA00985
R13	RESISTOR F	ERD-25VJ472	1/4W 4.7K OHM		5RDAA00985
R21	RESISTOR F	ERD-25VJ562	1/4W 5.6K OHM		5RDAA00987
R22	RESISTOR F	ERD-25VJ331	1/4W 330 0 HM		5RDAA00957
R23	RESISTOR F	ERD-25VJ182	1/4W 1.8K OHM		5RDAA00975
R24	RESISTOR F	ERD-25VJ152	1/4W 1.5K OHM		5RDAA00973
R25	RESISTOR F	ERD-25VJ221	1/4W 220 0 HM		5RDAA00953
R26	RESISTOR F	ERD-25VJ101	1/4W 100 0 HM		5RDAA00945

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	14
PARTS NO	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
R27	RESISTOR	F ERD-25VJ332	1/4W 3.3K		5RDAA00981
	XD		OHM		
R28	RESISTOR	F ERD-25VJ8R2	1/4W 8.2 0		5RDAA00919
	XD		HM		
R29	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
R30	RESISTOR	F ERD-25VJ682	1/4W 6.8K		5RDAA00989
	XD		OHM		
5 R31	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
R32	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
R33	RESISTOR	F ERD-25VJ471	1/4W 470 0		5RDAA00961
	XD		HM		
R34	RESISTOR	F ERD-25VJ680	1/4W 68 OH		5RDAA00941
	XD		M		
R35	RESISTOR	F ERD-25VJ750	1/4W 75 OH		5RDAA00942
	XD		M		
10 R36	RESISTOR	F ERD-25VJ104	1/4W 100K		5RDAA01017
	XD		OHM		
R37	RESISTOR	F ERD-25VJ104	1/4W 100K		5RDAA01017
	XD		OHM		
R38	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R39	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R40	RESISTOR	F ERD-25VJ101	1/4W 100 0		5RDAA00945
	XD		HM		
15 R41	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R42	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R43	RESISTOR	F ERD-25VJ682	1/4W 6.8K		5RDAA00989
	XD		OHM		
R44	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
R45	RESISTOR	F ERD-25VJ471	1/4W 470 0		5RDAA00961
	XD		HM		
20 R46	RESISTOR	F ERD-25VJ222	1/4W 2.2K		5RDAA00977
	XD		OHM		
R47	RESISTOR	F ERD-25VJ471	1/4W 470 0		5RDAA00961
	XD		HM		
R48	RESISTOR	F ERD-25VJ101	1/4W 100 0		5RDAA00945
	XD		HM		
R49	RESISTOR	F ERD-25VJ101	1/4W 100 0		5RDAA00945
	XD		HM		
R50	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
25 R51	RESISTOR	F ERD-25VJ331	1/4W 330 0		5RDAA00957
	XD		HM		
R52	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R53	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R54	RESISTOR	F ERD-25VJ222	1/4W 2.2K		5RDAA00977
	XD		OHM		
R55	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R56	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R57	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R59	RESISTOR	F ERD-25VJ104	1/4W 100K		5RDAA01017
	XD		OHM		
R60	RESISTOR	F ERD-25VJ151	1/4W 150 0		5RDAA00949
	XD		HM		
R61	RESISTOR	F ERD-25VJ471	1/4W 470 0		5RDAA00961
	XD		HM		
35 R62	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		

ORDER		TITLE	LIST NO.	SHEET NO.	
SYNTHESIZER		CMG-62A		15	
PARTS NO	PARTS NAME	TYPE	DISCRIP-TION	REMARKS	CODE
R63	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XO		OHM		
R64	RESISTOR	F ERD-25VJ471	1/4W 470 0		5RDAA00961
	XO		HM		
R65	RESISTOR	F ERD-25VJ151	1/4W 150 0		5RDAA00949
	XO		HM		
R66	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XO		OHM		
5 R67	RESISTOR	F ERD-25VJ392	1/4W 3.9K		5RDAA00983
	XO		OHM		
R68	RESISTOR	F ERD-25VJ223	1/4W 22K 0		5RDAA01001
	XO		HM		
R69	RESISTOR	F ERD-25VJ104	1/4W 100K		5RDAA01017
	XO		OHM		
R70	RESISTOR	F ERD-25VJ473	1/4W 47K 0		5RDAA01009
	XO		HM		
R71	RESISTOR	F ERD-25VJ473	1/4W 47K 0		5RDAA01009
	XO		HM		
10 R72	RESISTOR	F ERD-25VJ103	1/4W 10K 0		5RDAA00993
	XO		HM		
R73	RESISTOR	F ERD-25VJ223	1/4W 22K 0		5RDAA01001
	XO		HM		
R74	RESISTOR	F ERD-25VJ103	1/4W 10K 0		5RDAA00993
	XO		HM		
R75	RESISTOR	F ERD-25VJ101	1/4W 100 0		5RDAA00945
	XO		HM		
R76	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XO		M		
15 R81	RESISTOR	F ERD-25VJ103	1/4W 10K 0		5RDAA00993
	XO		HM		
R82	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XO		OHM		
R83	RESISTOR	F ERD-25VJ331	1/4W 330 0		5RDAA00957
	XO		HM		
R84	RESISTOR	F ERD-25VJ221	1/4W 220 0		5RDAA00953
	XO		HM		
R85	RESISTOR	F ERD-25VJ331	1/4W 330 0		5RDAA00957
	XO		HM		
20 R86	RESISTOR	F ERD-25VJ330	1/4W 33 OH		5RDAA00933
	XO		M		
R87	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XO		OHM		
R88	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XO		OHM		
R89	RESISTOR	F ERD-50TJ101	1/2W 100 0		5RDAA00811
	XO		HM		
R100	RESISTOR	F ERD-25VJ332	1/4W 3.3K		5RDAA00981
	XO		OHM		
25 R101	RESISTOR	F ERD-25VJ222	1/4W 2.2K		5RDAA00977
	XO		OHM		
R102	RESISTOR	F ERD-25VJ104	1/4W 100K		5RDAA01017
	XO		OHM		
R103	RESISTOR	F ERD-25VJ223	1/4W 22K 0		5RDAA01001
	XO		HM		
R104	RESISTOR	F ERD-25VJ223	1/4W 22K 0		5RDAA01001
	XO		HM		
R105	RESISTOR	F ERD-25VJ223	1/4W 22K 0		5RDAA01001
	XO		HM		
R106	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XO		M		
R107	RESISTOR	F ERD-25VJ333	1/4W 33K 0		5RDAA01005
	XO		HM		
R108	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XO		OHM		
R109	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XO		OHM		
R110	RESISTOR	F ERD-25VJ471	1/4W 470 0		5RDAA00961
	XO		HM		
35 R111	RESISTOR	F ERD-25VJ101	1/4W 100 0		5RDAA00945
	XO		HM		

## PARTS LIST

ORDER		TITLE	LIST NO.	SHEET NO.	
		SYNTHESIZER	CMG-62A	16	
PARTS NO	PARTS NAME	TYPE	DISCRIP-TION	REMARKS	CODE
R112	RESISTOR F	ERD-25VJ101	1/4W 100 0		5RDAA00945
	XD		HM		
R113	RESISTOR F	ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
R114	RESISTOR F	ERD-25VJ332	1/4W 3.3K		5RDAA00981
	XD		OHM		
R116	RESISTOR F	ERD-25VJ473	1/4W 47K 0		5RDAA01009
	XD		HM		
5 R121	RESISTOR F	ERD-25VJ562	1/4W 5.6K		5RDAA00987
	XD		OHM		
R122	RESISTOR F	ERD-25VJ331	1/4W 330 0		5RDAA00957
	XD		HM		
R123	RESISTOR F	ERD-25VJ101	1/4W 100 0		5RDAA00945
	XD		HM		
R124	RESISTOR F	ERD-25VJ101	1/4W 100 0		5RDAA00945
	XD		HM		
R125	RESISTOR F	ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
10 R126	RESISTOR F	ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
R127	RESISTOR F	ERD-25VJ471	1/4W 470 0		5RDAA00961
	XD		HM		
R128	RESISTOR F	ERD-25VJ331	1/4W 330 0		5RDAA00957
	XD		HM		
R129	RESISTOR F	ERD-25VJ330	1/4W 33 OH		5RDAA00933
	XD		M		
R130	RESISTOR F	ERD-25VJ682	1/4W 6.8K		5RDAA00989
	XD		OHM		
15 R131	RESISTOR F	ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R132	RESISTOR F	ERD-25VJ471	1/4W 470 0		5RDAA00961
	XD		HM		
R133	RESISTOR F	ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
R134	RESISTOR F	ERD-25VJ222	1/4W 2.2K		5RDAA00977
	XD		OHM		
R135	RESISTOR F	ERD-25VJ471	1/4W 470 0		5RDAA00961
	XD		HM		
20 R136	RESISTOR F	ERD-25VJ101	1/4W 100 0		5RDAA00945
	XD		HM		
R137	RESISTOR F	ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R138	RESISTOR F	ERD-25VJ470	1/4W 47 OH		5RDAA00937
	XD		M		
R139	RESISTOR F	ERD-25VJ332	1/4W 3.3K		5RDAA00981
	XD		OHM		
R140	RESISTOR F	ERD-25VJ332	1/4W 3.3K		5RDAA00981
	XD		OHM		
25 R141	RESISTOR F	ERD-25VJ220	1/4W 22 OH		5RDAA00929
	XD		M		
R142	RESISTOR F	ERD-25VJ330	1/4W 33 OH		5RDAA00933
	XD		M		
R143	RESISTOR F	ERD-25VJ221	1/4W 220 0		5RDAA00953
	XD		HM		
R145	RESISTOR F	ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R146	RESISTOR F	ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
R148	RESISTOR F	HT1/4-5.1M OHM J			5RDAC00778
	XD				
R149	RESISTOR F	ERD-25VJ680	1/4W 68 OH		5RDAA00941
	XD		M		
R150	RESISTOR F	ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R151	RESISTOR F	ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R152	RESISTOR F	ERD-25VJ222	1/4W 2.2K		5RDAA00977
	XD		OHM		
35 R153	RESISTOR F	ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	17
PARTS NO.	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
R154	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R155	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
R156	RESISTOR	F ERD-25VJ331	1/4W 330 O		5RDAA00957
	XD		HM		
R157	RESISTOR	F ERD-25VJ103	1/4W 10K O		5RDAA00993
	XD		HM		
5 R158	RESISTOR	F ERD-25VJ103	1/4W 10K O		5RDAA00993
	XD		HM		
R159	RESISTOR	F ERD-25VJ103	1/4W 10K O		5RDAA00993
	XD		HM		
R160	RESISTOR	F ERD-25VJ103	1/4W 10K O		5RDAA00993
	XD		HM		
R161	RESISTOR	F ERD-25VJ103	1/4W 10K O		5RDAA00993
	XD		HM		
R162	RESISTOR	F ERD-25VJ103	1/4W 10K O		5RDAA00993
	XD		HM		
10 R163	RESISTOR	F ERD-25VJ100	1/4W 10 OH		5RDAA00921
	XD		M		
R164	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
R165	RESISTOR	F ERD-25VJ682	1/4W 6.8K		5RDAA00989
	XD		OHM		
R167	RESISTOR	F ERD-25VJ332	1/4W 3.3K		5RDAA00981
	XD		OHM		
R168	RESISTOR	F ERD-25VJ332	1/4W 3.3K		5RDAA00981
	XD		OHM		
15 R169	RESISTOR	F ERD-25VJ332	1/4W 3.3K		5RDAA00981
	XD		OHM		
R170	RESISTOR	F ERD-25VJ330	1/4W 33 OH		5RDAA00933
	XD		M		
R171	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R181	RESISTOR	F ERD-25VJ103	1/4W 10K O		5RDAA00993
	XD		HM		
R182	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
20 R183	RESISTOR	F ERD-25VJ821	1/4W 820 O		5RDAA00967
	XD		HM		
R184	RESISTOR	F ERD-25VJ331	1/4W 330 O		5RDAA00957
	XD		HM		
R185	RESISTOR	F ERD-25VJ151	1/4W 150 O		5RDAA00949
	XD		HM		
R186	RESISTOR	F ERD-25VJ222	1/4W 2.2K		5RDAA00977
	XD		OHM		
R187	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
25 R188	RESISTOR	F ERD-25VJ101	1/4W 100 O		5RDAA00945
	XD		HM		
R189	RESISTOR	F ERD-25VJ101	1/4W 100 O		5RDAA00945
	XD		HM		
R190	RESISTOR	F ERD-25VJ103	1/4W 10K O		5RDAA00993
	XD		HM		
R191	RESISTOR	F ERD-25VJ154	1/4W 150K		5RDAA01021
	XD		OHM		
R192	RESISTOR	F ERD-25VJ104	1/4W 100K		5RDAA01017
	XD		OHM		
R193	RESISTOR	F ERD-25VJ102	1/4W 1K OH		5RDAA00969
	XD		M		
R194	RESISTOR	F ERD-25VJ101	1/4W 100 O		5RDAA00945
	XD		HM		
R195	RESISTOR	F ERD-25VJ472	1/4W 4.7K		5RDAA00985
	XD		OHM		
R196	RESISTOR	F ERD-25VJ153	1/4W 15K O		5RDAA00997
	XD		HM		
R197	RESISTOR	F ERD-25VJ821	1/4W 820 O		5RDAA00967
	XD		HM		
35 R199	RESISTOR	F ERD-25VJ471	1/4W 470 O		5RDAA00961
	XD		HM		

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	18
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
R200	RESISTOR F ERD-25VJ470		1/4W 47 OH		5RDAA00937
	XD		M		
R201	RESISTOR F ERD-25VJ472		1/4W 4.7K		5RDAA00985
	XD		OHM		
R202	RESISTOR F ERD-25VJ153		1/4W 15K 0		5RDAA00997
	XD		HM		
R203	RESISTOR F ERD-25VJ471		1/4W 470 0		5RDAA00961
	XD		HM		
5 R204	RESISTOR F ERD-25VJ101		1/4W 100 0		5RDAA00945
	XD		HM		
R211	RESISTOR F ERD-25VJ104		1/4W 100K		5RDAA01017
	XD		OHM		
R212	RESISTOR F ERD-25VJ223		1/4W 22K 0		5RDAA01001
	XD		HM		
R213	RESISTOR F ERD-25VJ223		1/4W 22K 0		5RDAA01001
	XD		HM		
R214	RESISTOR F ERD-25VJ223		1/4W 22K 0		5RDAA01001
	XD		HM		
10 R215	RESISTOR F ERD-25VJ102		1/4W 1K OH		5RDAA00969
	XD		M		
R216	RESISTOR F ERD-25VJ681		1/4W 680 0		5RDAA00965
	XD		HM		
R217	RESISTOR F ERD-25VJ223		1/4W 22K 0		5RDAA01001
	XD		HM		
R218	RESISTOR F ERD-25VJ103		1/4W 10K 0		5RDAA00993
	XD		HM		
R219	RESISTOR F ERD-25VJ104		1/4W 100K		5RDAA01017
	XD		OHM		
15 R220	RESISTOR F ERD-25VJ473		1/4W 47K 0		5RDAA01009
	XD		HM		
R221	RESISTOR F ERD-25VJ102		1/4W 1K OH		5RDAA00969
	XD		M		
R222	RESISTOR F ERD-25VJ101		1/4W 100 0		5RDAA00945
	XD		HM		
R224	RESISTOR F ERD-25VJ472		1/4W 4.7K		5RDAA00985
	XD		OHM		
R225	RESISTOR F ERD-25VJ822		1/4W 8.2K		5RDAA00991
	XD		OHM		
20 R226	RESISTOR F ERD-25VJ472		1/4W 4.7K		5RDAA00985
	XD		OHM		
R227	RESISTOR F ERD-25VJ152		1/4W 1.5K		5RDAA00973
	XD		OHM		
R228	RESISTOR F ERD-25VJ472		1/4W 4.7K		5RDAA00985
	XD		OHM		
R229	RESISTOR F ERD-25VJ821		1/4W 820 0		5RDAA00967
	XD		HM		
R230	RESISTOR F ERD-25VJ473		1/4W 47K 0		5RDAA01009
	XD		HM		
25 R231	RESISTOR F ERD-25VJ473		1/4W 47K 0		5RDAA01009
	XD		HM		
R232	RESISTOR F ERD-25VJ473		1/4W 47K 0		5RDAA01009
	XD		HM		
R233	RESISTOR F ERD-25VJ473		1/4W 47K 0		5RDAA01009
	XD		HM		
R234	RESISTOR F ERD-25VJ151		1/4W 150 0		5RDAA00949
	XD		HM		
R235	RESISTOR F ERD-25VJ330		1/4W 33 OH		5RDAA00933
	XD		M		
R236	RESISTOR F ERD-25VJ330		1/4W 33 OH		5RDAA00933
	XD		M		
RV1	RESISTOR V RG06H2102		1K OHM		5RMAC00068
	AR				
RV2	RESISTOR V RG06H2103		10K OHM		5RMAC00067
	AR				
RV3	RESISTOR V RG06H2103		10K OHM		5RMAC00067
	AR				
RV4	RESISTOR V RG06H2102		1K OHM		5RMAC00068
	AR				
35 RV5	RESISTOR V RG06H2103		10K OHM		5RMAC00067
	AR				

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	19
PARTS NO	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
RV6	RESISTOR V	RG06H2103	10K OHM		5RMAC00067
RV7	AR RESISTOR V	RG06H2103	10K OHM		5RMAC00067
RV8	AR RESISTOR V	RG06H2503	B50K		5RMAC00069
T1	AR RF XFMR	JD-LD749-73			6LHJD00030
5	T2	RF XFMR	JD-LD749-73		6LHJD00030
T3	RF XFMR	H-6LHJD00172			6LHJD00172
T4	RF XFMR	JD-LD774-74	0.1-30MHZ		6LHJD00109
T5	RF XFMR	JD-LD780-74			6LHJD00115
T6	RF XFMR	JD-LD780-74			6LHJD00115
10	T7	RF XFMR	H-6LHJD00172		6LHJD00172
T8	RF XFMR	H-6LHJD00172			6LHJD00172
T9	RF XFMR	H-6LHJD00172			6LHJD00172
T10	RF XFMR	H-6LHJD00172			6LHJD00172
T11	RF XFMR	H-6LHJD00172			6LHJD00172
15	T12	RF XFMR	H-6LHJD00172		6LHJD00172
T13	RF XFMR	JD-LD782-74			6LHJD00118
T14	RF XFMR	JD-LD782-74			6LHJD00118
T15	RF XFMR	H-6LHJD00172			6LHJD00172
T16	RF XFMR	H-6LHJD00172			6LHJD00172
20	T17	RF XFMR	H-6LHJD00172		6LHJD00172
T18	RF XFMR	1D-LD593-42 RED			6LJJD00007
TP	CONNECTOR	PCN6-PEG			5JDAA00186
TR1	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
TR2	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
25	TR3	TRANSISTOR	3SK45B		5TKAB00006
TR4	TRANSISTOR	2SK19TM-BL			5TKAA00061
TR5	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
TR6	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR7	TRANSISTOR	2SA495GTM-Y			5TAAG00090
TR8	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
TR9	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR10	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
TR11	TRANSISTOR	2SC372GTM-Y			5TCAF00245
TR12	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
35	TR13	TRANSISTOR	2SC372GTMA-Y		5TCAF00290

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		SYNTHESIZER		CMG-62A	20
PARTS NO	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
TR14	TRANSISTOR	2SA495GTM-Y			5TAAG00090
TR15	TRANSISTOR	2SC1254			5TCAB00024
TR16	TRANSISTOR	2SC1254			5TCAB00024
TR17	TRANSISTOR	2SC1254			5TCAB00024
5 TR18	TRANSISTOR	2SA495GTM-Y			5TAAG00090
TR19	TRANSISTOR	2SA495GTM-Y			5TAAG00090
TR20	TRANSISTOR	2SA495GTM-Y			5TAAG00090
TR21	TRANSISTOR	2SC382TM-W			5TCAF00262
TR22	TRANSISTOR	3SK45B			5TKAB00006
10 TR23	TRANSISTOR	3SK45B			5TKAB00006
TR24	TRANSISTOR	2SC382TM-W			5TCAF00262
TR25	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
TR26	TRANSISTOR	2SC372GTMA-Y			5TCAF00290
X1	CRYSTAL	H-6XHJD00131	10MHZ		6XHJD00131
15 X2	CRYSTAL	H-6XHJD00126	19MHZ		6XHJD00126
X3	CRYSTAL	H-6XHJD00127	5MHZ		6XHJD00127
X4	CRYSTAL	H-6XHJD00132	70MHZ		6XHJD00132
X5	CRYSTAL	H-6XHJD00133	5.455MHZ		6XHJD00133

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## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		PULSE GEN.	CPA-94		1
PARTS NO	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
C1	CAP,FXD	CE RD340E102P50V02	1000PF 50V		5CBAB00021
C2	R CAP,FXD	CE RD340E102P50V02	1000PF 50V		5CBAB00021
C3	R CAP,FXD	TA ECS-225MA4R7	25V 4.7UF		5CSAA00090
CD1	NTAL LED	TLR108			5TZAD00037
5 CD2	LED	TLR108			5TZAD00037
IC1	IC	TC4049BP			5DDAE00044
IC2	IC	TC4001BP			5DDAE00042
IC3	IC	TC4011BP			5DDAE00053
IC4	IC	TC4011BP			5DDAE00053
10 L1	COIL	LF1-100K	10UH		5LCAB00001
PC1	PCB	MPPC07722			MPPC07722
PC2	PCB	MPPC04647A	CPA-33		MPPC04647A
R1	RESISTOR	F ERD-25TJ103	1/4W 10K 0		5RDAA00728
R2	XD RESISTOR	F ERD-25TJ103	HM 1/4W 10K 0		5RDAA00728
15 R3	XD RESISTOR	F ERD-25TJ680	HM 1/4W 68 OH		5RDAA00676
R4	XD RESISTOR	F ERD-25TJ334	HM 1/4W 330K		5RDAA00764
R5	XD RESISTOR	F ERD-25TJ334	HM 1/4W 330K		5RDAA00764
R6	XD RESISTOR	F ERD-25TJ332	HM 1/4W 3.3K		5RDAA00716
R7	XD RESISTOR	F ERD-25TJ332	HM 1/4W 3.3K		5RDAA00716
20 RV1	XD RESISTOR	V PN822H503H	HM 50K OHM		5RMAA00012
RV2	AR RESISTOR	V PN822H503H	50K OHM		5RMAA00012
TP1	TERMINAL	A-8			5JTB000006
TP2	TERMINAL	A-8			5JTB000006
TP3	TERMINAL	A-8			5JTB000006
25 TP4	TERMINAL	A-8			5JTB000006
TR1	TRANSISTOR	T-28A			5TZAJ00005
TR2	TRANSISTOR	T-28A			5TZAJ00005
TR3	TRANSISTOR	2SC373GTMA			5TCAF00291
TR4	TRANSISTOR	2SC373GTMA			5TCAF00291

ORDER		TITLE		LIST NO.	SHEET NO.
		POWER SUPPLY		C80-375	1
PARTS NO	PARTS NAME	TYPE	DISCRIPTION	REMARKS	CODE
C1	CAP, FXD CTLT	EL ECE-T35R472SW			5CEAA01265
C2	CAP, FXD STC	PL ECQ-M1H474KZ			5CRAA00130
C3	CAP, FXD STC	PL ECQ-M1H104KZ			5CRAA00123
C4	CAP, FXD CTLT	EL ECE-A1ES101	25V100UF		5CEAA01349
5 C5	CAP, FXD CTLT	EL ECE-T25R682SW			5CEAA01261
C6	CAP, FXD STC	PL ECQ-M1H474KZ			5CRAA00130
C7	CAP, FXD STC	PL ECQ-M1H104KZ			5CRAA00123
C8	CAP, FXD CTLT	EL ECE-A1ES101	25V100UF		5CEAA01349
C12	CAP, FXD STC	PL ECQ-M1H104KZ			5CRAA00123
10 C13	CAP, FXD CTLT	EL ECE-A1ES101	25V100UF		5CEAA01349
CD1	DIODE	S4VB10			5TXAC00065
CD2	DIODE	S4VB10			5TXAC00065
IC7	IC	UA7815UC	15V 1A		5DAAM00010
IC8	IC	UA7815UC	15V 1A		5DAAM00010
15 IC9	IC	UA7805UC			5DAAM00005
PC1	PCB	MPPC07962A			MPPC07962A

20

25

35

## PARTS LIST

ORDER		TITLE		LIST NO.	SHEET NO.
		ACCESSORIES	NRD-515		1
PARTS NO.	PARTS NAME	TYPE	DISCRIP- TION	REMARKS	CODE
F1	FUSE	MF60-1A	1A		5ZFAD00014
P1	CONNECTOR	M-P-3			5JAAB00011
P2	PIN PLUG	CN7017(PLUG)			5JJAJ00001
P3	PLUG	S-H3001			5JWAV00001
P4	CONNECTOR	P-1616BA-C	16P		5JBAB00454
PL1	LAMP	AS05121	A12V2WBD 0 -16A		5WAAB00090

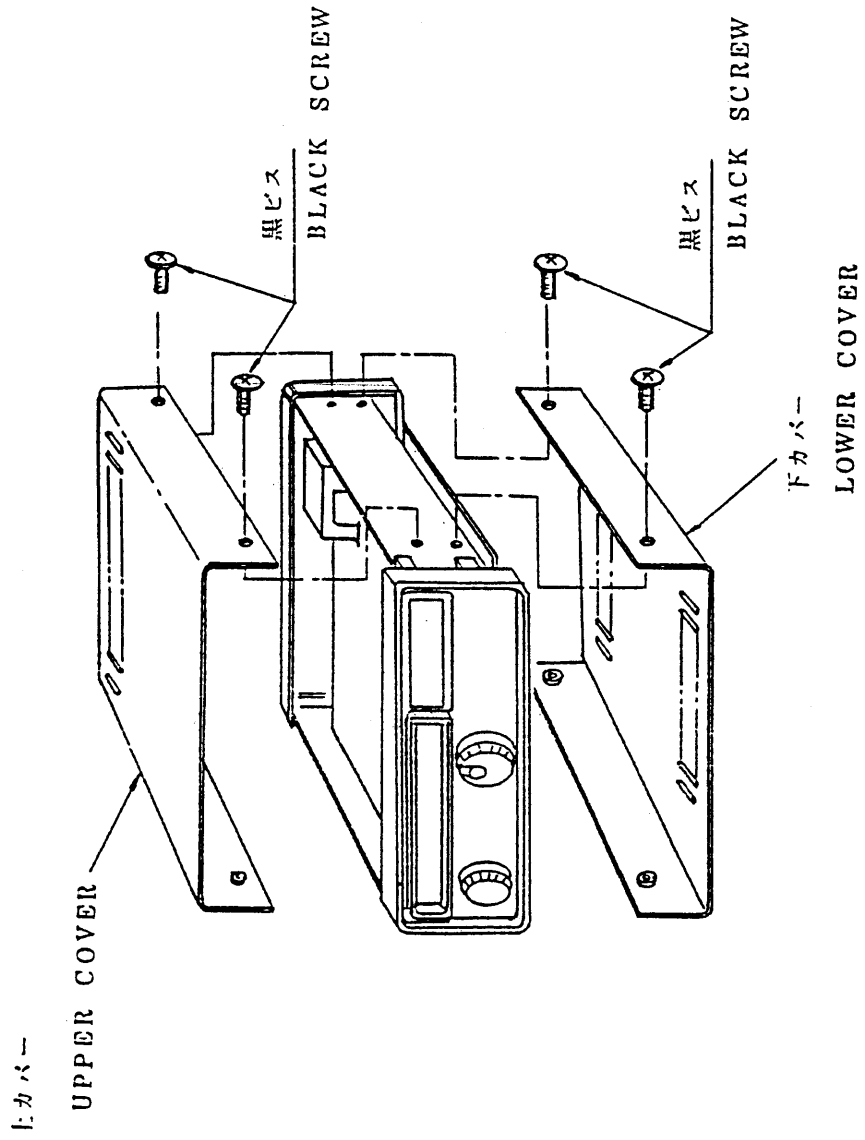
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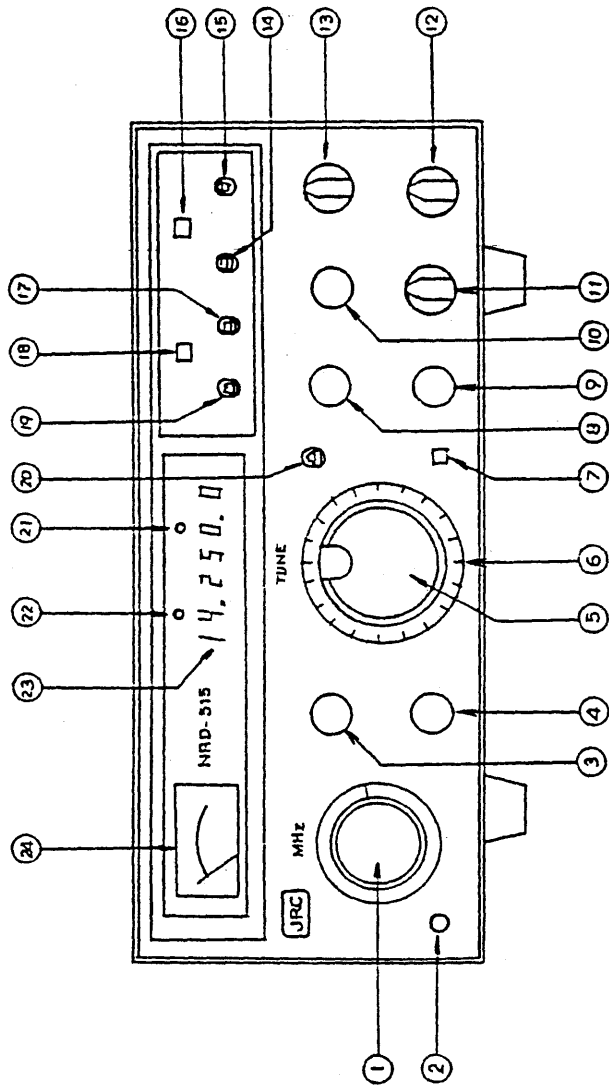
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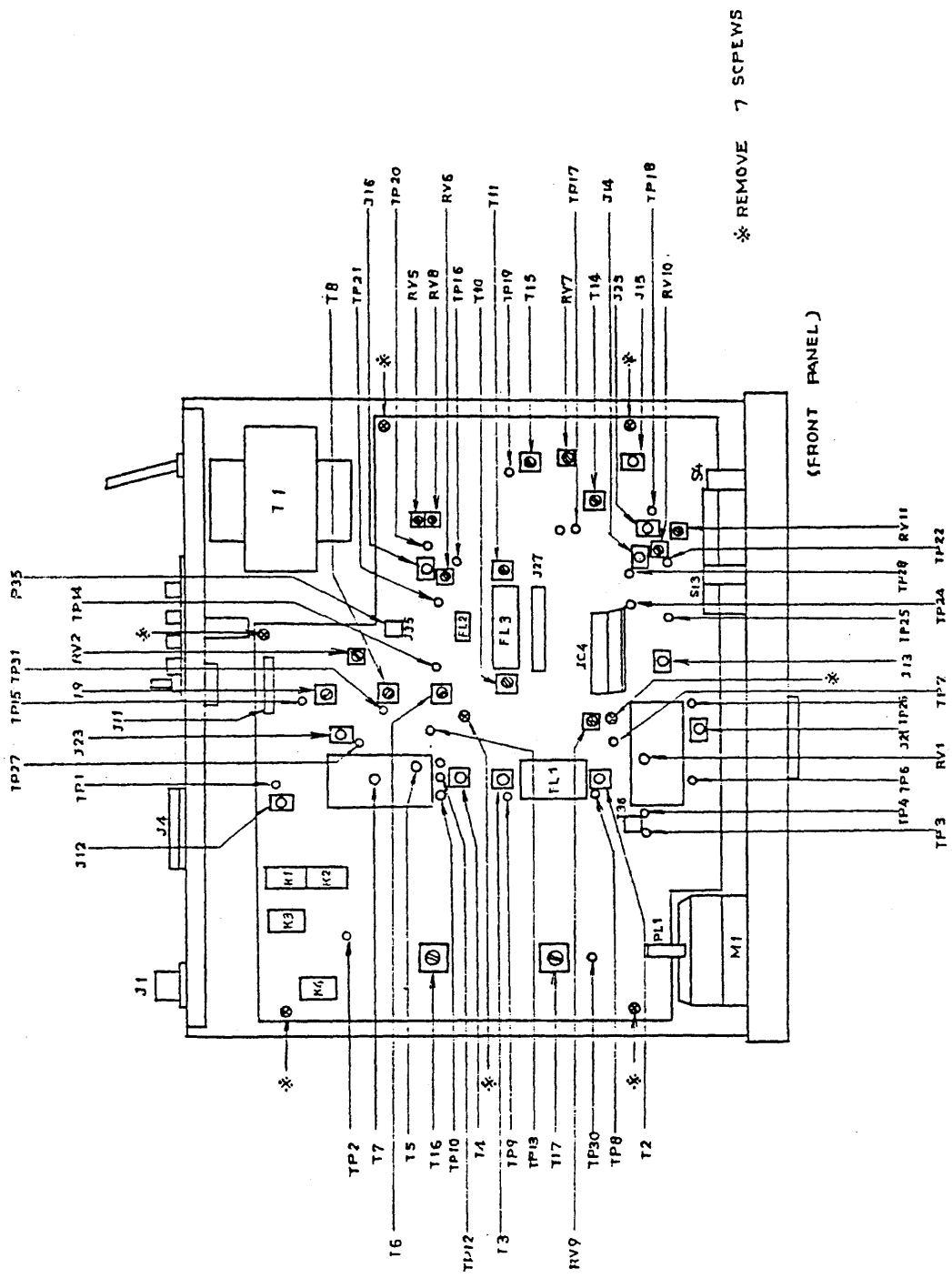
付 図 1 1  
 APPENDIX 1



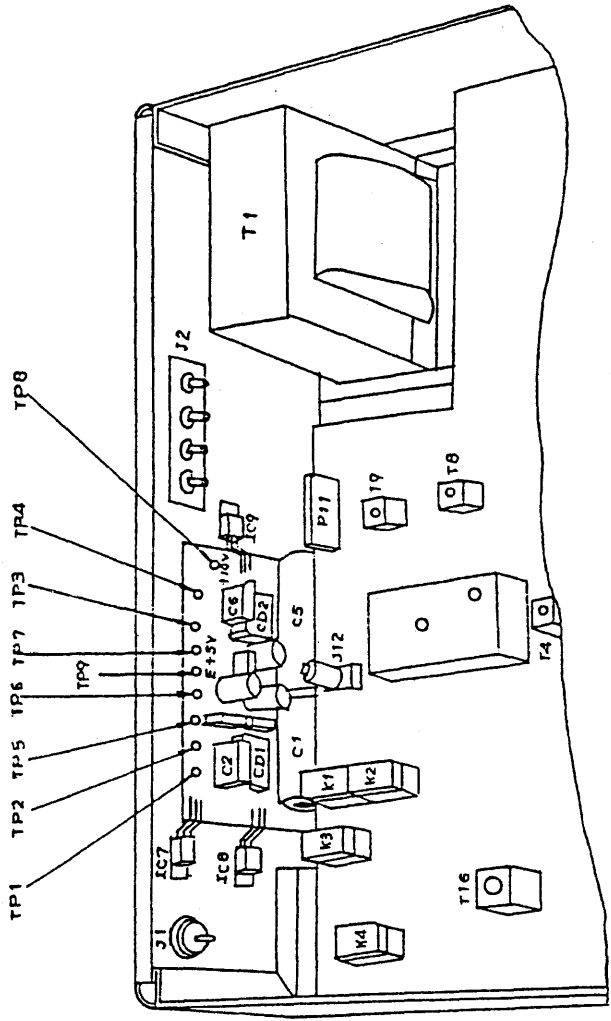
付図 2 前面パネル

APPENDIX 2 FRONT PANEL





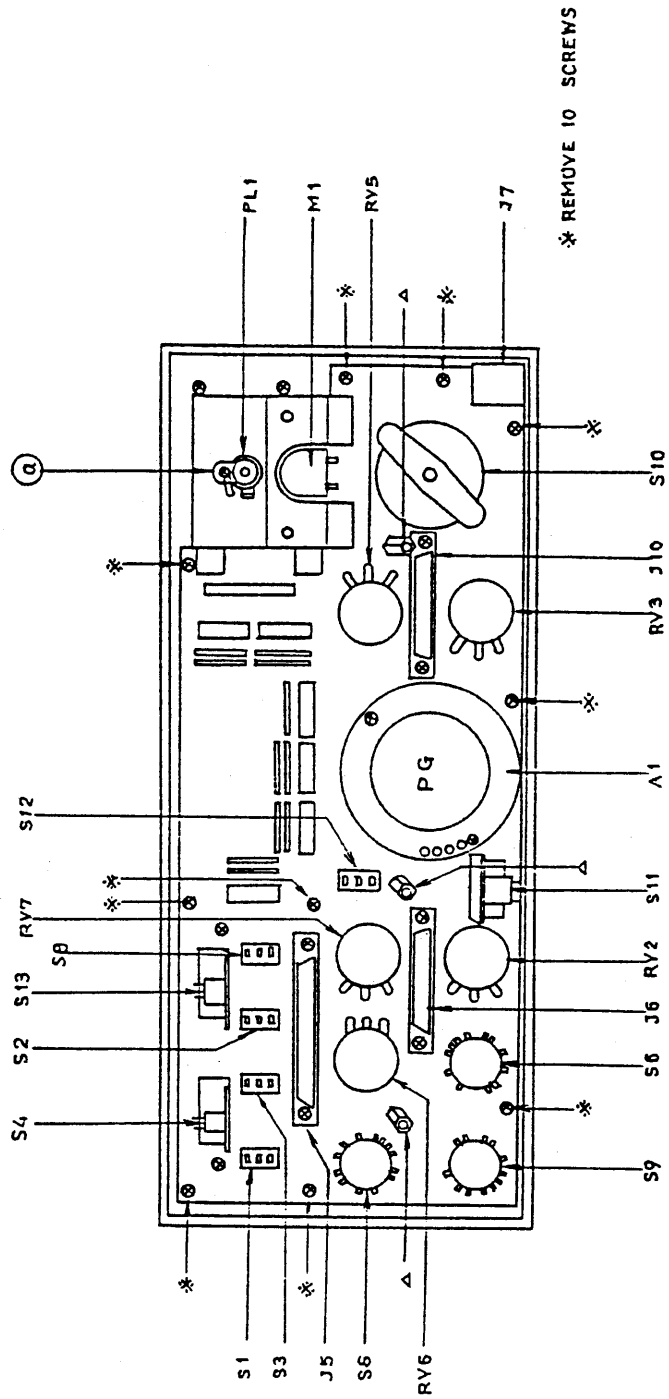
付 図 4 I. III Ⅷ  
 APPENDIX 4 TOP VIEW



付 5 1: 面 图

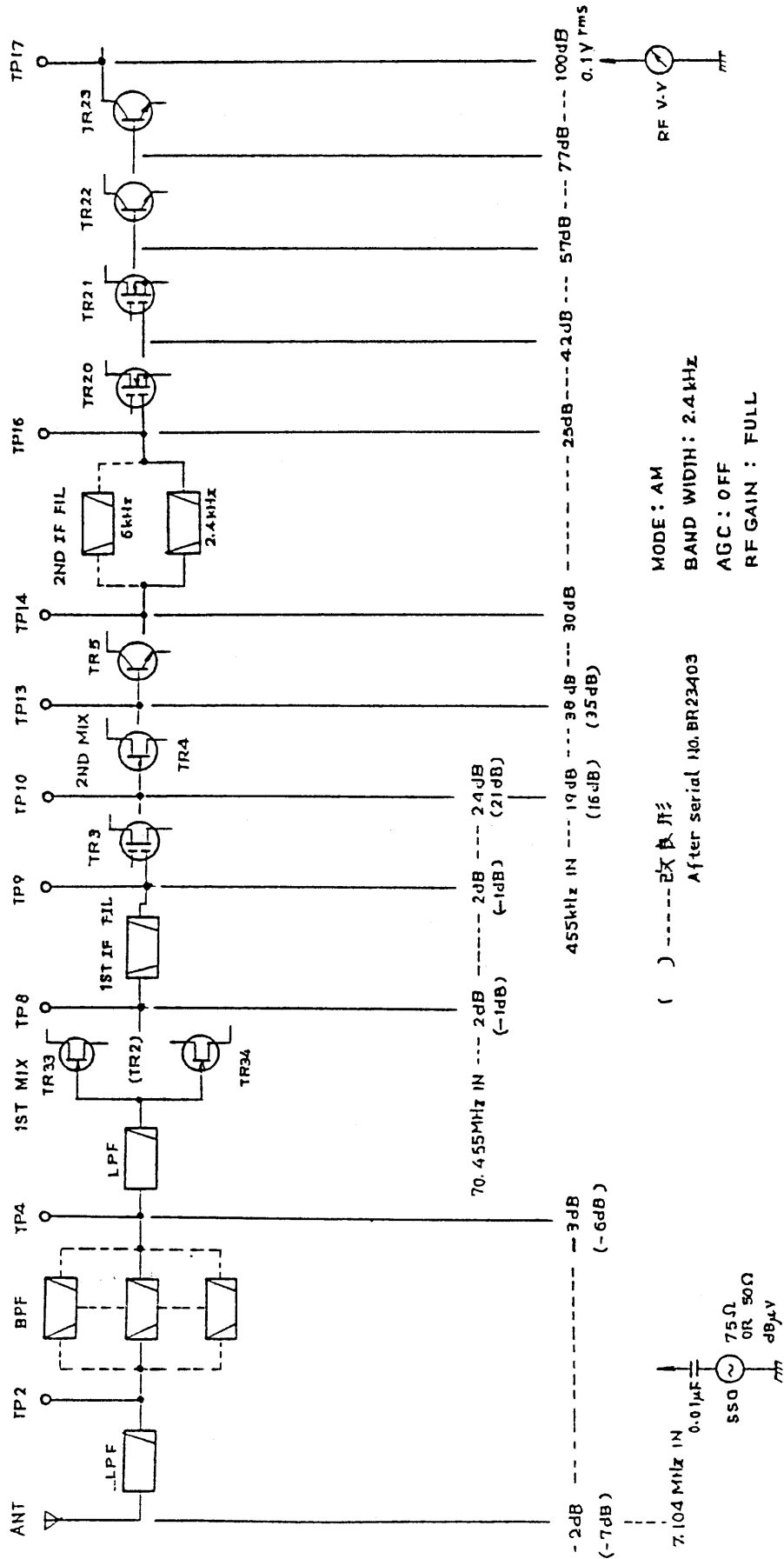
APPENDIX 5 TOP VIEW



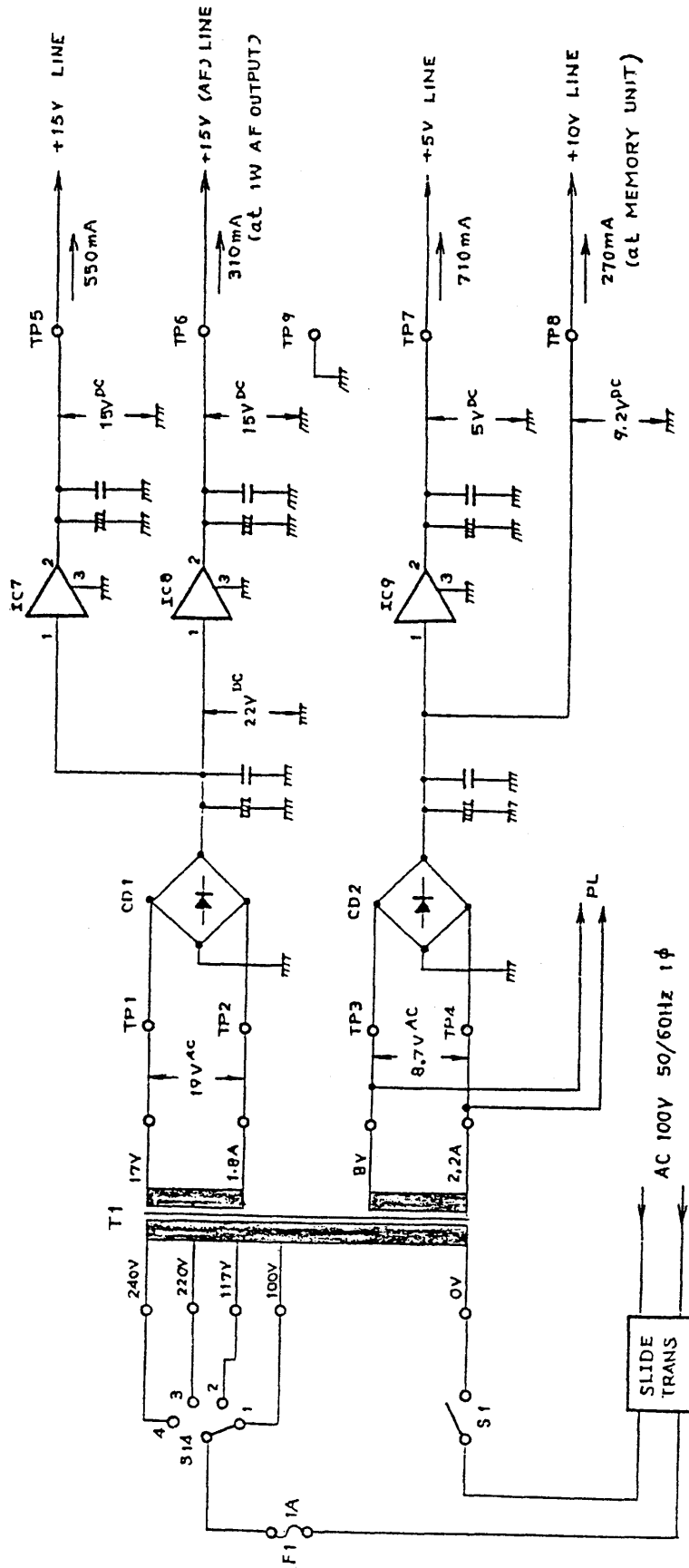


付 図 6 前 面 パ ネ ル の 裏 面 図  
 APPENDIX 6 FRONT PANEL REAR VIEW

NRD-515 各部利得  
STAGE GAIN



NRD-515 電源部 各部電圧・電流  
POWER SUPPLY UNIT

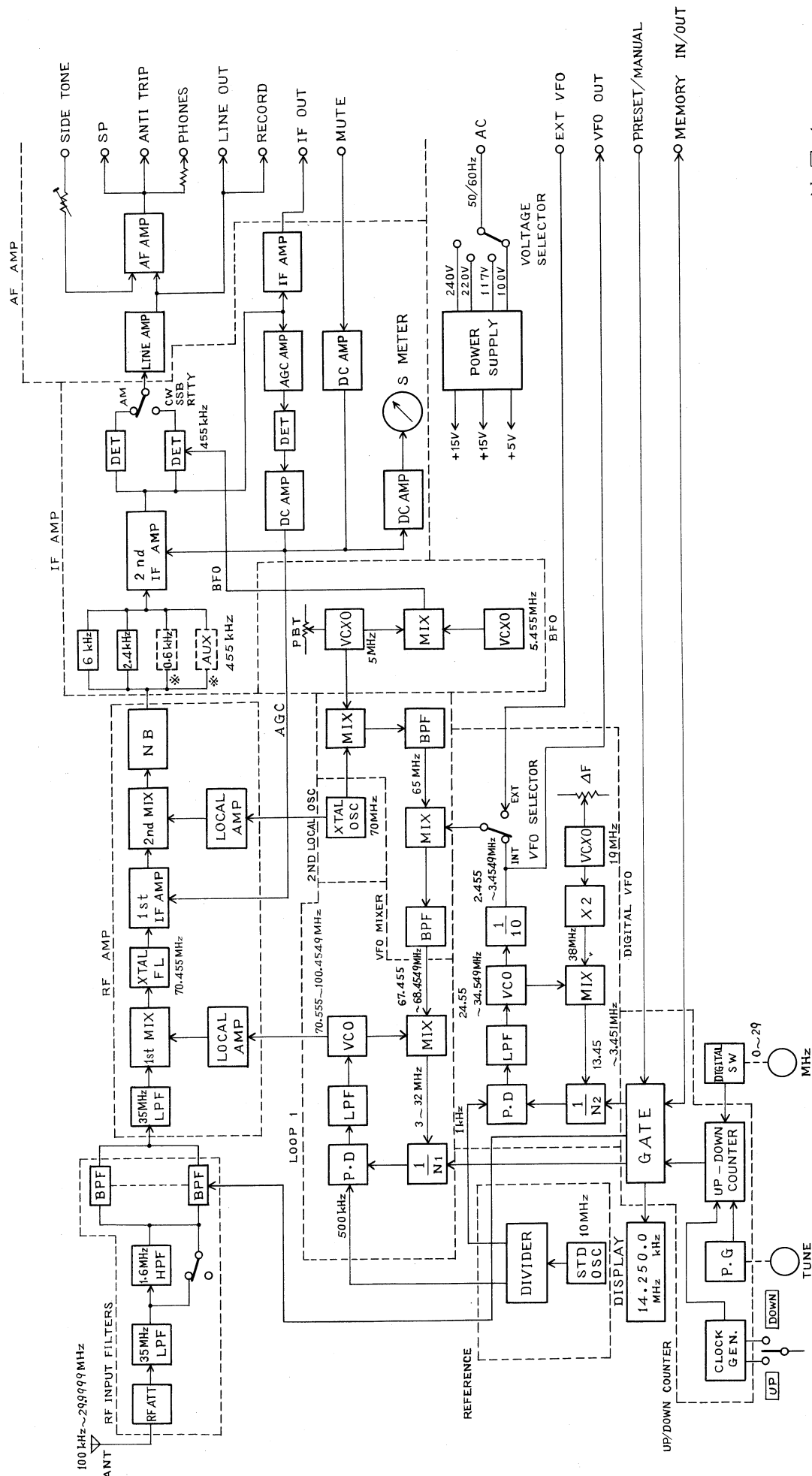


各値は標準値を示します。

Values indicate standard ones

付 図 8

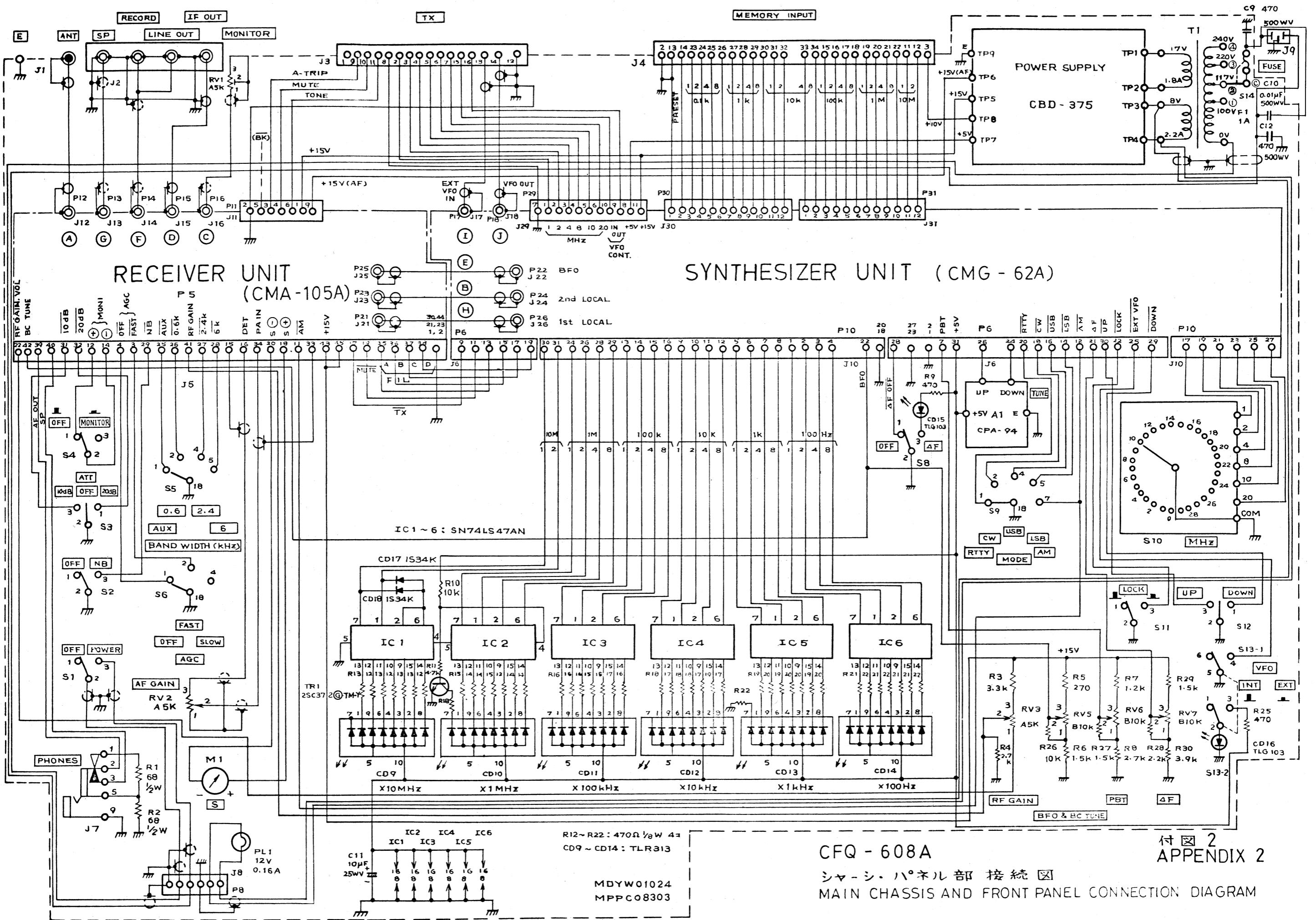
APPENDIX 8



付図 1  
APPENDIX 1

NRD-515  
全波受信機系統図  
ALL-WAVE RECEIVER FUNCTIONAL BLOCK DIAGRAM

\* [ ] OPTION を示します。

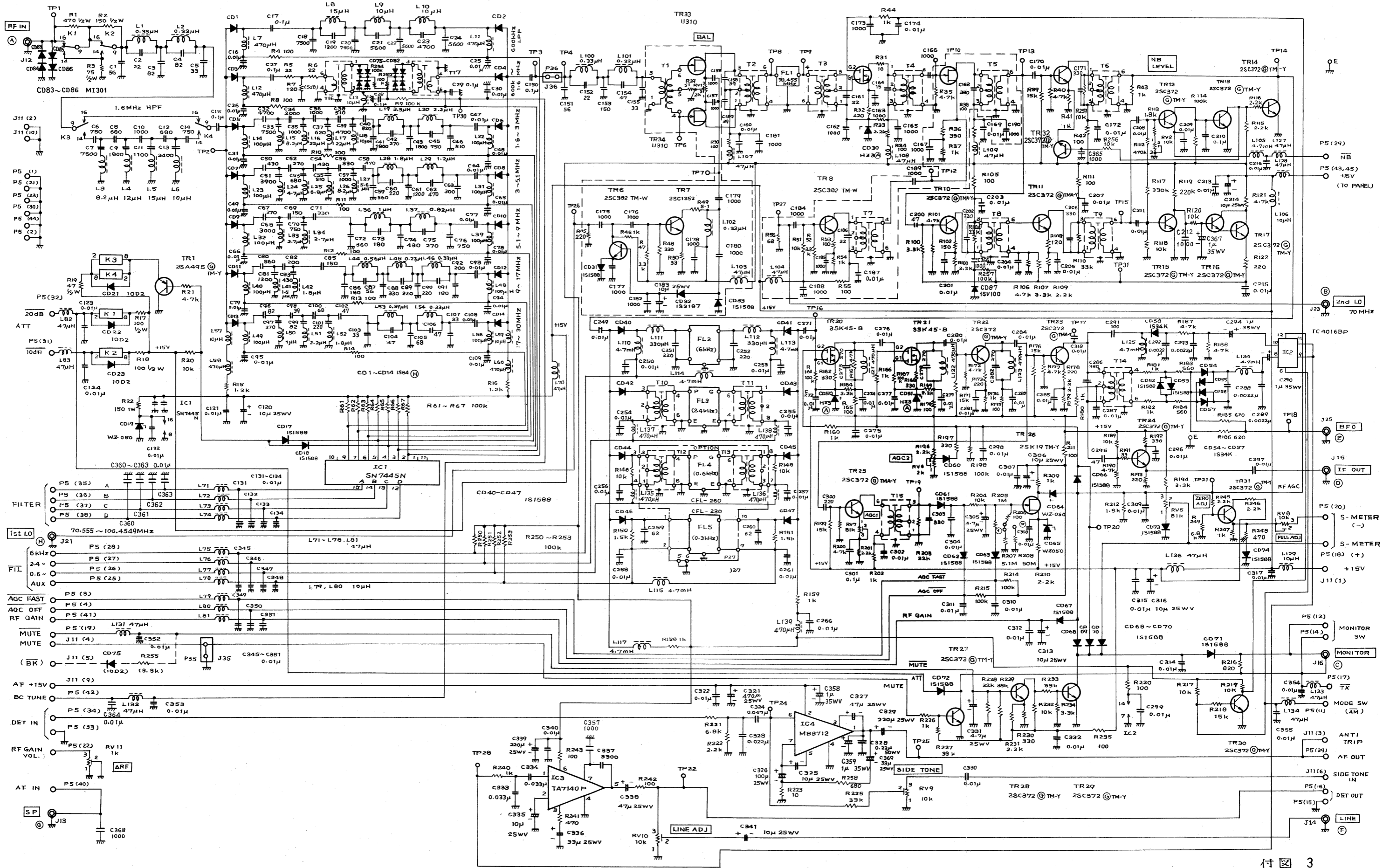


CFQ - 608A

シャーシ・パネル部 接続図  
 MAIN CHASSIS AND FRONT PANEL CONNECTION DIAGRAM

付図 2  
 APPENDIX 2

注1) 特記外の抵抗は全てΩおよび1/4Wを示し、容量はPFを示す。  
 2) ※印は調整用部品を示す。  
 NOTES 1. UNLESS OTHERWISE INDICATED RESISTANCES ARE IN OHMS CAPACITANCES ARE IN MICRO-MICRO FARADS.  
 2. \* VALUES SELECTED IN MANUFACTURE.



付図 3 APPENDIX 3

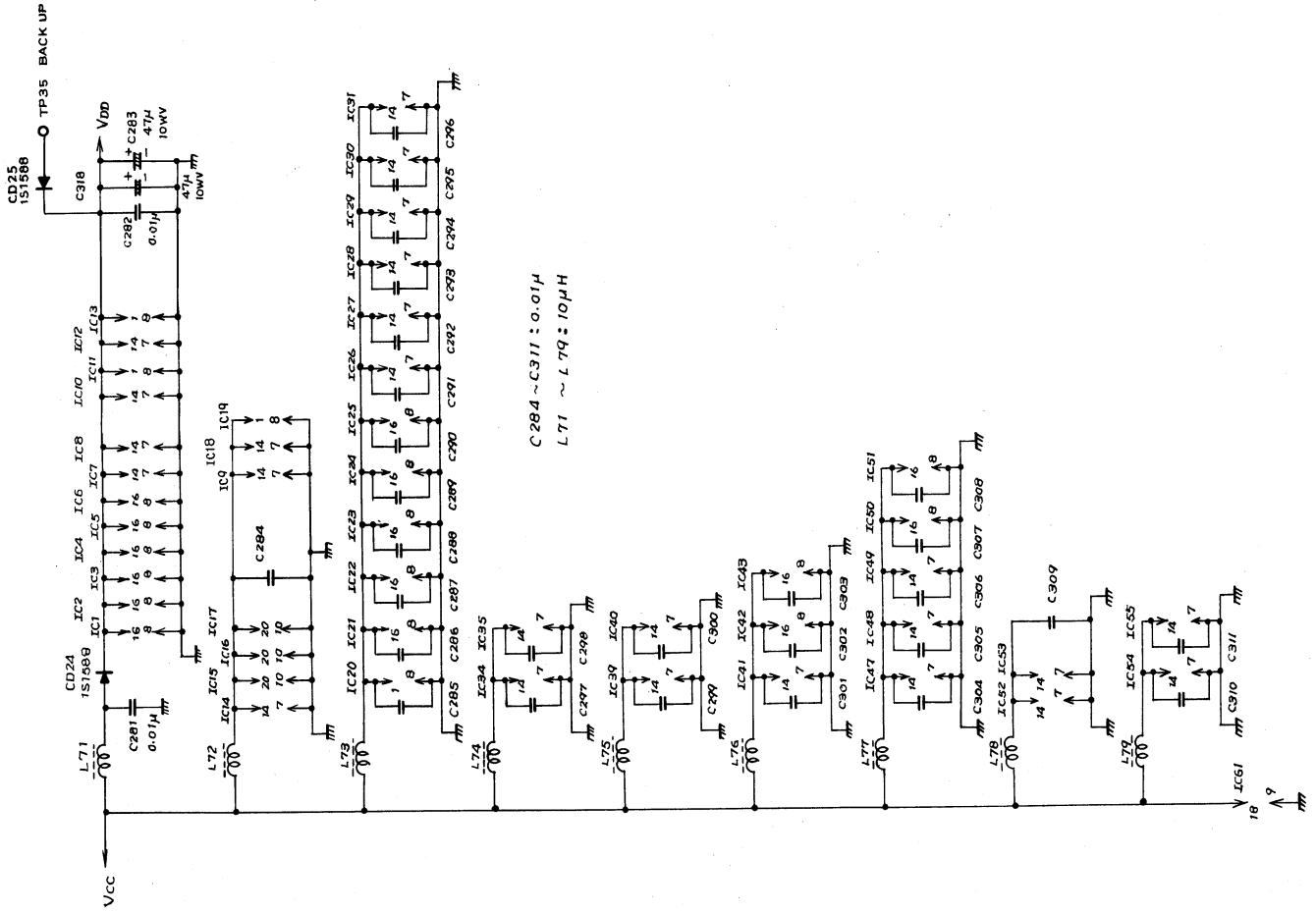
CMA-105A 受信部接続図 RECEIVER UNIT SCHEMATIC DIAGRAM



MC 4044

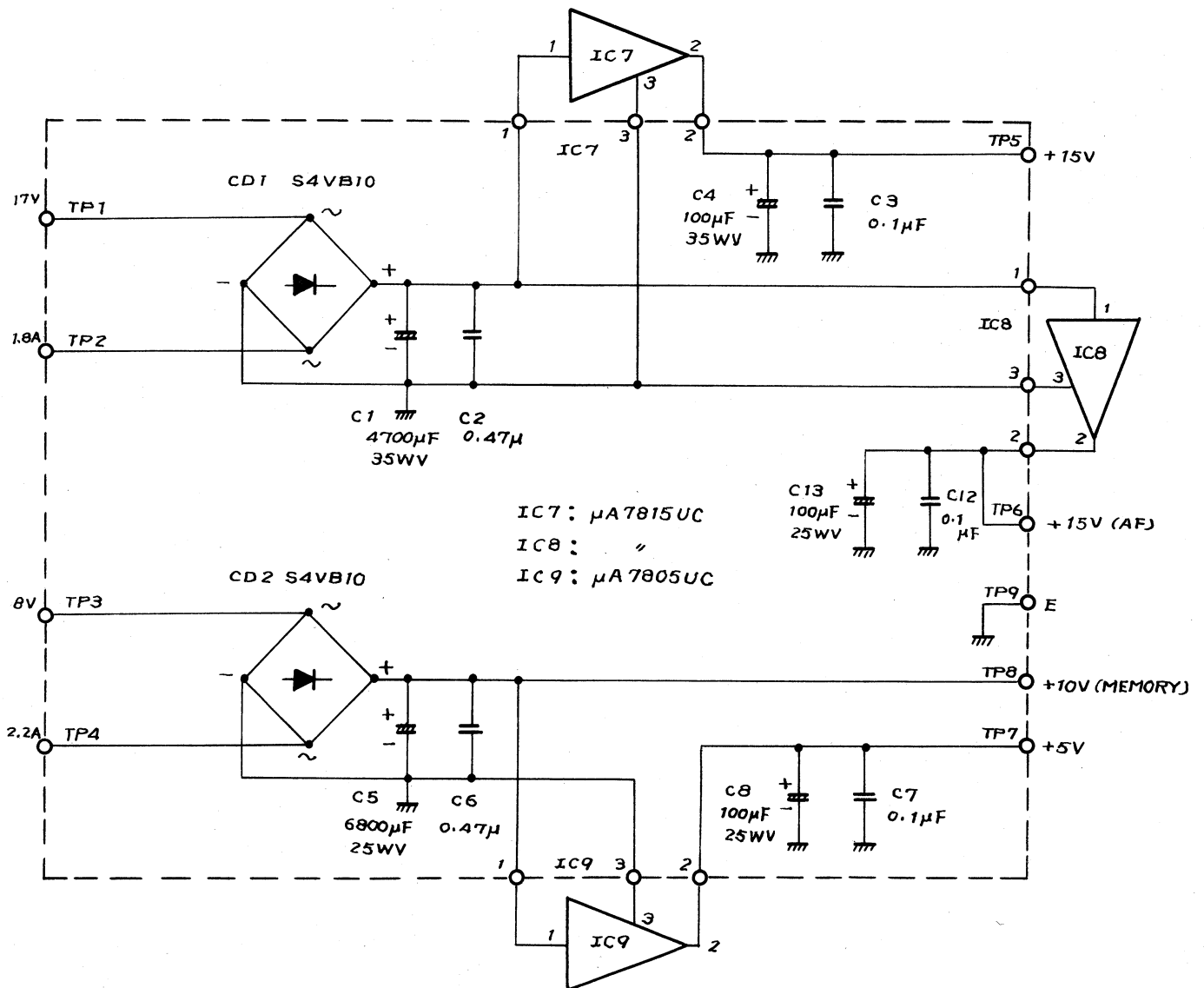
IC1	TC4010BP	IC36	TC4016BP
IC2	"	IC37	TC4011BP
IC3	"	IC38	TC4016BP
IC4	"	IC39	SN74LS00N
IC5	"	IC40	SN74LS196N
IC6	"	IC41	SN7400N
IC7	TC4001BP	IC42	SN74LS390N
IC8	TC4011BP	IC43	"
IC9	TC4001BP	IC44	TC4016BP
IC10	TC4013BP	IC45	TC4049BP
IC11	TC4049BP	IC46	MC1950P
IC12	TC4023BP	IC47	SN74LS04N
IC13	TC4049BP	IC48	SN74LS20N
IC14	SN74LS04N	IC49	SN74S74N
IC15	SN74LS244N	IC50	SN74LS192N
IC16	"	IC51	"
IC17	"	IC52	SN74LS00N
IC18	TC4011BP	IC53	SN74LS26N
IC19	TC4049BP	IC54	11C44DC
IC20	"	IC55	SN74LS26N
IC21	SN74LS192N	IC56	TC4016BP
IC22	"	IC57	HA723T
IC23	"	IC58	TA7045M
IC24	"	IC59	TC4049BP
IC25	"	IC60	TC4016BP
IC26	SN74LS00N	IC61	MPB426D(2)
IC27	SN74LS10N		
IC28	SN74LS00N		
IC29	SN74LS10N		
IC30	SN74LS00N		
IC31	SN74LS74N		
IC32	MC1950P		
IC33	HA723T		
IC34	11C44DC		
IC35	SN74LS26N		

MC 4044



付 図 5  
APPENDIX 5





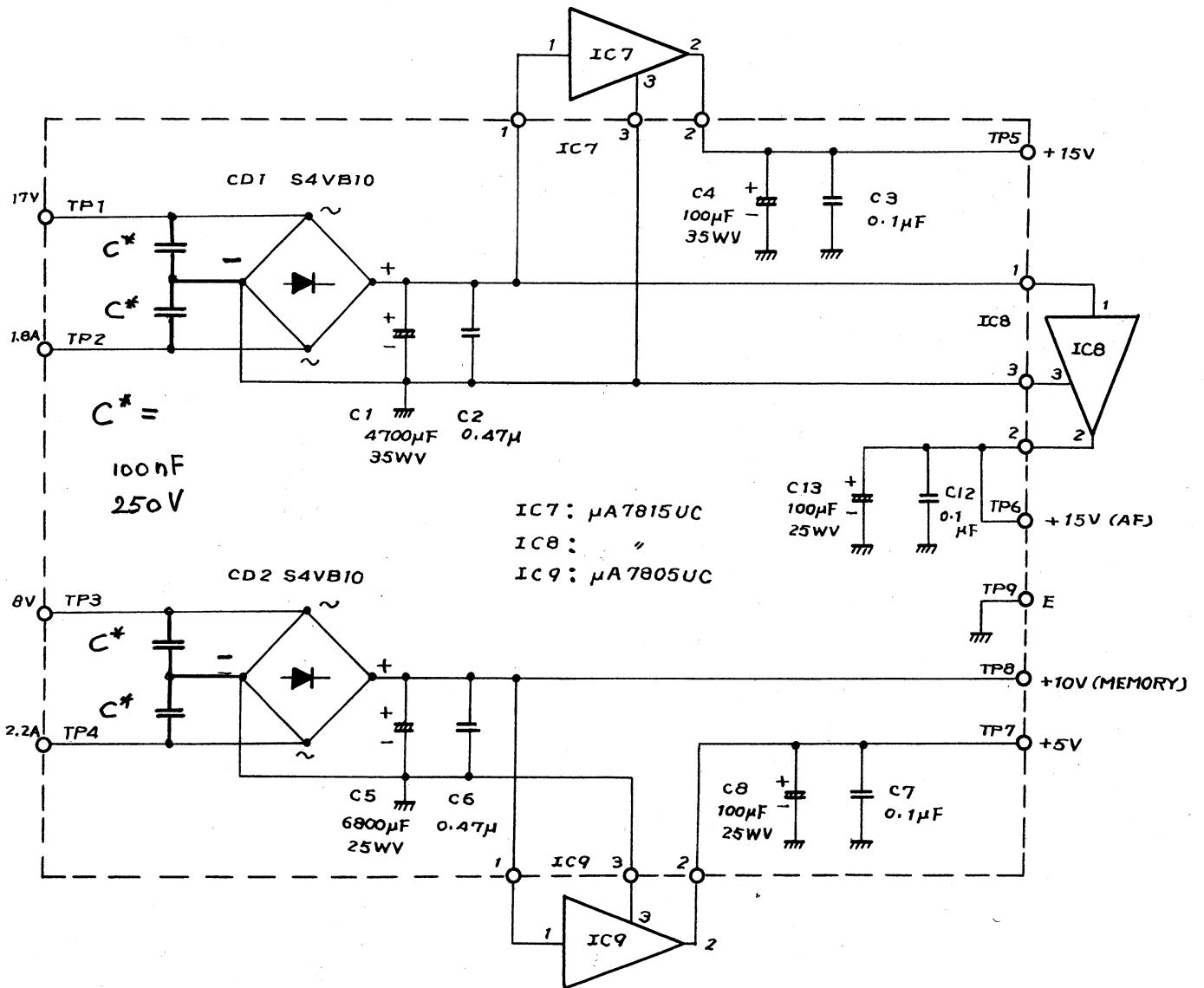
MDBW00795  
MPPC07962

付図 6  
APPENDIX 6

CBD - 375

電源部接続図

RECTIFIER UNIT SCHEMATIC DIAGRAM

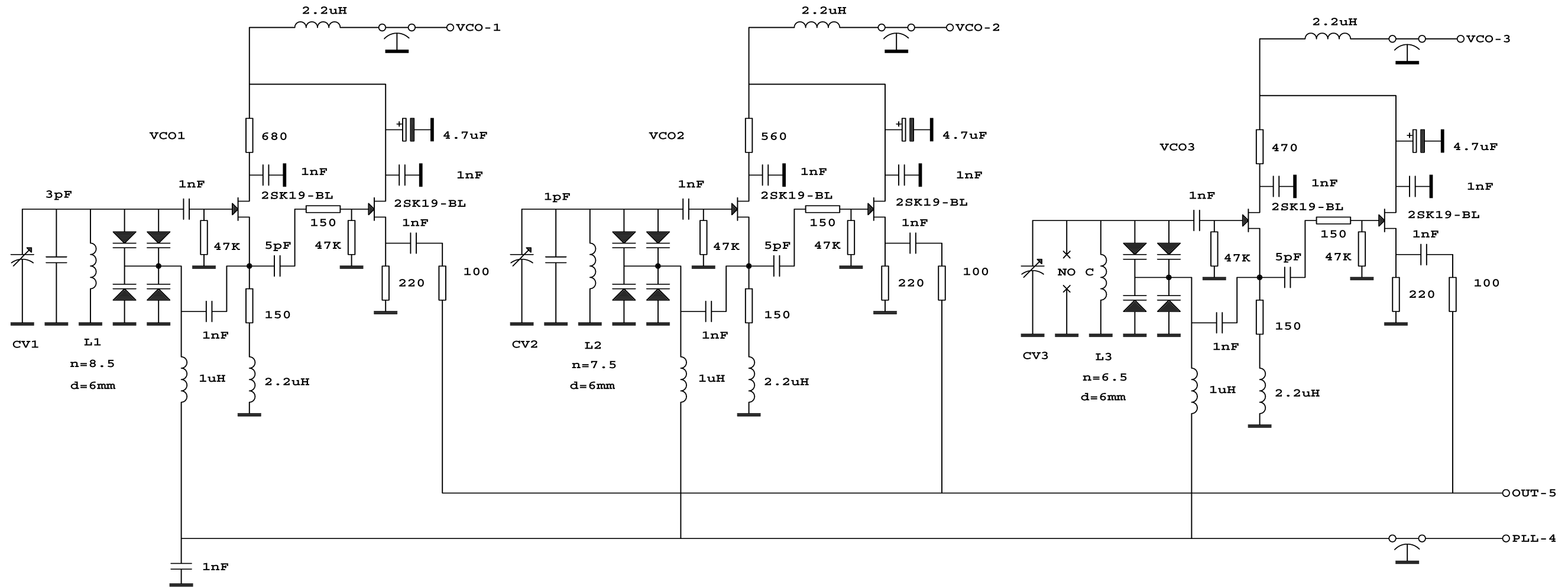


MDBW00795  
 MPPC 07962

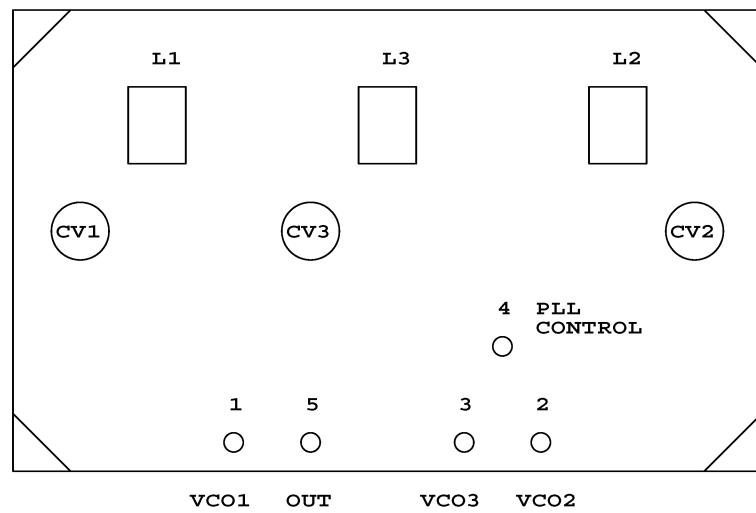
付図 6  
 APPENDIX 6

CBD - 375  
 電源部接続図  
 RECTIFIER UNIT SCHEMATIC DIAGRAM  
 added anti-rattle C's

VARICAP TYPE UNKNOWN  
VHF TUNER TYPE



VCO CIRCUITBOARD SIDE  
(SYNTH BOARD ON THE BACK)

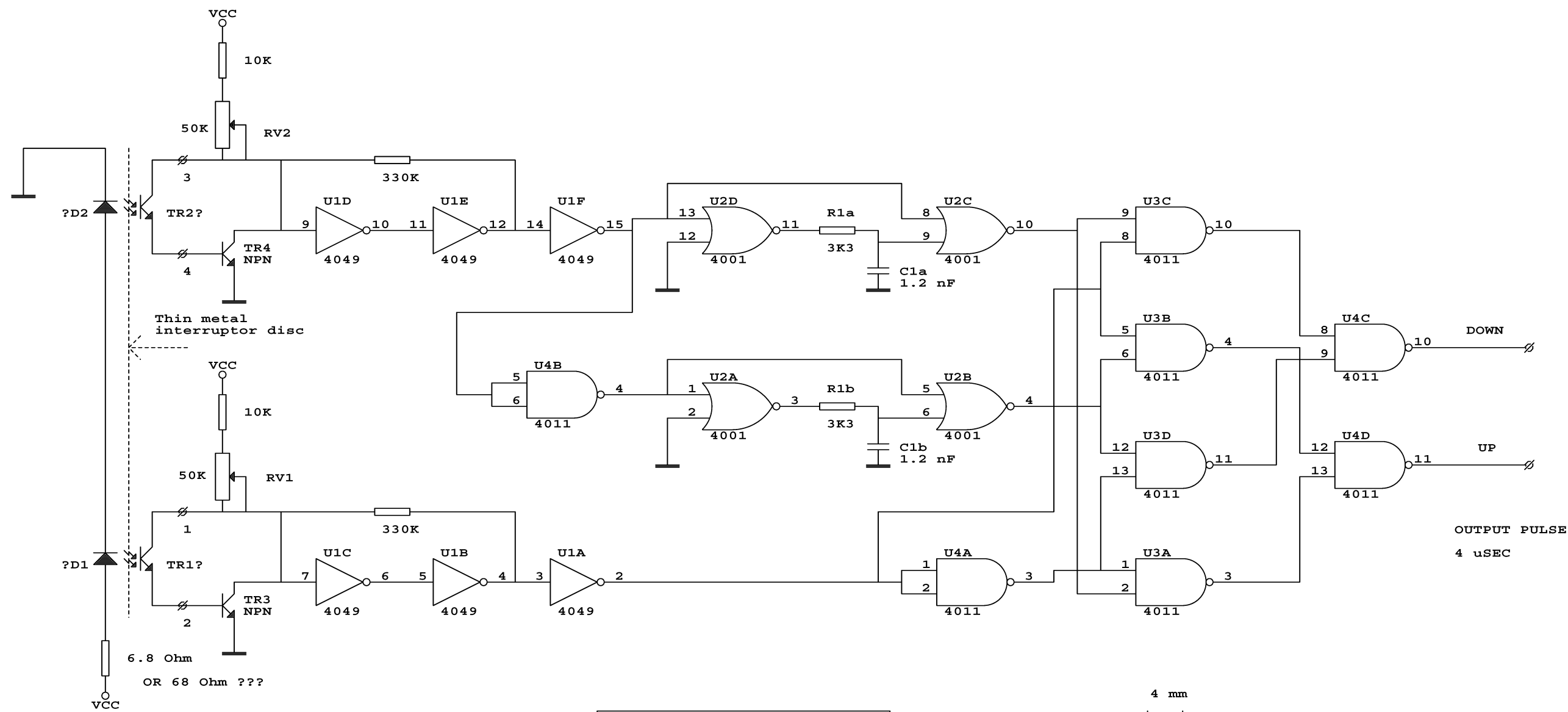


VCO-1 RANGE +/- 70 - 80 MHz ( Rx RANGE 0.000.0 - 9.999.9 )  
 VCO-2 RANGE +/- 80 - 90 MHz ( Rx RANGE 10.000.0 - 19.999.9 )  
 VCO-3 RANGE +/- 90 - 100 MHz ( Rx RANGE 20.000.0 - 29.999.9 )

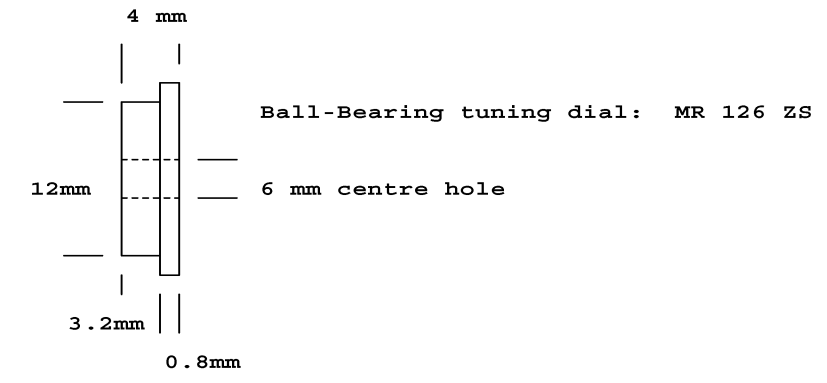
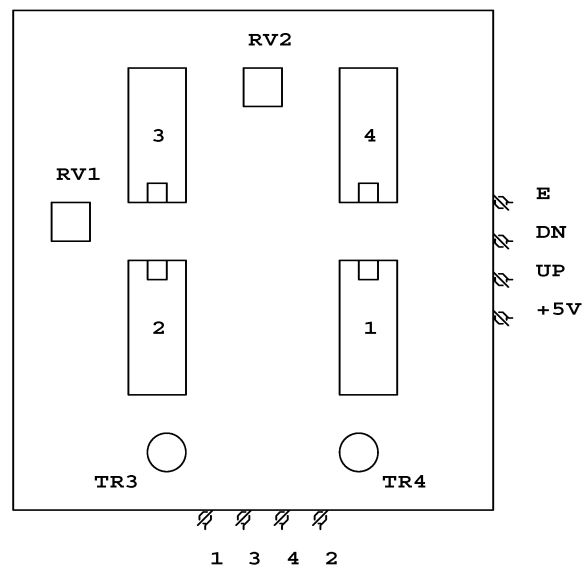
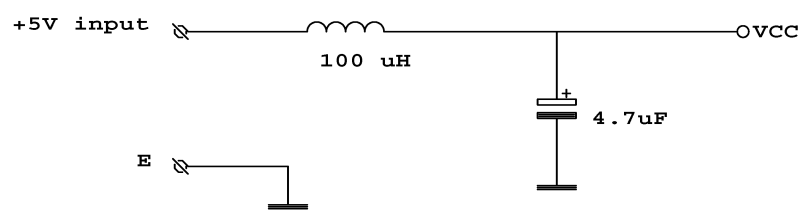
PLL VOLTAGE RANGE FOR EACH VCO WITHIN 4.00 - 10.50 VOLTS LIMITS

CGA-68.SCH

REVERSE ENGINEERING BY PELABR		
Title MAIN VCO SYNTH NRD-515		
Size B	Document Number CGA-68 VCO - DRAWING MDEW00416	REV A
Date: May 21, 2006	Sheet 1 of	1

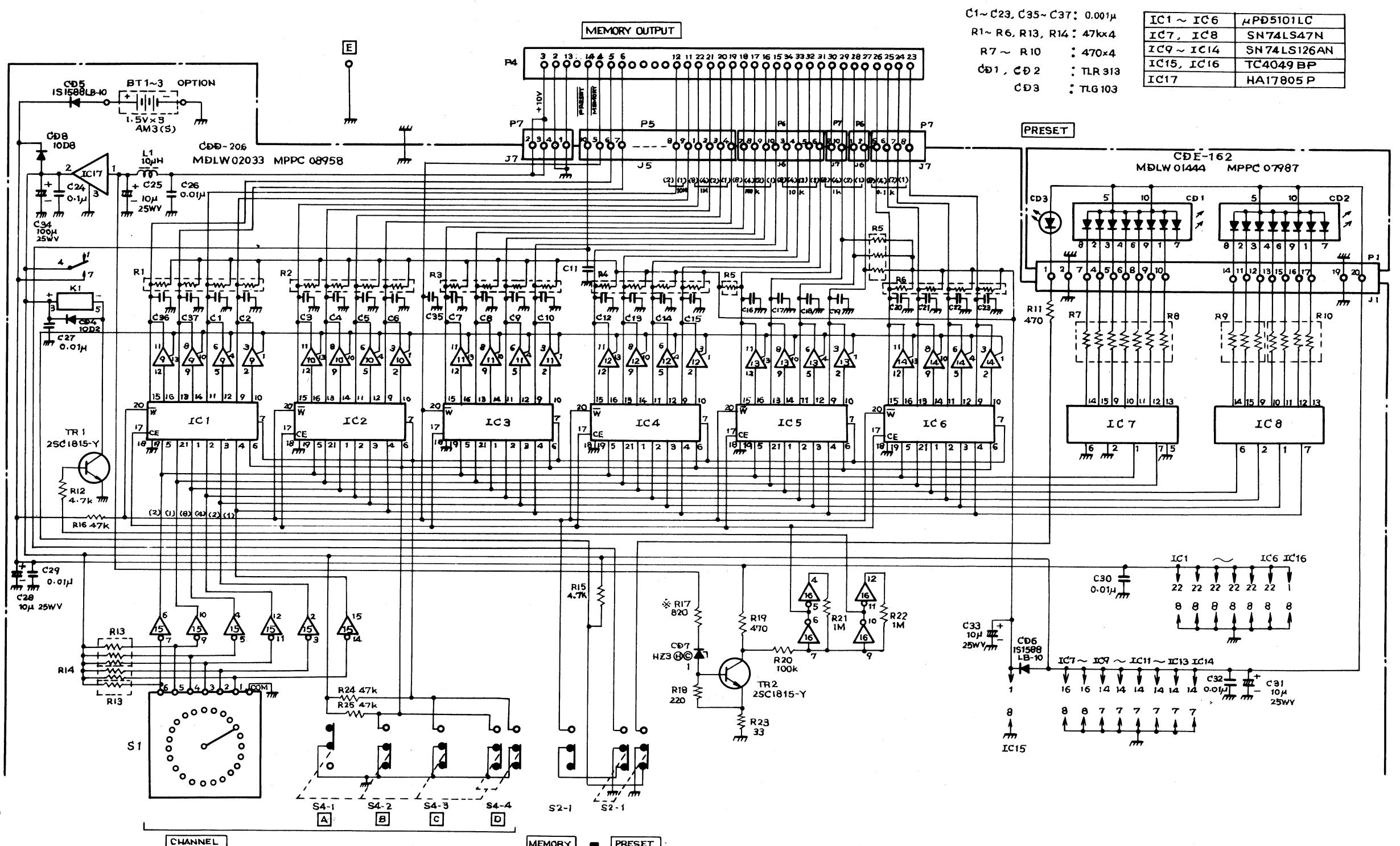


OUTPUT PULSE  
4 uSEC



1-2006 ADDED APROXIMATE R1 & C1 VALUES FOR AN OUTPUT PULSE OF 4 uSEC		
reverse engin. by Albert Westenberg - PA0AWN		
Title CPA-94 main tuning dial encoder JRC NRD515		
Size	Document Number	REV
B	Drawn by Walter Geeraert - PE1ABR	4
Date:	January 6, 2006	Sheet 1 of 1

CPA-94.SCH



C1~C23, C35~C37: 0.001μ  
 R1~R6, R13, R14: 47kx4  
 R7~R10: 470x4  
 CD1, CD2: TLR 313  
 CD3: TLR 103

IC1 ~ IC6	μPD5101LC
IC7, IC8	SN74LS47N
IC9 ~ IC14	SN74LS126AN
IC15, IC16	TC4049BP
IC17	HA17805P

注 1) 特記外の抵抗は全てΩおよび1/4Wを示し容量はpFを示す。  
 2) \*印は調整用部品を示す。  
 NOTES 1. UNLESS OTHERWISE INDICATED RESISTANCES ARE IN OHMS CAPACITANCES ARE IN MICRO-MICRO FRADS.  
 2. \* VALUES SELECTED IN MANUFACTURE.

付図 1  
 NDH-518  
 メモリユニット接続図  
 MEMORY UNIT SCHEMATIC DIAGRAM  
 APPENDIX 1  
 1/1