

REALISTIC[®]

Service Manual

20-148

PRO-2026 100-CHANNEL DIRECT ENTRY PROGRAMMABLE SCANNER

Catalog Number : 20-148

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SPECIFICATIONS

General

| | |
|---------------------------------|---|
| Band Coverage: | 12 Bands plus Weather Channel 100 channels (20 ch x 5 Banks) |
| Frequency Range: | <div> <div> 29.0 MHz - 54.0 MHz 108.0 MHz - 174.0 MHz 406.0 MHz - 512.0 MHz 806.0 MHz - 956.0 MHz </div> <div> 29 to 29.7 MHz (10 Meter Amateur Band) 29.7 to 50 MHz (VHF Low Band) 50 to 54 MHz (6 Meter Amateur Band) 108 to 136.975 MHz (Aircraft Band) 137 to 144 MHz (Military Land Mobile) 144 to 148 MHz (2 Meter Amateur Band) 148 to 174 MHz (VHF High Band) 406 to 420 MHz (Federal Government Land Mobile) 420 to 450 MHz (70-cm Amateur Band) 450 to 470 MHz (UHF Standard Band) 470 to 512 MHz (UHF "T" Band) 806 to 956 MHz (Public Service Except Cellular Band) </div> </div> |
| | Weather Service Channel (162.400 to 162.550 MHz) |
| Display: | LCD (With Back Light) 10 Digits and special Annunciator (Bank 1 ~ 5, Police, FIRE/EMG, AIR, WX, MRN, SCAN, MAN, PGM, MON, L/O, PRI, DLY, SRCH ▲ ▼, P) |
| Keys (PROGRAM): (OPERATION): | Total 1 set 12 keys ("0" to "9", "ENTER", ".") Total 16 keys (Scan, Manual, L/O Decimal/Delay, Limit, Priority, WX, ▲, ▼, Clear, Marine, Police, Fire, EMG, AIR, Program, Monitor) |
| Controls/Switches: | Volume Control, with Power ON/OFF Switch Squelch Control |
| External Jacks: | ANT. Jack (BNC Type) Earphone Jack (3.5 ϕ) |
| Internal Speaker: | 8 ohm, 3W |
| Power Requirements: | 12VDC \pm 10% |
| Operating Temp. : | - 4°F (-20°C) ~ 140°F (60°C) |
| Size: | W : 6-1/4" (160 mm) x H : 1-5/8" (41 mm) x D : 7-3/8" (188 mm) |
| Weight: | 2.2 1b (1 kg) |

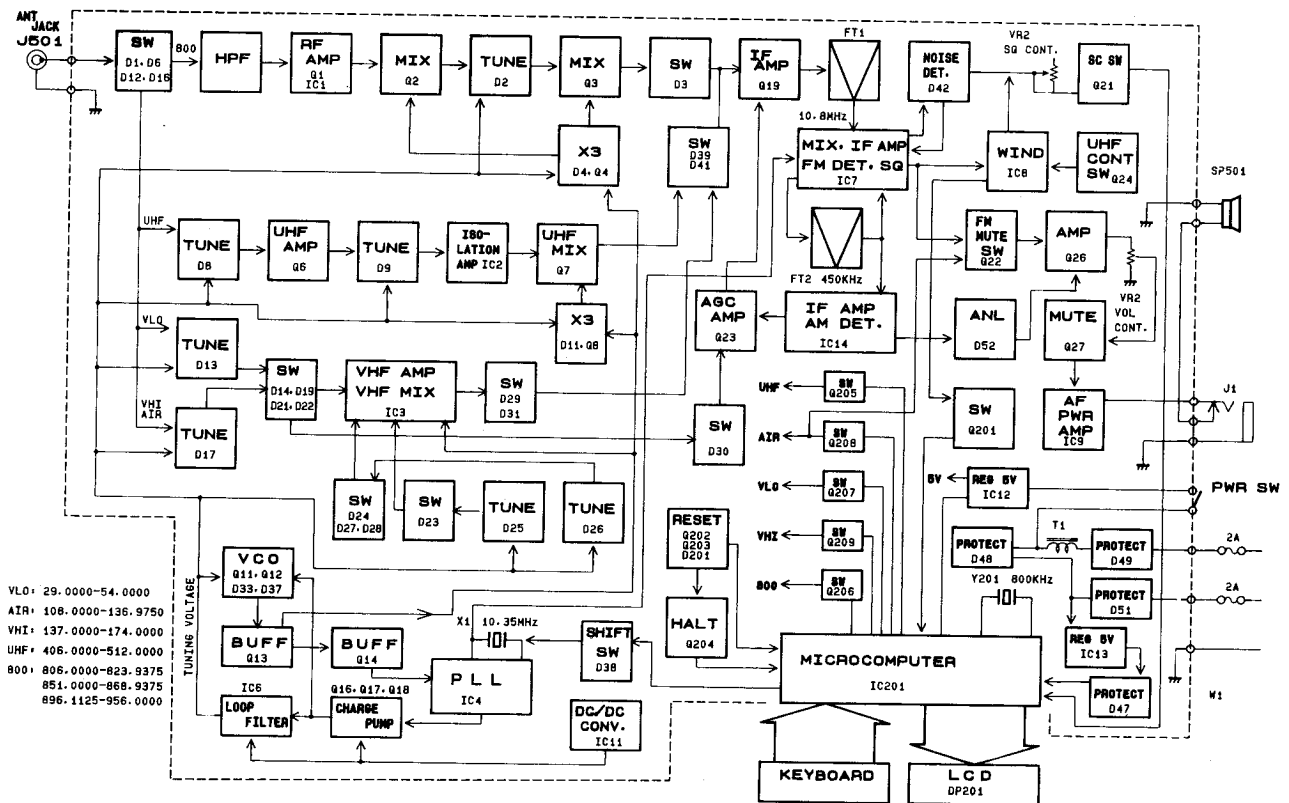
Measurement Conditions

| | |
|-----------------------------|--|
| Power Source: | 12VDC |
| Antenna Impedance: | 50 ohm |
| Test Temperature: | 77°F (25°C) |
| Modulation Frequency: | 1 kHz |
| Deviation: | FM \pm 3 kHz Dev. & AM 60% for Aircraft Band |
| Mean Signal Input Level: | 100 μ V |
| Audio Output Load: | 8 ohm Resistive Load |
| Standard Ref, Audio Output: | 125 mW (1V) |

| Item | | Unit | Nominal | Limit |
|---|------------------|-----------|----------|-------------|
| Sensitivity (12 dB S/N) | | | | |
| VHF Low Band | 30 ~50.0 MHz | μV | 0.5 | 2.0 |
| VHF High Band | 140.0 ~170.0 MHz | μV | 0.7 | 3.0 |
| UHF Band | 410.0 ~510.0 MHz | μV | 0.7 | 4.0 |
| Aircraft | 118.0 ~135.0 MHz | μV | 1.6 | 8.0 |
| Public Service Band | 810.0 ~950.0 MHz | μV | 0.8 | 5.0 |
| Threshold and Tight Squelch (S/N) | | | | |
| VHF Low Band | at 40.0 MHz | μV / dB | 0.4 / 25 | 1.0 / 20 |
| VHF High Band | at 155.0 MHz | μV / dB | 0.5 / 25 | 1.2 / 20 |
| UHF Band | at 460.0 MHz | μV / dB | 0.4 / 25 | 1.8 / 20 |
| Aircraft | at 127.0 MHz | μV / dB | 0.4 / 15 | 2.0 / 10 |
| Public Service Band | at 860.0 MHz | μV / dB | 0.9 / 25 | 3.0 / 20 |
| Signal to Noise | | | | |
| VHF Low Band | at 40.0 MHz | dB | 50 | 35 |
| VHF High Band | at 155.0 MHz | dB | 45 | 30 |
| UHF Band | at 460.0 MHz | dB | 35 | 25 |
| Aircraft | at 127.0 MHz | dB | 45 | 30 |
| Public Service Band | at 860.0 MHz | dB | 33 | 25 |
| Audio Frequency Response -6 dB (at 155.0 MHz) | | | | |
| | Low | Hz | 250 | 150 - 350 |
| | High | Hz | 2200 | 1500 - 3500 |
| Audio Output Power (at 155.0 MHz) | | | | |
| Max. Output Power | | mW | 1100 | 500 |
| 10% THD Output Power | | mW | 970 | 400 |
| Distortion at 155 MHz, 1 mV Input | | % | 1.5 | 6 |
| Modulation Acceptance at EIA RS-204-A | | kHz | ± 12 | ± 5 |
| Selectivity (155 MHz) | | | | |
| -6 dB | | kHz | ± 11 | ± 15 |
| -50 dB | | kHz | ± 15 | ± 20 |
| IF Rejection at 155 MHz | | dB | 60 | 50 |
| Residual Noise (at SQ Open) | | mV | 0.2 | 5 |
| Scan Rate | | CH / Sec. | 14 | 12 |
| Scan Delay | | Sec. | 2 | 1 ~ 3 |
| Current Drain | | | | |
| (at full output) | | mA DC | 420 | 300 - 500 |
| (squelched) | | mA DC | 230 | 300 |
| (keep alive) | | μA DC | 3 | 50 |

Note: Nominal specs represent the design specs. All units should be able to approximate these – some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition that still might be considered acceptable; in no case should a unit fail to meet limit specs.

BLOCK DIAGRAM



ALIGNMENT PROCEDURES

Preparation for Alignment

Change to Test Mode :

Turn on the power switch while pressing and holding 3 buttons - [2], [9], and [L/OUT].

Confirm that test frequencies (Table 1) have been called to each memory channel.

Attention: Incorrect operating sequence or method often results in a display of the error indicator "Error" or an incorrect indication of frequency.

Table 1

| CH | FREQUENCY | CH | FREQUENCY |
|----|--------------|----|--------------|
| 1 | 30.05 MHz | 14 | 66.450 MHz |
| 2 | 40.84 MHz | 15 | 76.825 MHz |
| 3 | 49.90 MHz | 16 | 87.425 MHz |
| 4 | 138.15 MHz | 17 | 157.800 MHz |
| 5 | 162.40 MHz | 18 | 482.3625 MHz |
| 6 | 173.225 MHz | 19 | 29.000 MHz |
| 7 | 406.875 MHz | 20 | 54.000 MHz |
| 8 | 453.25 MHz | 21 | 806.000 MHz |
| 9 | 511.9125 MHz | 22 | 857.200 MHz |
| 10 | 108.500 MHz | 23 | 888.9600 MHz |
| 11 | 118.800 MHz | 24 | 911.500 MHz |
| 12 | 127.175 MHz | 25 | 954.9125 MHz |
| 13 | 135.500 MHz | | |

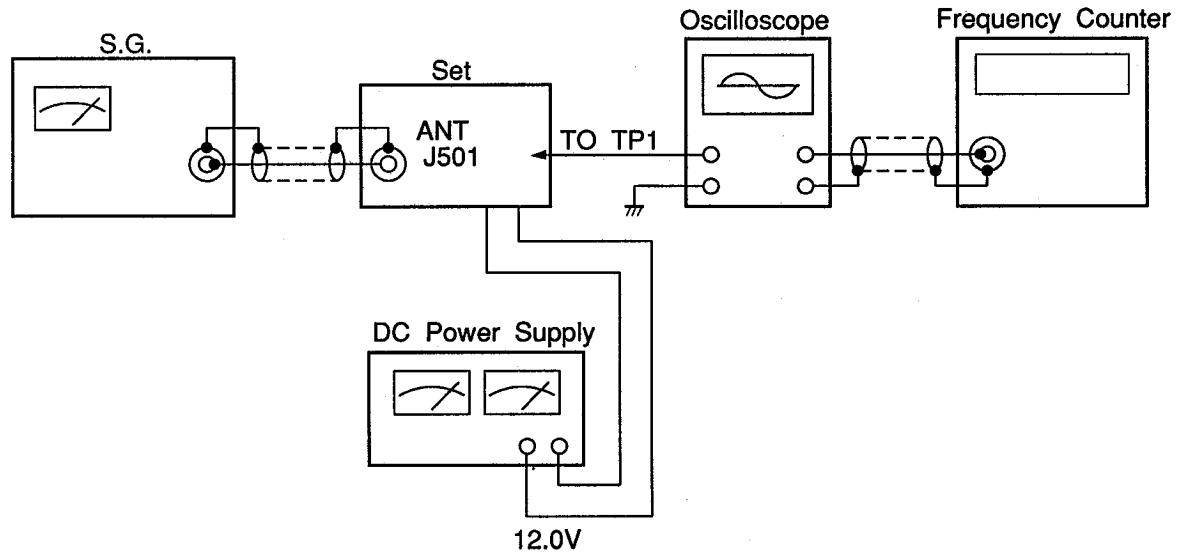
Table 2

| | CH | FREQUENCY | DC VOLTAGE(volts) |
|------------------------|----|--------------|-------------------|
| VHF(Low) Adjust | 1 | 30.05 MHz | 1.2 ± 0.1 |
| Confirm | 2 | 40.84 MHz | 5.4 ± 0.5 |
| Confirm | 3 | 49.9 MHz | 8.6 ± 0.5 |
| Confirm | 4 | 138.15 MHz | 3.6 ± 0.5 |
| Confirm | 5 | 162.4 MHz | 9.2 ± 0.5 |
| Confirm | 6 | 173.225 MHz | 11.2 ± 0.5 |
| Confirm | 7 | 406.875 MHz | 4.9 ± 0.5 |
| Confirm | 8 | 453.25 MHz | 8.5 ± 0.5 |
| VHF (High) /UHF Adjust | 9 | 511.9125 MHz | 12.5 ± 0.1 |

Alignment of PLL

Test Equipment Required and Connections

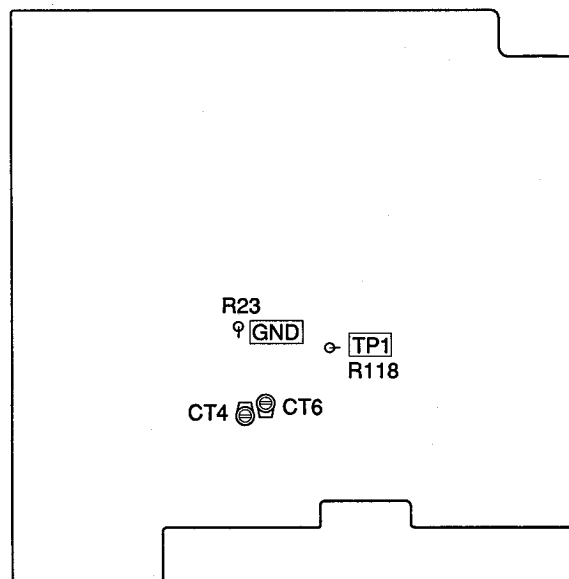
- DC Power Supply : 12.0 V
- Signal Generator : S. G.
- Oscilloscope
- Frequency Counter



Alignment Procedure

| Step | Preset to | Adjustment | Remarks |
|------|-----------|--------------|---|
| 1 | CH : 24 | CT4 | <ul style="list-style-type: none"> • PLL adjustment. • Connect oscilloscope and frequency counter to TP1 (R118). • Adjust CT4 to $10.350000 \pm 0.00001\text{MHz}$. |
| 2 | CH : 25 | CT6 | <ul style="list-style-type: none"> • Adjust CT6 to $10.349850 \pm 0.00001\text{MHz}$. |
| 3 | CH : 25 | No Alignment | <ul style="list-style-type: none"> • Connect oscilloscope to TP1. Check to see if the waveform makes a sinusoidal wave and the peak to peak voltage is $450 \pm 100\text{mV}$. |

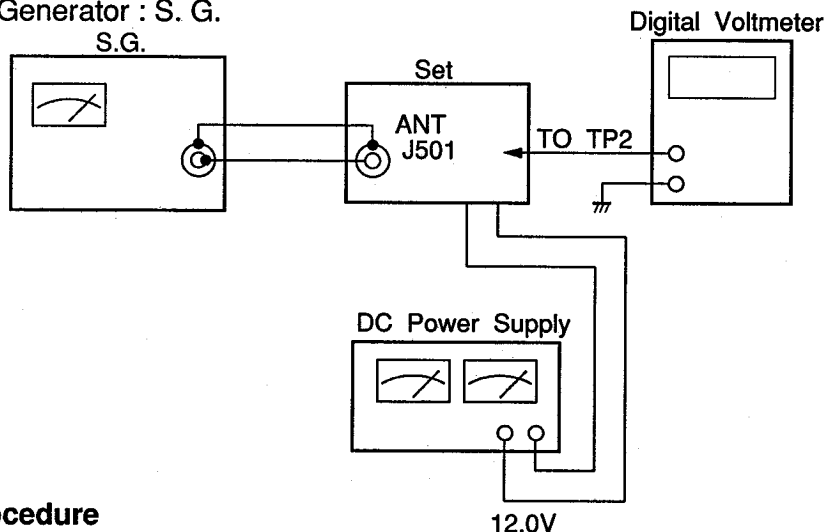
Alignment Point Locations (PLL and Main PCB)



Alignment of VCO

Test Equipment Required and Connections

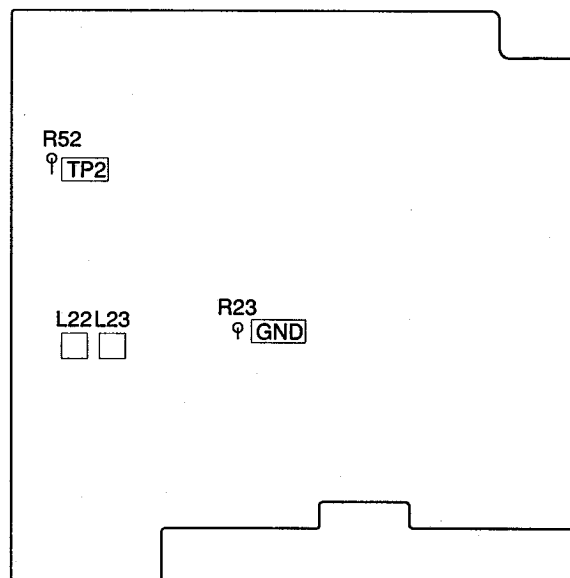
- DC Power Supply : 12.0 V
- Digital Voltmeter
- Signal Generator : S. G.



Alignment Procedure

| Step | Preset to | Adjustment | Remarks |
|------|--------------|--------------|--|
| 1 | CH : 9 | L23 | <ul style="list-style-type: none"> • Connect SG to ANT terminal. • Connect oscilloscope or DC voltmeter to TP2 (R52). • Adjust L23 to $12.5 \pm 0.1V$. |
| 2 | CH : 7, 8 | No Alignment | <ul style="list-style-type: none"> • Check if VCO is at each channel voltage. (Refer to Table 2.) |
| 3 | CH : 4, 5, 6 | No Alignment | <ul style="list-style-type: none"> • Check if VCO is at each channel voltage. (Refer to Table 2.) |
| 4 | CH : 1 | L22 | <ul style="list-style-type: none"> • Adjust L22 to 1.2V at TP2. |
| 5 | CH : 2, 3 | No Alignment | <ul style="list-style-type: none"> • Check if VCO is at each channel voltage. (Refer to Table 2.) |

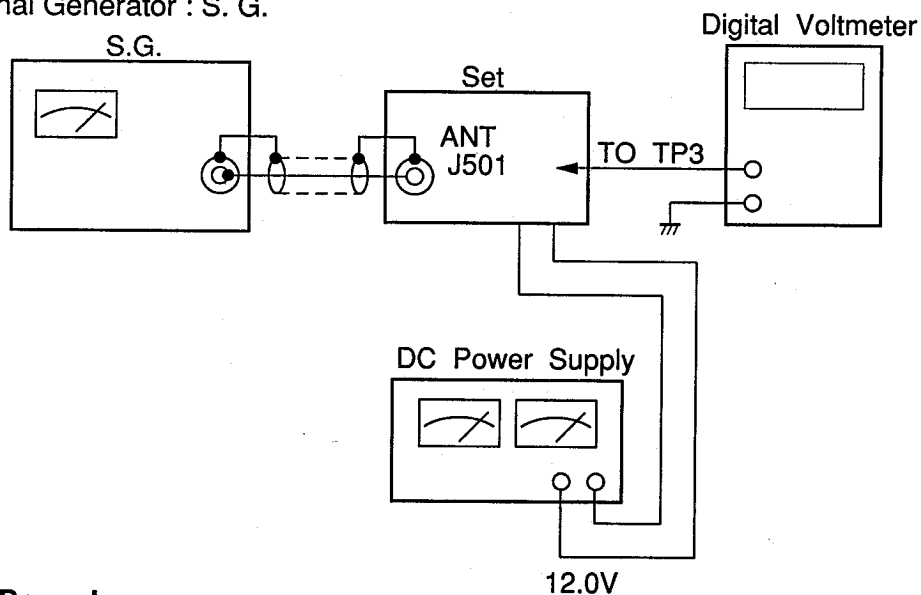
Alignment Point Locations (PLL and Main PCB)



Alignment of Discriminator

Test Equipment Required and Connections

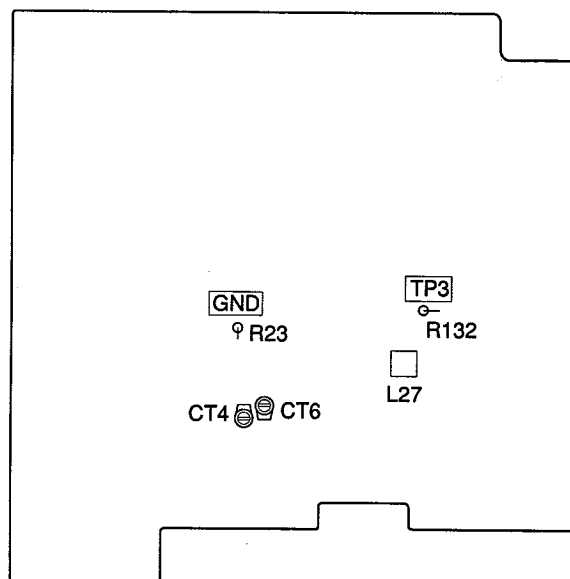
- DC Power Supply : 12.0 V
- Digital Voltmeter
- Signal Generator : S. G.



Alignment Procedure

| Step | Preset to | Adjustment | Remarks |
|------|--|------------|---|
| 1 | CH : 2 SG : 40.84MHz 1mV No Mod. | L27 | <ul style="list-style-type: none"> • Connect SSG to ANT. terminal. • Connect digital voltmeter to TP3 (R132). • Adjust L27 to $2.0 \pm 0.05V$ (DC). |
| 2 | CH : 24 SG : 911.5MHz 1mV No Mod. | CT4 | <ul style="list-style-type: none"> • Adjust CT4 slightly to $2.0 \pm 0.05V$ (DC) on voltage of TP3. |
| 3 | CH : 25 SG : 954.9125MHz 1mV No Mod. | CT6 | <ul style="list-style-type: none"> • Adjust CT6 slightly to $2.0 \pm 0.05V$ (DC) on voltage of TP3. |

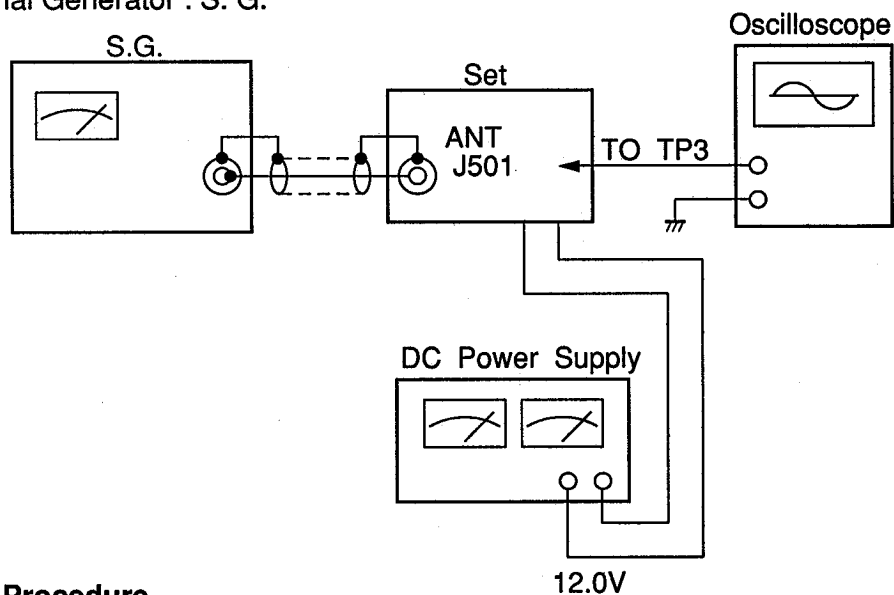
Alignment Point Locations (Main PCB)



Alignment of IF

Test Equipment Required and Connections

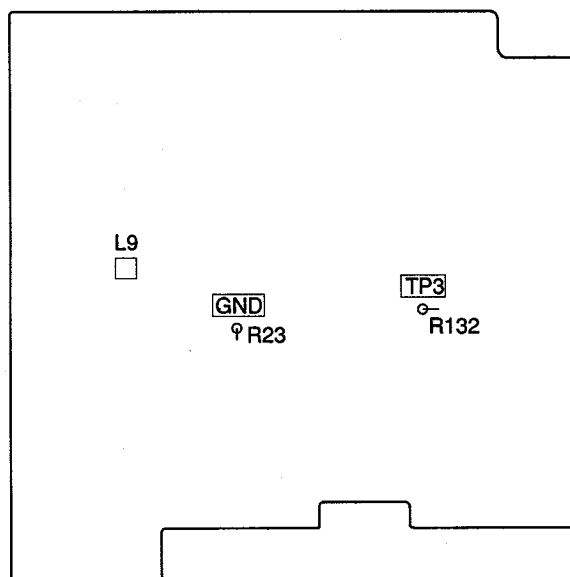
- DC Power Supply : 12.0 V
- Oscilloscope
- Signal Generator : S. G.



Alignment Procedure

| Step | Preset to | Adjustment | Remarks |
|------|-----------------------------------|------------|---|
| | CH : 12 SG : 127.175MHz 2uV | L9 | • Adjust L9 to AF output maximum reading on oscilloscope. |

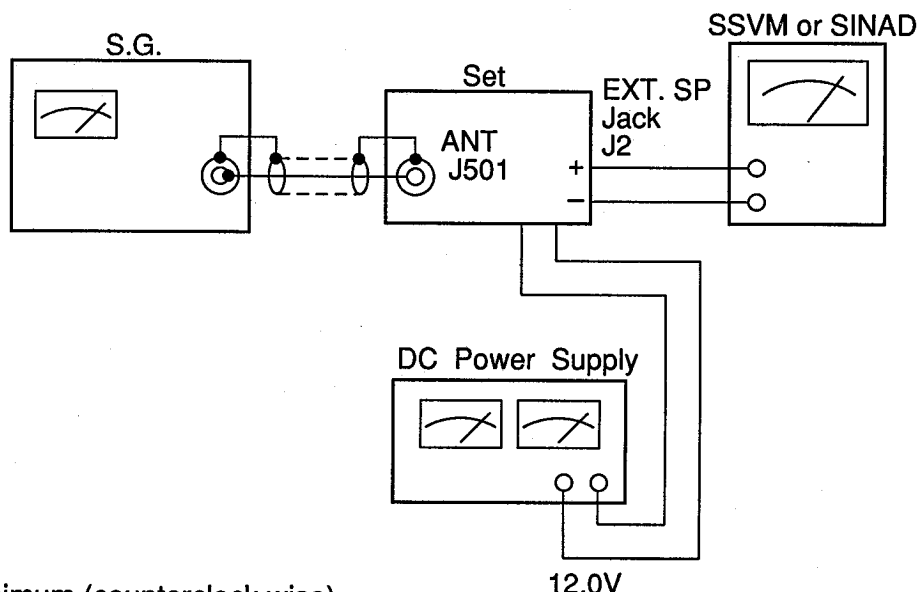
Alignment Point Locations (Main PCB)



Alignment of Receiving

Test Equipment Required and Connections

- DC Power Supply : 12.0 V
- SSVM
- Signal Generator : S. G.
- SINAD



PRESET: SQUELCH Minimum (counterclock wise)
 SIGNAL FM : 1 kHz, ± 3 kHz deviation
 AM : 1 kHz, 60% modulation
 Audio Output Level : 125 mW
 (1V across 8Ω resistor)

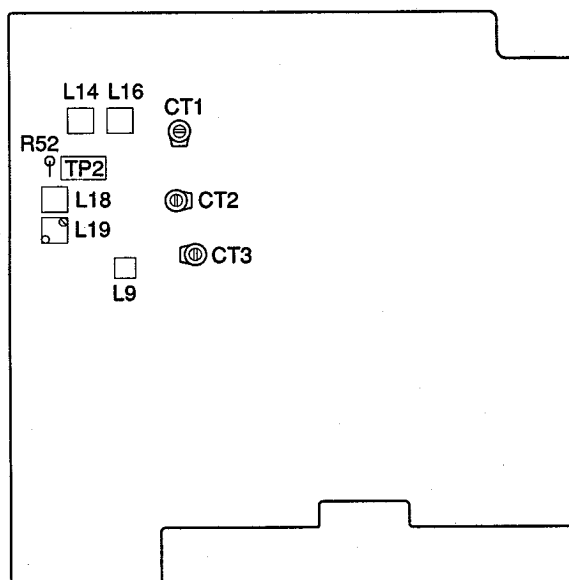
Connect SSG to ANT. terminal.

Alignment Procedure

| Step | Preset to | Adjustment | Remarks |
|------|---|----------------|---|
| 1 | CH : 5 SG : 162.4MHz 0.4 μ V, FM | Volume Control | <ul style="list-style-type: none"> Connect SSVM to audio output terminal. Adjust volume control to 125mW (1V across 8Ω resistor). |
| 2 | CH : 5 SG : 162.4MHz 0.4 μ V, FM | L16, L19 | <ul style="list-style-type: none"> Connect SINAD meter to audio output terminal. Adjust coils to the best SINAD. Then adjust SSG to 12dB SINAD level and check if the output voltage of SSG is less than 0.8μV. |
| 3 | CH : 2 SG : 40.84MHz 0.3 μ V, FM | L14, L18 | <ul style="list-style-type: none"> Connect SINAD meter to audio output terminal. Adjust coils to the best SINAD. Then adjust SSG to 12dB SINAD level and check if the output voltage of SSG is less than 0.8μV. |
| 4 | CH : 8 SG : 453.25MHz 0.6 μ V, FM | CT1, CT2, CT3 | <ul style="list-style-type: none"> Same as step 2. Adjust CT1, CT2, CT3, to the best SINAD. |

| Step | Preset to | Adjustment | Remarks |
|------|--|--------------|--|
| 5 | CH : 7, 9 SG : 406.875MHz 511.9125MHz 0.6μV, FM | CT3 | • Adjust CT3 to equal SINAD for CH7 and CH8. |
| 6 | CH : 7, 8, 9 SG : FM | No Alignment | • Confirm that 12dB SINAD sensitivity is less than 1.0μV for each channel. |
| 7 | CH : 21, 23, 25 SG : FM | No Alignment | • Confirm that 12dB SINAD sensitivity is less than 1.0μV for each channel. |
| 8 | CH : 10, 11, 12, 13 SG : AM | No Alignment | Aircraft • Confirm that 12dB SINAD sensitivity is less than 1.6μV for each channel. |

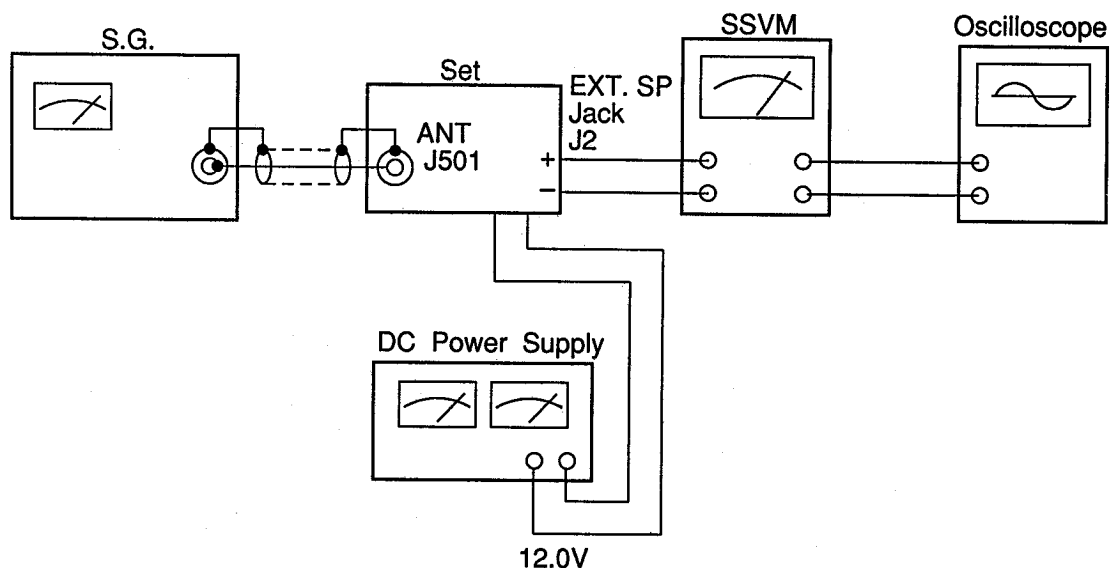
Alignment Point Locations



Alignment of Squelch

Test Equipment Required and Connections

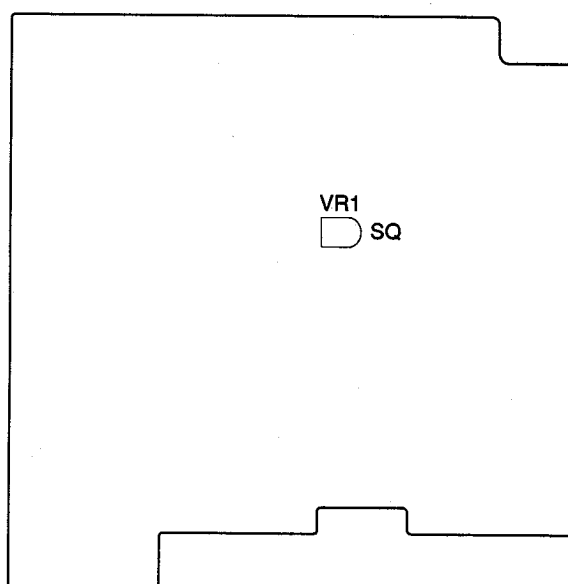
- DC Power Supply : 12.0 V
- Signal Generator : S. G.
- SSVM
- Oscilloscope



Alignment Procedure

| Step | Preset to | Adjustment | Remarks |
|------|---|------------|--|
| | CH : 2 SG : 40.84MHz S / N 27~29 dB (TYP 0.8μV) Sq : CW (Max) | VR1 | <ul style="list-style-type: none"> • Turn VR1 fully counterclock wise. • Adjust VR1 to the point where audio output voltage will appear. |

Alignment Point Locations (Main PCB)



TROUBLESHOOTING

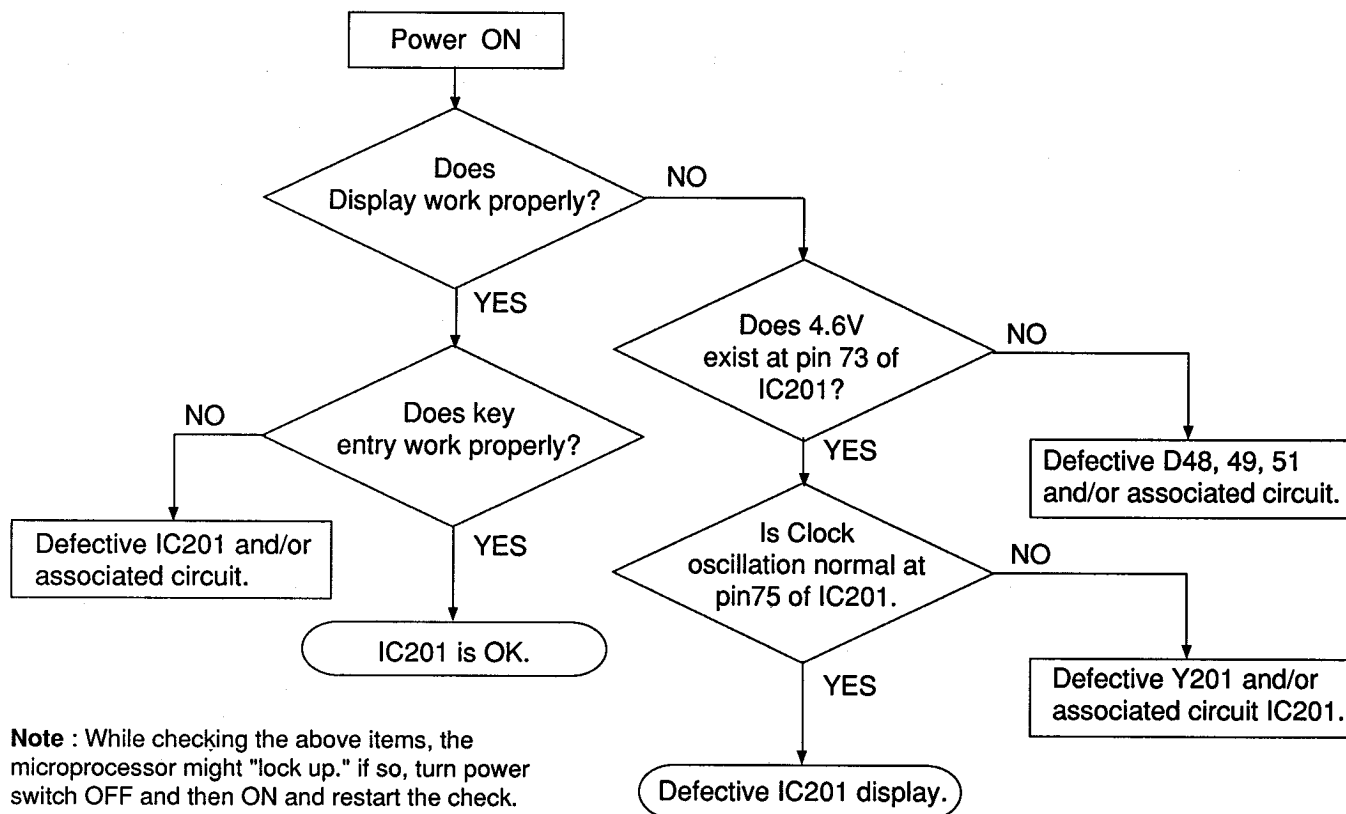
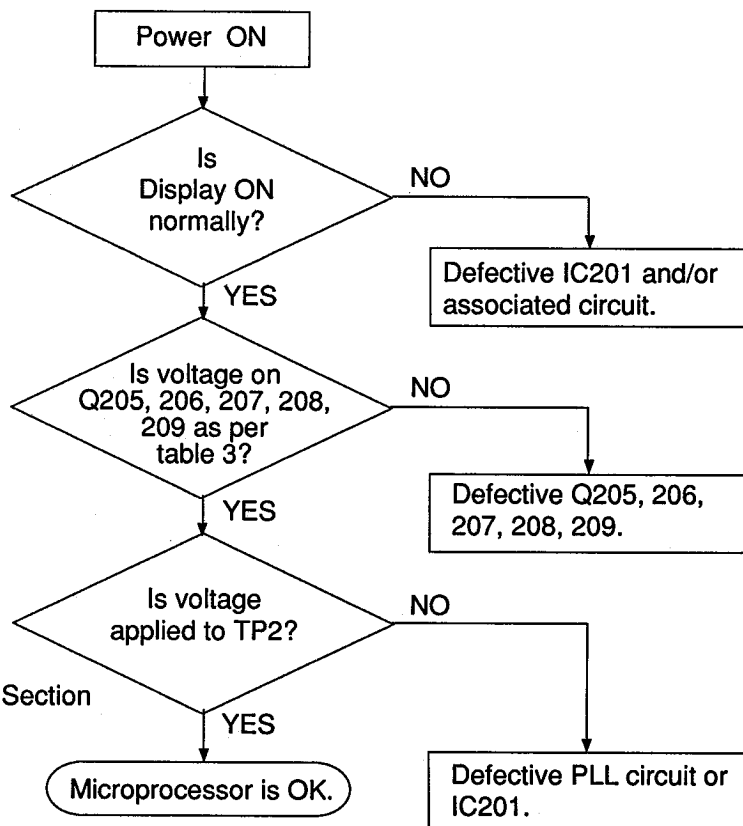
Reception Check

Table 3

| Collector voltage Freq. BAND | Q207 | Q209 | Q205 | Q208 | Q206 |
|---------------------------------------|------|------|------|------|------|
| VLO | 1 | 0 | 0 | 0 | 0 |
| VHI | 0 | 1 | 0 | 0 | 0 |
| UHF | 0 | 0 | 1 | 0 | 0 |
| AIR | 0 | 0 | 0 | 1 | 0 |
| 800 | 0 | 0 | 0 | 0 | 1 |

Note : 1 = 4.8V
0 = 0V

See VCO Alignment Section
(Page 6)

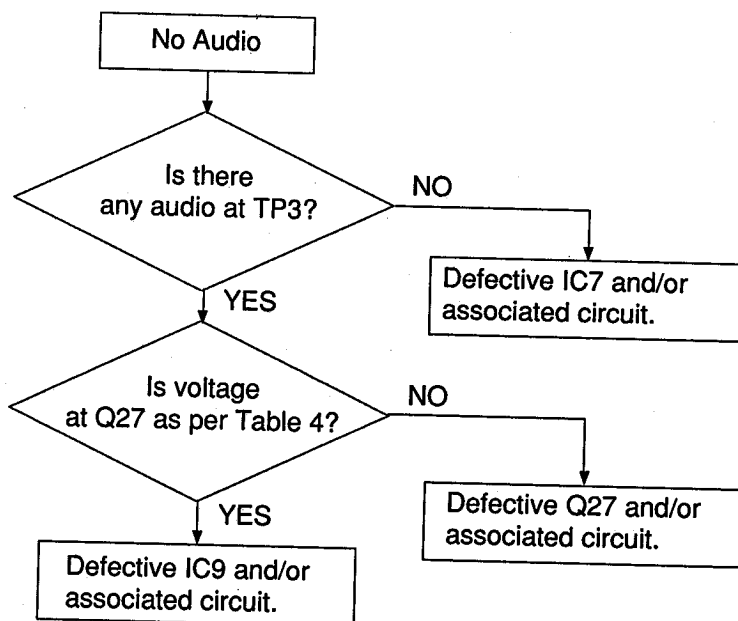


Note : While checking the above items, the microprocessor might "lock up." if so, turn power switch OFF and then ON and restart the check.

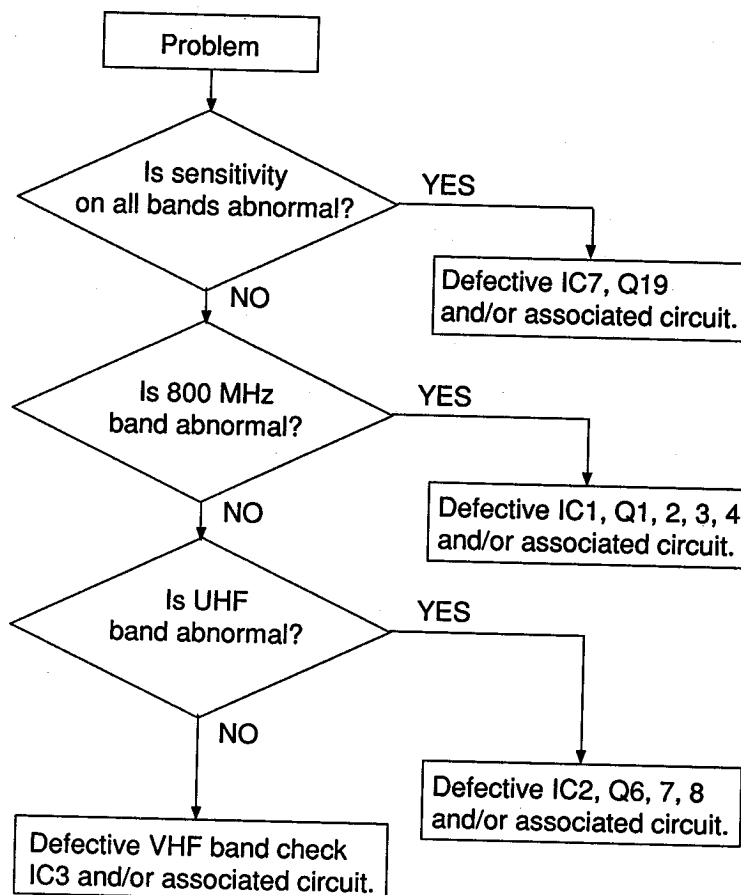
Audio Section

Table 4

| Squelch Condition | Base Voltage |
|-------------------|--------------|
| | Q27 |
| Open | 0 |
| Close | 4.5 |

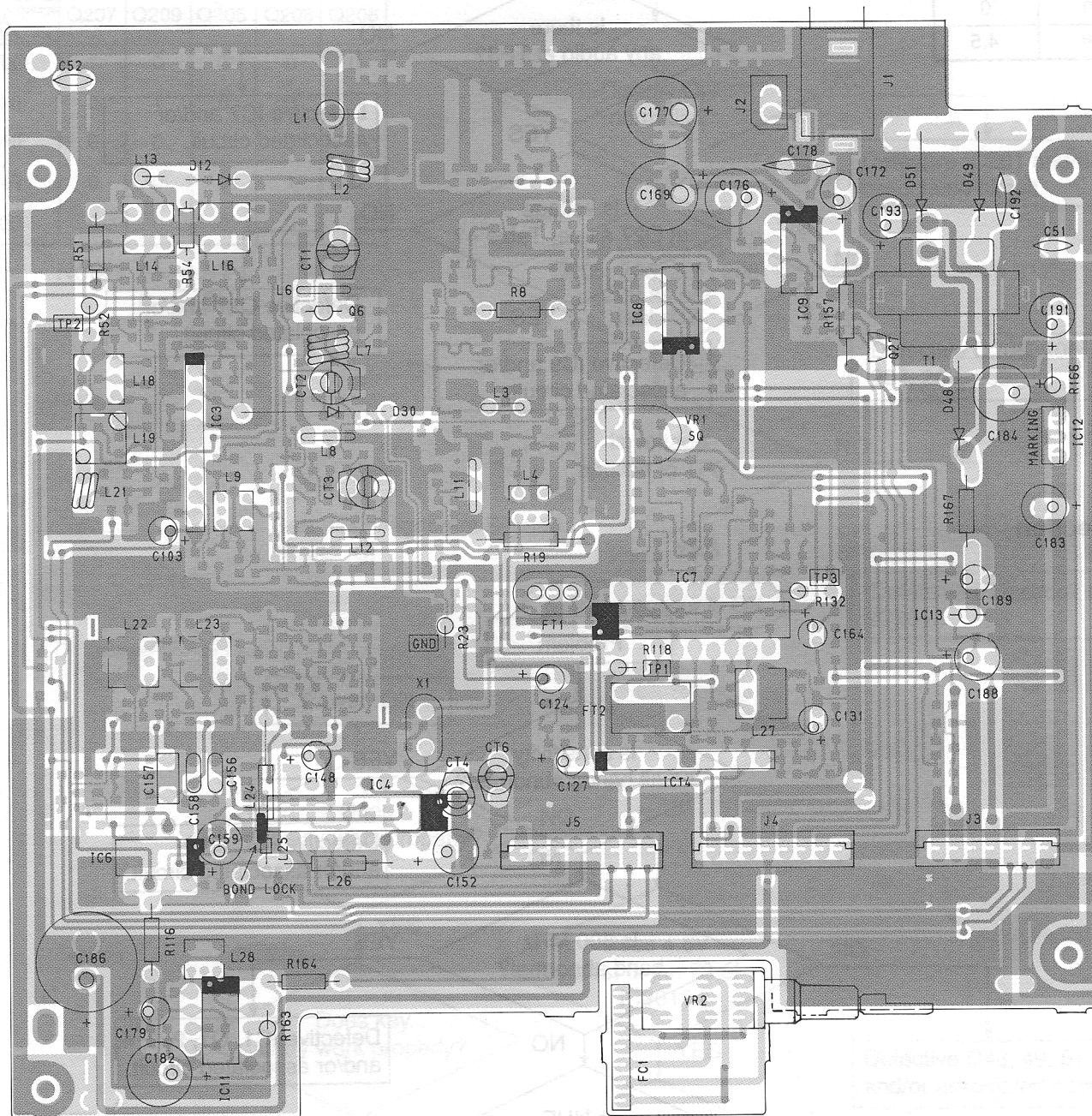


RF Section



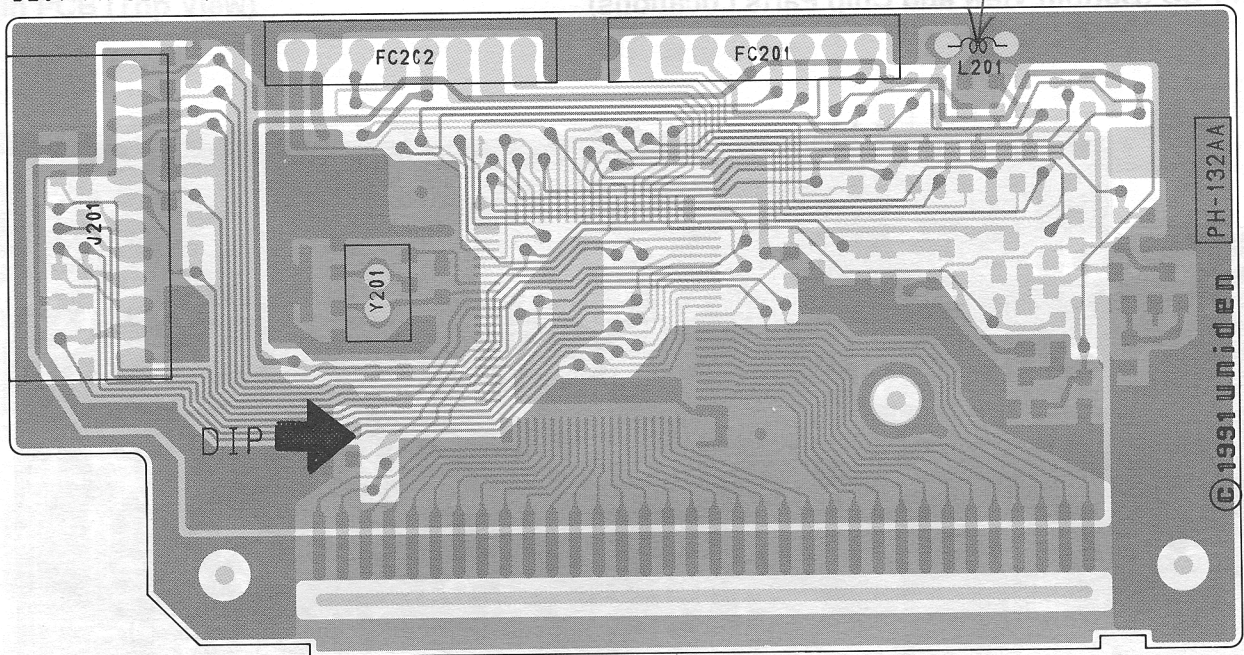
PRINTED CIRCUIT BOARDS

Main PCB (Top View)

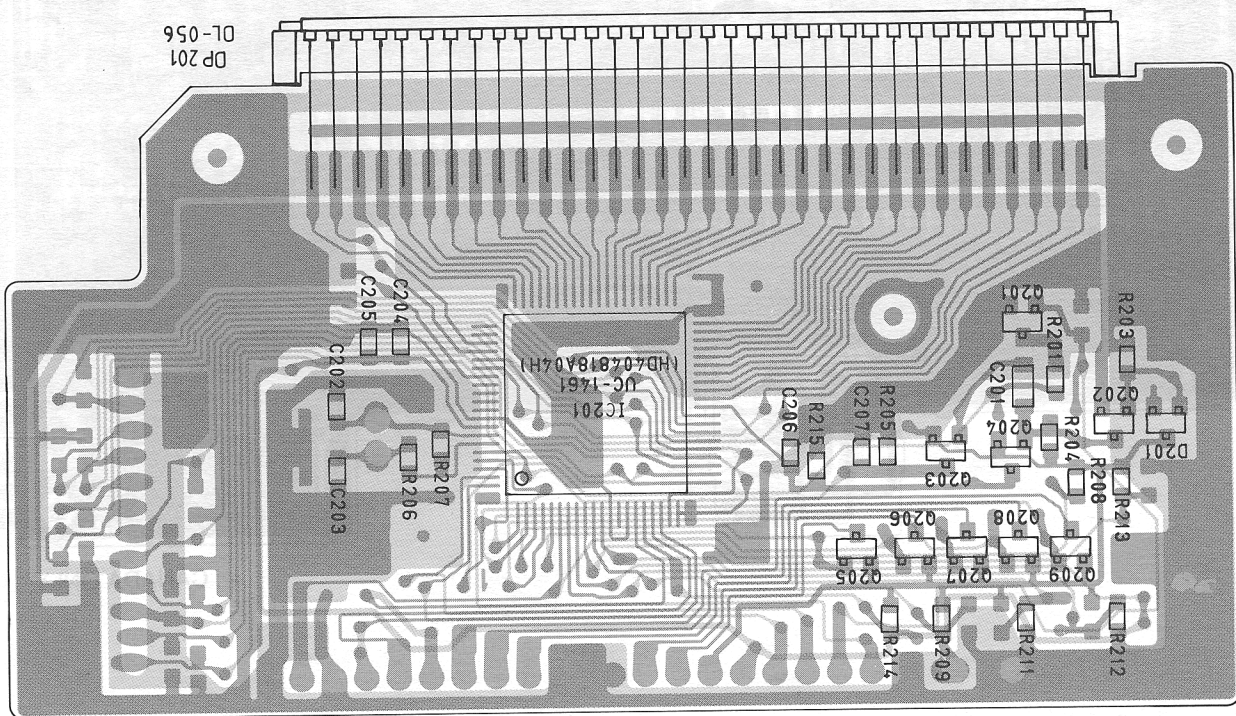


Control PCB (Top)

B201 PH132AA (TOP VIEW)

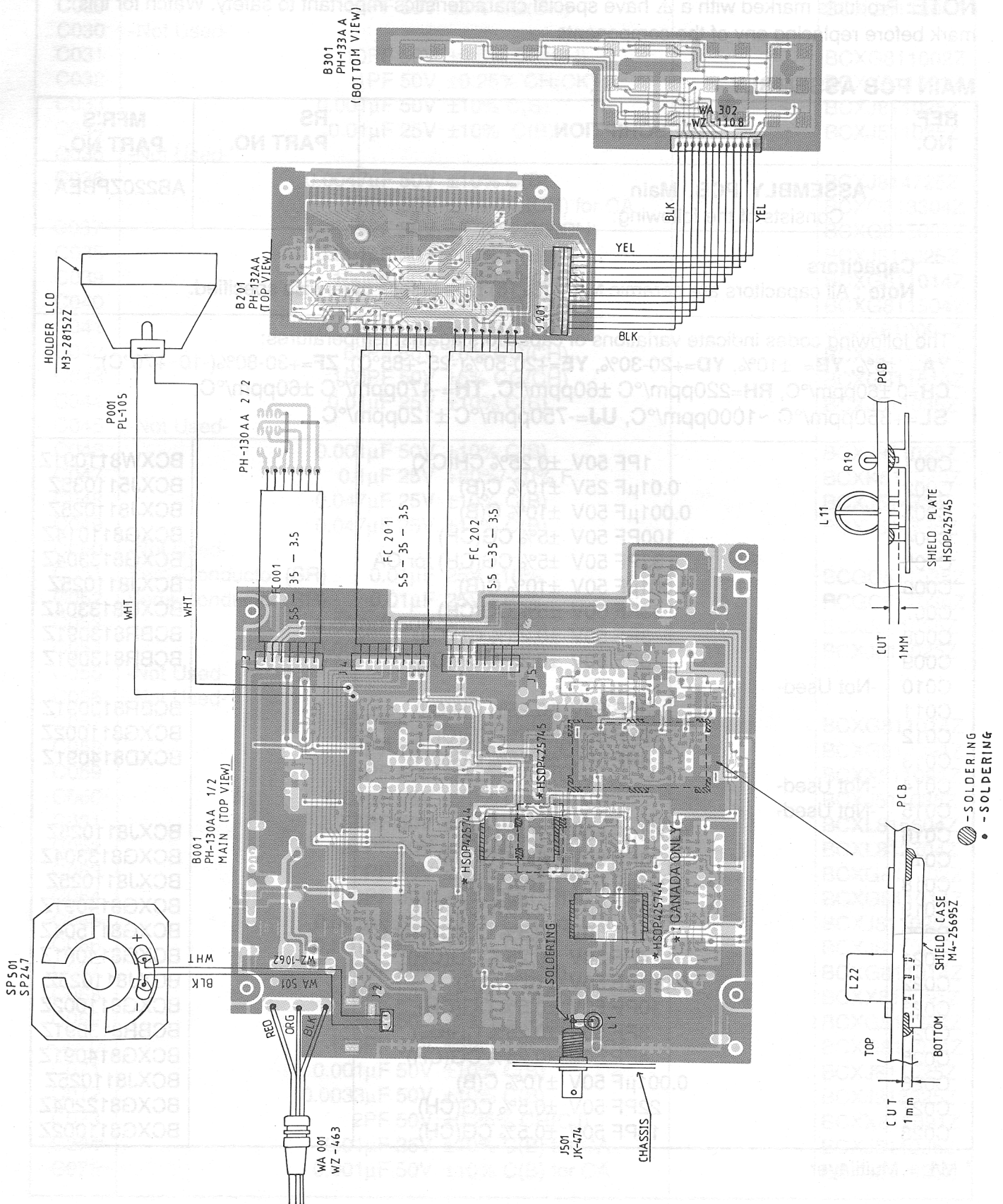


Control PCB (Bottom)



B201 PH-132AA (BOTTOM VIEW)

WIRING DIAGRAM



ELECTRICAL PARTS LIST

NOTE: Products marked with a Δ have special characteristics important to safety. Watch for this mark before replacing any of the components.

MAIN PCB ASSEMBLY

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|---|--|-------------|----------------|
| | ASSEMBLY, PCB, Main Consists of the following: | | AB220ZPBEA |
| Capacitors Note : All capacitors are ceramic M/L * (3216) type unless otherwise specified. | | | |
| The following codes indicate variations of capacitors against temperatures: YA= $\pm 5\%$, YB= $\pm 10\%$, YD= $+20-30\%$, YE= $+20-50\%(-25\sim+85^{\circ}\text{C})$, ZF= $+30-80\%(-10\sim+70^{\circ}\text{C})$, CH= $0 \pm 60\text{ppm}/^{\circ}\text{C}$, RH= $220\text{ppm}/^{\circ}\text{C} \pm 60\text{ppm}/^{\circ}\text{C}$, TH= $-470\text{ppm}/^{\circ}\text{C} \pm 60\text{ppm}/^{\circ}\text{C}$, SL= $+350\text{ppm}/^{\circ}\text{C} \sim 1000\text{ppm}/^{\circ}\text{C}$, UJ= $-750\text{ppm}/^{\circ}\text{C} \pm 120\text{ppm}/^{\circ}\text{C}$ | | | |
| C001 | 1PF 50V $\pm 0.25\%$ CH(CK) | | BCXW811091Z |
| C002 | 0.01 μ F 25V $\pm 10\%$ C(B) | | BCXJ511035Z |
| C003 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C004 | 100PF 50V $\pm 5\%$ CG(CH) | | BCXG811014Z |
| C005 | 33PF 50V $\pm 5\%$ CG(CH) for CA | | BCXG813304Z |
| C006 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C007 | 33PF 50V $\pm 5\%$ CG(CH) | | BCXG813304Z |
| C008 | 3PF 50V $\pm 0.25\%$ CH(CJ) | | BCBR813091Z |
| C009 | 3PF 50V $\pm 0.25\%$ CH(CJ) | | BCBR813091Z |
| C010 | -Not Used- | | |
| C011 | 3PF 50V $\pm 0.25\%$ CH(CJ) | | BCBR813091Z |
| C012 | 10PF 50V $\pm 0.5\%$ CG(CH) | | BCXG811002Z |
| C013 | 4PF 50V $\pm 0.25\%$ CG(CH) | | BCXD814091Z |
| C014 | -Not Used- | | |
| C015 | -Not Used- | | |
| C016 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C017 | 33PF 50V $\pm 5\%$ CG(CH) | | BCXG813304Z |
| C018 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C019 | 4PF 50V $\pm 0.25\%$ CG(CH) | | BCXG814091Z |
| C020 | 15PF 50V $\pm 0.5\%$ CG(CH) for CA | | BCXG811504Z |
| C021 | 4PF 50V $\pm 0.25\%$ CG(CH) | | BCXG814091Z |
| C022 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C023 | 10PF 50V $\pm 0.5\%$ CG(CH) | | BCXG811002Z |
| C024 | 3PF 50V $\pm 0.25\%$ CH(CJ) | | BCBR813091Z |
| C025 | 4PF 50V $\pm 0.25\%$ CG(CH) | | BCXG814091Z |
| C026 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C027 | 22PF 50V $\pm 0.5\%$ CG(CH) | | BCXG812204Z |
| C028 | 10PF 50V $\pm 0.5\%$ CG(CH) | | BCXG811002Z |

* M/L = Multilayer.

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|-----------------|---|----------------|-------------------|
| C029 | 18PF 50V $\pm 5\%$ CG(CH) | | BCXG811804Z |
| C030 | -Not Used- | | |
| C031 | 10PF 50V $\pm 0.5\%$ CG(CH) | | BCXG811002Z |
| C032 | 1PF 50V $\pm 0.25\%$ CH(CK) | | BCXX811091Z |
| C033 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C034 | 0.01 μ F 25V $\pm 10\%$ C(B) | | BCXJ511035Z |
| C035 | -Not Used- | | |
| C036 | 0.0047 μ F 50V $\pm 10\%$ C(B) | | BCXJ814725Z |
| | 33PF 50V $\pm 5\%$ CG(CH) for CA | | BCXG813304Z |
| C037 | 5PF 50V $\pm 0.25\%$ CG(CH) | | BCXG815091Z |
| C038 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C039 | 100PF 50V $\pm 5\%$ CG(CH) | | BCXG811014Z |
| C040 | 15PF 50V $\pm 5\%$ CG(CH) | | BCXG811504Z |
| C041 | 2PF 50V $\pm 0.25\%$ CH(CJ) | | BCXX812091Z |
| C042 | 68PF 50V $\pm 5\%$ CG(CH) | | BCXG816804Z |
| C043 | 150PF 50V $\pm 5\%$ CG(CH) | | BCXG811514Z |
| C044 | 0.01 μ F 25V $\pm 10\%$ C(B) | | BCXJ511035Z |
| C045 | -Not Used- | | |
| C046 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C047 | 0.1 μ F 25V $+80\%/-20\%$ F | | BCXK511040Z |
| C048 | 0.047 μ F 25V $\pm 10\%$ C(B) | | BCXJ514735Z |
| C049 | 0.047 μ F 25V $\pm 10\%$ C(B) | | BCXJ514735Z |
| C050 | -Not Used- | | |
| C051 | Semi-Conductor (SR) 0.01 μ F 25V $\pm 10\%$ | | BCGC511035Z |
| C052 | Semi-Conductor (SR) 0.01 μ F 25V $\pm 10\%$ | | BCGC511035Z |
| C053 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C054 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C055 | -Not Used- | | |
| C056 | -Not Used- | | |
| C057 | 100PF 50V $\pm 5\%$ CG(CH) | | BCXG811014Z |
| C058 | 4PF 50V $\pm 0.25\%$ CG(CH) | | BCXG814091Z |
| C059 | 1PF 50V $\pm 0.25\%$ CH(CK) | | BCXX811091Z |
| C060 | 0.01 μ F 25V $\pm 10\%$ C(B) for CA | | BCXJ511035Z |
| C061 | 56PF 50V $\pm 5\%$ UJ | | BCXL815604Z |
| C062 | 27PF 50V $\pm 5\%$ UJ | | BCXL812704Z |
| C063 | 10PF 50V $\pm 0.5\%$ CG(CH) | | BCXG811002Z |
| C064 | 100PF 50V $\pm 5\%$ CG(CH) | | BCXG811014Z |
| C065 | 0.001 μ F 50V $\pm 10\%$ C(B) for CA | | BCXJ811025Z |
| C066 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C067 | 100PF 50V $\pm 5\%$ CG(CH) | | BCXG811014Z |
| C068 | 2PF 50V $\pm 0.25\%$ CH(CJ) | | BCXX812091Z |
| C069 | 33PF 50V $\pm 5\%$ CG(CH) | | BCXG813304Z |
| C070 | 100PF 50V $\pm 5\%$ CG(CH) for CA | | BCXG811014Z |
| C071 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C072 | 0.0033 μ F 50V $\pm 10\%$ C(B) | | BCXJ813325Z |
| C073 | 2PF 50V $\pm 0.25\%$ CH(CJ) | | BCXX812091Z |
| C074 | 0.01 μ F 25V $\pm 10\%$ C(B) for CA | | BCXJ511035Z |
| C075 | 0.001 μ F 50V $\pm 10\%$ C(B) for CA | | BCXJ811025Z |

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|-----------------|--|----------------|-------------------|
| C076 | 47PF 50V $\pm 5\%$ UJ | | BCXL814704Z |
| C077 | 10PF 50V $\pm 0.5\%$ CG(CH) | | BCXG811002Z |
| C078 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C079 | 100PF 50V $\pm 5\%$ CG(CH) | | BCXG811014Z |
| C080 | 100PF 50V $\pm 5\%$ CG(CH) for CA | | BCXG811014Z |
| C081 | 27PF 50V $\pm 5\%$ CG(CH) | | BCXG812704Z |
| C082 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C083 | 33PF 50V $\pm 5\%$ CG(CH) | | BCXG813304Z |
| C084 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C085 | 0.01 μ F 25V $\pm 10\%$ C(B) for CA | | BCXJ511035Z |
| C086 | 0.01 μ F 25V $\pm 10\%$ C(B) | | BCXJ511035Z |
| C087 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C088 | 9PF 50V $\pm 0.5\%$ CG(CH) | | BCXG819092Z |
| C089 | 27PF 50V $\pm 5\%$ CG(CH) | | BCXG812704Z |
| C090 | 0.001 μ F 50V $\pm 10\%$ C(B) for CA | | BCXJ811025Z |
| C091 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C092 | 15PF 50V $\pm 5\%$ CG(CH) | | BCXG811504Z |
| C093 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C094 | 0.01 μ F 25V $\pm 10\%$ C(B) | | BCXJ511035Z |
| C095 | 33PF 50V $\pm 5\%$ CG(CH) for CA | | BCXG813304Z |
| C096 | 330PF 50V $\pm 5\%$ CG(CH) | | BCXG813314Z |
| C097 | 39PF 50V $\pm 5\%$ CG(CH) | | BCXG813904Z |
| C098 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C099 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C100 | 33PF 50V $\pm 5\%$ CG(CH) for CA | | BCXG813304Z |
| C101 | 470PF 50V $\pm 5\%$ CG(CH) | | BCXG814714Z |
| | 10PF 50V $\pm 0.5\%$ CG(CH) for CA | | BCXG811002Z |
| C102 | 0.01 μ F 25V $\pm 10\%$ C(B) | | BCXJ511035Z |
| C103 | Electrolytic 4.7 μ F 50V $\pm 20\%$ C-130 | | BCAP814796Z |
| C104 | Tantalum Chip Tape 0.22 μ F 35V $\pm 20\%$ A C-227 | | BCPP662286Z |
| C105 | 33PF 50V $\pm 5\%$ CG(CH) for CA | | BCXG813304Z |
| C106 | 470PF 50V $\pm 5\%$ CG(CH) | | BCXG814714Z |
| C107 | 470PF 50V $\pm 5\%$ CG(CH) | | BCXG814714Z |
| C108 | 0.0047 μ F 50V $\pm 10\%$ C(B) | | BCXJ814725Z |
| C109 | 0.0012 μ F 50V $\pm 10\%$ C(B) | | BCXJ811225Z |
| C110 | 33PF 50V $\pm 5\%$ CG(CH) for CA | | BCXG813304Z |
| C111 | 0.022 μ F 50V $\pm 10\%$ C(B) | | BCXJ812235Z |
| C112 | Tantalum Chip Tape 0.1 μ F 35V $\pm 20\%$ A C-227 | | BCPP661086Z |
| C113 | 0.01 μ F 25V $\pm 10\%$ C(B) | | BCXJ511035Z |
| C114 | 0.1 μ F 25V $+80\%/-20\%$ F | | BCXK511040Z |
| C115 | 33PF 50V $\pm 5\%$ CG(CH) for CA | | BCXG813304Z |
| C116 | 27PF 50V $\pm 5\%$ CG(CH) | | BCXG812704Z |
| C117 | 220PF 50V $\pm 5\%$ CG(CH) | | BCXG812214Z |
| C118 | 0.047 μ F 25V $\pm 10\%$ C(B) | | BCXJ514735Z |
| C119 | 0.047 μ F 25V $\pm 10\%$ C(B) | | BCXJ514735Z |
| C120 | -Not Used- | | |
| C121 | 0.047 μ F 25V $\pm 10\%$ C(B) | | BCXJ514735Z |
| C122 | 0.0047 μ F 50V $\pm 10\%$ C(B) | | BCXJ814725Z |

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|-------------|---|----------------|-------------------|
| C123 | 220PF 50V $\pm 5\%$ CG(CH) | | BCXG812214Z |
| C124 | Electrolytic 3.3 μ F 50V $\pm 20\%$ C-130 | | BCAP813396Z |
| C125 | -Not Used- | | |
| C126 | 0.047 μ F 25V $\pm 10\%$ C(B) | | BCXJ514735Z |
| C127 | Electrolytic 22 μ F 50V $\pm 20\%$ C-130 | | BCAP812206Z |
| C128 | 0.047 μ F 25V $\pm 10\%$ C(B) | | BCXJ514735Z |
| C129 | 0.01 μ F 25V $\pm 10\%$ C(B) | | BCXJ511035Z |
| C130 | -Not Used- | | |
| C131 | Electrolytic 1 μ F 50V $\pm 20\%$ C-130 | | BCAP811096Z |
| C132 | 0.022 μ F 50V $\pm 10\%$ C(B) | | BCXJ812235Z |
| C133 | 0.0047 μ F 50V $\pm 10\%$ C(B) | | BCXJ814725Z |
| C134 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C135 | -Not Used- | | |
| C136 | 0.022 μ F 50V $\pm 10\%$ C(B) | | BCXJ812235Z |
| C137 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C138 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C139 | 33PF 50V $\pm 5\%$ CG(CH) | | BCXG813304Z |
| C140 | -Not Used- | | |
| C141 | 1.5PF 50V $\pm 0.25\%$ UJ | | BCXL811591Z |
| C142 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C143 | Cylinder-Ceramic Tape | | |
| | 0.001 μ F 25V $\pm 20\%$ Y C-161 | | BCWJ511026Z |
| C144 | 0.033 μ F 50V $\pm 10\%$ $\pm 0.25\%$ | | BCXJ813335Z |
| C145 | -Not Used- | | |
| C146 | 47PF 50V $\pm 5\%$ SL | | BCXH814704Z |
| C147 | 0.0033 μ F 50V $\pm 10\%$ C(B) | | BCXJ813325Z |
| C148 | Electrolytic 100 μ F 10V $\pm 20\%$ C-130 | | BCAP111016Z |
| C149 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C150 | -Not Used- | | |
| C151 | 18PF 50V $\pm 5\%$ CG(CH) | | BCXG811804Z |
| C152 | Electrolytic 100 μ F 16V $\pm 20\%$ C-130 | | BCAP311016Z |
| C153 | 10PF 50V $\pm 0.5\%$ SL | | BCXH811002Z |
| C154 | 10PF 50V $\pm 0.5\%$ SL | | BCXH811002Z |
| C155 | 39PF 50V $\pm 5\%$ CG(CH) | | BCXG813904Z |
| C156 | Mylar ** 0.0047 μ F 50V $\pm 5\%$ C-114 | | BCQD814724Z |
| C157 | Mylar(MKT) 0.1 μ F 63V $\pm 5\%$ C-184 | | BCQX911044Z |
| C158 | Mylar 0.0047 μ F 50V $\pm 5\%$ C-114 | | BCQD814724Z |
| C159 | Electrolytic 22 μ F 50V $\pm 20\%$ C-130 | | BCAP812206Z |
| C160 | -Not Used- | | |
| C161 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C162 | 0.015 μ F 50V $\pm 10\%$ C(B) | | BCXJ811535Z |
| C163 | Tantalum Chip Tape 0.1 μ F 35V $\pm 20\%$ A C-227 | | BCPP661086Z |
| C164 | Electrolytic 1 μ F 50V $\pm 20\%$ C-130 | | BCAP811096Z |
| C165 | Tantalum Chip Tape 3.3 μ F 7V $\pm 20\%$ A C-228 | | BCPP903396Z |
| C166 | 0.001 μ F 50V $\pm 10\%$ C(B) | | BCXJ811025Z |
| C167 | 0.01 μ F 25V $\pm 10\%$ C(B) | | BCXJ511035Z |
| C168 | 0.01 μ F 25V $\pm 10\%$ C(B) | | BCXJ511035Z |
| C169 | Electrolytic 470 μ F 25V $\pm 20\%$ C-130 | | BCAP514716Z |

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| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|-----------------|---------------------|-----------------|----------------|
| C170 | -Not Used- | | BCXG818214Z |
| C171 | | | BCAP311016Z |
| C172 | Electrolytic | | BCBR813091Z |
| C173 | | | BCXJ811025Z |
| C174 | | | |
| C175 | -Not Used- | | BCAP512216Z |
| C176 | Electrolytic | | BCAP514716Z |
| C177 | Electrolytic | | BCGC511045Z |
| C178 | Semi-Conductor (SR) | | BCAP514706Z |
| C179 | Electrolytic | | BCXG812214Z |
| C181 | | | |
| C180 | -Not Used- | | BCAP512216Z |
| C182 | Electrolytic | | BCAP511016Z |
| C183 | Electrolytic | | BCAP312216Z |
| C184 | Electrolytic | | |
| C185 | -Not Used- | | BCAP511026Z |
| C186 | Electrolytic | | BCXJ811025Z |
| C187 | | | BCAP511016Z |
| C188 | Electrolytic | | BCAP514706Z |
| C189 | Electrolytic | | |
| C190 | -Not Used- | | BCAP511016Z |
| C191 | Electrolytic | | BCKG514730Z |
| C192 | Ceramic | | BCAP514706Z |
| C193 | Electrolytic | | |
| Diodes | | | |
| D001 | | HSK110 TR | BDAY0400001 |
| D002 | Varicap | 1SV188-9 TRP | BDAY0398001 |
| D003 | | HSK110 TR | BDAY0400001 |
| D004 | Varicap | 1SV188-9 TRP | BDAY0398001 |
| D005 | -Not Used- | | |
| D006 | | HSK110 TR | BDAY0400001 |
| D006 | | HSK120TR for CA | BDAY0393001 |
| D007 | -Not Used- | | |
| D008 | Varicap | 1SV201-4 TRP | BDAY0399001 |
| D009 | Varicap | 1SV201-4 TRP | BDAY0399001 |
| D010 | -Not Used- | | |
| D011 | Varicap | 1SV201-4 TRP | BDAY0399001 |
| D012 | | 1SS85 | BDAY0326001 |
| D013 | Varicap | 1SV201-4 TRP | BDAY0399001 |
| D014 | | HSK110 TR | BDAY0400001 |
| D015 | -Not Used- | | |
| D016 | | HSK110 TR | BDAY0400001 |
| D017 | Varicap | 1SV201-4 TRP | BDAY0399001 |
| D018 | | 1SS184 TE85L | BDAY0256001 |
| D019 | | HSK110 TR | BDAY0400001 |

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|--------------|----------------------|-------------|----------------|
| D020 | -Not Used- | | |
| D021 | HSK120 TR Taping | | BDAY0393001 |
| D022 | HSK110 TR | | BDAY0400001 |
| D023 | HSK110 TR | | BDAY0400001 |
| D024 | HSK110 TR | | BDAY0400001 |
| D025 | Varicap KV-1450 TL00 | | BDAY0543001 |
| D026 | Varicap 1SV201-4 TRP | | BDAY0399001 |
| D027 | HSK110 TR | | BDAY0400001 |
| D028 | HSK110 TR | | BDAY0400001 |
| D029 | HSK110 TR | | BDAY0400001 |
| D030 | 1SS97 | | BDAY0164001 |
| D031 | 1SS184 TE85L | | BDAY0256001 |
| D032 | 1SS184 TE85L | | BDAY0256001 |
| D033 | Varicap 1SV201-4 TRP | | BDAY0399001 |
| D034 | HSK110 TR | | BDAY0400001 |
| D035 | -Not Used- | | |
| D036 | HSK110 TR | | BDAY0400001 |
| D037 | Varicap 1SV201-4 TRP | | BDAY0399001 |
| D038 | HSK110 TR | | BDAY0400001 |
| D039 | HSK110 TR | | BDAY0400001 |
| D041 | HSK110 TR | | BDAY0400001 |
| D042 | HSM88AS TL | | BDAY0346001 |
| D043 | HSK120 TR Taping | | BDAY0393001 |
| D044 | HSK120 TR Taping | | BDAY0393001 |
| D045 | -Not Used- | | |
| D046 | HSK120 TR Taping | | BDAY0393001 |
| D047 | HSK120 TR Taping | | BDAY0393001 |
| D048 | 1N4003 | | BDAY0133001 |
| D049 | 1N4003 | | BDAY0133001 |
| D050 | -Not Used- | | |
| D051 | 1N4003 | | BDAY0133001 |
| D052 | HSK120 TR Taping | | BDAY0393001 |
| Jacks | | | |
| J001 | JK-089 HSJ0615 | | BJKY0089001 |
| J002 | JK-276 5267-02A | | BJKY0276002 |
| J003 | JK-662 7P | | BJKY0662007 |
| J004 | JK-662 8P | | BJKY0662008 |
| J005 | JK-662 8P | | BJKY0662008 |
| Coils | | | |
| L001 | LD-033 | | BLDY0033001 |
| L002 | LE-127 D2.5 2 1/2T | | BLEY0127001 |
| L003 | LE-351 D3.6 1/2T | | BLEY0351001 |
| L004 | LF-207 | | BLFY0207001 |

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|--------------------|--------------------------|--------------------------|----------------|
| L005 | -Not Used- | | |
| L006 | LE-366 | | BLEY0366001 |
| L007 | LE-201 D2.4 3 1/2T | | BLEY0201001 |
| L008 | LE-353 D6.35 1/2T | | BLEY0353001 |
| L009 | LF-207 | | BLFY0207001 |
| L010 | -Not Used- | | |
| L011 | LE-366 | | BLEY0366001 |
| L012 | LE-293 D6.96 1/2T | | BLEY0293001 |
| L013 | Inductor Molded | | BLZY0041278 |
| L014 | LZ-041 0.27UH | | BLBY0607001 |
| L015 | -Not Used- | | |
| L016 | LB-704 61M7D3(R22-E651A) | | BLBY0704001 |
| L017 | -Not Used- | | |
| L018 | LB-799 V291XNS-5343Z | | BLBY0799001 |
| L019 | LC-226 | | BLCY0226001 |
| L020 | -Not Used- | | |
| L021 | LE-127 D2.5 2 1/2T | | BLEY0127001 |
| L022 | LB-644 VB363SN-120IB | | BLBY0644001 |
| L023 | LB-568 VB363SN-099IB | | BLBY0568001 |
| L024 | Inductor Molded | | BLZY0041228 |
| L025 | LZ-041 0.22UH | | BLDY0087001 |
| L026 | LD-087 BF04-3*5*1 | | BLDY0087001 |
| L027 | Inductor Molded | | BLZY0041568 |
| L027 | LZ-041 0.56UH | | BLZY0041568 |
| L027 | LB-538 A7TRCS-10651Z | | BLBY0538001 |
| L028 | LF-149 5PNR-2736Z | | BLFY0149001 |
| L029 | Inductor Molded | | BLZY0087470 |
| L029 | LZ-087 47UH | | BLZY0087470 |
| Transistors | | | |
| Q001 | Silicon NPN | DB-711 2SC3356-R24 T1B | BDBC3356646 |
| Q002 | Silicon NPN | DB-717 2SC3704 Taping | BDBC3704000 |
| Q003 | Silicon NPN | DB-717 2SC3704 Taping | BDBC3704000 |
| Q004 | Silicon NPN | DB-717 2SC3704 Taping | BDBC3704000 |
| Q005 | -Not Used- | | |
| Q006 | Silicon NPN | DB-386 2SC3128 | BDBC3128000 |
| Q007 | Silicon NPN | DB-717 2SC3704 Taping | BDBC3704000 |
| Q008 | Silicon NPN | DB-724 2SC3121 TE85L | BDBC3121000 |
| Q009 | Silicon PNP | DB-036 2SA1162-Y TE85L | BDBA1162124 |
| Q010 | -Not Used- | | |
| Q011 | Silicon NPN | DB-724 2SC3121 TE85L | BDBC3121000 |
| Q012 | Silicon NPN | DB-724 2SC3121 TE85L | BDBC3121000 |
| Q013 | Silicon NPN | DB-724 2SC3121 TE85L | BDBC3121000 |
| Q014 | Silicon NPN | DB-724 2SC3121 TE85L | BDBC3121000 |
| Q015 | -Not Used- | | |
| Q016 | Silicon NPN | DB-777 2SC3121-T5L TE85L | BDBC3121814 |
| Q017 | Silicon NPN | DB-777 2SC3121-T5L TE85L | BDBC3121814 |
| Q018 | Silicon PNP | DB-036 2SA1162-Y TE85L | BDBA1162124 |
| Q019 | Silicon NPN | DB-381 2SC2712-Y TE85L | BDBC2712124 |
| Q020 | -Not Used- | | |

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|---|---|-------------|----------------|
| Q021 | Silicon NPN DB-381 2SC2712-Y TE85L | | BDBC2712124 |
| Q022 | Silicon NPN DB-538 DTC114EK T96 | | BDBZ0538001 |
| Q023 | Silicon NPN DB-381 2SC2712-Y TE85L | | BDBC2712124 |
| Q024 | Silicon NPN DB-538 DTC114EK T96 | | BDBZ0538001 |
| Q025 | -Not Used- | | |
| Q026 | Silicon NPN DB-381 2SC2712-Y TE85L | | BDBC2712124 |
| Q027 | Silicon NPN DB-439 2SD1676 | | BDBD1676000 |
| Resistors Note : All resistors are carbon fixed-chip type, unless otherwise specified. | | | |
| R001 | 1M ohm 1/10W $\pm 5\%$ Taping | | BRFC011054Z |
| R002 | 560 ohm 1/10W $\pm 5\%$ Taping | | BRFC015614Z |
| R003 | 2.7K ohm 1/10W $\pm 5\%$ Taping | | BRFC012724Z |
| R004 | 82K ohm 1/10W $\pm 5\%$ Taping | | BRFC018234Z |
| R005 | -Not Used- | | |
| R006 | 5.6 ohm 1/10W $\pm 5\%$ Taping | | BRFC015694Z |
| R007 | 150 ohm 1/10W $\pm 5\%$ Taping | | BRFC011514Z |
| R008 | AX TS 26 33 ohm 1/6W $\pm 5\%$ Taping | | BRPA613304Z |
| R009 | 220K ohm 1/10W $\pm 5\%$ Taping | | BRFC012244Z |
| R010 | -Not Used- | | |
| R011 | 330 ohm 1/10W $\pm 5\%$ Taping | | BRFC013314Z |
| R012 | 100 ohm 1/10W $\pm 5\%$ Taping | | BRFC011014Z |
| R013 | 22K ohm 1/10W $\pm 5\%$ Taping | | BRFC012234Z |
| R014 | 330K ohm 1/10W $\pm 5\%$ Taping | | BRFC013344Z |
| R015 | -Not Used- | | |
| R016 | 220 ohm 1/10W $\pm 5\%$ Taping | | BRFC012214Z |
| R017 | 1K ohm 1/10W $\pm 5\%$ Taping | | BRFC011024Z |
| R018 | 22K ohm 1/10W $\pm 5\%$ Taping | | BRFC012234Z |
| R019 | Carbon Axial Lead 220 ohm 1/4W $\pm 5\%$ | | BRFT142214Z |
| R020 | -Not Used- | | |
| R021 | 100K ohm 1/10W $\pm 5\%$ Taping | | BRFC011044Z |
| R022 | -Not Used- | | |
| R023 | Carbon Axial Lead 3.3K ohm 1/4W $\pm 5\%$ | | BRFT143324Z |
| R024 | 56K ohm 1/10W $\pm 5\%$ Taping | | BRFC015634Z |
| R025 | -Not Used- | | |
| R026 | 47K ohm 1/10W $\pm 5\%$ Taping | | BRFC014734Z |
| R027 | 2.2K ohm 1/10W $\pm 5\%$ Taping | | BRFC012224Z |
| R028 | 1.2K ohm 1/10W $\pm 5\%$ Taping | | BRFC011224Z |
| R029 | 100 ohm 1/10W $\pm 5\%$ Taping | | BRFC011014Z |
| R030 | -Not Used- | | |
| R031 | 2.7K ohm 1/10W $\pm 5\%$ Taping | | BRFC012724Z |
| R032 | 1K ohm 1/10W $\pm 5\%$ Taping | | BRFC011024Z |
| R033 | 2.7K ohm 1/10W $\pm 5\%$ Taping | | BRFC012724Z |
| R034 | 33K ohm 1/10W $\pm 5\%$ Taping | | BRFC013334Z |
| R035 | -Not Used- | | |
| R036 | 47K ohm 1/10W $\pm 5\%$ Taping | | BRFC014734Z |
| R037 | 82 ohm 1/10W $\pm 5\%$ Taping | | BRFC018204Z |

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|-------------|--|----------------|-------------------|
| R038 | 100 ohm 1/10W ±5% Taping | | BRFC011014Z |
| R039 | 33K ohm 1/10W ±5% Taping | | BRFC013334Z |
| R040 | -Not Used- | | |
| R041 | 33 ohm 1/10W ±5% Taping | | BRFC013304Z |
| R042 | 1 ohm 1/10W ±5% Taping | | BRFC011094Z |
| R043 | 390K ohm 1/10W ±5% Taping | | BRFC013944Z |
| R044 | 1K ohm 1/10W ±5% Taping | | BRFC011024Z |
| R045 | -Not Used- | | |
| R046 | 100 ohm 1/10W ±5% Taping | | BRFC011014Z |
| R047 | 1.5K ohm 1/10W ±5% Taping | | BRFC011524Z |
| R048 | 1K ohm 1/10W ±5% Taping | | BRFC011024Z |
| R049 | 390K ohm 1/10W ±5% Taping | | BRFC013944Z |
| R050 | -Not Used- | | |
| R051 | AX TS 26 2.7K ohm 1/6W ±5% Taping | | BRPA612724Z |
| R052 | Carbon Axial Lead 47K ohm 1/4W ±5% | | BRFT144734Z |
| R053 | 2.7K ohm 1/10W ±5% Taping | | BRFC012724Z |
| R054 | AX TS 26 2.7K ohm 1/6W ±5% Taping | | BRPA612724Z |
| R055 | -Not Used- | | |
| R056 | 47K ohm 1/10W Taping | | BRFC014734Z |
| R057 | 2.7K ohm 1/10W ±5% Taping | | BRFC012724Z |
| R058 | 2.7K ohm 1/10W ±5% Taping | | BRFC012724Z |
| R059 | 1K ohm 1/10W ±5% Taping | | BRFC011024Z |
| R060 | -Not Used- | | |
| R061 | 100 ohm 1/10W ±5% Taping | | BRFC011014Z |
| R062 | 3.3K ohm 1/10W ±5% Taping | | BRFC013324Z |
| R063 | 47K ohm 1/10W ±5% Taping | | BRFC014734Z |
| R064 | 100 ohm 1/10W ±5% Taping | | BRFC011014Z |
| R065 | 1K ohm 1/10W ±5% Taping | | BRFC011024Z |
| R066 | 100 ohm 1/10W ±5% Taping | | BRFC011014Z |
| R067 | 47K ohm 1/10W ±5% Taping | | BRFC014734Z |
| R068 | 47K ohm 1/10W ±5% Taping | | BRFC014734Z |
| R069 | 47K ohm 1/10W ±5% Taping | | BRFC014734Z |
| R070 | Jumper Chip RZ-035 RMC 1/10 JP Tape ϕ | | BRZY0035001 |
| R070 | 33 ohm 1/10W ±5% Taping for CA | | BRFC013304Z |
| R071 | 330K ohm 1/10W ±5% Taping | | BRFC013344Z |
| R072 | 1K ohm 1/10W ±5% Taping | | BRFC011024Z |
| R073 | 12K ohm 1/10W ±5% Taping | | BRFC011234Z |
| R074 | 12K ohm 1/10W ±5% Taping | | BRFC011234Z |
| R075 | -Not Used- | | |
| R076 | 470K ohm 1/10W ±5% Taping | | BRFC014744Z |
| R077 | 10K ohm 1/10W ±5% Taping | | BRFC011034Z |
| R078 | 10K ohm 1/10W ±5% Taping | | BRFC011034Z |
| R079 | 4.7K ohm 1/10W ±5% Taping | | BRFC014724Z |
| R080 | -Not Used- | | |
| R081 | 100K ohm 1/10W ±5% Taping | | BRFC011044Z |
| R082 | 10K ohm 1/10W ±5% Taping | | BRFC011034Z |
| R083 | 10K ohm 1/10W ±5% Taping | | BRFC011034Z |
| R084 | 1.8K ohm 1/10W ±5% Taping | | BRFC011824Z |

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|-------------|--|----------------|-------------------|
| R085 | 100 ohm 1/10W \pm 5% Taping | | BRFC011014Z |
| R086 | 100 ohm 1/10W \pm 5% Taping | | BRFC011014Z |
| R087 | -Not Used- | | |
| R088 | 4.7K ohm 1/10W \pm 5% Taping | | BRFC014724Z |
| R089 | 4.7K ohm 1/10W \pm 5% Taping | | BRFC014724Z |
| R090 | -Not Used- | | |
| R091 | 10K ohm 1/10W \pm 5% Taping | | BRFC011034Z |
| R092 | 560 ohm 1/10W \pm 5% Taping | | BRFC015614Z |
| R093 | 330 ohm 1/10W \pm 5% Taping | | BRFC013314Z |
| R094 | 33K ohm 1/10W \pm 5% Taping | | BRFC013334Z |
| R095 | -Not Used- | | |
| R096 | 100 ohm 1/10W \pm 5% Taping | | BRFC011014Z |
| R097 | 470 ohm 1/10W \pm 5% Taping | | BRFC014714Z |
| R098 | 100K ohm 1/10W \pm 5% Taping | | BRFC011044Z |
| R099 | 100 ohm 1/10W \pm 5% Taping | | BRFC011014Z |
| R100 | -Not Used- | | |
| R101 | 10 ohm 1/10W \pm 5% Taping | | BRFC011004Z |
| R102 | 330 ohm 1/10W \pm 5% Taping | | BRFC013314Z |
| R103 | 2.7K ohm 1/10W \pm 5% Taping | | BRFC012724Z |
| R104 | 33K ohm 1/10W \pm 5% Taping | | BRFC013334Z |
| R105 | 10K ohm 1/10W \pm 5% Taping | | BRFC011034Z |
| R106 | 10K ohm 1/10W \pm 5% Taping | | BRFC011034Z |
| R107 | 10K ohm 1/10W \pm 5% Taping | | BRFC011034Z |
| R108 | 220K ohm 1/10W \pm 5% Taping | | BRFC012244Z |
| R109 | 22K ohm 1/10W \pm 5% Taping | | BRFC012234Z |
| R110 | -Not Used- | | |
| R111 | 15K ohm 1/10W \pm 5% Taping | | BRFC011534Z |
| R112 | 18K ohm 1/10W \pm 5% Taping | | BRFC011834Z |
| R113 | 18K ohm 1/10W \pm 5% Taping | | BRFC011834Z |
| R114 | 2.2M ohm 1/10W \pm 5% Taping | | BRFC012254Z |
| R115 | 82K ohm 1/10W \pm 5% Taping | | BRFC018234Z |
| R116 | AX TS 26 10 ohm 1/6W \pm 5% Taping | | BRPA611004Z |
| R117 | 3.3K ohm 1/10W \pm 5% Taping | | BRFC013324Z |
| R118 | Carbon Axial Lead 15K ohm 1/4W \pm 5% | | BRFT141534Z |
| R119 | 1K ohm 1/10W \pm 5% Taping | | BRFC011024Z |
| R121 | 12K ohm 1/10W \pm 5% Taping | | BRFC011234Z |
| R122 | 4.7K ohm 1/10W \pm 5% Taping | | BRFC014724Z |
| R123 | 56K ohm 1/10W \pm 5% Taping | | BRFC015634Z |
| R124 | 56K ohm 1/10W \pm 5% Taping | | BRFC015634Z |
| R125 | Jumper Chip RZ-035 RMC 1/10 JP Tape ϕ | | BRZY0035001 |
| R126 | 56K ohm 1/10W \pm 5% Taping | | BRFC015634Z |
| R127 | 12K ohm 1/10W \pm 5% Taping | | BRFC011234Z |
| R128 | 18K ohm 1/10W \pm 5% Taping | | BRFC011834Z |
| R129 | 1K ohm 1/10W \pm 5% Taping | | BRFC011024Z |
| R130 | -Not Used- | | |
| R131 | 6.8K ohm 1/10W \pm 5% Taping | | BRFC016824Z |
| R132 | Carbon Axial Lead 8.2K ohm 1/4W \pm 5% | | BRFT148224Z |
| R133 | 100K ohm 1/10W \pm 5% Taping | | BRFC011044Z |

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|----------------------------|--|-------------|----------------|
| R134 | 680K ohm 1/10W $\pm 5\%$ Taping | | BRFC016844Z |
| R135 | -Not Used- | | |
| R136 | 18K ohm 1/10W $\pm 2\%$ Taping | | BRFC011837Z |
| R137 | 18K ohm 1/10W $\pm 2\%$ Taping | | BRFC011837Z |
| R138 | 10K ohm 1/10W $\pm 2\%$ Taping | | BRFC011037Z |
| R139 | 33K ohm 1/10W $\pm 2\%$ Taping | | BRFC013337Z |
| R140 | -Not Used- | | |
| R141 | 18K ohm 1/10W $\pm 2\%$ Taping | | BRFC011837Z |
| R142 | 3.9K ohm 1/10W $\pm 2\%$ Taping | | BRFC013927Z |
| R143 | 100K ohm 1/10W $\pm 5\%$ Taping | | BRFC011044Z |
| R144 | 100K ohm 1/10W $\pm 5\%$ Taping | | BRFC011044Z |
| R145 | -Not Used- | | |
| R146 | 330K ohm 1/10W Taping | | BRFC013344Z |
| R147 | 680K ohm 1/10W $\pm 5\%$ Taping | | BRFC016844Z |
| R148 | 4.7K ohm 1/10W $\pm 5\%$ Taping | | BRFC014724Z |
| R149 | 330 ohm 1/10W $\pm 5\%$ Taping | | BRFC013314Z |
| R150 | -Not Used- | | |
| R151 | 270K ohm 1/10W $\pm 5\%$ Taping | | BRFC012744Z |
| R152 | 470K ohm 1/10W $\pm 5\%$ Taping | | BRFC014744Z |
| R153 | 47K ohm 1/10W $\pm 5\%$ Taping | | BRFC014734Z |
| R154 | 33 ohm 1/10W $\pm 5\%$ Taping | | BRFC013304Z |
| R155 | -Not Used- | | |
| R156 | 33K ohm 1/10W $\pm 5\%$ Taping | | BRFC013334Z |
| R157 | Carbon Axial Lead 2.2 ohm 1/4W $\pm 5\%$ | | BRFT142294Z |
| R158 | 1 ohm 1/10W $\pm 5\%$ Taping | | BRFC011094Z |
| R159 | 39K ohm 1/10W $\pm 5\%$ Taping | | BRFC013934Z |
| R160 | -Not Used- | | |
| R161 | 3.3K ohm 1/10W $\pm 5\%$ Taping | | BRFC013324Z |
| R162 | 180 ohm 1/10W $\pm 5\%$ Taping | | BRFC011814Z |
| R163 | Carbon Formed Vert 0.5 ohm 1/4W $\pm 5\%$ | | BRUB145084Z |
| R164 | AX TS 26 22 ohm 1/6W $\pm 5\%$ Taping | | BRPA612204Z |
| R165 | -Not Used- | | |
| R166 | Metal Oxide 10 ohm 1WS $\pm 5\%$ | | BRSJ001004Z |
| R167 | Carbon AX TS 26 47 ohm 1/6W $\pm 5\%$ Taping | | BRPA614704Z |
| Integrated Circuits | | | |
| IC001 | RF Amp UPC1675G-T1 | | BDEY1190001 |
| IC002 | RF Amp UPC1675G-T1 | | BDEY1190001 |
| IC003 | RF Amp Mixer LA-1186N | | BDEY1051001 |
| IC004 | PLL PLL2002A1 | | BDEY0868001 |
| IC005 | -Not Used- | | |
| IC006 | Loop Filter CA3140E | | BDEY0604001 |
| IC007 | IF Amp & Detector NJM3359D-A | | BDEY0815001 |
| IC008 | Window NJM2904D | | BDEY0580001 |
| IC009 | AF Power Amp TBA820M | | BDEY0659001 |
| IC010 | -Not Used- | | |
| IC011 | DC-DC Converter IR3M03A | | BDEY1153001 |
| IC012 | Regulator L78M05CV | | BDEY0995001 |

| REF. NO. | DESCRIPTION | | RS PART NO. | MFR'S PART NO. |
|----------------------|-----------------|--|-------------|----------------|
| IC013 | Regulator | S-81250HG | | BDEY0688001 |
| IC014 | IF Amp & IF DET | LA1600A | | BDEY1000001 |
| Miscellaneous | | | | |
| T001 | Transformer | TF-374 INPUT POWER INDUCTOR | | BTFY0374001 |
| X001 | Crystal | QX-486 10.35MHZ | | BQXY0486001 |
| CT001 | Trimmer | CT-064 ECR-GAO35M11 | | BCTY0064350 |
| CT002 | Trimmer | CT-064 ECR-GAO35M11 | | BCTY0064350 |
| CT003 | Trimmer | CT-064 ECR-GAO35M11 | | BCTY0064350 |
| CT004 | Trimmer | CT-082 50PF | | BCTY0082500 |
| CT006 | Trimmer | CT-064 ECR-GAO35E11 | | BCTY0064350 |
| FC001 | Flat Cable | WF-060 5.5- 35- 3.5 | | BWfy0600353 |
| FT001 | Filter Crystal | FL-177 UMF-208C | | BFLY0177001 |
| FT002 | Filter Ceramic | FL-142 SFR450D | | BFLY0142001 |
| VR001 | Semi-Fixed | RT-182 TT24R 30KB <i>SQUELCH TRIM POT.</i> | | BRTY0182303 |
| VR002 | Variable | RV-766 100KA & 100KC <i>SQUELCH ADJUST</i> | | BRVY0766001 |
| WA001 | DC Cord 5.5MM | WZ-463 1565 <i>VOLUME</i> | | BWZY0463001 |
| P001 | Pilot Lamp | PL-105 5V | | BPLY0105001 |

CONTROL PCB ASSEMBLY

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|--|---|-------------|----------------|
| | ASSEMBLY, PCB, Control Consists of the following: | | AB220ZPBEB |
| Capacitors Note : All capacitors are ceramic M/L (2125) type unless otherwise specified. | | | |
| The following codes indicate variations of capacitors against temperatures: YA = ±5%, YB = ±10%, YD =+20-30%, YE =+20-50%(-25~+85°C), ZF =+30-80%(-10~+70°C), CH =0 ±60ppm/°C, RH =220ppm/°C ±60ppm/°C, TH =-470ppm/°C ±60ppm/°C, SL =+350ppm/°C ~1000ppm/°C, UJ =-750ppm/°C ±120ppm/°C | | | |
| C201 | 1μF 16V +80%/-20% F | | BCXF311050Z |
| C202 | 220PF 50V ±5% CG(CH) | | BCXG812214Z |
| C203 | 220PF 50V ±5% CG(CH) | | BCXG812214Z |
| C204 | 0.01μF 25V ±10% C(B) | | BCXJ511035Z |
| C205 | 0.1μF 25V +80%/-20% F | | BCXK511080Z |
| C206 | 0.001μF 50V ±10% C(B) | | BCXJ811025Z |
| C207 | 0.001μF 50V ±10% C(B) | | BCXJ811025Z |
| Diode | | | |
| D201 | H3M3.6NB2 | | BDA0673006 |

KEYBOARD PCB ASSEMBLY

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|--------------------------------|--|-------------|--|
| | ASSEMBLY, PCB, Keyboard Consists of the following: | | AB220ZPBEC |
| B301 WA302 | PC Board, Keyboard PH-133AA Wires, Assembled WZ-1108 UB-220 (P)(B) Parts | | BPHY0133AAZ BWZY1108001 AB220ZPBEC |
| J501 Y501 SP501 WA501 | JK-474 BNC-RB3-8D-01 Keyboard, Rubber YY-1247 Speaker SP-247 Wires, Assembled WZ-1062 | | BJKY0474001 BYYY1247001 BSPY0247001 BWZY1062001 |

SUBSTITUTION

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|----------|---|-------------|----------------|
| C101 | Electrolytic 4.7μF 50V ±20% C-128 | | BCAM814796Z |
| C103 | Electrolytic 4.7μF 50V ±20% C-156 | | BCAZ814796Z |
| C104 | Tantalum Chip 0.22μF 35V ±20% C-122 TAPE | | BCSH662286Z |
| C104 | Tantalum Chip 0.22μF 35V ±20% AC-222 TAPE | | BCSU662286Z |
| C112 | Tantalum Chip 0.1μF 35V ±20% C-122 TAPE | | BCSH661086Z |
| C112 | Tantalum Chip 0.1μF 35V ±20% AC-222 TAPE | | BCSU661086Z |
| C124 | Electrolytic 3.3μF 50V ±20% C-128 | | BCAM813396Z |
| C124 | Electrolytic 3.3μF 50V ±20% C-156 | | BCAZ813396Z |
| C127 | Electrolytic 22μF 50V ±20% C-128 | | BCAM812206Z |
| C127 | Electrolytic 22μF 50V ±20% C-156 | | BCAZ812206Z |
| C131 | Electrolytic 1μF 50V ±20% C-128 | | BCAM811096Z |
| C131 | Electrolytic 1μF 50V ±20% C-156 | | BCAZ811096Z |
| C131 | Electrolytic 100μF 10V ±20% C-128 | | BCAM111016Z |
| C152 | Electrolytic 100μF 10V ±20% C-128 | | BCAM111016Z |
| C152 | Electrolytic 100μF 10V ±20% C-156 | | BCAZ111016Z |
| C159 | Electrolytic 22μF 50V ±20% C-128 | | BCAM812206Z |
| C159 | Electrolytic 22μF 50V ±20% C-159 | | BCAZ812206Z |
| C163 | Tantalum Chip 0.1μF 35V ±20% C-122 TAPE | | BCSH661086Z |
| C163 | Tantalum Chip 0.1μF 35V ±20% AC-222 TAPE | | BCSU661086Z |
| C164 | Electrolytic 1μF 50V ±20% C-128 | | BCAM811096Z |
| C164 | Electrolytic 1μF 50V ±20% C-156 | | BCAZ811096Z |
| C165 | Tantalum Chip Tape 3.3μF 7V ±20% AC-228 | | BCSH903396Z |
| C165 | Tantalum Chip Tape 3.3μF 6.3V ±20% AC-222 | | BCSU903396Z |
| C169 | Electrolytic 470μF 25V ±20% C-128 | | BCAM514716Z |
| C169 | Electrolytic 470μF 25V ±20% C-156 | | BCAZ514716Z |
| C172 | Electrolytic 100μF 10V ±20% C-128 | | BCAM111016Z |
| C172 | Electrolytic 100μF 10V ±20% C-156 | | BCAZ111016Z |
| C176 | Electrolytic 220μF 25V ±20% C-128 | | BCAM512216Z |

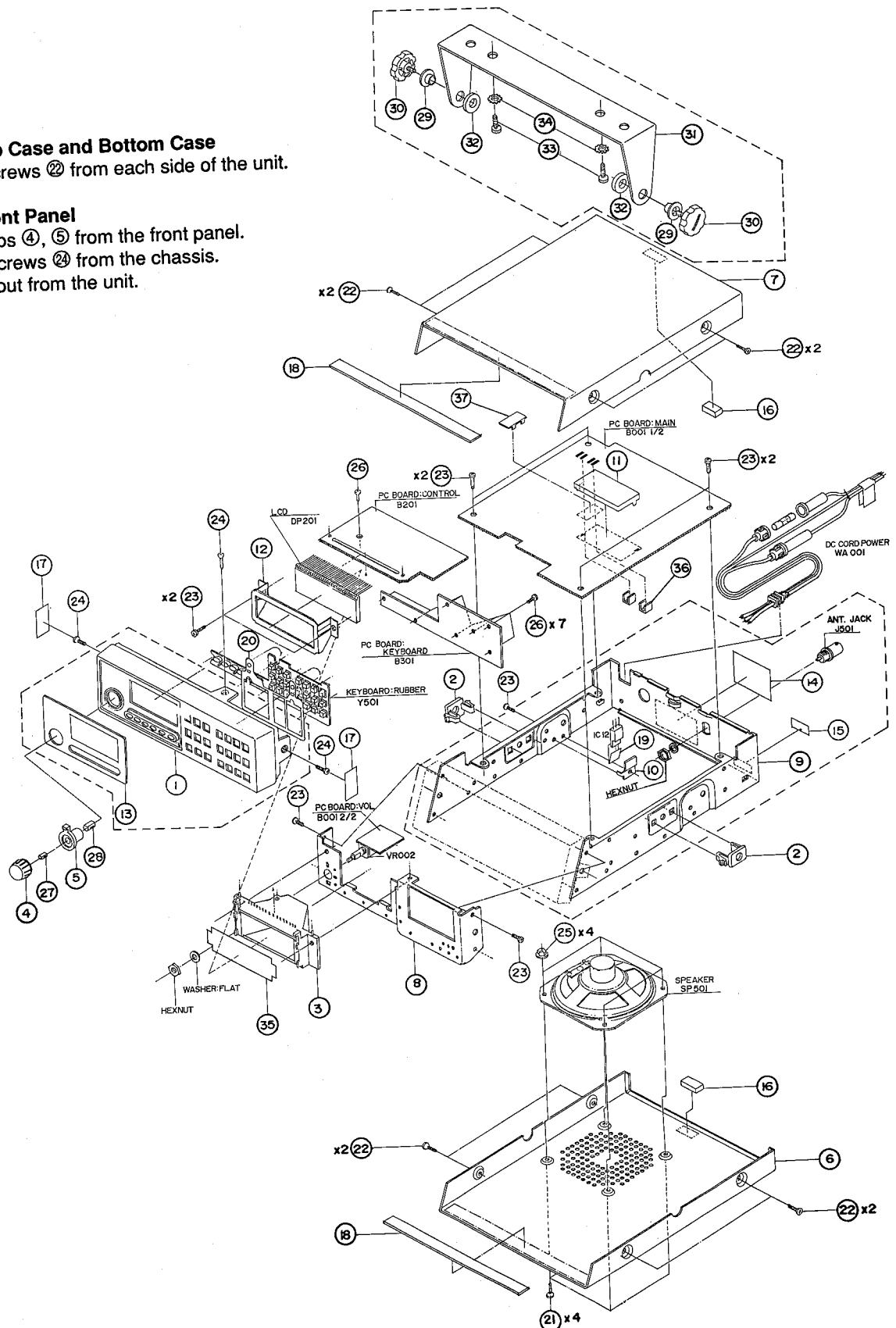
| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|-------------|------------------------------------|----------------|-------------------|
| C176 | Electrolytic 220μF 25V ±20% C-156 | | BCAZ512216Z |
| C177 | Electrolytic 470μF 25V ±20% C-128 | | BCAM514716Z |
| C177 | Electrolytic 470μF 25V ±20% C-156 | | BCAZ514716Z |
| C179 | Electrolytic 47μF 25V ±20% C-128 | | BCAM514706Z |
| C179 | Electrolytic 47μF 25V ±20% C-156 | | BCAZ514706Z |
| C182 | Electrolytic 220μF 25V ±20% C-128 | | BCAM512216Z |
| C182 | Electrolytic 220μF 25V ±20% C-156 | | BCAZ512216Z |
| C183 | Electrolytic 100μF 25V ±20% C-128 | | BCAM511016Z |
| C183 | Electrolytic 100μF 25V ±20% C-156 | | BCAZ511016Z |
| C186 | Electrolytic 1000μF 25V ±20% C-128 | | BCAM511026Z |
| C186 | Electrolytic 1000μF 25V ±20% C-156 | | BCAZ511026Z |
| C188 | Electrolytic 100μF 25V ±20% C-128 | | BCAM511016Z |
| C188 | Electrolytic 100μF 25V ±20% C-156 | | BCAZ511016Z |
| C189 | Electrolytic 47μF 25V ±20% C-128 | | BCAM514706Z |
| C189 | Electrolytic 47μF 25V ±20% C-156 | | BCAZ514706Z |
| C191 | Electrolytic 100μF 25V ±20% C-125 | | BCAM511016Z |
| C191 | Electrolytic 100μF 25V ±20% C-156 | | BCAZ511016Z |
| C193 | Electrolytic 47μF 25V ±20% C-128 | | BCAM514706Z |
| C193 | Electrolytic 47μF 25V ±20% C-156 | | BCAZ514706Z |
| D018 | DCB010 TB | | BDAY0423002 |
| D031 | DCB010 TB | | BDAY0423002 |
| D032 | DCB010 TB | | BDAY0423002 |
| D048 | 1N4003 | | BDAY0060003 |
| D049 | 1N4003 | | BDAY0060003 |
| D051 | 1N4003 | | BDAY0060003 |
| L019 | LC-209 | | BLCY0209001 |
| Q009 | DB-036 2SA1162-G(GR)TE85L | | BDBA1162107 |
| Q009 | DB-048 2SA1179-M5 TB | | BDBA1179666 |
| Q018 | DB-036 2SA1162-G(GR)TE85L | | BDBA1162107 |
| Q018 | DB-048 2SA1179-M5 TB | | BDBA1179666 |
| Q019 | DB-743 2SC2812-L5 TB | | BDBC2812642 |
| Q021 | DB-743 2SC2812-L5 TB | | BDBC2812642 |
| Q021 | DB-381 2SC2712-GR TE85L | | BDBC2712303 |
| Q022 | DB-573 RT1N141C-T12-1 T1 | | BDBZ0573001 |
| Q023 | DB-743 2SC2812-L5 TB | | BDBC2812642 |
| Q024 | DB-573 RT1N141C-T12-1 T1 | | BDBZ0573001 |
| Q026 | DB-743 2SC2812-L5 TB | | BDBC2812642 |
| Q027 | DB-428 2SD1676 | | BDBY1676000 |
| Q201 | DB-743 2SC2812-L6 TB | | BDBC2812648 |
| Q201 | DB-381 2SC2712-BL TE85L | | BDBC2712301 |
| Q202 | DB-573 RT1N141C-T12-1 T1 | | BDBZ0573001 |
| Q203 | DB-565 RT1P144C-T12 T1 | | BDBZ0565001 |
| Q205 | DB-565 RT1P144C-T12 T1 | | BDBZ0565001 |
| Q206 | DB-565 RT1P144C-T12 T1 | | BDBZ0565001 |
| Q207 | DB-565 RT1P144C-T12 T1 | | BDBZ0565001 |
| Q208 | DB-565 RT1P144C-T12 T1 | | BDBZ0565001 |
| Q209 | DB-565 RT1P144C-T12 T1 | | BDBZ0565001 |
| D021 | RLS4148 TE11 | | BDAY0433001 |

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|-------------|--------------|----------------|-------------------|
| D043 | RLS4148 TE11 | | BDAY0433001 |
| D044 | RLS4148 TE11 | | BDAY0433001 |
| D046 | RLS4148 TE11 | | BDAY0433001 |
| D047 | RLS4148 TE11 | | BDAY0433001 |
| D052 | RLS4148 TE11 | | BDAY0433001 |
| D001 | RLS135 TE11 | | BDAY0730001 |
| D003 | RLS135 TE11 | | BDAY0730001 |
| D006 | RLS135 TE11 | | BDAY0730001 |
| D014 | RLS135 TE11 | | BDAY0730001 |
| D016 | RLS135 TE11 | | BDAY0730001 |
| D019 | RLS135 TE11 | | BDAY0730001 |
| D022 | RLS135 TE11 | | BDAY0730001 |
| D023 | RLS135 TE11 | | BDAY0730001 |
| D024 | RLS135 TE11 | | BDAY0730001 |
| D027 | RLS135 TE11 | | BDAY0730001 |
| D028 | RLS135 TE11 | | BDAY0730001 |
| D029 | RLS135 TE11 | | BDAY0730001 |
| D034 | RLS135 TE11 | | BDAY0730001 |
| D036 | RLS135 TE11 | | BDAY0730001 |
| D038 | RLS135 TE11 | | BDAY0730001 |
| D039 | RLS135 TE11 | | BDAY0730001 |
| D041 | RLS135 TE11 | | BDAY0730001 |

DISASSEMBLY/EXPLODED VIEW

To Remove the Top Case and Bottom Case
Remove the eight screws 22 from each side of the unit.

To Remove the Front Panel
Pull out the two knobs 4, 5 from the front panel.
Remove the three screws 24 from the chassis.
Pull the front panel out from the unit.



Note: Parts with reference numbers are listed in the MECHANICAL PARTS LIST.
Other parts are listed in the ELECTRICAL PARTS LIST.

MECHANICAL PARTS LIST

| REF. NO. | DESCRIPTION | RS PART NO. | MFR'S PART NO. |
|-------------|---------------------------|------------------------------|-------------------|
| 1 | Panel, Front | ABS(HS-300) Gray | GCMF128151Z |
| 2 | Spacer (C) | PP Black | GETC416896Z |
| 3 | Holder, LCD | ABS(HS-300) White | GHDZ328152Z |
| 4 | Knob, VOL | ABS Black | GNBW419527Z |
| 5 | Knob, SQ | ABS Black | GNBW419528Z |
| 6 | Cover, Bottom | SB K08 1T | HCMB325690Z |
| 7 | Cover, Top | SB-K08 1T | HCMT319531Z |
| 8 | Front Chassis | SPCC 1.0T ZMC | HCSF328186Z |
| 9 | Chassis | SPCC 1.0T ZMC | HCSY228185Z |
| 10 | Holder, IC | SPCC 1.0T ZMC | HHDE481129Z |
| 11 | Shield Case | SPTE 0.3T | HSDC425695Z |
| 12 | Frame, LCD | SPTE 0.3T | HSDP428146Z |
| 13 | Plate, Display | PC 1T Silk | KDPT428153Z |
| 14 | Label, FCC | Polyester 0.05T | PLBF425692Z |
| | Label, DOC | Polyester 0.05T for CA only | PLBF425731Z |
| 15 | Label, Production Date | Polyester Film 0.05T | PLBS490315A |
| 16 | Cushion | Neoprene SP 3T | RCUN404172A |
| 17 | Insulation Tape (C) | | RETC420040Z |
| 18 | Wool-Coated Paper | Wool Tack | |
| | Wool Paper 10*150*0.T | | RUTC403865Z |
| 19 | Insulation Plate | PC 0.3T | RZEB420863A |
| 20 | ESD Plate | ALP=T=0.1 | HSDP325724Z |
| 21 | Screw, Bind HD + | M3X8 BNI | SSCW193008B |
| 22 | Screw, Taptight Bind HD + | M3X6 BNI | SSCW343006B |
| 23 | Screw, Taptight Bind HD + | M3X6 NI | SSCW343006N |
| 24 | Screw, Taptight Flat HD + | M3X6 NI | SSCW373006N |
| 25 | Nut, Flange | M3 ZMC | SSCW480030Z |
| 26 | Screw, P Tight Bind HD+ | D2X6 NI | SSCW802006N |
| 27 | Spring Plate, Knob | D3.5 | TSTD0200001 |
| 28 | Spring Plate | D6 | TSTD0200002 |
| 29 | Bushing | Polyacetal White | GBSG460079Z |
| 30 | Screw, Mounting | ABS INST CLR Black | GMSC405736Z |
| 31 | Mounting Bracket | SPCC 1.6T Black | HBCT420028Z |
| 32 | Washer, Rubber | Neoprene Black 9*17*2.0T | LWSR420029Z |
| | Label, Production Date | Paper | PLBS490199A |
| 33 | Screw, Tapping Round HD + | D5X10 NI | SSCW295010N |
| 34 | Washer, Star | D5 NI | SSCW540050N |
| 35 | LCD Paper | Yupo Paper 0.15t | RETC425737Z |
| 36 | Shield Case | SPTE 0.3T for CA only | HSDP425744Z |
| 37 | Shield Case | SPTE 0.3T for CA only | HSDP425745Z |
| | Front Panel Assmby | (Ref. No. 1 and 13) | FRPAAS220ZP |
| | Chassis Assmby | (Ref. No.2, 9, and 14) | CHAssy220ZP |
| | Mounting Bracket Assmby | (Ref. No.29, 31, 32, and 34) | MTBRAS220ZP |

NOTE: Ref. No. in this Mechanical Parts List correspond with the number in the Exploded View.

DIODE AND TRANSISTOR VOLTAGE CHART

| IC | Pin | VLO | VHI | UHF | 800 | Remarks |
|-----|-----|-----|-----|-----|-----|---------|
| 201 | 1 | | 4.9 | | | |
| | 2 | | 0 | | | |
| | 3 | | 4.9 | | | |
| | 4 | | 4.9 | | | |
| | 5 | | 4.9 | | | |
| | 6 | | 0 | | | |
| | 7 | | 0 | | | |
| | 8 | | 0 | | | |
| 9 | | 4.9 | | | | |
| 10 | | 0 | | | | |
| 11 | | 4.6 | | | | |
| 12 | | 0 | | | | |
| 13 | | | | | | |
| 14 | | 0 | | | | |
| 15 | | 4.6 | | | | |
| 16 | | 4.9 | | | | |
| 17 | | | | | | |
| 18 | | 4.8 | | | | |
| 19 | | 4.6 | | | | |
| 20 | | 4.6 | | | | |
| 21 | | 4.6 | | | | |
| 22 | | 4.6 | | | | |
| 23 | | 0 | | | | |
| 24 | | 0 | | | | |
| 25 | | 0 | | | | |
| 26 | | 0 | | | | |
| 27 | | 0 | | | | |
| 28 | | 0 | | | | |
| 29 | | 0 | | | | |
| 30 | | 4.9 | | | | |
| 31 | | 2.3 | | | | |
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| IC | Pin | VLO | VHI | UHF | 800 | Remarks |
|-----|-----|-----|-----|-----|-----|---------|
| 201 | 67 | | X | | | |
| | 68 | | X | | | |
| | 69 | | X | | | |
| | 70 | | X | | | |
| 71 | 71 | | X | | | |
| | 72 | | X | | | |
| | 73 | | 4.6 | | | |
| | 74 | | 2.1 | | | |
| 75 | 75 | | X | | | |
| | 76 | | 0 | | | |
| | 77 | | 4.7 | | | |
| | 78 | | 4.6 | | | |
| 79 | 79 | | 0 | | | |
| | 80 | | 4.6 | | | |

| Q | Pin | VLO | VHI | UHF | 800 | Remarks |
|-----|-----|-----|-----|-----|-----|---------|
| 201 | E | | 0 | | | |
| | C | | 4.5 | | | |
| | B | | 0 | | | |
| | 202 | E | | 0 | | |
| 203 | C | | 0 | | | |
| | B | | 1.7 | | | |
| | E | | 4.9 | | | |
| | C | | 0 | | | |
| 204 | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| | C | | 4.9 | | | |
| | B | | 0 | | | |
| 205 | E | | 4.9 | 4.9 | | |
| | C | | 0 | 4.7 | | |
| | B | | 4.9 | 0 | | |
| | E | | 4.9 | 0 | | |
| 206 | C | | 0 | | | |
| | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| | C | | 0 | | | |
| 207 | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |
| | B | | 0 | 4.9 | | |
| 208 | E | | 4.9 | | | |
| | C | | 0 | | | |
| | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| 209 | C | | 4.8 | | | |
| | B | | 0 | | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |

| Q | Pin | VLO | VHI | UHF | 800 | Remarks |
|----|-----|-----|------|-----|-----|---------|
| 14 | E | | 0 | | | |
| | C | | 4.3 | | | |
| | B | | 0.7 | | | |
| | 16 | E | | 4.7 | | |
| 17 | C | | 16.2 | | | |
| | B | | 1.1 | | | |
| | E | | 4.7 | | | |
| | C | | 8.9 | | | |
| 18 | B | | 1.1 | | | |
| | E | | 16.2 | | | |
| | C | | 8.9 | | | |
| | B | | 16.2 | | | |
| 19 | E | | 0 | | | |
| | C | | 2.2 | | | |
| | B | | 0.7 | | | |
| | E | | 0 | | | |
| 21 | C | | 4.7 | | | |
| | B | | 0 | | | |
| | E | | 0 | | | |
| | C | | 0.8 | | | |
| 22 | B | | 0 | | | |
| | E | | 0 | | | |
| | C | | 0.8 | | | |
| | B | | 0 | 4.8 | | |
| 23 | E | | 0 | | | |
| | C | | 1.5 | | | |
| | B | | 0 | | | |
| | E | | 0 | 0 | | |
| 24 | C | | 1.0 | | | |
| | B | | 0 | 4.7 | | |
| | E | | 0.2 | | | |
| | C | | 2.7 | | | |
| 26 | B | | 0.8 | | | |
| | 1 | | 0 | | | |
| | 2 | | 0 | | | |
| | 3 | | 0 | 4.5 | | |

| Q | Pin | VLO | VHI | UHF | 800 | Remarks |
|----|-----|-----|-----|-----|-----|---------|
| 1 | E | | 0 | | 0 | |
| | C | | 0 | | 4.0 | |
| | B | | 0 | | 0.7 | |
| | 2 | E | | 0 | | 0 |
| 3 | C | | 0 | | 4.1 | |
| | B | | 0 | | 0.7 | |
| | E | | 0 | | 0 | |
| | C | | 0 | | 4.4 | |
| 4 | B | | 0 | | 0.7 | |
| | E | | | | 0 | |
| | C | | | | 3.9 | |
| | B | | | | 1.7 | |
| 6 | 1 | | 0 | 0.8 | | |
| | 2 | | 0 | 0 | | |
| | 3 | | 0 | 3.9 | | |
| | E | | 0 | 0 | | |
| 7 | C | | 0 | 3.2 | | |
| | B | | 0 | 0.7 | | |
| | E | | 0 | 0 | | |
| | C | | 0 | 3.3 | | |
| 9 | B | | 0 | 0.7 | | |
| | E | | 4.7 | 4.7 | | |
| | C | | 0 | 4.6 | | |
| | B | | 4.1 | 4.1 | | |
| 11 | E | | 0.8 | | | |
| | C | | 4.0 | | | |
| | B | | 1.5 | | | |
| | E | | 0.8 | | | |
| 12 | C | | 4.5 | | | |
| | B | | 1.5 | | | |
| | E | | 2.5 | | | |
| | C | | 4.2 | | | |
| 13 | B | | 3.3 | | | |
| | | | | | | |
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| Q | Pin | VLO | VHI | UHF | 800 | Remarks |
|-----|-----|-----|-----|-----|-----|---------|
| 201 | E | | 0 | | | |
| | C | | 4.5 | | | |
| | B | | 0 | | | |
| | 202 | E | | 0 | | |
| 203 | C | | 0 | | | |
| | B | | 1.7 | | | |
| | E | | 4.9 | | | |
| | C | | 0 | | | |
| 204 | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| | C | | 4.9 | | | |
| | B | | 0 | | | |
| 205 | E | | 4.9 | 4.9 | | |
| | C | | 0 | 4.7 | | |
| | B | | 4.9 | 0 | | |
| | E | | 4.9 | 0 | | |
| 206 | C | | 0 | | | |
| | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |
| 207 | B | | 0 | 4.9 | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |
| | B | | 0 | 4.9 | | |
| 208 | E | | 4.9 | | | |
| | C | | 0 | | | |
| | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| 209 | C | | 4.8 | | | |
| | B | | 0 | | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |

| Q | Pin | VLO | VHI | UHF | 800 | Remarks |
|-----|-----|-----|-----|-----|-----|---------|
| 201 | E | | 0 | | | |
| | C | | 4.5 | | | |
| | B | | 0 | | | |
| | 202 | E | | 0 | | |
| 203 | C | | 0 | | | |
| | B | | 1.7 | | | |
| | E | | 4.9 | | | |
| | C | | 0 | | | |
| 204 | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| | C | | 4.9 | | | |
| | B | | 0 | | | |
| 205 | E | | 4.9 | 4.9 | | |
| | C | | 0 | 4.7 | | |
| | B | | 4.9 | 0 | | |
| | E | | 4.9 | 0 | | |
| 206 | C | | 0 | | | |
| | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |
| 207 | B | | 0 | 4.9 | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |
| | B | | 0 | 4.9 | | |
| 208 | E | | 4.9 | | | |
| | C | | 0 | | | |
| | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| 209 | C | | 4.8 | | | |
| | B | | 0 | | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |

| Q | Pin | VLO | VHI | UHF | 800 | Remarks |
|-----|-----|-----|-----|-----|-----|---------|
| 201 | E | | 0 | | | |
| | C | | 4.5 | | | |
| | B | | 0 | | | |
| | 202 | E | | 0 | | |
| 203 | C | | 0 | | | |
| | B | | 1.7 | | | |
| | E | | 4.9 | | | |
| | C | | 0 | | | |
| 204 | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| | C | | 4.9 | | | |
| | B | | 0 | | | |
| 205 | E | | 4.9 | 4.9 | | |
| | C | | 0 | 4.7 | | |
| | B | | 4.9 | 0 | | |
| | E | | 4.9 | 0 | | |
| 206 | C | | 0 | | | |
| | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |
| 207 | B | | 0 | 4.9 | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |
| | B | | 0 | 4.9 | | |
| 208 | E | | 4.9 | | | |
| | C | | 0 | | | |
| | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| 209 | C | | 4.8 | | | |
| | B | | 0 | | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |

| Q | Pin | VLO | VHI | UHF | 800 | Remarks |
|-----|-----|-----|-----|-----|-----|---------|
| 201 | E | | 0 | | | |
| | C | | 4.5 | | | |
| | B | | 0 | | | |
| | 202 | E | | 0 | | |
| 203 | C | | 0 | | | |
| | B | | 1.7 | | | |
| | E | | 4.9 | | | |
| | C | | 0 | | | |
| 204 | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| | C | | 4.9 | | | |
| | B | | 0 | | | |
| 205 | E | | 4.9 | 4.9 | | |
| | C | | 0 | 4.7 | | |
| | B | | 4.9 | 0 | | |
| | E | | 4.9 | 0 | | |
| 206 | C | | 0 | | | |
| | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |
| 207 | B | | 0 | 4.9 | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |
| | B | | 0 | 4.9 | | |
| 208 | E | | 4.9 | | | |
| | C | | 0 | | | |
| | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| 209 | C | | 4.8 | | | |
| | B | | 0 | | | |
| | E | | 4.9 | | | |
| | C | | 4.8 | | | |

| Q | Pin | VLO | VHI | UHF | 800 | Remarks |
|-----|-----|-----|------|-----|-----|---------|
| 201 | E | | 0 | | | |
| | C | | 4.3 | | | |
| | B | | 0.7 | | | |
| | 16 | E | | 4.7 | | |
| 17 | C | | 16.2 | | | |
| | B | | 1.1 | | | |
| | E | | 4.7 | | | |
| | C | | 8.9 | | | |
| 18 | B | | 1.1 | | | |
| | E | | 16.2 | | | |
| | C | | 8.9 | | | |
| | B | | 16.2 | | | |
| 19 | E | | 0 | | | |
| | C | | 2.2 | | | |
| | B | | 0.7 | | | |
| | E | | 0 | | | |
| 21 | C | | 4.7 | | | |
| | B | | 0 | | | |
| | E | | 0 | | | |
| | C | | 0.8 | | | |
| 22 | B | | 0 | | | |
| | E | | 0 | | | |
| | C | | 0.8 | | | |
| | B | | 0 | 4.8 | | |
| 23 | E | | 0 | | | |
| | C | | 1.5 | | | |
| | B | | 0 | | | |
| | E | | 0 | 0 | | |
| 24 | C | | 1.0 | | | |
| | B | | 0 | 4.7 | | |
| | E | | 0.2 | | | |
| | C | | 2.7 | | | |
| 26 | B | | 0.8 | | | |
| | 1 | | 0 | | | |
| | 2 | | 0 | | | |
| | 3 | | 0 | 4.5 | | |

| Q | Pin | VLO | VHI | UHF | 800 | Remarks |
|----|-----|-----|-----|-----|-----|---------|
| 1 | E | | 0 | | 0 | |
| | C | | 0 | | 4.0 | |
| | B | | 0 | | 0.7 | |
| | 2 | E | | 0 | | 0 |
| 3 | C | | 0 | | 4.1 | |
| | B | | 0 | | 0.7 | |
| | E | | 0 | | 0 | |
| | C | | 0 | | 4.4 | |
| 4 | B | | 0 | | 0.7 | |
| | E | | | | 0 | |
| | C | | | | 3.9 | |
| | B | | | | 1.7 | |
| 6 | 1 | | 0 | 0.8 | | |
| | 2 | | 0 | 0 | | |
| | 3 | | 0 | 3.9 | | |
| | E | | 0 | 0 | | |
| 7 | C | | 0 | 3.2 | | |
| | B | | 0 | 0.7 | | |
| | E | | 0 | 0 | | |
| | C | | 0 | 3.3 | | |
| 9 | B | | 0 | 0.7 | | |
| | E | | 4.7 | 4.7 | | |
| | C | | 0 | 4.6 | | |
| | B | | 4.1 | 4.1 | | |
| 11 | E | | 0.8 | | | |
| | C | | 4.0 | | | |
| | B | | 1.5 | | | |
| | E | | 0.8 | | | |
| 12 | C | | 4.5 | | | |
| | B | | 1.5 | | | |
| | E | | 2.5 | | | |
| | C | | 4.2 | | | |
| 13 | B | | 3.3 | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| Q | Pin | VLO | VHI | UHF | 800 | Remarks |
|-----|-----|-----|-----|-----|-----|---------|
| 201 | E | | 0 | | | |
| | C | | 4.5 | | | |
| | B | | 0 | | | |
| | 202 | E | | 0 | | |
| 203 | C | | 0 | | | |
| | B | | 1.7 | | | |
| | E | | 4.9 | | | |
| | C | | 0 | | | |
| 204 | B | | 4.9 | | | |
| | E | | 4.9 | | | |
| | C | | 4.9 | | | |
| | B | | 0 | | | |
| 205 | E | | 4.9 | | | |

SEMICONDUCTOR LEAD IDENTIFICATION

DIODES

C — A IN4003

C A 1SS85

A C 1SS97

C A HSK110TR
HSK120

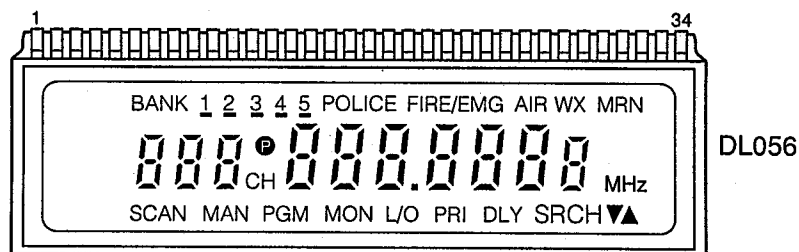
C A 1SV201-4 TRP
1SV188-9 TRP

C
A NC
HXM36NB

C
A A
1SS184
TE85L

C/A
A C
HSM88AS
TL

A
K1 K1
KV-1450



TRANSISTORS

C
E B
2SC3356-R24
2SC3121
2SA1162-Y
2SC3121-T5L

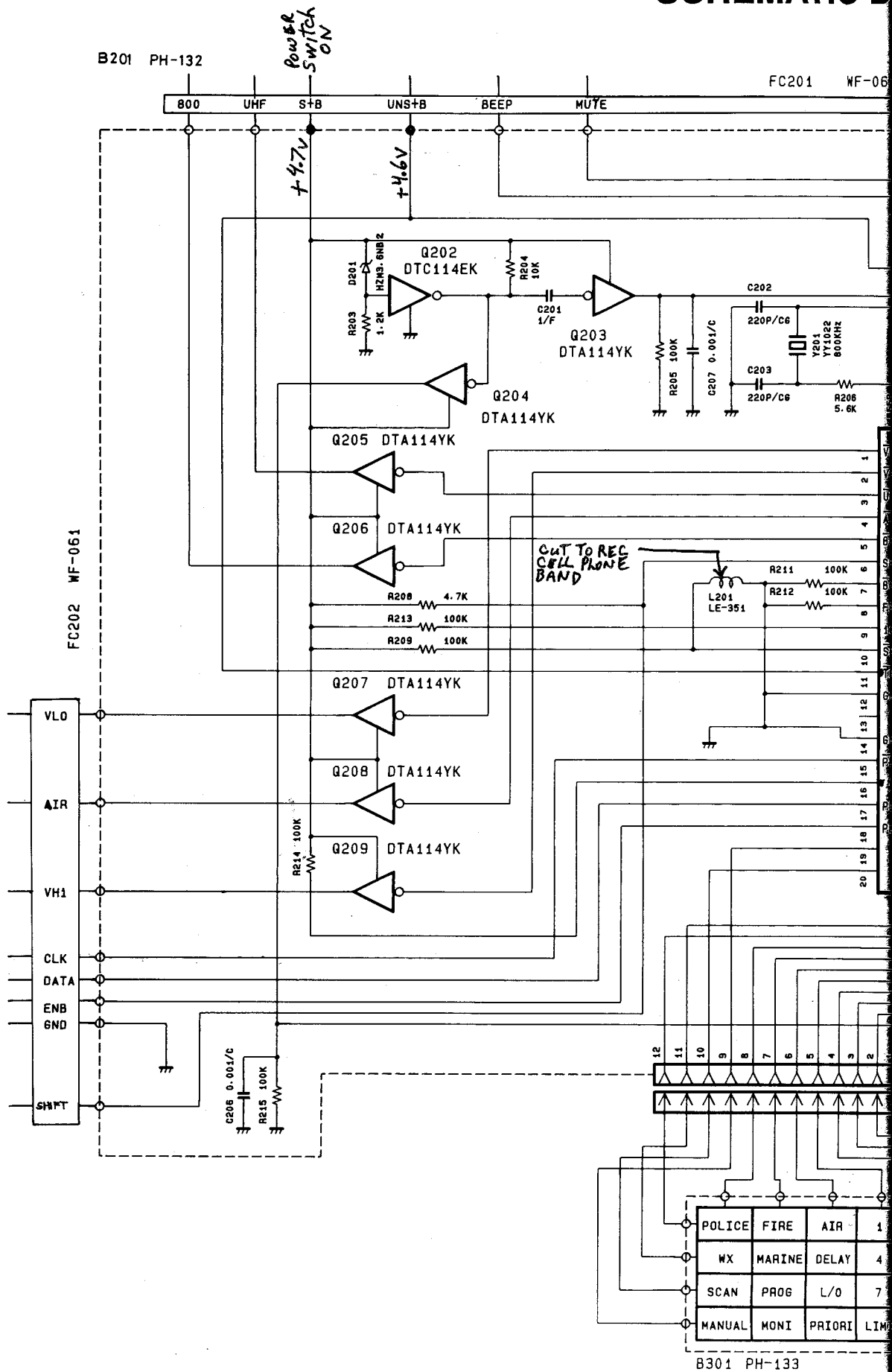
B
E C
2SC2812-L5
2SC3704
2SC2712-Y
DTC114 EK
DTA114 YK

B
E C
2SC3128

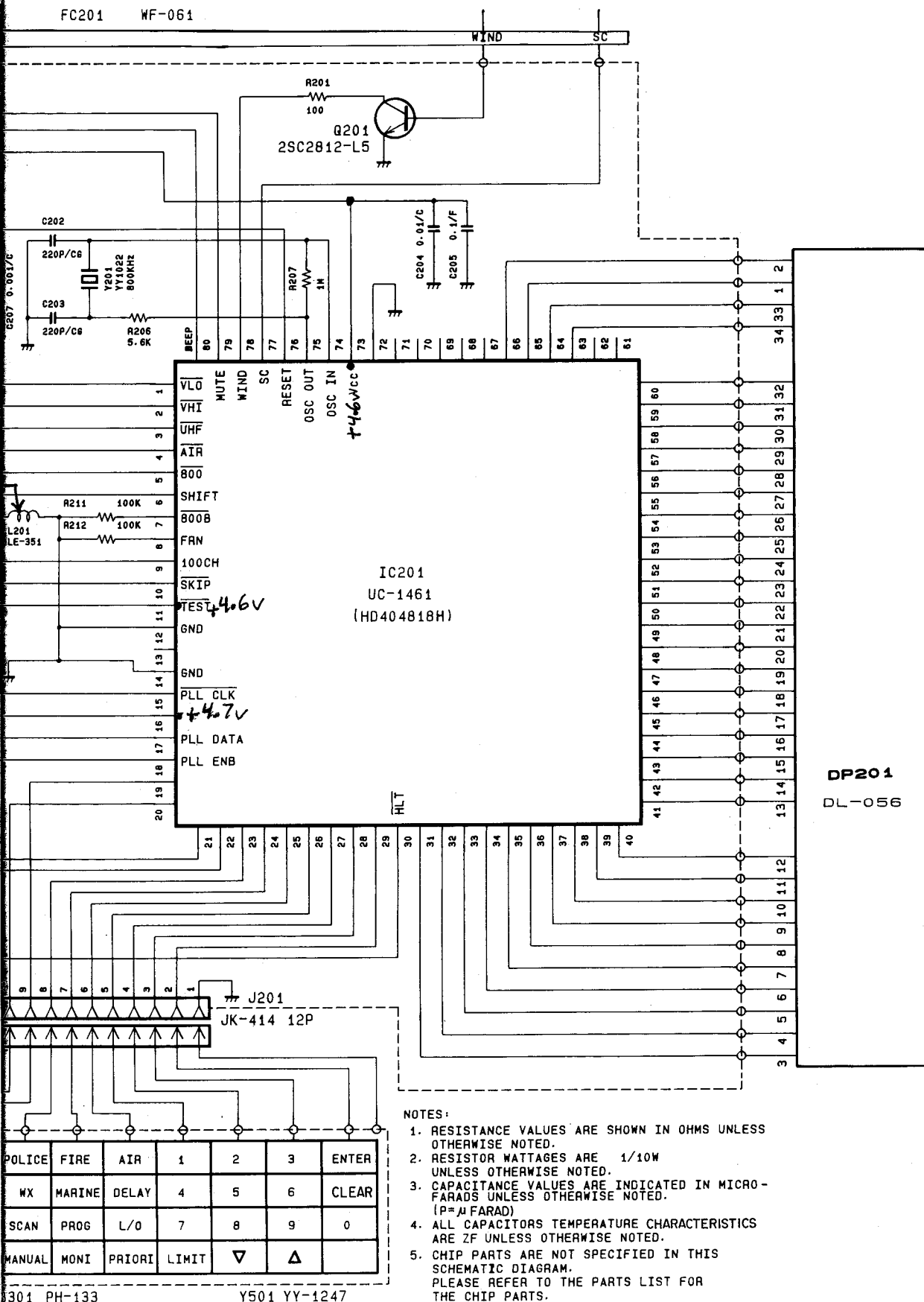
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SCHEMATIC D

Control Section

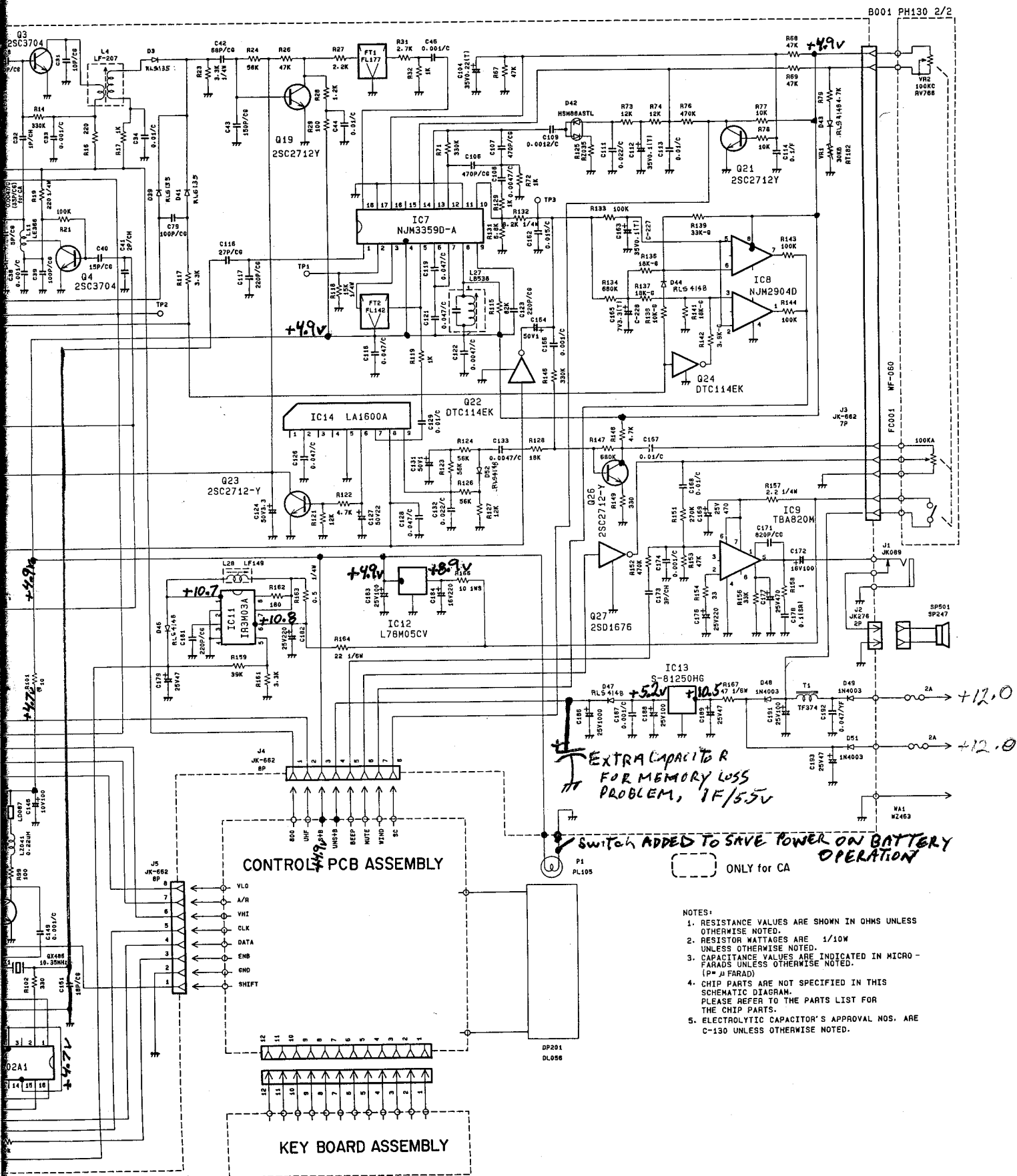


SCHEMATIC DIAGRAMS



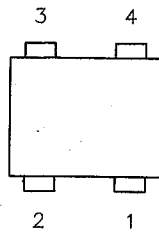
B001 PH-130 1/2





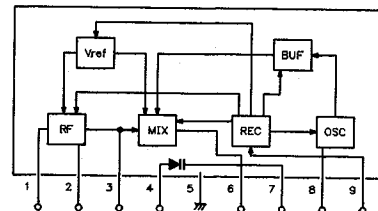
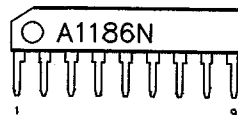
IC INTERNAL DIAGRAM

IC1,IC2
UPC1675G-T1

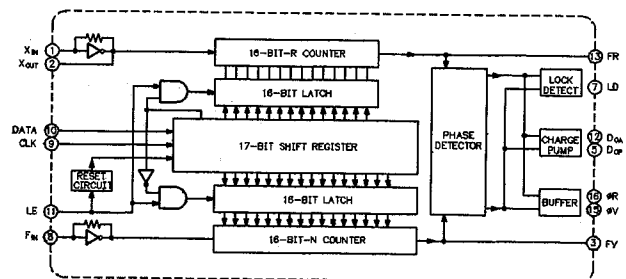
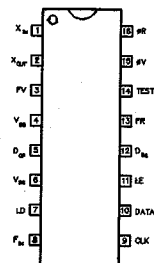


- 1: GND
- 2: Output
- 3: Vcc
- 4: Input

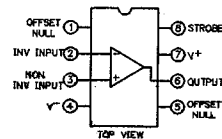
IC3
LA1186N



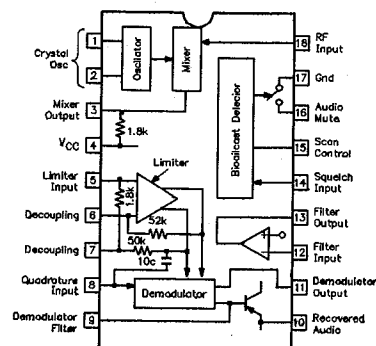
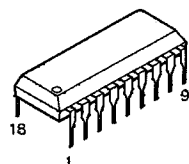
IC4
PLL2002A1



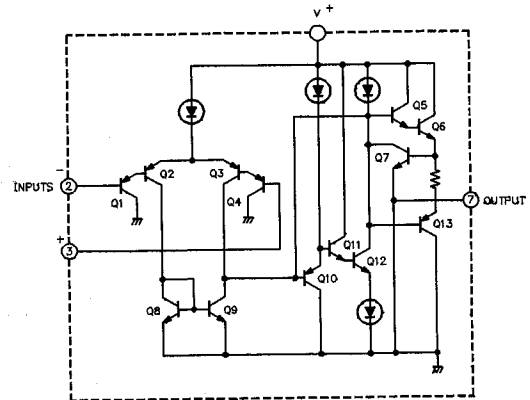
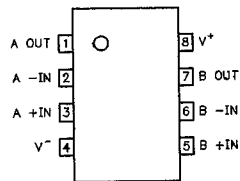
IC6
CA3140E



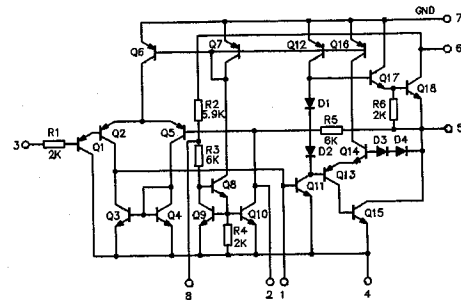
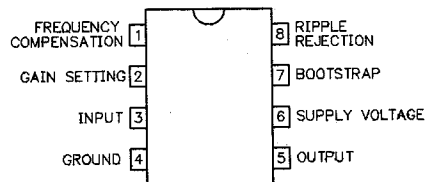
IC7
NJM3359D



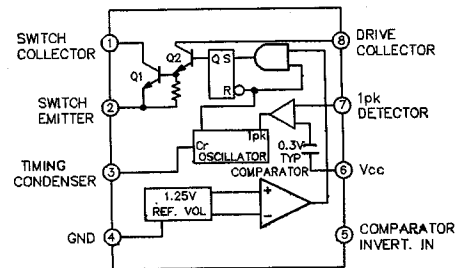
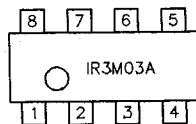
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NJM2904D



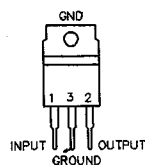
IC9
TBA820M



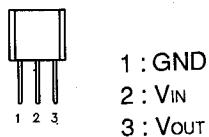
IC11
IR3M03A



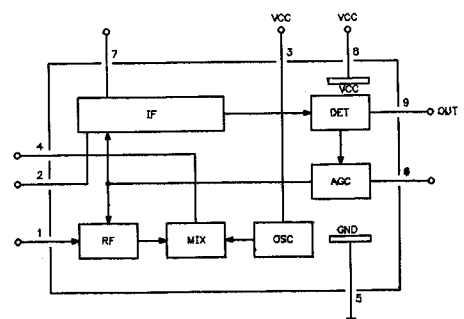
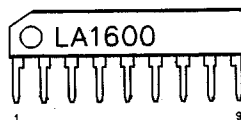
IC12
L78M05CV



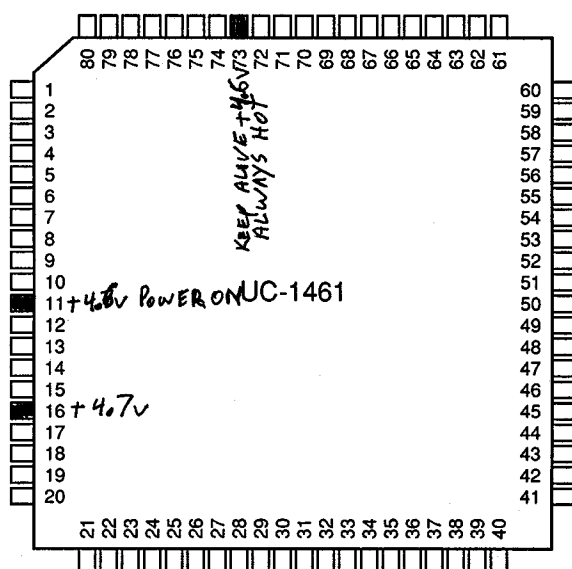
IC13
S-81250 HG



IC14
LA1600A



IC201
UC-1461



| PIN NO. | SIGNAL NAME | TERMINAL DESCRIPTION | PIN NO. | SIGNAL NAME | TERMINAL DESCRIPTION | PIN NO. | SIGNAL NAME | TERMINAL DESCRIPTION |
|---------|-------------|------------------------------------|---------|-------------|----------------------|---------|-------------|-------------------------|
| 1 | D4 | VL L FRN L AIR H DHI H UHF H 800 H | 28 | TIMO/R31 | 3 6 9 Δ | 55 | SEG25 | 27 |
| 2 | D5 | H H H L H H | 29 | INTO/R32 | ENT CLR 0 | 56 | SEG26 | 28 |
| 3 | D6 | H H H H L H | 30 | INTI/R33 | L : POWER SW OFF | 57 | SEG27 | 29 |
| 4 | D7 | H H L H H H | 31 | SEG1 | (DL 056) LCD PIN 3 | 58 | SEG28 | LCD PIN 30 |
| 5 | D8 | H H H H H L | 32 | SEG2 | 4 | 59 | SEG29 | 31 |
| 6 | D9 | 800MHz SHIFT H : SHIFT DOWN | 33 | SEG3 | 5 | 60 | SEG30 | 32 |
| 7 | D10 | 800MHz L : 800M | 34 | SEG4 | 6 | 61 | SEG31 | (OPEN) |
| 8 | VCREF/D11 | FRN H : FRN | 35 | S3G5 | 7 | 62 | SEG32 | (OPEN) |
| 9 | COMPO/D12 | 100CH/50 CH H : 100CH | 36 | SEG6 | 8 | 63 | COM1 | PIN 34 |
| 10 | COM1/D13 | CELLULAR SKIP L : SKIP (L20) | 37 | SEG7 | 9 | 64 | COM2 | PIN 33 |
| 11 | TEST | TO VCC +4.6V | 38 | SEG8 | LCD PIN 10 | 65 | COM3 | PIN 1 |
| 12 | X1 | TO GND | 39 | SEG9 | 11 | 66 | COM4 | PIN 2 |
| 13 | X2 | OPEN | 40 | SEG10 | 12 | 67 | V1 | OPEN |
| 14 | GND | GND | 41 | SEG11 | 13 | 68 | V2 | OPEN |
| 15 | SCK/R00 | PLL CLK (PLL IC 9 PIN) | 42 | SEG12 | 14 | 69 | V3 | OPEN |
| 16 | SI/R01 | PULL UP +4.7V | 43 | SEG13 | 15 | 70 | NUMO | OPEN |
| 17 | SO/R02 | PLL DATA (PLL IC 10 PIN) | 44 | SEG14 | 16 | 71 | NUMO | OPEN |
| 18 | R03 | PLL LE (PLL IC 11 PIN) | 45 | SEG15 | 17 | 72 | NUMG | GND |
| 19 | R10 | | 46 | SEG16 | 18 | 73 | VCC | + 4.6V |
| 20 | R11 | | 47 | SEG17 | 19 | 74 | OSC1 | OSC IN 800KHZ CELA LOCK |
| 21 | R12 | | 48 | SEG18 | LCD PIN 20 | 75 | OSC2 | OSC OUT |
| 22 | R13 | | 49 | SEG19 | 21 | 76 | RESET | H : RESET |
| 23 | R20 | POL WX SCN MAN | 50 | SEG20 | 22 | 77 | D0 | H : SCAN STOP |
| 24 | R21 | FIR MRN PRG MON | 51 | SEG21 | 23 | 78 | D1 | H : WINDOW CENTER F |
| 25 | R22 | AIR DLY L/O PRI | 52 | SEG22 | 24 | 79 | D2 | H : MUTE ON |
| 26 | R23 | 1 4 7 LIM | 53 | SEG23 | 25 | 80 | D3 | KEY TOUCH TONE |
| 27 | R30 | 2 5 8 ▽ | 54 | SEG24 | 26 | | | |

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