

*Mobile Communications*

---

**S-550 SERIES CONTROL UNITS**

16 CHANNELS NO OPTIONS	19B801550P1
32 CHANNELS NO OPTIONS	19B801550P2
16 CHANNELS WITH SCAN	19B801550P3
32 CHANNELS WITH SCAN	19B801550P4
32 CHANNELS WITH ALL OPTIONS	19B801550P5

---

## TABLE OF CONTENTS

SPECIFICATIONS .....	3
DESCRIPTION .....	4
Control Unit Identification Chart .....	5
FIELD MODIFICATIONS .....	4
Modification Procedures .....	4
Speaker Jumper Connections .....	4
Scan Function Selection .....	4
INSTALLATION .....	7
OPERATION .....	7
To Receive A Message.....	7
To Transmit A Message .....	7
Programming .....	7
Dual Control .....	7
Int/Ext Speaker & Public Address .....	7
Mode Switch .....	8
CIRCUIT ANALYSIS .....	8
System Board.....	8
Display Board .....	10
Logic Board .....	10
Logic/Scan Board (Earlier Models).....	11
Logic/EEPROM Scan Board (Later Models).....	12
SCAN OPERATION.....	12
PROGRAMMING .....	13
SCAN OPTIONS .....	13
MAINTENANCE .....	13
Disassembly .....	13
Reassembly .....	14
Removing IC's .....	14
ADJUSTMENTS .....	14
Fast Squelch Adjust .....	14
PA Audio Levels .....	14
Frequency Stop Adjust .....	14
INTERCONNECTION DIAGRAM .....	16
PARTS LIST.....	17
MECHANICAL PARTS BREAKDOWN .....	22
OUTLINE DIAGRAMS:	
Logic Board (Non-Scan) .....	23
Logic/Scan Board (Earlier Models).....	23
Logic/ EEPROM Scan Board (Later Models).....	23
System Board.....	24
Display Board .....	24
SCHEMATIC DIAGRAMS:	
Display Board .....	25
Logic Board (Non-Scan) .....	26
Logic/Scan Board (Earlier Models).....	27
Logic/EEPROM Scan Board (Later Models).....	28
System Board.....	29

## SPECIFICATIONS\*

Input Voltage	+13.8 VDC
Current Drain	500 Milliamperes
Temperature Range	-30°C to 60°C (-22°F to 140°F)
Dimensions (H x W x D)	71.5 x 170.7 x 190 mm (including bracket)
Weight	15 oz.
Controls    Off-volume	Squelch Channel Selector Mode Selector Scan Controls INT/EXT, PA (Public Address) Dual control
Indicators	Transmit Light: Red Channel Busy Light: Amber Scan Indicator: Red Dual Control: Green Pmomy (PI): Yellow

### WARNING

Although the highest DC voltage in the Control Unit is supplied by the vehicle battery, high currents may be drawn under short circuit conditions. These currents can possibly heat objects such as tools, rings, watchbands, etc., enough to cause burns. Be careful when working near energized circuits!

High-level RF energy in the Transmitter Power Amplifier assembly can cause RF burns upon contact. Keep away from these circuits when the transmitter is energized!

\* These specifications are intended primarily for the use of the serviceman. Refer to the appropriate specification sheet for the complete specifications.

## DESCRIPTION

The S-550 Series Control Units (19B801550P1-P5) are attractively styled, highly functional units that are enclosed in a two-piece molded housing for durability and ease of disassembly. The Control Unit utilizes printed circuit boards to minimize wiring and increase reliability. The only cable used in the Control Unit connects the microphone jack to an internal connector.

Cable plugs are secured to the back of the Control Unit by plastic locking clips. The plugs are equipped with indexing tabs to assure connection to the correct jack.

The microphone plug is secured to a jack at the back of the unit by means of a captive locking screw.

All indicators are light emitting diodes (LEDS) that increase reliability, provide long life, and low power consumption. The seven segment display in addition to identifying the selected channel also serves as a power indicator.

If Public Address is present in the Control Unit, jumper P610 on the T/R/S Board in the Delta radio must be installed to complete the audio path to the external speaker.

The S-550 Control Unit is provided in five versions as identified in Table 1.

The Control Units each contain a System Board, Display Board, and a Logic Board or Logic/Scan Board. The Logic Board mounts vertically into the System Board through Molex connectors.

## FIELD MODIFICATIONS

### NOTE

When using Ignition Switch Standby with a second fused lead, the printed wire run between J1-J11 and J1-16 must be cut. The run is located on the back of the System Board at J1.

## MODIFICATION PROCEDURES

All Control Units are shipped with all options enabled; however, only those options being used are to be enabled when the Control Unit is put into service. All others must be disabled to prevent the switches from accidentally being operated and putting the radio out of service. Table 2 identifies the jumper status required to enable or disable each option. Refer also to Figures 1 and 2 for jumper locations when making the modifications.

## SPEAKER JUMPER CONNECTIONS

Control Unit 19B801550P1-P4: As shipped, jumpers C, A and D are installed. Verify jumper connections before making any option modifications.

Control Unit 19B801550P5: As shipped, jumpers R, A and D are installed. Verify jumper connections before making any option modifications.

As shipped the internal speaker is always connected. Table 2 identifies the jumper connections required to enable the handset/hookswitch and external speaker options.

## SCAN FUNCTION SELECTION

The Scan function may be strapped to operate in two of four modes as shown in Figure 2.

- Priority channel front programmable (as shipped)
- Priority channel follows channel selector switch
- Scans carrier only (ignores Channel Guard as shipped)
- Scan for carrier and Channel Guard (except ignores Channel Guard on priority channel)

**NOTE**

When setting up a control unit with Scan, the following items should be considered:

1. If Mode A/B is to be disabled on a new unit, Scan channels in Mode B must be deleted first before installing jumper J5. Unit may have Scan channels stored in Mode B from the factory.
2. When replacing the Scan Board on a 16 channel control unit with a 32 channel Scan Board, Scan channels in Mode B on the new Scan Board need to be deleted.
3. The new EEPROM Scan Board must be installed in a 32 channel control head to delete channels in Mode B. Channels must be deleted manually. There is no way to clear the EEPROM in the same manner that removing the battery cleared the hardware in earlier models.

Scan channels in Mode B cannot be accessed with a 16 channel control unit, but they will be counted as channels in Scan. The result will cause the control unit to be unable to scan 16 channels.

**Table 1 - Standard Control Unit Features**

CONTROL UNIT PART NO.	FEATURES						
	CHAN/ OPTION	CHAN BUSY	SQUELCH	SCAN	MODE A/B	SPKR	DUAL CNTRL
19B801550P1	16/NONE	YES	YES	NO	NO	NO	NO
19B801550P2	32/NONE	YES	YES	NO	YES	NO	NO
19B801550P3	16/WITH	YES	YES	YES	NO	NO	NO
19B801550P4	32/WITH	YES	YES	YES	YES	NO	NO
19B801550P5	32/WITH	YES	YES	YES	YES	YES	YES

**Table 2 - Option Configuration**

OPTION	DISPLAY BOARD JUMPERS TO DISABLE
EXT SPKR	Install jumper at J2 (internal speaker only).
Public Address	Disconnect wire from J6 and tape.
MODE A/B	Install Jumper at J5.
Dual Control	(No modifications required).

**SYSTEM BOARD JUMPERS**

OPTION	19B801550P1-P4				19B801550P5			
	A	C	D	R,S	A	C,S	D	R
CONFIGURATION AS SHIPPED	Installed	Installed	Installed	Removed	Installed	Removed	Installed	Installed
Handset Only								
Normal Handset/ Hookswitch	Remove	Remove			Remove			Remove
Tone Decoder with speaker mute		Remove						
Universal Encode/ Decode with Mute		Remove						

Note: Blank boxes indicates no change.

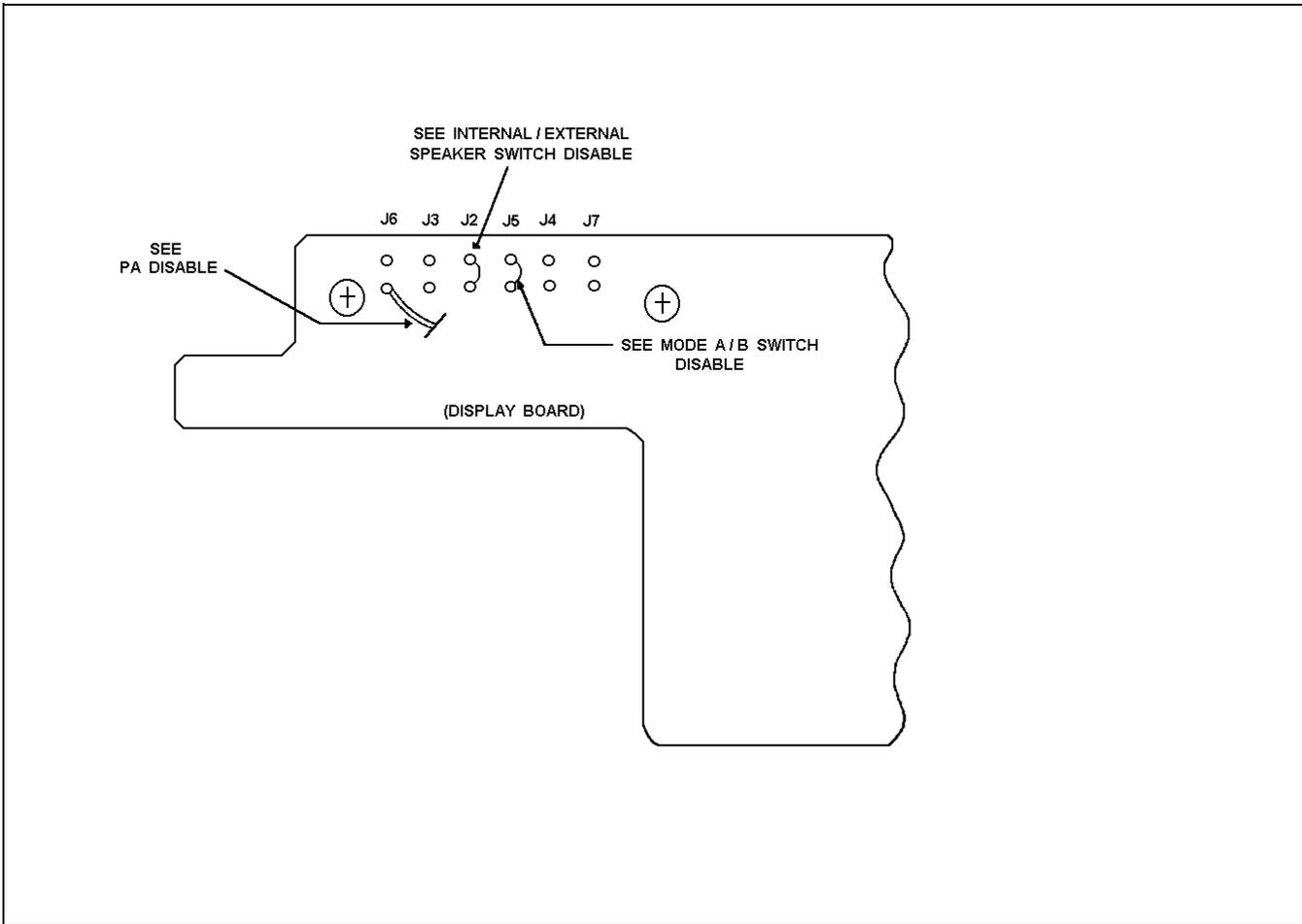


Figure 1 - Display Board Jumper Locations

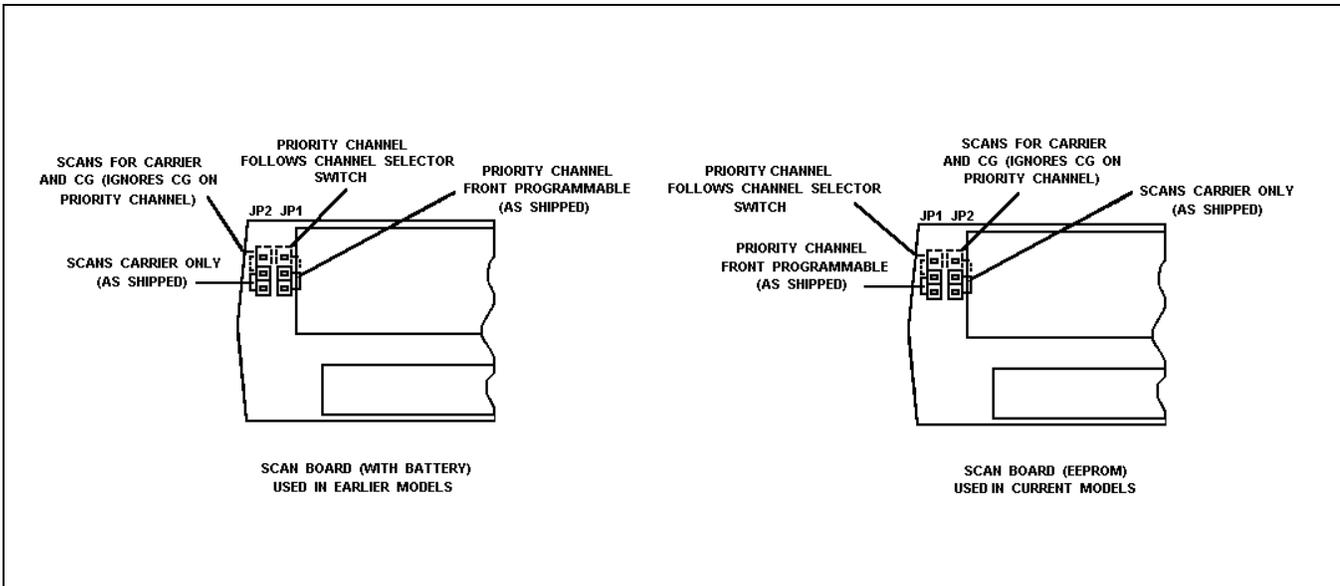


Figure 2 - Logic/Scan Board Jumper Locations

## **INSTALLATION**

Refer to the Installation manual LBI-31571 (RANGR) or LBI-31549 (DELTA-S, SX) for the physical installation of the Control Unit and to LBI-31562 Control Unit Accessories (RANGR) for interconnect information.

If the radio is moved to a vehicle with a positive ground, see LBI-31549, Delta-S SX Installation manual.

## **OPERATION**

Power to the S-550 Control Unit and to the radio is controlled by the OFF/VOLUME control. Power on is indicated by the illumination of the 7-segment display. The radio and Control Unit are operated by the front panel controls.

### **TO RECEIVE A MESSAGE**

1. Turn the radio and the Control Unit on by rotating the OFF/VOLUME control to the right.
2. Select the desired channel and operating mode, if mode option is present.
3. Set VOLUME control to mid position.
4. Set the squelch level by coming off-hook with the microphone and rotating the SQUELCH control until noise is heard (adjust VOLUME control to desired listening level) and then backing off until the noise just disappears.
5. If SCAN is present and if channel scanning is desired press the (SCAN) switch to turn on. The SCN "on" indicator will light.
6. The radio is now ready to receive messages.

### **TO TRANSMIT A MESSAGE**

1. Select the desired channel by rotating the CHANNEL switch.
2. Check the BSY (Channel Busy) indicator to make sure the channel is not being used.
3. Pick up the microphone and press the Push-to-Talk (PTT) switch. The red transmit light will turn on. Speak across the face of the microphone in a normal voice. Always release the PTT switch when the message is completed and listen for an answer.

## **PROGRAMMING SCAN FUNCTIONS**

- A. FRONT PANEL PROGRAMMABLE (as shipped)
1. Turn the radio on.
  2. Turn the scan off, if on.
  3. Using the channel selector switch, select the channel to be scanned.
  4. Press the ADD switch once to add the channel to the scan list (NON-PRIORITY).
  5. To establish a channel as the priority channel press the ADD switch twice.
  6. To add additional channels to the scan repeat steps 3 and 4.

To delete a channel from the scan list, select the channel to be deleted and press the DEL (Delete) switch once.

- B. SELECTABLE PRIORITY (Follows the Channel switch, see Field Modifications)

1. Non-priority channels are selected as described above.
2. The priority channel follows the channel selector switch when scan is turned on. (See FIELD MODIFICATIONS to enable this option).

## **DUAL CONTROL**

To select the dual control function momentarily slide the DUAL CTRL switch toward the front of the Control Unit and release. The indicator will light to indicate that the control unit has taken control.

## **INTERNAL/EXTERNAL SPEAKER & PUBLIC ADDRESS**

The Internal/External Speaker and Public Address functions are controlled by a three position slide switch. To select the desired function move the switch to the position indicated.

## **MODE A/B SWITCH**

To select Mode A or B move the MODE switch to the position indicated.

## **CIRCUIT ANALYSIS**

### **SYSTEM BOARD (Refer to Schematic Diagram)**

The Control Units are each equipped with a System Board, Display Board and a Logic or Logic/Scan Board. There are two versions of the System Board:

The first System Board is used in non-scan models equipped with the Logic Board and contains the Volume/Power switch, a 16-position frequency select control the Channel Busy light. Diode protection is also provided on all logic board connections.

The second System Board is more complex and is used with the scan option. This unit will be equipped with the Logic/Scan Board. In addition, this System Board contains circuitry for fast squelch, muting for scan, a public address amplifier, a relay for Internal/External speaker control and logic to generate a Control A- signal to operate the Dual Control function.

Display Driver U301 is a transistor array containing 8 Darlington connected transistor circuits that drive the seven segment display on the display board. R303 thru R312 are current limiting resistors in series with the collectors of the Darlington configurations. The input control signals to the display driver are received from the Logic Board. Q302 is controlled by the mode switch on the Display Board. Q316 is controlled by the control A- signal through Q317. When control A- is present Q317 is turned off, allowing Q316 to be turned on by +5 volts through pull-up resistor R365. This in turn supplies ground to the decimal point through Q302.

The transmit indicator is controlled by the radio PTT switch through limiting resistor R331. Radio PTT also turns off Q303, the RX indicator control transistor, to prevent it from coming on when radio PTT is operated. Rx control transistor Q303 monitors the CAS line. When a carrier is received the CAS line goes high allowing Q303 to be turned on by +5V through R322 and D318. This supplies a ground to the Rx indicator, turning it on. D320 holds the Rx indicator off when a carrier is not being received (CAS is low). D318 assures that Q303 can be turned off by a diode drop.

Channel Selection is controlled by a hexadecimal encoded switch, SW301, and the mode switch on the Display Board. The mode switch determines which bank of 16 channels is active and the channel select switch selects the chan-

nel. Except for channel 16, the value of each switch position corresponds to the selected channel. the value of channel 16 is zero. Resistor array RP301 functions as a pull-up resistor for the switch. Refer to Figure 3, Channel Selection Truth Table, for binary data corresponding to the channel selected.

### **Fast Squelch:**

OP AMP U306 and associated components make up the fast squelch circuit required for scan operation. The circuit filters noise frequencies above 6 kHz, removes low frequency components, and rectifies the resultant signal. If the noise level drops below the level set by R347 and R348 the circuit will indicate that a carrier is present by grounding the base of Q318. The fast squelch circuit will indicate the presence of a carrier within 10 milliseconds after the carrier appears. Resistor VR303 sets the fast response level and normally is set to operate squelch on a -15 dBm or stronger signal.

U306B acts as a two-pole high pass filter. U306A, R344 and C330 comprise an averaging detector. U306C is a DC amplifier. U306D is a Schmitt trigger/comparator, the output of which controls fast squelch switch Q318.

### **Mic Pre-Amp:**

The mic pre-amp consists of Q308, Q309 and associated circuitry. It operates from the 8-volt supply and Control A-lines and provides a gain of 8 dB. The operating point is established by interacting bias resistors R324 and R326 through R328. R325 and R329 are feedback resistors. The sensitivity logic/gain is set by VR304.

### **Speaker Selection:**

Speaker selection is controlled by the INT EXT/PA switch, Q310 and relay RY301. Receiver audio is present at RY301-1. The internal speaker is selected when the INT SW line (J6-30) goes low. Q310 is turned off and the internal speaker is connected through RY301-1 & 4. The external speaker is selected when the INT EXT/PA switch is in the EXT position. J6-30 goes high, turning Q301 on and energizing RY301. The external speaker is connected through relay RY301-1 & 3. Jumpers A, C, D, R and S are provided to hookup the various hookswitch and decoder combinations.

CHANNEL	A0/ FB1	A1/ FB2	A2/ FB3	A3/ FB4
1	0	1	1	1
2	1	0	1	1
3	0	0	1	1
4	1	1	0	1
5	0	1	0	1
6	1	0	0	1
7	0	0	0	1
8	1	1	1	0
9	0	1	1	0
10	1	0	1	0
11	0	0	1	0
12	0	0	1	1
13	0	1	0	0
14	1	0	0	0
15	0	0	0	0
16	1	1	1	1
FB5 = 1 = MODE A EE PROM CH 1-16				
FB5 = 0 = MODE B EE PROM CH 17-32				

Figure 3 - Channel Selection Truth Table

### Public Address

The Public Address option allows mic audio to be amplified directly by the receiver amplifier and applied to the external speaker. The PA option is selected by setting the INT/EXT switch to the PA position. This removes ground from the base of Q310, allowing it to turn on and activate relay RY301, which connects speaker audio to the external speaker. The PA switch also grounds the PA line and turns Q304-off. This closes switch U307D allowing mic audio on to the PA audio line. Turning Q304 off also turns Q305 on, applying A- to the RX PA KEY line. This enables the receiver

audio amplifier independent of the squelch circuit. The low in the P0A line turns off Q306, interrupting the PTT line between the mic switch and the radio. This prevents the radio from transmitting when the PA option is selected. Switch U307B is used to open the PA audio path during normal transmit.

The PA switch also applies A- to scan mute gate U307A through diode D328. This opens the switch, preventing receive audio from being heard when the PA option is selected

### Dual Control

The dual control circuit consists of Q314 through Q317 and associated circuitry. The status of the Control A- signal determines whether the Control Unit is active or inactive. When this line is low, the control unit is active. Only one Control Unit is active at any given time.

Q317 senses the Control A- line. When Control A- is low Q317 is turned off, allowing pull-up resistor R365 to turn Q316 and Q315 on. Q316 allows the decimal point to be displayed. Q315 provides A- to the 5V CTRL line to enable the Logic Board to select the frequency channels.

When a Control A- is high Q317 is turned on, applying A- to Q316 and Q315, turning them both off. Q314 turns on and supplies ground to mic mute switch U307D, preventing mic audio from being transmitted. The 5V CTRL A- signal to the Logic Board goes high and prevents the Logic Board from selecting any channels. It will also blank the displays.

### SERVICE HINT

The Control A- line will float high if it is not specifically grounded. This causes a control unit operated with just a power cable to be inactive. The Control A- line must be grounded.

### Level Conversions

The System Board provides DC level conversion to 5 Volt logic levels for the CAS, RX MUTE and MIC PTT. Diode protection is provided for all CMOS switch and audio lines.

## DISPLAY BOARD

The Display Board provides the interface between the user and the radio by providing real time status indications and control of the radio through operator switches. These switches include the MODE, DUSL CONTROL, INT EXT/PA and SCAN. The membrane type SCAN, ADD and DELETE switches are built into the Display Board. (The OFF/VOLUME, CHANNEL and SQUELCH switches are located on the System Board). Status indicators include power on, channel busy, dual control and priority channel receive.

In addition to the switches the Display Board contains four seven-segment displays and associated drivers. The drivers consist of three sets of NPN and PNP transistors, Q101 through Q106. The drivers are controlled by multiplexed signals Digits 1, 2 and 3 from the Scan Board and turn on the selected display. A display is turned on by placing a high on the desired display control line and a zero on the two remaining control lines. Digit 1 controls the channel display, Digit 2 controls the scan display and Digit 3 controls the various indicator displays and the backlighting.

The dual seven segment displays indicate the operating channel and the scanned channels. Only the b and c segment of the 10's digit is used, causing it to be blank or to display only a one. Individual segments are controlled by the A through G ones signals (unit digits) and the b and c signal (tens digit) from the Scan Board. (The display driver for the segment controls is located on the System Board.) The channel decimal point is controlled by the MODE switch. The decimal point for the scan display is controlled by the C control line through P1-25. the decimal point is displayed only when the ones digit is displayed.

The SCAN, ADD and DELETE switches are multiplexed to the display control lines through diodes D110, D111 and D112. the diodes sense the status of the display control lines and when any of the switches are closed will turn Q107 on. Q107 then grounds the scan input of the microprocessor.

## LOGIC BOARD

The Logic Board converts the hexadecimal channel information from the frequency switch to radio channel and display information. Provisions are made to float the frequency select lines and blank the display when the Control Unit is not selected in a dual control application. The board contains five IC's, four transistors and a voltage regulator.

U001 is controlled by the Control A- signal from the System Board. When the Control Unit is not selected in a

dual control system, this line goes high and the FB1-FB4 frequency bits are high. When the Control A- signal goes low, the control signal is selected and the output of U1001 is valid. The advance change pulse is also passed through U001 so that it can be disabled by Control A-.

The blanking input of decoder U005 is controlled by Control A- through Q001 and is active low. Therefore the Control A- signal is inverted before being applied to the blanking input. The tens signal is blanked in dual control systems by passing it through double inverters Q002 and Q004. The inverted 5-volt signal from Q001 is used to drive open collector transistor Q002. When 5V Control A- is low, Q002 is turned on, putting the emitter of the first inverter, Q003 at ground. When 5V Control A- goes high, Q002 turns off, floating the emitter of Q003. This causes Q004 to turn on, putting a low on the tens bc signal.

U006 is a voltage regulator converting the A+ switched voltage to +5V. Digit 1 is tied to the +5V line while digits 2 and 3 are held low. This allows the Non-Scan Board to be used with a scan display board as well as the simple version of the Display Board. Scan mute is also held low so that the receive audio is never muted.

The selected channel number (HEX) from SW301 on the System Board is applied to U001 on the Scan Board before being presented to the radio as frequency data. U001 is a tri-state buffer which compliments the frequency data. The status of the mode switch is also complimented through U001 as FB5.

Channel data from U001 information is also applied to channel 16 decoder U002A. All channels with a ten's digit of one keep greater than hex 09H. However channel 16 has a switch value of zero. This compliments to OFH and causes the output of NAND gate U002A to be low only when the selected channel is 16. The output of the channel 16 decoder is applied to the input of the comparator as a reference signal to allow it to determine the status of the ten's digit on the display.

The frequency switch information is also applied directly to the A inputs of comparator U003 and adder U004. Since a hexadecimal switch is used to encode switch position information, a BCD to seven segment converter must be used to decode this information and allow it to be displayed. In a BCD system only digits 0 thru 9 are recognized: therefore, for switch positions above 9 an adder is employed to add 6 to the channel number and provide a new decimal number. This number is displayed as the one's digit of the selected channel. If the selected channel is less than 10 the output of the channel 16 decoder is high. This high is applied a value of OAH to the B inputs of comparator U003.

The A<B output of U003 will also be high causing the output of inverter U002A to go low. The low is applied to adder U004, which then allows only a 0 to be added to the channel number, and causes the base of Q003 to be low. Q003 turns off, turning Q004 on. This grounds P5-7, preventing the bc segments (1) of the tens display from turning on. The A0 through A3 inputs of the adder sense the switch position and since it is less than 10 (HEX), it is passed through the adder to the 7-segment decoder and displayed as read.

If a channel between 10 and 15 is selected, the output of the channel 16 decoder will remain high causing the B input of comparator U003 to remain at OAH. Since the number selected is now greater than 10 the A<B output of U003 is low. With one input to NAND gate U002B high and the other low, the output at U002B-8 is high, causing a 6 to be added to the selected channel number by adder U004. This high output also is applied to the base of Q003 causing it to turn on and turn Q004 off. With Q004 off P5-7 is pulled high by pull-up resistor R008, allowing the bc (1) segments of the tens display to be turned on. For example, if channel 12 were selected a 6 would be added to that number making it a decimal 18. Decimal 18 converts to HEX digit 12, allowing a 2 to be displayed. The tens digit was turned on as described previously, allowing the display to indicate a 12.

As mentioned earlier, channel 16 has a switch value of zero. These zero's are complimented to all ones by tri-state buffer U001 and applied to channel 16 decoder U002A. With all ones on its input the output of the channel 16 decoder is low. This low is applied to the B inputs of the comparator and appears as a low at the input of NAND gate U002A-9. With a switch value of zero for channel 16 the A0 through A3 inputs of comparator U003 are low. This low is passed through to the A<B output which is applied to NAND gate U002B. With both inputs to U002B low the output is high. The high is applied to the B inputs of adder U004 causing a 6 to be added to the switch reading of zero. Therefore a 6 is displayed as the units digit. The high is also applied to the base of Q003, causing it to turn on and Q002 to turn off. This removes the ground from the tens digit and allows P7-5 to be pulled high by pull-up resistor R008, causing the ones digit on the tens display to turn on.

## LOGIC/SCAN BOARD (Earlier Models)

The Logic/Scan Board contains a microprocessor, a voltage sensing circuit, and a five volt regulator. The microprocessor is bypassed and shielded to prevent spurious signals from entering the radio.

The microprocessor reads the frequency switch and presents the proper bit pattern to the radio. It provides the bcd

to 7-segment conversion, stores scan information, and controls the dual control function. To control the dual control function it monitors the control A- line. When this line is high it will cause the frequency control lines to go high and blank the display, passing control to the alternate Control Unit. When this line goes low, the processor will return control to the primary Control Unit. A 3-volt battery is provided as a backup to the power supply to retain microprocessor memory if the unit is turned off.

### NOTE

With the microprocessor disabled the battery should last approximately 1 year. It is recommended that it be changed annually.

The 5-volt regulator supplies approximately 15 mA for the Logic/Scan Board and the pull-up resistors on the System Board.

The voltage sensing circuit consists of comparator, U202A and precision reference diode U201. The output of the comparator controls the power down feature of the microprocessor. If the voltage goes above 9.25 volts the power down pin of the microprocessor, U203-36 is brought high, enabling the processor to run. When the power falls below 9.25V, this output goes low, putting the microprocessor in a dormant state.

The reset circuit consists of U201, U202 and associated components. D201 provides a 2.5V reference. When power is turned on, U201 will provide its reference before SW A+ reaches 4 volts. The voltage at U202 pin 3, the result of the division SW A+ by R202 and R203, will remain below this 2.5 V reference until SW A+ reaches 9.75 volts. This holds the output of U202A low, keeping the processor in its low current sleep mode and also holding U202 Pin 5 near ground. This, in turn, holds the processor's reset line low. When SW A+ goes above 9.75 volts, U202A goes high, allowing the processor to start. It also allows the voltage at U202 Pin 5 to rise. When U202-5 exceeds 2.5V, U202B-7 goes high, releasing the processor reset line.

When SW A+ falls below 9.25 volts, U202-3 falls below 2.5 volts causing U202A to go low. This puts the processor into its sleep mode and forces U202-5 low. This causes U202B-7 to go low and reset the processor. This puts the processor in the sleep mode while its 5V input is still valid, allowing the scan information to be retained in the internal ram.

## **LOGIC/EEPROM SCAN BOARD (Later Models)**

The user will see little change from EEPROM Scan Board. However, the display will flash once as the scan, add and delete buttons are pressed due to the processor updating the EEPROM.

The hardware has changed slightly as the scan list is maintained in a Xicor 2444 EEPROM. The Xicor is controlled by three lines. Two of the lines, the clock and data lines, are multiplexed with the tens digit of the display. The third control line selects the EEPROM. This was an unused pin on the processor in earlier models. The 2444 is 256 bit device. It does not require personality programming.

Care should be taken when moving a scan board from a 32 to a 16 channel control head. Scan channels in mode "B" cannot be accessed with a 16 channel control head, but they will be counted as channels in scan. The result will cause the control head to be unable to scan 16 channels. To correct the problem, install the scan board in a 32 channel control head and manually delete the channels in mode "B". There is no way to clear the EEPROM in the same manner that removing the battery cleared the hardware in earlier models.

A SGS L387 comprises a new regulator circuit. This regulator has an internal reset circuit and is used instead of the 78L05 and the comparitor circuit used in earlier models. The reset point is when the output voltage falls below 4.75 volts. C201 sets the length of the reset pulse.

## **SCAN OPERATION**

Up to 16 channels may be included in the scan list. The scan list contains all channels that are to be scanned during normal operation. If an attempt is made to enter a 17th channel, the display will indicate an error condition, inhibiting operation of the radio. To correct this condition, press the SCN, ADD or DELEte buttons. This will erase the error condition, leaving the scan channels unchanged.

The scan function is toggled "on" and "off" using the scan switch. The scan LED will be "on" when scan is active. All channels on the scan list will be sequentially searched at 30 milliseconds per channel. If scan option "Priority Option Channel Follows Channel Selector Switch" is used, the Priority channel need not be included on the list. If the "Front Programmable Priority Option is used, then the priority channel must be included in the scan list. It will be searched in sequence with all other non-priority channels in addition to being searched as the priority channel.

When the receiver is squelched, the scan display is blanked, the P1 LED is off, and the scan LED is "on".

A channel is considered active if first fast squelch is active, then slow squelch becomes active and then if optional Channel Guard is decoded. Fast squelch is used because the normal scan rate is too fast for the radio slow squelch. The radio slow squelch is needed to keep from falsing on fast squelch. The radio must inform the control head of channel guard status via RX mute.

If the "Scan For Carrier and Channel Guard" option is used, the scan will pause for 400 milliseconds after each active channel to see if a Channel Guard tone/code is not detected during this time, scanning will continue on to the next channel. Note, the busy indicator will flash if the scanned channel is active, but the wrong Channel Guard tone/code is present.

When receiving a non-priority channel, the channel number is displayed and the priority channel is scanned every 250 ms. Audio at the Control Unit will be muted during the priority channel scan time. If the priority channel is active, then scan will stay on the priority channel and the non-priority channel will be dropped. If the priority channel is not active, the scan will return to the non-priority channel. The DELEte switch will remove the channel from the scan list. The ADD switch has no effect while scan is "on".

Channel Guard is ignored, regardless of the jumper programming, when scan checks the priority channel. If the priority channel is active, scan will lock on that channel, display the channel number and turn on P1 indicator. Scan will stay on the priority channel until the message is terminated. If CG is not correct, the audio is muted, scan is locked on the channel, and the P1 indicator will remain on until the signal is no longer needed.

If the unit is front programmable, the DELEte switch may be used to remove the channel from the non-priority scan list and from being the priority channel. There will be no priority channel until scan is turned off and a new priority channel is programmed.

If the priority channel follows the channel selector switch, then the DELEte switch has no effect. In either case the ADD switch is inactive.

There is no hang time after receiving a priority or non-priority message. Scan will resume as soon as the channel is dropped.

When the PTT switch is pressed, scan will revert the channel displayed. The scan display will blank and the scan LED will turn off. Then PTT is released, scan will resume operation.

## PROGRAMMING

Scan is programmed when scan is inactive, as indicated by the scan indicator being off. If a channel is not on the scan list, the display is blank. If the channel is on the scan list, the channel number is displayed. If priority is programmed to follow the channel select switch, the P1 indicator will be off. If front programmable and the channel is the priority channel, then the channel number is displayed and the P1 indicator is on.

To add a channel to the scan list, set the channel select switch to that channel and press the ADD switch. The channel number should appear in the display. If the three bar error indicator appears in the scan display, it indicates that there are already sixteen channels on the scan list. The Control Unit will not accept a 17th channel. The error indicator will stay on until either the scan, add or delete switches are pressed. Pressing these switches will only clear the error. It will not execute the function of the switch. If it is truly desired to add that command to the scan list, one or more of the channels already on the list will have to be deleted.

If the Front Programmable option is selected, pressing the ADD switch with a channel already in scan will cause that channel to become the priority channel. Pressing the ADD switch again while on the priority channel will have no further effect. If the unit is set so that the priority channel follows the channel select switch, then pressing the ADD switch with a channel already in scan will have no effect.

The DELete switch is used to remove a channel from scan. To delete a channel, select the undesired channel with the frequency select switch. The scan display will blank. The channel will no longer be in scan. If the control unit is front programmable, DELete will also delete the priority channel. Pressing DEL while on the priority channel will remove it from the scan list as well as remove it from being the priority channel. There will be no priority channel until a new one is programmed. It is not possible to delete a priority channel if the priority follows the channel select switch.

The 19B801550P3, P4 and P5 units are set up so that having the mic off-hook will disable scan. This is done by multiplexing on to the PTT sense line to the processor. Therefore, the add and delete switches will not work with the mic off-hook. The mis must be on-hook and scan must be turned off in order to program channels on to the scan list. This option can be disabled by removing diode D331 on the System Board.

## SCAN OPTIONS

Four scan options are available: Refer to Field Modifications for detailed instructions.

- Priority channel front programmable (as shipped)
- Priority channel follows channel selector switch
- Scans carrier only [ignores Channel Guard (as shipped)]
- Scan for carrier and Channel Guard (except ignores Channel Guard on priority channel)

## MAINTENANCE

### DISASSEMBLY

1. To gain access to the inside of the Control Unit remove the two screws and lock washers holding the top and bottom covers together. Lift up on the front of the top cover and slide back to remove.
2. Disconnect the display cable plug from J6 on the System Board and set aside.
3. Disconnect the mic cable from the System Board by lifting it up.
4. To remove the Scan Board lift up on either side while gently rocking the board back and forth.
5. To remove the System Board remove the four POZI DRIV® screws from the corners of the board and lift out.
6. To remove the Display Board remove the five POZI DRIV screws from the outer edges of the board and two smaller screws from near the center of the board. Remove board.
7. To remove the faceplate remove the five POZI DRIV screws and lift the top cover off.

POZI DRIV® Trademark of Phillips International Co.

## REASSEMBLY

1. To reassemble the control unit perform the above procedures in reverse order.

### NOTE

When re-installing the Scan Board be sure to slide the board down between the guides on either side of the Control Unit while carefully aligning the plug with the pins on the System Board. Be careful not to misalign the board.

2. When installing the top cover, press down on the back of the Control Unit to snap the plastic locks in place.
3. Replace the two screws securing the two covers together.

### NOTE

When installing the Display Board be sure the cable plug is properly aligned with the jack on the System Board. Failure to do so may result in damage to the Display Board.

## REMOVING IC's

### CAUTION



CMOS integrated circuit devices used in this equipment can be destroyed by static discharges. Before handling one of these devices, the serviceman should discharge himself by touching the case of a bench test instrument that has a 3-prong power cord connected to an outlet with a known good earth ground. When soldering or desoldering CMOS devices, the soldering iron should also have a 3-prong power cord connected to an outlet with a known good earth ground. A battery operated soldering iron may be used in place of the regular soldering iron.

## ADJUSTMENTS

### FAST SQUELCH ADJUST

1. Enable scan by pressing the SCN switch on the control panel. The ON indicator will light.
2. Select a non-priority channel and apply a strong on channel frequency to the radio.
3. Remove plug button (bottom towards front of unit) and adjust Squelch Adjust control VR303 fully clockwise making scan erratic. Then adjust counter-clockwise slowly until scan becomes smoother with no skips. Replace button.

### PA AUDIO LEVEL

1. Select the Public Address mode by setting the INT/EXT PA switch to the PA position.
2. Set VR304 fully clockwise (access is gained from the bottom of the Control Unit. The control is located near the rear center of the Control Unit).
3. Press the push-to-talk (PTT) switch and while speaking in a normal voice, adjust VR304 for rated audio. See radio Maintenance Manual.

### FREQUENCY STOP ADJUSTMENT

(Refer to Figure 4)

1. Remove the two Phillips head screws from the bottom of the control unit and lift cover off.
2. Disconnect plug from System Board and lay top cover aside.

### NOTE

Look into the rear of the channel select knob and note the channel numbers 1, 9 & 13 are embossed on the inside of the knob. Note also the metal wafer fitted between the slots of the knob and the shaft. This wafer is the frequency stop and is positioned in channel 16. Channel 16 to selected when the red arrow on the channel selection shaft is facing up. It should not be removed.

3. Located on either side of the channel select knob are a frequency stop wafer and a frequency stop pin. To activate the frequency stop, this pin must be reversed, i.e., the pin must be oriented so that the long end of the pin is pointed toward the inside of the knob.
4. Using a pair of needle nose pliers insert the metal wafer into the slots designated for the channel stop.
5. Reassemble the Control Unit.
6. Apply power to the Control Unit and verify the frequency stops.

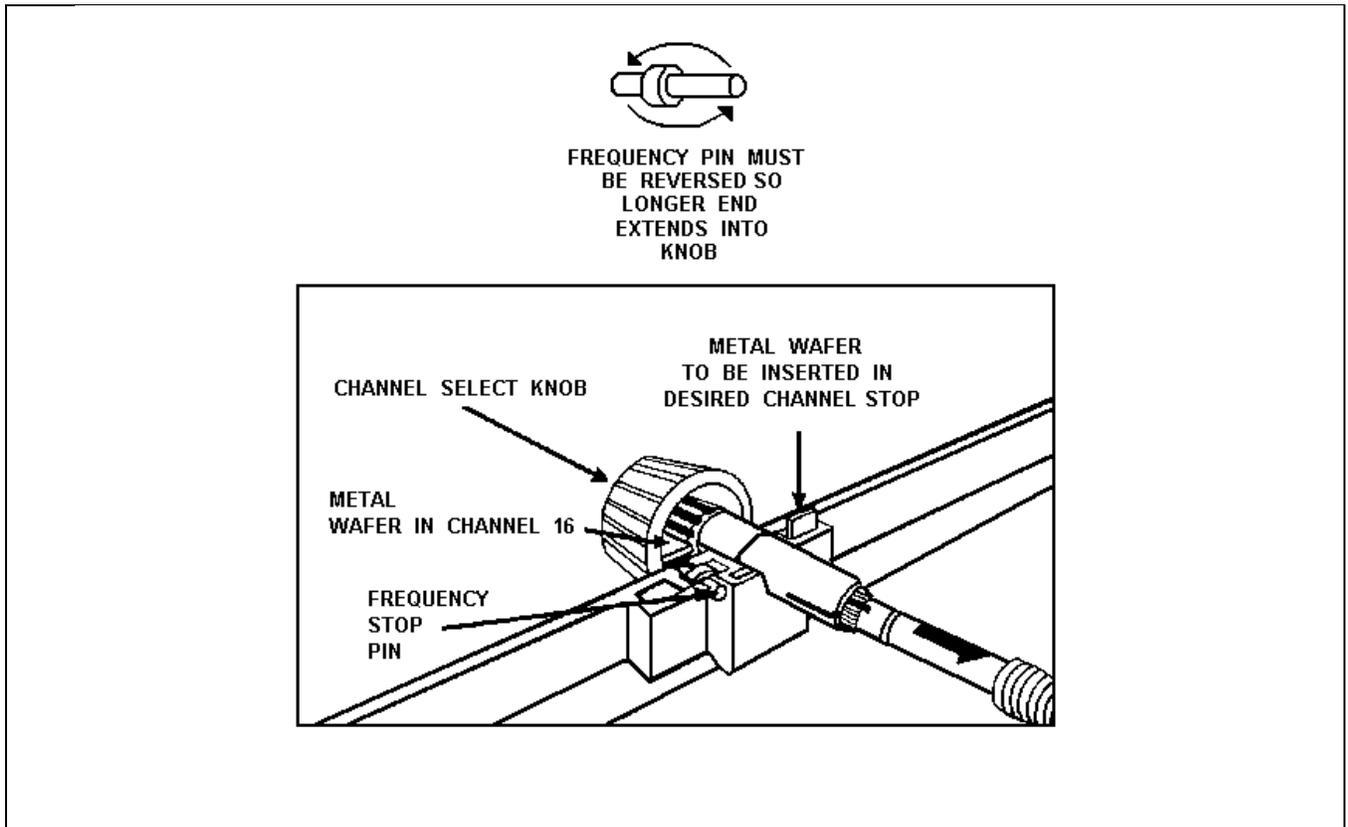
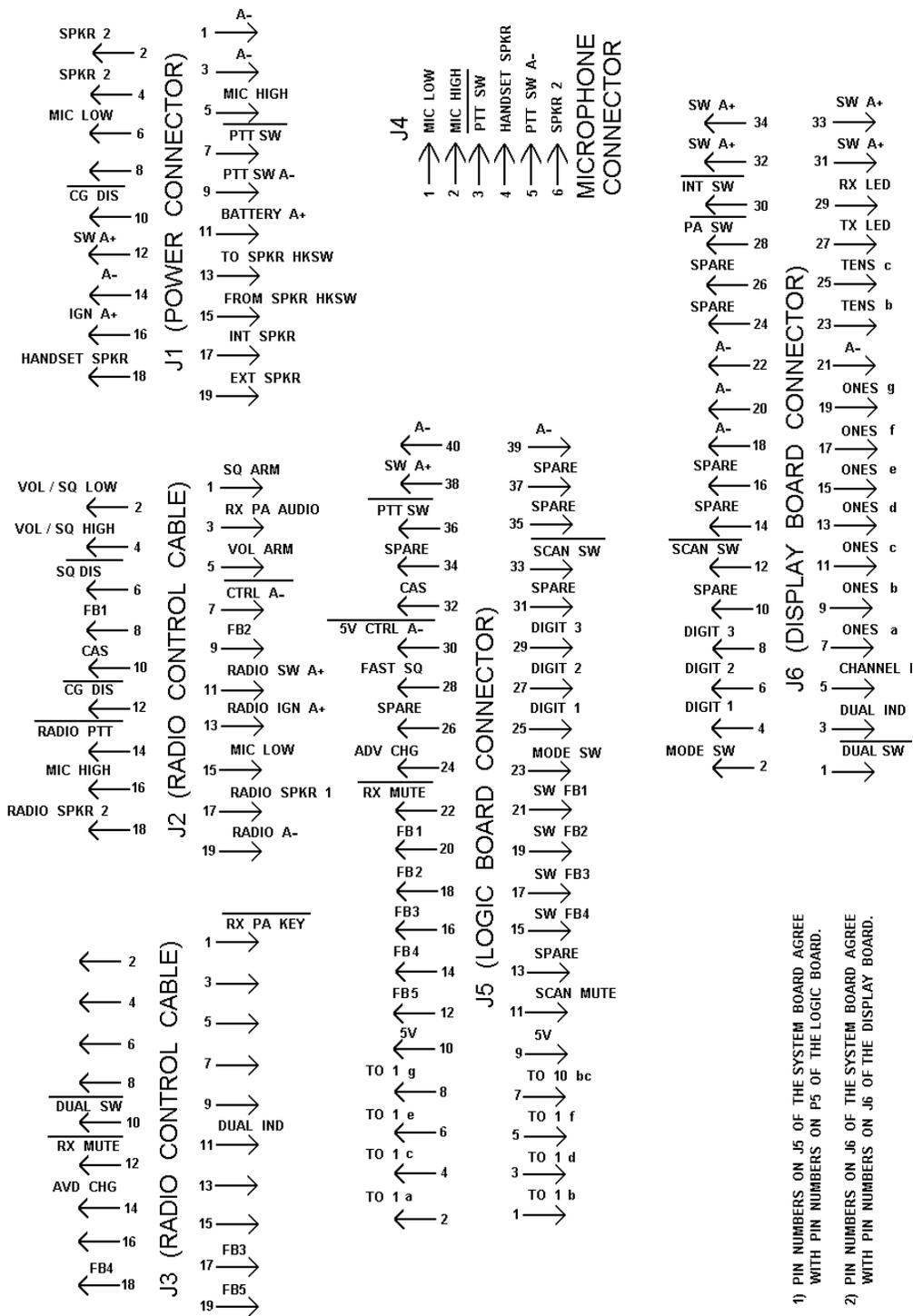


Figure 4 - Frequency Stop Installation



Ericsson GE Mobile Communications Inc.  
Mountain View Road • Lynchburg, Virginia 24502

Printed in U.S.A.



1) PIN NUMBERS ON J5 OF THE SYSTEM BOARD AGREE WITH PIN NUMBERS ON P5 OF THE LOGIC BOARD.

2) PIN NUMBERS ON J6 OF THE SYSTEM BOARD AGREE WITH PIN NUMBERS ON J6 OF THE DISPLAY BOARD.

PARTS LIST

LBI - 31711A  
S590 SYSTEM BOARD

SYMBOL	VENDOR PART NO.	GE PART NO.	DESCRIPTION
			----- CAPACITORS -----
C301 thru C305		19A700121P2	Ceramic: 0.01 uF ± 20%, 50 VDCW.
C306		19A701534P3	Tantalum: 0.47 uF ± 20%, 35 VDCW.
C307		19A703314P6	Electrolytic: 1 uF -10+50% tol, 50 VDCW; sim to Panasonic LS Series
C308		19A116192P2	Ceramic: 470 pF ± 20%, 50 VDCW; sim to Erie 811 - A050 - WSR - 471M.
C309 and C310		19A703314P10	Electrolytic: 10 uF ± 20%, -10+50% tol, 50 VDCW; sim to Panasonic LS Series.
C311		19A701534P3	Tantalum: 0.47 uF ± 20%, 35 VDCW.
C312		19A700121P2	Ceramic: 0.01 uF ± 20%, 50 VDCW.
C313		19A703314P10	Electrolytic: 10 uF -10+50% tol, 50 VDCW; sim to Panasonic LS Series.
C314		19A700121P2	Ceramic: 0.01 uF ± 20%, 50 VDCW.
C315		19A116192P14	Ceramic: 0.1 uF ± 20%, 50 VDCW; sim to Erie USCC CW20C104 - M2.
C316		19A700121P2	Ceramic: 0.01 uF ± 20%, 50 VDCW.
C317		T644ACP233K	Polyester: .0033 uF ± 10%, 50 VDCW.
C320		19A701225P3	Electrolytic: 220 uF, -10+50%, 25 VDCW.
C321		19A700121P2	Ceramic: 0.01 uF ± 20%, 50 VDCW.
C326		T644ACP210K	Polyester: .0010 uF ± 10%, 50 VDCW.
C327		T644ACP215K	Polyester: .0015 uF ± 10%, 50 VDCW.
C328		T644ACP347K	Polyester: .047 uF ± 10%, 50 VDCW.
C329		19A116192P2	Ceramic: 470 pF ± 20%, 50 VDCW; sim to Erie 811 - A050 - WSR - 471M.
C330		Y644ACP310K	Polyester: .0010 uF ± 10%, 50 VDCW.
C331 and C332		19A116192P2	Ceramic: 470 pF ± 20%, 50 VDCW; sim to Erie 811 - A050 - WSR - 471M.
C333		19A703314P1	Electrolytic: 100 uF -10+50%, 10 VDCW; sim to Panasonic LS Series.
C334		19A116192P2	Ceramic: 470 pF ± 20%, 50 VDCW; sim to Erie 811 - A050 - WSR - 471M.
			----- DIODES -----
D301 thru D324		19A700028P1	Silicon, fast recovery: fwd current 75 mA, 75 PIV; sim to Type 1n4148.
D325		19A704142P1	Rectifier, silicon, general purpose.
D326	1N5400		Silicon: 5 amp.
D327 thru D333		19A700028P1	Silicon, fast recovery: fwd current 75 mA, 75 PIV; sim to Type 1n4148.
			----- JACKS -----
J1	T19 / 51119RD000		19 Pin Control Cable Connector.
			----- RESISTORS -----
R301		H212CRP227C	Deposited carbon: 2.7K ohms ± 5%, 1/4 w.  NOTE - The values of R303 thru R312 are dependent on whether or not scan function is used.
R303 thru R312		19A700113P49	Composition: 270 ohms ± 5%, 1/2 w. (Used with scan system.)
R303 thru R312		19A700113P57	Composition: 560 ohms ± 5%, 1/2W. (Used with non-scan system.)
R313		H212CRP310C	Deposited carbon: 10K ohms ± 5%, 1/4 w.

\*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	VENDOR PART NO.	GE PART NO.	DESCRIPTION
R314		H212CRP322C	Deposited carbon: 22K ohms ± 5%, 1/4 w.
R315		H212CRP010C	Deposited carbon: 10 ohms ± 5%, 1/4 w.
R316 and R317		H212CRP310C	Deposited carbon: 10K ohms ± 5%, 1/4 w.
R318		H212CRP322C	Deposited carbon: 22K ohms ± 5%, 1/4 w.
R319 and R320		H212CRP310C	Deposited carbon: 10K ohms ± 5%, 1/4 w.
R321		H212CRP210C	Deposited carbon: 1K ohms ± 5%, 1/4 w.
R322		H212CRP310C	Deposited carbon: 10K ohms ± 5%, 1/4 w.
R323		H212CRP210C	Deposited carbon: 1K ohms ± 5%, 1/4 w.
R324		H212CRP310C	Deposited carbon: 10K ohms ± 5%, 1/4 w.
R325		H212CRP227C	Deposited carbon: 2.7K ohms ± 5%, 1/4 w.
R326		H212CRP212C	Deposited carbon: 1.2K ohms ± 5%, 1/4 w.
R327		H212CRP347C	Deposited carbon: 47K ohms ± 5%, 1/4 w.
R328		H212CRP182C	Deposited carbon: 820 ohms ± 5%, 1/4 w.
R329		H212CRP327C	Deposited carbon: 27K ohms ± 5%, 1/4 w.
R330		H212CRP110C	Deposited carbon: 100 ohms ± 5%, 1/4 w.
R331		H212CRP210C	Deposited carbon: 1K ohms ± 5%, 1/4 w.
R332 and R333		H212CRP322C	Deposited carbon: 22K ohms ± 5%, 1/4 w.
R335 thru R337		H212CRP310C	Deposited carbon: 10K ohms ± 5%, 1/4 w.
R338		H212CRP410C	Deposited carbon: 0.1M ohms ± 5%, 1/4 w.
R339		H212CRP256C	Deposited carbon: 5.6K ohms ± 5%, 1/4 w.
R340		H212CRP247C	Deposited carbon: 4.7K ohms ± 5%, 1/4 w.
R341		H212CRP282C	Deposited carbon: 8.2K ohms ± 5%, 1/4 w.
R342		H212CRP310C	Deposited carbon: 10K ohms ± 5%, 1/4 w.
R343		H212CRP410C	Deposited carbon: 0.1M ohms ± 5%, 1/4 w.
R344		H212CRP433C	Deposited carbon: 0.33M ohms ± 5%, 1/4 w.
R345		H212CRP310C	Deposited carbon: 10K ohms ± 5%, 1/4 w.
R346		H212CRP412C	Deposited carbon: 0.12M ohms ± 5%, 1/4 w.
R347		H212CRP322C	Deposited carbon: 22K ohms ± 5%, 1/4 w.
R348		H212CRP415C	Deposited carbon: 0.15M ohms ± 5%, 1/4 w.
R349		H212CRP310C	Deposited carbon: 10K ohms ± 5%, 1/4 w.
R353		H212CRP310C	Deposited carbon: 10K ohms ± 5%, 1/4 w.
R357		H212CRP327C	Deposited carbon: 27K ohms ± 5%, 1/4 w.
R358 and R359		H212CRP422C	Deposited carbon: 0.22M ohms ± 5%, 1/4 w.
R360		H212CRP227C	Deposited carbon: 2.7K ohms ± 5%, 1/4 w.

SYMBOL	VENDOR PART NO.	GE PART NO.	DESCRIPTION
R361		H212CRP410C	Deposited carbon: 0.1M ohms ±5%, 1/4 w.
R362		H212CRP310C	Deposited carbon: 10K ohms ±5%, 1/4, w.
R363 and R364		H212CRP210C	Deposited carbon: 1K ohms ±5%, 1/4, w.
R365		H212CRP310C	Deposited carbon: 10K ohms ±5%, 1/4, w.
R366		H212CRP322C	Deposited carbon: 22K ohms ±5%, 1/4, w.
R367		H212CRP247C	Deposited carbon: 4.7K ohms ±5%, 1/4 w.
RP301	M5 - 1 - 223J		Resistive Network: 22K ohms.
VR301	T19 / 01ESW4M101		Volume Potentiometer: 10K ohms.
VR302	T19 / 01EVR4M101		Squelch Potentiometer: 10 ohms.
VR303	T19 / 01ETM4M101		Fast Squelch Level Control.
VR304	T19 / 01ETM4M101		PA Audio Level Control.
			----- SWITCHES -----
S101	T19 / 551011D0FJ		MODE A / B.
S102	T19 / 551021D0FJ		Speaker INT / EXT.
S103	T19 / 557108DOCK		Dual Contact.
SW301	T19 / CD5550005		Channel Switch.
			----- TRANSISTORS -----
Q302 thru Q310		19A700023P1	Silicon, NPN; sim to Type 2N3904.
Q314 thru Q318		19A700023P1	Silicon, NPN; sim to Type 2N3904.
			----- RELAYS -----
RLY301	T19 / 56112D5012		Subminiature Speaker Relay.
			----- INTEGRATED CIRCUITS -----
U301		19A134693P2	Interface: sim to ULN - 2803A
U305		19J706031P2	5V Regulator.
U306		19A701789P1	Linear, Low Power OP AMP; sim to LM324N.
U307		19A700029P44	Digital: BILATERAL SWITCH.

PARTS LIST

LBI - 31709B  
S550 DISPLAY BOARD

SYMBOL	PART NO.	DESCRIPTION
----- RESISTORS -----		
R101	H212CRP247C	Deposited carbon: 4.7K ohms ±5%, 1/4 w.
R102	H212CRP233C	Deposited carbon: 3.3K ohms ±5%, 1/4 w.
R103 and R104	H212CRP210C	Deposited carbon: 1K ohms ±5%, 1/4 w.
R105	H212CRP233C	Deposited carbon: 3.3K ohms ±5%, 1/4 w.
R106 and R107	H212CRP247C	Deposited carbon: 4.7K ohms ±5%, 1/4 w.
R108	H212CRP233C	Deposited carbon: 3.3K ohms ±5%, 1/4 w.
R109	H212CRP210C	Deposited carbon: 1K ohms ±5%, 1/4 w.
R110 and R112	H212CRP147C	Deposited carbon: 470 ohms ±5%, 1/4 w.
R113	H212CRP322C	Deposited carbon: 22K ohms ±5%, 1/4 w.
R114	H212CRP233C	Deposited carbon: 3.3K ohms ±5%, 1/4 w.
----- DIODES -----		
D101	T19 / 2524YY4LED	LED, Yellow.
D102	T19 / 2524VR2LED	LED, Red.
D103	T19 / 2524MG5LED	DUAL LED, Green.
D104	T19 / 2524VR2LED	SCAN LED, Red.
D105	T19 / 2524YY4LED	P1 LED, Yellow.
D106 thru D108	T19 / 2520GD5LED	LED, Clear.
D110 and D112	19A700028P1	Silicon, fast recovery: fwd current thru 75 mA, 75 PIV; sim to Type 1n4148.
----- SWITCHES -----		
SW101	T19 / 55 - 1011K - 08M	1P2T SW 8M1101.
SW102	T19 / 55 - 1021K - 08M	1P3T SW 8M1021.
SW103	T19 / 55 - 7108K - J2Z	MEMO SW 7108 - J2 - Z - ZQ.
----- TRANSISTORS -----		
Q101	T19 / 32 - 03904 - 2N1	Silicon, NPN: 2N3904.
Q102	T19 / 31 - 04403 - 2N1	Silicon, PNP: 2N4403.
Q103	T19 / 32 - 03904 - 2N1	Silicon, NPN: 2N3904.
Q104	T19 / 31 - 04403 - 2N1	Silicon, PNP: 2N4403.
Q105	T19 / 32 - 03904 - 2N1	Silicon, NPN: 2N3904.
Q106	T19 / 31 - 04403 - 2N1	Silicon, PNP: 2N4403.
Q107	T19 / 32 - 03904 - 2N1	Silicon, NPN: 2N3904.
----- INTEGRATED CIRCUITS -----		
U1 and U2	T19 / 2755212LED	Dual 7 Segment Display Channel Display, Red.
----- PLUGS -----		
P6		34 Pin Display Board Connector; sim to: AMP 499485 - 8.

\*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

LBI-31572

PARTS LIST

LBI - 31708C  
S550 SCAN BOARD  
(Earlier Models)

PARTS LIST

LBI - 31712A  
S550 NON - SCAN BOARD PL

SYMBOL	PART NO.	DESCRIPTION
----- INTEGRATED CIRCUITS -----		
U201	19A702939P1	Linear: sim to T1 TL431CLP.
U202	19A134764P2	Linear: (VOLTAGE COMPARATOR), sim to LM393N.
U203	19A149182G5	Programmed Microprocessor.
U204	19A706031P1	5V Regulator.
----- CRYSTALS -----		
Y201	19A702511G1	Crystal, 3.57945 MHz.
----- RESISTORS -----		
R201	19A700113P61	Composition: 820 ohms $\pm 5\%$ , 1/2 w.
R202	19A701250P344	Metal film: 28K ohms $\pm 1\%$ , 250 VDCW, 1/4 w.
R203	19A701250P301	Metal film: 10K ohms $\pm 1\%$ , 250 VDCW, 1/4 w.
R204	H212CRP422C	Deposited carbon: 0.22M ohms $\pm 5\%$ , 1/4 w.
R205	H212CRP322C	Deposited carbon: 22K ohms $\pm 5\%$ , 1/4 w.
R206	H212CRP410C	Deposited carbon: 0.1M ohms $\pm 5\%$ , 1/4 w.
R207 thru R210	H212CRP322C	Deposited carbon: 22K ohms $\pm 5\%$ , 1/4 w.
R211 thru R212	H212CRP322C	Deposited carbon: 22K ohms $\pm 5\%$ , 1/4 w.
----- CAPACITORS -----		
C201	19A703314P10	Electrolytic: 10uF .10 + 50% tol, 50 VDCW; sim to Panasonic LS Series.
C202	19A701534P4	Tantalum: 1uF $\pm 20\%$ , 35 VDCW.
C203 and C204	19A700219P44	Ceramic: 27 pF $\pm 5\%$ , 100 VDCW.
C205 and C206	19A702061P13	Ceramic: 10 pF $\pm 5\%$ , 50 VDCW, temp coef 0 $\pm 30$ PPM. (See Note on Schematic Diagram.)
C207 thru C285	19A700058P5	Ceramic: 0.001 uF $\pm 10\%$ , 50 VDCW. (See Note On Schematic Diagram.)
----- DIODES -----		
D201 thru D203	19A700028P1	Silicon, fast recovery: fwd current 75 mA, 75 PIV; sim to Type 1N4148.
----- PLUG -----		
P5		40 Pin Logic Board Connector; sim to: AMP 4 - 102083 - 6.
----- MISCELLANEOUS -----		
BT201	CR2025	Lithium, 160 mAh, 3 VDC, sim to SONY / EVERREADY.

\*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	VENDOR PART NO.	GE PART NO.	DESCRIPTION
----- INTEGRATED CIRCUIT -----			
U101	T19 / 40743680HC		Hex Tri - State Inverter; sim to: 74HC368.
U102	T19 / 40074200HC		Dual Four Input NAND GATE; sim to: 74HC20.
U103	T19 / 40074850HC		Four Bit Logical Comparator; sim to: 74HC85.
U104	T19 / 40742830HC		Four Bit Full Adder; sim to 74HC283.
U105		19A700029P204	Digital: BCD - TO - SEVEN SEGMENT LATCH / DECODER / DRIVER; sim to: 4511.
U106		19J706031P1	Linear: POSITIVE VOLTAGE REGULATOR; sim to: 78L05.
----- RESISTORS -----			
R101 and R102		H212CRP322C	Deposited carbon: 22K ohms $\pm 5\%$ , 1/4 w.
R103		H212CRP227C	Deposited carbon: 2.7K ohms $\pm 5\%$ , 1/4 w.
R104 and R105		H212CRP322C	Deposited carbon: 22K ohms $\pm 5\%$ , 1/4 w.
R106		H212CRP227C	Deposited carbon: 2.7K ohms $\pm 5\%$ , 1/4 w.
R107		H212CRP322C	Deposited carbon: 22K ohms $\pm 5\%$ , 1/4 w.
R108		H212CRP310C	Deposited carbon: 10K ohms $\pm 5\%$ , 1/4 w.
R109		H212CRP322C	Deposited carbon: 22K ohms $\pm 5\%$ , 1/4 w.
----- CAPACITORS -----			
C101		19A703314P10	Electrolytic: 10uF .10 + 50% tol, 50 VDCW; sim to Panasonic LS Series.
C102 thru C105		19A700121P2	Ceramic: 0.01 uF $\pm 20\%$ , 50 VDCW
Q101 thru Q104		19A700023P1	Silicon, NPN; sim to Type 2N3904.
----- PLUG -----			
P5			40 Pin Logic Board Connector; sim to: AMP 4 - 102083 - 6.

\*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

LBI - 31407A  
S - 550 SCAN BOARD (EEPROM)

SYMBOL	PART NO.	DESCRIPTION
		----- CAPACITORS -----
C201	19A703314P6	Electrolytic: 1 uF, 50 V.
C202	19A703314P10	Electrolytic: 10 uF, 50 V.
C203	19A701534P1	Tantalum: 47 uF, 6.3 V.
C204	19A7001219106	Ceramic: .1 uF.
C205 and C206	19A700219P44	Ceramic: 27 pF.
C207	19A700121P106	Ceramic: .1 uF.
		----- CONNECTORS -----
JP1 and JP2	19A704852P29	3 pin, .1 inch, male.
P5	T19 / 51 - 040BD - 001	40 pin, dual row, female.
		----- RESISTORS -----
R201	H212CRP322C	22K ohm, 1/4 w.
R203	H212CRP510C	1M ohm, 1/4 w.
R204 thru R209	H212CRP322C	22K ohm, 1/4 w.
		----- INTEGRATED CIRCUITS -----
U201	19A149672G1	S550 EEPROM board programmed processor.
U202	19A704970P1	5 V REGULATOR, with reset.
U203	19A704032P1	NMOB 16 x 16 SERIAL EEPROM.
		----- CRYSTALS -----
Y201	19A702511G1	Color burst crystal.

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter", which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for the descriptions of parts affected by these revisions.

REV A - 19B8015500P3\_P5 CONTROL UNIT  
Changed software for U203 to correct Rx Audio failure when Tx is keyed and released with SCAN on.

REV B - 19B8015500P5 CONTROL UNIT  
To eliminate ground loop that caused oscillation when return for CG Public Address Option was used, changed A - HKS.W.

REV B - 19B801550P3.P4 CONTROL UNIT

REV C - 19B801550P5 CONTROL UNIT  
Changed U203 software to:

- o Eliminate 2 second SCAN hang time.
- o Delete MIC PTT turning off SCAN to only SCAN disable during FTT.
- o Eliminated partial Audio Mute during SCAN.
- o Correct SCAN timing for Low Band applications.

U203 was: T19 / 46637050HD.

To provide off hook SCAN disable. Added D331 and D332.

REV C 19B801550P3.P4 CONTROL UNIT

REV D 19B801550P5 CONTROL UNIT

To increase adjustment range of VR303 Fast Squech Adjust, to allow proper adjustment for low band applications, and to prevent skip in SCAN when locked to a non - priority channel, changed C317.

C317 was: T644ACP215K Polyester: .0015 uF ± 10%, 50 VDCW.

REV A - 19B801550P1\_P2 CONTROL UNIT

REV D - 19B801550P3\_P4 CONTROL UNIT

REV E - 19B801550P5 CONTROL UNIT

To allow Control Unit to be used on Voice Guard applications, added D333.

REV E - 19B801550P3\_P4 CONTROL UNIT

REV F - 19B801550P5 CONTROL UNIT

To correct a reset problem, changed C202.

C202 was: 19A116192P14 Ceramic: 0.1 uF ± 20%, 50 VDCW.

REV B - 19B801550P1\_P2 CONTROL UNIT

REV F - 19B801550P3\_P4 CONTROL UNIT

REV G - 19B801550P5 CONTROL UNIT

To allow use of new Ignition cable without splices. Added internal jumpers J1 - 1 to J1 - 9 (PTT) and J1 - 11 to J1 - 16 (A+ to IGN A+).

REV C - 19B801550P1\_P2 CONTROL UNIT

REV G - 19B801550P3\_P4 CONTROL UNIT

REV H - 19B801550P5 CONTROL UNIT

Changed internal MIC Jack / Plug to gold.

REV D - 19B801550P1\_P2 CONTROL UNIT

REV H - 19B801550P3\_P4 CONTROL UNIT

REV J - 19B801550P5 CONTROL UNIT

Changed top and bottom covers to Noryl. Color changed to dark gray. Deleted break away mounting device.

REV J - 19B801550P3\_P4 CONTROL UNIT

REV K - 19B801550P5 CONTROL UNIT

To correct SCAN timing to prevent missing of priority channel with presence of heavy non - priority channel activity. Changed U203 software.

U203 was 19A149192G4 - Programmed Microprocessor.

REV K - 19B801550P3\_P4 CONTROL UNIT

REV L - 19B801550P5 CONTROL UNIT

Changed SCAN board assembly to T19 / TC - 01a - 550 - EE with EEPROM.

REV L - 19B801550P3\_P4 CONTROL UNIT

REV M - 19B801550P5 CONTROL UNIT

To improve reset function at power up on SCAN board. Changed C201 from .1 uF to 1 uF.

\*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

# PARTS LIST

LBI-31572

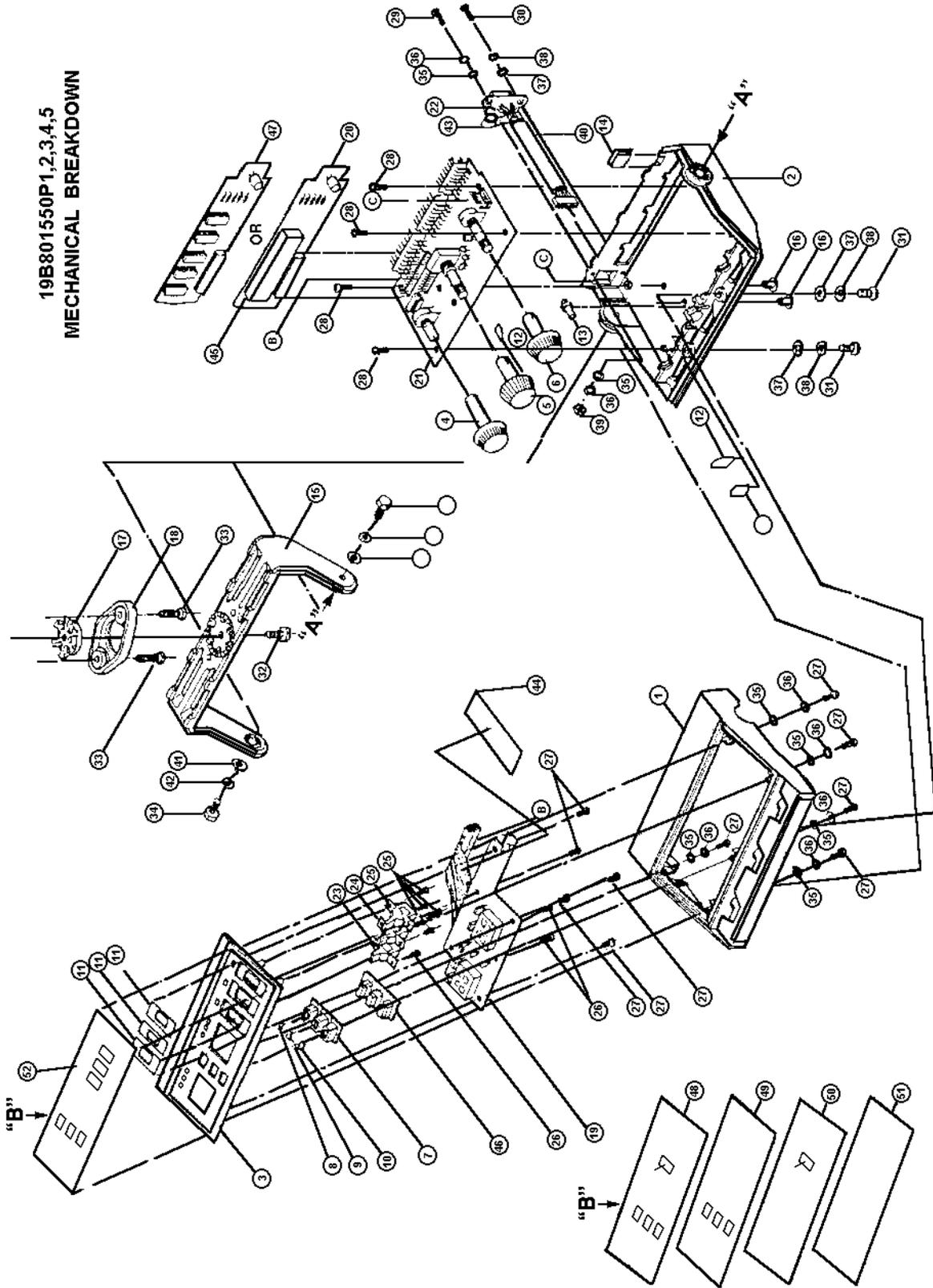
**PARTS LIST**  
 S - 550 CONTROL UNIT  
 19B001550P1 - 5  
 MECHANICAL PARTS  
 ISSUE 2

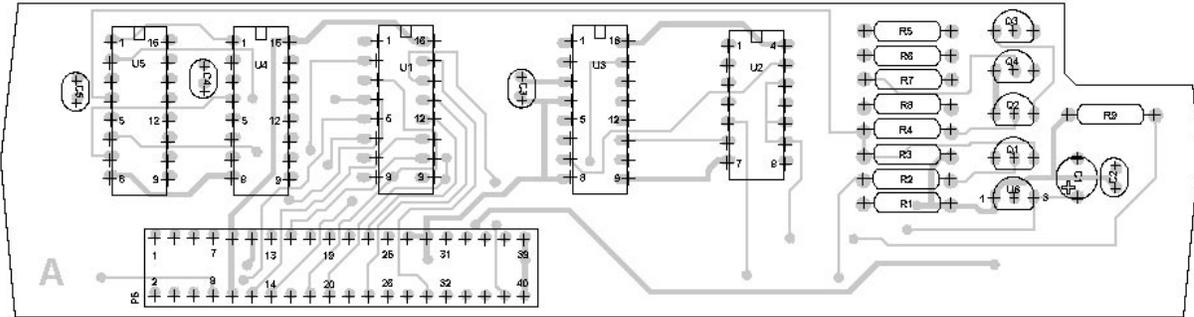
SYMBOL	PART NO.	DESCRIPTION
1	T19 / ME - 0S550 - 469	FRONT HOUSING. (Used with P1 - 5).
2	T19 / ME - 0S550 - 470	REAR HOUSING. (Used with P1 - 5).
3	T19 / ME - 0S550 - 467	CONTROL PANEL. (Used with P1 - 5).
4	T19 / ME - 0S550 - 423	VOLUME KNOB. (Used with P1 - 5).
5	T19 / ME - 0S550 - 424	CHANNEL KNOB. (Used with P1 - 5).
6	T19 / ME - 0S550 - 425	SQUELCH KNOB. (Used with P1 - 5).
7	T19 / ME - 0S550 - 426	KEY TOP. (Used with P3 - 5).
8	T19 - MS - 0S550 - 301	KEY PLATE (SCN). (Used with P3 - 5).
9	T19 - MS - 0S550 - 302	KEY PLATE (ADD). (Used with P3 - 5).
10	T19 - MS - 0S550 - 303	KEY PLATE (DEL). (Used with P3 - 5).
11	T19 / ME - 0S550 - 429	MASK. (Used with P2, 4 , & 5.)
12	T19 / MP - 0S550 - 430	KNOB PLATE. (Used with P1 - 5).
13	T19 / ML - 0S550 - 401	STOPPER. (Used with P1 - 5).
14	T19 / MR - 0S550 - 403	DUST COVER. (Used with P1 - 5).
15	T19 / ME - 0S550 - 473	MOUNTING BRACKET. (Used with P1 - 5).
16	T19 / ME - 0S550 - 021	CAP. (Used with P1 - 5).
17	T19 / ME - 0S550 - 445	BREAK - AWAY DEVICE. (Part of Option MA99).
18	T19 / ME - 0S550 - 444	RETAINER MOUNTING. (Part of Option MA99).
19	T19 / 69 - 0S550 - 003	DISPLAY BOARD. (Used with P1 - 5).
20	T19 / TC - 01A - 550 - EE	SCAN BOARD. (Used with P3 - 5).
21	T19 / 69 - 0S550 - 001	SYSTEM BOARD. (Used with P1 - 5).
22	T19 / 51 - 006SD - 500	MICROPHONE JACK. (Used with P1 - 5).
23	T19 / 55 - 1011K - 08M	ON - OFF SWITCH. (Used with P2, 4 , & 5.)
24	T19 / 55 - 1021K - 08M	ON - OFF - ON SWITCH. (Used with P5).
25	T19 / 55 - 7108K - JZZ	ON - MOMENTARY SWITCH. (Used with P5).
26	T19 / 77 - S2006 - POZ	2 x 6 SELF TAPPING SCREW. (Used with P2 - 5).
27	T19 / 77 - S3008 - POM	3 x 8 SELF TAPPING SCREW. (Used with P1 - 5).
28	T19 / 77 - S3006 - POM	3 x 6 SELF TAPPING SCREW. (Used with P1 - 5).
29	T19 / 77 - S3020 - KOM	M3 x 20 MACHINE SCREW. (Used with P1 - 5).
30	T19 / 77 - S4010 - KOM	4 x 10 SELF TAPPING SCREW. (Used with P1 - 5).
31	T19 / 77 - 0S550 - 032	PTB 4 x 10 WC SCREW. (Used with P1 - 5).
32	T19 / 81 - SA010 - H1Z	10 - 32 UNF x 5/8 " LONG. (Used with P1 - 5).
33	T19 / 77 - S4820 - HIM	4.8 x 20 SELF TAPPING SCREW. (Used with P1 - 5).
34	T19 / 75 - S5012 - C1B	M5 x 12 MACHINE SCREW. (Used with P1 - 5).
35	T19 / 79 - S3080 - F5M	M3 FLAT WASHER. (Used with P1 - 5).
36	T19 / 79 - S3060 - S7Z	ME3 SPRING WASHER. (Used with P1 - 5).
37	T19 / 79 - S4080 - F8M	M4 FLAT WASHER. (Used with P1 - 5).
38	T19 / 79 - S4080 - SOZ	M4 SPRING WASHER. (Used with P1 - 5).
39	T19 / 78 - S3000 - HXM	M3 NUT. (Used with P1 - 5).
40	T19 / 72 - 00711 - 01P	TUBE. (Used with P1 - 5).
41	T19 / 79 - S50A0 - F0M	M5 FLAT WASHER. (Used with P1 - 5).
42	T19 / 79 - S50A0 - EB0	M5 EXTERNAL TOOTHE WASHER. (Used with P1 - 5).
43	T19 / 86 - 0ALC1 - 59N	MOUNTING TIE. (Used with P1 - 5).
44	T19 / 74 - 0S550 - 031	TAPE. (Used with P1 - 5).
45	T19 / MP - 0S550 - 022	SHIELD CAN. (Used with P3 - 5).
46	T19 / MR - 0S550 - 427	RUBBER KEY. (Used with P3 - 5).
47	T19 / 69 - 0S550 - 004	NON - SCAN BOARD. (Used with P1 & 2).
48	T19 / MS - 0S550 - 101	NAMEPLATE. (Used with P1).

\*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

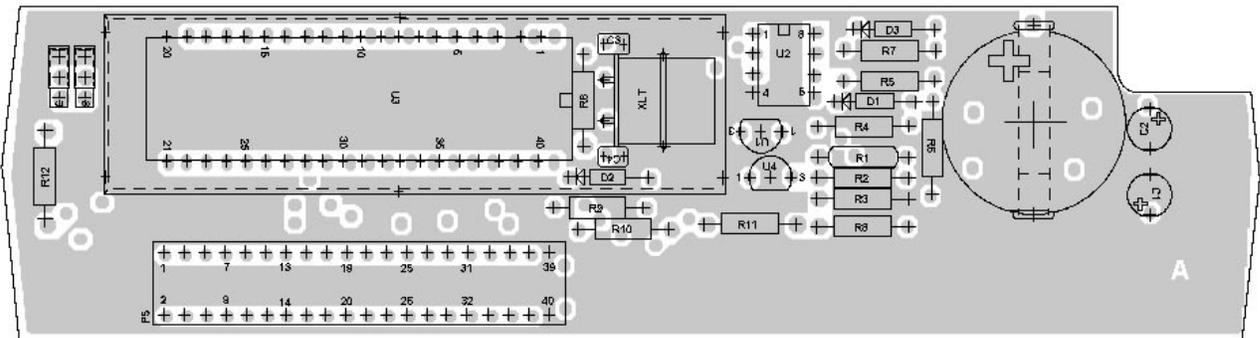
SYMBOL	PART NO.	DESCRIPTION
49	T19 / MS - 0S550 - 102	NAMEPLATE. (Used with P2).
50	T19 / MS - 0S550 - 103	NAMEPLATE. (Used with P3).
51	T19 / MS - 0S550 - 104	NAMEPLATE. (Used with P4).
52	T19 / MS - 0S550 - 105	NAMEPLATE. (Used with P5).
53	T19 / MP - 0S550 - 407	KNOB PLATE FASTENER. (Used with P1 - 5).

19B801550P1,2,3,4,5  
MECHANICAL BREAKDOWN

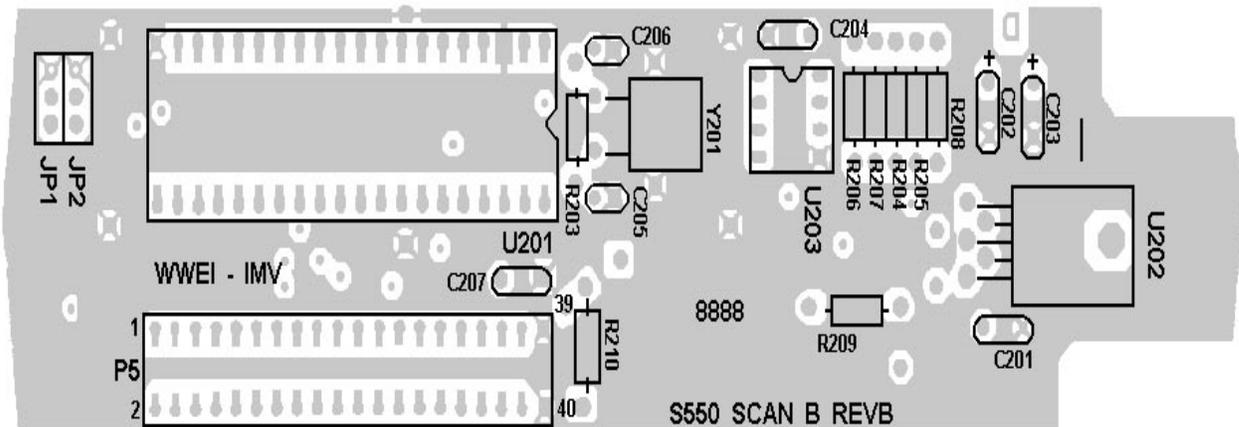




(19D901791)  
(19A705009, Sh. 1, Rev. A)  
(19A705009, Sh. 2, Rev. A)

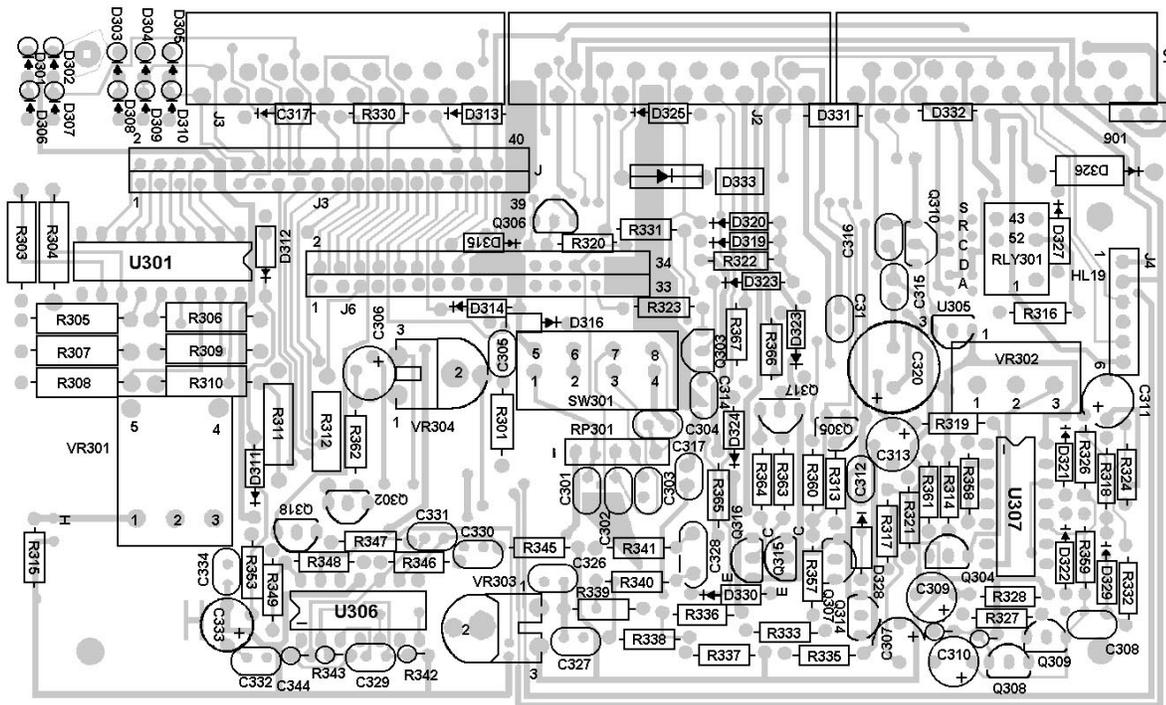


(19D901812)  
(19A705045, Sh. 1, Rev. A)  
(19A705045, Sh. 2, Rev. A)

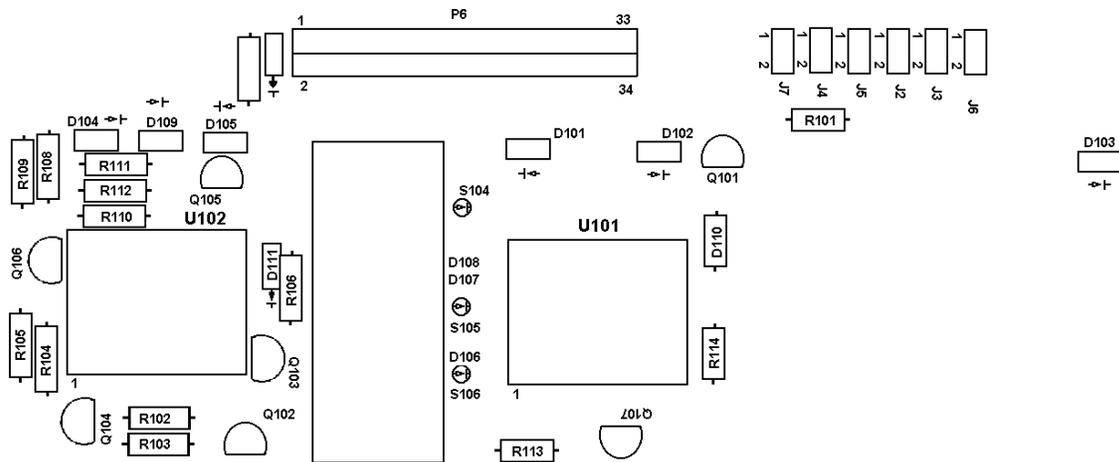


RC-7566  
(B465, Sh. 1, Rev. D)

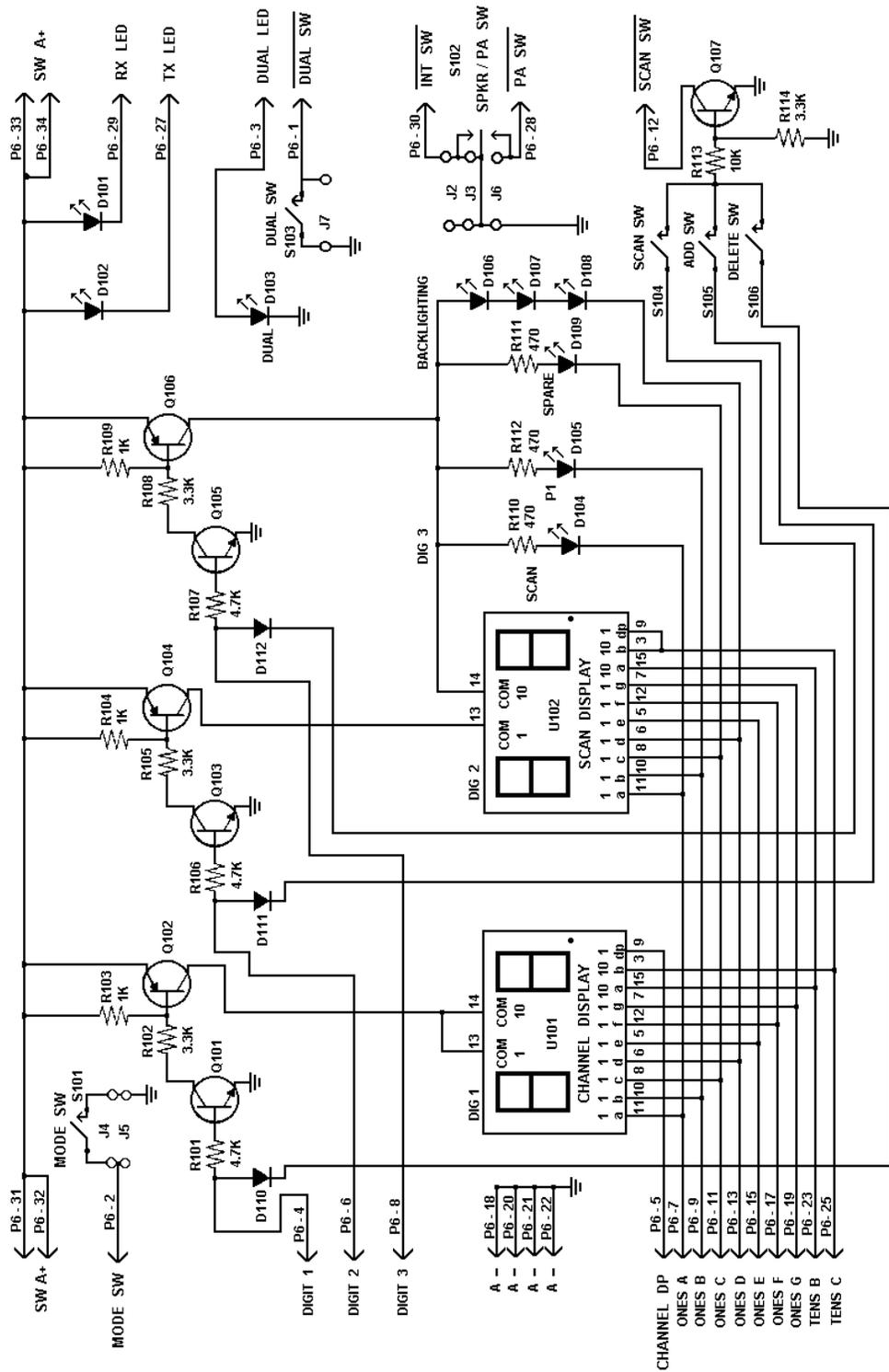
**LOGIC BOARD (NON-SCAN)  
LOGIC/SCAN BOARD (Earlier Models)  
LOGIC/EEPROM SCAN BOARD**



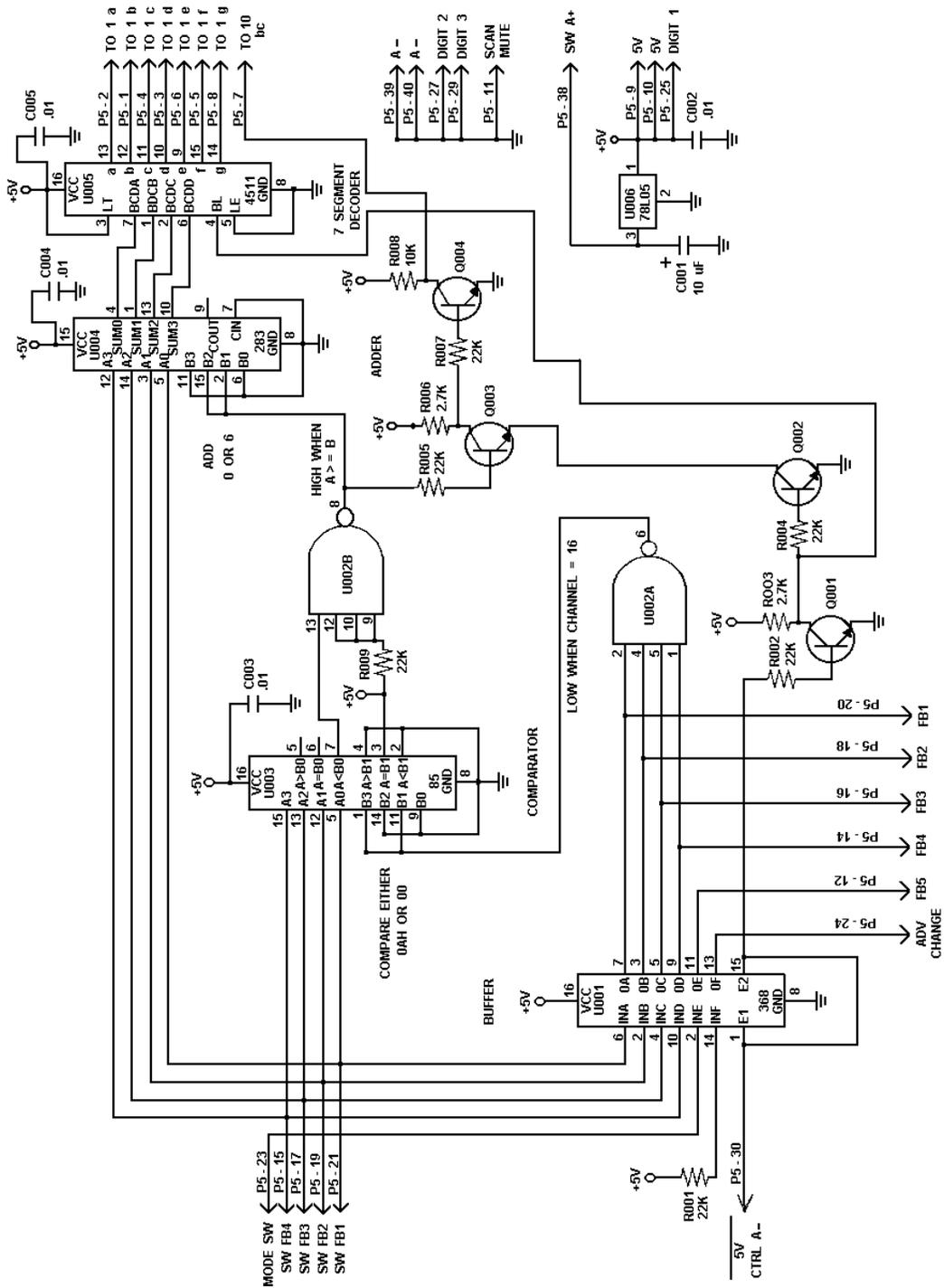
(RC-7564)  
 (19A704936, Sh. 1, Rev. H)  
 (19A704936, Sh. 2, Rev. H)



**SYSTEM BOARD  
 DISPLAY BOARD**

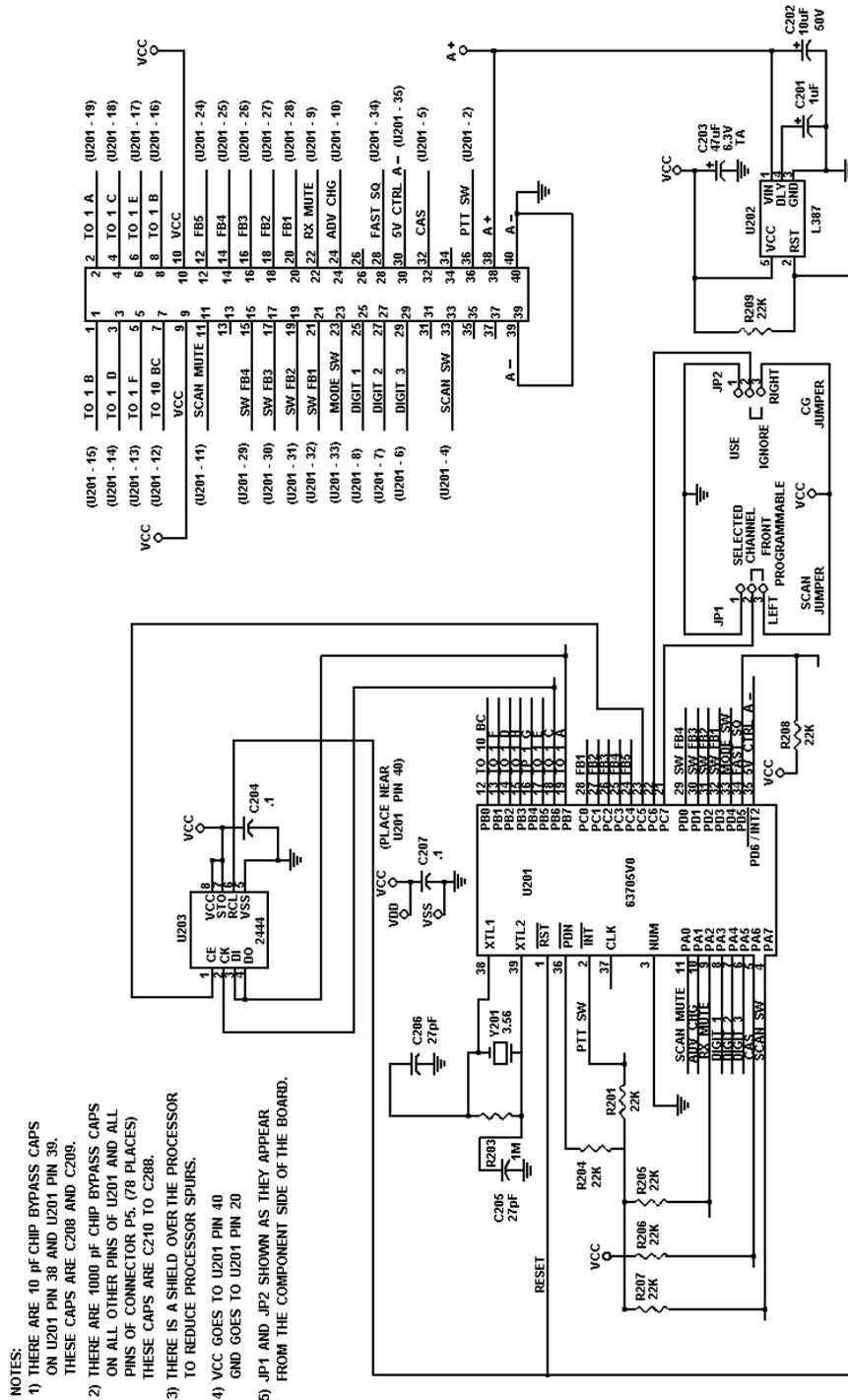


**DISPLAY BOARD**



LOGIC BOARD (NON-SCAN)





**LOGIC/EEPROM SCAN BOARD (Later Models)**



