NOTE: THE STANDARD MODEL GX1510U IS IDENTICAL TO THE UNIDEN MODEL SMU4525K

Standard Communications

GX1510U

Service Manual

CONTENTS

25 Watt UHF Mobile Transceiver

FCC ID#
AMWUL083

LAND MOBILE

GX1510U/ SERVICE MANUAL

Table of Contents

Specifications

The GX1510U meets or exceeds Standard TIA/EIA 603 and the following specifications:

General

Available Channels	10
Frequency Range	450 - 470 MHz
Frequency Spread	TX: 7 MHz, RX 7 MHz (3dB degradation)
Channel Spacing	25.0 kHz/12.5 kHz (with narrow band option)
Power Source	13.6VDC ±0.2VDC (negative ground only)
Current Drain @ 13.6 VDC	
TX	6.5 A
RX@ Full Rated Audio	1000 mA
SQ.	500 mA
Operating Temperature Range	-30°C to +60°C
Size	2" H x 6.1" W x 7.5" D (55 mm x 155 mm x 191 mm)
Weight	2 lb 8 oz. (1.15 Kg)
Industry Canada Approval	Yes
FCC Type Acceptance	Part 90 and Part 15

Transmitter

Conforms to EIA RS-152-C

RF Output	25 W
Operating Bandwidth without Degradation	7 MHz (3dB degradation)
Frequency Stability	±5 ppm or 0.0005%
Modulation	16KOF3E
Modulation Frequency Response	
500 Hz	-6.0 dB
2 Hz	+6.0 dB
Spurious and Harmonic Suppression	-60 dB
FM Hum and Noise	-45 dB

Receiver

Conforms to EIA RS-204-C

Modulation Acceptance	7.5 kHz
FM Hum and Noise	-48 dB (unsquelched)
Operating Bandwidth without Degradation	7 MHz (3dB degradation)
12 dB Sinad Sensitivity	0.25 µV
Squelch Sensitivity	0.15 µV
Selectivity	-75 dB
Intermodulation Rejection	-70 dB
Frequency Stability	±5 ppm or 0.0005%
Spurious Rejection	-85 dB
Image rejection (better than)	-85 dB
Audio Distortion	3%THD @ 1000 Hz, 3 kHz Deviation
Audio Output	5.3W into 4Ω,10% THD

Features and specifications are subject to change without notice.

Introduction

Scope of Manual

This service manual is intended for use by experienced technicians familiar with similar types of equipment. The manual contains all service information required for the equipment described and is current as of the printing date. Changes that occur after the printing date are incorporated by Service Manual Revisions. The revisions are added to the manual as engineering changes are incorporated into the equipment.

Product Support

Technical Assistance and information is available from the Product Support Group during normal work days between the hours of 8:00 A.M. and 5:00 P.M. Pacific Standard Time. You may reach the Product Support Group by writing to:

STANDARD COMMUNICATIONS CORP.
Product Support
1111 Knox Street
Torrance, CA 90502.

Or by telephone:
1-800-411-9548

Licensing

Before using your transceiver, it must be properly licensed by the appropriate government licensing agency and properly installed. Your SCC Dealer will be able to help you with any or all of these requirements and will be there to help you with all your future communications needs.

Replacement Parts

Replacement parts are available through the SCC Parts and Service Division located in Los Angeles, California. When ordering replacement parts, please use the complete identification number of the part. If the identification number is not known, the order should contain the Part Symbol Number, the Unit Model Number, and a description of the part so that the part may be properly identified. Parts orders may be placed by writing to:

Standard Communications Corp.
Parts Department
1111 Knox Street
Torrance, CA 90502.

Or by telephone: 1-800-366-4566
or by FAX: 1-800-359-4122

Ordering Additional Manuals

To order additional copies of this Service Manual, MMGX1510U, send order to:

Standard Communications Corp.
Parts Department
1111 Knox Street
Torrance, CA 90502.

Or by telephone: 1-800-366-4566
or by FAX: 1-800-359-4122

Installation

Planning the Installation

The radio can perform reliably if you install all of the parts properly. A bad installation may result in adverse vehicle operation. Before you start installation, make sure that you have all of the parts, tools, and test equipment used in the installation. Also make sure that all the parts operate properly and that you have throughly planned the mounting locations. If you do this, you can avoid problems and save time. Remember that planning is the key to a good installation.

Adverse Vehicle Operation

The installation of radio equipment in certain vehicles may adversely affect vehicle operations, such as:

- Engine performance
- Driver information systems
- Anti-skid braking systems
- Electrical charging systems
- Entertainment systems

Standard Communications Corp. is not responsible for the cost to protect the vehicle from adverse operations following the installation of radio equipment.

Unpacking

Carefully unpack the radio and make sure that you have all of the following:

- Transceiver mounting bracket
- Transceiver
- Microphone hang-up bracket
- Microphone
- Power cable with fuse holder
- Antenna
- Operator's Guide (Read carefully and save)

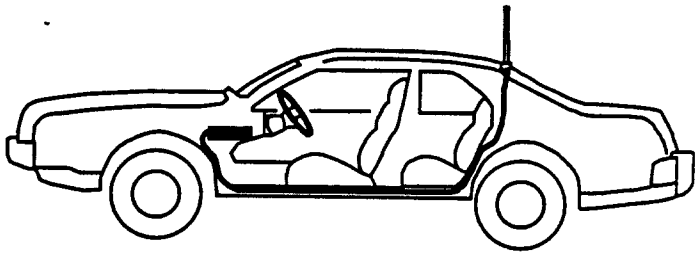
If any radio equipment is missing or damaged, notify the distributor.

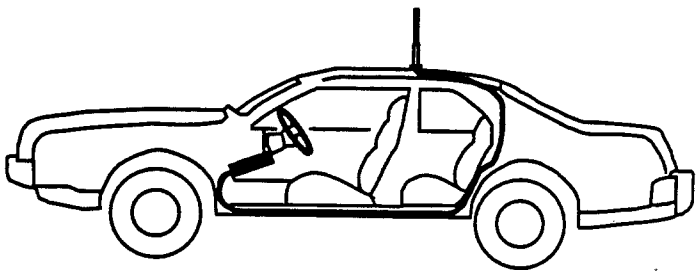
Operational Tests

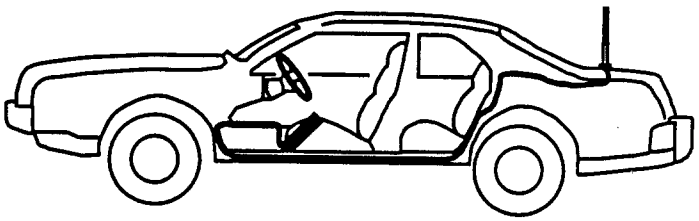
Before you install the transceiver in a vehicle, make sure the transceiver operates properly. All SCC transceivers are factory tested and are in working order when shipped. However, shipping can affect the unit's alignment. Perform an operating test with all parts connected that will be used in the final installation. Check the transmitter's output power, frequency, and deviation; the receiver's sensitivity, squelch operation, audio power, and distortion; and CTCSS. Do not install any part that has a problem. Correct any problems before installing the transceiver.

Transceiver and Antenna Mounting Locations

The transceiver, and the antenna can be installed in a number of places on the vehicle. The following illustrations show possible locations for each of these components.







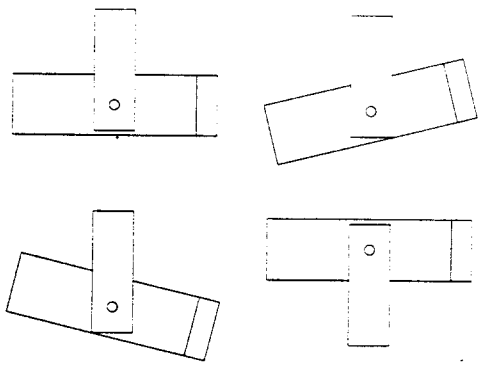
The transceiver, and the antenna can be installed in a number of places on the vehicle. The following illustrations show possible locations for each of these components.

When you plan the location of the components, keep the following precautions in mind to makinstallation easier and to ensure that the installe parts and the vehicle work properly:

- Plan the locations of the components so that they will not interfere with the driver's vision or operation of the vehicle.
- Plan the locations of the components so that all controls and displays can be viewed and easily accessed by the operator.
- Avoid unnecessary disturbing of the vehicle's electrical system.
- Use existing passages in the dashboard, trunk, and floor to avoid excessive drilling.
- When you drill holes, be careful not to damage other components of the vehicle.
- When you route wiring or cables through holes or other locations with sharp edges, be careful not to damage the insulation. After you route the wiring or cables through these locations, seat the wiring or cables with a grommet or other means to avoid future insulation damage due to normal vibration and use.
- Avoid locations that may involve moving parts, such as seat or window mechanisms.
- Avoid locations that may expose the parts to moisture.

Installing the Transceiver

The transceiver is small enough to fit almost anywhere. You can install it under the dash, seat, or in any other convenient location. Plan the location for mounting the transceiver so that all controls and displays can be viewed and easily accessed by the operator without obstructing the driver's vision. The antenna cable, power cord, and the external speaker wiring connect at the rear of the radio. The radio can be mounted in any position on any suitable surface.



Keep the following in mind when you install the transceiver:

- Make sure that air can circulate around the transceiver and that nothing is placed directly on top of it.
- Check all moving seat parts and doors to avoid contact with cables or connectors.
- Allow ample room to access connectors.

To install the transceiver:

1. Securely attach the mounting bracket to a structural member of the vehicle, using the hardware provided.
2. Slide the radio into the mounting bracket and tighten the knurled knobs until they secure the transceiver to the mounting bracket.

Installing the Antenna

Each vehicle model and body style reacts differently to radio frequency energy. How you install the antenna can effect the range and quality of communications.

Before you mount an antenna on a vehicle, use a magnetic mount antenna to check the proposed antenna location for any undesired effects on the vehicle. After you check the proposed antenna location for problems, mount the antenna used in the final installation according to the manufacturer's instructions. The permanent body mount antenna or the magnetic mount antenna has the best performance when mounted in the center of the roof or rear deck lid. The glass mount antenna has the best performance when mounted in the center of the upper edge of the rear window, side window, or windshield.

After you mount the antenna, route the antenna cable through channels in the vehicle's body and as far as possible from the electrical system. This reduces the amount of RF energy that may leak into the electrical system. When you route the antenna coaxial cable through holes or other locations with sharp edges, be careful not to damage the insulation.

After you route the cable through these locations, seat the cable with grommets or other means to avoid future insulation damage due to normal vibration and use. Make sure that the coaxial antenna cable is protected from moisture, moving parts, and passengers. Connect the antenna cable to the antenna jack on the transceiver.

Refer to the antenna manufacturer's instructions for antenna tuning. This adjustment must be done with the antenna and the radio installed and connected. The antenna has the best performance if its voltage standing wave ratio (VSWR) is kept as low as possible on all transmit channels. Do not exceed a VSWR of 1.5:1.

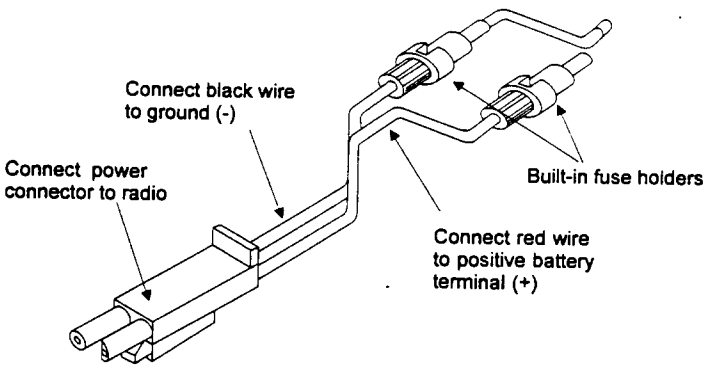
Connecting the Power

This radio is designed to operate on a +13.6 VDC, 15-ampere power source, with a negative ground. Connect the power cables directly to the battery terminals. Install the inline fuse holder as close as possible to the positive terminal of the battery. Before you connect the power cable to the transceiver, make sure that all of its fuses are properly installed. Connect the wires in the power cable as follows:

- Red wire to positive terminal of battery.
- Black wire to negative terminal of battery.

If the transceiver is not mounted in the dash area, route the power cable to the door sills and along the door sills to the dash area. From the dash area, route the power cable through the fire wall into the engine compartment and then to the battery.

If the power cables must cross to the other side of the vehicle, route the cables to the front of the engine compartment and then cross over to the battery.



When you route the power cable through holes or other locations with sharp edges, be careful not to damage the insulation. After you route the power cable through these locations, seat the power cable with grommets or other means to avoid future insulation damage due to normal vibration and use.

Make sure that the power cable is protected from moisture, moving parts, passengers, and engine heat in the engine compartment.

Microphone

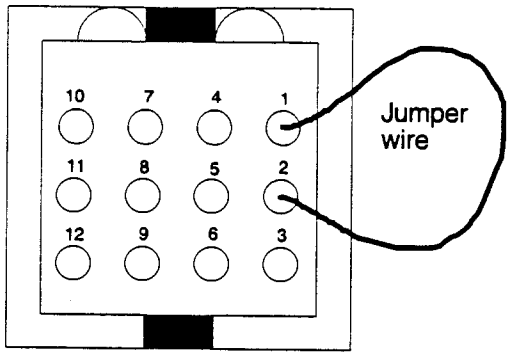
Do not use a preamplified microphone with this radio. The audio portion of this radio is adequate. Preamplification is not necessary. Mount the microphone hang-up bracket within reach of the microphone cord. If the radio operates with CTCSS, make sure that the microphone hang-up bracket is electrically grounded. Connect the microphone to the microphone jack at the front of the radio.

Built-in or External Speaker

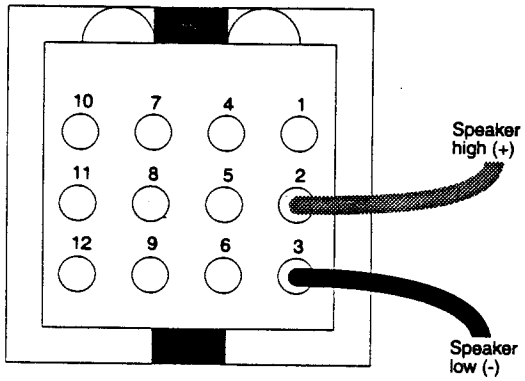
If an external speaker is not used, make sure that a jumper wire connects pins 1 and 2 of the speaker jumper plug. Place the speaker jumper plug in the accessory socket at the rear of the radio

If an external speaker is used, make sure that you have the speaker properly connected to the accessory socket. Also make sure that you have the speaker's positive wire connected to pin 2 of the

accessory plug and the speaker's negative wire connected to pin 3 of the accessory plug.



The external speaker may be mounted at any convenient location in the vehicle. Plan the location of the external speaker so that it does not obstruct the driver's vision. Protect the external speaker from moisture, moving parts, and passengers.



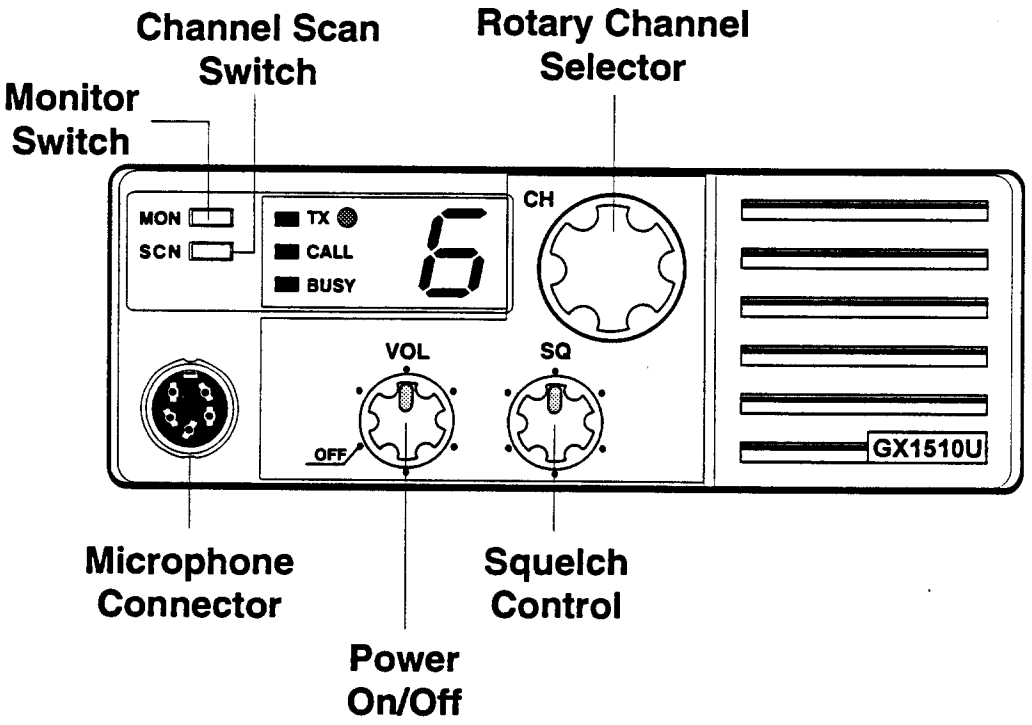
Troubleshooting Installation Problems

If any problems apperas following installation, determin the cause of the problem and correct it before operating the vehicle. Some possible sources of problems are:

- Power cable connected to points other than the battery.
- Antenna location
- Poor shielding or connections on the wiring or cables
- Transceiver wiring located too close to the vehicle's electrical system.

Controls, Connectors and Indicators

Front Controls



Monitor Switch (MON) Press to monitor a transmission whether or not it has CTCSS or DCS coding. Monitor stops active scanning. Press again to disable.

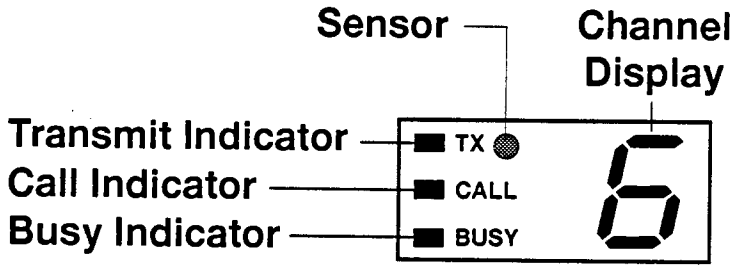
Channel Scan Switch (SCAN) Press to turn the scan feature on. Press again to disable.

Rotary Channel Selector (CH) Rotate either clockwise or counterclockwise to select a channel. The selected channel number appears in the channel LED display.

Power On/Off - Volume Control (VOL) Rotate clockwise to turn the power on and to increase the volume. Rotate counterclockwise to decrease the volume and turn the power off.

Squelch Control (SQ) Rotate clockwise to decrease or counterclockwise to increase the opening sensitivity of the receiver. When you first switch the radio on, rotate this control fully counterclockwise, adjust the volume to a comfortable level, and then rotate clockwise until all background noise disappears.

Push-to-Talk (PTT) Switch (on microphone) Press to transmit. Release to receive.



Automatic Dimmer Sensor — Adjusts the intensity of the indicators. If the ambient light level increases, the intensity of the indicators increases. If the ambient light level decreases, the intensity of the indicators decreases. This sensor requires no operator adjustments.

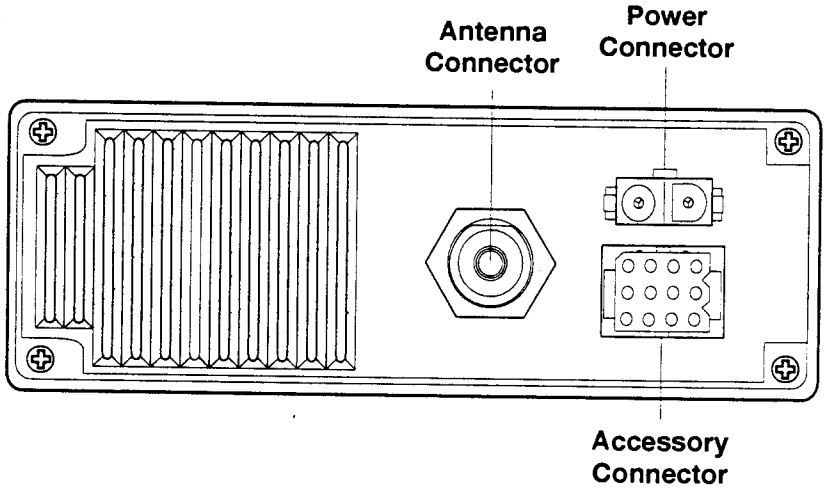
Channel Display — Green seven-segment LED shows the current channel number as a single digit. Channel 10 displays as 0 (zero).

Transmit Indicator (TX) — Red indicator lights while you press the PTT switch and shows that the radio is transmitting.

Call Indicator (CALL) — If you receive a call on a CTCSS or DCS coded channel, the yellow indicator lights to show transmission from another radio. If you press the PTT switch, this indicator turns off.

Busy Indicator (BUSY) — Green indicator lights if a carrier occurs on the receive channel. This shows transmit activity on the channel by another radio.

Rear Connectors



Antenna Connector — Connects the antenna cable to the radio.

Power Connector — Connects the power cable to the radio.

Accessory Connector — Connects optional accessories to the radio, such as an optional external speaker.

Operating Instructions

The GX1510U is a high-performance UHF mobile radio. The operating frequency band is from 450 to 470 MHz. The channel spacing is 25 kHz. The transmitter RF power output is 25 Watts.

The radio-operating software is stored in EPROM, programmed at the factory. The customer data, such as channel information, is stored in EEPROM, programmable by a trained SCC Dealer. The SCC Radio Programmer, A1510, and PPS1510 software are required to program the customer data.

Power Up

1. Rotate the VOL (volume) control clockwise until it clicks to turn on the radio.
2. Press in and latch the MON* switch.
3. Rotate the SQ (squelch) control fully counterclockwise.
4. Adjust the volume to a comfortable level by rotating the VOL control clockwise to increase the volume or counterclockwise to decrease the volume.
5. Rotate the SQ control clockwise until all background noise disappears. For the best operation, leave the squelch control in this position. Continuing to rotate the squelch control clockwise results in decreased receiver sensitivity.
6. Press the MON switch again to unlatch.
7. Rotate the Rotary Channel Selector until the channel number you want appears in the channel display.
8. Listen for any messages on the channel.
9. To use the scan feature, press in the SCAN* switch.
10. When there is no activity on the channel, press and hold the PTT switch to begin transmitting. This lights the RED Tx indicator. For the best transmission, hold the microphone approximately two inches in front of your mouth. Before you start speaking, wait 1 to 2 seconds after pressing the PTT switch. Speak clearly and in a normal conversational voice.
11. When you finish speaking, immediately release the PTT switch and listen for a reply.

Busy Channel TX Lockout DISABLED

This feature prevents keying up the transmitter when a carrier with the same frequency is present. It blocks interference to other users sharing the same channel frequency.

Scan ENABLED

To start scanning, press in and latch the SCAN switch. To search for calls addressed to your unit, leave the scan feature on. When you unhook the microphone from a properly grounded microphone hanger, the channel scan pauses. Channel scanning resumes when you place the microphone on the grounded hook. The radio scans until you either unground the microphone, press the Monitor switch, or press the Scan switch again to release it.

Monitor

To monitor a channel, press in and latch the MON* switch. The monitor feature disables the CTCSS/DCS decoding and scanning. The radio monitors the selected channel whether it is coded or not. Press and unlatch the switch to end monitoring.

Scanning and Monitoring Usage

The following table lists the actions with all combinations of the SCAN and MON switches.

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* To function properly, the microphone must be placed securely into its holder.

	MON ON (switch in)	MON OFF (switch out)
SCAN ON (switch in)	No scanning, monitoring the selected channel	Scanning if microphone is grounded.
SCAN OFF (switch out)	Monitoring the selected channel	No monitoring or scanning.

Talk-Back Channel 3 SECONDS

The talk-back channel allows the user to respond to a call without using the channel selector to reach the active channel. If the talk-back feature is programmed for RECEIVED, and a call is received on a non-priority channel, the user can press the PTT button to respond. If the PTT button is not pressed during the amount of time selected in the drop out delay field (1 second or 3 seconds), or if the user hangs up the mic after responding to the call, the radio resumes scanning. The talk-back feature is programmed into the radio by a dealer.

Time Out Timer

The Time Out Timer automatically turns off the transmitter after the programmed time interval expires. Before disconnecting, the radio sounds an alert. It prevents busying a repeater caused by accidental transmission and also possible transmitter damage caused by transmitting for extended periods.

The Time-out Timer is programmable into the radio by your dealer to eight choices:

- disabled ← DEFAULT
- 15 seconds
- 30 seconds
- 60 seconds
- 90 seconds
- 120 seconds
- 180 seconds
- 240 seconds.

Note: The timer is reset after each transmission.

Switch Tone ON

The Switch Tone feature can be programmed by a dealer to sound a tone when you press the MON and SCAN switches.

Programming

The GX1510U is programmed using a dealer-supplied personal computer, programmer software (PPS1510), and programmer adapter (A1510). The RS-232 cable from the computer to the A1510 is not supplied.

The programmer adapter converts the RS-232 logic levels from the computer to TTL levels required by the GX1510U and vice versa. The programmer adapter is connected to the radio microphone jack.

The programming data is as follows:

- Customer Data Parameter
  - Function Parameter
    - Time Out Timer
      - (disable, 15, 30, 60, 90, 120, 180, 240 seconds)
    - Busy Channel Lock Out (Yes, No)
    - Switch Tone (On, Off)
- Scan Parameter
  - Scan (Yes, No)
  - Drop Out Delay (1, 3 seconds)
  - Dwell time (100, 150, 200 ms)
  - Priority Type
    - Priority Scan Off
    - 1st Priority On
    - 1st and 2nd Priority On
  - Priority Channel — First / First, Second
    - Fixed None
    - Fixed Fixed
  - Talk-Back Channel (priority, received)
- Channel Parameter (up to 10 Channels)
  - TX frequency
  - TX Tone (Carrier, DCS, CTCSS)
  - RX frequency
  - RX Tone (Carrier, DCS, CTCSS)

If a channel is programmed for receive only, the display will blink if you attempt to transmit on that channel.

Circuit Description

To better understand the theory of operation of the GX1510U, refer to the block diagram and schematic. The GX1510U consists of the Main, Logic, PLL, H. IC*, VOL and the LED PCBs. The circuits of the PLL, H. IC, and VOL PCBs are included in the Main PCB description.

Main PCB

The Main PC board assembly consists of:

- Synthesizer (includes the PLL PCB)
- Receiver
- Transmitter
- Regulator

Synthesizer

The synthesizer consists of a Phase Locked Loop (PLL) with a prescaler, a reference crystal oscillator, and two Voltage Controlled Oscillators (VCO).

When the operating channel of the radio is selected, the microprocessor (IC601) provides the PLL IC (IC301) with channel frequency information. Pins 10, 11, and 12 of IC601 supply clock pulses, a latch enable pulse, and PLL data to IC301 respectively.

The Tx VCO consists of Q305, D302, and D305 while the Rx VCO consists of Q302, L302, and D301. Enabling the VCO is accomplished when the PTT switches the TX and RX +B DC lines. The output of the VCOs feeds back to pin 5 of the PLL IC through the buffer-amplifier (Q301).

The VCO output enters the phase detector at pin 5 of IC301 and keeps it in phase so that no frequency changes are detected. The internal phase detector of the PLL IC senses any phase difference between the divided VCO frequency and the reference oscillator frequency. A logical low level is set at pin 6 of IC301 to indicate an out-of-lock condition of the PLL. This signal then goes to the microprocessor (pin 7 of IC601). When the PLL is in the locked condition, pin 6 of IC301 sets a logical high.

The synthesizer frequency stability is maintained to within 5.0 ppm over a temperature range of -30°C to +60°C. The synthesizer has a 12.8 MHz reference oscillator (Q304 and X301).

The temperature compensation circuit for the reference oscillator consists of Q310, Q311, Q312, Q313, and TH302. In case the temperature is less than 0°C, both the temperature sensor (TH302) and the heater (Q313) keep the temperature to 0°C around the crystal (X301). The tuning coil L306 adjusts the oscillation frequency of the reference oscillator.

Tx audio and Tx tone signals are applied to the variable capacitor diodes D305 and D303 to be modulated to the VCO and reference frequencies, so the modulation response is flat for a wide range of audio frequencies.

In the Rx mode, the Rx VCO oscillates 21.4 MHz lower than the Rx channel frequency. The Rx mixer (Q102) produces the first IF frequency (21.4 MHz) from the received signal and the Rx local frequency, the Rx VCO output.

In the Tx mode, the Tx VCO oscillates at the Tx channel frequency.

Receiver

The receiver converts the received RF signal to an audio signal. It contains an antenna switch, amplifier, mixer, IF IC, de-emphasis/high pass filter, audio muting, SQ control, and audio power amplifier. The receiver is a double-conversion type with intermediate frequencies of 21.4 MHz and 455 kHz. The programmable frequency range is from 450 to 470 MHz with a 7 MHz bandwidth within 3 dB degradation. The filters in the Rx section provide selectivity, image and spurious rejection, and reduction of other undesired frequencies.

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* The H.IC PCB is a hybrid current sensor printed circuit board.

Antenna Switch (D201 and D203)

In the Tx mode, PIN diodes D201 and D203 are turned on, providing an RF path for the transmitted signal and reflecting RF away from the receiver input. During receive, both diodes are turned off, isolating the transmitter amplifier from the receiver input and providing a low loss path for the received signal to the receiver front end. Both transmitted power, and the received signal pass through a low-pass filter that is coupled to the antenna.

First Amplifier (Q101)

The antenna switch sends the received signal to 1st amplifier Q101, passing through FT102 a band-pass filter (BPF) to reduce undesired frequencies.

Q101 amplifies the filtered signal to recover the losses of the antenna switch and the filters, and to increase sensitivity. Then this amplified signal is sent to the 1st mixer, passing through BPF FT102.

First Mixer (Q102)

The received signal is mixed with the first local frequency to produce a 21.4 MHz first IF signal. The first IF signal is sent to the 21.4 MHz crystal band pass filters (FT103 and FT104) which reduce adjacent channel undesired frequencies.

IF IC (IC101)

IC101 provides all the functions of a comprehensive FM IF system. This IC contains a second local oscillator, second IF mixer, second IF limiting amplifier, and quadrature FM detector.

The second mixer combines the first IF signal with the second local frequency (20.945 MHz) to produce the 455 kHz second IF signal.

The second IF signal is supplied to 455 kHz ceramic filters (FT105 and FT106) to reduce noise near the second IF. The signal is then applied to the second IF amplifier and limiting amplifier. The limiting amplifier limits the signal to a specific level, removing any amplitude noise by clipping the 455 kHz signal. The limited 455 kHz signal then goes to the quadrature detector that sends a demodulated audio signal to pin 15 of IC101. This signal contains CTCSS tone (or CDCS) and voice audio, or just a white noise at no signal.

De-emphasis/High Pass Filter (R128, C152 and IC102)

The output audio signal (with data) of IF IC (pin 15) goes through a de-emphasis circuit (R128 and C152), and high pass filter (IC102). The de-emphasis circuit filters recovered audio for a specific audio frequency response. The high pass filter attenuates the low frequency signal of DCS or CTCSS contained in the demodulated signal.

Rx Audio Muting (Q605 and Q606)

The output audio signal from the HPF is sent to the AF muting circuit (Q605 and Q606) on the logic PCB. The microprocessor (pin 30) sends a mute control signal to Q605. The transistor Q605 supplies a logical low when the control signal from the microprocessor is a logical high, causing Q606 to mute the received audio.

The audio signal passes through the mute circuit when the microprocessor sends a logical low level to Q605.

Squelch (Q103 and IC101)

The discriminator output (with CTCSS tone or DCS) from the IF IC goes to the noise amplifier (Q103), then to the squelch circuit in IC101 passing through the squelch control on the front case (VR602). This circuit is disabled in the TX mode when the microprocessor sends a TX control signal and forces the collector of Q103 to almost ground potential. The squelch information is provided to the microprocessor (pin 33) from the IF IC (pin 19 of IC101). VR101 adjusts the tight squelch level of the radio.

Audio Power Amplifier (IC103)

Pin 6 of IC103 receives and amplifies the audio signal from the AF volume control VR601 (VOL PCB). The audio power output (pin 1 of IC103) is delivered to the internal speaker or an external speaker through the 12-pin accessory plug (W502).

The microprocessor (pin 13) generates a tone to the speaker to indicate radio conditions such as

busy channel lockout, time out timer, and switch tone. The tone is applied to the audio amplifier through R636, R637, C610, and R641.

Transmitter

The transmitter converts an audio message to an RF signal and amplifies the RF signal to 25 Watts. The transmitter contains the HPF, limiter and pre-emphasis, LPF, FM modulator, pre-driver, RF power amplifier, RF power controller, transmit inhibit, and antenna switch.

The synthesizer output frequency is from 450 MHz to 470 MHz, which is the same as the Tx frequency. The Tx bandwidth within 3 dB degradation is 7 MHz.

When The PTT switch is pressed, the microprocessor (pin 34) detects the pressed PTT switch and switches TX control line (pin 48) to a logical high.

High Pass Filter (IC272) and MIC Amplifier (IC272)

The speech audio from the external microphone enters to the HPF (pin 3 of IC272) passing through the microphone jack on the front panel (pin 4 of J603) and the MIC amplifier (Pin 5 or IC272).

Limiter and pre-emphasis (IC272)

The output of the HPF/Mic Amp goes to the high-gain amplifier (the limiting amplifier) that has a 6 dB octave gain curve for pre-emphasize, providing a limiting modulation. The output of the limiter goes to the low pass filter (LPF), passing through VR202 that adjust the maximum AF deviation.

Low Pass Filter (IC271)

The output of the limiter is supplied to the low pass filter (IC271). The LPF passes audio frequencies from 300 Hz to 3 KHz and attenuates everything above 3 KHz. The processed audio signal is applied to varactor modulation diodes in both the reference oscillator and TX VCO circuits. The ratio between the two modulators is adjusted by the modulation balance control, VR 301.

CTCSS or DCS signals are applied from the logic PCB to the FM modulator, passing through VR203. VR203 adjusts the Tx tone deviation.

Tx Pre-Amplifier (Q204)

In the Tx mode, the output of the synthesizer is supplied to the Tx pre-amplifier. The Tx pre-amplifier increases the transmit signal to a level sufficient to drive the Tx final stage. Transistor Q204 is enabled by the Tx inhibit control line from the microprocessor (pin 20 of IC601) through transistors Q208 and Q209.

Final Stage and Power Controller (Q203, Q202, Q201, IC801, Q207, and Q206)

The power amplifier has 3 stages, consisting of Q203, Q202, and Q201.

The power amplifier circuit amplifies the output of the synthesizer to the proper output wattage (25W at the antenna connector). The power control circuit (IC801, H. IC* PCB) is connected to the final stage of the Tx power amplifier and monitors the current drain entering the final Tx power amplifier through the current sense resistor (R205).

The power control circuit is a negative feedback closed loop system (made up of Q201, IC801, Q207, Q206, Q203, Q202, Q201). Since it monitors current drain and increases the control voltage to the base of the transistor (Q207) when the power output decreases, the output RF power is stabilized to the level adjusted by VR201.

Transmit Inhibit (Q208 and Q209)

While the PLL is out of lock, pin 6 of the PLL IC (IC301) releases a logical low level to the microprocessor (pin 7 of IC601). The microprocessor then sends a logical low level to the Tx inhibit control signal (pin 20 of IC601). This signal is sent to Q209, and turns Q209 and Q208 off. Q208, when off cuts DC power to the pre-driver (Q205 and Q204) to inhibit Tx power output from Q204

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* The H.IC PCB is a hybrid current sensor printed circuit board.

and prevent transmission on an improper frequency.

When the PLL is locked, pin 6 of microprocessor IC301 becomes a logical high. This causes the microprocessor to send a logical high signal to theTx inhibit circuit to turn Q209 on. This forces the base of Q208 to ground, turning it on. This results in +8 VDC power being supplied to the Tx pre-driver (Q205 and Q204), enabling Tx power output in the Tx mode.

Antenna Switch (D201 and D203)

During Tx , PIN diodes D201 and D203 are turned on, providing a low loss path for the transmitted signal and reflecting RF energy away from the receiver input. During receive, both diodes are turned off, isolating the transmitter amplifier from the receiver input and providing a low loss path from the antenna filter to the receiver input. The Tx harmonic filter reduces the second and third harmonic frequencies generated within the RF amplifier.

Power Supply / Regulator

The power control circuit (Q206 and IC801) and power amplifiers Q202 and Q201 (through R205) are directly connected to the car battery. When the power switch of the radio is turned off, the current drain is less than 10 mA. Other components are connected to the switching transistor (Q403).

When the power switch of the radio is turned on, the base of the switching transistor Q403 is forced to ground and turned on. Q403 supplies normally filtered 13.6 V of the car battery voltage to IC103 (AF amplifier) and IC401 (8V regulator).

The voltage regulator (IC401) regulates common +8V DC supply voltage to each component in either the Rx or Tx mode. It also supplies voltage to the LOGIC PCB.

Transistors Q402 and Q401 control the supply voltages of Tx +8V (TXB) and Rx +8V (RXB).

In the Rx mode, pin 32 of the microprocessor (Tx control signal) releases a logical high level, turning transistor Q604 on and Q603 off. Since Q603 is an open collector output, Q402 is turned off supplying no voltage to the TXB. Q401, however, is turned on and supplies +8VDC to the receiver section.

In the Tx mode, pin 32 of the microprocessor (Tx control signal) releases a logical low level, turning transistor Q604 off and Q603 on. Since the output of Q603 forces the base of Q402 to ground, Q402 turns on and supplies +8 VDC power to the transmitter section. The output of Q402 also turns Q401 off, removing voltage to the RXB.

Transistors Q402 and Q401 control the supply voltages of Tx +8V (TXB) and Rx +8V (RXB).

Two fuses in the power cable, along with D401, reduces the damage to other parts in the radio should a short circuit occur or should the polarity of the DC supply voltage be reversed. Connect DC power correctly to ensure proper radio operation.

Logic PCB

The logic PCB contains the following:

- Microprocessor
- EEPROM memory
- Tone decoder
- CTCSS or DCS encoder
- Memory back up
- Reset circuit

Microprocessor

The microprocessor (IC601) controls many of the Tx and Rx functions of the radio. The microprocessor operates according to the software instructions stored in the internal mask ROM memory.

EEPROM (IC602)

IC602 is an Electrically Erasable Programmable Read Only Memory (EEPROM). It stores customer information such as channel information and function parameters. Since this device is non-volatile memory, all information is retained even when power is removed.

The programming adapter A1510 is connected to the microphone jack (J603). When the audio input (pin 4 of J603) is set to a logical high for a few seconds from the programmer, that signal passes through R631 to pin 35 of IC601 and the radio is

placed in the programming mode. During the programming mode, several commands and data are exchanged through pin 5 of J603 with the microprocessor (pins 14 and 15), passing through buffers (Q610, Q611, Q612, and Q613).

Tone Decoder (IC603, IC604, Q601 and Q602)

This circuit contains switched capacitor low pass filter (SW Cap. LPF) IC603 that is used in both Tx and Rx modes. The analog switch (IC604) switches IC603 to function as either a Rx tone path or Tx tone path to the microprocessor (IC601). There are two operational amplifiers (op-amps) following the SW Capacitor LPF that function as comparators to convert the analog waveform to digital format. These operational amplifiers are located inside of IC603.

In the Rx mode, the Tx control (pin 32 of IC601) supplies a logical high level to pins 5 and 6 of IC604. When these pins are driven high, the two analog gates are closed, enabling a path between pins 3 and 4 as well as between pins 8 and 9. The Rx tone with audio from the main board go to pin 8 of IC603, passing through R607 and IC604 (from pin 4 to pin 3). Clock pulses from the microprocessor (pin 6) go to pin 9 of IC603, providing the cut off frequency of the LPF (fc=fclk ÷ 50). The LPF only passes the desired tone and filters out high frequencies contained in the Rx data signal (discriminator output).

The filtered Rx tone with audio goes from pin 3 of IC603 to op-amp #1 (pin 13 of IC603) through R610, IC604 (from pin 8 to pin 9), C602, and C601. IC604 amplifies the Rx data to approximately 0.8 V peak-to-peak of level at TP601, being adjusted by VR603. The amplified data is supplied to a comparator (pin 14 of IC603, op-amp #2).

When the voltage at pin 14 of IC603 becomes greater than that at pin 1, a logical low is released to pin 2 of IC603. When the voltage at pin 14 of IC603 decreases lower than at pin 1, a logical high is released to pin 2 of IC603. Voltage at pin 1 of IC603 provides a reference level of the comparator around the center of the data waveform.

Digitized data (square wave) is released to pin 2 of IC603 and supplied to the microprocessor (pin 16). The microprocessor then decodes this tone input.

CTCSS or DCS Encoder (IC603)

In the Tx mode, the microprocessor sets the Tx control (pin 32) to a logical low, which is inverted by Q604. The output of Q604 (a logical high) is supplied to pin 12 of IC604 to enable the analog gate (pins 10 and 11) to close.

Clock pulses from the microprocessor (pin 6) are applied to pin 9 of IC603, providing the cut off frequency of the low pass filter (LPF) as fc=fclk ÷ 50. The LPF only passes tone and filters out high frequencies contained in the Tx data signal (square wave signal).

Pin 4 of the microprocessor provides a Tx tone to the LPF (pin 8 of IC603) passing through IC604 (from pin 11 to pin 10). The filtered CTCSS tone or DCS signal is applied to the Tx modulator on the main PCB.

Regulator and Memory Back-Up

The +5 V regulator (IC605) supplies voltage to the microprocessor. The output voltage of IC605 is 5.6 V to compensate for the voltage drop across D601 or D602. 5 V is applied to the microprocessor (pin 57 of IC601) and charges the super capacitor C623 for the memory backup.

The microprocessor retains in RAM (Random Access Memory) the selected channel number, CALL status of each channel, and SCAN status, while the power switch is turned off. When the microprocessor senses the power turned off (pin 17 of IC601 becomes low) the current drain into the microprocessor is decreased to save power consumption while in the stand-by (power off) mode. When the power switch is off, the stored charge in C623 keeps the microprocessor "alive" during stand-by mode.

Reset Circuit (IC606 and Q607)

IC606 contains a schmitt trigger circuit that maintains the output voltage at approximately 0.7 V until the input voltage reaches about 4.25 V. When the input voltage exceeds 4.25 V, IC606 releases an output voltage of the same level after a delay of approximately 200 µsec.

When the output of IC606 is a logical high, a positive rising pulse is supplied to Q607 through C616. Q607 then releases a logical low pulse that is sent to pin 19 of IC601. The microprocessor resets and normal operation begins.

LED PCB

The LED PCB contains:

- LED display drivers and display
- Auto-dimmer
- Switches

LED Display Drivers (Q703 - Q712)

The microprocessor provides the signals that turn Q703 - Q712 on or off. Q703 through Q709 provide the drive (active low) to illuminate the appropriate segments of the channel display, giving a visual indication of the channel selected. Q710 through Q712 drive the TX, CALL, and BUSY LEDs respectively.

Auto-Dimmer (Q701, Q702, and Y701)

The auto-dimmer circuit controls the intensity of all LEDs on the front panel.

The photo-conduct cell Y701 senses the brightness around the radio and changes the bias voltage of Q701. This controlled bias voltage provides output current to Q702 for controlling the brightness of the channel display, and all of the indicator LEDs for varying ambient light conditions.

Switches (S601, S602, and S603)

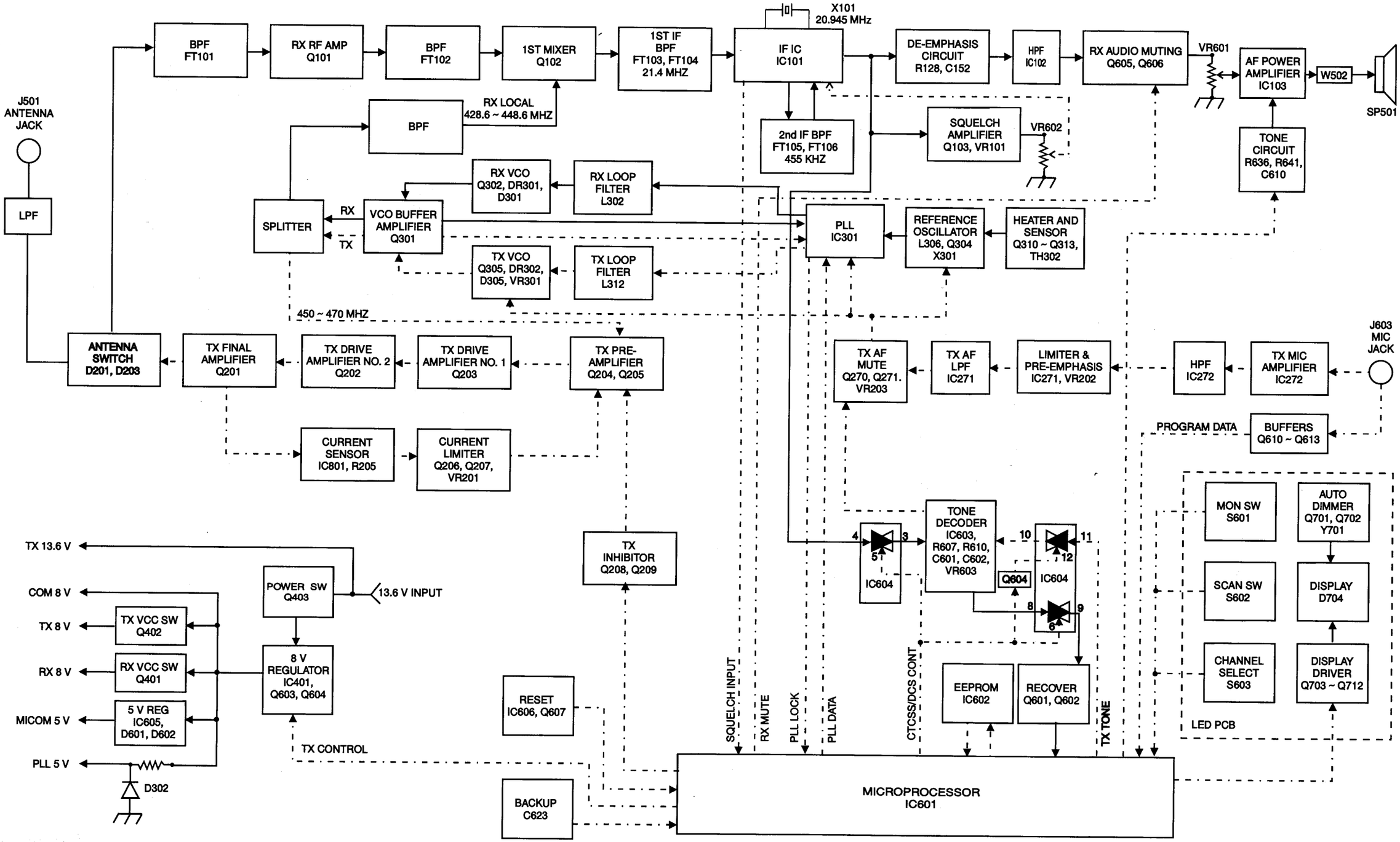
The MON, SCN, and CH switches are directly connected to the microprocessor. The microprocessor sets the radio operation in response to the inputs from these switches.

When the MON (monitor) switch is latched (in) the microprocessor will disable scanning and set the radio to monitor the selected channel. When unlatched (out), and with the microphone grounded the microprocessor will cause the radio to scan the available channels.

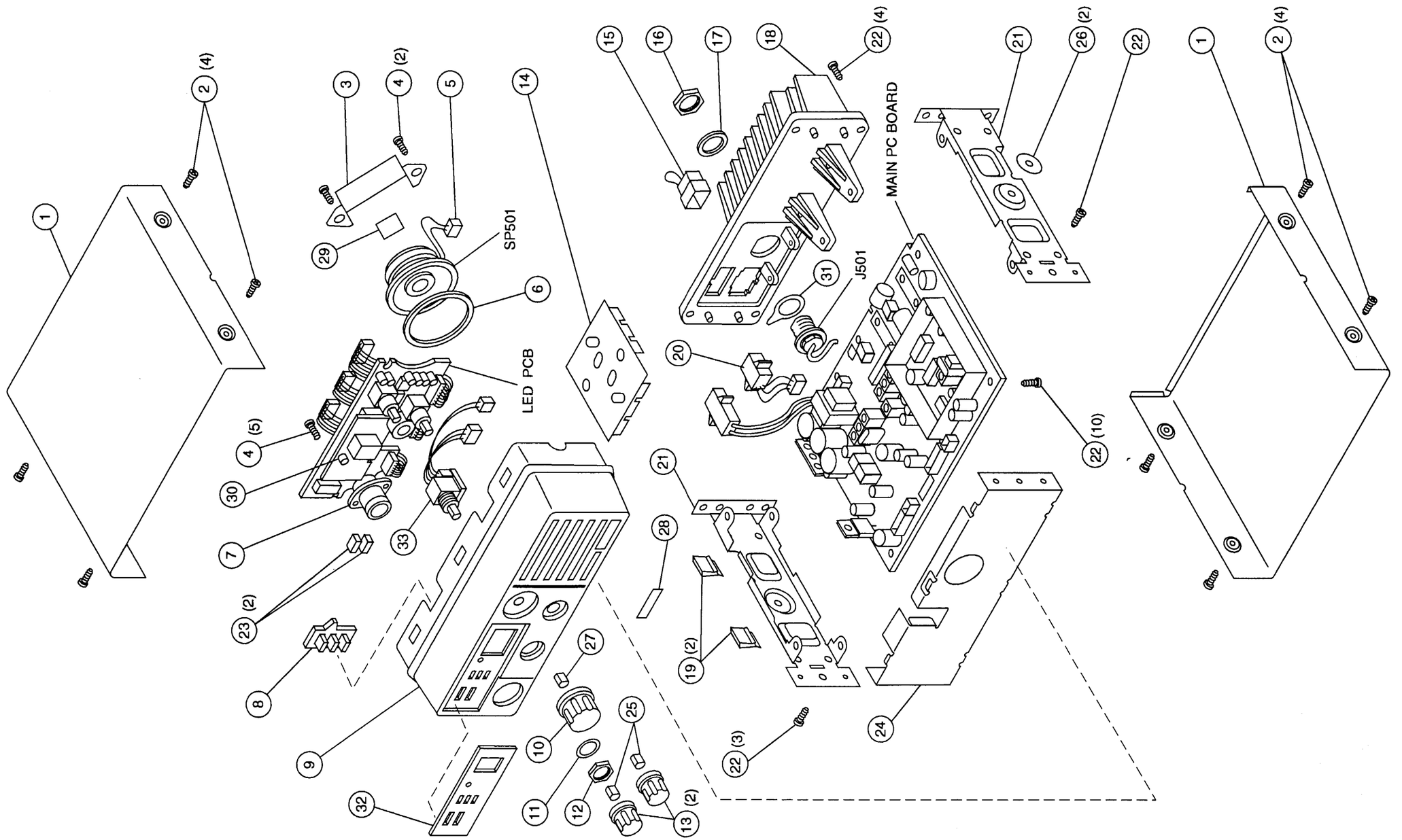
The SCN (scan) switch, when latched (in) will scan all channels providing the microphone is grounded and the MON switch is unlatched (out). Scanning will not occur with the MON switch latched (in).

When both the MON and SCN switches are unlatched (out), the microprocessor will place the radio in the normal mode of operation.

The microprocessor uses the inputs from the CH (channel) switch to set the inputs to the PLL. This establishes the channel of operation for the radio.



Block Diagram



Exploded Mechanical View

Exploded Mechanical View Parts List

1	Case	064001018A
2	Screw, Tapping Round Head, D3.5X8	569001024A
3	Holder, Speaker	271004013A
4	Screw, Pan Head, D2.6X8	569002024A
5	Assy, Wire W-071489	YB0002026A
6	Spacer, Neoprene	118001025A
7	Holder, Microphone Jack	271003013A
8	Lens, Clear	355001011A
9	Panel, Front	063001011A
10	Knob, Channel	154002019A
11	Washer, Flat, Accessory for RV-819	581001035A
12	Nut, Hex, Accessory for RV-819	580002028A
13	Knob	154001019A
14	Cover, VCO Box 0.3T	053001028A
15	Assy, Wire W-071378	YB0001026A
16	Nut, Hex, Accessory for JK-425	580001028A
17	Washer, Spring, Accessory for JK-425	581002035A
18	Chassis, Rear	105003011A
19	Holder, IC SUS304-1/2H 0.5T	271001013A
20	Assy, Wire W-072029	YB0003026A
21	Chassis, Side	105001011A
22	Screw, Tapping, M3X6	569003024A
23	Button, Push	270001008A
24	Chassis, Front	105002011A
25	Spring, Plate, Knob D6	115001013A
26	Spacer, Wool	118002025A
27	Spring, Plate, Knob D6.02XL9.53	115002013A
28	Plate, Brand 0.5T	568001014A
29	Holder, LED Rubber	271002013A
31	Lug, Terminal, Accessory for JK-425	363002004A
32	Plate, Window 0.5T	568002014A
33	Assy, Wire W-072030	YB0004026A
34	Assy, Wire W-072034	YB0008026A
35	Earth Lug, 0.3T Non Oil	363001004A

Disassembly/Reassembly

Disassembly

Cover Removal

Removing the covers provides access to the most commonly repaired components as well as to the alignment points.

1. Remove the retaining screws (four each) from the sides of the top and bottom covers.
2. Remove the top and bottom covers by lifting them off.

Front Panel Removal

Removing the front panel provides access to the logic board, the display LED and the speaker.

> Caution
> Excessive pressure could break the plastic retaining tabs when removing the front panel.

1. Remove the top and bottom covers.
2. Place a flat screw driver or key between the middle plastic retaining tab (top or bottom of radio) and the radio frame.
3. Carefully lift the tab away from the retaining lug. This also unlocks the tabs on each side of the middle tab and releases part of the front panel.
4. Pull the released part of the front panel forward and down. This unlocks the tabs on the opposite side of the front panel and releases the entire front panel.

   All electronic components related to RF are on the main circuit board.

Back Panel Removal

Removing the back panel may be necessary for repairing or replacing the power transistors, power connector, accessory connector and antenna connector. Normally, the connectors can be serviced while leaving the back panel in place.

> Caution
> Wires from the power connector are soldered into the main PCB. Rough handling could break the solder joints.

1. Remove the DC power connector by squeezing its retainer tabs and pushing the connector toward the inside of the back panel.
2. Remove the accessory connector by squeezing its retainer tabs and pushing the connector toward the inside of the back panel. Then unplug the wiring harness from connector J102 on the main PCB.
3. Remove the antenna connector by loosening the retaining nut and pushing the connector toward the inside of the back panel.
4. Remove the four retaining screws (two on each side rail) from the outside corners of the back panel.
5. Remove the retaining screws from the bottom side of the main PCB. These screws are located on each side of the antenna connector.

> Caution
> Attempting to remove the back panel without removing the heat sink screws could damage the power transistor solder joints.

6. Remove the screws (two on each transistor, Q201 and Q202) holding the heat sink to the power transistors.

   The back panel is now released.

Reassembly

Front Panel Replacement

> Caution
> Excessive pressure could break the retaining tab when replacing the front panel

1. Lock the plastic retaining tabs on to the retaining lugs on either top or bottom of the radio frame front.
2. Push the other side of the front panel back and up to unlock the tabs on the opposit side of the front panel.

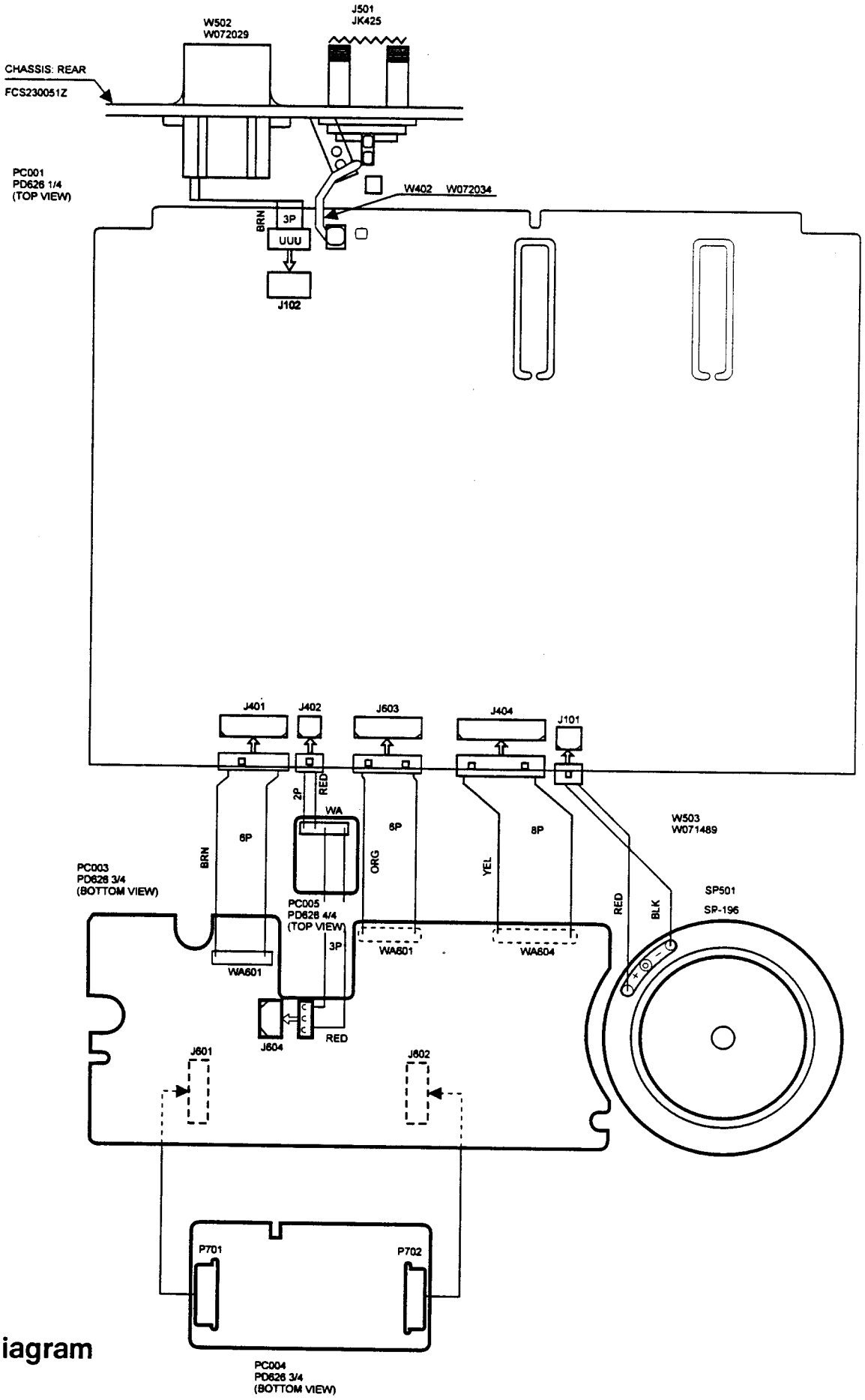
Back Panel Replacement

> Caution
> Wires from the power connector are soldered into the main PCB. Rough handling could break the solder joints.

1. Position the back panel by placing the nipples on the back panel into the matching holes on the radio frame.
2. Insert and tighten all screws.
3. Reattach all connectors.

Cover Replacement Replacement

1. Replace the front and back panels, if they are removed.
2. Place the covers on the top and bottom of the radio frame.
3. Align the screws holes on the covers and the frame.
4. Insert and tighten the retaining screws.



Wiring Diagram

Alignment Procedures

Test Equipment

- Service Monitor ..... IFR COM 120 or equivalent
- RF Wattmeter ..... Bird 6154 or equivalent
- Spectrum Analyzer ..... HP 853
- AC Voltmeter ..... HP 427
- Power Tap 40dB ..... Bird 4275 or equivalent
- DC Ammeter ..... Simpson 260 or equivalent
- DC Power Supply ..... Ratelco 2064B or equivalent
- Modulation Analyzer (optional)

NOTE

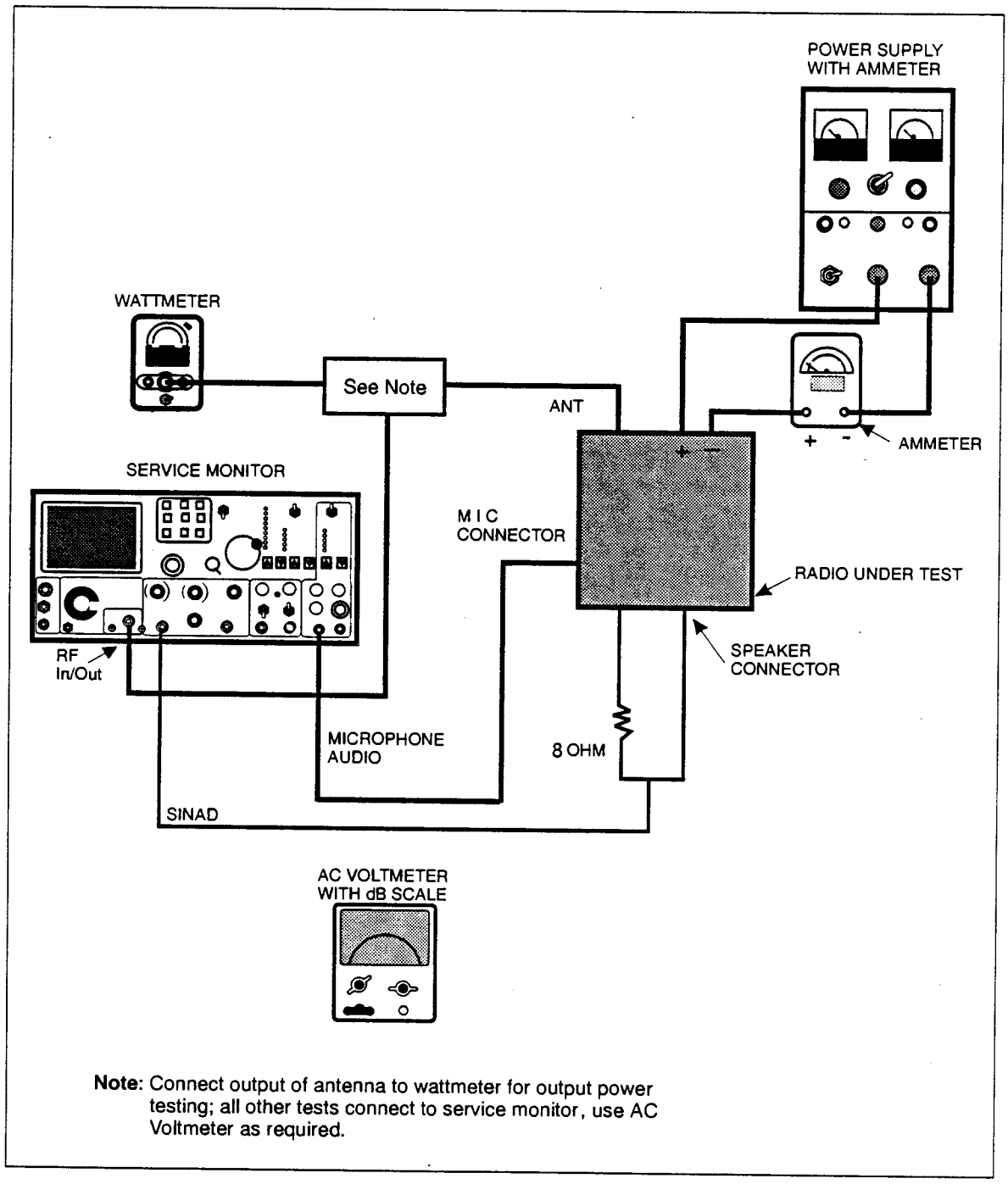
Prior to tuning, the GX1510U must be programmed using a dealer-supplied personal computer, programmer software (PPS 1510), and programmer adapter (A1510).

General

For general factory tuning, the GX1510U should be set up with the test frequencies listed in Tables 1 and 3. At the completion of the factory tuning (testing) the GX1510U should be retuned, using the customer specified frequencies. For the Transmitter/Receiver Alignment Procedures reference Tables 2 and 4 respectively.

Factory Program Settings

Timeout Time	Disable
Busy Channel Lockout	No
Switch Tone	On
Scan	Yes
Dropout Delay	3 sec
Dwell Time	100 msec
Priority Type	Priority Scan Off
Talk Back	Received



Note: Connect output of antenna to wattmeter for output power testing; all other tests connect to service monitor, use AC Voltmeter as required.

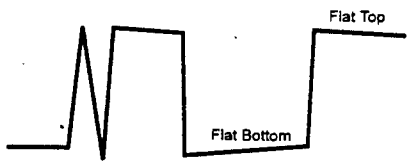
Test Equipment Setup

Transmitter Test Frequencies

Table 1. Transmitter Test Frequencies				
Channel	**Frequency (MHz)**	**CTSCC**	**DCS**	**Carrier Squelch**
1.	461.0000	Off	Off	On
2.	457.5000	Off	Off	On
3.	464.5000	Off	Off	On
4.	461.0000	167.9 Hz	Off	Off
5.	461.0000	Off	172	Off
6.	461.0000	67.0 Hz	Off	Off
7.	461.0000	250.3 Hz	Off	Off
8.	450.5000	Off	Off	On
9.	469.5000	Off	Off	On
10.	461.0000	Off	Off	On

NOTE

This transmitter has a relatively narrow RF bandwidth. If Operated beyond ±3.5 MHz from center frequency, transmitter may have to be realigned to meet performance specifications.

Table 2. Transmitter Alignment Procedure			
Step#/CH.#	**Action**	**Adjust**	**Results**
1. (CH.1)	Select channel 1 and allow radio to warm up for a minimum of 5 minutes.	L306 CT201, CT202 and CT200 VR201	461.000 MHz ±50 Hz output frequency Maximum Transmitter output power 25 Watts output power
2. (CH.1)	Select Channel 5	Using a modulation analyzer or DC coupled demodulator and oscilloscope, adjust VR301 for a wave form with flat tops and bottoms. Verify that the peak deviations remains within the ± 1 kHz limit.	Square wave with flat tops and bottoms.  DCS modolation balance
3. (CH.1)	Select Channel 4	VR203	±700 Hz peak deviation
4. (CH.4)	Select Channel 1 and inject a 1 kHz at 100 mV into the microphone connector J401	VR202	±4.7 kHz peak deviation

Receiver Test Frequencies

Table 3. Receiver Test Frequencies				
Channel	Frequency (MHz)	CTSCC	DCS	Carrier Squelch
1.	460.0500	Off	Off	On
2.	456.5500	Off	Off	On
3.	463.5500	Off	Off	On
4.	460.0500	167.9 Hz	Off	Off
5.	460.0500	Off	172	Off
6.	460.0500	67.0 Hz	Off	Off
7.	460.0500	250.3 Hz	Off	Off
8.	450.0500	Off	Off	On
9.	469.9875	Off	Off	On
10.	460.8000	Off	Off	On

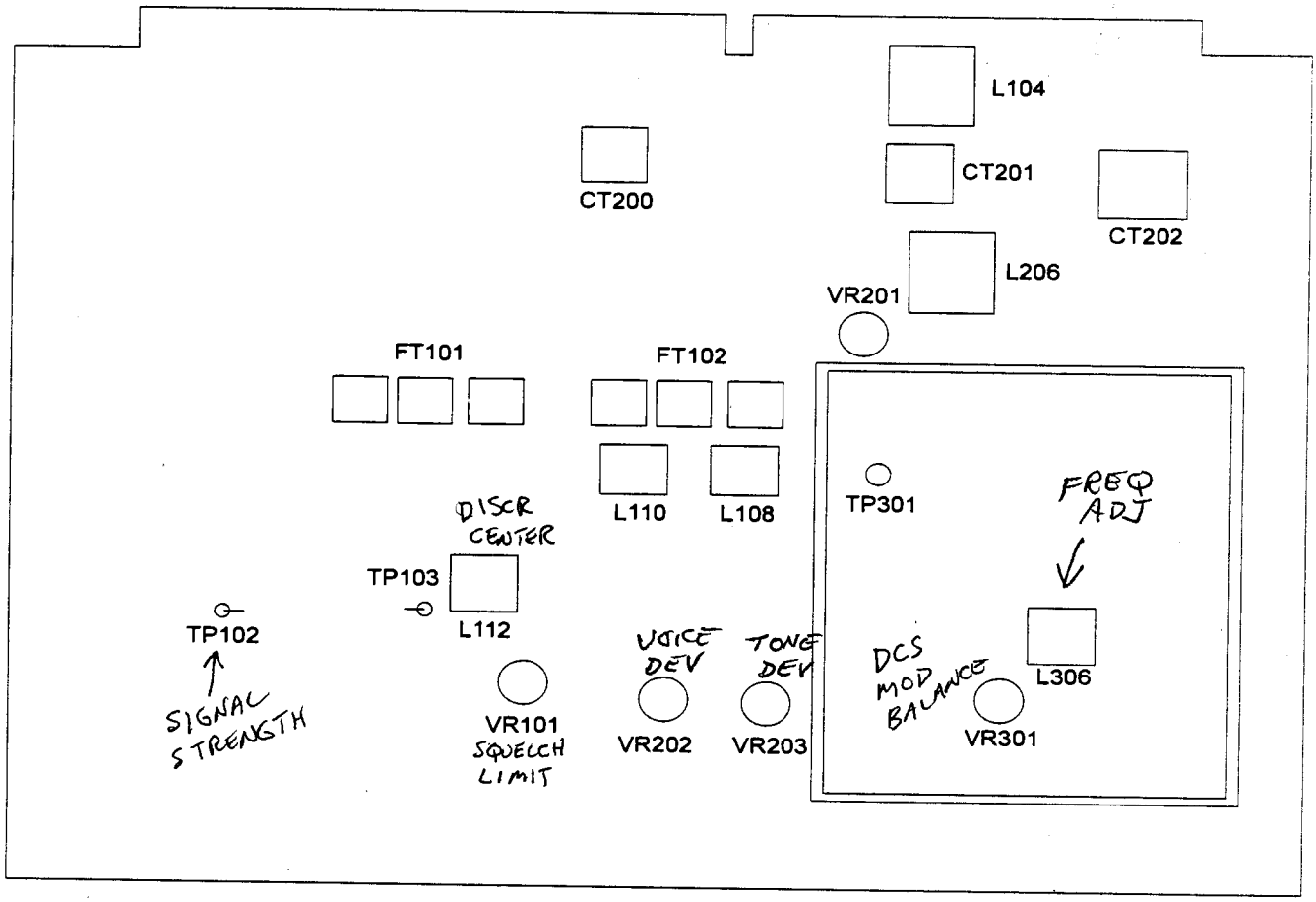
NOTE

Because the receiver has a relatively narrow RF bandwidth, it is necessary to align the receiver front end for the portion of the band that it is to be used in. The receiver will not meet the required specifications without this realigment

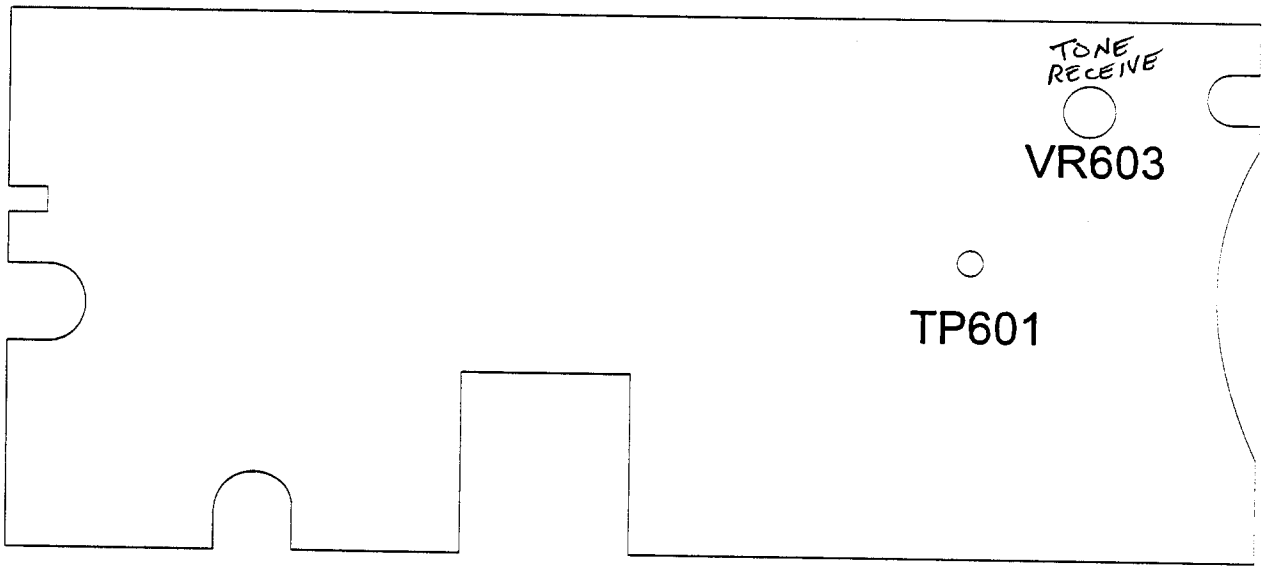
Receiver Alignment Procedure (Use test channels listed below)

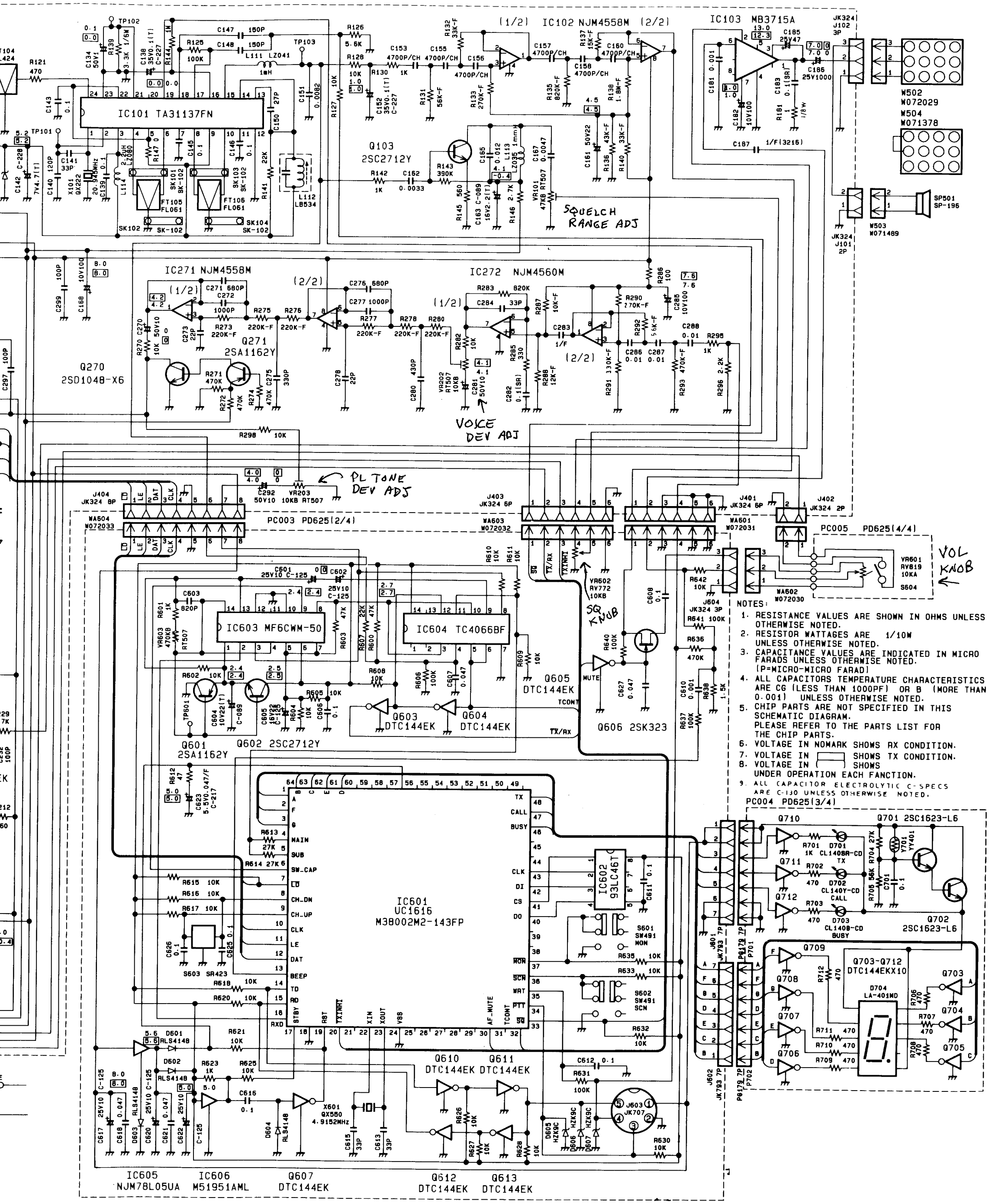
Table 4. Receiver Alignment Procedure			
Step#/CH#	Action	Adjust	Results
1. (CH.1)	Inject 1mV RX frequency with no modulation.	L112	1 VDC at TP103
2. (CH.1)	Inject 1mV RX frequency. Modulate with 1 KHz deviation at 3 KHz.	L110	Minimum distortion at speaker.
3. (CH.1)	Inject .1µV RX frequency. Modulate with 1 KHz of deviation at 3KHz Squelch off.	FT101, FT102	For best SINAD or maximum dc volts at TP102.
4. (CH.1)	Inject 1µV RX frequency. Modulate with 1 KHz at 3 KHz deviation at 3 KHz. Apply maximum squelch	VR101	Break squelch.
5. (CH.4)	Inject 1mV RX frequency. Modulate with CTCSS deviation at ±700 Hz.	VR603 (logic board)	0.8 Vpp at TP601.

Main PCB Alignment Points

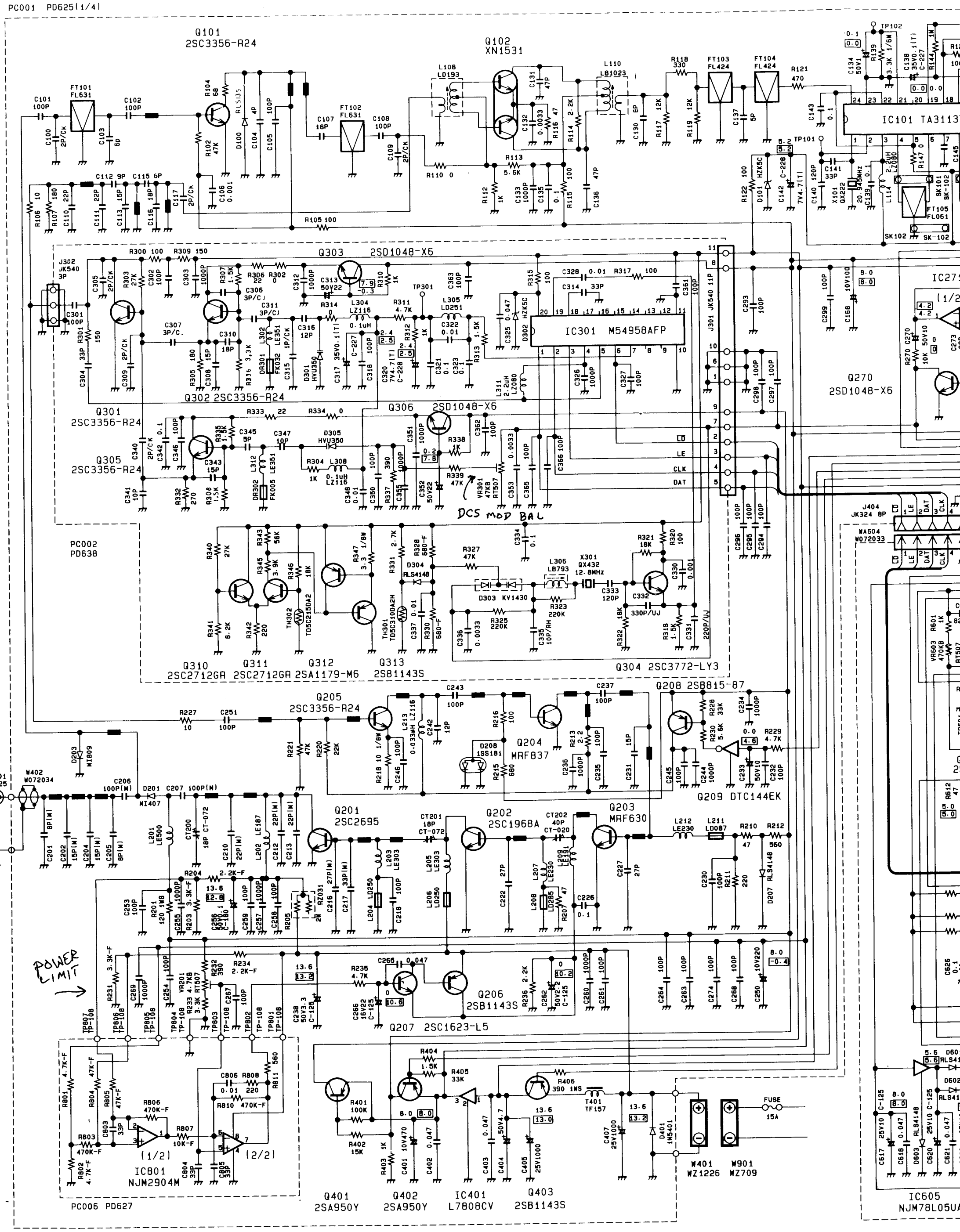


Logic PCB Alignment Points



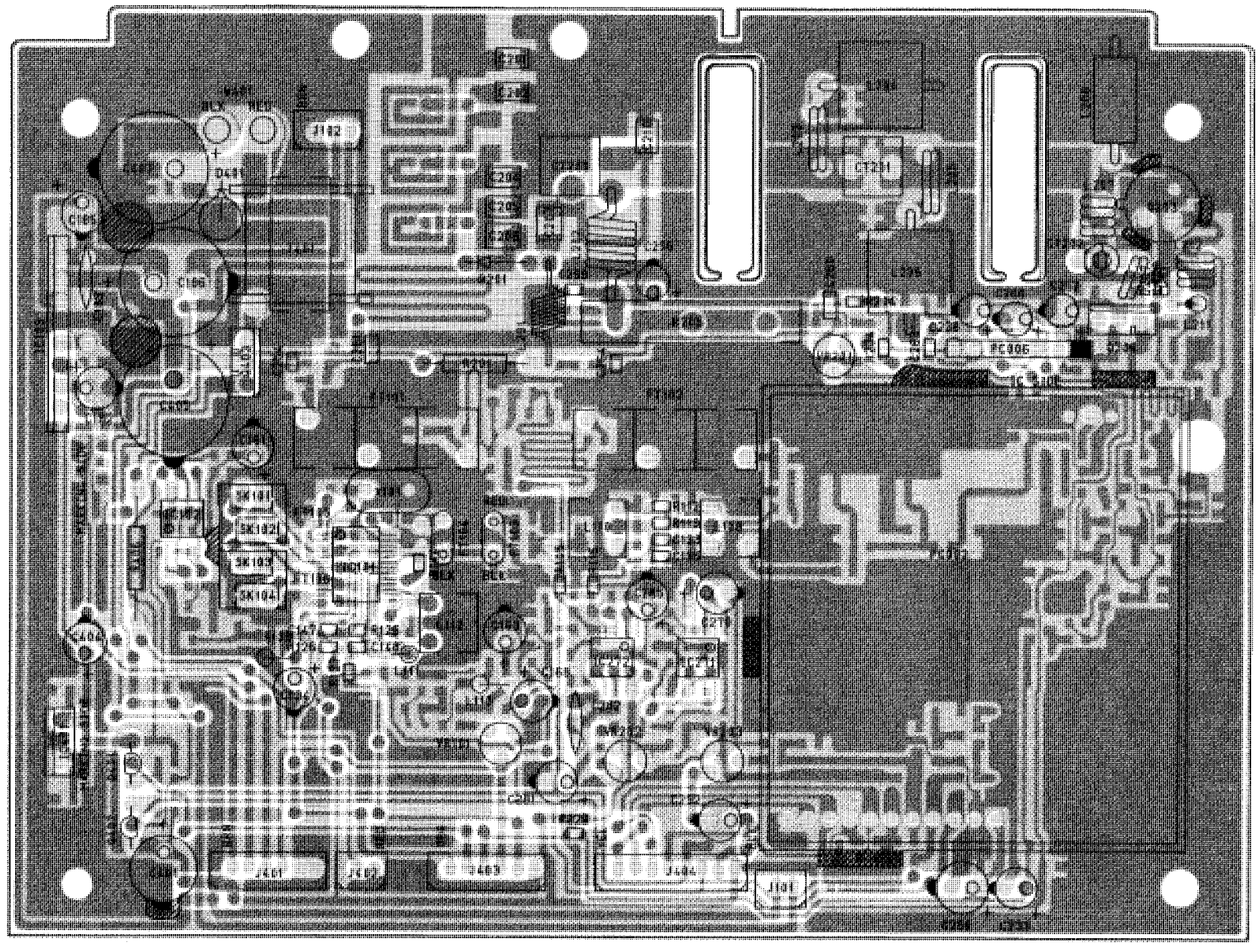

IC101 TA31137FN
IC102 NJM4558M
IC103 MB3715A
Q103 2SC2712Y
SQUELCH RANGE ADJ
IC271 NJM4558M
IC272 NJM4560M
Q270 2SD1048-X6
Q271 2SA1162Y
VOICE DEV ADJ
PL TONE DEV ADJ
PC003 PD625(2/4)
PC004 PD625(3/4)
PC005 PD625(4/4)
IC603 MF6CWM-50
IC604 TC4066BF
IC601 UC1616 M38002M2-143FP
IC602 93LC46T
Q601 2SA1162Y
Q602 2SC2712Y
Q603 DTC144EK
Q604 DTC144EK
Q605 DTC144EK
Q606 2SK323
Q610 DTC144EK
Q611 DTC144EK
IC605 NJM78L05UA
IC606 M51951AML
Q607 DTC144EK
Q612 DTC144EK
Q613 DTC144EK
VOL KNOB
SQ KNOB
W502 W072029
W504 W071378
W503 W071489
SP501 SP-196
Q703-Q712 DTC144EKX10
D704 LA-401MD
NOTES:
1. RESISTANCE VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED.
2. RESISTOR WATTAGES ARE 1/10W UNLESS OTHERWISE NOTED.
3. CAPACITANCE VALUES ARE INDICATED IN MICRO FARADS UNLESS OTHERWISE NOTED. (P=MICRO-MICRO FARAD)
4. ALL CAPACITORS TEMPERATURE CHARACTERISTICS ARE CG (LESS THAN 1000PF) OR B (MORE THAN 0.001) UNLESS OTHERWISE NOTED.
5. CHIP PARTS ARE NOT SPECIFIED IN THIS SCHEMATIC DIAGRAM. PLEASE REFER TO THE PARTS LIST FOR THE CHIP PARTS.
6. VOLTAGE IN NOMARK SHOWS RX CONDITION.
7. VOLTAGE IN ▭ SHOWS TX CONDITION.
8. VOLTAGE IN ( ) SHOWS UNDER OPERATION EACH FANCTION.
9. ALL CAPACITOR ELECTROLYTIC C-SPECS ARE C-130 UNLESS OTHERWISE NOTED.

PC001 PD625(1/4)



NOTE: PAGES 31A AND 31B WILL BE REPLACED WITH A FULL-PAGE SCAN WHEN AVAILABLE

PC001 PD-625AA 1/4 (TOP VIEW)



NOTES:
1. RESISTANCE VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED. (K=KILO OHM. M=MEG OHM)
2. RESISTOR WATTAGES ARE 1/10W UNLESS OTHERWISE NOTED.
3. CAPACITANCE VALUES ARE INDICATED IN MICRO FARADS UNLESS OTHERWISE NOTED.(P=MICRO-MICRO FARAD)
4. ALL CAPACITORS TEMPERATURE CHARACTERISTICS ARE CG (LESS THAN 1000PF) OR B (MORE THAN 0.001uF) UNLESS OTHERWISE NOTED.

C134	50V1
C161	50V22
C163	16V2.2(T)C-089
C168	10V100
C182	10V100
C183	0.1(SR)
C185	25V47
C186	25V1000
C233	50V10
C238	50V3.3 C-125
C250	10V220
C256	50V0.1 C-180
C262	50V2.2 C-125
C266	16V22 C-125
C270	50V10
C281	50V10
C282	0.1(SR)
C285	10V100
C292	50V10
C401	10V470
C404	50V4.7
C405	25V1000
C407	25V1000

C133	1000P
C135	0.1
C147	150P
C148	150P
C201	8P(M) C-073
C202	15P(M) C-073
C204	15P(M) C-073
C205	8P(M) C-073
C206	100P(M)C-073
C207	100P(M)C-073
C210	22P(M) C-073
C254	100P
C259	100P
C260	1000P
C261	100P

VR101	RT507 47KB
VR201	RT507 4.7KB
VR202	RT507 10KB
VR203	RT507 10KB

R139	3.3K 1/6W
R201	120 1WS
R205	2W RZ-031
R406	390 1WS

L108	LD193
L110	LB1023
L111	LZ041 1mH
L112	LB534
L113	LZ035 1mmH
L201	LE500
L202	LE187
L203	LE303
L204	LD250
L205	LE303
L206	LD250
L207	LE230
L208	LD285
L209	LE191
L211	LD087
L212	LE230

C263	100P
C264	100P

D207	RLS4148

CT200	CT-072 18P
CT201	CT-072 18P
CT202	CT-020 40P

IC103	MB3715A
IC401	L7808CV

D201	MI407
D401	1N5401

X101	QX222 20.945MHz

FT101	FL631
FT102	FL631
FT103	FL424
FT104	FL424
FT105	FL061
FT106	FL061

J101	JK324 2P
J102	JK324 3P
J401	JK324 6P
J402	JK324 2P
J403	JK324 6P
J404	JK324 8P

R105	100
R112	1K
R113	5.6K
R115	100
R125	100K
R126	5.6K
R127	10K
R144	1M
R204	2.2K-F
R229	4.7K
R234	2.2K-F

W401	WZ1226

PC002	PD638AA
PC006	PD627AA

T401	TF157

Q203	MRF630
Q206	2SB1143-S
Q401	2SA950Y
Q402	2SA950Y
Q403	2SB1143-S

SK101	SK-102 1P
SK102	SK-102 1P
SK103	SK-102 1P
SK104	SK-102 1P

IC101	TA31137FN
IC102	NJM4558M
IC271	NJM4558M
IC272	NJM4560M

Main PCB Top View

R102	47K
R104	68
R106	10
R107	180
R110	0
R114	2.2K
R116	47
R117	12K
R118	330
R119	12K
R121	470
R122	100
R128	10K
R130	1K
R131	56K-F
R132	33K-F
R133	270K-F
R135	820K-F
R136	43K-F
R137	15K-F
R138	1.8M-F
R140	33K-F
R141	22K
R142	1K
R143	390K
R145	560

R146	2.7K
R147	0
R181	1 1/8W
R203	3.3K-F
R207	47
R210	47
R211	220
R212	560
R213	2.2
R215	680
R216	100
R218	10 1/8W
R220	22K
R221	47K
R227	10
R228	33K
R230	5.6K
R231	3.3K-F
R232	390
R233	3.3K
R235	4.7K
R236	2.2K
R270	10K
R271	470K
R272	470K
R273	220K-F

R274	470K
R275	220K-F
R276	220K-F
R277	220K-F
R278	220K-F
R280	220K-F
R282	10K
R283	820K
R285	330
R286	100
R287	10K-F
R288	12K-F
R290	270K-F
R291	330K-F
R292	56K-F
R293	470K-F
R295	1K
R296	2.2K
R298	10K
R401	100K
R402	15K
R403	1K
R404	1.5K
R405	33K

Q101	2SC3356-R24
Q102	XN1531
Q103	2SC2712-Y
Q205	2SC3356-R24
Q207	2SC1623-L5
Q208	2SB815-B7
Q209	DTC144EK
Q270	2SD1048-X6
Q271	2SA1162-Y

D100	RLS135
D101	HZK5C
D203	MI809
D208	1SS181

L114	LZ080 2.2uH
L213	LZ116 0.033uH

C100	2P/CK
C101	100P
C102	100P
C103	6P
C104	4P
C105	100P
C106	0.001
C107	18P
C108	100P
C109	2P/CK
C110	22P
C111	22P
C112	9P
C113	15P
C115	6P
C116	18P
C117	2P/CK
C130	6P
C131	47P
C132	0.0033
C136	47P
C137	5P
C138	35V0.1(T)C-227
C139	0.1
C140	120P
C141	33P

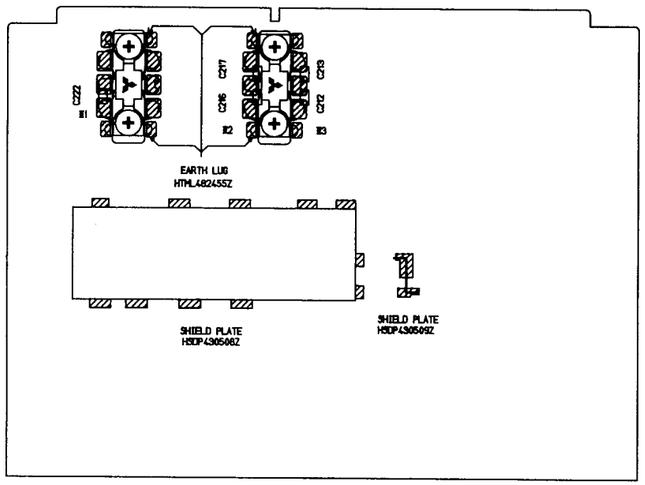
C142	7V4.7(T)C-228
C143	0.1
C145	0.1
C146	0.1
C150	27P
C151	0.0082
C152	35V0.1(T)C-227
C153	4700P/CG (3216)
C155	4700P/CG (3216)
C156	4700P/CG (3216)
C157	4700P/CG (3216)
C158	4700P/CG (3216)
C160	4700P/CG (3216)
C162	0.0033
C165	0.012
C167	0.0047
C181	0.001
C187	1/F
C218	100P
C226	0.1
C227	27P
C230	100P
C231	15P
C232	100P
C234	1000P
C235	100P

C236	1000P
C237	100P
C242	12P
C243	100P
C244	1000P
C245	100P
C246	100P
C251	100P
C253	100P
C255	1000P
C257	1000P
C258	100P
C265	0.047
C267	100P
C268	100P
C269	1000P
C271	680P
C272	1000P
C273	22P
C274	100P
C275	330P
C276	680P
C277	1000P
C278	22P
C280	430P
C283	1/F

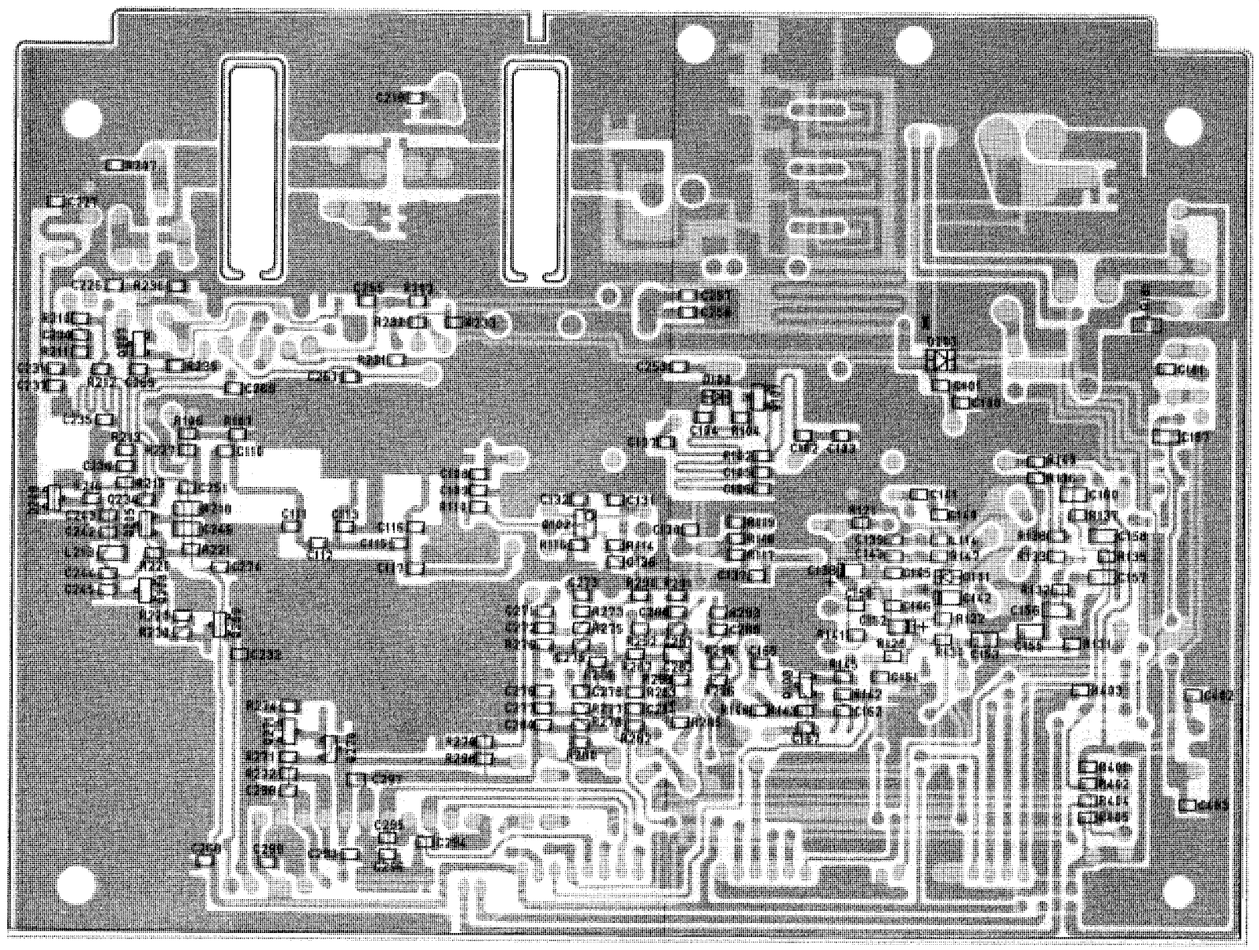
C284	33P
C286	0.01
C287	0.01
C288	0.01
C293	100P
C294	100P
C295	100P
C296	100P
C297	100P
C298	100P
C299	100P
C402	0.047
C403	0.047

C212	22P(M)
C213	22P(M)
C216	27P(M)
C217	33P(M)
C222	27P(3216)
Q201	2SC2695
Q202	2SC1968A
Q204	MRF837

P.C001
PD-625AA 1/4 (BOTTOM VIEW)



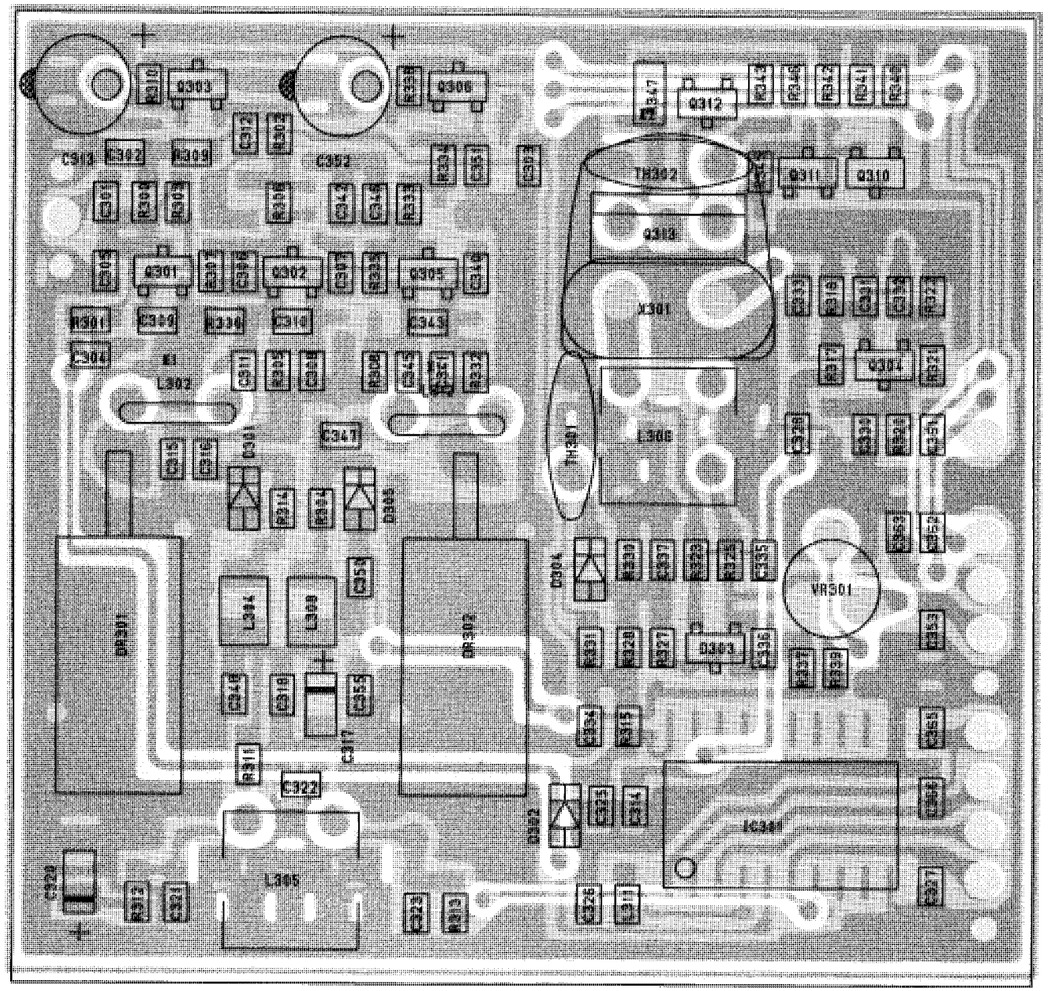
PC001 PD-625AA 1/4 (BOTTOM VIEW)



NOTES:
1. RESISTANCE VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED. (K=KILO OHM, M=MEG OHM)
2. RESISTOR WATTAGES ARE 1/10W UNLESS OTHERWISE NOTED.
3. CAPACITANCE VALUES ARE INDICATED IN MICRO FARADS UNLESS OTHERWISE NOTED.(P=MICRO-MICRO FARAD)
4. ALL CAPACITORS TEMPERATURE CHARACTERISTICS ARE CG (LESS THAN 1000PF) OR B (MORE THAN 0.001uF) UNLESS OTHERWISE NOTED.

Main PCB Bottom View

PC002 PD638AA (TOP VIEW)



C301	100P
C302	100P
C303	1000P
C304	33P
C305	2P/CK
C306	3P/CJ
C307	3P/CJ
C308	15P
C309	2P/CK
C310	18P
C311	3P/CK
C312	1000P

C314	33P
C315	1P/CK
C316	12P
C317	35V0.1(TIC-227
C318	100P
C320	7V4.7(TIC-228
C321	0.1
C322	0.01
C323	0.1
C325	0.047
C326	1000P
C327	100P

C328	0.01
C330	0.001
C331	220P/UJ
C332	330P/UJ
C333	120P
C334	0.1
C335	10P/RH
C336	0.0033
C337	0.01
C340	2P/CK
C341	10P
C342	0.1

C343	15P
C345	5P
C346	100P
C347	10P
C348	0.01
C350	100P
C351	1000P
C353	0.0033
C355	1000P
C361	100P
C362	100P
C363	100P

C365	100P
C366	100P

R300	100
R301	150
R302	0
R303	27K
R304	1K
R305	180
R306	22
R307	1.5K
R308	1.5K
R309	150
R310	1K
R311	4.7K
R312	1K
R313	1.5K
R314	0
R315	100
R317	100
R318	1.5K
R320	100
R321	18K
R322	18K
R323	220K
R325	220K
R327	47K
R328	680-F
R330	680-F
R331	2.7K
R332	270
R333	22
R334	0
R335	1.5K
R336	3.3K
R337	390
R338	1K
R339	47K
R340	27K
R341	8.2K
R342	220
R343	56K
R345	3.9K

R346	18K
R347	3.3 1/8W

D301	HVU350
D302	HZK5C
D303	KV1430
D304	RLS4148
D305	HVU350

Q301	2SC3356-R24
Q302	2SC3356-R24
Q303	2SD1048-X6
Q304	2SC3772-LY3
Q305	2SC3356-R24
Q306	2SD1048-X6
Q310	2SC2712-GR
Q311	2SC2712-GR
Q312	2SA1179-M6

DR301	FK032
DR302	FK005

IC301	M54958AFP

L304	LZ116 0.1μH
L308	LZ116 0.1μH
L311	LZ080 2.2μH

L302	LE351
L305	LD251
L306	LB793
L312	LE351

TH301	TD5C310DA2H
TH302	TD5C215DA2

C313	50V22 C-130
C352	50V22 C-130

X301	QX432 12.8MHz

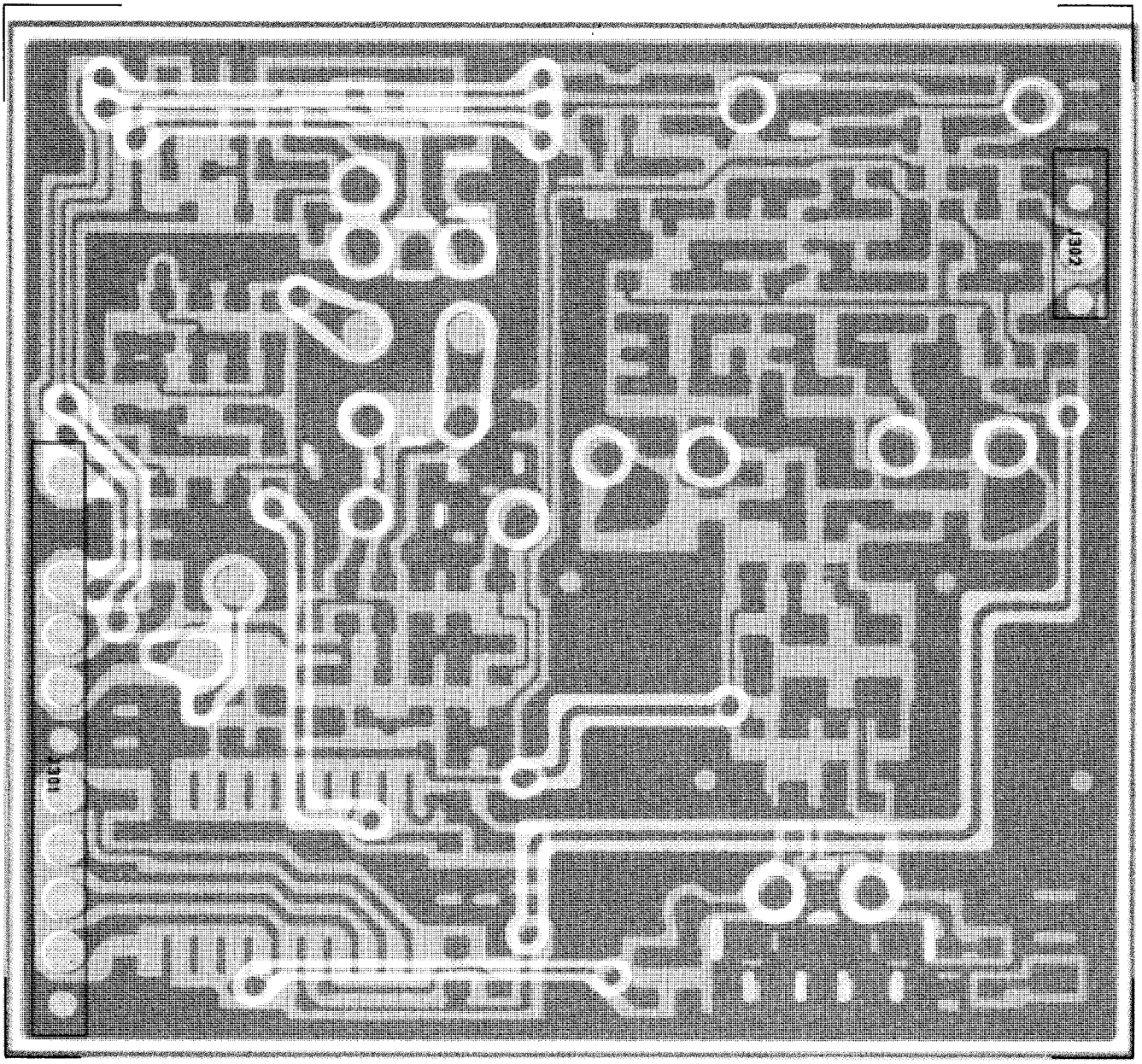
VR301	RT507 47KB

Q313	2SB1143S

NOTES:
1. RESISTANCE VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED. (K=KILO OHM. M=MEG OHM)
2. RESISTOR WATTAGES ARE 1/10W UNLESS OTHERWISE NOTED.
3. CAPACITANCE VALUES ARE INDICATED IN MICRO FARADS UNLESS OTHERWISE NOTED. (P=MICRO-MICRO FARAD)
4. ALL CAPACITORS TEMPERATURE CHARACTERISTICS ARE CG (LESS THAN 1000PF) OR B (MORE THAN 0.001μF) UNLESS OTHERWISE NOTED.

PLL PCB Top View

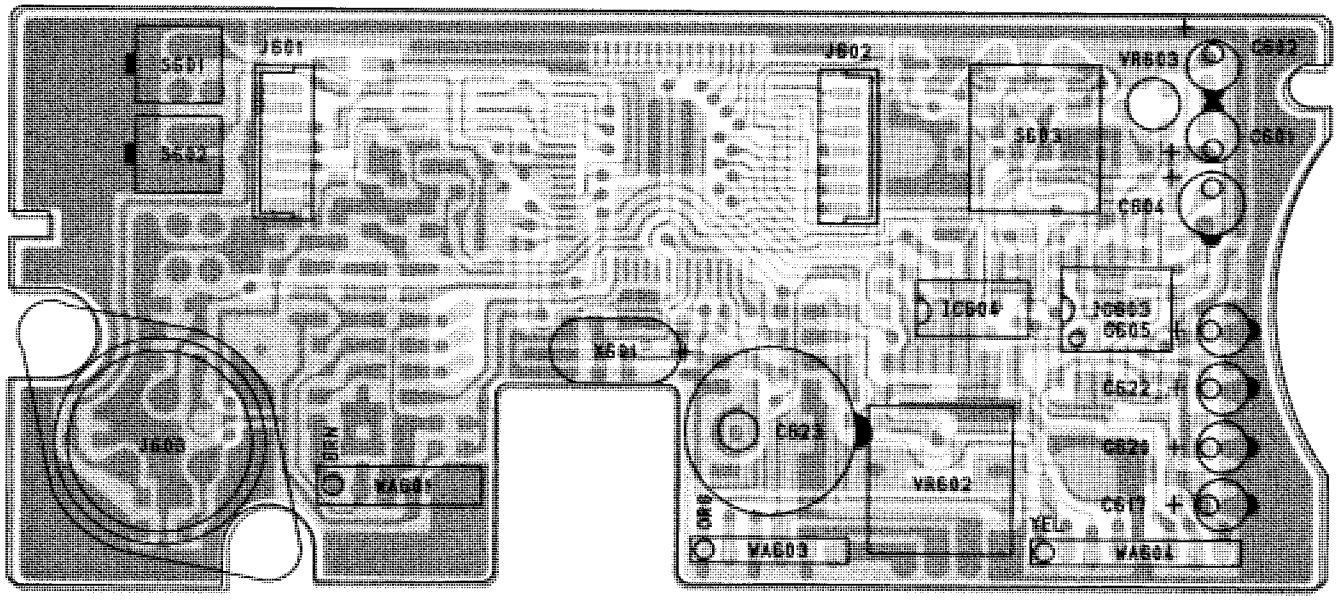
PC002 PD638AA (BOTTOM VIEW)



J301	JK540 11P
J302	JK540 3P

PLL PCB Bottom View

PC003 PD-625AA 2/4 (TOP VIEW)



C601	25V10 C-125	
C602	25V10 C-125	
C604	10V22 C-089	
C605	16V22 C-125	
C617	25V10 C-125	
C620	25V10 C-125	
C622	25V10 C-125	
C623	5.5V0.047F C-217	

J601	JK793 7P
J602	JK793 7P
J603	JK707

VR602	RV772 10KB
VR603	RT507 470KB

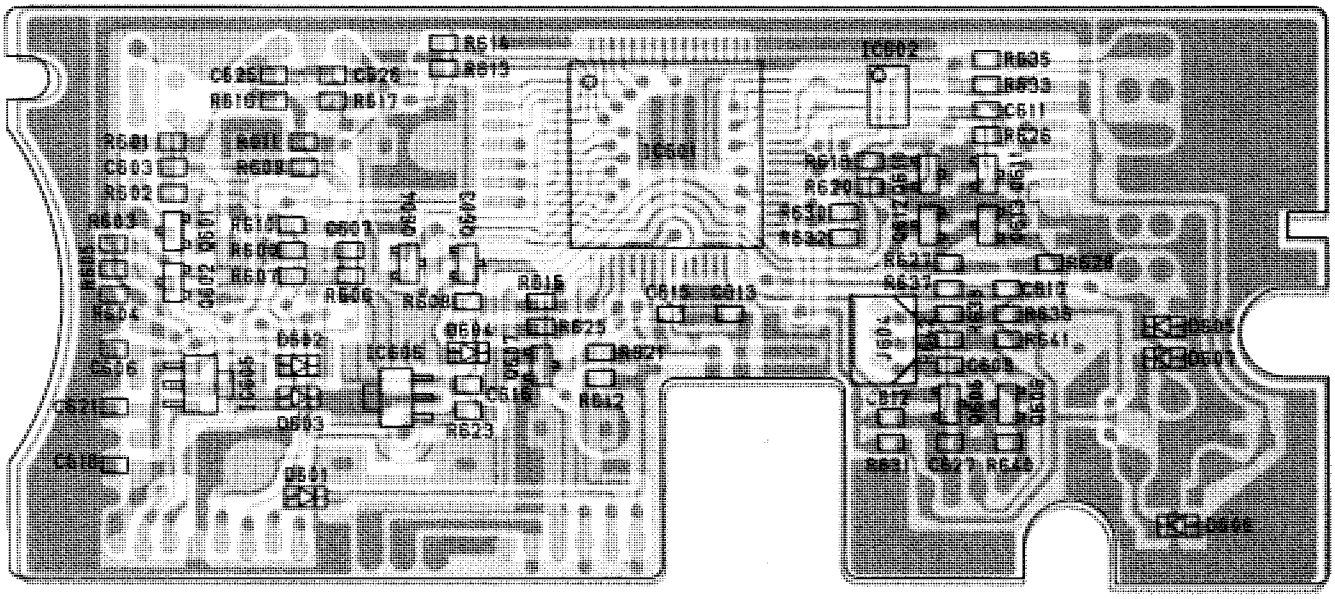
S601	SW491
S602	SW491
S603	SR423

WA601	W072031
WA603	W072032
WA604	W072033

NOTE.
1. CAPACITANCE VALUES ARE INDICATED IN MICRO FARADS UNLESS OTHERWISE NOTED. (P=MICRO-MICRO FARAD)

Logic PCB Top View

PC003 PD-625AA 2/4 (BOTTOM VIEW)



R600	47K
R601	1K
R602	10K
R603	47K
R604	10K
R605	10K
R606	100K
R607	22K
R608	10K
R609	10K
R610	10K
R611	10K
R612	47
R613	27K
R614	27K
R615	10K
R616	10K
R617	10K
R618	10K
R620	10K
R621	10K
R623	1K

R625	10K
R626	10K
R627	10K
R628	10K
R630	10K
R631	100K
R632	10K
R633	10K
R635	10K
R636	470K
R637	100K
R638	1.5K
R640	100K
R641	100K
R642	10K

C603	820P
C606	0.1
C607	0.047
C608	0.1
C610	0.001
C611	0.1
C612	0.1
C613	33P
C615	33P
C616	0.1
C618	0.047
C621	0.047
C625	0.1
C626	0.1
C627	0.047

Q601	2SA1162-Y
Q602	2SC2712-Y
Q603	DTC144EK
Q604	DTC144EK
Q605	DTC144EK
Q606	2SK323
Q607	DTC144EK
Q610	DTC144EK
Q611	DTC144EK
Q612	DTC144EK
Q613	DTC144EK

IC601	UC1616 M38002M2-143FP
IC602	93LC46T
IC605	NJM78L05UA
IC606	M51951AML

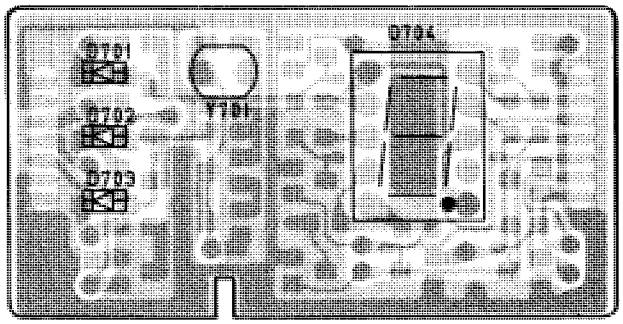
D601	RLS4148
D602	RLS4148
D603	RLS4148
D604	RLS4148
D605	HZK9C
D606	HZK9C
D607	HZK9C

J604	JK324 3P

NOTES:
1. RESISTANCE VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED. (K=KILO OHM. M=MEG OHM)
2. RESISTOR WATTAGES ARE 1/10W UNLESS OTHERWISE NOTED.
3. CAPACITANCE VALUES ARE INDICATED IN MICRO FARAD: UNLESS OTHERWISE NOTED.(P=MICRO-MICRO FARAD)
4. ALL CAPACITORS TEMPERATURE CHARACTERISTICS ARE CG (LESS THAN 1000PF) OR B (MORE THAN 0.001uF) UNLESS OTHERWISE NOTED.

Logic PCB Bottom View

PC004 PD-625AA3/4 (TOP VIEW)

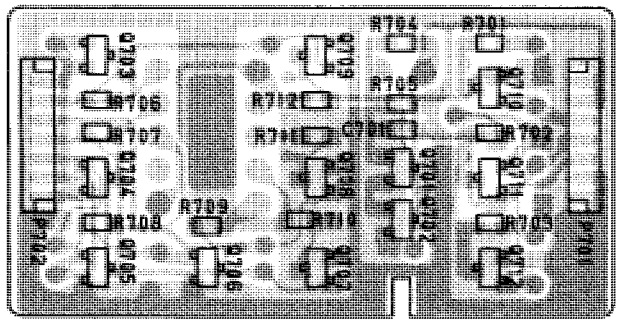


D701	CL140SR
D702	CL140Y
D703	CL140G

D704	LA-401MD

Y701	YY401

PC004 PD-625AA3/4 (BOTTOM VIEW)



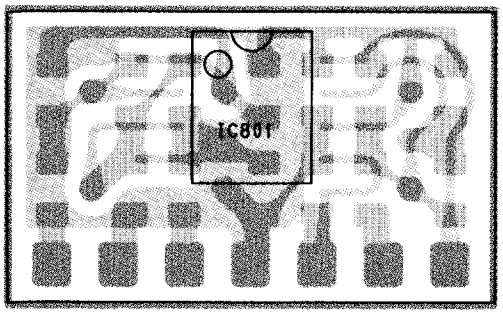
Q701	2SC1623-L6
Q702	2SC1623-L6
Q703	DTC144EK
Q704	DTC144EK
Q705	DTC144EK
Q706	DTC144EK
Q707	DTC144EK
Q708	DTC144EK
Q709	DTC144EK
Q710	DTC144EK
Q711	DTC144EK
Q712	DTC144EK
P701	PG179 7P
P702	PG179 7P

R701	1K
R702	470
R703	470
R704	27K
R705	56K
R706	470
R707	470
R708	470
R709	470
R710	470
R711	470
R712	470
C701	0.1/B

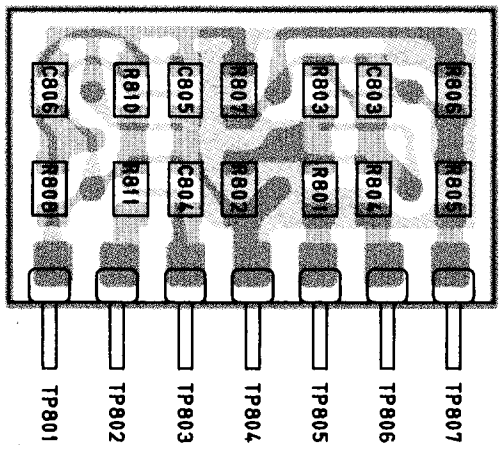
NOTES:
1. RESISTANCE VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED. (K=KILO OHM. M=MEG OHM)
2. RESISTOR WATTAGES ARE 1/10W UNLESS OTHERWISE NOTED.
3. CAPACITANCE VALUES ARE INDICATED IN MICRO FARADS UNLESS OTHERWISE NOTED.(P=MICRO-MICRO FARAD)

LED PCB
Top and Bottom Views

PC006 PD-627AA (TOP VIEW)



PC006 PD-627AA (BOTTOM VIEW)



IC801	NJM2904M

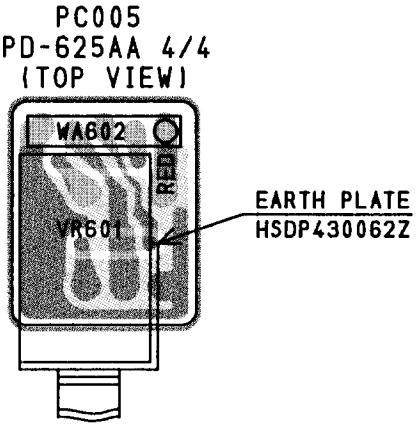
R801	4.7K-F
R802	4.7K-F
R803	470K-F
R804	47K-F
R805	47K-F
R806	470K-F
R807	10K-F
R808	220
R810	470K-F
R811	560

C803	33P/CG
C804	33P/CG
C805	33P/CG
C806	0.01/B

TP801	TP-108
TP802	TP-108
TP803	TP-108
TP804	TP-108
TP805	TP-108
TP806	TP-108
TP807	TP-108

NOTES:
1. RESISTANCE VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED. (K=KILO OHM. M=MEG OHM)
2. RESISTOR WATTAGES ARE 1/10W UNLESS OTHERWISE NOTED.
3. CAPACITANCE VALUES ARE INDICATED IN MICRO FARADS UNLESS OTHERWISE NOTED. (P=MICRO-MICRO FARAD)

H. IC PCB
Top and Bottom Views



VR601	RV819 10KA

WA602	W072030

VOL PCB Top View

PARTS LIST

REFERENCE DESIGNATOR	DESCRIPTION	PART NUMBER
CAPACITORS		
C100	Capacitor, Ceramic 2PF 50V ±0.25PF	DD4045017A
C101	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C102	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C103	Capacitor, Ceramic 6PF 50V ±5%	DD4044017A
C104	Capacitor, Ceramic 4PF 50V ±0.25PF	DD4020017A
C105	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C106	Capacitor, Ceramic 0.001µF 50V	DD4036017A
C107	Capacitor, Ceramic 18PF 50V ±5%	DD4012017A
C108	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C109	Capacitor, Ceramic 2PF 50V ±0.25PF	DD4045017A
C110	Capacitor, Ceramic 22PF 50V ±5%	DD4014017A
C111	Capacitor, Ceramic 22PF 50V ±5%	DD4014017A
C112	Capacitor, Ceramic 9PF 50V ±0.5PF	DD4029017A
C113	Capacitor, Ceramic 15PF 50V ±5%	DD4010017A
C115	Capacitor, Ceramic 6PF 50V ±5%	DD4044017A
C116	Capacitor, Ceramic 18PF 50V ±5%	DD4012017A
C117	Capacitor, Ceramic 2PF 50V ±0.25PF	DD4045017A
C130	Capacitor, Ceramic 6PF 50V ±5%	DD4044017A
C131	Capacitor, Ceramic 47PF 50V ±5%	DD4022017A
C132	Capacitor, Ceramic 0.0033µF 50V	DD4039017A
C133	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C134	Capacitor, Electrolytic 1µF 50V	EA0006017A
C135	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C136	Capacitor, Ceramic 47PF 50V ±5%	DD4022017A
C137	Capacitor, Ceramic 5PF 50V ±0.25PF	DD4023017A
C138	Capacitor, Tantalum Chip 0.1µF 35V	EY0001017A
C139	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C140	Capacitor, Ceramic 120PF 50V ±5%	DD4009017A
C141	Capacitor, Ceramic 33PF 50V ±5%	DD4016017A
C142	Capacitor, Tantalum Chip 4.7µF 7V	EY0003017A
C143	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C145	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C146	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C147	Capacitor, Ceramic 150PF 50V ±5%	DD4011017A
C148	Capacitor, Ceramic 150PF 50V ±5%	DD4011017A
C150	Capacitor, Ceramic 27PF 50V ±5%	DD4015017A
C151	Capacitor, Ceramic 0.0082µF 50V	DD4041017A
C152	Capacitor, Tantalum Chip 0.1µF 35V	EY0001017A
C153	Capacitor, Ceramic 4700PF 50V ±5%	DD4004017A
C155	Capacitor, Ceramic 4700PF 50V ±5%	DD4004017A
C156	Capacitor, Ceramic 4700PF 50V ±5%	DD4004017A
C157	Capacitor, Ceramic 4700PF 50V ±5%	DD4004017A
C158	Capacitor, Ceramic 4700PF 50V ±5%	DD4004017A
C160	Capacitor, Ceramic 4700PF 50V ±5%	DD4004017A
C161	Capacitor, Electrolytic 22µF 50V	EA0007017A
C162	Capacitor, Ceramic 0.0033µF 50V	DD4039017A
C163	Capacitor, Tantalum 2.2µF 16V	EV0002017A
C165	Capacitor, Ceramic 0.012µF 50V	DD4038017A
C167	Capacitor, Ceramic 0.0047µF 50V	DD4040017A
C168	Capacitor, Electrolytic 100µF 10V	EA0001017A
C181	Capacitor, Ceramic 0.001µF 50V	DD4036017A
C182	Capacitor, Electrolytic 100µF 10V	EA0001017A
C183	Capacitor, Electrolytic 0.1µF 25V	EA0014017A
C185	Capacitor, Electrolytic 47µF 25V	EA0004017A
C186	Capacitor, Electrolytic 1000µF 25V	EA0003017A
C187	Capacitor, Ceramic 1µF 16V	DD4005017A
C201	Capacitor, Chip Mica 8PF 500V	DF9012017A
C202	Capacitor, Chip Mica 15PF 500V	DF9001017A
C204	Capacitor, Chip Mica 15PF 500V	DF9001017A
C205	Capacitor, Chip Mica 8PF 500V	DF9012017A
C206	Capacitor, Chip Mica 100PF 500V	DF9009017A

PARTS LIST

REFERENCE DESIGNATOR	DESCRIPTION	PART NUMBER
C207	Capacitor, Chip Mica 100PF 500V	DF9009017A
C210	Capacitor, Chip Mica 22PF 500V	DF9010017A
C212	Capacitor, Chip Mica 22PF 500V	DF9010017A
C213	Capacitor, Chip Mica 22PF 500V	DF9010017A
C216	Capacitor, Chip Mica 27PF 500V	DF9011017A
C217	Capacitor, Chip Mica 33PF 500V	DF9004017A
C218	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C222	Capacitor, Ceramic 27PF 50V ±5%	DD4015017A
C226	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C227	Capacitor, Ceramic 27PF 50V ±5%	DD4015017A
C230	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C231	Capacitor, Ceramic 15PF 50V ±5%	DD4010017A
C232	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C233	Capacitor, Electrolytic 10µF 50V	EA0005017A
C234	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C235	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C236	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C237	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C238	Capacitor, Electrolytic 3.3µF 50V	EA0016017A
C242	Capacitor, Ceramic 12PF 50V ±5%	DD4008017A
C243	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C244	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C245	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C246	Capacitor, Ceramic 100PF 50V ±5%	DD4001017A
C250	Capacitor, Electrolytic 220µF 10V	EA0002017A
C251	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C253	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C254	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C255	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C256	Capacitor, Electrolytic 0.1µF 50V	EA0017017A
C257	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C258	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C259	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C260	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C261	Capacitor, Ceramic 100PF 50V ±5%	DD4001017A
C262	Capacitor, Electrolytic 2.2µF 50V	EA0011017A
C263	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C264	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C265	Capacitor, Ceramic 0.047µF 25V	DD4035017A
C266	Capacitor, Electrolytic 22µF 16V	EA0009017A
C267	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C268	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C269	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C270	Capacitor, Electrolytic 10µF 50V	EA0005017A
C271	Capacitor, Ceramic 680PF 50V ±5%	DD4026017A
C272	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C273	Capacitor, Ceramic 22PF 50V ±5%	DD4014017A
C274	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C275	Capacitor, Ceramic 330PF 50V ±5%	DD4017017A
C276	Capacitor, Ceramic 680PF 50V ±5%	DD4026017A
C277	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C278	Capacitor, Ceramic 22PF 50V ±5%	DD4014017A
C280	Capacitor, Ceramic 430PF 50V ±5%	DD4021017A
C281	Capacitor, Electrolytic 10µF 50V	EA0005017A
C282	Capacitor, Electrolytic 0.1µF 25V	EA0014017A
C283	Capacitor, Ceramic 1µF 16V	DD4005017A
C284	Capacitor, Ceramic 33PF 50V ±5%	DD4016017A
C285	Capacitor, Electrolytic 100µF 10V	EA0001017A
C286	Capacitor, Ceramic 0.01µF 50V	DD4037017A
C287	Capacitor, Ceramic 0.01µF 50V	DD4037017A
C288	Capacitor, Ceramic 0.01µF 50V	DD4037017A
C292	Capacitor, Electrolytic 10µF 50V	EA0005017A
C293	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C294	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C295	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A

PARTS LIST

REFERENCE DESIGNATOR	DESCRIPTION	PART NUMBER
C296	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C297	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C298	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C299	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C301	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C302	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C303	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C304	Capacitor, Ceramic 33PF 50V ±5%	DD4016017A
C305	Capacitor, Ceramic 2PF 50V ±0.25PF	DD4045017A
C306	Capacitor, Ceramic 3PF 50V ±0.25PF	DD4033017A
C307	Capacitor, Ceramic 3PF 50V ±0.25PF	DD4033017A
C308	Capacitor, Ceramic 15PF 50V ±5%	DD4010017A
C309	Capacitor, Ceramic 2PF 50V ±0.25PF	DD4045017A
C310	Capacitor, Ceramic 18PF 50V ±5%	DD4012017A
C311	Capacitor, Ceramic 3PF 50V ±0.25PF	DD4033017A
C312	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C313	Capacitor, Electrolytic 22µF 50V	EA0007017A
C314	Capacitor, Ceramic 33PF 50V ±5%	DD4016017A
C315	Capacitor, Ceramic 1PF 50V ±0.25PF	DD4042017A
C316	Capacitor, Ceramic 12PF 50V ±5%	DD4008017A
C317	Capacitor, Tantalum Chip 0.1µF 35V	EY0001017A
C318	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C320	Capacitor, Tantalum Chip 4.7µF 7V	EY0003017A
C321	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C322	Capacitor, Ceramic 0.01µF 50V	DD4037017A
C323	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C325	Capacitor, Ceramic 0.047µF 25V	DD4035017A
C326	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C327	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C328	Capacitor, Ceramic 0.01µF 50V	DD4037017A
C330	Capacitor, Ceramic 0.001µF 50V	DD4036017A
C331	Capacitor, Ceramic 220PF 50V ±5%	DD4030017A
C332	Capacitor, Ceramic 330PF 50V ±5%	DD4031017A
C333	Capacitor, Ceramic 120PF 50V ±5%	DD4009017A
C334	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C335	Capacitor, Ceramic 10PF 50V	DD4032017A
C336	Capacitor, Ceramic 0.0033µF 50V	DD4039017A
C337	Capacitor, Ceramic 0.01µF 50V	DD4037017A
C340	Capacitor, Ceramic 2PF 50V ±0.25PF	DD4045017A
C341	Capacitor, Ceramic 10PF 50V ±5%	DD4032017A
C342	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C343	Capacitor, Ceramic 15PF 50V ±5%	DD4010017A
C345	Capacitor, Ceramic 5PF 50V ±0.25PF	DD4023017A
C346	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C347	Capacitor, Ceramic 10PF 50V ±5%	DD4032017A
C348	Capacitor, Ceramic 0.01µF 50V	DD4037017A
C350	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C351	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C352	Capacitor, Electrolytic 22µF 50V	EA0007017A
C353	Capacitor, Ceramic 0.0033µF 50V	DD4039017A
C355	Capacitor, Ceramic 1000PF 50V ±5%	DD4007017A
C361	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C362	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C363	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C365	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C366	Capacitor, Ceramic 100PF 50V ±5%	DD4006017A
C401	Capacitor, Electrolytic 470µF 10V	EA0001517A
C402	Capacitor, Ceramic 0.047µF 25V	DD4035017A
C403	Capacitor, Ceramic 0.047µF 25V	DD4035017A
C404	Capacitor, Electrolytic 4.7µF 50V	EA0008017A
C405	Capacitor, Electrolytic 1000µF 25V	EA0003017A
C407	Capacitor, Electrolytic 1000µF 25V	EA0003017A
C601	Capacitor, Electrolytic 10µF 25V	EA0010017A

PARTS LIST

REFERENCE DESIGNATOR	DESCRIPTION	PART NUMBER
C602	Capacitor, Electrolytic 10µF 25V	EA0010017A
C603	Capacitor, Ceramic 820PF 50V ±5%	DD4028017A
C604	Capacitor, Tantalum 22µF 10V	EV0001017A
C605	Capacitor, Electrolytic 22µF 16V	EA0009017A
C606	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C607	Capacitor, Ceramic 0.047µF 25V	DD4035017A
C608	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C610	Capacitor, Ceramic 0.001µF 50V	DD4036017A
C611	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C612	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C613	Capacitor, Ceramic 33PF 50V ±5%	DD4016017A
C615	Capacitor, Ceramic 33PF 50V ±5%	DD4016017A
C616	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C617	Capacitor, Electrolytic 10µF 25V	EA0010017A
C618	Capacitor, Ceramic 0.047µF 25V	DD4035017A
C620	Capacitor, Electrolytic 10µF 25V	EA0010017A
C621	Capacitor, Ceramic 0.047µF 25V	DD4035017A
C622	Capacitor, Electrolytic 10µF 25V	EA0010017A
C623	Capacitor, Electrolytic 0.047F 5.5V	EA0013017A
C625	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C626	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C627	Capacitor, Ceramic 0.047µF 25V	DD4035017A
C701	Capacitor, Ceramic 0.1µF 25V	DD4034017A
C803	Capacitor, Ceramic 33PF 50V ±5%	DD4016017A
C804	Capacitor, Ceramic 33PF 50V ±5%	DD4016017A
C805	Capacitor, Ceramic 33PF 50V ±5%	DD4016017A
C806	Capacitor, Ceramic 0.01µF 50V	DD4037017A
CT200	Capacitor, Trimmer CT-072 18PF	CT0002017A
CT201	Capacitor, Trimmer CT-072 18PF	CT0002017A
CT202	Capacitor, Trimmer 40PF	CT0003017A

INDUCTORS

L108	Coil, LD-193 T159SNS-1280N	LC0007019A
L110	COIL, LB-1023 292GNS-7148N	LC0024019A
L111	Inductor, Molded 1mH	LC0018019A
L112	Coil, LB-534 A7MC-10092AZ	LC0002019A
L113	Inductor, Molded SPS0413-102 1mH	LC0017019A
L114	Inductor, Molded 2.2µH	LC0020019A
L201	COIL, LE-500 D4.0 7T	LC0029019A
L202	Coil, LE-187 D4.0 7 Turn	LC0012019A
L203	COIL, LE-303 D6 1 1/2T	LC0027019A
L204	Coil, LD-250	LC0009019A
L205	COIL, LE-303 D6 1 1/2T	LC0027019A
L206	Coil, LD-250	LC0009019A
L207	Coil, LE-230 D3.0 3 1/2 Turn	LC0014019A
L208	Coil, LD-285 SB-5HK OP6-10-1.2H	LC0011019A
L209	COIL, LE-191 D3.0 1 1/2 Turn	LC0030019A
L211	COIL, LD-087 BF04-3*5*1	LC0025019A
L212	Coil, LE-230 D3.0 3 1/2 Turn	LC0014019A
L213	Iinductor, Molded LZ-116 0.033 µH	LC0031019A
L302	COIL, LE-351 D3.6 1/2T	LC0028019A
L304	Inductor, Molded LQN1AR10J04 0.1µH	LC0023019A
L305	COIL, LD-251 159XNS-1380Z	LC0026019A
L306	Coil, LB-793 B113ZNS-T1089Z	LC0003019A
L308	Inductor, Molded LQN1AR10J04 0.1µH	LC0023019A
L311	Inductor, Molded 2.2µH	LC0020019A
L312	Coil, LE-351 D3.6 1/2T	LC0028019A

PARTS LIST

REFERENCE DESIGNATOR	DESCRIPTION	PART NUMBER
SEMICONDUCTORS		
D100	Diode, RLS135	HZ2004015A
D101	Diode, Zener HZK5C	HZ3001015A
D201	Diode, MI407	HZ2002015A
D203	Diode, MI809-T11	HZ2005015A
D207	Diode, RLS4148	HZ2006015A
D208	Diode, 1SS181	HZ2007015A
D301	Diode, HVU350	HZ200815A
D302	Diode, Zener HZK5C	HZ3001015A
D303	Diode, KV1430 01	HZ2003015A
D304	Diode, RLS4148	HZ2006015A
D305	Diode, HVU350	HZ200815A
D401	Diode, 1N5401	HZ2001015A
D601	Diode, RLS4148	HZ2006015A
D602	Diode, RLS4148	HZ2006015A
D603	Diode, RLS4148	HZ2006015A
D604	Diode, RLS4148	HZ2006015A
D605	Diode, Zener HZK9C	HZ3002015A
D606	Diode, Zener HZK9C	HZ3002015A
D607	Diode, Zener HZK9C	HZ3002015A
D701	LED, CL140SR-CD-T	HI0003032A
D702	LED, CL-140Y-CD-T	HI0002032A
D703	LED, CL140G-CD-T	HI0001032A
D704	LED, LA-401MD	HI0004032A
IC101	IC, TA31137FN(EL)	HC1011034A
IC102	IC, NJM4558M	HC1003034A
IC103	IC, MB3715AM-G	HC1013034A
IC271	IC, NJM4558M	HC1003034A
IC272	IC, NJM4560M	HC1008034A
IC301	IC, M54958AFP-702	HC1010034A
IC401	IC, L7808CV	HC1004034A
IC601	IC, UC1616 M38002M2-143FP	HC1001034A
IC602	IC, 93LC46T-I/SN	HC1012034A
IC603	IC, MF6CWM-51	HC1005034A
IC604	IC, TC4066BF(EL)	HC1007034A
IC605	IC, NJM78L05UA-TE2	HC1009034A
IC606	IC, M51951AML-301	HC1006034A
IC801	IC, NJM2904M	HC10036091
Q101	Transistor, 2SC3356-R24	HX3009013A
Q102	Transistor, XN1531-TX	BA2002016A
Q103	Transistor, 2SC2712-Y	HX3006013A
Q201	Transistor, 2SC2695	HX3012013A
Q202	Transistor, 2SC1968A	HX3011013A
Q203	TRANSISTOR, MRF630	HX3013013A
Q204	TRANSISTOR, MRF837	HX3014013A
Q205	Transistor, 2SC3356-R24	HX3009013A
Q206	Transistor, 2SB1143-S	HX2002013A
Q207	Transistor, 2SC1623-L6	HX3001013A
Q208	Transistor, 2SB815-B8	HX2001013A
Q209	Transistor, DTC144EK	BA2001016A
Q270	Transistor, 2SD1048-X6	HX4001013A
Q271	Transistor, 2SA1162-Y	HX1002013A
Q301	Transistor, 2SC3356-R24	HX3009013A
Q302	Transistor, 2SC3356-R24	HX3009013A
Q303	Transistor, 2SD1048-X6	HX4001013A
Q304	Transistor, 2SC3772-LY4	HX3010013A
Q305	Transistor, 2SC3356-R24	HX3009013A
Q306	Transistor, 2SD1048-X6	HX4001013A
Q310	Transistor, 2SC2712-GR	HX3007013A
Q311	Transistor, 2SC2712-GR	HX3007013A
Q312	Transistor, 2SA1179-M	HX1002013A
Q313	Transistor, 2SB1143-S	HX2002013A

PARTS LIST

REFERENCE DESIGNATOR	DESCRIPTION	PART NUMBER
Q401	Transistor, 2SA950-Y	HX1001013A
Q402	Transistor, 2SA950-Y	HX1001013A
Q403	Transistor, 2SB1143-S	HX2002013A
Q601	Transistor, 2SA1162-Y	HX1002013A
Q602	Transistor, 2SC2712-Y	HX3006013A
Q603	Transistor, DTC144EK	BA2001016A
Q604	Transistor, DTC144EK	BA2001016A
Q605	Transistor, DTC144EK	BA2001016A
Q606	FET, 2SK323 TL	HY2001013A
Q607	Transistor, DTC144EK	BA2001016A
Q610	Transistor, DTC144EK	BA2001016A
Q611	Transistor, DTC144EK	BA2001016A
Q612	Transistor, DTC144EK	BA2001016A
Q613	Transistor, DTC144EK	BA2001016A
Q701	Transistor, 2SC1623-L7	HX3002013A
Q702	Transistor, 2SC1623-L8	HX3002013A
Q703	Transistor, DTC144EK	BA2001016A
Q704	Transistor, DTC144EK	BA2001016A
Q705	Transistor, DTC144EK	BA2001016A
Q706	Transistor, DTC144EK	BA2001016A
Q707	Transistor, DTC144EK	BA2001016A
Q708	Transistor, DTC144EK	BA2001016A
Q709	Transistor, DTC144EK	BA2001016A
Q710	Transistor, DTC144EK	BA2001016A
Q711	Transistor, DTC144EK	BA2001016A
Q712	Transistor, DTC144EK	BA2001016A

RESISTORS

R102	Resistor, Carbon Film, Chip 47K 1/10W ±5%	NI05473110
R104	Resistor, Carbon Film, Chip 68 1/10W ±5%	NI05680110
R105	Resistor, Carbon Film, Chip 100 1/10W ±5%	NI05101110
R106	Resistor, Carbon Film, Chip 10 1/10W ±5%	NI05100110
R107	Resistor, Carbon Film, Chip 180 1/10W ±5%	NI05181111
R110	Resistor, Carbon Film, Chip 0 1/10W ±5%	NI05000110
R112	Resistor, Carbon Film, Chip 1K 1/10W ±5%	NI05102110
R113	Resistor, Carbon Film, Chip 5.6K 1/10W ±5%	NI05562110
R114	Resistor, Carbon Film, Chip 2.2K 1/10W ±5%	NI05222110
R115	Resistor, Carbon Film, Chip 100 1/10W ±5%	NI05101110
R116	Resistor, Carbon Film, Chip 47 1/10W ±5%	NI05470110
R117	Resistor, Carbon Film, Chip 12K 1/10W ±5%	NI05123110
R118	Resistor, Carbon Film, Chip 330 1/10W ±5%	NI05331110
R119	Resistor, Carbon Film, Chip 12K 1/10W ±5%	NI05123110
R121	Resistor, Carbon Film, Chip 470 1/10W ±5%	NI05471110
R122	Resistor, Carbon Film, Chip 100 1/10W ±5%	NI05101110
R125	Resistor, Carbon Film, Chip 100K 1/10W ±5%	NI05104110
R126	Resistor, Carbon Film, Chip 5.6K 1/10W ±5%	NI05562110
R127	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R128	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R130	Resistor, Carbon Film, Chip 1K 1/10W ±5%	NI05102110
R131	Resistor, Carbon Film, Chip 56K 1/10W ±5%	NI05563110
R132	Resistor, Carbon Film, Chip 33K 1/10W ±5%	NI05333110
R133	Resistor, Carbon Film, Chip 270K 1/10W ±5%	NI05273111
R135	Resistor, Carbon Film, Chip 820K 1/10W ±5%	NI05824110
R136	Resistor, Carbon Film, Chip 43K 1/10W ±5%	NI05433110
R137	Resistor, Carbon Film, Chip 15K 1/10W ±5%	NI05153111
R138	Resistor, Carbon Film, Chip 1.8M 1/10W ±5%	NI05184110
R139	Resistor, Carbon Film Axial 3.3K 1/6W ±5%	GD05332160
R140	Resistor, Carbon Film, Chip 33K 1/10W ±5%	NI05333110
R141	Resistor, Carbon Film, Chip 22K 1/10W ±5%	NI05223110
R142	Resistor, Carbon Film, Chip 1K 1/10W ±5%	NI05102110
R143	Resistor, Carbon Film, Chip 390K 1/10W ±5%	NI05394110
R144	Resistor, Carbon Film, Chip 1M 1/10W ±5%	NI05105110
R145	Resistor, Carbon Film, Chip 560 1/10W ±5%	NI05561110

PARTS LIST

REFERENCE DESIGNATOR	DESCRIPTION	PART NUMBER
R146	Resistor, Carbon Film, Chip 2.7K 1/10W ±5%	NI05272110
R147	Resistor, Carbon Film, Chip 0 1/10W ±5%	NI05000110
R181	Resistor, Carbon Film, Chip 1 1/8W ±5%	NI05010180
R201	Resistor, Metal Oxide 120 1W ±5%	GA0001003A
R203	Resistor, Carbon Film, Chip 3.3K 1/10W ±5%	NI05332110
R204	Resistor, Carbon Film, Chip 2.2K 1/10W ±5%	NI05222110
R205	Resistor, Cement RZ-031 0.1X2 2W	GA0003003A
R207	Resistor, Carbon Film, Chip 47 1/10W ±5%	NI05470110
R210	Resistor, Carbon Film, Chip 47 1/10W ±5%	NI05470110
R211	Resistor, Carbon Film, Chip 220 1/10W ±5%	NI05221110
R212	Resistor, Carbon Film, Chip 560 1/10W ±5%	NI05561110
R213	Resistor, Carbon Film, Chip 2.2 1/10W ±5%	NI05022110
R215	Resistor, Carbon Film, Chip 680 1/10W ±5%	NI05681110
R216	Resistor, Carbon Film, Chip 100 1/10W ±5%	NI05101110
R218	Resistor, Carbon Film, Chip 10 1/8W ±5%	NI05100180
R220	Resistor, Carbon Film, Chip 22K 1/10W ±5%	NI05223110
R221	Resistor, Carbon Film, Chip 47K 1/10W ±5%	NI05473110
R227	Resistor, Carbon Film, Chip 10 1/10W ±5%	NI05100110
R228	Resistor, Carbon Film, Chip 33K 1/10W ±5%	NI05333110
R229	Resistor, Carbon Film, Chip 4.7K 1/10W ±5%	NI05472110
R230	Resistor, Carbon Film, Chip 5.6K 1/10W ±5%	NI05562110
R231	Resistor, Carbon Film, Chip 3.3K 1/10W ±5%	NI05332110
R232	Resistor, Carbon Film, Chip 390 1/10W ±5%	NI05391110
R233	Resistor, Carbon Film, Chip 3.3K 1/10W ±5%	NI05332110
R234	Resistor, Carbon Film, Chip 2.2K 1/10W ±5%	NI05222110
R235	Resistor, Carbon Film, Chip 4.7K 1/10W ±5%	NI05472110
R236	Resistor, Carbon Film, Chip 2.2K 1/10W ±5%	NI05222110
R270	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R271	Resistor, Carbon Film, Chip 470K 1/10W ±5%	NI05474110
R272	Resistor, Carbon Film, Chip 470K 1/10W ±5%	NI05474110
R273	Resistor, Carbon Film, Chip 220K 1/10W ±5%	NI05224110
R274	Resistor, Carbon Film, Chip 470K 1/10W ±5%	NI05474110
R275	Resistor, Carbon Film, Chip 220K 1/10W ±5%	NI05224110
R276	Resistor, Carbon Film, Chip 220K 1/10W ±5%	NI05224110
R277	Resistor, Carbon Film, Chip 220K 1/10W ±5%	NI05224110
R278	Resistor, Carbon Film, Chip 220K 1/10W ±5%	NI05224110
R280	Resistor, Carbon Film, Chip 220K 1/10W ±5%	NI05224110
R282	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R283	Resistor, Carbon Film, Chip 820K 1/10W ±5%	NI05824111
R285	Resistor, Carbon Film, Chip 330 1/10W ±5%	NI05331110
R286	Resistor, Carbon Film, Chip 100 1/10W ±5%	NI05101110
R287	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R288	Resistor, Carbon Film, Chip 12K 1/10W ±5%	NI05123110
R290	Resistor, Carbon Film, Chip 270K 1/10W ±5%	NI05273112
R291	Resistor, Carbon Film, Chip 330K 1/10W ±5%	NI05334110
R292	Resistor, Carbon Film, Chip 56K 1/10W ±5%	NI05563110
R293	Resistor, Carbon Film, Chip 470K 1/10W ±5%	NI05474110
R295	Resistor, Carbon Film, Chip 1K 1/10W ±5%	NI05102110
R296	Resistor, Carbon Film, Chip 2.2K 1/10W ±5%	NI05222110
R298	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R300	Resistor, Carbon Film, Chip 100 1/10W ±5%	NI05101110
R301	Resistor, Carbon Film, Chip 150 1/10W ±5%	NI05151111
R302	Resistor, Carbon Film, Chip 0 1/10W ±5%	NI05000110
R303	Resistor, Carbon Film, Chip 27K 1/10W ±5%	NI05273110
R304	Resistor, Carbon Film, Chip 1K 1/10W ±5%	NI05102110
R305	Resistor, Carbon Film, Chip 180 1/10W ±5%	NI05181112
R306	Resistor, Carbon Film, Chip 22 1/10W ±5%	NI05220110
R307	Resistor, Carbon Film, Chip 1.5K 1/10W ±5%	NI05152110
R308	Resistor, Carbon Film, Chip 1.5K 1/10W ±5%	NI05152111
R309	Resistor, Carbon Film, Chip 150 1/10W ±5%	NI05151112
R310	Resistor, Carbon Film, Chip 1K 1/10W ±5%	NI05102110
R311	Resistor, Carbon Film, Chip 4.7K 1/10W ±5%	NI05472110
R312	Resistor, Carbon Film, Chip 1K 1/10W ±5%	NI05102110
R313	Resistor, Carbon Film, Chip 1.5K 1/10W ±5%	NI05152112

PARTS LIST

REFERENCE DESIGNATOR	DESCRIPTION	PART NUMBER
R314	Resistor, Carbon Film, Chip 0 1/10W ±5%	NI05000110
R315	Resistor, Carbon Film, Chip 100 1/10W ±5%	NI05101110
R317	Resistor, Carbon Film, Chip 100 1/10W ±5%	NI05101110
R318	Resistor, Carbon Film, Chip 1.5K 1/10W ±5%	NI05152113
R320	Resistor, Carbon Film, Chip 100 1/10W ±5%	NI05101110
R321	Resistor, Carbon Film, Chip 18K 1/10W ±5%	NI05183111
R322	Resistor, Carbon Film, Chip 18K 1/10W ±5%	NI05183112
R323	Resistor, Carbon Film, Chip 220K 1/10W ±5%	NI05224110
R325	Resistor, Carbon Film, Chip 220K 1/10W ±5%	NI05224110
R327	Resistor, Carbon Film, Chip 47K 1/10W ±5%	NI05473110
R328	Resistor, Carbon Film, Chip 680 1/10W ±5%	NI05681110
R330	Resistor, Carbon Film, Chip 680 1/10W ±5%	NI05681110
R331	Resistor, Carbon Film, Chip 2.7K 1/10W ±5%	NI05272110
R332	Resistor, Carbon Film, Chip 270 1/10W ±5%	NI05271110
R333	Resistor, Carbon Film, Chip 22 1/10W ±5%	NI05220110
R334	Resistor, Carbon Film, Chip 0 1/10W ±5%	NI05000110
R335	Resistor, Carbon Film, Chip 1.5K 1/10W ±5%	NI05152114
R336	Resistor, Carbon Film, Chip 3.3K 1/10W ±5%	NI05332110
R337	Resistor, Carbon Film, Chip 390 1/10W ±5%	NI05391110
R338	Resistor, Carbon Film, Chip 1K 1/10W ±5%	NI05102110
R339	Resistor, Carbon Film, Chip 47K 1/10W ±5%	NI05473110
R340	Resistor, Carbon Film, Chip 27K 1/10W ±5%	NI05273110
R341	Resistor, Carbon Film, Chip 8.2K 1/10W ±5%	NI05822110
R342	Resistor, Carbon Film, Chip 220 1/10W ±5%	NI05221110
R343	Resistor, Carbon Film, Chip 56K 1/10W ±5%	NI05563110
R345	Resistor, Carbon Film, Chip 3.9K 1/10W ±5%	NI05392110
R346	Resistor, Carbon Film, Chip 18K 1/10W ±5%	NI05183113
R347	Resistor, Carbon Film, Chip 3.3 1/8W ±5%	NI05033180
R401	Resistor, Carbon Film, Chip 100K 1/10W ±5%	NI05104110
R402	Resistor, Carbon Film, Chip 15K 1/10W ±5%	NI05153111
R403	Resistor, Carbon Film, Chip 1K 1/10W ±5%	NI05102110
R404	Resistor, Carbon Film, Chip 1.5K 1/10W ±5%	NI05152115
R405	Resistor, Carbon Film, Chip 33K 1/10W ±5%	NI05333110
R406	Resistor, Metal Oxide 390 1W ±5%	GA0002003A
R600	Resistor, Carbon Film, Chip 47K 1/10W ±5%	NI05473110
R601	Resistor, Carbon Film, Chip 1K 1/10W ±5%	NI05102110
R602	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R603	Resistor, Carbon Film, Chip 47K 1/10W ±5%	NI05473110
R604	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R605	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R606	Resistor, Carbon Film, Chip 100K 1/10W ±5%	NI05104110
R607	Resistor, Carbon Film, Chip 22K 1/10W ±5%	NI05223110
R608	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R609	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R610	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R611	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R612	Resistor, Carbon Film, Chip 47 1/10W ±5%	NI05470110
R613	Resistor, Carbon Film, Chip 27K 1/10W ±5%	NI05273110
R614	Resistor, Carbon Film, Chip 27K 1/10W ±5%	NI05273110
R615	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R616	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R617	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R618	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R620	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R621	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R623	Resistor, Carbon Film, Chip 1K 1/10W ±5%	NI05102110
R625	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R626	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R627	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R628	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R630	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R631	Resistor, Carbon Film, Chip 100K 1/10W ±5%	NI05104110
R632	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R633	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110

PARTS LIST

REFERENCE DESIGNATOR	DESCRIPTION	PART NUMBER
R635	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R636	Resistor, Carbon Film, Chip 470K 1/10W ±5%	NI05474110
R637	Resistor, Carbon Film, Chip 100K 1/10W ±5%	NI05104110
R638	Resistor, Carbon Film, Chip 1.5K 1/10W ±5%	NI05152116
R640	Resistor, Carbon Film, Chip 100K 1/10W ±5%	NI05104110
R641	Resistor, Carbon Film, Chip 100K 1/10W ±5%	NI05104110
R642	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R701	Resistor, Carbon Film, Chip 1K 1/10W ±5%	NI05102110
R702	Resistor, Carbon Film, Chip 470 1/10W ±5%	NI05471110
R703	Resistor, Carbon Film, Chip 470 1/10W ±5%	NI05471110
R704	Resistor, Carbon Film, Chip 27K 1/10W ±5%	NI05273110
R705	Resistor, Carbon Film, Chip 56K 1/10W ±5%	NI05563110
R706	Resistor, Carbon Film, Chip 470 1/10W ±5%	NI05471110
R707	Resistor, Carbon Film, Chip 470 1/10W ±5%	NI05471110
R708	Resistor, Carbon Film, Chip 470 1/10W ±5%	NI05471110
R709	Resistor, Carbon Film, Chip 470 1/10W ±5%	NI05471110
R710	Resistor, Carbon Film, Chip 470 1/10W ±5%	NI05471110
R711	Resistor, Carbon Film, Chip 470 1/10W ±5%	NI05471110
R712	Resistor, Carbon Film, Chip 470 1/10W ±5%	NI05471110
R801	Resistor, Carbon Film, Chip 4.7K 1/10W ±5%	NI05472110
R802	Resistor, Carbon Film, Chip 4.7K 1/10W ±5%	NI05472110
R803	Resistor, Carbon Film, Chip 470K 1/10W ±5%	NI05474110
R804	Resistor, Carbon Film, Chip 47K 1/10W ±5%	NI05473110
R805	Resistor, Carbon Film, Chip 47K 1/10W ±5%	NI05473110
R806	Resistor, Carbon Film, Chip 470K 1/10W ±5%	NI05474110
R807	Resistor, Carbon Film, Chip 10K 1/10W ±5%	NI05103110
R808	Resistor, Carbon Film, Chip 220 1/10W ±5%	NI05221110
R810	Resistor, Carbon Film, Chip 470K 1/10W ±5%	NI05474110
R811	Resistor, Carbon Film, Chip 560 1/10W ±5%	NI05561110
VR101	Resistor, Semi-Fixed 47K	RB0003014A
VR201	Resistor, Semi-Fixed 4.7K	RB0002014A
VR202	Resistor, Semi-Fixed 10KB RH0421C	RB0001014A
VR203	Resistor, Semi-Fixed 10KB RH0421C	RB0001014A
VR301	Resistor, Semi-Fixed 47K	RB0003014A
VR601	Resistor, Variable RV-819 RK0971111 10K	RB0006014A
VR602	Resistor, Variable RV-772 RK09L1140 10K	RB0005014A
VR603	Resistor, Semi-Fixed 470K	RB0004014A

MISCELLANEOUS ELECTRICAL

DR301	Filter, FK-032 TUCF1G0570W008B01	FG0004015A
DR302	Filter, FK-005	FG0003015A
FT101	FILTER, FL-631 302MNPR-1703D	FG0005015A
FT102	FILTER, FL-631 302MNPR-1703D	FG0005015A
FT103	Filter, Crystal FL-424	FG0002015A
FT104	Filter, Crystal FL-424	FG0002015A
FT105	Filter, Ceramic FL-061 CFU455E2	FG0001015A
FT106	Filter, Ceramic FL-061 CFU455E2	FG0001015A
J101	Jack, JK-324 53014-0210 2P	YJ0001053A
J102	Jack, JK-324 53014-0310 3P	YJ0002053A
J301	Jack, JK-540 87156-1101 11P	YJ0007053A
J302	Jack, JK-540 3P	YJ0006053A
J401	Jack, JK-324 53014-0610 6P	YJ0003053A
J402	Jack, JK-324 53014-0210 2P	YJ0001053A
J403	Jack, JK-324 53014-0610 6P	YJ0003053A
J404	Jack, JK-324 53014-0810 8P	YJ0004053A
J501	Jack, Antenna NT JK-425 M-RM-L 103	YJ0005053A
J601	Jack, JK-793 IMSA-9120B-07 7P	YJ0009053A
J602	Jack, JK-793 IMSA-9120B-07 7P	YJ0009053A
J603	Jack, JK-707 12R5D-708	YJ0008053A
J604	Jack, JK-324 53014-0310 3P	YJ0002053A
P701	Socket, PG-179 IMSA-9120S-07 7P	YJ0010053A
P702	Socket, PG-179 IMSA-9120S-07 7P	YJ0010053A
PC001	Assy, Main PD-625AA	L75449507A

PARTS LIST

REFERENCE DESIGNATOR	DESCRIPTION	PART NUMBER
PC002	PC BOARD:PLL, PD-638AA	L75449511A
PC003	Assy, Logic PD-625AA	L75449508A
PC004	Assy, LED PD-625AA	L75449509A
PC005	Assy, Volume PD-625AA	L75449510A
PC006	Assy, HIC PD-627AA	L75449505A
S601	Switch, Push SPH221A	SC0002041A
S602	Switch, Push SPH221A	SC0002041A
S603	Switch, Rotary RK09710WH	SC0001041A
SK101	Socket, SK-102 PIC-FB01-TC1 1P	YJ0011053A
SK102	Socket, SK-102 PIC-FB01-TC1 1P	YJ0011053A
SK103	Socket, SK-102 PIC-FB01-TC1 1P	YJ0011053A
SK104	Socket, SK-102 PIC-FB01-TC1 1P	YJ0011053A
SP501	Speaker, SP-196	QK0001010A
T401	Transformer, AF Choke TF-157	TS0001025A
TH301	Thermistor, TD5C310DA2H	HH0001008A
TH302	Thermistor, TD5-C215DA2	HH0002008A
W401	Cord, WZ-1226 60 W/P 2P	YC0002026A
W901	Cord, Power WZ-709	YC0001026A
X101	Crystal, QX-222 20.945MHZ	XF0001019A
X301	Crystal, QX-432 12.8MHz	XF0002019A
X601	Crystal, QX-550 4.9152MHz	XF0003019A

END OF DOCUMENT