

uniden®

ARU 251

**450-470 MHz
25 WATTS**

USA Version 1982 - 1987



SAFETY INFORMATION

Through the provisions of the Occupational Safety and Health Act (OSHA) of 1970, the United States Department of Labor has established an electromagnetic safety standard which applies to the use of two-way radio equipment. The proper use of this transceiver will result in exposure below the OSHA limit.

The following precautions are recommended:

WARNING

DO NOT operate the transmitter of a mobile radio, or a fixed radio station when someone is within two feet of the antenna.

DO NOT operate the transmitter of any radio equipment with the antenna touching, or close to the eyes, face, or exposed body parts.

DO NOT operate the transmitter of any radio equipment unless all the Radio Frequency (RF) connectors are secure and any open connectors are properly terminated.

DO NOT operate the transmitter of any radio equipment near electrical blasting caps or in an explosive atmosphere.

DO NOT let children operate any transmitter-equipped radio equipment.

All radio equipment **MUST** be properly grounded.

Have your radio equipment serviced by a qualified technician.

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SPECIFICATIONS

This Equipment Meets or Exceeds the Following Specifications

GENERAL

Channels	1
Frequency Range	450-470 MHz
Size	14 ⁷ / ₈ "W × 5 ³ / ₈ "H × 12 ³ / ₄ "D
Weight	25 lbs.
Input Power	
Standard	117 VAC, 60 Hz
Optional	117/220 VAC, 50/60 Hz
Current Drain	
Transmit	1.0 AMP
Receive	0.5 AMP
Operating Temperature Range	-30° C to +60° C
Channel Spacing	25 kHz
Tone Module (standard)	1 Tone Encode/Decode
Community Repeater Panel (optional)	Holds 7 Additional Tones
FCC Type Acceptance & Certification	Parts 21, 90, 95, 15

TRANSMITTER

RF Power Output	25 Watts (EIA DUTY CYCLE) 15 Watts Continuous 2 Watts Optional
Audio Distortion	3%
Modulation	16F3
FM Hum and Noise	60 dB
Spurious and Harmonic Suppression	60 dB
Frequency Stability	± 0.00025% (- 30° C + 60° C)

RECEIVER

Sensitivity	
12 dB SINAD	0.35 μV
20 dB Quieting	0.45 μV
Selectivity	85 dB
Intermodulation Rejection	75 dB
Spurious Rejection	80 dB
Image Rejection	75 dB
Modulation Acceptance	7 kHz
Audio Output (at 10% THD)	2.5 W
Frequency Stability	± 0.0005%

Specifications 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.

Description

The ARU251 repeater is a solid state FM system capable of 25 watts of RF Power. The repeater is normally operated from a 117 volts AC (60 Hz) source, or may be ordered to operate from 117/220 volts AC (50/60 Hz) source. Provisions have been made for a 12 volt battery source to take over when the AC power fails. **However, NO provisions were made for charging the battery during normal operation.** The standard repeater can be accessed by a carrier only or by a single CTCSS tone. The tone accessed system can be upgraded to an 8 user community repeater with the addition of the ARX 200 Community Repeater panel. The repeater has a Time-Out-Timer that can be adjusted for 2 to 8 minutes, and a warning beep to alert the operator that the system is being operated from the standby battery.

Technical Support

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

UNIDEN AMERICA CORPORATION
Commercial Communications Division
Technical Support
4700 Amon Carter Boulevard
Fort Worth, Texas 76155

or by telephone: 1-800-445-5017

Replacement Parts

Replacement parts are available through the Parts Department located in Fort Worth, Texas. 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:

UNIDEN AMERICA CORPORATION
Commercial Communications Division
Parts Department
4700 Amon Carter Boulevard
Fort Worth, Texas 76155

or by telephone: 1-817-858-3600
or by FAX: 1-817-858-3523

Ordering Additional Manuals

To order additional copies of this Service Manual, send order for CC SM 8A to:

UNIDEN AMERICA CORPORATION
Commercial Communications Division
Literature Department
4700 Amon Carter Boulevard
Fort Worth, Texas 76155

or by telephone: 1-817-858-3631

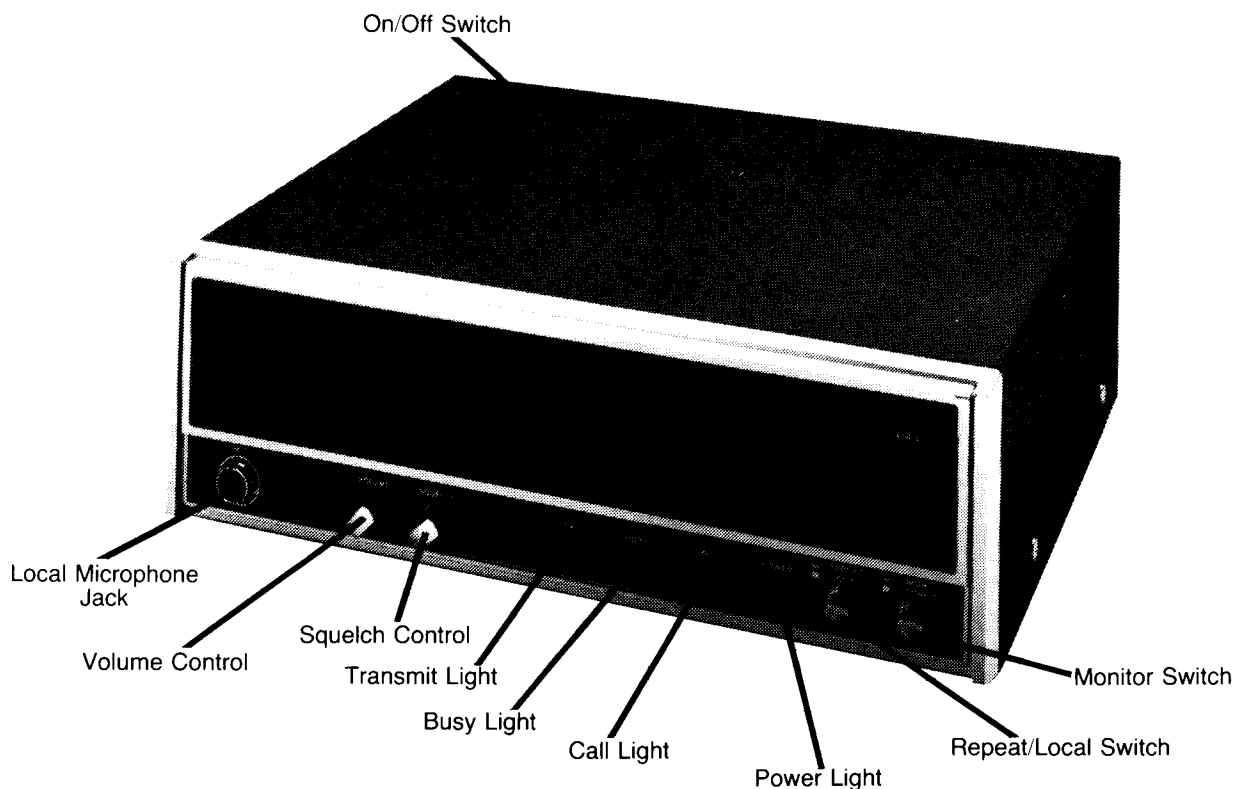
In Canada, write to:

UNIDEN CANADA, INCORPORATED
200 Aberdeen Drive
London, Ontario

Canada N5V 4N2

or by telephone: 1-519-457-0203
or by FAX: 1-519-457-0204

OPERATING INSTRUCTIONS



CONGRATULATIONS

You now own the best value in land mobile radio . . . a Uniden/Force Communications Radio from Uniden. You'll find that it gives you consistently outstanding performance in virtually all conditions and situations.

Before using, your radio must be properly licensed by the Federal Communications Commission (FCC) and be properly installed. Your Uniden Dealer will be able to help you with any or all of these requirements. He will also be there to help you with all your future communication needs.

LOCAL CONTROL REPEATER/BASE STATION OPERATION

1. After initial power-up, allow a 5 minute warm-up period to ensure that the transmitter is within FCC frequency specifications.
2. Rotate the squelch control fully counterclockwise.
3. Adjust the volume control for a comfortable listening level.
4. Turn the squelch control clockwise until all background noise disappears.
5. Place the REPEAT/LOCAL switch in the "LOCAL" (OUT) position.
6. The monitor switch is used as follows:
 - 6.1 Switch In: Lets you receive all calls broadcast on the channel.
 - 6.2 Switch Out: Lets you hear only those calls meant for your group, if the unit is equipped with CTCSS, and if the microphone is hung-up in a

properly grounded hang up bracket. When a call is received, the CALL light will come on and remain on until you pick up the microphone or reset the light by momentarily depressing and releasing the monitor "MON" switch. The CALL light will alert you that a call was received while you were away from your station.

7. Before transmitting, monitor your channel to ensure that it is not busy. The BUSY light will be on if the channel is busy.
8. To transmit, depress the Push-To-Talk switch on the side of the microphone and hold it in while you transmit your message. Release the switch when your message is finished. For better voice quality in your transmissions, hold the microphone vertically in front of your face with the top of the microphone approximately level with your lips and about 2 inches away from your mouth.
9. When your call is finished, and a reply has been made, it is a good practice to hang up the microphone.

REPEATER OPERATION

1. After initial power-up, allow a 5 minute warm-up period to ensure that the transmitter is within FCC frequency specifications.
2. Place the Repeat/Local switch in the Repeat (IN) position.
3. That's it! The ARU 251 is now a repeater.

OPERATING CONTROLS AND THEIR FUNCTIONS

ON/OFF SWITCH:

Located on the rear panel. When activated, the switch applies power to the unit.

POWER LIGHT:

This green LED will glow steady during AC power operation, and will flash during battery operation.

TRANSMIT LIGHT:

This red LED indicates the presence of the transmitter RF carrier.

BUSY LIGHT:

This yellow LED indicates the presence of a carrier on the receive frequency, and shows the user that the channel is busy.

CALL LIGHT:

This yellow LED indicator is provided for use when the ARU 251 is utilized as a local control repeater/base station. It will come on and remain on when the correct CTCSS tone has been received, provided the unit is equipped with CTCSS, and the microphone is in a properly grounded hang up bracket and the "MON" switch is in the "TONE SQ" position. Resetting the call light can be accomplished by simply removing the microphone from the hang up bracket or momentarily depressing and releasing the "MON" switch.

MONITOR SWITCH:

By placing this switch in the monitor position, (IN) the user can monitor or receive all calls broadcast on the channel. When the switch is in "TONE SQ" position (OUT), the user will only hear the calls intended for his group, if the unit is equipped with the CTCSS option.

REPEAT/LOCAL SWITCH:

When this switch is in the "Repeat" (IN) position, the repeater action is automatic and can be accessed by another station as well as the local microphone. In the "Local" (OUT) position, keying of the transmitter can only be accomplished by the local microphone.

SQUELCH CONTROL:

This control adjusts the Local audio amplifier opening sensitivity and should be adjusted in the following manner. **Note: This control has no effect on repeater operation.**

1. Rotate the squelch control fully counterclockwise.
2. Then rotate the control clockwise until the noise just disappears. For the best results, leave the control in this position. Turning the control further will result in diminished sensitivity.

VOLUME CONTROL:

This control adjusts the local speaker audio output level.

THEORY OF OPERATION

To better understand the theory of operation of the ARU 251 refer to the block diagram and the schematic diagram.

TRANSMITTER OSCILLATOR

The transmitter frequency is controlled by a crystal oscillator, composed of a third overtone series resonant crystal X001, transistor Q013, varactor diode D010, and tuning coil L019. This circuit oscillates at a frequency between 37.5 to 39.2 MHz as determined by the crystal that is installed. The oscillator is modulated by the phase modulator D015 and D016. Thermistor TH301 and transistor Q008 make up the temperature compensation network for the transmit oscillator. All components used in the oscillator and compensation network were chosen to have a minimal effect on the frequency as the operating temperature changes.

SPEECH AMPLIFIER

In the local mode, the output of the dynamic microphone is passed through the input pre-emphasis circuit consisting of C078, R071 and R070 before being amplified by Q014. IC001 (1/2) acts as an amplifier and limiter. The output from the limiter is fed into an active low-pass filter, IC001 (2/2), which provides a very sharp attenuation of frequencies above 3000 Hz to prevent radiation outside the permissible bandwidth.

PHASE MODULATOR

The output of the speech amplifier is fed to the phase modulator D015 and D016 through an RC network composed of R056, R060, R061, C064 and C069 where it then modulates the output of the transmit oscillator, Q003. The modulated RF signal is taken from L024 and applied to the frequency multipliers at Q007.

FREQUENCY MULTIPLIERS

The modulated RF signal from the phase modulator is fed to the frequency multipliers where the signal is doubled by Q007, tripled by Q006, and doubled again by Q005 for a total multiplication of 12. Transistor Q004 and Q003 amplifies the signal to about 400 mW to provide sufficient drive level for the final amplifier. The output of Q003 is then passed through a tuned network to suppress harmonics and other spurious emissions before being applied to the power amplifier.

RF POWER AMPLIFIER

The signal, at the proper transmit frequency and containing modulation, is fed to the power amplifier consisting of Q303, Q302, and Q301. This RF power amplifier increases the output power to 25 watts. The signal then passes through a tuned output circuit to transform the collector impedance of Q301 to 50 ohms; followed by a fixed tuned low-pass filter to suppress harmonics of the transmitter.

POWER CONTROLS

The ALC, Automatic Level Control, circuit consists of D304, VR302, Q015 and Q009. The ALC monitors the forward power and controls the collector voltage on Q004 to maintain 25 watts of output power under varying conditions.

The APC, Automatic Power Control, circuit consists of D302, VR301, Q305, Q015, and Q009. The APC monitors the reflected power and aids in protecting the Power Amplifier by decreasing the collector voltage to Q004 under mismatched load conditions.

RECEIVER RF SECTION

The received signal passes through a dual-tuned helical resonator L101 and L102 to the RF amplifier Q101. The output of Q101 is coupled to the first mixer through helical resonators L103, L104, L105, and L106. This balanced mixer is composed of L107, Q102, Q103 and L108. The output of the mixer is passed through the 21.4 MHz crystal filter FL101.

RECEIVER OSCILLATOR

The receive crystal X102 is connected to the oscillator Q107 by switching transistor Q109. The oscillator oscillates at a frequency of 47.6 to 49.8 MHz. This signal is tripled by Q106, L117, L116, and L115, then tripled again by Q105 and the helical resonators L113 and L112. This output frequency is then applied to balance mixer as the injection frequency.

FIRST and SECOND IF

The output of the first mixer, at L108, is passed through a 21.4 MHz crystal filter FT101 to obtain the desired selectivity. The IF signal is then amplified by the IF amplifier Q104. This amplified IF signal is then applied to pin 16 of the integrated circuit IC101. This integrated circuit contains the second mixer and the second local oscillator. A 20.945 MHz crystal is connected to pins 1 and 2 of IC101 to complete the second local oscillator. The output of the second mixer, pin 3 of IC101, is passed through a 455 kHz ceramic filter FT102 and is applied to the amplifiers, limiters, and quadrature detector contained in IC101. The recovered audio is available at pin 9 of IC101 and is applied to the squelch gate, audio amplifier and CTCSS decoder.

SQUELCH GATE

The noise signal from IC101 is fed to the squelch control VR502 via the limit control VR101. This signal is then amplified by the noise amplifier Q111 and fed to the active filter of IC101, pin 10. The output of the filter, pin 11, is then rectified by D101 and used to drive the squelch trigger circuit in IC101, pin 12. The output of the trigger, pin 13 of IC101, drives the base of Q113 high in the squelched mode, thus pulling the gate of Q112 low muting the audio noise in the speaker with no carrier present.

RECEIVER AUDIO

The audio signal from IC101 is fed through an active high pass filter FT103 to the audio pre-amplifier Q110. The output of this amplifier passes through the squelch gate, Q112, to the volume control VR501, then to the audio power amplifier IC102, which amplifies the recovered audio to a level sufficient to drive the speaker.

TX AND BUSY LED'S

The TX LED is activated by detecting a portion of the transmitted RF signal by D303 which turns Q306 on, pulling the cathode of D500 near ground potential. The anode of D500 is connected to the 8V line.

The BUSY LED is activated when a received signal causes pin 14 of IC101 to go high, turning on Q407, pulling the cathode of D501 near ground potential. The anode of D501 is connected to the 8V receive line.

CALL MEMORY

The CTCSS includes a call memory feature. On reception of a proper CTCSS signal Q402 is turned on, which also turns on Q406 and Q405, which turns on D502, the yellow call LED. Q406 and Q405 remain latched on until reset by the monitor switch or by removing the microphone from the hang-up clip.

CRYSTAL TEMPERATURE CONTROL

A posistor is clipped to the receive crystal which is used to heat the crystal when the ambient temperature is -10°C or lower.

As the temperature decreases, the resistance of thermistor TH505 increases, allowing Q501 and Q502 to turn on. Q502 supplies power to posistor TH501 and TH502.

A 47 ohm 2 watt resistor R316 is clipped to the transmit crystal to keep the crystal temperature at 75 to 80 degrees C. Thermistor TH302 is attached to the crystal clip and senses the temperature of the crystal. As the crystal temperature decreases, the base voltage of Q308 increases supplying more base current to Q307, thus allowing Q307 to supply more current to R316 raising the crystal temperature.

POWER SUPPLY

The output voltage is regulated by a 317-T adjustable voltage regulator IC1. This regulator controls the output voltage by maintaining a reference voltage between the output and adjustment pins. This reference voltage is applied across R712 resulting in a current flow of $(1.25\text{V}/\text{R712})$, which also flows through the series combination of R713 and VR701. The current flowing through R712 and VR701 will produce a voltage of $(1.25\text{V}/\text{R712}) \times (\text{R713} + \text{VR701})$. The output voltage is the result of the addition of this voltage to the reference voltage.

The high output current capability is provided by the pass transistor Q705 and driver Q703. As the load current increases, the output voltage tends to decrease,

which forces the reference voltage lower. Since the reference voltage must be maintained, IC1 draws more current from Q702. The increased current flowing through R703, supplies more base current to Q703, increasing its collector current and the base drive to Q705, thus allowing a higher load current at a set output voltage.

As the load current increases, the base emitter junction voltage of Q701 increases due to the current sensing resistor R716. As this voltage approaches 0.7 volts Q701 begins to conduct reverse biasing, Q702, forcing it into cutoff. With Q702 no longer fully conducting, the input to IC1 will be decreased below the necessary minimum, thus causing the output voltage to decrease. As Q702 is driven into cutoff, the emitter - collector current of Q702 will decrease, thus decreasing the base current to Q703. As the base current of Q703 is decreased, the collector current must also decrease, thus decreasing the drive to Q705 and the output load current.

As the load attempts to draw, increasing amounts of current from the power supply, Q701 is driven further into conduction, thus driving Q702 further into cutoff. As this happens, the output voltage is decreased, thus decreasing the output current. This condition is known as current fold-back.

When the output becomes shorted, the base of Q705 is pulled close to ground, thus driving Q705 into cutoff, severely limiting the output current. Also, the emitter of Q704 is pulled low turning on Q704 and unbalancing the resistor network of R705, R704, R701 and R716 turning on Q701 and folding back the current as above.

When the output voltage reaches a danger point, about 16.5 volts, the zener diode D703 breaks over and applies a voltage to the gate of the SCR, IC2. This gate voltage causes the SCR to fire, shorting the output of the power supply, thus protecting the equipment that is connected to it. The SCR will remain fired until the supply voltage has been removed.

REPEATER CONTROL BOARD

In the repeat mode, the audio signal from IC101 (push pin P22), is fed to the control PCB. On the control PCB, the audio path is split; one path will cause the transmitter to key, the other path is the repeat audio to the transmitter.

REPEAT AUDIO

In repeat mode, the CTCSS tone is stripped from the recovered audio signal by the high pass filter IC606, before it is de-emphasized by IC600-4. This audio signal is then passed through the audio transmission gate IC604 to the speech amplifier, via the gain control VR604. The audio signal is then processed by the speech amplifier in the same way as the signal from the local microphone.

In the repeat mode, one input of IC602-3 is held high by switch SW500, the other input is allowed to follow the C.O.S. line. When the C.O.S. goes high, the output of IC602-3 goes low and is inverted by IC602-4, thus opening the speech transmission gate. In the local mode the speech transmission gate is held closed by grounding one input of IC602-3.

REPEATER SQUELCH GATE

The recovered audio is also fed to the repeater squelch circuit, and the CTCSS tone decoder, if the unit is equipped with CTCSS. Op amp IC600-1 buffers the audio so as not to load down the receiver output. IC600-2 is a Hi-Pass filter which allows the high frequency "rush" noise to pass. This noise is rectified by D601 and used to charge capacitor C615. In the absence of carrier, C615 will remain charged, thus keeping the output of IC600-3 low. When an RF carrier is present, the "rush" noise is reduced, thus allowing C615 to discharge through R610, causing the output of IC600-3 to go high. The output of IC600-3 is wired OR'ed to the output of a second squelch gate IC611-1, and is connected to the input of IC611-2. This second squelch gate is composed of D612, IC611-1, C621 and R653 which parallels the operation of IC600-3, but with a shorter time constant. The output of IC611-2 is connected to one input of NAND gate IC602-4. When the output of IC600-3 or IC611-2 goes high it turns Q600 on, lighting up the yellow LED D609, showing that a carrier has been detected.

A portion of the recovered audio is fed to the tone decoder through P1-1. When the decoder sees the correct CTCSS tone it will output a high on P1-7. This high fed to the second input of IC602-1 through S1, and to the base of Q601 turning on the green LED D610, indicating that a CTCSS tone has been detected. This high is also applied to the call memory circuit of the receiver, causing it to latch if the microphone is hung up in a grounded bracket. When both inputs of NAND gate, IC602-1 are high, the output is low. This low is inverted by IC602-2 and fed to the speech and tone transmission gate, and to the transmitter Push-To-Talk line.

The repeater can be operated as a carrier access unit by placing switch S1 in the carrier squelch mode. When placed in this mode, the red LED D611 is turned on as an indication that the unit is in carrier only operation, and a logic high is placed on the tone input of IC602-1.

REPEATER PTT and DROPOUT TIMER

When the C.O.S. goes high, it turns on Q603, thus charging C617 and turning off IC603-1. When the output of IC603-1 goes low, the output of IC603-2 goes high, turning on Q602, pulling the collector near ground potential keying the transmitter. When the C.O.S. goes low, C617 will discharge through R624 and VR601, thus keeping the transmitter up until the input of IC603-1 is low enough for it to turn on. This dropout time can be set from 1 to 10 seconds. When the local microphone is keyed in the repeat mode, diode D605 is forward biased and will conduct keying the transmitter.

CTCSS TONE ENCODER

The CTCSS tone encoder is composed of IC605 and the resistor network R638, R639, R640 and VR605. Jumpers J7 and J8 control the frequency range of the encoder and VR605 controls the tone frequency. The output tone is taken from pin 3 of IC605 and fed to the tone transmission gate IC604-4 to P2-5 (tone input to the Phase Modulator VR202). When the C.O.S. line is high, the tone transmission gate is opened. In local mode the tone transmission gate is opened by pressing the Push-

To-Talk key, causing the output of IC603-3 to go high. Diodes D606 and D607 are used as isolation diodes.

TIME-OUT-TIMER

When the C.O.S. line goes high it will reset the T.O.T. pin 11 of IC601 via IC603-1, and start the T.O.T. oscillator IC603-4 via IC603-2. The output of the oscillator is fed to the counter IC601 pin 10. The counter is programmed to count 8192 cycles of the oscillator before sending pin 3 high. The high on pin 3 of IC601 starts the beep tone oscillator, sending 2 to 3 seconds of alert tone before C618 charging through R626 turns off IC603-2 unkeying the transmitter.

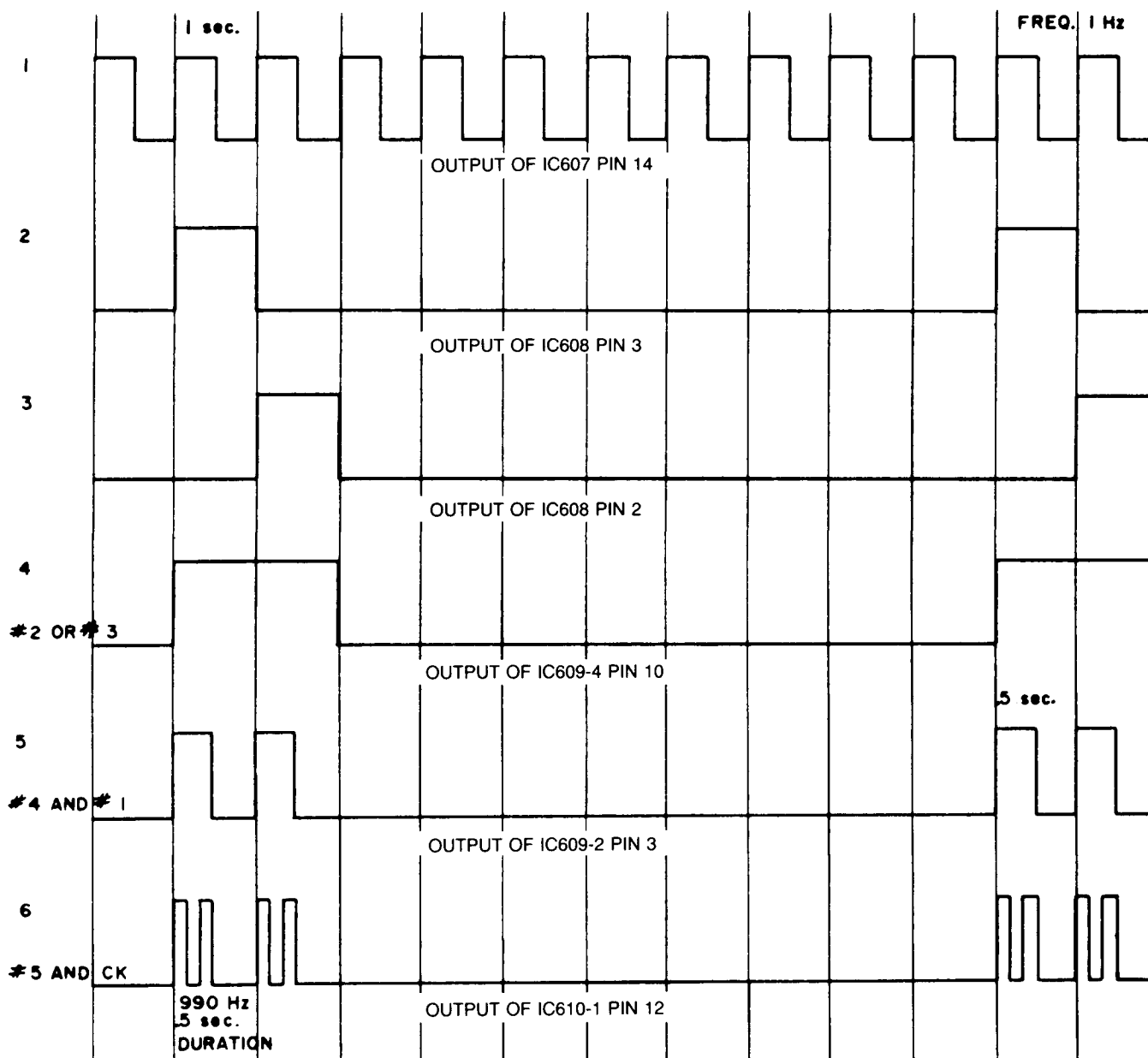
BATTERY OPERATION WARNING

When the internal AC power supply fails and the external battery takes over, the operation of the repeater, the

system warns the operator by flashing the green power LED, and transmitting an alert tone, consisting of two half-second tone burst every ten seconds.

To better understand the operation of the warning system, refer to the timing chart below. The warning system is enabled by removing the bias to the input of IC610-4, thus starting the clock, which is divided by IC607, to produce a frequency of about 1 Hz. The output of IC607, pin 14 is used to flash the green power LED and is divided again by IC608 to produce two signals of 1 second on and 9 seconds off with one offset by 1 second. These two outputs are OR'ed together in IC610-3, IC610-2 and IC609-4 to produce an output signal of 2 seconds on and 8 seconds off. This signal is NAND'ed in IC609-1 with the 1 Hz signal to produce two half-second pulses every 10 seconds. The signal is then inverted by IC609-2 and NAND'ed with the clock signal in IC609-3. The output is inverted by IC610-1 and applied to the modulator via VR606.

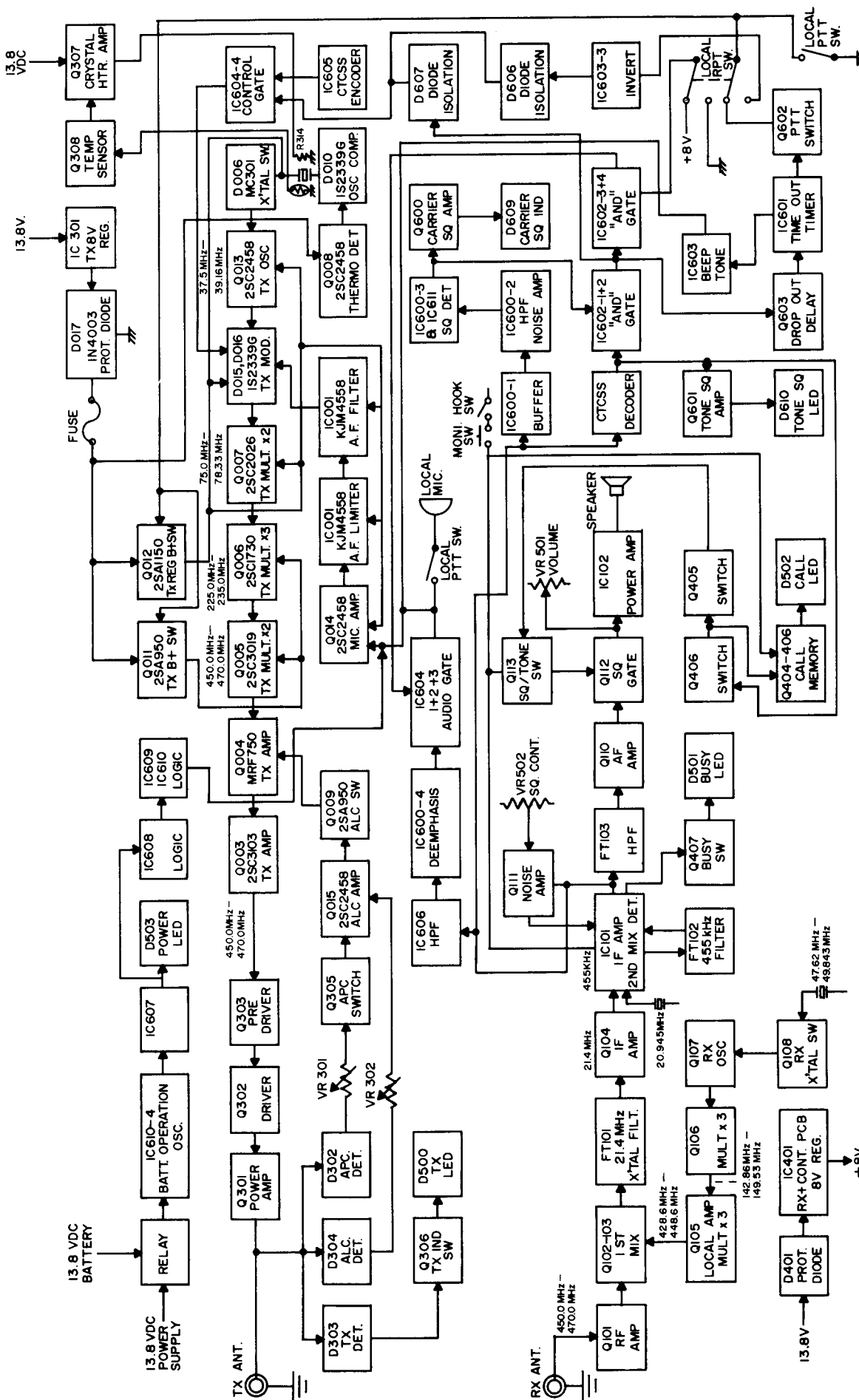
TIMING CHART A



SUGGESTED TEST EQUIPMENT

The following is a list of suggested test equipment that will be needed to repair this unit. Many of the individual items can be replaced by a service monitor. However, to completely test this unit you **must** be able to generate an RF signal while monitoring the transmitter.

TEST INSTRUMENT	REQUIRED SPECIFICATIONS	SUGGESTED TYPE
DC Power Supply	Voltage: 13.8 VDC Current: 7 Amps Cont.	Ratelco PS-9 12VDC Battery
RF Wattmeter	Frequency: 148 - 174 MHz Power: 0 - 50 Watts	Bird Model 43 & 50 C Element
RF Dummy Load	Impedance: 50 Ohms Power: 50 Watts	Bird Model 8085 Bird Model 8135
DC Voltmeter	Range: 0 - 10 V DC Resistance: 10 Meg Ohm	Simpson 260 Fluke D802 or D804
AC Voltmeter	Range: 3 mV - 10 V	Leader LMV 181 A
Audio Generator	Frequency: 10 - 10 kHz Level: 0 - 1 V	Leader LGA 120 A
Deviation Meter	Range: 0 - 5 kHz	Marconi TF 2304
Distortion Meter or	Range: 30 - 10 kHz Level: 1 mV - 300 V	Leader LDM 170
Sinadder	Input Level: 1 - 5 VAC	Helper's Sinadder 3
RF Frequency Counter	Range: 148 - 174 MHz Accuracy: ± 2 ppm/yr.	HP - 5383 A Data Precision 500/TB8
Oscilloscope	Bandwidth: 50 - 100 MHz Triggered Sweep	Tektronics 2213 or 456 Hameg HM705
RF Signal Generator	Range: 148 - 174 MHz Level: 0.1 - 1000 μ V Modulation: Int/Ext Deviation: 0 - 5 kHz	Wavetek 3005
Attenuator	Attenuation: 20 dB	Bird 8341-200 Bird 8343-200
Service Monitor	Power: 50 Watts Min.	Motorola RS2001 IFR 500 or 1000S, IFR 1200 or 1500 Wavetek 3000, 3000B or 3100 Cushman CE-4000 or CE-50



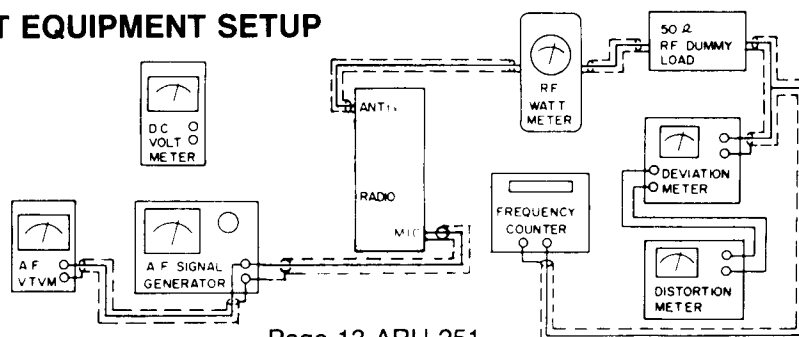
POWER SUPPLY ALIGNMENT PROCEDURE

STEP	PRESET TO	ADJUSTMENT	REMARKS
1	Connect unit to 117 VAC Source. Power switch: ON	VR701 (On Power Supply PCB)	Connect a DC Voltmeter to the eitter of Q705. Adjust VR701 to obtain a 13.8 VDC reading on the Voltmeter.

TRANSMITTER ALIGNMENT PROCEDURE

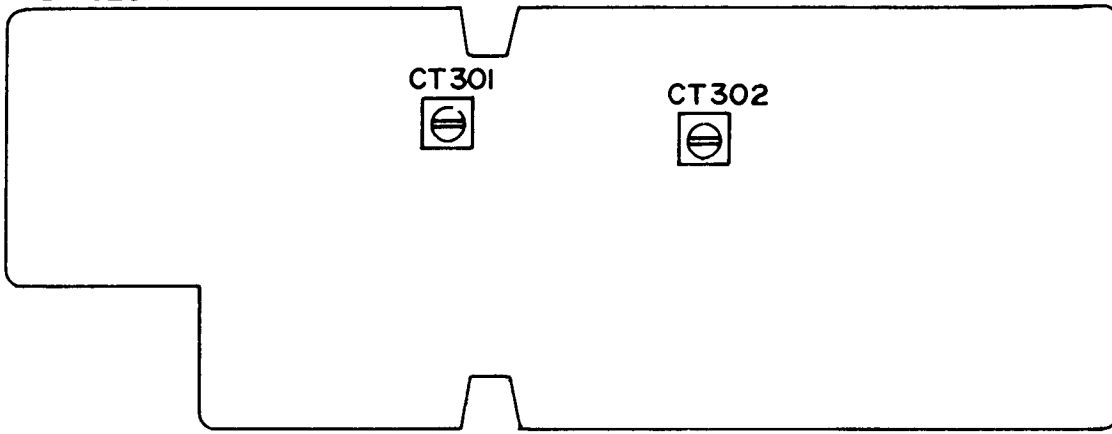
STEP	PRESET TO	ADJUSTMENT	REMARKS
1	Volume: Max (CW) Squelch: Max (CW) Mode: Local VR604: (On control board) Mid-Range	VR302	Preset VR302 fully CCW. Apply power to the unit for about 5 minutes to ensure that the crystal heater has reached its operating temperature.
2	Same as Above	L023, L024	Connect DC Voltmeter (+) to CM001 Pin 1, (-) to Ground. Adjust L023 and L024 for maximum DC Voltage. Inject 1KC tone (approx. 50mu) and adjust for best symetry and level.
3	Same as Above	L016, L017	Connect DC Voltmeter (+) to CM001 Pin 3, (-) to CM001 Pin 2. Adjust L016 and L017 for <i>minimum</i> DC Voltage.
4	Same as Above	CV005, CV006	Connect DC Voltmeter (+) to CM001 Pin 3, (-) to CM001 Pin 4. Adjust CV005 and CV006 for maximum DC Voltage.
5	Same as Above EXCEPT: VR302: Fully CCW VR301: Fully CCW	FL006, L006 CV004	Adjust FL006 and L006 for maximum RF power output.
6	Same as Above	CT301, CT302	Adjust CT301 and CT302 for maximum RF power output.
7	Same as Above	FL006, L006 CT301, CT302	Repeat Steps 5 and 6. Adjust for 25W intermittant duty or 15W continuous duty.
8	Same as Above	VR302	Adjust VR302 for desired RF output power level.
9	Same as Above	L019	Adjust L109 to obtain the correct transmit frequency as shown on the frequency counter.
10	Same as Above	VR301	Disconnect RF load and adjust VR301 for 5 Watts of reflected RF power.
11	Same as Above	VR002	Adjust VR002 to obtain 550 to 750 Hz CTCSS deviation.
12	Same as Above EXCEPT: AF SG: Freq: 1kHz Level: 30 mV	VR003	Apply output of AF generator to local microphone input. Adjust VR003 for 4.7 kHz total system deviation.

TRANSMITTER TEST EQUIPMENT SETUP

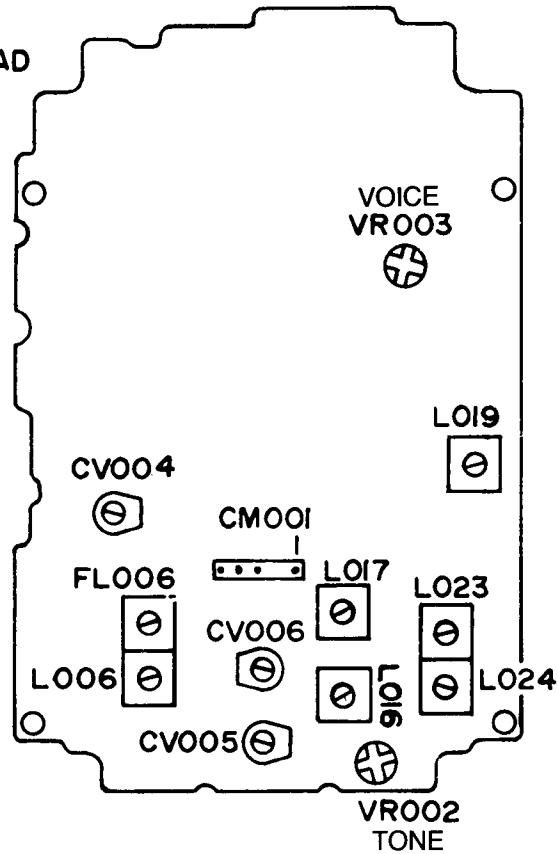


POWER AMPLIFIER P.C. BOARD

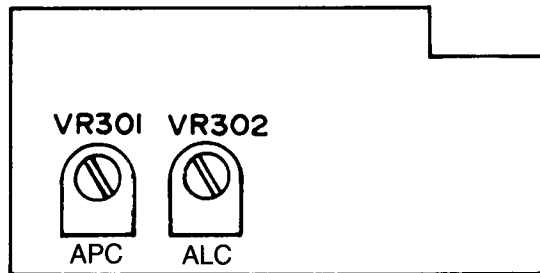
PD-026AA



PD-055AD



3500-120

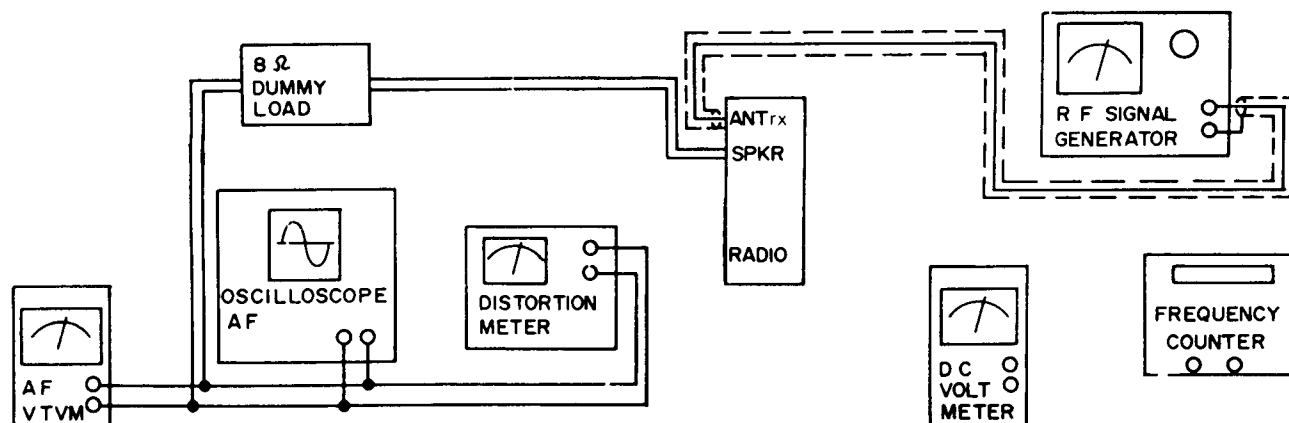


TRANSMITTER ALIGNMENT LOCATION CHART

RECEIVER ALIGNMENT PROCEDURE

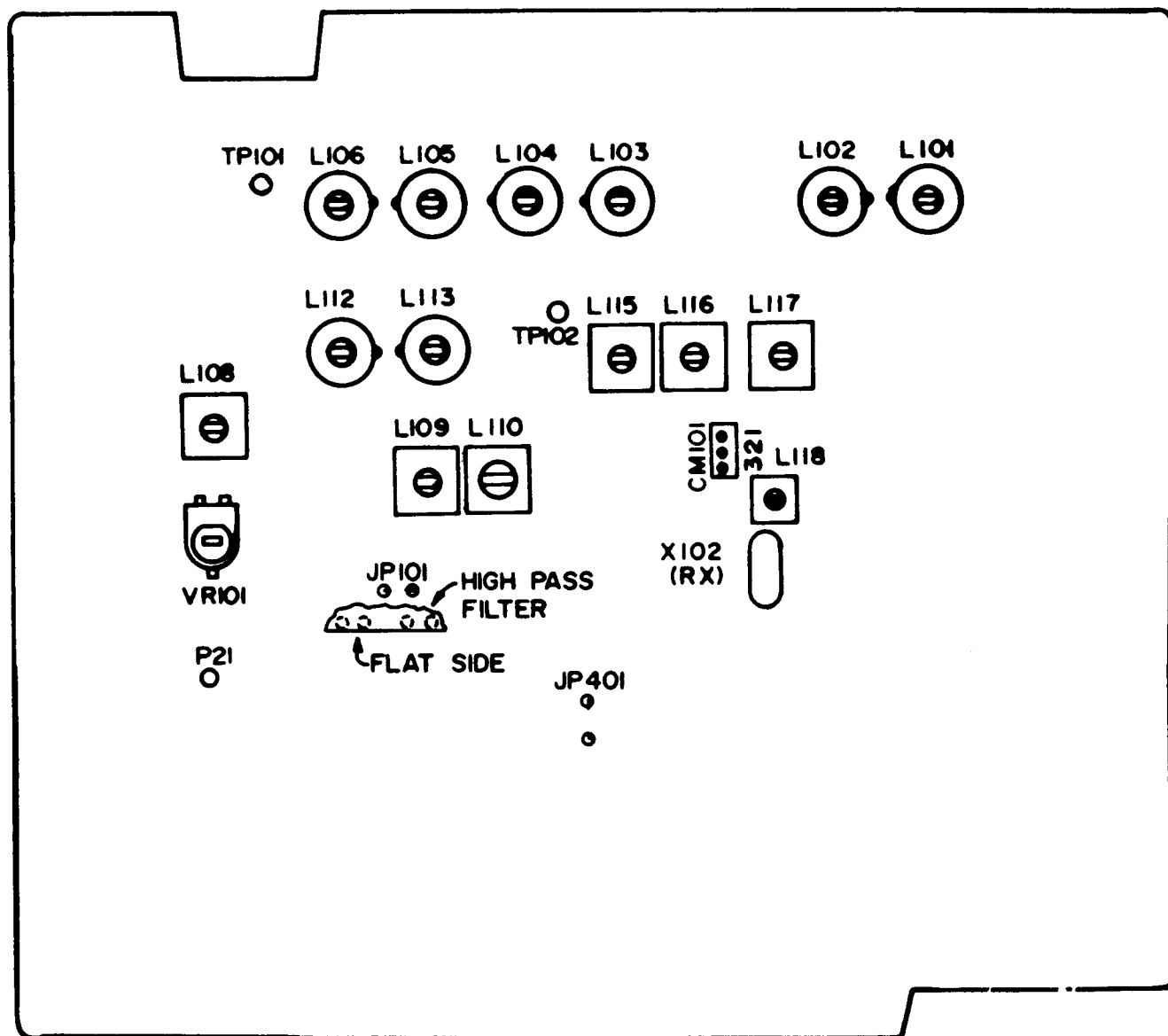
STEP	PRESET TO	ADJUSTMENT	REMARKS
1	Volume: Max (CW) Squelch: Max (CW) Mode: Local	L117, L116 L115	Connect Oscilloscope to TP102. Adjust L117, L116, and L115 for maximum indication on scope.
2	Same as Above	L113, L112	Connect DC Voltmeter to CM101 - Pin 1 and Ground. Adjust L113 and L112 for maximum DC Voltage.
3	Same as Above	L117, L116 L115, L113 L112	Readjust coils in the following order: L117 - L116 - L115 - L113 - L112 for maximum DC Voltage.
4	Same as Above	L118	Connect RF Counter to TP102. Adjust L118 to obtain the Receive Frequency - 21.4 MHz.
5	Volume: Max (CW) Squelch: Min (CCW) Mode: Local RF SG: 1mV, No Mod	L110	Connect DC Voltmeter to CM101 - Pin 3 and Ground. Adjust L110 to obtain a $4V \pm 0.2V$ reading on the DC Voltmeter.
6	Same as Above EXCEPT: RF SG Freq: 1kHz Dev: 3kHz Level: 0.2uV	L108, L109	Adjust L108 and L109 to obtain the best S/N ratio (about 10dB) indication on the distortion meter.
7	Same as Above	L101, L102 L103, L104 L105, L106	Adjust coils for minimum SINAD. Decrease signal generator level to obtain the best sensitivity.
8	Same as Above EXCEPT: RF SG Level: 1uV	L108, L109	Adjust L108 and L109 to obtain minimum distortion.
9	Same as Above EXCEPT: Squelch: Max (CW) RF SG Level: 1uV	VR101	Adjust VR101 so that the squelch will break at a 1uV input level.

RECEIVER TEST EQUIPMENT SETUP



P.C. BOARD

PD-027AA



RECEIVER ALIGNMENT LOCATION CHART

CONTROL BOARD ALIGNMENT PROCEDURE

STEP	PRESET TO	ADJUSTMENT	REMARKS
1	Volume: Max (CW) Squelch: Min (CCW) Mode: Local RF SG: Freq: 1kHz Dev: 3 kHz Level: 0.25 uV	VR600, VR601 VR602, VR603 VR604, VR605 VR606	Preset controls to mid-range.
2	Rptr. Sq. Adj. Same as Above	VR600	Adjust VR600 until the yellow L.E.D. (D609) just comes on. (Repeater squelch is open.)
3	CTCSS Adj. Same as Above	<u>JP1, JP2</u> ¹ or <u>JP 9, JP10</u> ²	Cut jumpers <u>JP1 and JP2</u> ¹ or <u>JP 9 and JP10</u> ² for the desired decode tone range. Refer to TABLE 1 .
4	CTCSS Adj. Same as Above	<u>VR1</u> ¹ or <u>VR610</u> ²	Connect a frequency counter to <u>test point 1</u> ¹ (<u>on the ARX 500</u>) or <u>test point 4</u> ² (<u>on the control board</u>) . With clip leads, connect J4 leads or pins together. - Adjust <u>VR1</u> ¹ or <u>VR610</u> ² to obtain the desired decode frequency. Remove clip leads from J4.
5	CTCSS Adj. Same as Above	J7, J8	Cut jumpers J7 and J8 for the desired encode tone range. Refer to TABLE 2.
6	CTCSS Adj. Same as Above	VR605 ³	Connect frequency counter to TP3. - Adjust VR605 to obtain the desired encode tone.
7	Rptr. Audio Adj. Same as Above EXCEPT: Mode: Repeat RF SG: Level: 1 mV S600: Carrier Sq.	VR604	TX should key. Adjust VR 604 to obtain 3.7 kHz deviation of the transmitter.
8	Rptr. TOT Adj. Same as Above	VR602	Connect frequency counter to TP2. - Adjust VR602 to obtain the desired timeout time using the formula: $FR=8192/(Time-2)$ Time is in seconds.
9	Drop Out Delay Same as Above	VR601	Apply a carrier to the receiver. Transmitter should key up. Remove carrier. - Adjust VR601 for the desired drop out time.
10	TOT Warning Level Same as Above	VR603	Cut Jumper J6. Apply a carrier to the receiver. Allow the transmitter to time out. Adjust VR603 for the desired modulation level of the beep tone (Approx. 1 kHz). Connect Jumper J6.
11	Batt Warning Level Same as Above EXCEPT: AC Power Removed Apply 13.6 V to battery back-up terminals.	VR606	Depress local PTT switch. Adjust VR606 for the desired modulation level of warning tone. (Approx. 1 kHz)

NOTES:

- These parts are located on the ARX 500 Decoder PC board used in the older versions.
- These parts are located on the control PC board (PD-200).
- When changing CTCSS Frequency it may be necessary to readjust transmitter deviation. Refer to transmitter alignment procedure, Steps 11 and 12.

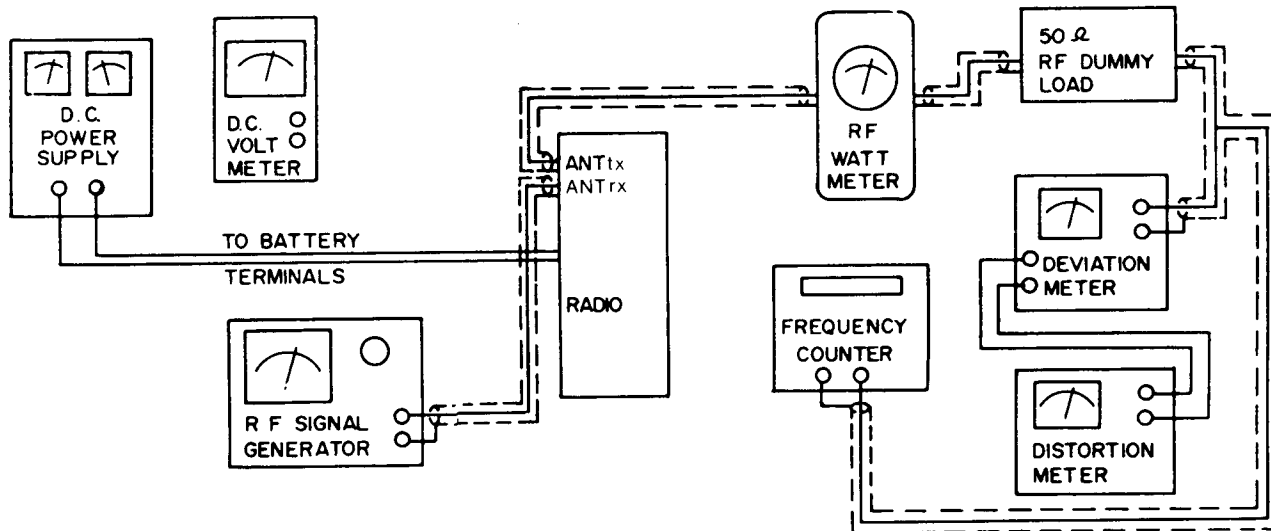
TABLE 1

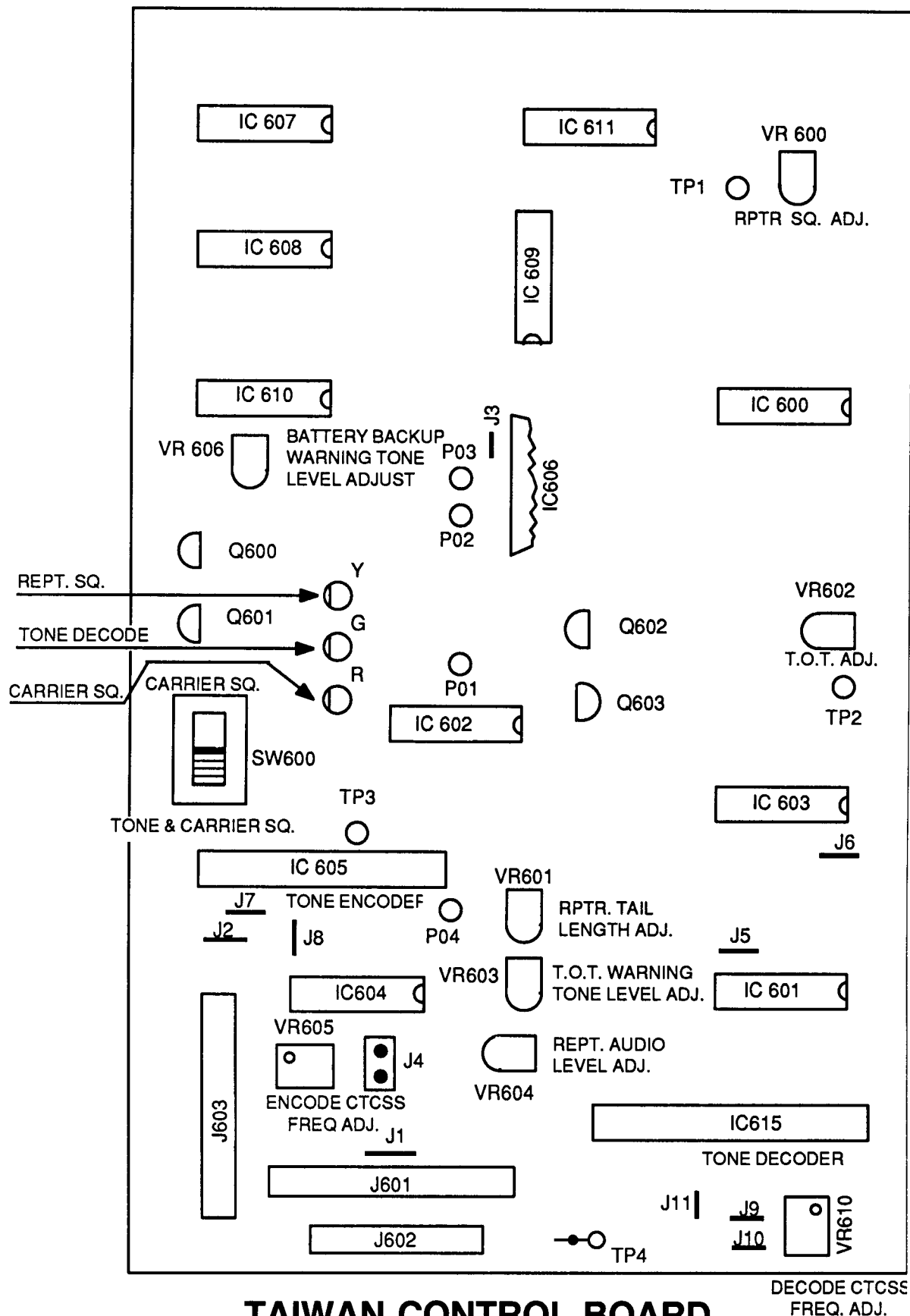
DECODER CTCSS FREQUENCY CHART		
FREQUENCY	JP1 ¹ JP9 ²	JP2 ¹ JP10 ²
160 -- 300	IN	IN
125 -- 165	CUT	IN
60 -- 135	CUT	CUT

TABLE 2

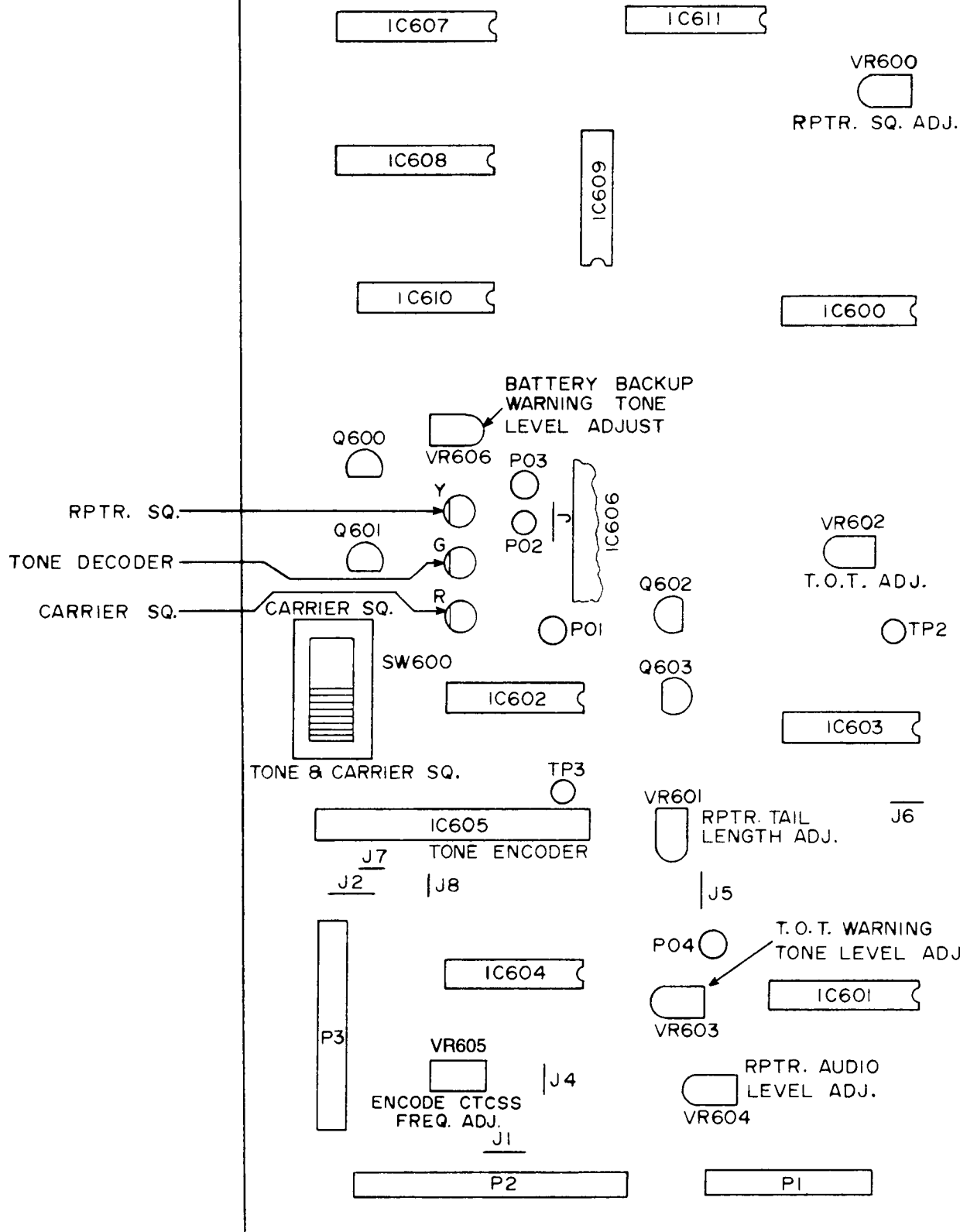
ENCODER CTCSS FREQUENCY CHART		
FREQUENCY	J7	J8
180 -- 340	IN	IN
140 -- 190	CUT	IN
60 -- 150	CUT	CUT

CONTROL BOARD TEST EQUIPMENT SETUP

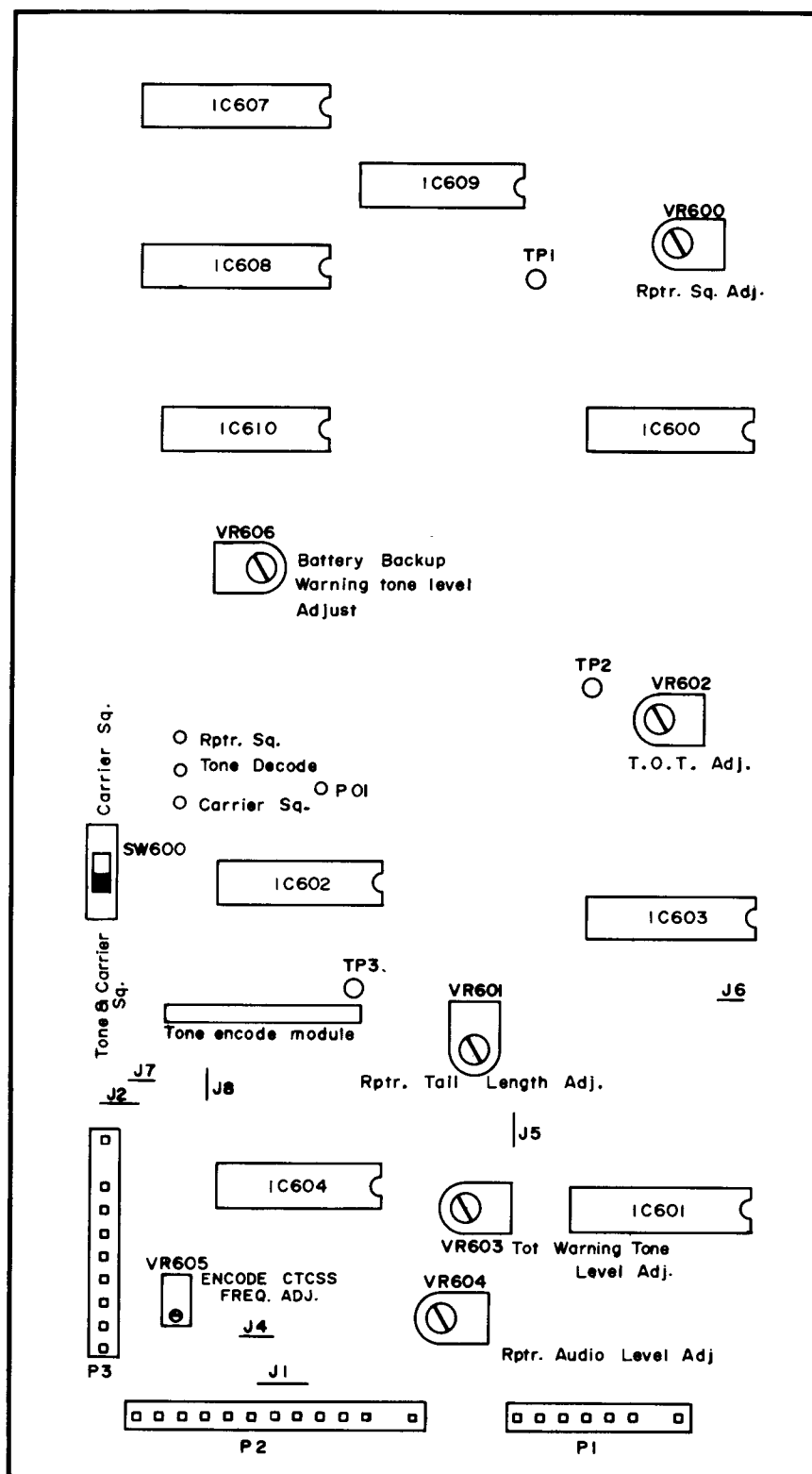




**TAIWAN CONTROL BOARD
ALIGNMENT LOCATION CHART**



NEW CONTROL BOARD ALIGNMENT LOCATION CHART



3500-117

OLD CONTROL BOARD ALIGNMENT LOCATION CHART

VOLTAGE CHART

EXCITER VOLTAGE CHART

PART NO.	PART NAME	EMITTER SOURCE	BASE GATE	COLLECTOR DRAIN	REMARKS
Q003	2SC3103	0.00	0.00	8.00	TX
Q004	MRF750	0.00	0.58	6.10	TX
Q005	2SC3019	0.00	0.47	6.70	TX
Q006	2SC1730-R	0.00	5.80	-1.80	TX
Q007	2SC2026-K	1.35	1.76	7.96	TX
Q008	2SC2458-Y	3.10	3.70	5.80	TX
Q009	2SA950-Y	7.80	7.20	5.60	TX
Q011	2SA950-Y	7.90	7.20	7.80	TX
Q012	2SA1150-Y	7.90	7.30	7.90	TX
Q013	2SC2458-BL	3.60	4.00	7.00	TX
Q014	2SC2458L-Y	0.95	1.58	4.10	TX
Q015	2SC2458-Y	0.00	0.38	6.00	TX
Q305	2SC945A-Q	0.00	0.25	0.65	TX
Q306	2SC945A-Q	0.00	0.71	0.57	TX
Q307	2SB772-R	13.50	12.90	7.90	TX
Q308	2SC945A-Q	1.40	2.00	12.90	TX

PART NO.	PART NAME	1	2	3	4	5	6	7	8
IC001	NJM4558D	4.40	4.40	4.40	0.00	4.40	4.40	4.40	7.90
IC301	MC7808CT	INPUT 13.50	COM 0.00	OUTPUT 8.00					

NOTES: All voltage readings were taken reference to ground using a D.V.M. with a 10 Meg Ohm DC input Resistance. Power supply voltage set to 13.8 VDC.

POWER AMPLIFIER VOLTAGE CHART

PART NO.	PART NAME	EMITTER SOURCE	BASE GATE	COLLECTOR DRAIN	REMARKS
Q301	2SC2695	0.00	0.00	13.50	TX
Q302	2SC1968-A	0.00	0.00	13.50	TX
Q303	2SC1966	0.00	0.00	13.50	TX

NOTES: All voltage readings were taken reference to ground using a D.V.M. with a 10 Meg Ohm DC input Resistance. Power supply voltage set to 13.8 VDC.

RECEIVER VOLTAGE CHART

PART NO.	PART NAME	EMITTER SOURCE	BASE GATE	COLLECTOR DRAIN	REMARKS
Q101	2SC2549	1.10	1.80	9.10	RX
Q102	2SC2549	0.55	0.90	12.90	RX
Q103	2SC2549	0.55	0.90	12.90	RX
Q104	2SC1674-L	0.93	1.60	7.40	RX
Q105	2SC2026-L	0.00	0.64	5.80	RX
Q106	LSP1200	2.20	2.80	7.20	RX
Q107	2SC1675-L	2.80	3.40	5.30	RX
Q109	2SC1675-L	3.10	3.80	3.10	RX
Q110	2SC9445A-Q	3.90	4.50	7.80	RX
Q111	2SC945A-P	0.00	0.61	1.80	RX
Q112	2SK117-GR	3.90 3.90	0.00 3.90	0.80 3.90	RX, SQ. ON RX, SQ. OFF
Q113	2SC945A-Q	0.00 0.00	0.63 0.01	0.00 3.90	RX, SQ. ON RX, SQ. OFF
Q401	2SC945A-P	13.00	13.70	13.80	RX
Q402	2SC945A-P	3.90	0.00	8.20	RX
Q403	2SC945A-P	0.00	0.60	0.00	RX
Q404	2SC945A-Q	0.00	0.10	0.00	RX
Q405	2SA733-P	6.90	6.90	7.30	RX
Q406	2SC945A-P	7.60	7.30	6.90	RX
Q407	2SC945A-P	0.00 0.00	0.00 0.68	6.80 0.10	RX, SQ. ON RX, SQ. OFF
Q501	2SA945A-Q	0.40	0.30	13.30	RX
Q502	2SB722-R	13.80	13.30	0.00	RX

PART NO. IC101	PART NAME MC3357-P	1 8.20	2 7.60	3 7.60	4 8.20	5 1.00	6 1.00	7 1.00	8 8.20
PIN NO.	9 4.10	10 1.90	11 1.90	12 0.50	13 7.40	14 0.00	15 0.00	16 1.90	REMARKS
PART NO. IC102	PART NAME MB3713	1 7.00	2 12.00	3 13.20	4 0.00	5 NC	6 0.00	7 0.55	8 0.58
PART NO. IC401	PART NAME MB3756	1 8.20	2 13.80	3 8.20	4 0.00	5 13.70	6 8.20	7 NC	8 NC

NOTES: All voltage readings were taken reference to ground using a D.V.M. with a 10 Meg Ohm DC input Resistance.
Power supply voltage set to 13.8 VDC.

CONTROL BOARD VOLTAGE CHART

PART NO.	PART NAME	EMITTER SOURCE	BASE GATE	COLLECTOR DRAIN	REMARKS
Q600	2SC945A-Q	0.00 0.00	0.20 0.71	6.80 0.07	NO SIGNAL SIGNAL
Q601	2SC945A-Q	0.00 0.00	0.00 0.70	6.70 0.13	NO SIGNAL SIGNAL
Q602	2SC945A-Q	0.00 0.00	0.12 0.70	7.50 0.03	NO SIGNAL SIGNAL
Q603	2SC945A-Q	0.00 7.55	0.00 8.14	8.20 8.20	NO SIGNAL SIGNAL

PART NO. IC600	PART NAME LM324	1 4.10 4.17	2 4.10 4.26	3 4.10 4.10	4 8.20 8.26	5 3.90 3.95	6 3.90 3.95	7 3.80 3.80	8 0.60 0.92
PIN NO.	9 4.20 3.68	10 4.00 4.18	11 0.00 0.00	12 4.10 4.10	13 4.10 4.12	14 4.10 4.10			REMARKS NO SIGNAL SIGNAL
PART NO. IC601	PART NAME MC14020BCP	1 0.00 0.00 0.00	2 0.00 0.00 0.00	3 0.00 0.00 8.18	4 0.00 4.06 0.00	5 0.00 4.29 0.00	6 0.00 3.82 0.00	7 0.00 4.00 0.00	8 0.00 0.00 0.00
PIN NO.	9 0.00 4.12 0.00	10 7.90 4.13 8.14	11 8.20 0.00 0.40	12 0.00 8.25 8.25	13 0.00 7.78 8.25	14 0.00 8.24 0.00	15 0.00 0.00 0.00	16 8.20 8.25 8.26	REMARKS NO SIGNAL SIGNAL TIMED OUT
PART NO. IC602	PART NAME MC14011BCP	1 8.20 8.26 8.26	2 0.00 8.25 8.26	3 8.20 0.00 0.00	4 0.00 8.25 8.26	5 8.20 0.00 0.00	6 8.20 0.00 0.00	7 0.00 0.00 0.00	8 0.60 6.92 6.91
PIN NO.	9 0.00 6.86 6.87	10 8.20 0.00 0.00	11 0.00 8.25 8.25	12 8.20 0.00 0.00	13 8.20 0.00 0.00	14 8.20 8.26 8.26			REMARKS NO SIGNAL SIGNAL TIMED OUT

PART NO. IC603	PART NAME MM74C14	1 8.20 0.00 6.35	2 0.16 8.04 0.00	3 0.74 4.13 0.59	4 0.00 4.13 8.15	5 0.00 7.75 0.00	6 8.20 0.00 0.00	7 0.00 0.00 0.00	8 0.00 0.00 0.00
PIN NO.	9 0.22 0.00 0.72	10 0.00 0.00 0.50	11 8.20 8.25 8.25	12 8.20 8.20 4.11	13 0.53 0.53 4.11	14 8.20 8.25 8.26		REMARKS NO SIGNAL SIGNAL TIMED OUT	
PART NO. IC604	PART NAME MC14066BCP	1 3.60 3.67	2 0.50 3.67	3 0.00 3.63	4 0.00 3.70	5 0.00 8.21	6 0.00 8.21	7 0.00 0.00	8 3.80 3.81
PIN NO.	9 0.10 3.71	10 0.10 3.70	11 0.10 3.71	12 0.00 8.21	13 0.10 8.07	14 8.20 8.25		REMARKS NO SIGNAL SIGNAL	
PART NO. IC605	PART NAME DE-390	1 0.00	2 3.63	3 3.67	4 3.67	5 0.00	6 0.00	7 2.75	8 0.00
PIN NO.	9 2.37	10 8.26						REMARKS SIGNAL	
PART NO. IC606	PART NAME DE-334	1 8.60 8.25	2 3.97 3.97	3 0.00 0.00	4 4.43 4.80			REMARKS SIGNAL NO SIGNAL	
PART NO. IC607	PART NAME MC14020BCP	1 0.06 14.20	2 0.06 14.20	3 0.06 0.00	4 0.06 7.15	5 0.02 7.15	6 0.01 7.37	7 0.00 7.14	8 0.00 0.00
PIN NO.	9 0.00 7.14	10 0.37 7.11	11 8.40 0.00	12 0.54 7.02	13 0.06 7.13	14 1.51 PULSE	15 0.06 PULSE	16 13.80 14.20	REMARKS AC BATTERY
PART NO. IC608	PART NAME MC14017	1 0.00 PULSE	2 0.00 PULSE	3 0.00 PULSE	4 0.00 PULSE	5 0.00 PULSE	6 0.00 PULSE	7 13.80 PULSE	8 0.00 0.00
PIN NO.	9 0.00 PULSE	10 0.00 PULSE	11 13.80 PULSE	12 0.00 PULSE	13 0.00 0.00	14 1.58 PULSE	15 0.00 0.00	16 13.80 13.40	REMARKS AC BATTERY
PART NO. IC609	PART NAME MC14011BCP	1 13.80 PULSE	2 13.80 PULSE	3 0.00 PULSE	4 13.80 PULSE	5 1.58 PULSE	6 0.00 PULSE	7 0.00 0.00	8 13.80 PULSE
PIN NO.	9 13.80 PULSE	10 0.00 PULSE	11 13.80 PULSE	12 0.39 SQ.	13 0.00 PULSE	14 13.80 14.20		REMARKS AC BATTERY	
PART NO. IC610	PART NAME MM74C14	1 0.19 0.00	2 13.80 14.10	3 0.00 PULSE	4 13.80 PULSE	5 0.00 PULSE	6 13.80 PULSE	7 0.00 0.00	8 0.39 SQ.
PIN NO.	9 8.30 TRI.	10 0.00 0.00	11 0.18 0.00	12 0.00 PULSE	13 13.80 PULSE	14 13.80 14.20		REMARKS AC BATTERY	

NOTES: All voltage readings were taken reference to ground using a D.V.M. with a 10 Meg Ohm DC input Resistance.
Power supply voltage set to 13.8 VDC.
PULSE: A pulsed wave form.
SQ: A Square wave form.
TRI: A triangular wave form.

POWER SUPPLY VOLTAGE CHART

PART NO.	PART NAME	EMITTER SOURCE	BASE GATE	COLLECTOR DRAIN	REMARKS
Q701	MPSA55	24.00	23.90	22.70	RX
Q702	MPSA55	23.40	22.70	23.40	RX
Q703	TIP32	24.00	23.40	14.40	RX
Q704	MPSA05	0.90	1.30	24.00	RX
Q705	2N3771	13.80	14.40	24.00	RX
IC701	LM317T	INPUT 23.30	ADJ. 12.60	OUTPUT 13.80	
IC702	2N6504	CATH 0.00	GATE 0.00	ANODE 13.80	

NOTES: All voltage readings were taken reference to ground using a D.V.M. with a 10 Meg Ohm DC input Resistance.
Power supply voltage set to 13.8 VDC.

FEED THRU VOLTAGE CHART

FT1 0.00	FT2 0.00	FT3 0.00	FT4 7.70	FT5 6.90	FT6 0.00	FT7 0.00	FT8 0.00			
FT9 0.00	FT10 0.00	FT11 0.00	FT12 6.80	FT13 4.20	FT14 8.20	FT15 8.20	FT16 13.80			
FT17 6.81 6.14	FT18 0.48 0.47	FT19 0.00 0.00	FT20 0.00 0.00	FT21 7.50 0.00	FT22 0.00 0.00	FT23 0.01 7.60	FT24 1.16 -3.93	FT25 0.00 0.44	FT26 13.80 13.50	REMARKS RX TX

NOTES: All voltage readings were taken reference to ground using a D.V.M. with a 10 Meg Ohm DC input Resistance.
Power supply voltage set to 13.8 VDC.

WAVE FORM PHOTOGRAPHS

Photo 1
Pin 1 of P2
Recovered Audio
RFSG to Rx Ant.
Level: 1000 uV
Dev: 8 kHz
Mod. Freq: 1 kHz
Scale
H: 1 ms/Div
V: 0.5V/Div
DCV: 4.8V



Photo 2
Pin 1 of P1
Tone decoder input
RFSG to Rx Ant.
Level: 1000 uV
Dev: 500 Hz
Mod. Freq: 150 Hz
Scale
H: 5ms/Div
V: 50mV/Div
DCV: 1V

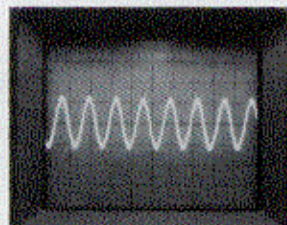


Photo 3
Test Point 3
input to tone
transmission gate.
Tx Keyed.
Scale
H: 5ms/Div
V: 0.5V/Div
DCV: 3.6V

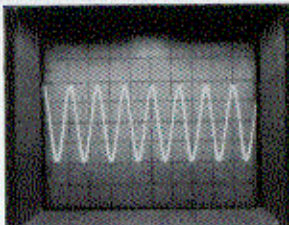


Photo 4
Pin 8 of IC604
Input of audio
transmission gate
Carrier Sq. Operation.
RF SG to Rx Ant.
Level: 1000uV
Dev: 3 kHz
Mod. Freq: 1 kHz
Scale
H: 1ms/Div
V: 0.2V/Div
DCV: 3.6V

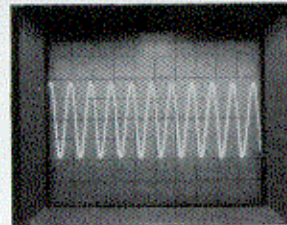


Photo 5
Collector of Q14
Output of the microphone
pre-amplifier.
Repeater carrier squelch.
RF SG to Rx Ant.
Level: 1000uV
Dev: 3 kHz
Mod. Freq: 1 kHz
Scale
H: 1ms/Div
V: 50mV/Div
DCV: 4.2V

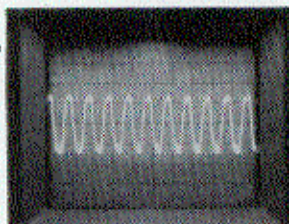


Photo 6
Pin 1 of IC001
Output of the microphone
amplifier.
Repeater carrier squelch.
RF SG to Rx Ant.
Level: 1000uV
Dev: 3 kHz
Mod. Freq: 1 kHz
Scale
H: 1ms/Div
V: 1V/Div
DCV: 4.5V

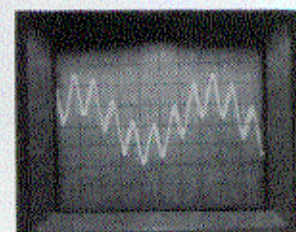
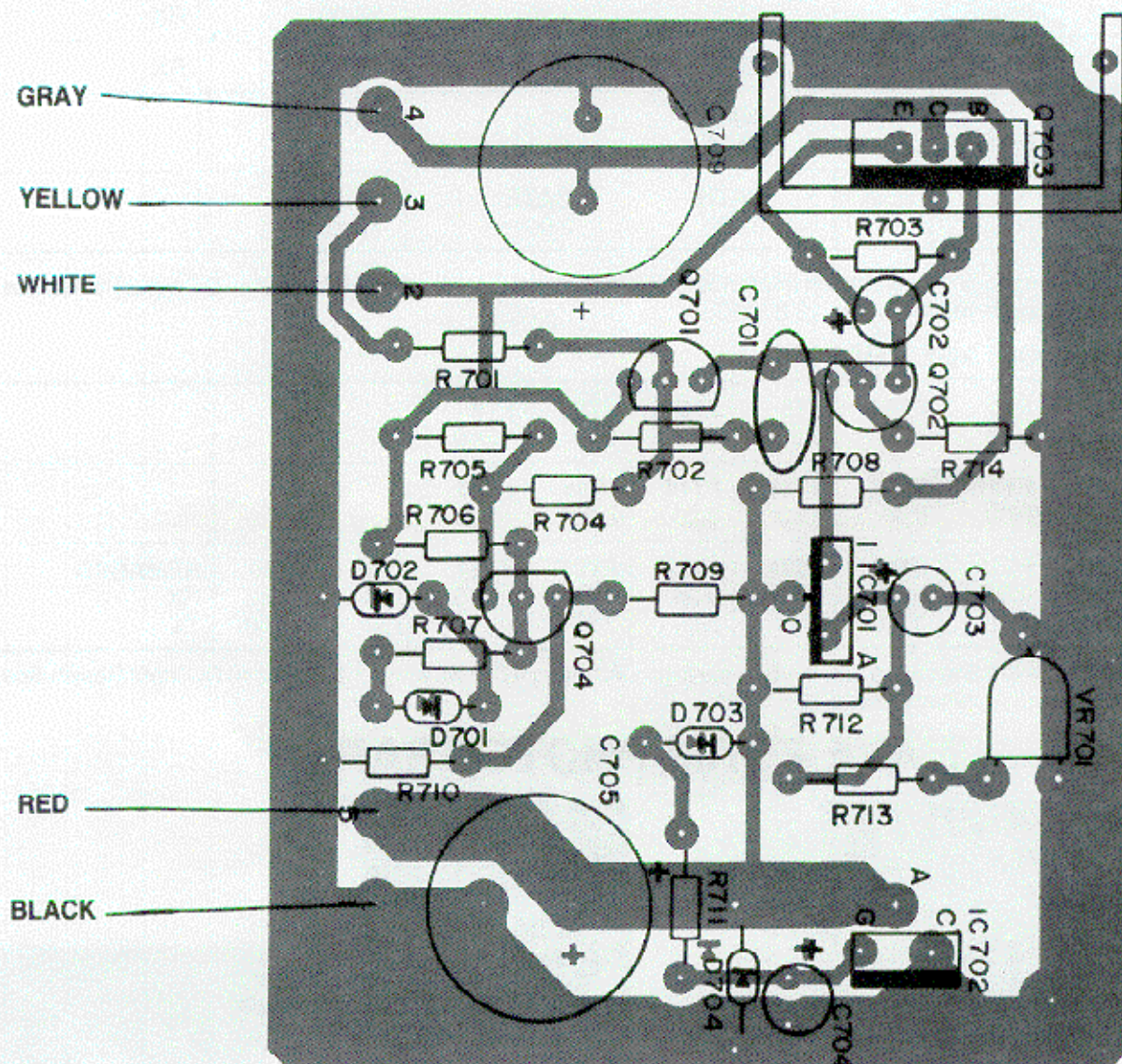


Photo 7
Test Point TP10
Input to the modulator.
Repeater in tone operation.
RF SG to Rx Ant.
Level: 1000uV
Dev: 3 kHz
Mod. Freq: 1 kHz
Scale
H: 1ms/Div
V: 0.1V/Div
DCV: 0V

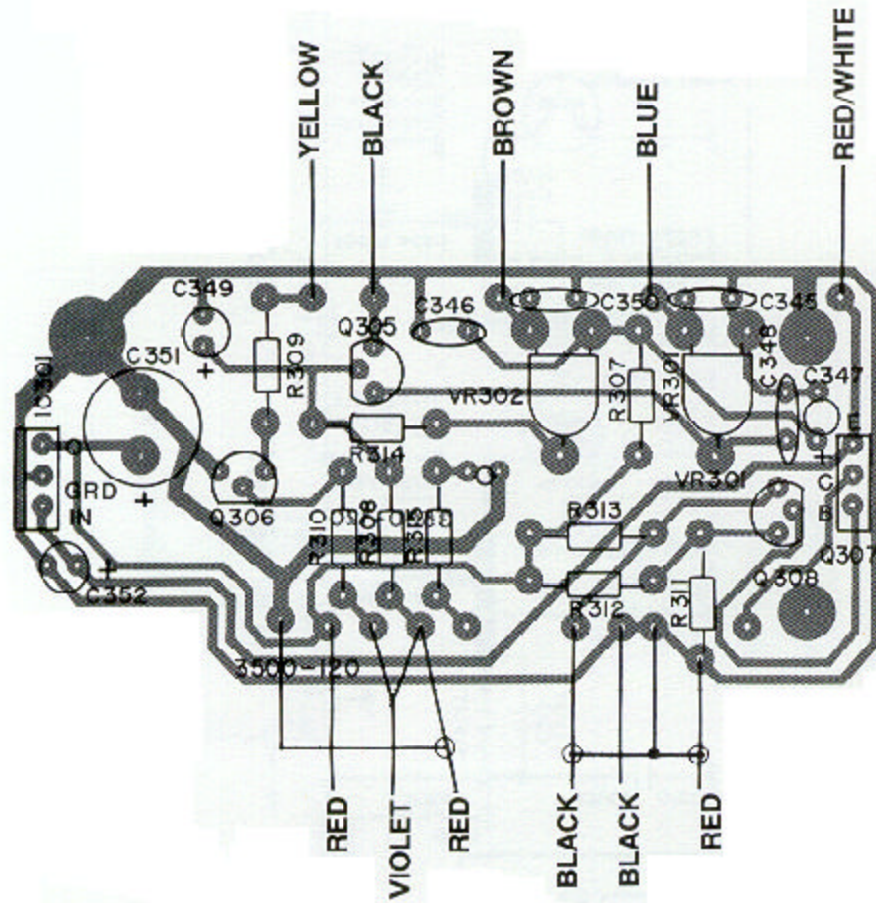


POWER SUPPLY X-RAY VIEW

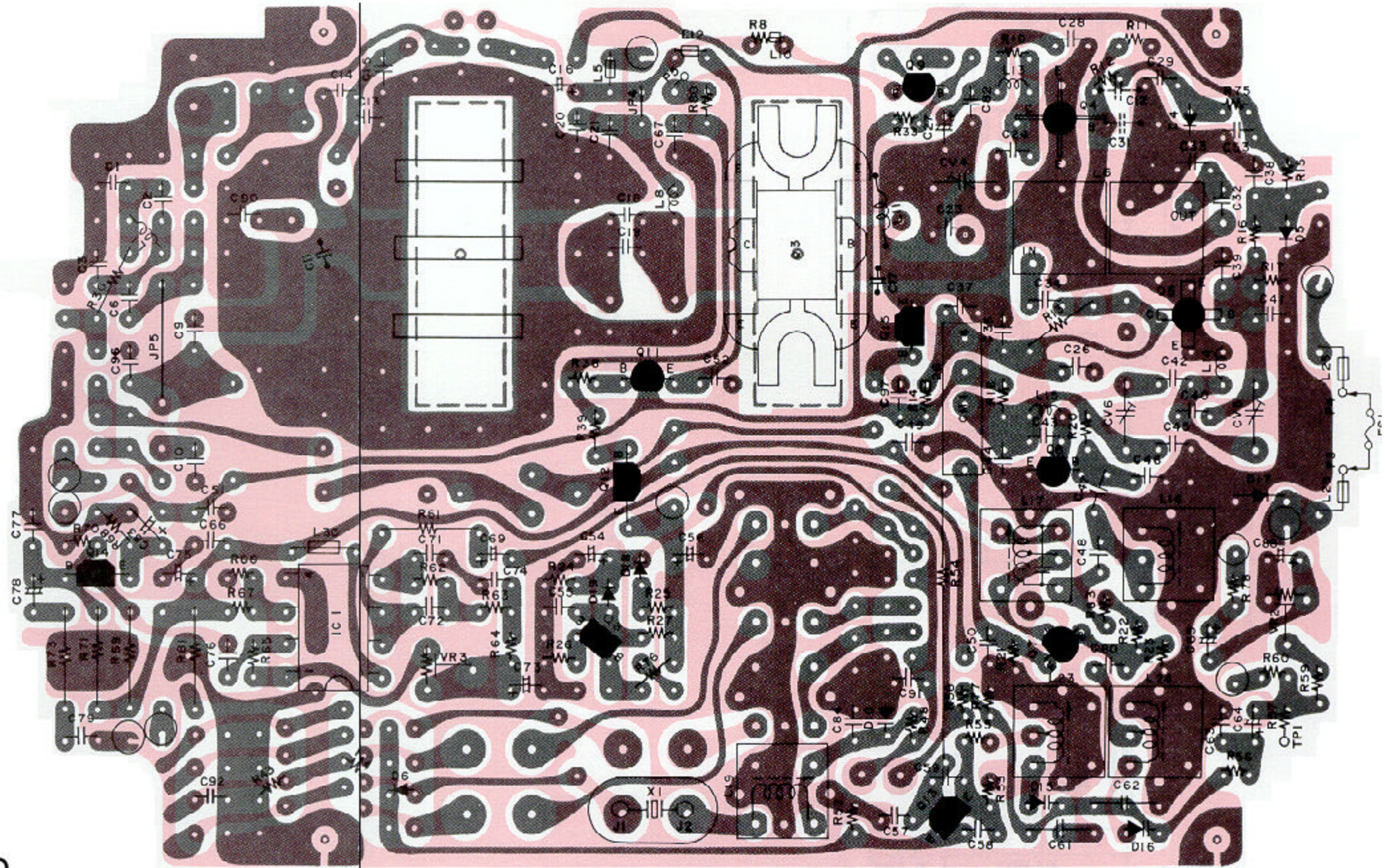


**POWER AMPLIFIER
X-RAY VIEW
SHOWN FROM COMPONENT SIDE**

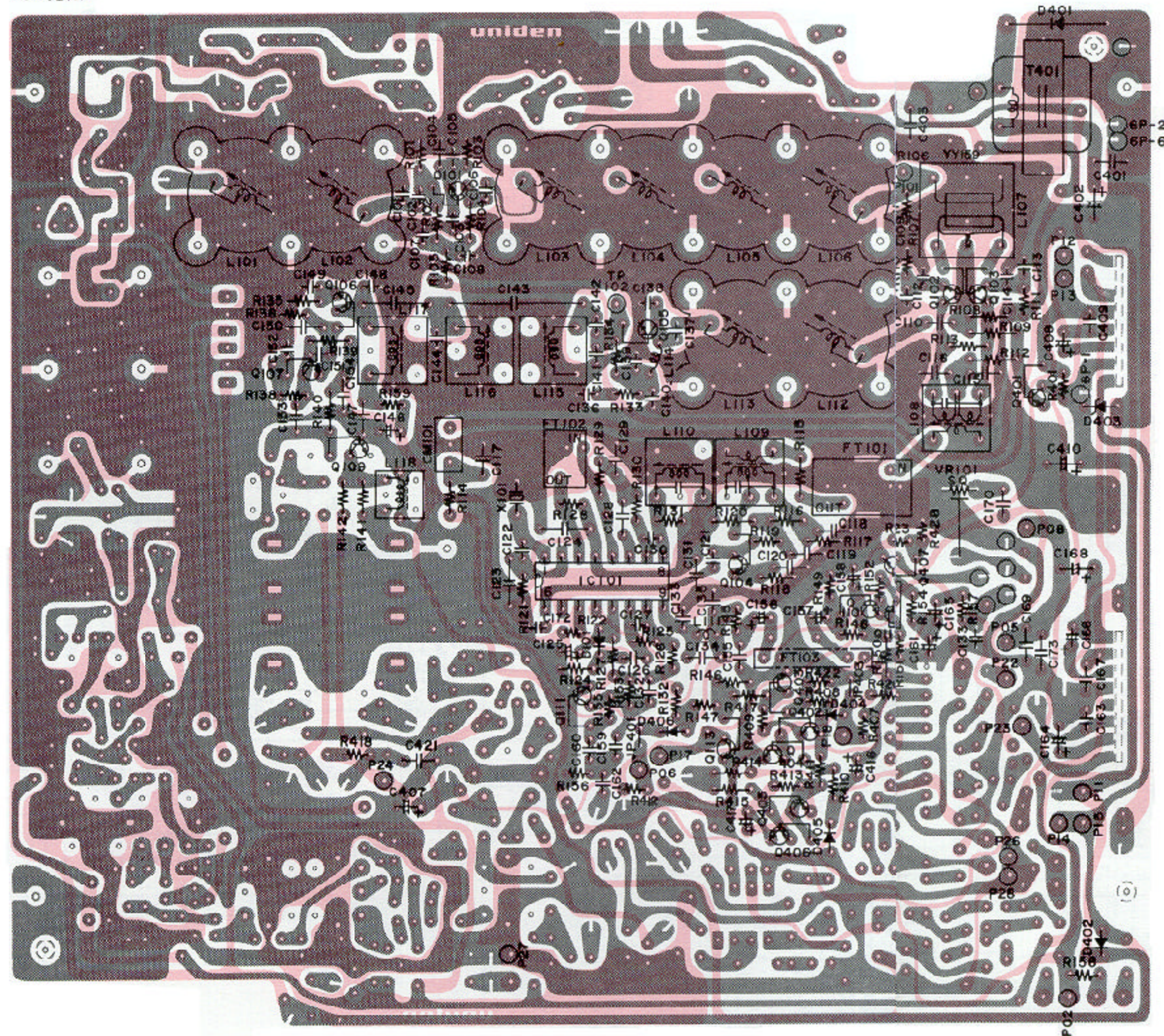




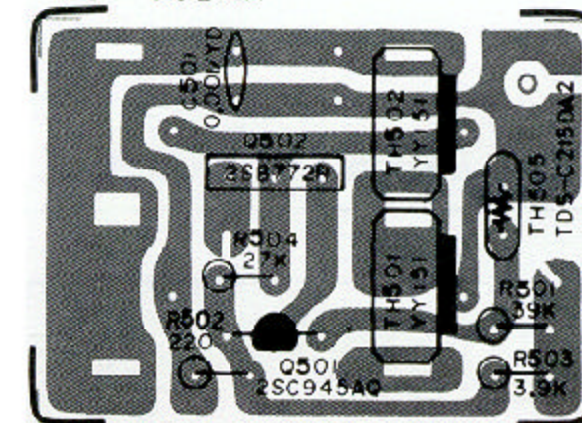
EXCITER INTERFACE P.C. BOARD
X-RAY VIEW
COMPONENT SIDE



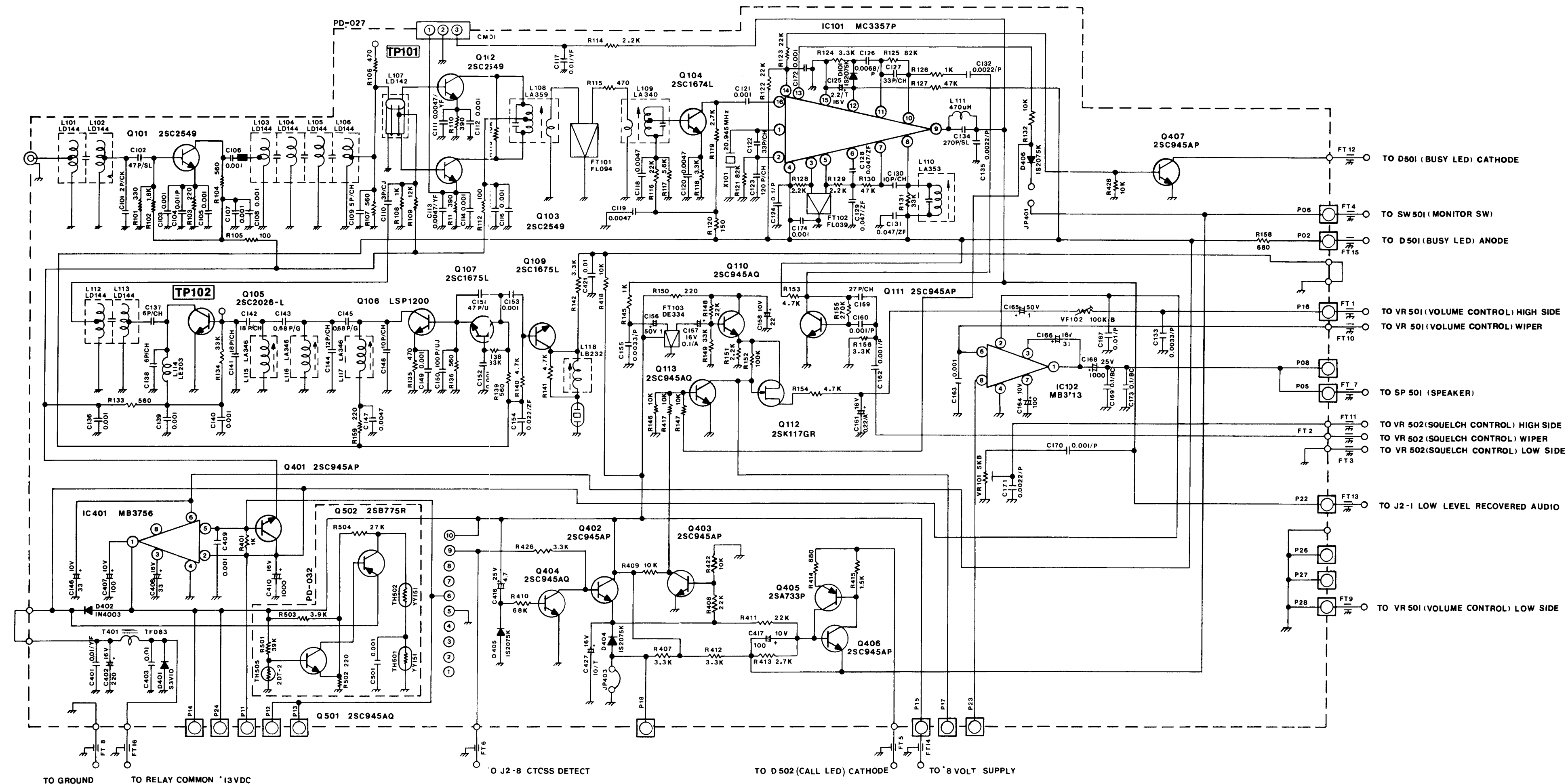
EXCITER INTERFACE P.C. BOARD
X-RAY VIEW
SOLDER SIDE



RECEIVER P.C. BOARD
X-RAY VIEW
SHOWN FROM SOLDER SIDE

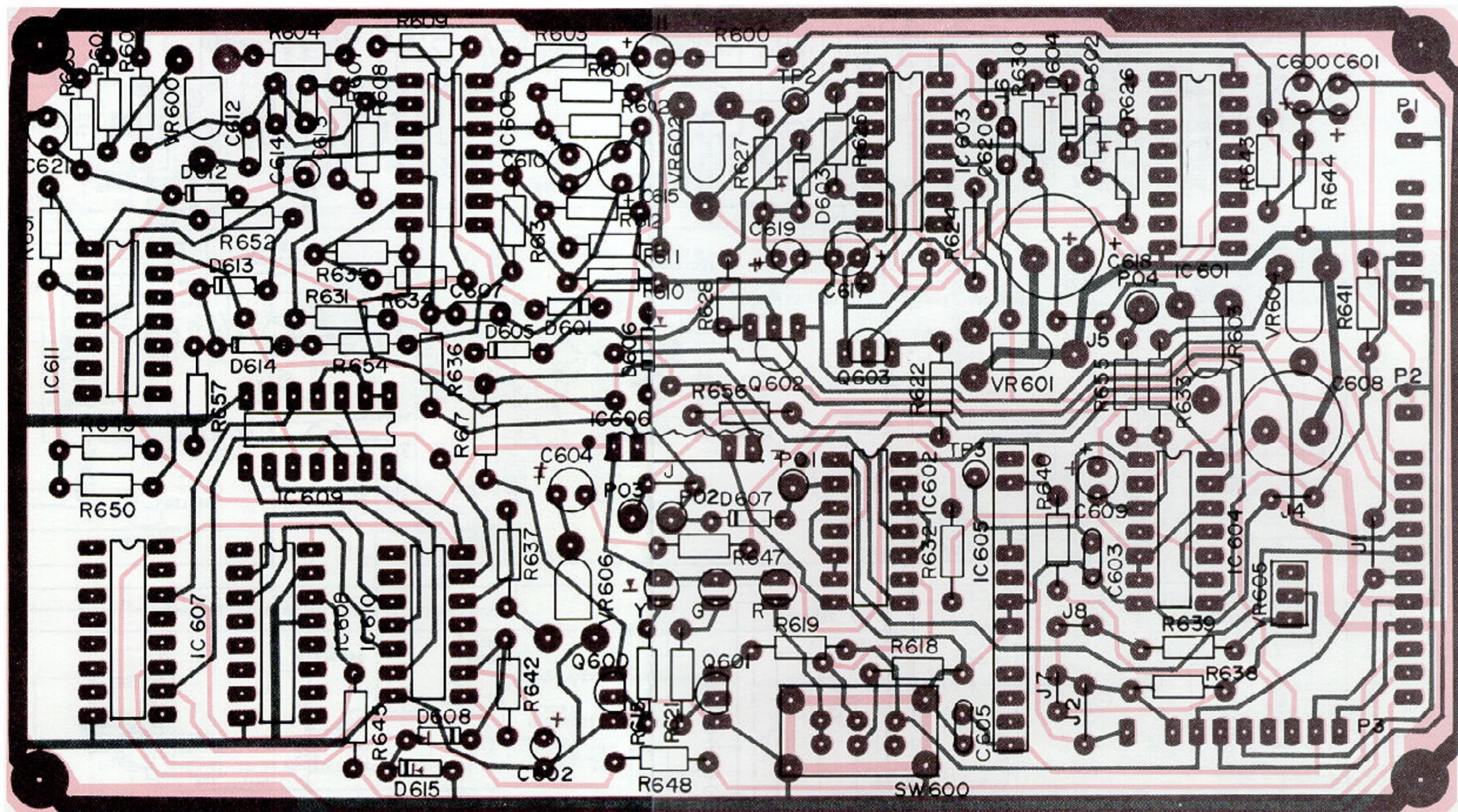


POSISTOR P.C. BOARD
X-RAY VIEW
SHOWN FROM COMPONENT SIDE



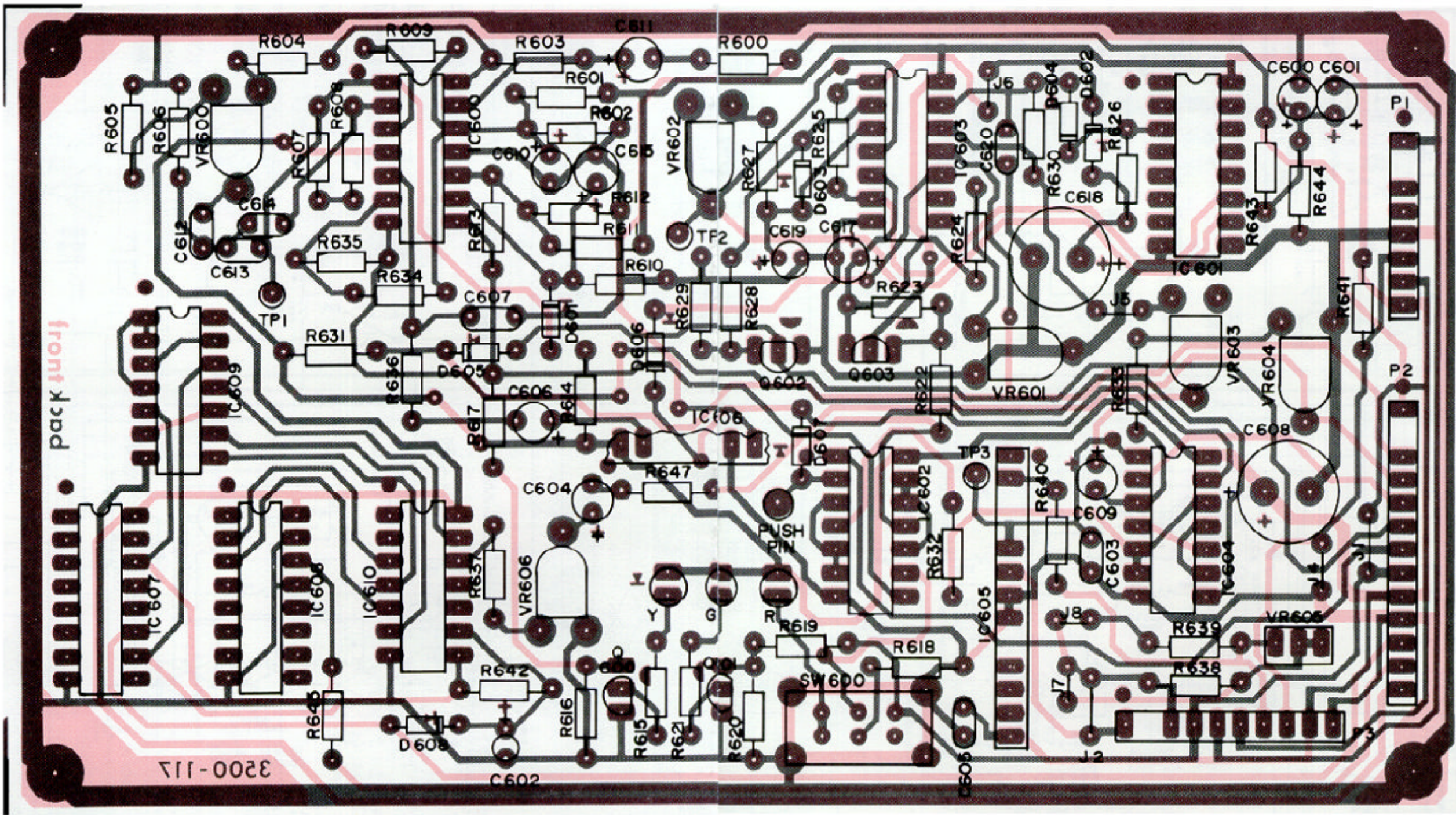
RECEIVER ARU 251

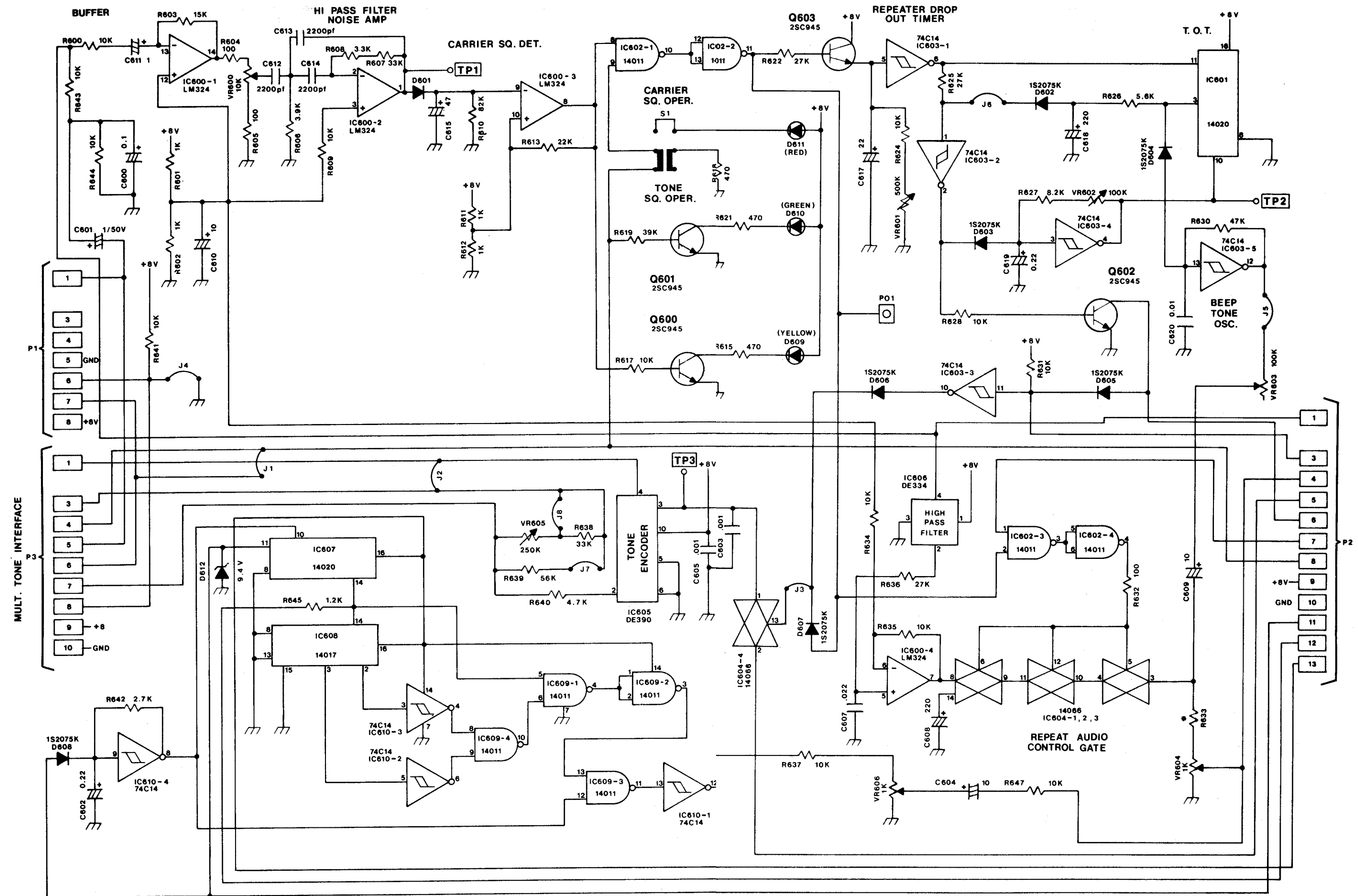
NEW CONTROL P.C. BOARD
X-RAY VIEW
SHOWN FROM COMPONENT SIDE



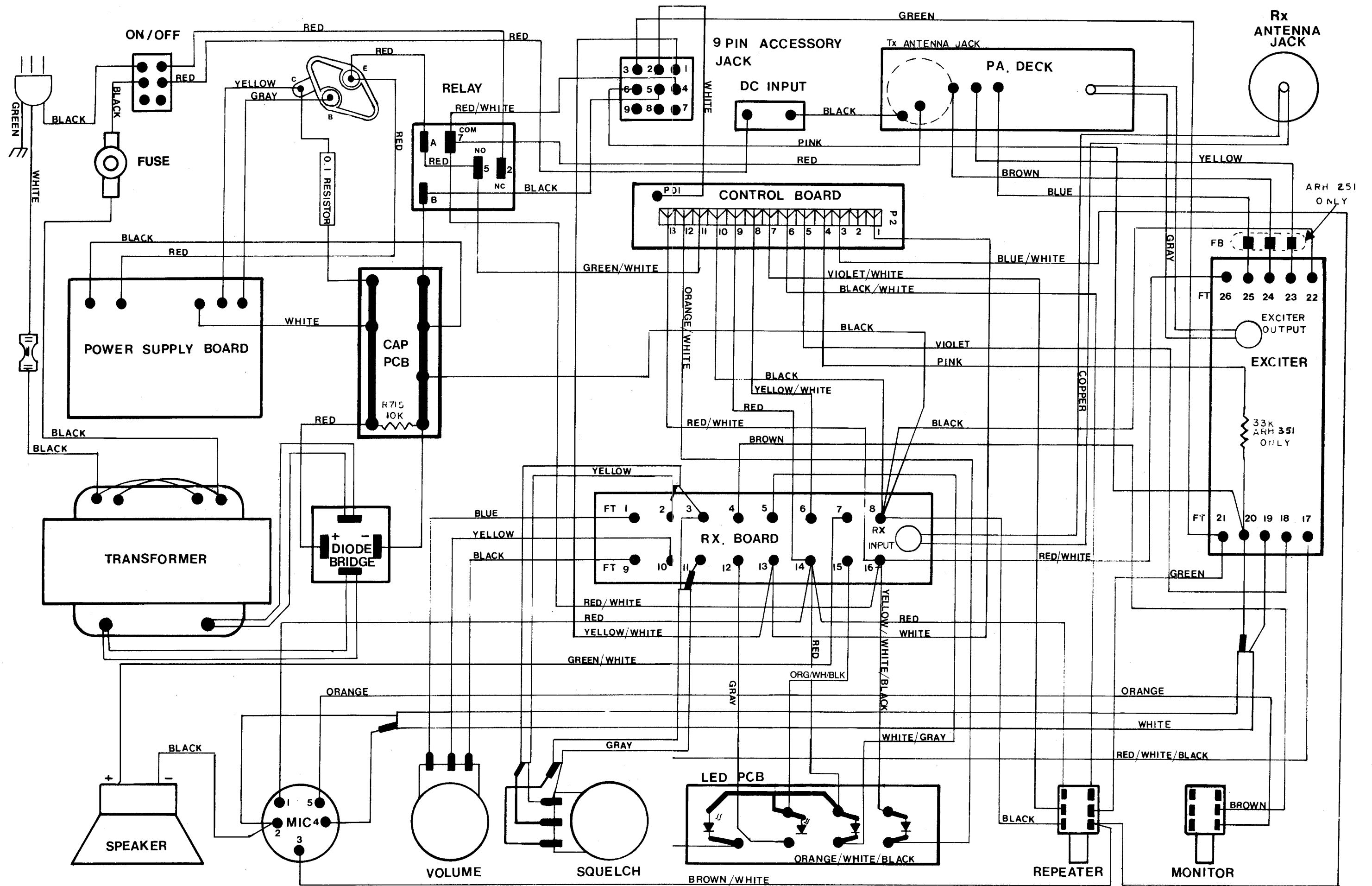
pack tuorj

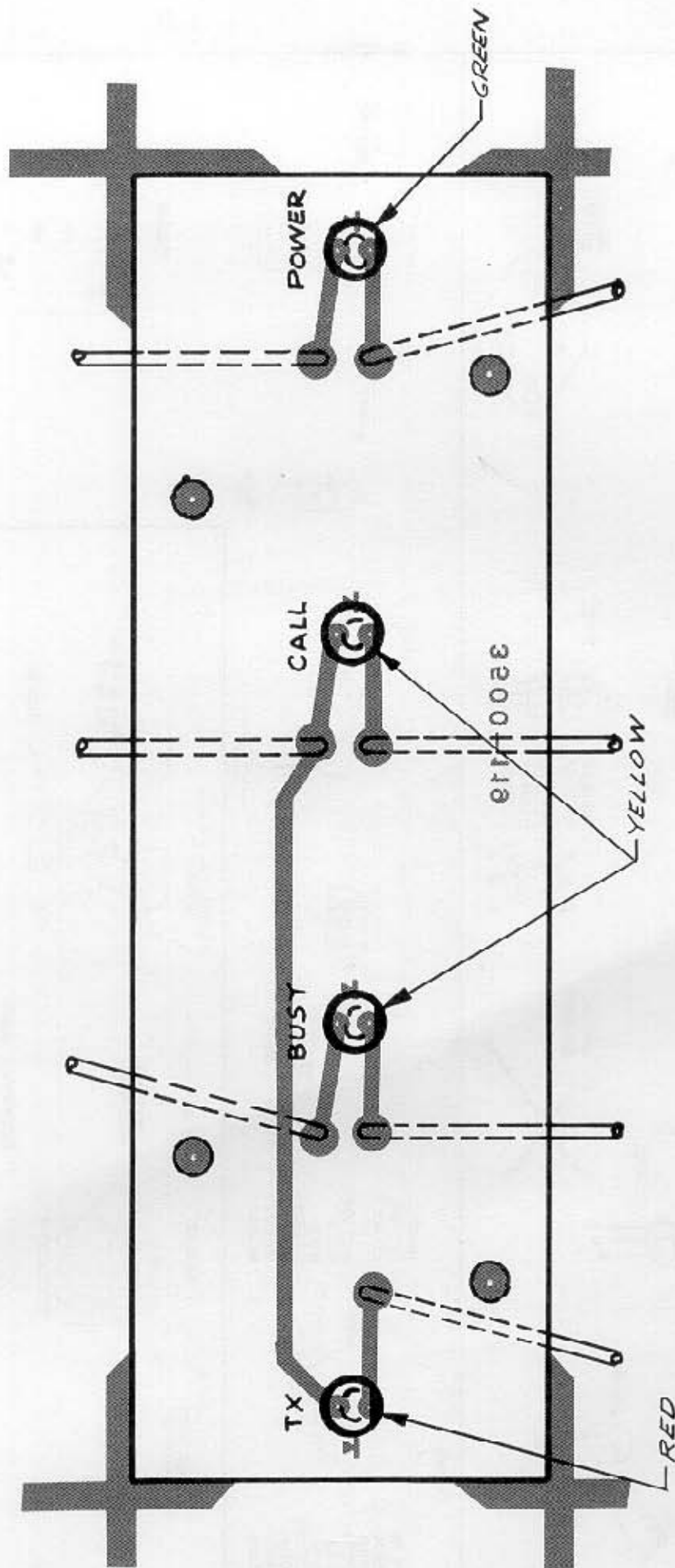
3200-117





OLD REPEATER CONTROL BOARD

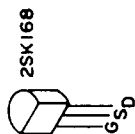
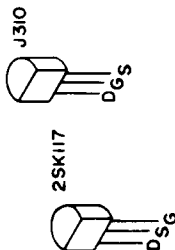




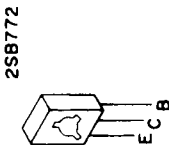
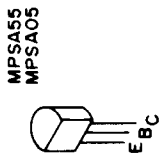
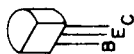
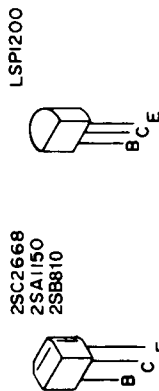
LED P.C. BOARD
SHOWN FROM COMPONENT SIDE

Semiconductor Pin Connections

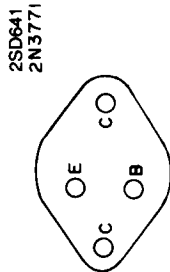
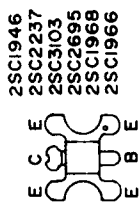
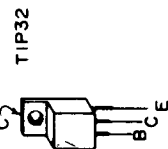
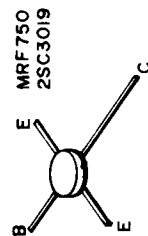
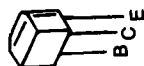
FET



Transistors

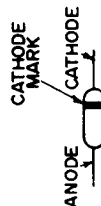


2SB705

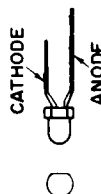


Diodes

HZ168P
HZ6A1L
ISS98
CZ094
BZ162
IN4002
IS2075K
53V10
IN4003
XZ185



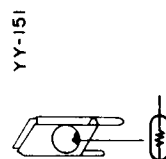
1N5401
HZ9.1BP
1S1555
ISS97
IS2339G
IN60P
MV201
HZ682L
MI402
IN5401
MC301



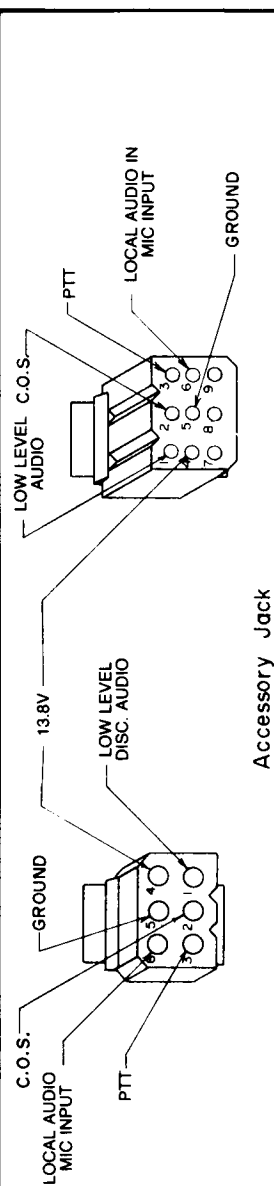
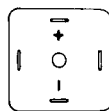
TLR-124
TLY-124
TLG-124A



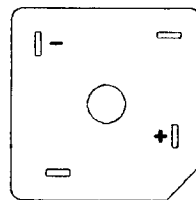
2DT-2
TD5-C215DA2



MDA980



15B4B41

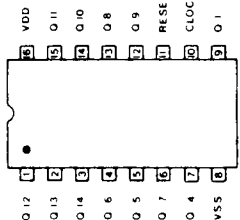


INTEGRATED CIRCUITS
TC4020BP
MC14020B

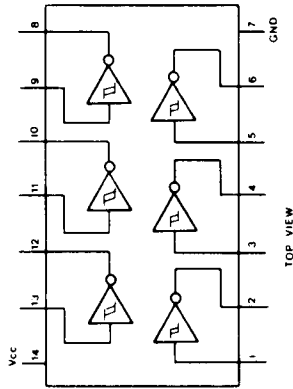
TRUTH TABLE		
CLOCK	RESET	OUTPUT STATE
0	0	No Change
0	1	Reset to 0
1	0	Toggle
1	1	Set to 1

TC4017BP
MC14017B

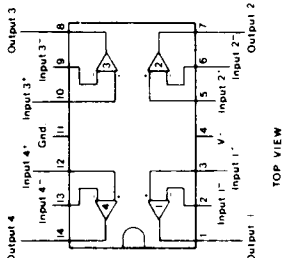
FUNCTIONAL TRUTH TABLE		
(Positive Logic)		
CLOCK	ENABLE	DECODE OUTPUT
0	0	0
0	1	0
1	0	0
1	1	0



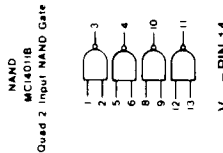
TC4584BP
MM74C14



NJM2902N
LM324

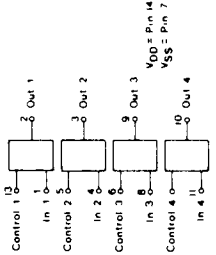


TC4011
MC14011

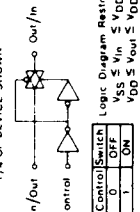


TC4066BP
M4066BP
MC14066B

BLOCK
DIAGRAM



LOGIC DIAGRAM AND TRUTH TABLE
1/4 OF DEVICE SHOWN

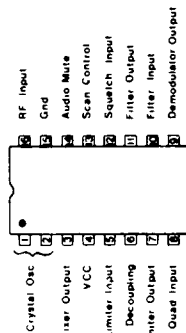


Control Switch	Control	Output
0	OFF	0
1	ON	1

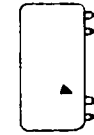
NJM4558D
BA4558
M5218P



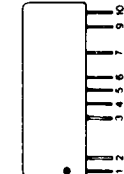
MC3357P



HI PASS FILTER (DE 334)
PART NO. 2200-331

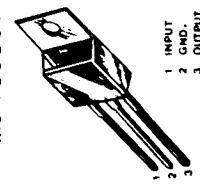


CTCSS HYBRID IC (DE 390)
PART NO. 2000-1001

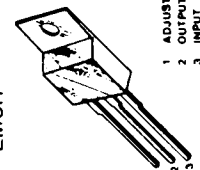


PIN 1 - SIGNAL IN
PIN 2 - EXT. RESISTOR
PIN 3 - EXT. CAPACITOR
PIN 4 - EXT. RESISTOR
PIN 5 - GND
PIN 6 - ENCODE SW
PIN 7 - EXT. CAPACITOR
PIN 8 - DECODE SW
PIN 9 - DECODE OUT
PIN 10 - +VCC

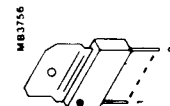
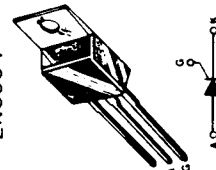
HA17808
MC 7808CT



UPC317H
LM317



5P4M
2N6504



MECHANICAL PARTS LIST

ARU 251

QUANTITY	DESCRIPTION	VENDOR PART NUMBER	UNIDEN PART NUMBER	SYMBOL NUMBER	DESCRIPTION	VENDOR PART NUMBER	UNIDEN PART NUMBER
1	SHIELD PLATE	HSDP480454Z		4	STANDOFF - PEN NUT	SO-440-8C1	1100-0912
3	SPACER	HCLR480102Z		1	BUTT SPLICE	34070	1100-0076
1	THERMAL CONDUCTOR	EHSK480390Z		5	SOLDERLESS TERMINALS	61974-2	1100-0077
1	HOLDER:IC	HHDE480101A		1	TERMINAL STRIP KEY	15-04-9209	1100-0087
1	SHIELD PLATE	HSPD410453Z		2	INSULATED TAB RECEPTACLE	640934-1	1100-0090
3	CONNECTING PLATE	HETC480468B		3	LOCKING TERMINAL LUG	1415-6	1100-0784
1	INSULATION PLATE:XTAL	RZEB480052A		1	FUSE HOLDER	341001	1100-0852
1	THERMAL CONDUCTOR	HHSK480390Z		1	YY-051	BYYY0051001	1100-0827
1	SHIELD PLATE	HSDP480109Z	3300-0312	1	SOCKET:TRANSISTOR TO-3	8080-1G3	1400-0009
2	HELICAL CAVITY 2 SECTION	FSDC410288B	3300-0315	4	SPACER:LED	LHDL411326Z	3400-0019
1	HELICAL CAVITY 4 SECTION	FSDC410289B	3300-0316	1	INSULATOR:MICA WASHER	BYDY0003002	3400-0226
				1	INSULATOR:MICA WASHER	BYDY0003003	3400-0233
2	SCREW:M PAN HD M2.6x4	SSCW102604N	1100-1740	3	PLASTIC STANDOFF	1919N	1100-0336
1	SCREW:M BIND HD M2.6x5	SSCW212605N		1	STRAIN RELIEF	SR-5N-4	1100-0824
2	SCREW:M FLAT HD M2.6x6 NI	SSCW132606N	1100-1702	2	GROMMET	2817	1100-0825
22	SCREW:M BIND HD M2.6x7	SSCW722607N	1100-1741	1	CAPACITOR MOUNTING CLAMP	1780-11	1100-0844
8	SCREW:M BIND HD M3x5 NI	SSCW193005N	1100-0728	4	RUBBER FEET 20x16 (ABS)	TSDT0100004	1100-0745
6	SCREW:M FLAT HD M3x6 BLK	SSCW143006K	1100-0788	3	FRONT INSERT CLAMP	3400-0024	1100-0838
14	SCREW:M BIND HD M3x8 NI	SSCW193008N	1100-0723	1	CRYSTAL HEATER CLIP		1100-0841
2	SCREW:M BIND HD M3x8 BLK	SSCW193008B	1100-0705	3	DP-562 BLACK HOLE PLUGS	2653	1100-0842
6	SCREW:M PAN HD M3x8 NI	SSCW103008N	1100-0785	13	TIE WRAP: 4"	PLT1M-M0	1100-0843
4	SCREW:M BIND HD M5x10 NI	SSCW195010N	1100-0748	2	KNOB (REPEATER)	GNBY408150Z	1300-0093
8	SCREW:ADJUST M4	MNUT410285Z	1100-0792	2	PUSH BUTTON KNOB REPEATER	GNBP480760Z	1300-0094
1	STUD	MSTD410426Z	1100-0786	1	PANEL:FRONT	GCMF180751A	3300-0574
1	STUD, S3604B D6	MSTD480466Z		1	PANEL:FRONT SLIDE PIECE	GCMZ414434Z	3400-0756
				1	NYLON EDGING	TSTD0191110	4000-0062
23	SCREW:M PAN HD #4-40x1/4		1100-1734	1	LABEL:FCC (ARU 251)	1700-409	1700-0409
2	SCREW:M PAN HD #6-32x1/4		1100-0799	1	LABEL:REPEATER FUNCTION		1700-0611
2	SCREW:M PAN HD #6-32x3/4		1100-1704	1	LABEL:REPEATER REAR PANEL	UCA-2000	1700-0615
1	SCREW:M ROUND HD #6-32x1		1100-1706	1	NAMEPLATE:MOBILE (UNIDEN)	JDP4480523A	3400-0163
4	SCREW:M PAN HD #8-32x1/2		1100-0795				
3	THREADED STUD 4-40-5	FH-440-5	1100-0722	1	HEAT-SINK:TRANSISTOR	5630B	3000-0318
18	SCREW:T BIND HD M3x6 NI	SSCW343006N	1100-0725	1	CHASSIS:STATION FRONT	HCSF280753Z	3300-0012
4	SCREW:T BIND HD M3x14 NI	SSCW343014N	1100-0733	1	CHASSIS:STATION MAIN	HCSY180752Z	3300-0013
12	SCREW:T PAN HD #4-40x1/4		1100-0715	1	INSERT:STATION FRONT		3300-0014
4	SCREW:T PAN HD #4-40x3/4		1100-1708	1	CHASSIS:STATION REAR	HCSR280754Z	3300-0015
12	SCREW:T PAN HD #6-32x1/4		1100-0713	1	BRACKET:XFORMER SUPPORT		3300-0018
4	SCREW:T PAN HD #8-32x1/2		1100-0796	1	COVER:STATION TOP	HCMT204085Z	3300-0125
1	SCREW:T PAN HD #8-32x3/4		1100-1703	1	HEAT-SINK:POWER SUPPLY		3300-0317
1	HEX NUT M3 NI	SSCW430030N	1100-0735	1	HEAT-SINK:MRF750		3300-0320
7	HEX NUT #4-40		1100-0717	1	HOLDER:RIGHT	HHDF404083Z	3300-0805
4	HEX NUT #6-32		1100-0714	1	HOLDER:LEFT	HHDF404084Z	3300-0806
4	HEX NUT #8-32		1100-0797	1	COVER:STATION BOTTOM	HCM8204566Z	3300-0810
6	BAND-LOCK: M3 2T	TSTD0263020	1100-0326	1	SHIELD BOX:RX		4000-0500
8	SPRING NUT	HNUT480057Z	1100-0793	1	SHIELD COVER:TX		4000-0502
1	STAR WASHER M5	DCSSS-37	1100-1729	1	SHIELD COVER:RX		4000-0503
4	STAR WASHER #8 EXT TOOTH		1100-0798				
15	STANDOFF - PEM NUT	SO-440-6C1	1100-0911				

ELECTRICAL PARTS LIST

ARU 251

ABBREVIATIONS:

Resistors . . . CF: Carbon Film, MF: Metal Film, VR: Variable Resistor, SER: Semi-Fixed Resistor

Capacitors . . . AS: AL Solid, CC: Ceramic Chip, CD: Ceramic Disc, CG: Ceramic Gimmick, EL: Electrolytic, FS: Feed thru, MC: Myler Film, SD: Semiconductor, TT: Tantalum

The last code indicates tolerance of resistance: J = $\pm 5\%$, K = $\pm 10\%$, F = $\pm 1\%$

The first code indicates tolerance of capacitance:

C = $\pm 0.25\text{pF}$, D = $\pm 0.5\text{pF}$, F = $\pm 1\text{pF}$, G = $\pm 2\%$, J = $\pm 5\%$, K = $\pm 10\%$, M = $\pm 20\%$, Z = $+80\% - 20\%$.

The second code indicates variation of capacitance with temperature:

YA = $\pm 5\%$, YB = $\pm 10\%$, YD = $+20 - 30\%$, YE = $+20 - 50\%$, YF = $+30\% - 80\%$ (–25 to +85°C), ZF = $+30\% - 80\%$ (–10 to +70°C),

CH = $0 \pm 60\text{ppm}/^\circ\text{C}$, RH = $-220\text{ppm}/^\circ\text{C}$, CJ = $0 \pm 120\text{ppm}/^\circ\text{C}$ RJ = $-220\text{ppm}/^\circ\text{C} \pm 120\text{ppm}/^\circ\text{C}$, TH = $-470\text{ppm}/^\circ\text{C} \pm 60\text{ppm}/^\circ\text{C}$,

UJ = $-750\text{ppm}/^\circ\text{C} \pm 120\text{ppm}/^\circ\text{C}$, SL = $\pm 350\text{ppm}/^\circ\text{C}$ to $-1000\text{ppm}/^\circ\text{C}$

SYMBOL NUMBER	DESCRIPTION	VENDOR PART NUMBER	UNIDEN PART NUMBER
CAPACITORS			
C001	CD 5PF 50V C CH	BCCC815091Z	
C002	CD 2PF 50V C CK	BCCF812091Z	
C003	CD 5PF 50V C CH	BCCC815091Z	
C006	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C009	CD 120PF 50V J SL	BCCG811214Z	
C010	CD 2PF 50V C CK	BCCF812091Z	
C011	CC 22PF 50V J CG C-085	BCXA812204Z	18-9517-2205
C012	CC 22PF 50V J CG C-085	BCXA812204Z	18-9517-2205
C013	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C014	CD 0.047UF 50V K X7R(C)	BCPE814735Z	
C015	CD 0.022UF 50V K X7R(C)	BCPE812235Z	
C016	TT 4.7UF 10V M	BCSE114796Z	
C017	CC 22PF 50V J CG C-085	BCXA812204Z	18-9517-2205
C018	CD 8PF 50V D CH	BCCC818092Z	1800-0096
C019	CD 8PF 50V D CH	BCCC818092Z	1800-0096
C020	CD 0.047UF 50V K X7R(C)	BCPE814735Z	
C021	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C023	CD 15PF 50V J CH	BCCC811504Z	1800-0114
C024	CD 3PF 50V C CH	BCCC813091Z	1800-0094
C026	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C027	TT 4.7UF 10V M	BCSE114796Z	
C028	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C029	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C031	CC 22PF 50V J CG C-085	BCXA812204Z	18-9517-2205
C032	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C033	CD 10PF 50V D CH	BCCC811002Z	
C034	CD 10PF 50V D CH	BCCC811002Z	
C036	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C037	CD 0.01UF 50V K X7R(C)	BCPE811035Z	
C038	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C039	CD 33PF 50V J CH	BCCC813304Z	1800-0062
C040	CD 18PF 50V J CH	BCCC811804Z	1800-0060
C041	CD 15PF 50V J CH	BCCC811504Z	1800-0114
C042	CD 2PF 50V C CK	BCCF812091Z	
C043	CD 15PF 50V J CH	BCCC811504Z	1800-0114
C044	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C045	CD 0.01UF 50V K X7R(C)	BCPE811035Z	
C046	CD 27PF 50V J RH	BCCR812704Z	1800-0044
C047	CD 18PF 50V J RH	BCCR811804Z	18-0511-1805
C048	CD 1.5PF 50V C RK	BCCM811591Z	
C049	CD 0.0022UF 50V M YD	BCKD81226Z	
C050	CD 0.01UF 50V K X7R(C)	BCPE811035Z	
C051	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C052	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C053	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C054	TT 10UF 10V M	BCSE111006Z	
C055	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C056	EL 47UF 10V M C-095	BCER114706Z	
C057	CD 0.01UF 50V K X7R(C)	BCPE811035Z	
C058	CD 82PF 50V J SL	BCCG818204Z	
C059	CD 27PF 50V J UJ	BCCU812704Z	
C061	CD 100PF 50V J CH	BCCC811014Z	
C062	CD 100PF 50V J CH	BCCC811014Z	
C063	CD 0.01UF 50V K X7R(C)	BCPE811035Z	
C064	TT 2.2UF 16V M	BCSE312296Z	1800-0601
C065	EL 22UF 10V M C-095	BCER112206Z	
C066	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C067	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C069	TT 0.22UF 35V M	BCSE662286Z	1800-0614
C071	CD 330PF 50V J NPO C-082	BCPD813314Z	
C072	CD 0.056UF 50V K X7R(C)	BCPE815635Z	
C073	TT 2.2UF 16V M	BCSE312296Z	1800-0601

SYMBOL NUMBER	DESCRIPTION	VENDOR PART NUMBER	UNIDEN PART NUMBER
C074	CD 0.01UF 50V K X7R(C)	BCPE811035Z	
C075	TT 10UF 10V M	BCSE111006Z	
C076	CD 0.056UF 50V K X7R(C)	BCPE815635Z	
C077	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C078	TT 0.22UF 35V M	BCSE662286Z	1800-0614
C079	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C080	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C082	CD 0.01UF 50V K X7R(C)	BCPE811035Z	
C083	TT 0.22UF 35V M	BCSE662286Z	1800-0614
C084	CD 8PF 50V C CH	BCCC818092Z	1800-0096
C088	TT 0.47UF 35V M	BCSE664786Z	
C090	CD 7PF 50V D CH	BCCC817092Z	1800-0058
C091	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C092	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C096	CD 10PF 50V D CH	BCCC811002Z	
C097	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C101	CD 2PF 50V C CK	BCCF812091Z	
C102	CD 47PF 50V J SL	BCCG814704Z	
C103	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C104	MC 0.01UF 50V K	BCCM811035Z	1800-0407
C105	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C106	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C107	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C108	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C109	CD 5PF 50V C CH	BCCC815091Z	
C110	CD 3PF 50V C CJ	BCCC813091Z	
C111	CD 0.0047UF 50V Z YF	BCKG814720Z	
C112	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C113	CD 0.0047UF 50V Z YF	BCKG814720Z	
C114	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C115	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C116	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C117	CD 0.01UF 50V Z YF	BCKG811030Z	1800-0148
C118	CD 0.0047UF 50V M YD	BCKD814726Z	1800-0118
C119	CD 0.0047UF 50V M YD	BCKD814726Z	1800-0118
C120	CD 0.0047UF 50V M YD	BCKD814726Z	1800-0118
C121	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C122	CD 33PF 50V J CH	BCCC813304Z	1800-0062
C123	CD 120PF 50V J CH	BCCC811214Z	
C124	MC 0.1UF 50V K	BCCM811045Z	1800-0412
C125	TT 2.2UF 16V M	BCSE312296Z	1800-0601
C126	MC 0.0068UF 50V K	BCCM816825Z	1800-0414
C127	CD 33PF 50V J CH	BCCC813304Z	1800-0062
C128	CD 0.047UF 50V Z ZF	BCKC814730Z	1800-0111
C129	CD 0.047UF 50V Z ZF	BCKC814730Z	1800-0111
C130	CD 10PF 50V D CH	BCCC811002Z	
C131	CD 0.047UF 50V Z ZF	BCKC814730Z	1800-0111
C132	MC 0.0022UF 50V K	BCCM812225Z	1800-0419
C133	MC 0.0033UF 50V K	BCCM813325Z	1800-0421
C134	CD 270PF 50V J SL	BCCG812714Z	1800-0163
C135	MC 0.0022UF 50V K	BCCM812225Z	1800-0419
C136	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C137	CD 6PF 50V D CH	BCCC816092Z	
C138	CD 6PF 50V D CH	BCCC816092Z	
C139	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C140	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C141	CD 18PF 50V J CH	BCCC811804Z	1800-0060
C142	CD 18PF 50V J CH	BCCC811804Z	1800-0060
C143	CG 0.68PF 500V K	BCBA826885Z	1800-0801
C144	CD 12PF 50V J CH	BCCC811204Z	1800-0113
C145	CG 0.68PF 500V K	BCBA826885Z	1800-0801
C146	EL 33UF 10V	BCEL113300Z	1800-0323

SYMBOL NUMBER	DESCRIPTION	VENDOR PART NUMBER	UNIDEN PART NUMBER
C147	CD 0.0047UF 50V M YD	BCKD814726Z	1800-0118
C148	CD 10PF 50V D CH	BCCC811002Z	
C149	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C150	CD 100PF 50V J UJ	BCCU811014Z	
C151	CD 47PF 50V J UJ	BCCU814704Z	
C152	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C153	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C154	CD 0.022UF 50V Z ZF	BCKC812230Z	1800-0079
C155	MC 0.0033UF 50V K	BCQM813325Z	1800-0421
C156	EL 1UF 50V	BCEL811090Z	1800-0302
C157	AS 0.1UF 25V M	BCAA511086Z	
C158	EL 22UF 10V	BCEL112200Z	1800-0331
C159	CD 27PF 50V J CH	BCCC812704Z	1800-0099
C160	MC 0.001UF 50V K	BCQM811025Z	
C161	AS 0.22UF 25V M	BCAA512286Z	
C162	MC 0.001UF 50V K	BCQM811025Z	
C163	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C164	EL 100UF 10V	BCEL111010Z	1800-0310
C165	EL 1UF 50V	BCEL811090Z	1800-0302
C166	EL 33UF 16V	BCEL313300Z	1800-0307
C167	MC 0.01UF 50V K	BCQM811035Z	1800-0407
C168	EL 1000UF 25V M C-095	BCER511026Z	1800-0340
C169	SD 0.1UF 25V Z	BCCA511040Z	1800-0701
C170	MC 0.001UF 50V K	BCQM811025Z	
C171	MC 0.0022UF 50V K	BCQM812225Z	1800-0419
C172	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C173	SD 0.1UF 25V Z	BCCA511040Z	1800-0701
C174	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C301	CC 5PF 50V D CG C-085	BCXA815092Z	18-9517-5092
C302	CC 6PF 50V D CG C-085	BCXA816092Z	18-9517-6092
C303	CC 7PF 50V D CG C-085	BCXA817092Z	18-9517-7092
C306	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C307	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C308	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C309	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C310	CD 4PF 50V C CH	BCCC814091Z	1800-0112
C311	CD 47PF 50V J SL	BCCG814704Z	
C312	CD 47PF 50V J SL	BCCG814704Z	
C314	CC 18PF 500V J C-073	BCDD821804Z	18-9800-1805
C315	CC 27PF 500V J C-073	BCDD822704Z	18-9800-2705
C316	CC 27PF 500V J C-073	BCDD822704Z	18-9800-2705
C317	CC 18PF 50V K CG C-085	BCXA811805Z	18-9517-1809
C318	CC 22PF 50V K CG C-085	BCXA812205Z	18-9517-2209
C319	CD 6PF 50V D CH	BCCC816092Z	
C320	CC 22PF 50V K CG C-085	BCXA812205Z	18-9517-2209
C321	CC 22PF 50V K CG C-085	BCXA812205Z	18-9517-2209
C322	CD 10PF 50V D CH	BCCC811002Z	
C323	CD 10PF 50V D CH	BCCC811002Z	
C324	CD 10PF 50V D CH	BCCC811002Z	
C325	CD 10PF 50V D CH	BCCC811002Z	
C326	CD 10PF 50V D CH	BCCC811002Z	
C327	CD 10PF 50V D CH	BCCC811002Z	
C328	CD 10PF 50V D CH	BCCC811002Z	
C329	CD 4PF 50V C CH	BCCC814091Z	1800-0112
C330	FT 1000PF CZ-086	BCZY0086001	1800-0703
C331	FT 1000PF CZ-086	BCZY0086001	1800-0703
C332	TT 10UF 25V M	BCSE511006Z	1800-0605
C333	CD 0.01UF 50V M YD	BCKD811036Z	1800-0119
C334	FT 1000PF CZ-086	BCZY0086001	1800-0703
C335	EL 10UF 16V	BCEL311000Z	1800-0306
C336	CD 0.01UF 50V M YD	BCKD811036Z	1800-0119
C337	EL 10UF 16V	BCEL311000Z	1800-0306
C338	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C339	CD 0.01UF 50V M YD	BCKD811036Z	1800-0119
C341	CD 6PF 50V D CH	BCCC816092Z	
C342	CD 10PF 50V D CH	BCCC811002Z	
C345	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C346	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C347	EL 4.7UF 25V	BCEL514790Z	1800-0304
C348	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C349	EL 4.7UF 25V	BCEL514790Z	1800-0304
C350	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C351	EL 220UF 16V	BCEL312210Z	1800-0308
C352	EL 10UF 16V	BCEL311000Z	1800-0306
C401	CD 0.01UF 50V Z YF	BCKG811030Z	1800-0148

SYMBOL NUMBER	DESCRIPTION	VENDOR PART NUMBER	UNIDEN PART NUMBER
C402	EL 220UF 16V	BCEL312210Z	1800-0308
C403	CD 0.01UF 50V M YD	BCKD811036Z	1800-0119
C407	EL 100UF 10V	BCEL111010Z	1800-0310
C408	EL 33UF 16V	BCEL313300Z	1800-0307
C409	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C410	EL 1000UF 16V	BCEL311020Z	1800-0328
C416	EL 4.7UF 25V	BCEL514790Z	1800-0304
C417	EL 100UF 10V	BCEL111010Z	1800-0310
C421	CD 0.01UF 50V M YD	BCKD811036Z	1800-0119
C427	TT 10UF 16V M	BCSE311006Z	1800-0615
C501	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C600	TT 0.1UF 35V M	BCSE661086Z	1800-0613
C601	EL 1UF 50V	BCEL811090Z	1800-0302
C602	TT 0.22UF 35V M	BCSE662286Z	1800-0614
C603	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C604	EL 10UF 16V	BCEL311000Z	1800-0306
C605	CD 0.001UF 50V M YD	BCKD811026Z	1800-0117
C607	MC 0.022UF 50V K	BCQM812235Z	1800-0408
C608	EL 220UF 16V	BCEL312210Z	1800-0308
C609	EL 10UF 16V	BCEL311000Z	1800-0306
C610	EL 10UF 16V	BCEL311000Z	1800-0306
C611	EL 1UF 50V	BCEL811090Z	1800-0302
C612	MC 0.0022UF 50V K	BCQM812225Z	1800-0419
C613	MC 0.0022UF 50V K	BCQM812225Z	1800-0419
C614	MC 0.0022UF 50V K	BCQM812225Z	1800-0419
C615	EL 47UF 16V	BCEL314700Z	1800-0316
C617	TT 22UF 16V	BCSC312206Z	
C618	EL 220UF 16V	BCEL312210Z	1800-0308
C619	TT 0.22UF 35V M	BCSE662286Z	1800-0614
C620	MC 0.01UF 50V M	BCQM811036Z	1800-0402
C621	EL 10UF 16V	BCEL311000Z	1800-0306
C701	CD 0.1UF 50V Z ZF	BCKC811040Z	1800-0080
C702	EL 1UF 50V	BCEL811090Z	1800-0302
C703	EL 10UF 16V	BCEL811000Z	
C704	EL 1UF 50V	BCEL811090Z	1800-0302
C705	EL 1000UF 25V	BCEL511020Z	1800-0333
C706	EL 10000UF 25V	25TWP10000	1800-0339
C707	EL 10000UF 25V	25TWP10000	1800-0339
C708	EL 10000UF 25V	25TWP10000	1800-0339
C709	EL 1000UF 25V	BCEL511020Z	1800-0333
FT1-26	FT 1000PF CZ-086	BCZY0086001	1800-0703
TRIMMER CAPACITORS			
CT301	CT-059 10PF	BCTY0059100	1800-0222
CT302	CT-059 10PF	BCTY0059100	1800-0222
CV004	CT-020 20PF	BCTY0020200	
CV005	CT-020 10PF	BCTY0020100	1800-0223
CV006	CT-020 10PF	BCTY0020100	1800-0223
DIODES			
D004	1S2075K DIODE	BDAY0063001	2000-0332
D005	1S2075K DIODE	BDAY0063001	2000-0332
D006	MC-301 DIODE	BDAY0090001	2000-0341
D010	1S2339G VARACTOR	BDAY0030001	2000-0309
D015	1S2339G VARACTOR	BDAY0030001	2000-0309
D016	1S2339G VARACTOR	BDAY0030001	2000-0309
D017	1N4003 DIODE	BDAY0133001	2000-0608
D018	1SS88 DIODE	BDAY0208001	2000-0659
D019	1SS88 DIODE	BDAY0208001	2000-0659
D101	1S2075K DIODE	BDAY0063001	2000-0332
D302	1SS97 DIODE	BDAY0164001	2000-0378
D303	1S2075K DIODE	BDAY0063001	2000-0332
D304	1SS97 DIODE	BDAY0164001	2000-0378
D401	S3V10 DIODE	BDAY0068001	2000-0352
D402	1N4003 DIODE	BDAY0133001	2000-0608
D403	XZ-185 ZENER 18.5V	BDAY0020017	2000-0601
D404	1S2075K DIODE	BDAY0063001	2000-0332
D405	1S2075K DIODE	BDAY0063001	2000-0332
D406	1S2075K DIODE	BDAY0063001	2000-0332
D500	TLR-124 RED LED	BDAY0100001	2000-0347
D501	TLY-124 YELLOW LED	BDAY0122001	2000-0368
D502	TLY-124 YELLOW LED	BDAY0122001	2000-0368
D503	TLG-124A GREEN LED	BDAY0116001	2000-0355

SYMBOL NUMBER	DESCRIPTION	VENDOR PART NUMBER	UNIDEN PART NUMBER
D601	1S2075K DIODE	BDAY0063001	2000-0332
D602	1S2075K DIODE	BDAY0063001	2000-0332
D603	1S2075K DIODE	BDAY0063001	2000-0332
D604	1S2075K DIODE	BDAY0063001	2000-0332
D605	1S2075K DIODE	BDAY0063001	2000-0332
D606	1S2075K DIODE	BDAY0063001	2000-0332
D607	1S2075K DIODE	BDAY0063001	2000-0332
D608	1S2075K DIODE	BDAY0063001	2000-0332
D609	TLY-124 YELLOW LED	BDAY0122001	2000-0368
D610	TLG-124A GREEN LED	BDAY0116001	2000-0355
D611	TLR-124 RED LED	BDAY0100001	2000-0347
D612	CZ-094 9.4V ZENER	BDAY0008030	2000-0368
D612*	1S2075K DIODE	BDAY0063001	2000-0332
D613	1S2075K DIODE	BDAY0063001	2000-0332
D614	1S2075K DIODE	BDAY0063001	2000-0332
D615	CZ-094 9.4V ZENER	BDAY0008030	2000-0368
D701	1S2075K DIODE	BDAY0063001	2000-0332
D702	1S2075K DIODE	BDAY0063001	2000-0332
D703	BZ-162 ZENER: 16.2V	BDAY0009003	2000-0312
D704	1N4002 DIODE	1N4002	2000-0623
D705	DIODE BRIDGE RECTIFIER	MDA980-2	2000-0619
CERAMIC FILTERS			
FT101	FL-094 FILTER 21.4 MHZ	BFLY0094001	2200-0327
FT102	FL-039 FILTER 455 KHZ	BFLY0039001	2200-0323
FT103	DE-334 HI-PASS FILTER	BDEY0334001	2200-0331
INTEGRATED CIRCUITS			
IC001	NJM4558D IC	BDEY0145001	2000-0043
IC101	MC3357P IC	BDEY0293001	2000-0060
IC102	MB3713 IC	BDEY0159001	2000-0067
IC301	MC7808CT I.C.	MC7808	2000-0098
IC401	MB3756 IC	BDEY0131001	2000-0033
IC600	LM324 IC	LM324	2000-0088
IC601	MC14020BCP IC	MC14020	2000-0095
IC602	MC14011BCP IC	MC14011	2000-0093
IC603	MM74C14 IC	MM74C14	2000-1017
IC604	MC14066BCP IC	MC14066	2000-0096
IC605	DE-390 CTCSS IC	BDEY0390001	2000-1001
IC606	DE-334 HI-PASS FILTER	BDEY0334001	2200-0331
IC607	MC14020BCP IC	MC14020	2000-0095
IC608	MC14017 IC	MC14017	2000-0094
IC609	MC14011BCP IC	MC14011	2000-0093
IC610	MM74C14 IC	MM74C14	2000-1017
IC611	LM324 IC	LM324	2000-0088
IC701	LM317-T IC	LM317T	2000-0099
IC702	2N6504 SCR	2N6504	2000-0433
CONNECTORS			
CM001	JK-195 5048-4A 4P	BJKY0195004	
CM101	JK-206 5045-03A JACK:3P	BJKY0206003	1100-0057
J302	JK-208 JACK:RF	BJKY0208001	1100-0046
J501	JK-068 JACK:ANTENNA	BJKY0068001	1100-0002
J502	SO-239 BULKHEAD CONNECTOR	83-798	1100-0072
J502a	SO-239 HOOD	83-765	1100-0073
J503	WZ-225: 55 POWER	BWZY0225001	2700-0205
	PIN: DC POWER JACK	02-09-2103	1100-0116
J504	RECEPTACLE: FEMALE 6 PIN	03-06-1061	1100-0074
J504*	RECEPTACLE: FEMALE 9 PIN	03-06-0191	
	CONNECTOR:PIN FEMALE .062	02-06-1103	1100-0117
J505	JACK:PHONO RF	3501FP	1100-0085
J506	JACK:PHONO RF	3501FP	1100-0085
J507	JK-207 JACK:MICROPHONE	BJKY0207001	1100-0045
J2	HEADER:FEMALE 13 POSITION	10-11-2133	1100-0086
	CRIMP TERMINAL	08-50-005	1100-0118
P1	HEADER:MALE 8 POSITION	22-04-2081	1100-0078
P2	HEADER:MALE 13 POSITION	22-04-2131	1100-0080
P3	HEADER:MALE 10 POSITION	22-04-2101	1100-0079
P302	WZ-229 GRAY COAX	BWZY0229001	2700-0113
P504	PLUG:MALE 6 PIN	03-06-2061	1200-0013
P504*	PLUG:MALE 9 PIN	03-06-2092	
	CONNECTOR:PIN MALE 0.062	02-06-2103	1100-0109
P505	PLUG:PHONO RF	3501MC	1200-0005
P506	PLUG:PHONO RF	3501MC	1200-0005
P507	PLUG:MICROPHONE		1200-0012
J001	SK-035 SOCKET:CRYSTAL	BSKY0035001	1400-0010

SYMBOL NUMBER	DESCRIPTION	VENDOR PART NUMBER	UNIDEN PART NUMBER
J002	SK-035 SOCKET:CRYSTAL	BSKY0035001	1400-0010
SK101	SK-036 SOCKET:CRYSTAL	BSKY0036001	1400-0002*
SK201	SK-036 SOCKET:CRYSTAL	BSKY0036001	1400-0002*
INDUCTORS			
L001	LE-257	BLEY0257001	2200-1506
L005	LD-087	BLDY0087001	2200-0052
L006	FL-106	BFLY0106001	2200-0334
L008	LE-253	BLEY0253001	2200-1505
L010	LD-087	BLDY0087001	2200-0052
L011	LD-087	BLDY0087001	2200-0052
L012	LD-087	BLDY0087001	2200-0052
L013	LE-253	BLEY0253001	2200-1505
L014	LE-253	BLEY0253001	2200-1505
L015	LE-253	BLEY0253001	2200-1505
L016	LB-269	BLBY0269001	2200-1127
L017	LB-268	BLBY0268001	2200-1126
L019	LB-265	BLBY0265001	2200-1124
L023	LB-267	BLBY0267001	2200-1125
L024	LB-267	BLBY0267001	2200-1125
L025	LD-075	BLDY0075001	2200-0104
L026	LD-085	BLDY0085001	2200-1304
L028	LD-075	BLDY0075001	2200-0104
L030	LD-085	BLDY0085001	2200-1304
L031	LD-075	BLDY0075001	2200-0104
L032	LD-075	BLDY0075001	2200-0104
L101	LD-144	BLDY0144001	2200-0608
L102	LD-144	BLDY0144001	2200-0608
L103	LD-144	BLDY0144001	2200-0608
L104	LD-144	BLDY0144001	2200-0608
L105	LD-144	BLDY0144001	2200-0608
L106	LD-144	BLDY0144001	2200-0608
L107	LD-142	BLDY0142001	2200-0607
L108	LA-359	BLAY0359001	2200-0588
L109	LA-340	BLAY0340001	2200-0580
L110	LA-353	BLAY0353001	2200-0112
L111	LZ-016 SLO609-471K 470UH	BLZY0016471	2200-0621
L112	LD-144	BLDY0144001	2200-0608
L113	LD-144	BLDY0144001	2200-0608
L114	LE-203	BLEY0203001	2200-0614
L115	LA-346	BLAY0346001	2200-0586
L116	LA-346	BLAY0346001	2200-0586
L117	LA-346	BLAY0346001	2200-0586
L118	LB-232	BLBY0232001	2200-0131
L301	LD-087	BLDY0087001	2200-0052
L302	LE-156	BLEY0156001	2200-0542
L303	LD-087	BLDY0087001	2200-0052
L304	LE-156	BLEY0156001	2200-0542
L305	LD-087	BLDY0087001	2200-0052
L306	LE-156	BLEY0156001	2200-0542
L307	LD-087	BLDY0087001	2200-0052
L308	LD-087	BLDY0087001	2200-0052
L309	LD-087	BLDY0087001	2200-0052
L310	LD-087	BLDY0087001	2200-0052
TRANSISTORS			
Q003	2SC3103	BDBC3103000	2000-0440
Q004	MRF750	BDBC0525001	2000-0438
Q005	2SC3019	BDBC3019000	2000-0411
Q006	2SC1730-K	BDBC1730110	2000-0214
Q007	2SC2026-K	BDBC2026110	2000-0463
Q008	2SC2458-Y	BDBC2458124	2000-0408
Q009	2SA950-Y	BDBA0950124	2000-0414
Q011	2SA950-Y	BDBA0950124	2000-0414
Q012	2SA1150-Y	BDBA1150124	2200-0462
Q013	2SC2458-BL	BDBC2458301	2000-0406
Q014	2SC2458L-Y	BDBC2458521	2000-0461
Q015	2SC2458-Y	BDBC2458124	2000-0408
Q101	2SC2549	BDBC2549000	2000-0409
Q102	2SC2549	BDBC2549000	2000-0409
Q103	2SC2549	BDBC2549000	2000-0409
Q104	2SC1674-L	BDBC1674111	2000-0240
Q105	2SC2026-L	BDBC2026111	2000-0442
Q106	LSP1200	BDBZ0521001	2000-0422
Q107	2SC1675-L	BDBC1675111	2000-0213
Q109	2SC1675-L	BDBC1675111	2000-0213
Q110	2SC945A-Q	BDBC0945507	2000-0258
Q111	2SC945A-P	BDBC0945506	2000-0235

SYMBOL NUMBER	DESCRIPTION	VENDOR PART NUMBER	UNIDEN PART NUMBER
Q112	2SK117-GR	BDC80117303	2000-0115
Q113	2SC945A-Q	BDBC0945507	2000-0258
Q301	2SC2695	BDBC2695000	2000-0402
Q302	2SC1968A	BDBC1968101	2000-0403
Q303	2SC1966	BDBC1966000	2000-0400
Q305	2SC945A-Q	BDBC0945507	2000-0258
Q306	2SC945A-Q	BDBC0945507	2000-0258
Q307	2SB772-R	BDBB0772117	2000-0286
Q308	2SC945A-Q	BDBC0945507	2000-0258
Q401	2SC945A-P	BDBC0945506	2000-0235
Q402	2SC945A-P	BDBC0945506	2000-0235
Q403	2SC945A-P	BDBC0945506	2000-0235
Q404	2SC945A-P	BDBC0945507	2000-0258
Q405	2SA733-P	BDBA0733115	2000-0218
Q406	2SC945A-P	BDBC0945506	2000-0235
Q407	2SC945A-P	BDBC0945506	2000-0235
Q501	2SC945A-Q	BDBC0945507	2000-0258
Q502	2SB772-R	BDBB0772117	2000-0286
Q600	2SC945A-Q	BDBC0945507	2000-0258
Q601	2SC945A-Q	BDBC0945507	2000-0258
Q602	2SC945A-Q	BDBC0945507	2000-0258
Q603	2SC945A-Q	BDBC0945507	2000-0258
Q701	MPSA 55	MPSA55	2000-0435
Q702	MPSA 55	MPSA55	2000-0435
Q703	TIP-32	TIP32	2000-0436
Q704	MPSA 05	MPSA05	2000-0437
Q705	2N3771	2N3771	2000-0434

RESISTORS

R008	CF 1 ohms 1/4W J	BRPB181094Z	19-0014-1095
R010	CF 330 ohms 1/8W J	BRUB613314Z	19-1018-3315
R011	CF 220 ohms 1/8W J	BRUB612214Z	19-1018-2215
R012	CF 22 ohms 1/8W J	BRUB612204Z	19-1018-2205
R013	CF 180 ohms 1/8W J	BRPB611814Z	19-0018-1815
R014	CF 10 ohms 1/8W J	BRUB611004Z	19-1018-1005
R015	CF 1200 ohms 1/8W J	BRUB611224Z	19-1018-1225
R016	CF 100 ohms 1/8W J	BRUB611014Z	19-1018-1015
R017	CF 680 ohms 1/8W J	BRUB616814Z	19-1018-6815
R018	CF 150 ohms 1/8W J	BRUB611514Z	19-1018-1515
R020	CF 56K ohms 1/8W J	BRUB615634Z	19-1018-5635
R021	CF 150 ohms 1/8W J	BRUB611514Z	19-1018-1515
R022	CF 3900 ohms 1/8W J	BRUB613924Z	19-1018-3925
R023	CF 1200 ohms 1/8W J	BRUB611224Z	19-1018-1225
R024	MF 56K ohms 1/4W F	BRSS445633Z	19-2014-5361
R025	MF 27K ohms 1/4W F	BRSS442733Z	19-2014-2731
R026	MF 3300 ohms 1/4W F	BRSS443323Z	19-2014-3321
R027	MF 2200 ohms 1/4W F	BRSS442223Z	19-2014-2221
R033	CF 1800 ohms 1/8W J	BRUB611824Z	19-1018-1825
R038	CF 1000 ohms 1/8W J	BRUB611024Z	19-1018-1025
R039	CF 2200 ohms 1/8W J	BRUB612224Z	19-1018-2225
R043	CF 4700 ohms 1/8W J	BRUB614724Z	19-1018-4725
R044	CF 2200 ohms 1/8W J	BRUB612224Z	19-1018-2225
R048	CF 4700 ohms 1/8W J	BRUB614724Z	19-1018-4725
R052	CF 3900 ohms 1/8W J	BRUB613924Z	19-1018-3925
R053	CF 680 ohms 1/8W J	BRUB616814Z	19-1018-6815
R054	CF 100 ohms 1/4W J	BRPB181014Z	19-0014-1015
R055	CF 1000 ohms 1/8W J	BRUB611024Z	19-1018-1025
R056	CF 2200 ohms 1/8W J	BRUB612224Z	19-1018-2225
R057	CF 220 ohms 1/4W J	BRPB182214Z	19-0014-2215
R058	CF 56K ohms 1/8W J	BRUB615634Z	19-1018-5635
R059	CF 22K ohms 1/8W J	BRUB612234Z	19-1018-2235
R060	CF 2200 ohms 1/8W J	BRUB612224Z	19-1018-2225
R061	CF 1000 ohms 1/8W J	BRPB611024Z	19-0018-1025
R062	CF 12K ohms 1/8W J	BRUB611234Z	19-1018-1235
R063	CF 12K ohms 1/8W J	BRUB611234Z	19-1018-1235
R064	CF 12K ohms 1/8W J	BRUB611234Z	19-1018-1235
R065	CF 150K ohms 1/8W J	BRUB611544Z	19-1018-1545
R066	MF 13K ohms 1/8W F	BRSS881333Z	19-2018-1331
R067	MF 10K ohms 1/8W F	BRSS881033Z	19-2018-1031
R068	CF 560 ohms 1/8W J	BRUB615614Z	19-1018-5615
R069	CF 2200 ohms 1/8W J	BRPB612224Z	19-0018-2225
R070	CF 10K ohms 1/8W J	BRUB611034Z	19-1018-1035
R071	CF 39K ohms 1/8W J	BRPB613934Z	19-0018-3935
R073	CF 470 ohms 1/8W J	BRPB614714Z	19-0018-4715
R075	CF 330 ohms 1/8W J	BRUB613314Z	19-1018-3315
R076	MF 3900 ohms 1/4W F	BRSS443923Z	19-2014-3921

R077	CF 680K ohms 1/8W J	BRUB616844Z	19-1018-6845
R078	CF 220 ohms 1/8W J	BRUB612214Z	19-1018-2215
R080	CF 330 ohms 1/8W J	BRUB613314Z	19-1018-3315
R081	CF 330 ohms 1/8W J	BRPB613314Z	19-0018-3315
R083	CF 3300 ohms 1/8W J	BRUB613324Z	19-1018-3325
R101	CF 330 ohms 1/4W J	BRUB183314Z	19-1014-3315
R102	CF 1800 ohms 1/4W J	BRUB181824Z	19-1014-1825
R103	CF 220 ohms 1/4W J	BRUB182214Z	19-1014-2215
R104	CF 560 ohms 1/4W J	BRUB185614Z	19-1014-5615
R105	CF 100 ohms 1/4W J	BRUB181014Z	19-1014-1015
R106	CF 470 ohms 1/4W J	BRPB184714Z	19-0014-4715
R107	CF 560 ohms 1/4W J	BRUB185614Z	19-1014-5615
R108	CF 1000 ohms 1/4W J	BRUB181024Z	19-1014-1025
R109	CF 12K ohms 1/4W J	BRUB181234Z	19-1014-1235
R110	CF 390 ohms 1/4W J	BRUB183914Z	19-1014-3915
R111	CF 390 ohms 1/4W J	BRUB183914Z	19-1014-3915
R112	CF 100 ohms 1/4W J	BRUB181014Z	19-1014-1015
R113	CF 10K ohms 1/4W J	BRUB181034Z	19-1014-1035
R114	CF 2200 ohms 1/4W J	BRUB182224Z	19-1014-2225
R115	CF 470 ohms 1/4W J	BRUB184714Z	19-1014-4715
R116	CF 27K ohms 1/4W J	BRUB182734Z	19-1014-2735
R117	CF 5600 ohms 1/4W J	BRUB185624Z	19-1014-5625
R118	CF 3300 ohms 1/4W J	BRUB183324Z	19-1014-3325
R119	CF 2700 ohms 1/4W J	BRUB182724Z	19-1014-2725
R120	CF 150 ohms 1/4W J	BRUB181514Z	19-1014-1515
R121	CF 82K ohms 1/4W J	BRUB188234Z	19-1014-8235
R122	CF 27K ohms 1/4W J	BRUB182734Z	19-1014-2735
R123	CF 27K ohms 1/4W J	BRUB182734Z	19-1014-2735
R124	CF 3300 ohms 1/4W J	BRUB183324Z	19-1014-3325
R125	CF 82K ohms 1/4W J	BRUB188234Z	19-1014-8235
R126	CF 1000 ohms 1/4W J	BRUB181024Z	19-1014-1025
R127	CF 47K ohms 1/4W J	BRUB184734Z	19-1014-4735
R128	CF 2200 ohms 1/4W J	BRUB182224Z	19-1014-2225
R129	CF 2200 ohms 1/4W J	BRUB182224Z	19-1014-2225
R130	CF 47K ohms 1/4W J	BRUB184734Z	19-1014-4735
R131	CF 33K ohms 1/4W J	BRUB183334Z	19-1014-3335
R132	CF 10K ohms 1/4W J	BRUB181034Z	19-1014-1035
R133	CF 560 ohms 1/4W J	BRUB185614Z	19-1014-5615
R134	CF 33K ohms 1/4W J	BRUB183334Z	19-1014-3335
R135	CF 470 ohms 1/4W J	BRUB184714Z	19-1014-4715
R136	CF 560 ohms 1/4W J	BRUB185614Z	19-1014-5615
R138	CF 33K ohms 1/4W J	BRUB183334Z	19-1014-3335
R139	CF 560 ohms 1/4W J	BRUB185614Z	19-1014-5615
R140	CF 4700 ohms 1/4W J	BRUB184724Z	19-1014-4725
R141	CF 4700 ohms 1/4W J	BRUB184724Z	19-1014-4725
R142	CF 3300 ohms 1/4W J	BRUB183324Z	19-1014-3325
R145	CF 1000 ohms 1/4W J	BRUB181024Z	19-1014-1025
R146	CF 10K ohms 1/4W J	BRUB181034Z	19-1014-1035
R147	CF 10K ohms 1/4W J	BRUB181034Z	19-1014-1035
R148	CF 27K ohms 1/4W J	BRUB182734Z	19-1014-2735
R149	CF 33K ohms 1/4W J	BRUB183334Z	19-1014-3335
R150	CF 220 ohms 1/4W J	BRUB182214Z	19-1014-2215
R151	CF 2200 ohms 1/4W J	BRUB182224Z	19-1014-2225
R152	CF 100K ohms 1/4W J	BRUB181044Z	19-1014-1045
R153	CF 4700 ohms 1/4W J	BRUB184724Z	19-1014-4725
R154	CF 4700 ohms 1/4W J	BRUB184724Z	19-1014-4725
R155	CF 270K ohms 1/4W J	BRUB182744Z	19-1014-2745
R156	CF 3300 ohms 1/4W J	BRUB183324Z	19-1014-3325
R158	CF 680 ohms 1/4W J	BRUB186814Z	19-1014-6815
R159	CF 220 ohms 1/4W J	BRUB182214Z	19-1014-2215
R302	CF 10K ohms 1/4W J	BRUB181034Z	19-1014-1035
R303	CF 47 ohms 1/8W J	BRPB614704Z	19-0018-4705
R304	CF 4700 ohms 1/4W J	BRUB184724Z	19-1014-4725
R305	CF 1800 ohms 1/4W J	BRUB181824Z	19-1014-1825
R306	CF 1000 ohms 1/4W J	BRUB181024Z	19-1014-1025
R307	CF 3300 ohms 1/4W J	BRPB143324Z	19-0014-3325
R308	CF 33K ohms 1/4W J	BRPB143334Z	19-0014-3335
R309	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R310	CF 470 ohms 1/4W J	BRPB144714Z	19-0014-4715
R311	CF 220 ohms 1/4W J	BRPB142214Z	19-0014-2215
R312	CF 1200 ohms 1/4W J	BRPB141224Z	19-0014-1225
R313	CF 56K ohms 1/4W J	BRPB145634Z	19-0014-5635
R314	CF 1500 ohms 1/4W J	BRPB141524Z	19-0014-1525
R315	CF 1800 ohms 1/4W J	BRPB141824Z	19-0014-1825
R316	WW 47 ohms 2W	PW-2	1900-0339
R317	CF 100 ohms 1/4W J	BRPB141014Z	19-0014-1015
R401	CF 1000 ohms 1/4W J	BRUB181024Z	19-1014-1025

SYMBOL NUMBER	DESCRIPTION	VENDOR PART NUMBER	UNIDEN PART NUMBER
R407	CF 3300 ohms 1/4W J	BRUB183324Z	19-1014-3325
R408	CF 27K ohms 1/4W J	BRUB182734Z	19-1014-2735
R409	CF 10K ohms 1/4W J	BRUB181034Z	19-1014-1035
R410	CF 68K ohms 1/4W J	BRUB186834Z	19-1014-6835
R411	CF 27K ohms 1/4W J	BRUB182734Z	19-1014-2735
R412	CF 3300 ohms 1/4W J	BRUB183324Z	19-1014-3325
R413	CF 2700 ohms 1/4W J	BRUB182724Z	19-1014-2725
R414	CF 680 ohms 1/4W J	BRUB186814Z	19-1014-6815
R415	CF 1500 ohms 1/4W J	BRUB181524Z	19-1014-1525
R417	CF 10K ohms 1/4W J	BRUB181034Z	19-1014-1035
R418	CF 10K ohms 1/4W J	BRUB181034Z	19-1014-1035
R422	CF 10K ohms 1/4W J	BRUB181034Z	19-1014-1035
R426	CF 3300 ohms 1/4W J	BRPB183324Z	19-0014-3325
R428	CF 10K ohms 1/4W J	BRUB181034Z	19-1014-1035
R501	CF 39K ohms 1/4W J	BRUB183934Z	19-1014-3935
R502	CF 220 ohms 1/4W J	BRUB182214Z	19-1014-2215
R503	CF 3900 ohms 1/4W J	BRUB183924Z	19-1014-3925
R504	CF 27K ohms 1/4W J	BRUB182734Z	19-1014-2735
R600	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R601	CF 1000 ohms 1/4W J	BRPB141024Z	19-0014-1025
R602	CF 1000 ohms 1/4W J	BRPB141024Z	19-0014-1025
R603	CF 15K ohms 1/4W J	BRPB141534Z	19-0014-1535
R604	CF 100 ohms 1/4W J	BRPB141014Z	19-0014-1015
R605	CF 100 ohms 1/4W J	BRPB141014Z	19-0014-1015
R606	CF 3900 ohms 1/4W J	BRPB143924Z	19-0014-3925
R607	CF 33K ohms 1/4W J	BRPB143334Z	19-0014-3335
R608	CF 3300 ohms 1/4W J	BRPB143324Z	19-0014-3325
R609	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R610	CF 82K ohms 1/4W J	BRPB148234Z	19-0014-8235
R611	CF 1000 ohms 1/4W J	BRPB141024Z	19-0014-1025
R612	CF 1000 ohms 1/4W J	BRPB141024Z	19-0014-1025
R613	CF 22K ohms 1/4W J	BRPB142234Z	19-0014-2235
R615	CF 470 ohms 1/4W J	BRPB144714Z	19-0014-4715
R617	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R618	CF 470 ohms 1/4W J	BRPB144714Z	19-0014-4715
R619	CF 39K ohms 1/4W J	BRPB143934Z	19-0014-3935
R621	CF 470 ohms 1/4W J	BRPB144714Z	19-0014-4715
R622	CF 27K ohms 1/4W J	BRPB142734Z	19-0014-2735
R624	CF 39K ohms 1/4W J	BRUB183934Z	19-1014-3935
R624*	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R625	CF 27K ohms 1/4W J	BRPB142734Z	19-0014-2735
R626	CF 5600 ohms 1/4W J	BRPB145624Z	19-0014-5625
R627	CF 8200 ohms 1/4W J	BRPB148224Z	19-0014-8225
R628	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R630	CF 47K ohms 1/4W J	BRPB144734Z	19-0014-4735
R631	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R632	CF 100 ohms 1/4W J	BRPB141014Z	19-0014-1015
R633	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R634	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R635	CF 33K ohms 1/4W J	BRPB143334Z	19-0014-3335
R636	CF 27K ohms 1/4W J	BRPB142734Z	19-0014-2735
R637	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R638	CF 33K ohms 1/4W J	BRPB143334Z	19-0014-3335
R639	CF 56K ohms 1/4W J	BRPB145634Z	19-0014-5635
R640	CF 4700 ohms 1/4W J	BRPB144724Z	19-0014-4725
R641	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R642	CF 2700 ohms 1/4W J	BRPB142724Z	19-0014-2725
R643	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R644	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R645	CF 1200 ohms 1/4W J	BRPB141224Z	19-0014-1225
R647	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R648	CF 470 ohms 1/4W J	BRPB144714Z	19-0014-4715
R649	CF 1000 ohms 1/4W J	BRPB141024Z	19-0014-1025
R650	CF 1000 ohms 1/4W J	BRPB141024Z	19-0014-1025
R651	CF 18K ohms 1/4W J	BRPB141834Z	19-0014-1835
R652	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R653	CF 68K ohms 1/4W J	BRPB146834Z	19-0014-6835
R654	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R655	CF 33K ohms 1/4W J	BRPB143334Z	19-0014-3335
R656	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R657	CF 82K ohms 1/4W J	BRPB148234Z	19-0014-8235
R701	CF 3900 ohms 1/4W J	BRPB143924Z	19-0014-3925
R702	CF 5600 ohms 1/4W J	BRPB145624Z	19-0014-5625
R703	CF 33 ohms 1/4W J	BRPB143304Z	19-0014-3305
R704	CF 33K ohms 1/4W J	BRPB143334Z	19-0014-3335
R705	CF 680 ohms 1/4W J	BRPB146814Z	19-0014-6815

SYMBOL NUMBER	DESCRIPTION	VENDOR PART NUMBER	UNIDEN PART NUMBER
R706	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R707	CF 47 ohms 1/4W J	BRPB144704Z	19-0014-4705
R708	CF 33 ohms 1/4W J	BRPB143304Z	19-0014-3305
R709	CF 1000 ohms 1/4W J	BRPB141024Z	19-0014-1025
R710	CF 68 ohms 1/4W J	BRPB146804Z	19-0014-6805
R711	CF 22 ohms 1/4W J	BRPB142204Z	19-0014-2205
R712	CF 330 ohms 1/4W J	BRPB143314Z	19-0014-3315
R713	CF 2700 ohms 1/4W J	BRPB142724Z	19-0014-2725
R714	CF 15K ohms 1/4W J	BRPB1415.4Z	19-0014-1535
R715	CF 10K ohms 1/4W J	BRPB141034Z	19-0014-1035
R716	WW 0.1 ohm 10W J		1900-0340
SEMIFIXED RESISTORS			
VR002	RT-528 2200 ohms	BRTY0258222	1900-0234
VR003	RT-528 4700 ohms	BRTY0528472	1900-0235
VR101	RT-189 5K ohms	BRTY0189502	1900-0201
VR102	RT-513 100K ohms	BRTY0513104	1900-0238
VR301	RT-645 1000 ohms	TM8KV2-645-102	1900-0241
VR302	RT-645 10K ohms	TM8KV2-645-103	1900-0242
VR600	RT-645 10K ohms	TM8KV2-645-103	1900-0242
VR601	RT-645 500K ohms	TM8KV2-645-504	1900-0240
VR602	RT-645 100K ohms	TM8KV2-645-104	1900-0239
VR603	RT-645 100K ohms	TM8KV2-645-104	1900-0239
VR604	RT-645 1000 ohms	TM8KV2-645-102	1900-0241
VR605	RT-494 250K ohms	BRTY0494254	1900-0237
VR606	RT-645 1000 ohms	TM8KV2-645-102	1900-0241
VR701	RT-645 1000. ohms	TM8KV2-645-102	1900-0241
VARIABLE RESISTORS			
VR501	RV-239 10K ohms	BRVY0239001	1900-0119
VR502	RV-324 10KB ohms	BRVY0324001	1900-0141
SWITCHES			
S500.1	SW-395 PUSH SWITCH	BSWY0395001	3000-0083
S600	DPDT PCB: SLIDE SWITCH	MHS222	3000-0081
SW700	SWITCH:ROCKER DPDT	XRM-210N-00	3000-0082
THERMISTORS AND POSISTORS			
TH301	2DT-2 THERMISTOR	BDFY0014002	2000-0399
TH302	15501 THERMISTOR	RL1004104550155	2000-0622
TH501	YY-151 POSISTOR	BYYY0151001	1900-0700
TH502	YY-151 POSISTOR	BYYY0151001	1900-0700
TH505	2DT-2 THERMISTOR	BDFY0014002	2000-0399
MISCELLANEOUS			
	MOBILE MICROPHONE with HANG-UP CLIP		AMX 100
	MOBILE (DC) POWER CORD		AMX 120
	CTCSS TONE DECODER BOARD		ARX 500
	MICROPHONE HANGER	HMHG480108Z	4000-0112
RELAY	RELAY: 12VDC SPDT	1515-1C-12VDC	2400-0008
T401	TF-083 AF CHOKE	BTFY0083001	2300-0001
T701	POWER TRANSFORMER	16167-P	2600-0030
SP501	SP-014 SPEAKER	BSPY0014001	3100-0004
F701	FUSE SLOW BLOW: 2 AMP	31-3002	2800-0013
FS001	FUSE: 2.5 AMP	BFSY0021259	2800-0012
	POWER CORD (AC)	17236	2700-0203
X101	QX-120 20.945MHZ	BQXY0120001	2100-0068
TP1	TP-019	BTPY0019001	1100-0102
TP2	TP-019	BTPY0019001	1100-0102
TP3	TP-019	BTPY0019001	1100-0102
TP102	TP-019	BTPY0019001	1100-0102
P01	TP-043 PUSH PIN (MALE)	BTPY0043001	1100-0108
P02	TP-043 PUSH PIN (MALE)	BTPY0043001	1100-0108
P03	TP-043 PUSH PIN (MALE)	BTPY0043001	1100-0108
P04	TP-043 PUSH PIN (MALE)	BTPY0043001	1100-0108
P1-28	TP-043 PUSH PIN (MALE)	BTPY0043001	1100-0108
P003	TP-049 TERMINAL:TEST	BTPY0049001	
P004	TP-049 TERMINAL:TEST	BTPY0049001	
1	PUSH PIN (FEMALE)	60790-1	1100-0107
SC101	YY-159 SHIELD CASE	BYYY0159001	3300-0310
#	Values changed on newer versions.		