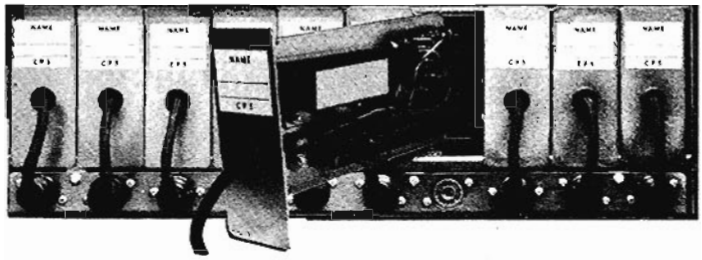
MOBILE RADIO

MASTR® II MAINTENANCE MANUAL

SHARED REPEATER TONE PANEL (OPTIONS 9543 & 7646)

Maintenance Manual LBI 4715 C
DATAFILE FOLDER - DF 5046

SHARED REPEATER PANEL



SPECIFICATIONS *

Tone Frequencies	71.9 to 203.5 Hz
Tone Frequency Stability	±0.2%
Decoder Response (threshold bandwidth)	3% ±0.5% of Tone Frequency
Audio Response	300 to 3000 Hz
Temperature Range	-30°C to +60°C (-22°F to +140°F)

Option No.	Description	Used With
9543	Tone Panel Mod. Kit 19A130052G1 Tone Panel 19D402486G1 Filter 19C320627G1 Mod. Kit 19A129953G1	MASTR II Repeater Station
7646	Tone Module 19D402608G1 and Tone Network 19B205280G1 thru G34	Tone Panel Option 9543

*These specifications are intended primarily for the use of the servicemon. Refer to the appropriate Specificotion Sheet for the complete specifications.

GENERAL ELECTRIC

TABLE OF CONTENTS

ILLUSTRATIONS

WARNING

No one should be permitted to handle any portion of the equipment that is supplied with high voltage; or to connect any external apparatus to the units while the units are supplied with power. KEEP AWAY FROM LIVE CIRCUITS.

DESCRIPTION

The General Electric Shared Repeater is a Channel Guard Repeater Station combination capable of providing repeater service for up to 10 different users (or fleets) sharing the same radio frequency. The Shared Repeater provides each user with a separate Channel Guard tone frequency, permitting him to hear only those calls from other units in his own system.

Encoder/Decoder modules are used to identify the tone frequency of each RF modulated signal -- and to re-transmit the message to the user's mobiles. Normally, the first signal received will be decoded and re-transmitted before the next message is received. In some instances, however, a stronger signal may override a signal that is already in the process of being re-transmitted by the station.

SYSTEM OPERATION

A signal received from a mobile unit by the repeater station is fed into the Audio Amplifier on the control shelf and to the Tone Panel low pass filter (Figure 1).

The low-pass filter eliminates voice frequencies and feeds the Channel Guard tone frequencies into the tone modules containing the tone frequency networks FL601 thru FL610. A tone coded signal that matches one of the tone frequency networks will activate Tone Controlled switch 19A129953G1 to trigger the Drop-out Delay Timer and key the transmitter.

The Drop-out Delay Timer decreases the number of transmitter "ON-OFF" cycles by keeping the transmitter keyed for a predetermined delay period after the receiver squelches loosing the RUS voltage. The delay period can be set for 0.5 to 5 seconds. If the receiver is unsquelched at any time during the delay period loosing the RUS voltage the transmitter stays keyed without interruption. After the delay time lapses and no signal is applied to the receiver, loosing RUS voltage, the transmitter keying circuit is de-energized and the transmitter turns off.

Tone from the frequency matching network is also fed into the transmitter to modulate the RF signal. The tone/voice-modulated signal is then received by the user's Channel Guard mobile receiver.

Signals received by the Repeater Station that are not modulated by one of the station Channel Guard frequencies will be attenuated by the tone frequency networks (FL601-FL610).

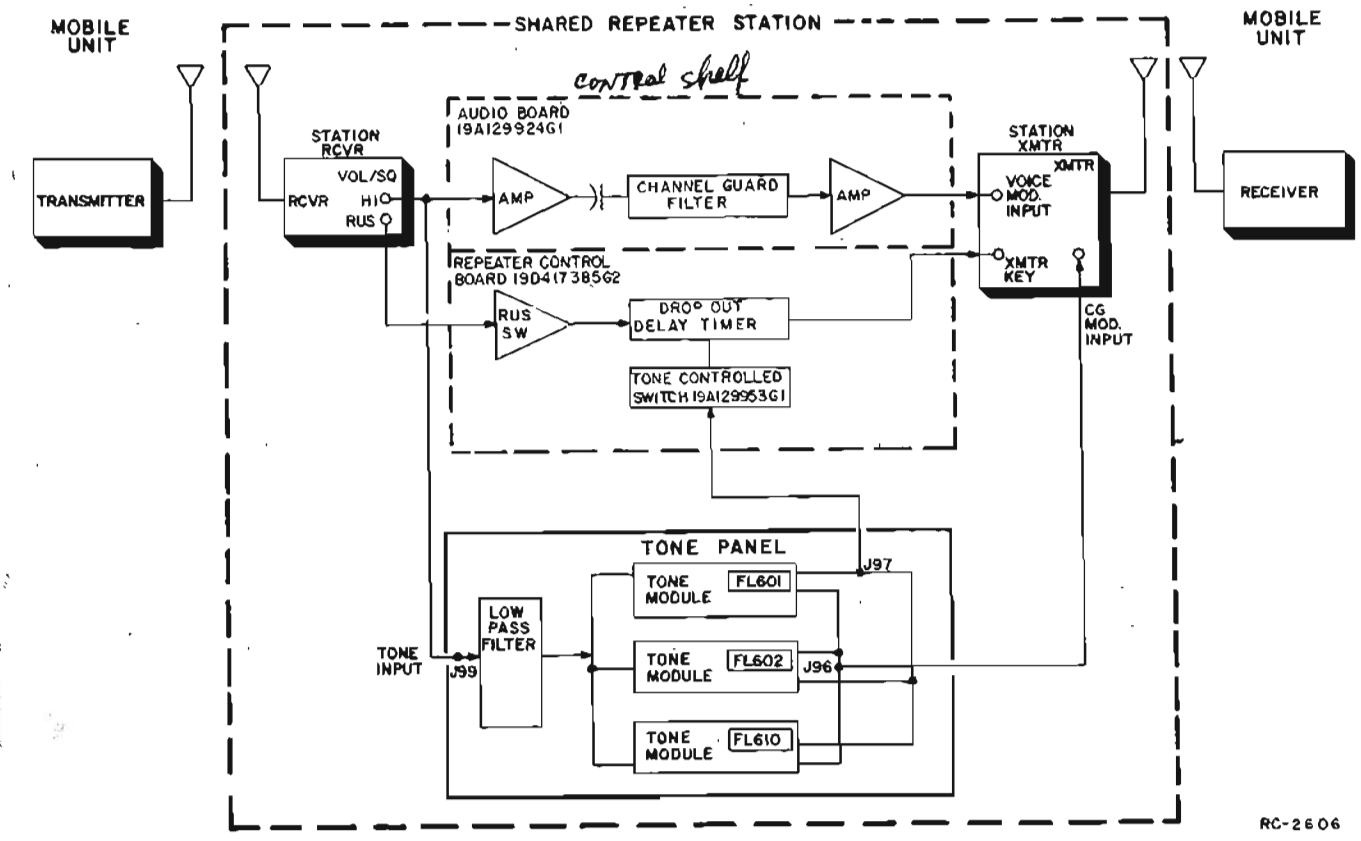


Figure 1 - Shared Repeater Block Diagram

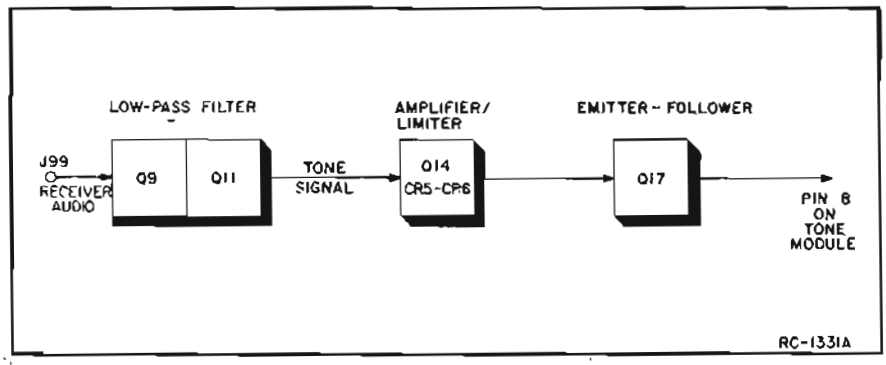


Figure 2 - Low-Pass Filter/Amplifier Block Diagram

CIRCUIT ANALYSIS

TONE PANEL

The Tone Panel circuit board contains the tone gate, low-pass filter, amplifiers, tone gate hold circuits, and provisions for inserting up to 10-slide-in Tone Modules. Each tone module contains a tone frequency network operating at a Channel Guard frequency within the 71.9 to 203.5 Hz range.

Low Pass Filter

Audio from the station receiver is fed to a low-pass filter on the Tone Panel. The filter blocks the voice frequency signals and allows the Channel Guard tones to pass (Figure 2).

Amplifier and Emitter-Follower

Tones from the low-pass filter are coupled through C20 to the base of amplifier Q14. Signals are limited by diodes CR5 and CR6, and fed to the base of emitter-follower Q17. Following Q17, the signals are coupled to Pin 8 of each Tone Module to drive the frequency networks.

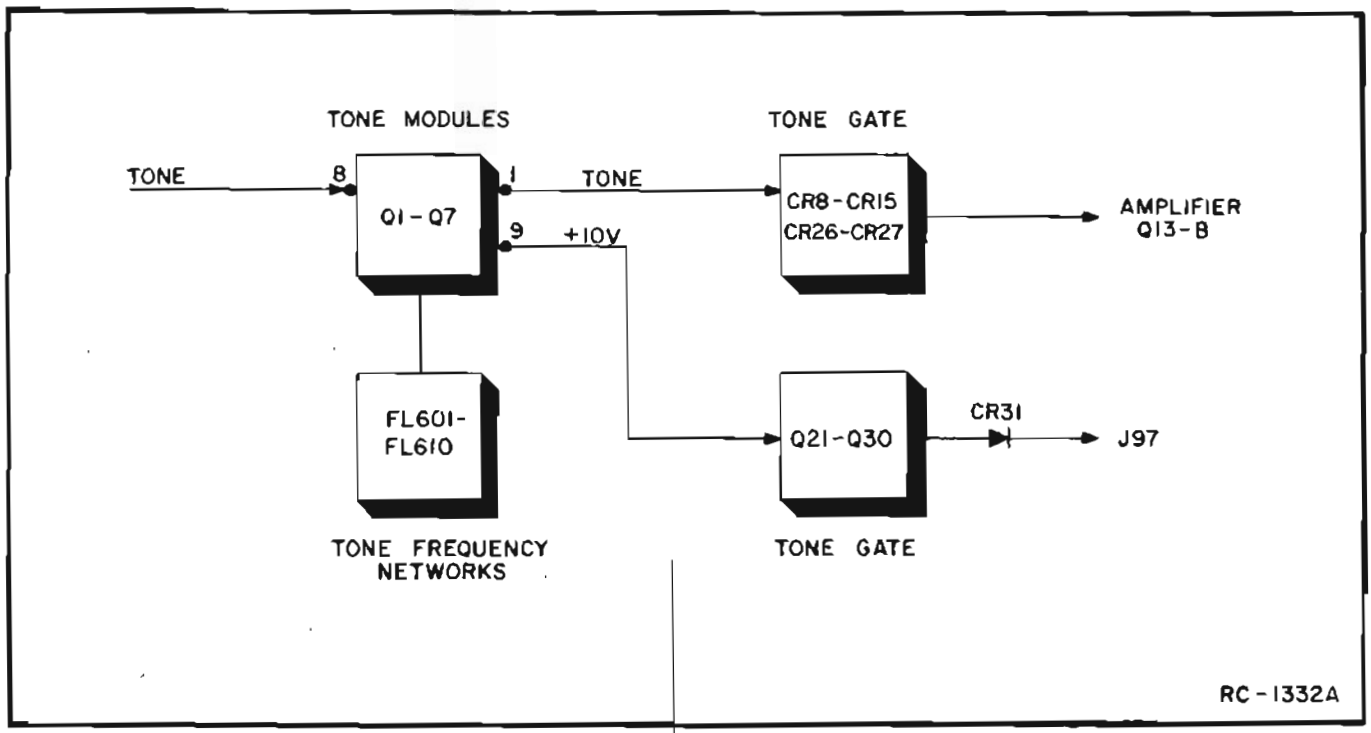


Figure 3 - Tone Gate/Tone Module Block Diagram

Tone Gate

The +10 Volts from a tone module will fire only 1 of the tone gate transistors (Q21-Q30) located on the Tone Panel.

The resulting positive voltage (+10 Volts) at the emitter of Q21 (for example) will then produce a voltage drop across R65 to turn on CR8, allowing the output of the tone module to pass through C28 and R75 to the base of amplifier Q13. The +10 Volts at the emitter of Q21 is coupled through diodes CR16 and CR31 to activate Tone Controlled Switch 19A129953G1 (Figure 3).

Amplifiers

The tone signal from the operating tone gate stage is amplified by Q13 and Q1 with de-emphasis provided by R2, C1, C3 and R10. The amplified output signal at J96 will produce a constant transmitter deviation at all transmitting frequencies.

Tone Gate Hold

Transistors Q18 and Q19 form a one-shot multivibrator timing circuit to keep the tone path from module to transmitter open during sudden fades or tone drop-outs. Assume, for example, that tone module with FL601 is functioning and diode CR8 is turned on by tone gate Q21. If the tone input to FL601 momentarily disappears, the DC voltage at tone module pin 9 will drop back to low value, cutting Q31 OFF. A negative-going edge at C45 will momentarily bias the base of Q18 negative through diode CR32, causing the collector voltage at Q18 to rise toward +10 Volts, as Q18 turns off.

The positive voltage at the collector of Q18 turns Q20 ON, and the positive voltage produced at Q20 emitter feeds thru R129 and CR38 to keep tone gate diode CR8 on for the duration of the Q18-Q19 timing cycle. The positive voltage to the Tone Controlled Switch (at J97) is maintained during the interval by the decay time constant of C46 with R111, and the input impedance of the Tone Controlled Switch.

TONE MODULE AND FREQUENCY NETWORK

Tone signals from the Tone Panel are fed to the base of amplifier Q1. The audio signal from the amplifier is fed to the base of common-emitter amplifier Q2, providing a 180° phase shift through R3, R2 and C1 for the positive feedback necessary to provide high gain in Q1-Q2.

Negative feedback is provided through the Tone Frequency Network from the collector to the base of Q1 at all frequencies, except at the tone network frequency. Q1 will amplify only at the network frequency. The positive feedback from C1 increases the gain of Q1-Q2. Protection against noise falsing is provided by the incoming noise signal to Q1. (Figure 5).

The tone output from emitter follower Q3 is fed to the tone gate stage on the Tone Panel and to the base of amplifier Q4. Amplified by Q4, the signal is isolated from the CR4-CR5 detector circuit by emitter-follower Q5. When the DC potential is above the threshold level of trigger circuit Q6-Q7, Q6 will turn ON and Q7 will turn OFF, thereby producing a +10 Volt output. The Q8 circuit is used in Remote operations only.

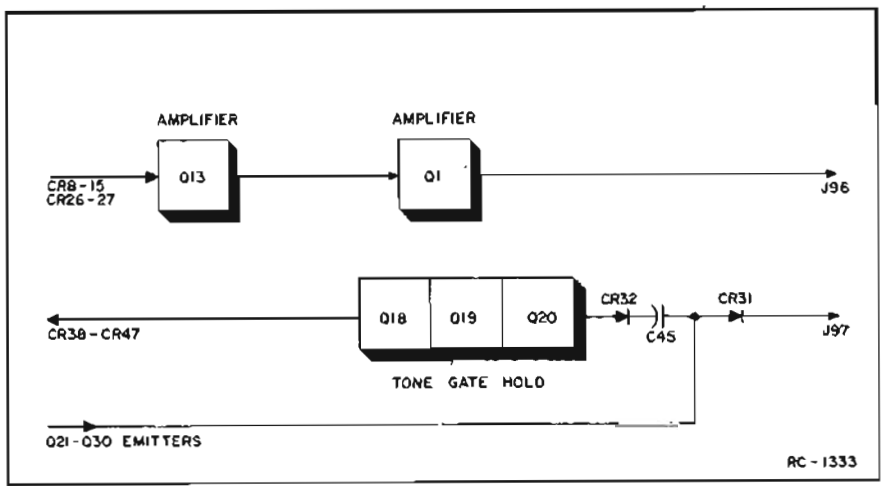


Figure 4 - Amplifier/Tone Gate Hold Block Diagram

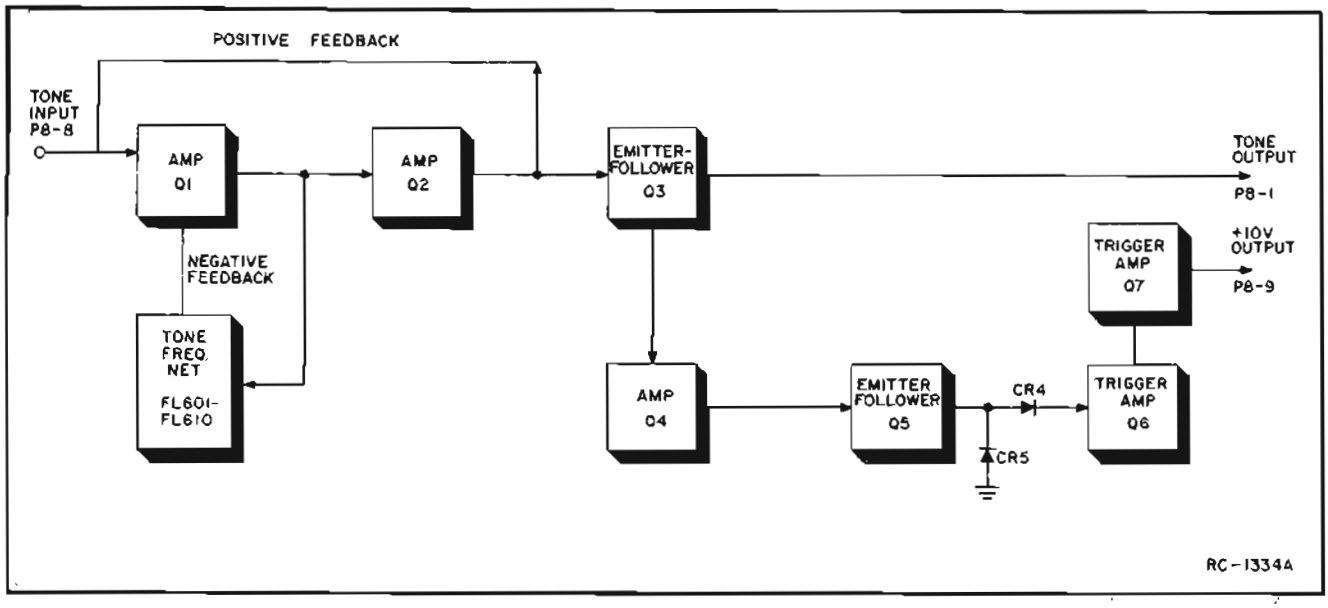


Figure 5 - Tone Module Block Diagram

TONE CONTROLLED SWITCH
(Part of Control Shelf)

Tone Controlled Switch

The Tone Controlled Switch will operate only when a greater than +6 Volt signal is fed into it from the tone gate stage of the Tone Panel. The voltage input turns on Q1701 to key the transmitter. Zener diode VR1701 prevents Q1701 from turning on until the proper operating voltage is received from the Tone Panel.

MODIFICATIONS

The Audio and Repeater Control boards on the Control Shelf and the rack mounted Tone Panel are modified for Shared Repeater operation as shown on the drawings at the back of the book.

MAINTENANCE

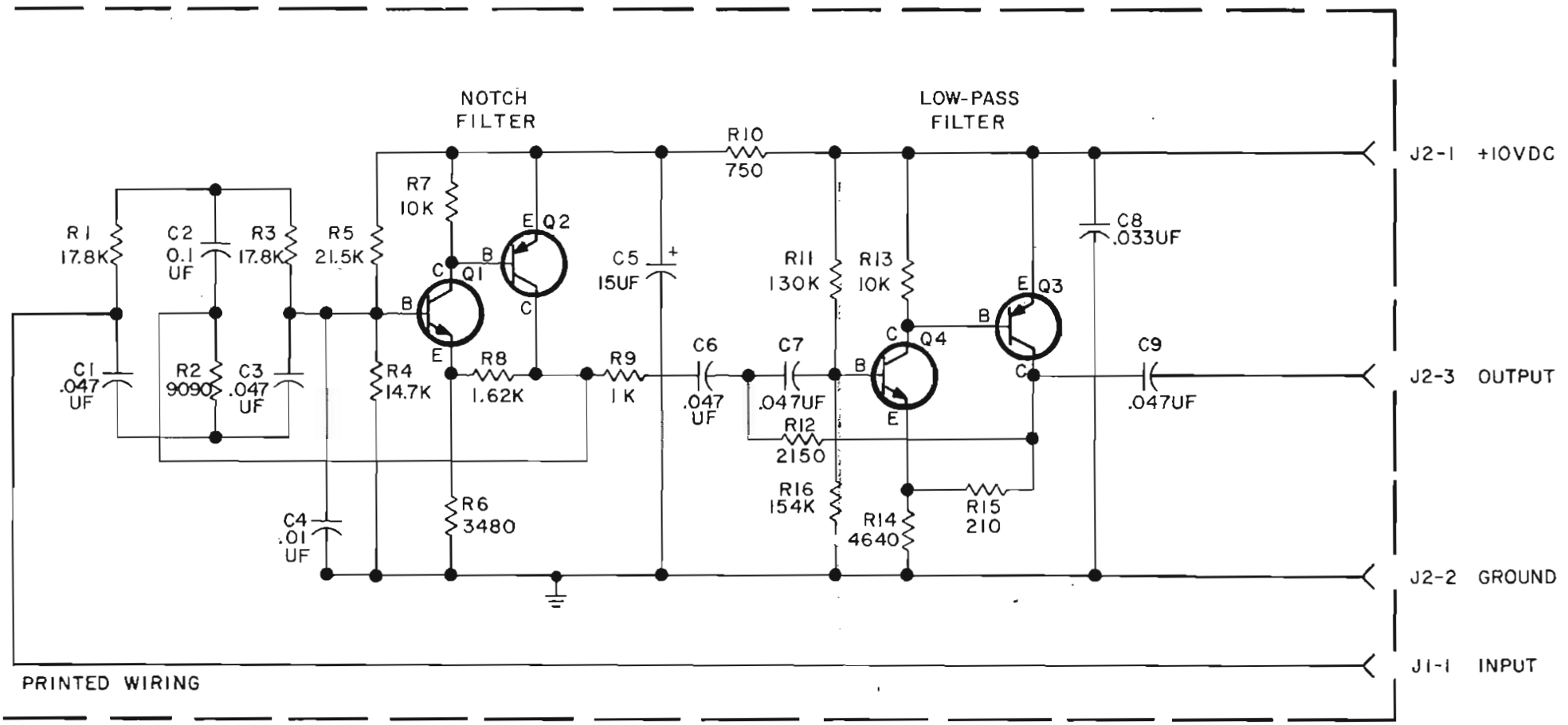
The Transmitter, Receiver, and Power Supply are essentially standard and servicing should be performed according to the standard techniques outlined in the unit Maintenance Manuals. The Repeater Control Board 19D417385G2 and Audio Board 19A129924G1 are part of the Base Station Control Shelf.

TROUBLESHOOTING

Troubleshooting and servicing those units that are unique to the Shared Repeater Station are described in the following Troubleshooting Procedure Chart.

SYMPTOM	CHECK THE FOLLOWING:
One individual mobile cannot operate Repeater Station. All other mobiles on same frequency OK.	Mobile transmitter for proper Channel Guard frequency and tone deviation.
One fleet of mobiles (with a common Channel Guard frequency) cannot operate Repeater. Other fleets (with other Channel Guard frequencies) OK.	I - TONE MODULE AND TONE FREQUENCY NETWORK
	a. That tone frequency network corresponds to proper Channel Guard tone frequency.
	b. For tone of proper frequency at pin 8 and amplified tone at pin 1 of tone module.
	c. For approximately 2 VDC (no tone) and 10 VDC (with tone) at pin 9.
	d. If tone appears at pin 1, but no DC at pin 9, check Q5, Q6 and Q7.
	e. If tone or DC voltage do not appear, check Q1, Q2, and Q3.
	f. Substitute a replacement network, if necessary.
	g. If tone and DC are both OK, go to Step II.
	II - TONE PANEL
	a. For tone at Q13-B and +DCV at J97 with the tone applied.
	b. Tone gate stage (Q21-30) and associated diodes, if no tone is measured in Step II-a.
Repeater is keyed by mobiles, but does not re-transmit any tones.	a. Tone amplifiers Q13 and Q1.
	b. Modulator circuit of transmitter.
No mobiles can key transmitters.	a. For RUS Voltage at J1204-11 on the Control Shelf. Also audio should be heard from test speaker when mobile comes on. If not, check receiver.
	b. If receiver is OK, jumper across H7 and H8 on Repeater Control board. When mobile is received, transmitter should key and be voice modulated (but not necessarily tone modulated). If not, check 5-second delay, 3-minute times, and transmitter keying circuits.
	c. If transmitter operates as in Step b above with jumper, then measure voltage at D8 on Repeater Control board in the Control Shelf. If voltage swings from approximately 1 VDC to 6 VDC or more with tone signal applied, the trouble is in Tone Controlled Switch (19A129953G1) Q1701. If voltage does not swing up, go to Step d.
	d. For a tone signal at pin 8 of all tone modules with a mobile signal being received. If no signal is present, trace signal through stages Q9, Q11, Q14, and Q17.

SCHEMATIC DIAGRAM



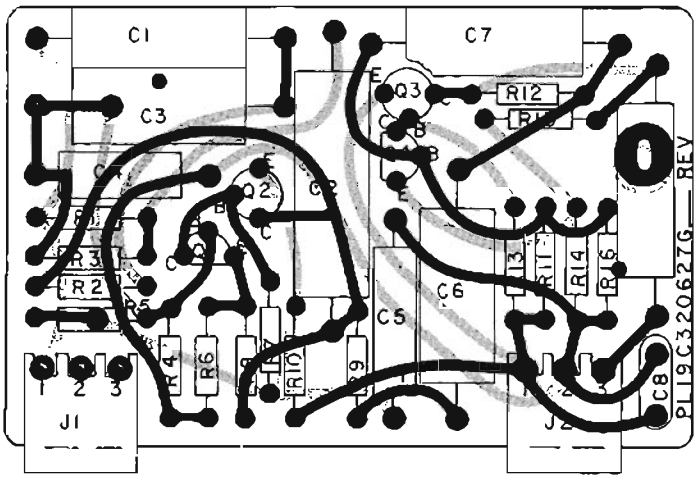
IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG = 1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF = MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH= MILLIHENRYS OR H=HENRYS.

SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.

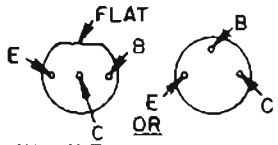
THIS ELEM DIAG APPLIES TO

OUTLINE DIAGRAM



(19C321338, Rev. 0)
(19C320625, Sh. 2, Rev. 0)
(19C320625, Sh. 3, Rev. 0)

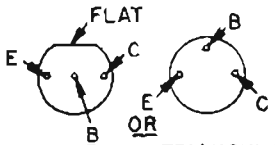
LEAD IDENTIFICATION
FOR Q2 & Q3



IN-LINE TRIANGULAR
VIEW FROM LEAD END

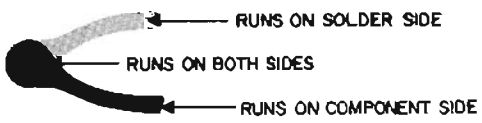
NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.

LEAD IDENTIFICATION
FOR Q1 & Q4



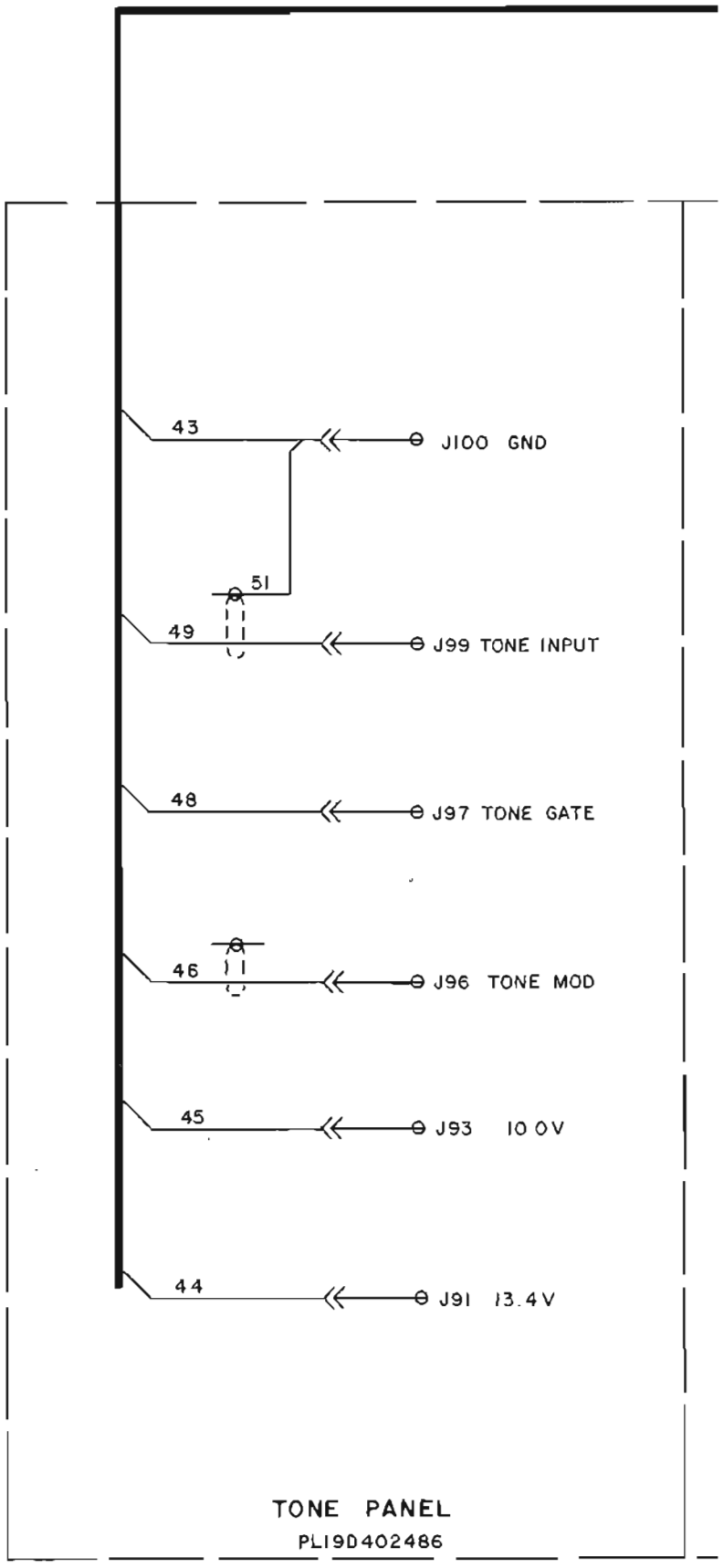
IN-LINE TRIANGULAR
VIEW FROM LEAD END

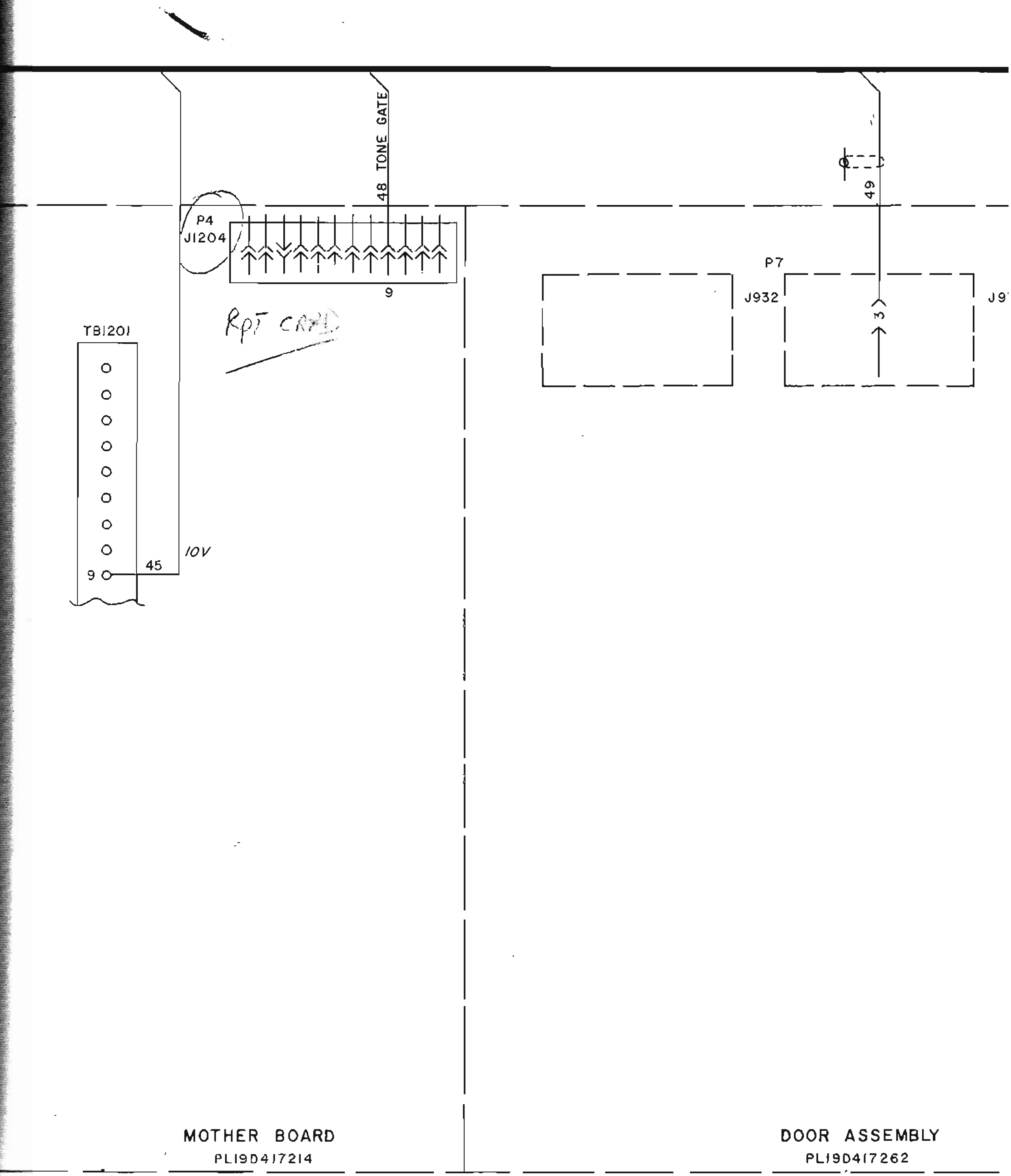
NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.



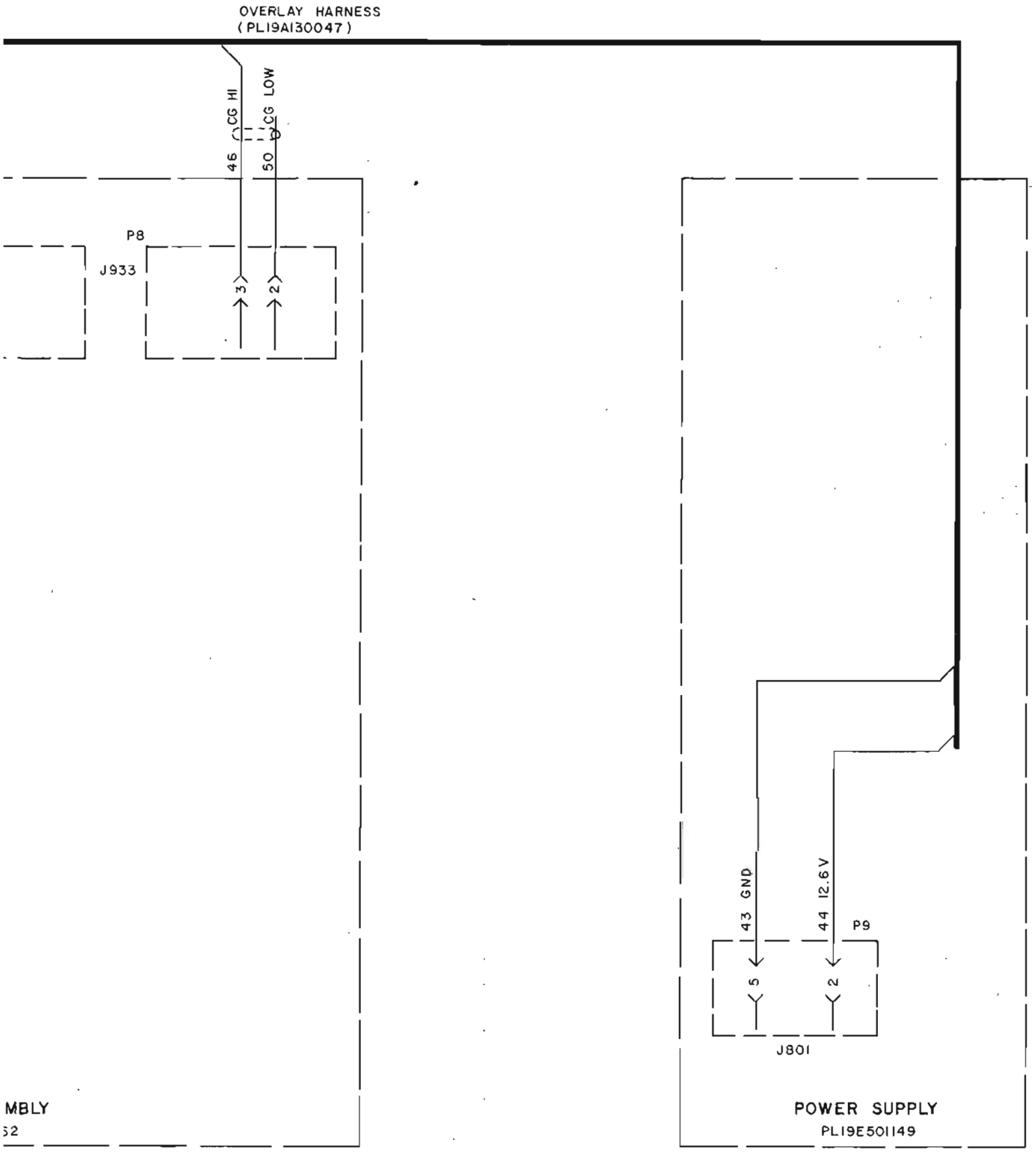
SCHEMATIC & OUTLINE DIAGRAM

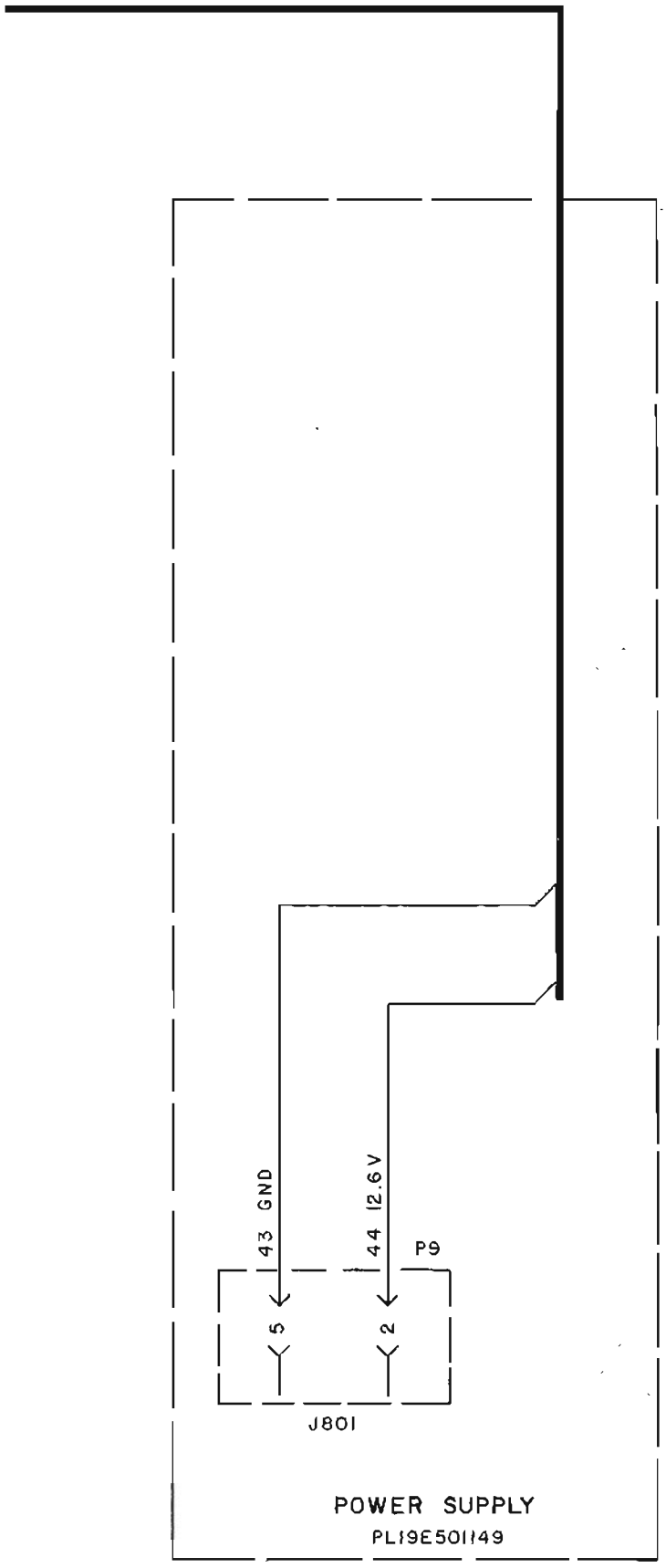
CHANNEL GUARD FILTER 19C320627G1


43
J100 GND
51
49
J99 TONE INPUT
48
J97 TONE GATE
46
J96 TONE MOD
45
J93 10.0V
44
J91 13.4V
TONE PANEL
PL19D402486



(19R622034, Rev. 3)


OVERLAY HARNESS
(PL19A130047)
46 CG HI
50 CG LOW
P8
J933
3
2
43 GND
44 12.6V
P9
5
2
J801
MBLY
52
POWER SUPPLY
PL19E501149



INSTRUCTIONS:

1. CABLE SHOULD BE CONSTRUCTED IN ACCORDANCE WITH WIRI INSTRUCTION 19A121850.
2. MARK WIRES IN CABLE ON BOTH ENDS WITH CORRESPONDING WIRE NUMBERS USING MARKER TAPE 19B209090.
3. ALL WIRES ARE #18 AWG EXCEPT WIRES #46 & #49 WHI ARE N22SJ-G.
4. MAKE WIRES 46 & 49 LONG ENOUGH AND CABLE IN SUCH A THAT DOOR ASSEMBLY WILL HINGE DOWN TO A HORIZONTAL POSITION.
5. CABLE SHOULD BE CONSTRUCTED IN SUCH A WAY AS TO ALL ENOUGH SLACK TO PERMIT MOUNTING A 5.25" OPTION PANEL BETWEEN POWER SUPPLY AND DOOR ASSEMBLY.
6. THE FOLLOWING WIRES HAVE SOLDER CONNECTIONS

   #46 AND #50 AT P8
   49 AT P7

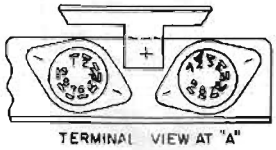
7. TERMINATE ALL WIRES EXCEPT THOSE HAVING SOLDER CONNECTIONS AS FOLLOWS:

WIRE	TERMINAL
#43 & #44 (AT POWER SUPPLY)	19B209288P
#44, #45 & #48 (AT TONE PANEL)	4029840P1
#43 & #51 (IN ONE TERMINAL) (AT TONE PANEL)	4029840P1
#46 & #49 (AT TONE PANEL)	4029840P2
#48 (AT MOTHER BOARD)	19B209288P
#45 (AT MOTHER BOARD)	19B209260P1

INTERCONNECTION DIAGRA

SHARED REPEATER TONE PAN

Issue 2



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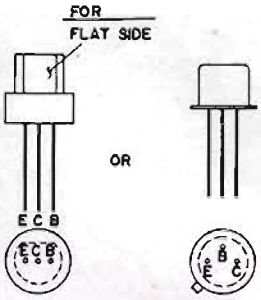
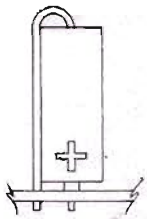


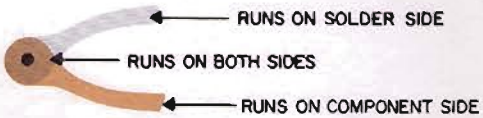
LEAD IDENTIFICATION
FOR Q1 THRU Q30

NOTE: COLOR BAND INDICATES CATHODE END OF DIODES.

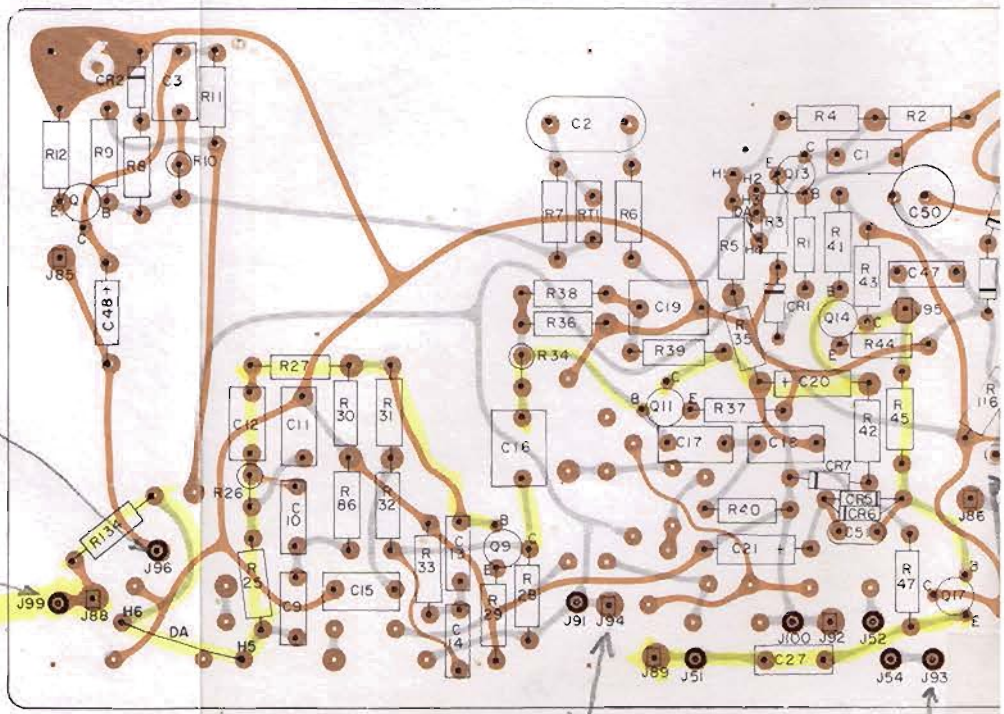


LEAD IDENTIFICATION
FOR C50

P4-9
J1204-9

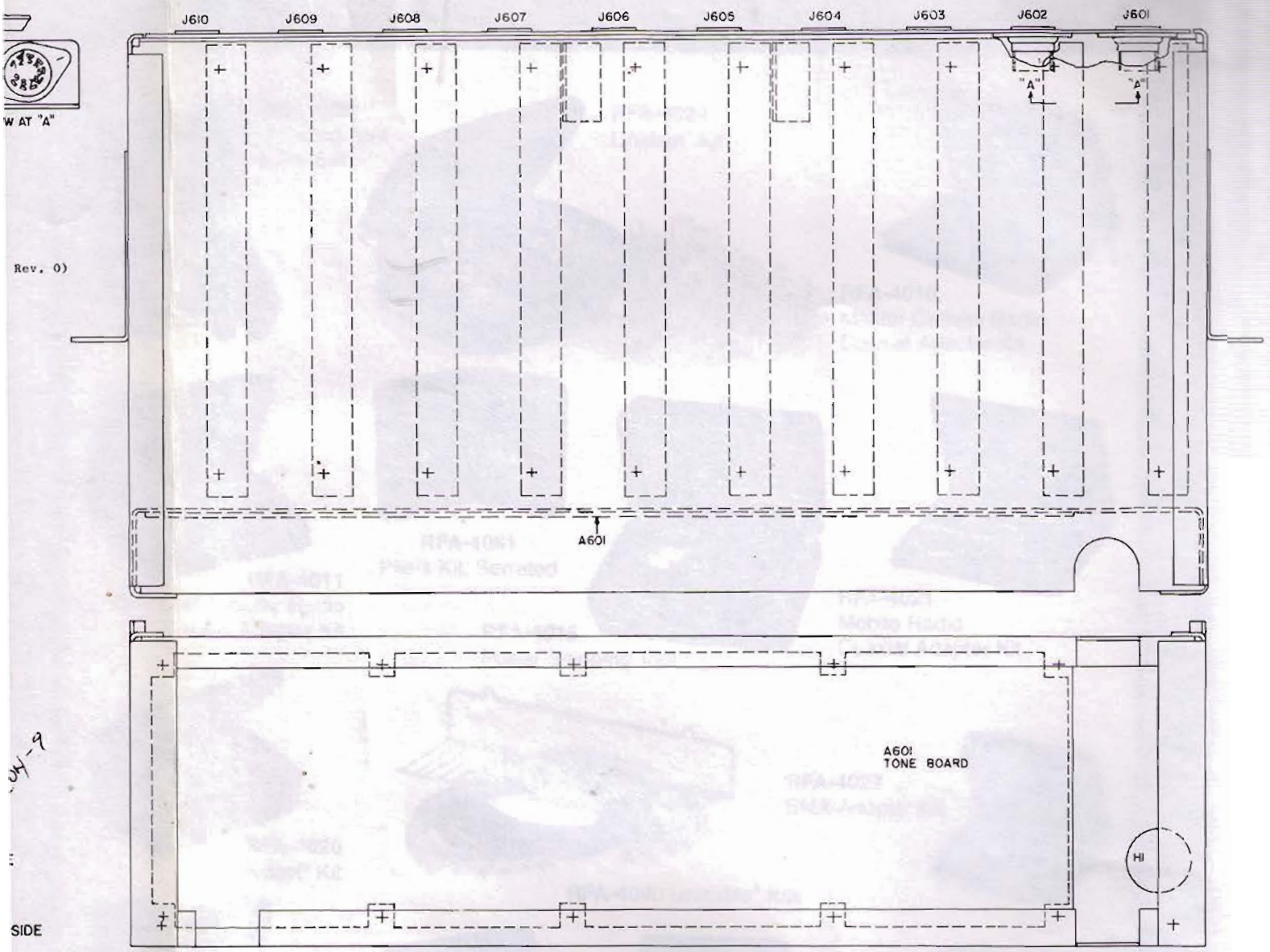


(19D402741, Rev. 8)
(19D402756, Sh. 1, Rev. 6)
(19D402756, Sh. 2, Rev. 6)

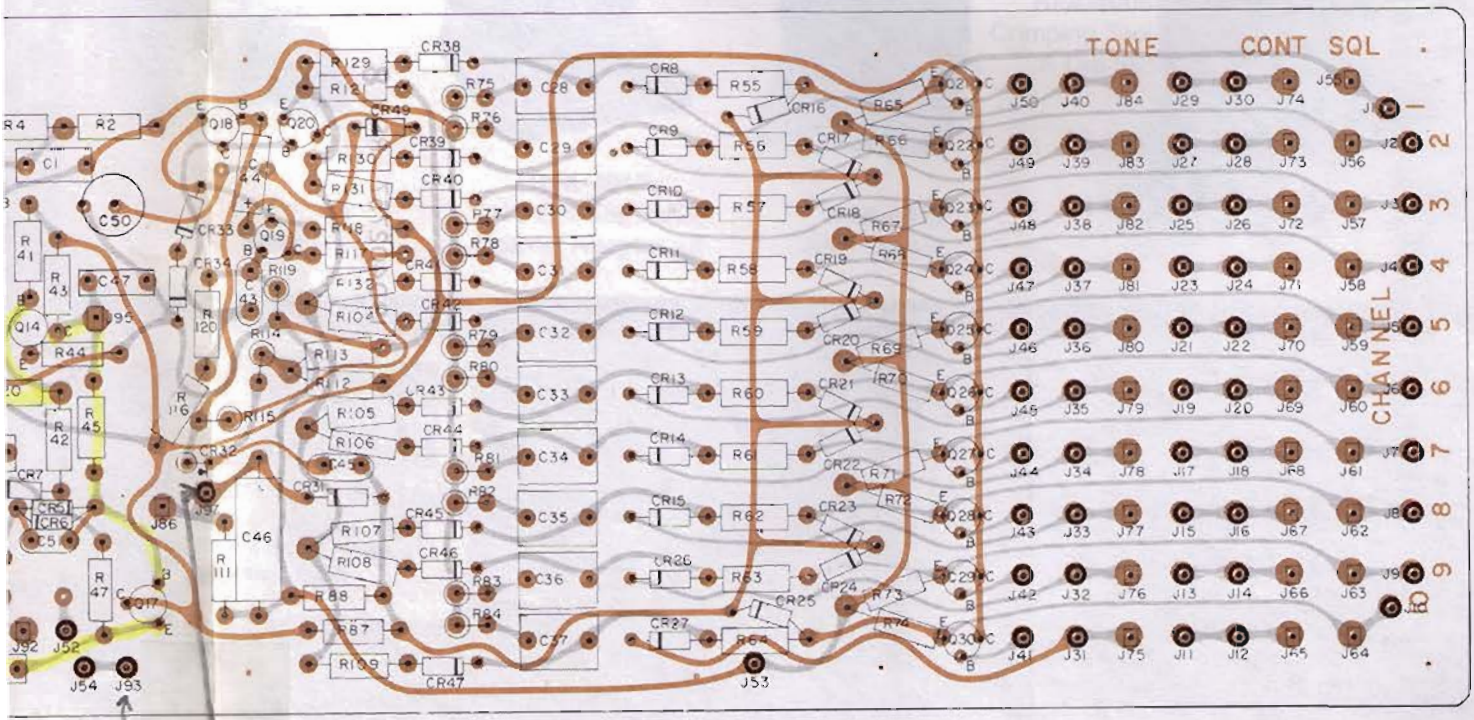


OUTLINE DIAGRAM

TONE PANEL 19D402486G1


J610
J609
J608
J607
J606
J605
J604
J603
J602
J601
"A"
"A"
A601
A601
TONE BOARD
HI

A601


TONE
CONT SQL
CHANNEL
1
2
3
4
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6
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8
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10
J50
J40
J84
J29
J30
J74
J56
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J62
J43
J33
J77
J15
J16
J67
J63
J42
J32
J76
J13
J14
J66
J64
J41
J31
J75
J11
J12
J65
J53
J54
J93
J92
J52
J86
+10V
PTT OUT TO RPT. CNTL BD.

PARTS LIST

LBI-4720

CHANNEL GUARD FILTER
19C320627G1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19C300075P47001G	Polyester: 47,000 pf ±2%, 100 VDCW; sim to GE Type 61F.
C2	19C300075P10002G	Polyester: 100,000 pf ±2%, 100 VDCW; sim to GE Type 61F.
C3	19C300075P47001G	Polyester: 47,000 pf ±2%, 100 VDCW; sim to GE Type 61F.
C4	19C300075P10001G	Polyester: 10,000 pf ±2%, 100 VDCW; sim to GE Type 61F.
C5	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C6 and C7	19C300075P47001G	Polyester: 47,000 pf ±2%, 100 VDCW; sim to GE Type 61F.
C8	19A116080P4	Polyester: 0.033 µf ±20%, 50 VDCW.
C9	19C300075P47001G	Polyester: 47,000 pf ±2%, 100 VDCW; sim to GE Type 61F.
		- - - - - - - - - JACKS AND RECEPTACLES - - - - - -
J1 and J2	19A116669P5	Connector, prited wiring: sim to Molex 09-52-3031.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19A116774P1	Silicon, NPN; sim to Type 2N5210.
Q2 and Q3	19A115768P1	Silicon, PNP; sim to Type 2N3702.
Q4	19A116774P1	Silicon, NPN; sim to Type 2N5210.
		- - - - - - - - - - - RESISTORS - - - - - - - - - - -
R1	19C314256P21782	Metal film: 17,800 ohms ±1%, 1/4 w.
R2	19C314256P20091	Metal film: 9090 ohms ±1%, 1/4 w.
R3	19C314256P21782	Metal film: 17,800 ohms ±1%, 1/4 w.
R4	19C314256P21472	Metal film: 14,700 ohms ±1%, 1/4 w.
R5	19C314256P22152	Metal film: 21,500 ohms ±1%, 1/4 w.
R6	19C314256P23481	Metal film: 3480 ohms ±1%, 1/4 w.
R7	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R8	19C314256P21621	Metal film: 1620 ohms ±1%, 1/4 w.
R9	19C314256P21001	Metal film: 1000 ohms ±1%, 1/4 w.
R10	3R152P751J	Composition: 750 ohms ±5%, 1/4 w.
R11	19C314256P21303	Metal film: 130,000 ohms ±1%, 1/4 w.
R12	19C314256P22151	Metal film: 2150 ohms ±1%, 1/4 w.
R13	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R14	19C314256P24641	Metal film: 4640 ohms ±1%, 1/4 w.
R15	19C314256P22100	Metal film: 210 ohms ±1%, 1/4 w.
R16	19C314256P21543	Metal film: 154,000 ohms ±1%, 1/4 w.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

LBI3690G

TONE PANEL
19D402486G1

SYMBOL	GE PART NO.	DESCRIPTION
A601		TONE BOARD 19D402615G2
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A1.6080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C2*	19A116080P1.	Polyester: 0.47 µf ±20%, 50 VDCW.
		In REV C & earlier:
	19A116080P8	Polyester: 0.22 µf ±20%, 50 VDCW.
C3	19A116080P8	Polyester: 0.15 µf ±20%, 50 VDCW.
C8*	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D. Deleted by REV B.
C9* and C10*	19A116080P205	Polyester: 0.047 µf ±5%, 50 VDCW.
		In Models of REV A & earlier:
	19B209243P5	Polyester: .047 µf ±20%, 50 VDCW.
C11*	19A116080P206	Polyester: 0.068 µf ±5%, 50 VDCW.
		In REV B-D:
	19A116080P207	Polyester: 0.1 µf ±5%, 50 VDCW.
		In Models of REV A & earlier:
	19B209243P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C12	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C13* and C14*	19A116080P205	Polyester: .047 µf ±5%, 50 VDCW.
		In Models of REV A & earlier:
	19B209243P5	Polyester: 0.047 µf ±20%, 50 VDCW.
C15*	19A116080P207	Polyester: 0.1 µf ±5%, 50 VDCW.
		In Models of REV A & earlier:
	19B209243P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C16	19A116080P9	Polyester, 0.22 µf ±20%, 50 VDCW.
C17* and C18*	19A116080P207	Polyester: 0.1 µf ±5%, 50 VDCW.
		In Models of REV A & earlier:
	19B209243P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C19*	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
		In Models of REV A & earlier:
	19B209243P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C20 and C21	5496267P18	Tantalum: 8.8 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C22* and C23*	19A116080P1	Polyester: 0.01 µf ±20%, 50 VDCW. Deleted by REV B.
C24* and C25*	7774750P5	Ceramic disc: 0.0015 µf +100% -0%, 500 VDCW. Deleted by REV B.
C26*	7774750P8	Ceramic disc: 0.0033 µf +100% -0%, 500 VDCW. Deleted by REV B.
C27 thru C37	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C43	774750P4	Ceramic disc: 0.001 µf +100% -0%, 500 VDCW.
C44	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C45	7774750P4	Ceramic disc: 0.001 µf +100% -0%, 500 VDCW.
C46	5496267P16	Tantalum: 100 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C47*	19A116080P5	Polyester: .047 µf ±20%, 50 VDCW. Added by REV A.
C48*	5496267P13	Tantalum: 2.2 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
		In REV B & C:
	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW. Added by REV A.
C49*	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW. Deleted by REV D.
C50*	19A1.6680P107	Electrolytic: 100 µf +150% -10%, 15 to Mallory Type TTX. Added by REV C
C51*	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDC RMC Type JF Discap. Added by REV F.
		- - - - - - - DIODES AND RECTIFIERS -
CR1 and CR2	19A115250P1	Silicon, fast recovery, 225 mA, 50 PI
CR5 thru CR27	19A115250P1	Silicon, fast recovery, 225 mA, 50 PI
CR31 thru CR34	19A115250P1	Silicon, fast recovery, 225 mA, 50 PI
CR38 thru CR47	19A115250P1	Silicon, fast recovery, 225 mA, 50 PI
CR49*	19A115250P1	Silicon, fast recovery, 225 mA, 50 PI REV C.
		- - - - - - - JACKS AND RECEPTACLES -
J1 thru J54	4033513P4	Contact, electrical: sim to Bead Cha
J55 thru J86	4031537P1	Terminal: sim to Alden Products 654T
J88 and J89	4031537P1	Terminal: sim to Alden Products 654T
J91	4033513P4	Contact, electrical: sim to Bead Cha
J92	4031537P1	Terminal: sim to Alden Products 654T
J93	4033513P4	Contact, electrical: sim to Bead Cha
J94 and J95	4031537P1	Terminal: sim to Alden Products 654T
J96 thru J101	4033513P4	Contact, electrical: sim to Bead Cha
		- - - - - - - - - - TRANSISTORS - - -
Q1	19A115123P1	Silicon, NPN.
Q4*	19A115123P1	Silicon, NPN. Deleted by REV B.
Q9	19A115123P1	Silicon, NPN.
Q10*	19A115123P1	Silicon, NPN. Deleted by REV B.
Q11	19A115123P1	Silicon, NPN.
Q13 and Q14	19A115123P1	Silicon, NPN.
Q17 thru Q30	19A115123P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - -
R1	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R2	3R77P753J	Composition: 75K ohms ±5%, 1/2 w.
R3	3R77P620J	Composition: 62 ohms ±5%, 1/2 w.
R4	3R77P102J	Composition: 1K ohms ±5%, 1/2 w.
R5	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R6	3R77P362J	Composition: 3.6K ohms ±5%, 1/2 w.
R7 and R8	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R9	3R77P753J	Composition: 75K ohms ±5%, 1/2 w.
R10	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R11	3R77P152J	Composition: 1.5K ohms ±5%, 1/2 w.
R12	3R77P101J	Composition: 100 ohms ±5%, 1/2 w.
R20*	3R77P272J	Composition: 2.7K ohms ±5%, 1/2 w. Deleted by REV B.
R21*	3R77P363J	Composition: 36K ohms ±5%, 1/2 w. Deleted by REV B.
R22*	3R77P102J	Composition: 1K ohms ±5%, 1/2 w. Deleted by REV B.
R23*	3R77P511J	Composition: 510 ohms ±5%, 1/2 w. Deleted by REV B.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SYMBOL	GE PART NO.	DESCRIPTION
C49*	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW. Added by REV A. Deleted by REV D.
C50*	19A115680P107	Electrolytic: 100 µf +150% -10%, 15 VDCW; sim to Mallory Type TTX. Added by REV C.
C51*	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JP Discap. Added by REV F.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 and CR2	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR5 thru CR27	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR31 thru CR34	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR38 thru CR47	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR48*	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV. Added by REV C.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J84	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
J55 thru J86	4031537P1	Terminal: sim to Alden Products 654T.
J88 and J89	4031537P1	Terminal: sim to Alden Products 654T.
J91	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
J92	4031537P1	Terminal: sim to Alden Products 654T.
J93	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
J94 and J95	4031537P1	Terminal: sim to Alden Products 654T.
J96 thru J101	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19A115123P1	Silicon, NPN.
Q4*	19A115123P1	Silicon, NPN. Deleted by REV B.
Q9	19A115123P1	Silicon, NPN.
Q10*	19A115123P1	Silicon, NPN. Deleted by REV B.
Q11	19A115123P1	Silicon, NPN.
Q13 and Q14	19A115123P1	Silicon, NPN.
Q17 thru Q30	19A115123P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R2	3R77P753J	Composition: 75K ohms ±5%, 1/2 w.
R3	3R77P620J	Composition: 62 ohms ±5%, 1/2 w.
R4	3R77P102J	Composition: 1K ohms ±5%, 1/2 w.
R5	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R6	3R77P362J	Composition: 3.6K ohms ±5%, 1/2 w.
R7 and R8	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R9	3R77P753J	Composition: 75K ohms ±5%, 1/2 w.
R10	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R11	3R77P152J	Composition: 1.5K ohms ±5%, 1/2 w.
R12	3R77P100J	Composition: 100 ohms ±5%, 1/2 w.
R20*	3R77P272J	Composition: 2.7K ohms ±5%, 1/2 w. Deleted by REV B.
R21*	3R77P363J	Composition: 36K ohms ±5%, 1/2 w. Deleted by REV B.
R22*	3R77P102J	Composition: 1K ohms ±5%, 1/2 w. Deleted by REV B.
R23*	3R77P511J	Composition: 510 ohms ±5%, 1/2 w. Deleted by REV B.

SYMBOL	GE PART NO.	DESCRIPTION
R24*	3R77P201J	Composition: 200 ohms ±5%, 1 REV D.
R25* and R26*	3R77P113J	Composition: 11K ohms ±5%, 1
		In Models of REV A or earlier
	3R77P103J	Composition: 10,000 ohms ±5%
R27	3R77P512J	Composition: 5.1K ohms ±5%,
R28	3R77P133J	Composition: 13K ohms ±5%, 1
R29	3R77P750J	Composition: 75 ohms ±5%, 1/
R30	3R77P103J	Composition: 10K ohms ±5%, 1,
R31 and R32	3R77P153J	Composition: 15K ohms ±5%, 1,
R33	3R77P822J	Composition: 8.2K ohms ±5%,
R34	3R77P103J	Composition: 10K ohms ±5%, 1,
R35	3R77P512J	Composition: 5.1K ohms ±5%,
R36	3R77P103J	Composition: 10K ohms ±5%, 1,
R37	3R77P301J	Composition: 300 ohms ±5%, 1,
R38 and R39	3R77P223J	Composition: 22K ohms ±5%, 1,
R40	3R77P123J	Composition: 12K ohms ±5%, 1,
R41	3R77P244J	Composition: 240K ohms ±5%, 1
R42	3R77P103J	Composition: 10K ohms ±5%, 1,
R43	3R77P752J	Composition: 7.5K ohms ±5%, 1
R44	3R77P331J	Composition: 330 ohms ±5%, 1,
R45	3R77P513J	Composition: 51K ohms ±5%, 1,
R47	3R77P202J	Composition: 2K ohms ±5%, 1/2
R48*	3R77P202J	Composition: 2K ohms ±5%, 1/2 by REV B.
R49* and R50*	3R77P512J	Composition: 5.1K ohms ±5%, 1 by REV B.
R51*	3R77P200J	Composition: 20 ohms ±5%, 1/2 REV B.
R52* and R53*	3R77P153J	Composition: 15K ohms ±5%, 1/ by REV B.
R54*	3R77P682J	Composition: 6.8K ohms ±5%, 1 by REV B.
R55 thru R64	3R77P752J	Composition: 7.5K ohms ±5%, 1
R65 thru R74	3R77P202J	Composition: 2K ohms ±5%, 1/2
R75 thru R84	3R77P103J	Composition: 10K ohms ±5%, 1/
R86*	3R77P512J	Composition: 5.1K ohms ±5%, 1
		In Models of REV A and earlier
	3R77P472J	Composition: 4.7K ohms ±5%, 1
R87	3R77P512J	Composition: 5.1K ohms ±5%, 1,
R88	3R77P511J	Composition: 510 ohms ±5%, 1/
R104 thru R109	3R77P512J	Composition: 5.1K ohms ±5%, 1
R111	3R77P622J	Composition: 6.2K ohms ±5%, 1,
R112	3R77P512J	Composition: 5.1K ohms ±5%, 1,
R113*	3R77P202J	Composition: 2K ohms ±5%, 1/2
		In REV and earlier:
	3R77P102J	Composition: 1K ohms ±5%, 1/2
R114	3R77P243J	Composition: 24K ohms ±5%, 1/
R115	3R77P623J	Composition: 62K ohms ±5%, 1/
R116 thru R118	3R77P202J	Composition: 2K ohms ±5%, 1/2

SYMBOL	GE PART NO.	DESCRIPTION
R24*	3R77P201J	Composition: 200 ohms ±5%, 1/2 w. Deleted by REV B.
R25* and R26*	3R77P113J	Composition: 11K ohms ±5%, 1/2 w.
		In Models of REV A or earlier:
	3R77P103J	Composition: 10,000 ohms ±5%, 1/2 w.
R27	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R28	3R77P133J	Composition: 13K ohms ±5%, 1/2 w.
R29	3R77P750J	Composition: 75 ohms ±5%, 1/2 w.
R30	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R31 and R32	3R77P153J	Composition: 15K ohms ±5%, 1/2 w.
R33	3R77P822J	Composition: 8.2K ohms ±5%, 1/2 w.
R34	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R35	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R36	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R37	3R77P301J	Composition: 300 ohms ±5%, 1/2 w.
R38 and R39	3R77P223J	Composition: 22K ohms ±5%, 1/2 w.
R40	3R77P123J	Composition: 12K ohms ±5%, 1/2 w.
R41	3R77P244J	Composition: 240K ohms ±5%, 1/2 w.
R42	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R43	3R77P752J	Composition: 7.5K ohms ±5%, 1/2 w.
R44	3R77P331J	Composition: 330 ohms ±5%, 1/2 w.
R45	3R77P513J	Composition: 51K ohms ±5%, 1/2 w.
R47	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R48*	3R77P202J	Composition: 2K ohms ±5%, 1/2 w. Deleted by REV B.
R49* and R50*	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w. Deleted by REV B.
R51*	3R77P200J	Composition: 20 ohms ±5%, 1/2 w. Deleted by REV B.
R52* and R53*	3R77P153J	Composition: 15K ohms ±5%, 1/2 w. Deleted by REV B.
R54*	3R77P682J	Composition: 6.8K ohms ±5%, 1/2 w. Deleted by REV B.
R55 thru R64	3R77P752J	Composition: 7.5K ohms ±5%, 1/2 w.
R65 thru R74	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R75 thru R84	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R86*	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
		In Models of REV A and earlier:
	3R77P472J	Composition: 4.7K ohms ±5%, 1/2 w.
R87	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R88	3R77P511J	Composition: 510 ohms ±5%, 1/2 w.
R104 thru R109	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R111	3R77P622J	Composition: 6.2K ohms ±5%, 1/2 w.
R112	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R113*	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
		In REV and earlier:
	3R77P102J	Composition: 1K ohms ±5%, 1/2 w.
R114	3R77P243J	Composition: 24K ohms ±5%, 1/2 w.
R115	3R77P623J	Composition: 62K ohms ±5%, 1/2 w.
R116 thru R118	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R119	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R120	3R77P163J	Composition: 16K ohms ±5%, 1/2 w.
R121	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R128 thru R132	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R134*	3R77P472J	Composition: 4.7K ohms ±5%, 1/2 w.
		In Models of REV A and earlier:
	3R77P101K	Composition: 100 ohms ±10%, 1/2 w. Added by REV A.
		- - - - - - - - - - THERMISTORS - - - - - - - - - -
RT1	5490828P21	Rod; 1250 ohms ±10%, 0.38 w max; sim to Carborundum Type 492H-11.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J601 thru J610	7480532P11	Connector, tube, phen: 9 pins; sim to Elco 04-802-27.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P601 thru P634	4029840P2	Contact, electrical: sim to AMP 42827-2.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	19D402486G2	Harness. (Includes J601-J610, P601-P634).

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 descriptions of parts affected by these revisions.

REV. C - Incorporated into initial shipment.

REV. D - To improve modulation level over the frequency range. Changed C2 and C48. Deleted C49.

REV. E - To improve the frequency response of the low pass filter. Changed C11.

REV. F - To stop the RF interference in the shared Channel Guard Repeater Panel. Added C51.

DESCRIPTION
tor: 0.22 µf ±20%, 50 VDCW. Added by REV A d by REV D.
olytic: 100 µf +150% -10%, 15 VDCW; sim lory Type TTX. Added by REV C.
c disc: 1000 pf ±20%, 1000 VDCW; sim to pe JF Discap. Added by REV F.
- - - - DIODES AND RECTIFIERS - - - - - - -
n, fast recovery, 225 mA, 50 PIV.
), fast recovery, 225 mA, 50 PIV.
), fast recovery, 225 mA, 50 PIV.
), fast recovery, 225 mA, 50 PIV. Added by
- - - - JACKS AND RECEPTACLES - - - - - -
., electrical: sim to Bead Chain L93-3.
): sim to Alden Products 654T.
): sim to Alden Products 654T.
, electrical: sim to Bead Chain L93-3.
): sim to Alden Products 654T.
, electrical. sim to Bead Chain L93-3.
): sim to Alden Products 654T.
, electrical: sim to Bead Chain L93-3.
- - - - - - TRANSISTORS - - - - - - - - -
, NPN.
, NPN. Deleted by REV B.
, NPN.
, NPN. Deleted by REV B.
, NPN.
, NPN.
, NPN.
- - - - - - RESISTORS - - - - - - - - -
tion: 2K ohms ±5%, 1/2 w.
tion: 75K ohms ±5%, 1/2 w.
tion: 62 ohms ±5%, 1/2 w.
tion: 1K ohms ±5%, 1/2 w.
tion: 5.1K ohms ±5%, 1/2 w.
tion: 3.6K ohms ±5%, 1/2 w.
tion: 5.1K ohms ±5%, 1/2 w.
tion: 75K ohms ±5%, 1/2 w.
tion: 2K ohms ±5%, 1/2 w.
tion: 1.5K ohms ±5%, 1/2 w.
tion: 100 ohms ±5%, 1/2 w.
tion: 2.7K ohms ±5%, 1/2 w. Deleted 3.
tion: 36K ohms ±5%, 1/2 w. Deleted 3.
tion: 1K ohms ±5%, 1/2 w. Deleted 3.
tion: 510 ohms ±5%, 1/2 w. Deleted by

SYMBOL	GE PART NO.	DESCRIPTION
R24*	3R77P201J	Composition: 200 ohms ±5%, 1/2 w. Deleted by REV B.
R25* and R26*	3R77P113J	Composition: 11K ohms ±5%, 1/2 w.
		In Models of REV A or earlier:
	3R77P103J	Composition: 10,000 ohms ±5%, 1/2 w.
R27	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R28	3R77P133J	Composition: 13K ohms ±5%, 1/2 w.
R29	3R77P750J	Composition: 75 ohms ±5%, 1/2 w.
R30	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R31 and R32	3R77P153J	Composition: 15K ohms ±5%, 1/2 w.
R33	3R77P822J	Composition: 8.2K ohms ±5%, 1/2 w.
R34	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R35	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R36	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R37	3R77P301J	Composition: 300 ohms ±5%, 1/2 w.
R38 and R39	3R77P223J	Composition: 22K ohms ±5%, 1/2 w.
R40	3R77P123J	Composition: 12K ohms ±5%, 1/2 w.
R41	3R77P244J	Composition: 240K ohms ±5%, 1/2 w.
R42	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R43	3R77P752J	Composition: 7.5K ohms ±5%, 1/2 w.
R44	3R77P331J	Composition: 330 ohms ±5%, 1/2 w.
R45	3R77P513J	Composition: 51K ohms ±5%, 1/2 w.
R47	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R48*	3R77P202J	Composition: 2K ohms ±5%, 1/2 w. Deleted by REV B.
R49* and R50*	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w. Deleted by REV B.
R51*	3R77P200J	Composition: 20 ohms ±5%, 1/2 w. Deleted by REV B.
R52* and R53*	3R77P153J	Composition: 15K ohms ±5%, 1/2 w. Deleted by REV B.
R54*	3R77P682J	Composition: 6.8K ohms ±5%, 1/2 w. Deleted by REV B.
R55 thru R64	3R77P752J	Composition: 7.5K ohms ±5%, 1/2 w.
R65 thru R74	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R75 thru R84	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R86*	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
		In Models of REV A and earlier:
	3R77P472J	Composition: 4.7K ohms ±5%, 1/2 w.
R87	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R88	3R77P511J	Composition: 510 ohms ±5%, 1/2 w.
R104 thru R109	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R111	3R77P622J	Composition: 6.2K ohms ±5%, 1/2 w.
R112	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R113*	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
		In REV and earlier:
	3R77P102J	Composition: 1K ohms ±5%, 1/2 w.
R114	3R77P243J	Composition: 24K ohms ±5%, 1/2 w.
R115	3R77P623J	Composition: 62K ohms ±5%, 1/2 w.
R116 thru R118	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.

SYMBOL	GE PART NO.	
R119	3R77P103J	Composit
R120	3R77P163J	Composit
R121	3R77P302J	Composit
R129 thru R132	3R77P512J	Composit
R134*	3R77P472J	Composit
		In Model
	3R77P101K	Composit by REV A
		- - - - -
RT1	5490828P21	Rod: 12 Carborun
		- - - - -
J601 thru J610	7480532P11	Connecto 04-902-2
		- - - - -
P601 thru P634	4029840P2	Contact.
		- - - - -
	19D402486G2	Harness.

PRODUCT

Changes in the equipment to improve perform
Letter," which is stamped after the model numb
previous revisions. Refer to the Parts List for

REV. C - Incorporated into initia

REV. D - To improve modulation le
C2 and C48. Deleted C49

REV. E - To improve the frequency
Changed C11.

REV. F - To stop the RF interfere
Panel. Added C51.

SYMBOL	GE PART NO.	DESCRIPTION
R119	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R120	3R77P163J	Composition: 16K ohms ±5%, 1/2 w.
R121	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R129 thru R132	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R134*	3R77P472J	Composition: 4.7K ohms ±5%, 1/2 w.
		In Models of REV A and earlier:
	3R77P101K	Composition: 100 ohms ±10%, 1/2 w. Added by REV A.
		- - - - - - - - - THERMISTORS - - - - - - - - -
RT1	5490828P21	Rod: 1250 ohms ±10%, 0.38 w max; sim to Carborundum Type 492H-11.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J601 thru J610	7480532P11	Connector, tube, pben: 9 pins; sim to Elco 04-902-27.
		- - - - - - - - - - - PLUGS - - - - - - - - - -
P601 thru P634	4029840P2	Contact, electrical: sim to AMP 42827-2.
		- - - - - - - - - - MISCELLANEOUS - - - - - - -
	19D402486G2	Harness. (Includes J601-J610, P601-P634).

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 descriptions of parts affected by these revisions.

REV. C - Incorporated into initial shipment.

REV. D - To improve modulation level over the frequency range. Changed C2 and C48. Deleted C49.

REV. E - To improve the frequency response of the low pass filter. Changed C11.

REV. F - To stop the RF interference in the shared Channel Guard Repeater Panel. Added C51.

PARTS LIST

LBI3700D

TONE MODULE
19D402608G1

SYMBOL	GE PART NO.	DESCRIPTION
A1*		COMPONENT BOARD 19C311129G1 (Added by REV A)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
C2	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C3 and C4	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C5	19A115028P111	Polyester: .047 µf ±20%, 200 VDCW.
C6	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 and CR2	5494922P1	Silicon; sim to Type 1N456.
CR3 thru CR6	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 and J2	4033513P15	Contact, electrical: sim to Bead Chain R40-1A.
J4 thru J7	4033513P15	Contact, electrical: sim to Bead Chain R40-1A.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 and Q2	19A115362P1	Silicon, NPN; sim to Type 2N2925.
Q3	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q4	19A115362P1	Silicon, NPN; sim to Type 2N2925.
Q5 thru Q7	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q8	19A115768P1	Silicon, PNP; sim to Type 2N3702.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	5495948P426	Deposited carbon: 182K ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
R2	19A116278P365	Metal film: 46.4K ohms ±2%, 1/2 w.
R3	19A116278P389	Metal film: 82.5K ohms ±2%, 1/2 w.
R4	3R152P204J	Composition: 200K ohms ±5%, 1/4 w.
R6	3R152P204J	Composition: 200K ohms ±5%, 1/4 w.
R10	19A116278P233	Metal film: 2150 ohms ±2%, 1/2 w.
R11	19A116278P353	Metal film: 34,800 ohms ±2%, 1/2 w.
R12	19A116278P301	Metal film: 10K ohms ±2%, 1/2 w.
R13	19A116278P65	Metal film: 46.4 ohms ±2%, 1/2 w.
R14	3R152P432J	Composition: 4.3K ohms ±5%, 1/4 w.
R15	19A116278P329	Metal film: 19.6K ohms ±2%, 1/2 w.
R16	19A116278P412	Metal film: 130K ohms ±2%, 1/2 w.
R17	19A116278P285	Metal film: 7.5K ohms ±2%, 1/2 w.
R18	19A116278P117	Metal film: 147 ohms ±2%, 1/2 w.
R19	19A116278P269	Metal film: 5110 ohms ±2%, 1/2 w.
R20	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
R21	3R152P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R22	3R152P113J	Composition: 11,000 ohms ±5%, 1/4 w.
R23	3R152P361J	Composition: 360 ohms ±5%, 1/4 w.
R24	3R152P242J	Composition: 2400 ohms ±5%, 1/4 w.
R25	3R152P152J	Composition: 1500 ohms ±5%, 1/4 w.
R26	3R152P201J	Composition: 200 ohms ±5%, 1/4 w.
R27	3R152P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R28	3R152P242J	Composition: 2400 ohms ±5%, 1/4 w.
R29	3R152P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R30	3R152P512J	Composition: 5100 ohms ±5%, 1/4 w.
R31	3R152P272J	Composition: 2700 ohms ±5%, 1/4 w.
R32	3R152P511J	Composition: 510 ohms ±5%, 1/4 w.
R33	3R152P182J	Composition: 1800 ohms ±5%, 1/4 w.
R34	3R152P512J	Composition: 5100 ohms ±5%, 1/4 w.
R35	3R152P302J	Composition: 3000 ohms ±5%, 1/4 w.
R36 and R37	3R152P303J	Composition: 30,000 ohms ±5%, 1/4 w.
R38	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
		- - - - - - - - - - SOCKETS - - - - -
XFL1	7768887P17	Tube, phen: 7 pins; sim to Elco 04-71
		IN MODELS EARLIER THAN REV
		COMPONENT BOARD 19C303864G1
		- - - - - - - - - - CAPACITORS - - - -
C1	19B209243P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C2	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Type 150D.
C3 and C4	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Type 150D.
		- - - - - - - DIODES AND RECTIFIERS -
CR1 and CR2	5494922P1	Silicon; sim to Type 1N456.
CR3 thru CR5	4036936P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES -
J1 thru J7	4033513P16	Contact, electrical: sim to Bead Chai
		- - - - - - - - - TRANSISTORS - - - -
Q1 and Q2	19A115362P1	Silicon, NPN; sim to Type 2N2925.
Q3	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q4	19A115362P1	Silicon, NPN; sim to Type 2N2925.
Q5 thru Q7	19A115123P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - -
R1	5495948P426	Deposited carbon: 182,000 ohms ±1%, 1 to Texas Instrument Type CD1/2MR.
R2	5495948P365	Deposited carbon: 46,400 ohms ±1%, 1/ to Texas Instrument Type CD1/2MR.
R3	5496948P389	Deposited carbon: 82,500 ohms ±1%, 1/ Texas Instrument Type CD1/2MR.
R4	3R77P204J	Composition: 0.2 megohm ±5%, 1/2 w.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SYMBOL	GE PART NO.	DESCRIPTION
R19	19A116278P269	Metal film: 5110 ohms ±2%, 1/2 w.
R20	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
R21	3R152P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R22	3R152P113J	Composition: 11,000 ohms ±5%, 1/4 w.
R23	3R152P361J	Composition: 360 ohms ±5%, 1/4 w.
R24	3R152P242J	Composition: 2400 ohms ±5%, 1/4 w.
R25	3R152P152J	Composition: 1500 ohms ±5%, 1/4 w.
R26	3R152P201J	Composition: 200 ohms ±5%, 1/4 w.
R27	3R152P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R28	3R152P242J	Composition: 2400 ohms ±5%, 1/4 w.
R29	3R152P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R30	3R152P512J	Composition: 5100 ohms ±5%, 1/4 w.
R31	3R152P272J	Composition: 2700 ohms ±5%, 1/4 w.
R32	3R152P511J	Composition: 510 ohms ±5%, 1/4 w.
R33	3R152P182J	Composition: 1800 ohms ±5%, 1/4 w.
R34	3R152P512J	Composition: 5100 ohms ±5%, 1/4 w.
R35	3R152P302J	Composition: 3000 ohms ±5%, 1/4 w.
R36 and R37	3R152P303J	Composition: 30,000 ohms ±5%, 1/4 w.
R38	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XFL1	7768887P17	Tube, phen: 7 pins; sim to Elco 04-710-02.
		IN MODELS EARLIER THAN REV A
		COMPONENT BOARD 19C303864G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19B209243P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C2	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C3 and C4	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR1 and CR2	5494922P1	Silicon; sim to Type 1N456.
CR3 thru CR5	4036936P1	Silicon.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1 thru J7	4033513P16	Contact, electrical: sim to Bead Chain R52-1.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 and Q2	19A115362P1	Silicon, NPN; sim to Type 2N2925.
Q3	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q4	19A115362P1	Silicon, NPN; sim to Type 2N2925.
Q5 thru Q7	19A115123P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	5495948P426	Deposited carbon: 182,000 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
R2	5495948P365	Deposited carbon: 46,400 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
R3	5495948P389	Deposited carbon: 82,500 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
R4	3R77P204J	Composition: 0.2 megohm ±5%, 1/2 w.

SYMBOL	GE PART NO.	DESCRIPTION
R5	5495948P438	Deposited carbon: 243,000 ohms ±1%, 1/2 w; s to Texas Instrument Type CD1/2MR.
R6	5495948P430	Deposited carbon: 200,000 ohms ±1%, 1/2 w; s to Texas Instrument Type CD1/2MR.
R10	5495948P233	Deposited carbon: 2150 ohms ±1%, 1/2 w; sim Texas Instrument Type CD1/2MR.
R11	5495948P353	Deposited carbon: 34,800 ohms ±1%, 1/2 w; sir Texas Instrument Type CD1/2MR.
R12	5495948P301	Deposited carbon: 10,000 ohms ±1%, 1/2 w; sir Texas Instrument Type CD1/2MR.
R13	5495948P65	Deposited carbon: 46.4 ohms ±1%, 1/2 w; sim Texas Instrument Type CD1/2MR.
R14	3R77P432J	Composition: 4300 ohms ±5%, 1/2 w.
R15	5495948P329	Deposited carbon: 19,600 ohms ±1%, 1/2 w; sin Texas Instrument Type CD1/2MR.
R16	5495948P412	Deposited carbon: 130,000 ohms ±1%, 1/2 w; si to Texas Instrument Type CD1/2MR.
R17	5495948P285	Deposited carbon: 7500 ohms ±1%, 1/2 w; sim Texas Instrument Type CD1/2MR.
R18	5495948P117	Deposited carbon: 147 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
R19	5495948P269	Deposited carbon: 5110 ohms ±1%, 1/2 w; sim Texas Instrument Type CD1/2MR.
R20	3R77P102J	Composition: 1000 ohms ±5%, 1/2 w.
R21	3R77P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R22	3R77P113J	Composition: 11,000 ohms ±5%, 1/2 w.
R23	3R77P361J	Composition: 360 ohms ±5%, 1/2 w.
R24	3R77P242J	Composition: 2400 ohms ±5%, 1/2 w.
R25	3R77P152J	Composition: 1500 ohms ±5%, 1/2 w.
R26	3R77P201J	Composition: 200 ohms ±5%, 1/2 w.
R27	3R77P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R28	3R77P242J	Composition: 2400 ohms ±5%, 1/2 w.
R29	3R77P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R30	3R77P512J	Composition: 5100 ohms ±5%, 1/2 w.
R31	3R77P272J	Composition: 2700 ohms ±5%, 1/2 w.
R32	3R77P511J	Composition: 510 ohms ±5%, 1/2 w.
R33	3R77P182J	Composition: 1800 ohms ±5%, 1/2 w.
R34	3R77P512J	Composition: 5100 ohms ±5%, 1/2 w.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XFL1	7768887P17	Tube, phen: 7 pins; sim to Elco 04-710-02.
		- - - - - - - - - - FILTERS - - - - - - - - - -
FL1		TONE FREQUENCY NETWORK 19B205280
	19B205280G1	71.9 Hz
	19B205280G2	77.0 Hz
	19B205280G3	82.5 Hz
	19B205280G4	88.5 Hz
	19B205280G5	94.8 Hz
	19B205280G6	100.0 Hz
	19B205280G7	103.5 Hz
	19B205280G8	107.2 Hz
	19B205280G9	110.9 Hz
	19B205280G10	114.8 Hz
	19B205280G11	118.8 Hz
	19B205280G12	123.0 Hz
	19B205280G13	127.3 Hz
	19B205280G14	131.8 Hz
	19B205280G15	136.5 Hz
	19B205280G16	141.3 Hz
	19B205280G17	146.2 Hz
	19B205280G18	151.4 Hz
	19B205280G19	156.7 Hz
	19B205280G20	162.2 Hz
	19B205280G21	167.9 Hz
	19B205280G22	173.8 Hz
	19B205280G23	179.9 Hz
	19B205280G24	188.2 Hz
	19B205280G25	192.8 Hz
	19B205280G28	203.5 Hz
	19B205280G30	74.4 Hz
	19B205280G31	7.97 Hz
	19B205280G32	85.4 Hz
	19B205280G33	91.5 Hz
	19B205280G34	97.4 Hz

NGES.

T NO.	DESCRIPTION
438	Deposited carbon: 243,000 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
430	Deposited carbon: 200,000 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
233	Deposited carbon: 2150 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
353	Deposited carbon: 34,800 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
301	Deposited carbon: 10,000 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
65	Deposited carbon: 46.4 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
J	Composition: 4300 ohms ±5%, 1/2 w.
329	Deposited carbon: 19,600 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
412	Deposited carbon: 130,000 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
285	Deposited carbon: 7500 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
117	Deposited carbon: 147 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
269	Deposited carbon: 5110 ohms ±1%, 1/2 w; sim to Texas Instrument Type CD1/2MR.
J	Composition: 1000 ohms ±5%, 1/2 w.
J	Composition: 20,000 ohms ±5%, 1/2 w.
J	Composition: 11,000 ohms ±5%, 1/2 w.
J	Composition: 360 ohms ±5%, 1/2 w.
J	Composition: 2400 ohms ±5%, 1/2 w.
J	Composition: 1500 ohms ±5%, 1/2 w.
J	Composition: 200 ohms ±5%, 1/2 w.
J	Composition: 51,000 ohms ±5%, 1/2 w.
J	Composition: 2400 ohms ±5%, 1/2 w.
J	Composition: 20,000 ohms ±5%, 1/2 w.
J	Composition: 5100 ohms ±5%, 1/2 w.
J	Composition: 2700 ohms ±5%, 1/2 w.
J	Composition: 510 ohms ±5%, 1/2 w.
J	Composition: 1800 ohms ±5%, 1/2 w.
J	Composition: 5100 ohms ±5%, 1/2 w.
	- - - - - - - - - - SOCKETS - - - - - - - - - -
17	Tube, phen: 7 pins; sim to Elco 04-710-02.
	- - - - - - - - - - FILTERS - - - - - - - - - -
	TONE FREQUENCY NETWORK 19B205280
001	71.9 Hz
002	77.0 Hz
003	82.5 Hz
004	88.5 Hz
005	94.8 Hz
006	100.0 Hz
007	103.5 Hz
008	107.2 Hz
009	110.9 Hz
010	114.8 Hz
011	118.8 Hz
012	123.0 Hz
013	127.3 Hz
014	131.8 Hz
015	136.5 Hz
016	141.3 Hz
017	146.2 Hz
018	151.4 Hz
019	156.7 Hz
020	162.2 Hz
021	167.9 Hz
022	173.8 Hz
023	179.9 Hz
024	186.2 Hz
025	192.8 Hz
026	203.5 Hz
030	74.4 Hz
031	7.97 Hz
032	85.4 Hz
033	91.5 Hz
034	97.4 Hz

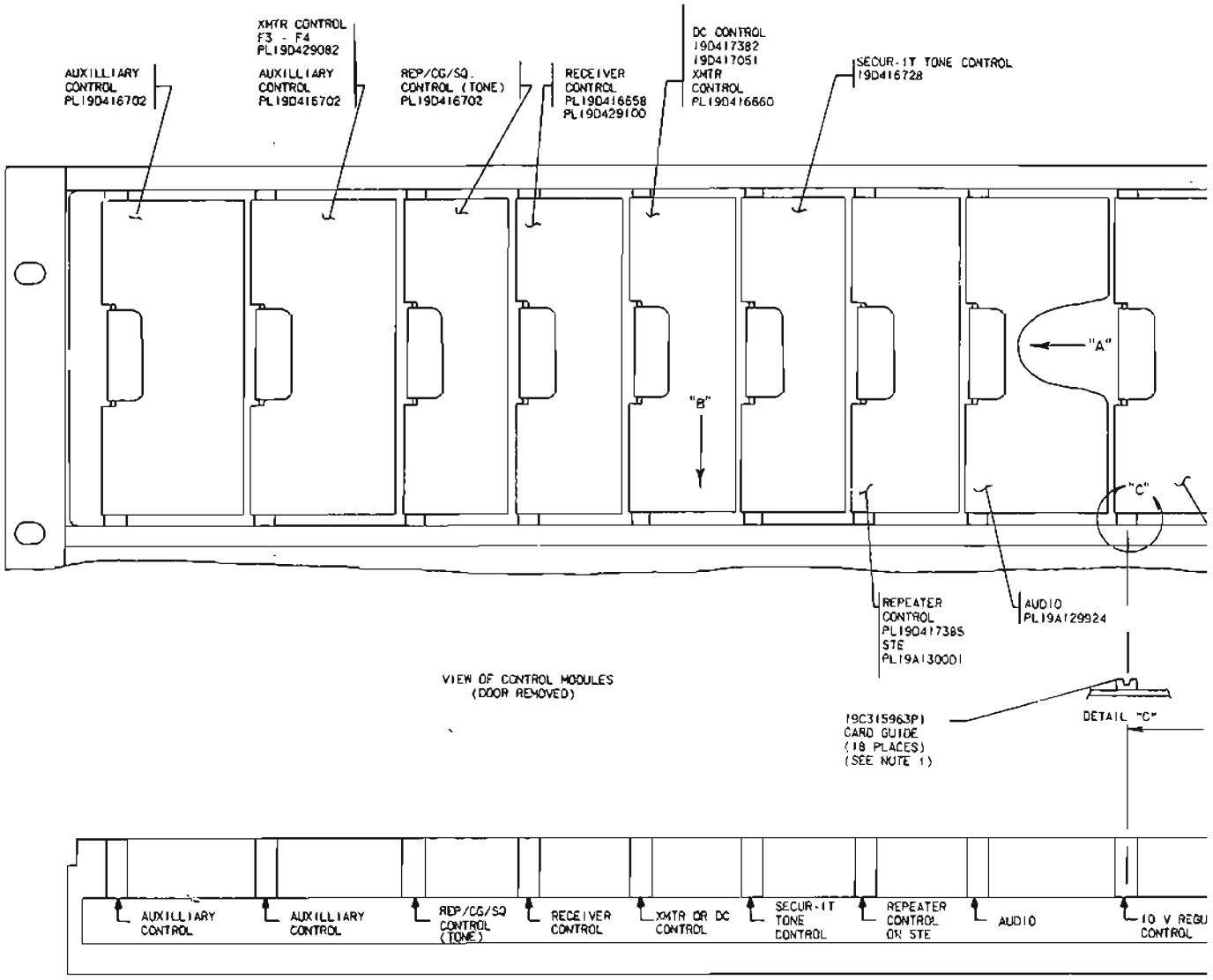
SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1	19B209040P7	Slide: SPDT, 0.5 amp at 125 v; sim to Continental-Wirt Type G-132. (Added by REV B).
		- - - - - - - - - - CABLES - - - - - - - - - -
W1		CABLE 19B205184G1
		- - - - - - - - - - PLUGS - - - - - - - - - -
P1 and P2	4036 34P2	Contact, electrical: sim to AMP 42429-2.
P4 thru P7	4036634P2	Contact, electrical: sim to AMP 42429-2.
P8		Includes the following:
	5491583P4	Shell, connector: sim to Methode C860-1V.
	5491583P2	Connector, phen: 9 pins; sim to Methode M860.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - - -
	NP248853	Nameplate, plastic.
	7763541P3	Retaining strap. (Secures W1).
	7878455P2	Terminal, solderless. (Located at W1 retainer).
	19B209008P3	Bushing, electrical conductor. (Used with W1).
	5491563P3	Cover, electrical. (Used with XFL1).

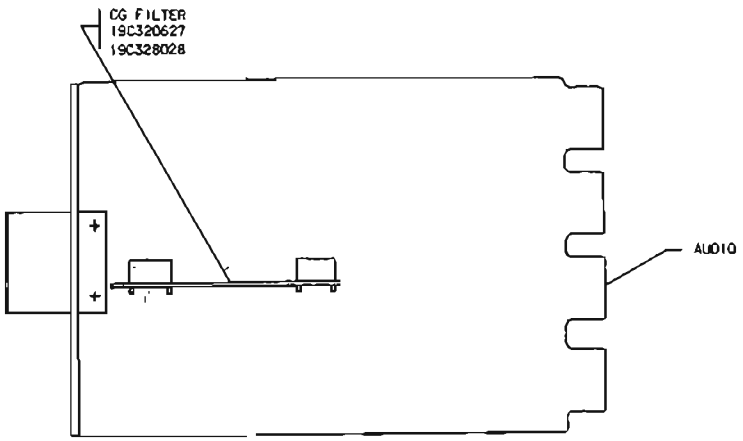
PRODUCTION CHANGES

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 descriptions of parts affected by these revisions.

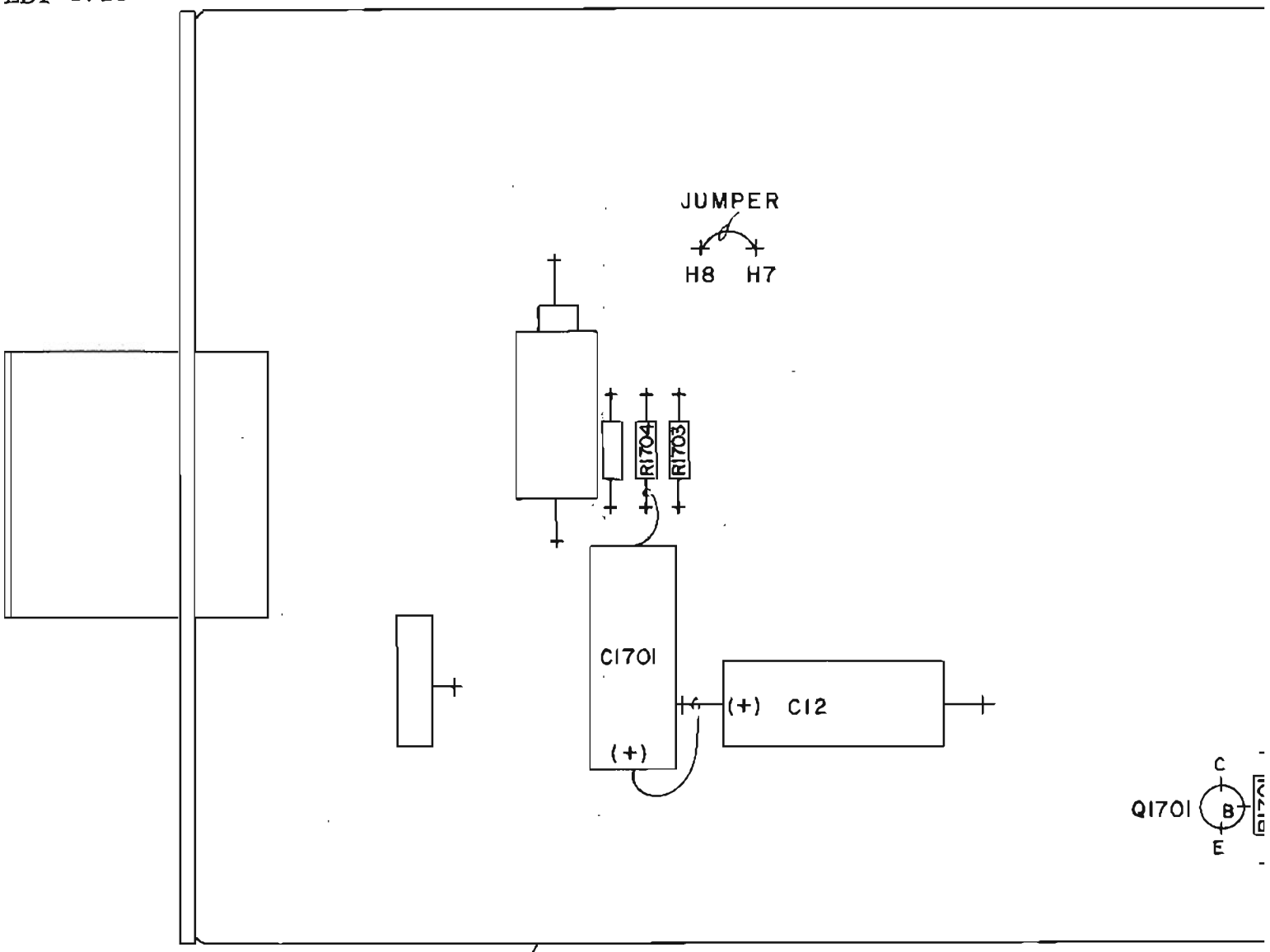
REV. A - To make Tone Module compatible with Shared Remote Equipment. Changed Component Board A1.

REV. B - To provide test switch. Added S1.

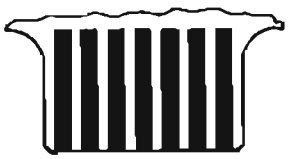




NOTES:
1 PART OF
2 ALIGN ARROW WITH



REPEATER BOARD
(PL19D417385)



8 9 10 11 12 13 14

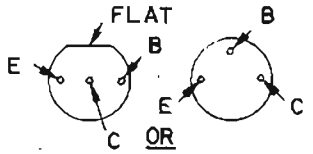
7 6 5 4 3 2 1

SOLDER SIDE

DETAIL "A"

TYP. NUMBERING OF CONT. FINGERS

LEAD IDENTIFICATION FOR



IN LINE TRIANGULAR

VIEW FROM LEAD END

NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION

THESE INSTRUCTIONS COVER THE INSTALL SHARED REPEATER KIT (PL19A129953G1) REPEATER BOARD.

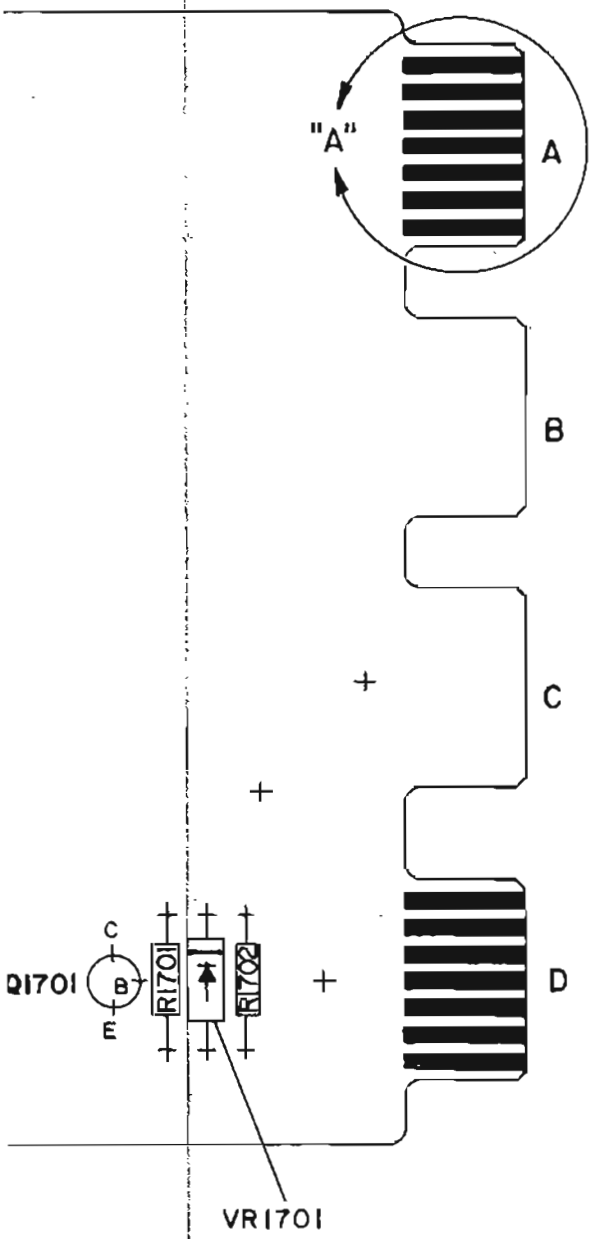
INSTRUCTIONS FOR THE SHARED REPEATER

1. SOLDER ALL ELECTRICAL CONNECTION
2. ASSEMBLE Q1701, R1701, R1702 AND
3. TRIM LEADS AND TABS PROJECTING F TO .06 MAX.
4. REMOVE JUMPER FROM H7 AND H8.

(19C320820, Rev. 2)

INSTALLATION INSTRUCTIONS

SHARED REPEATER KIT



PARTS LIST

LBI-4719

SHARED REPEATER KIT
19A129953G1
(Refer to Schematic Diagram of Repeater Control Board in Repeater Control Maintenance Manual)

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1701	19A115889P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1701	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R1702	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
		- - - - - - - - VOLTAGE REGULATORS - - - - - - - -
VR1701	4036887P5	Silicon, Zener.

THE INSTALLATION OF THE
9A129953G1) TO THE (PL19D417385)

RED REPEATER KIT (PL19A129953G1)

L CONNECTIONS:

1, R1702 AND VR1701 AS SHOWN.

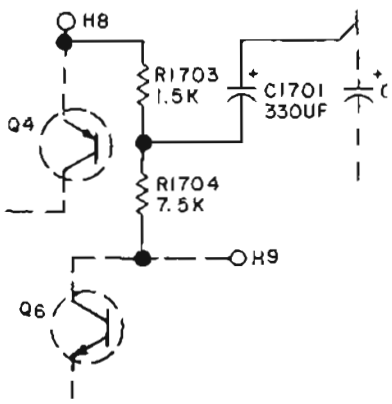
PROJECTING FROM SOLDER SIDE

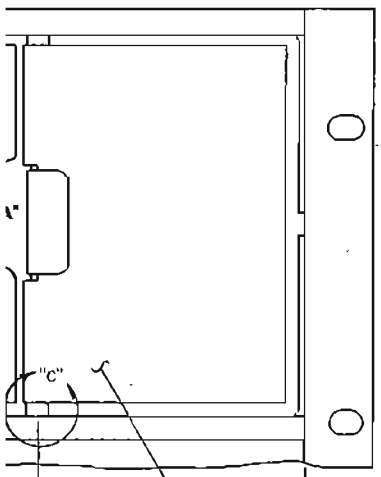
7 AND H8.

THESE INSTRUCTIONS COVER THE INSTALLATION OF THE REPEAT WITH REMOTE KEYING PANEL KIT (PL19A129953G2) TO THE REPEATER BOARD (PL19D417385).

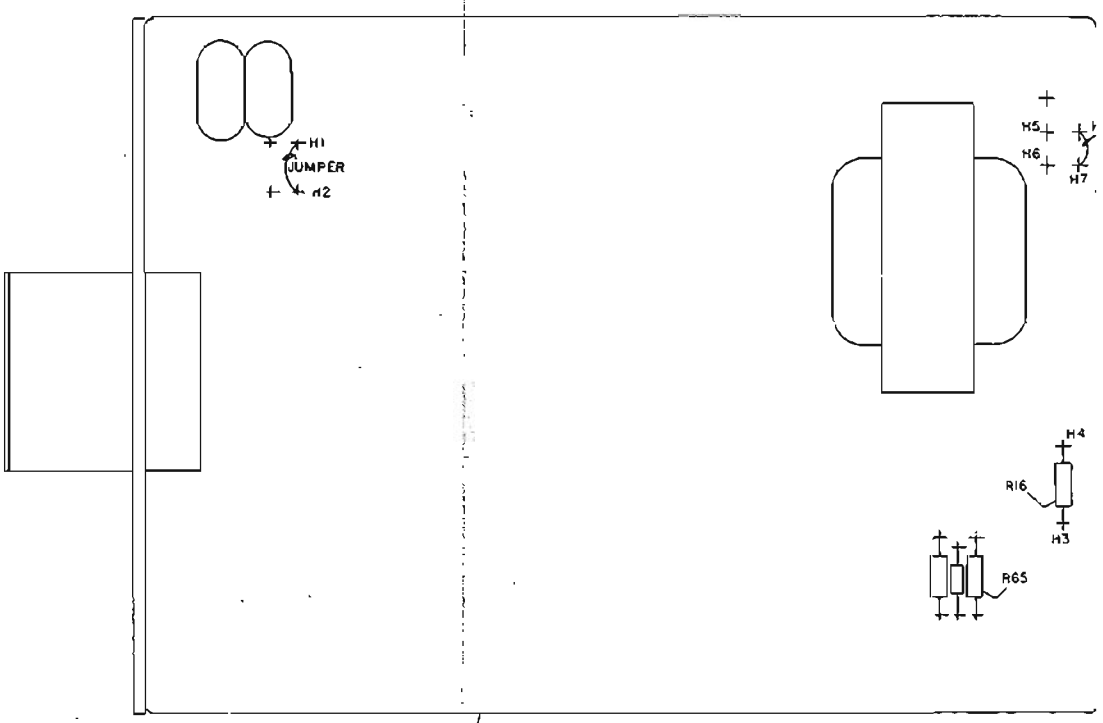
INSTRUCTIONS FOR REPEAT WITH REMOTE KEYING PANEL KIT (PL19A129953G2)

1. REMOVE R11 (5.1K) AND REPLACE WITH R1704 (7.5K).
2. REMOVE R12 (1K) AND REPLACE WITH R1703 (1.5K).
3. ASSEMBLE C1701 (330 uf) AS SHOWN.
4. TEST BY APPLYING +10V TO D1 AND GROUND TO D8. CONNECT A 10K RESISTOR FROM D3 TO +10V. BE SURE REPEATER DISABLE SWITCH IS IN THE ENABLE POSITION. GROUND A12 AND OBSERVE THAT THE OUTPUT AT D3 DROPS TO < 1V IN 180-250 MS.





RT OF HDW. KIT PL19A13003G3
IGN ARROW WITH CENTER OF FIRST GUIDE WITHIN .06.



THESE INSTRUCTIONS COVER THE MODIFICATIONS TO THE AUDIO BOARD (19A123924) FOR OPERATION WITH CHANNEL GUARD SYSTEM AND FOR OPERATION IN TONE CONTROL OR WITH CHANNEL GUARD IN A TONE CONTROL SYSTEM.

(1) MODIFICATION FOR OPERATION AS CHANNEL GUARD SYSTEM

1 REMOVE JUMPER BETWEEN HOLE 1 AND HOLE 2 AND DISCARD

(2) MODIFICATIONS FOR OPERATION IN TONE CONTROL SYSTEM

1 REMOVE R16 AND R65 AND DISCARD
2 REMOVE JUMPER BETWEEN HOLE 7 AND HOLE 8 AND DISCARD

(3) MODIFICATIONS FOR OPERATION IN TONE CONTROL SYSTEM WITH CHANNEL GUARD

1. REMOVE JUMPER BETWEEN HOLE 1 AND HOLE 2 AND DISCARD.
2. REMOVE R16 AND R65 AND DISCARD.
3. REMOVE JUMPER BETWEEN HOLE 7 AND HOLE 8 AND DISCARD

(19C320824, Rev. 1)

(10) RPT DISABLE (TONE)

(11) SQUELCH LEVEL (TONE)

(12) CG ON-OF (TONE)

(13) AUX CONTROL (2 FUNCTION)

(14) CG ON-OF & REPEAT DISABLE

(15) AUX CONTROL (1 FUNCTION)

(16) REPEAT DISABLE DC CONTROL

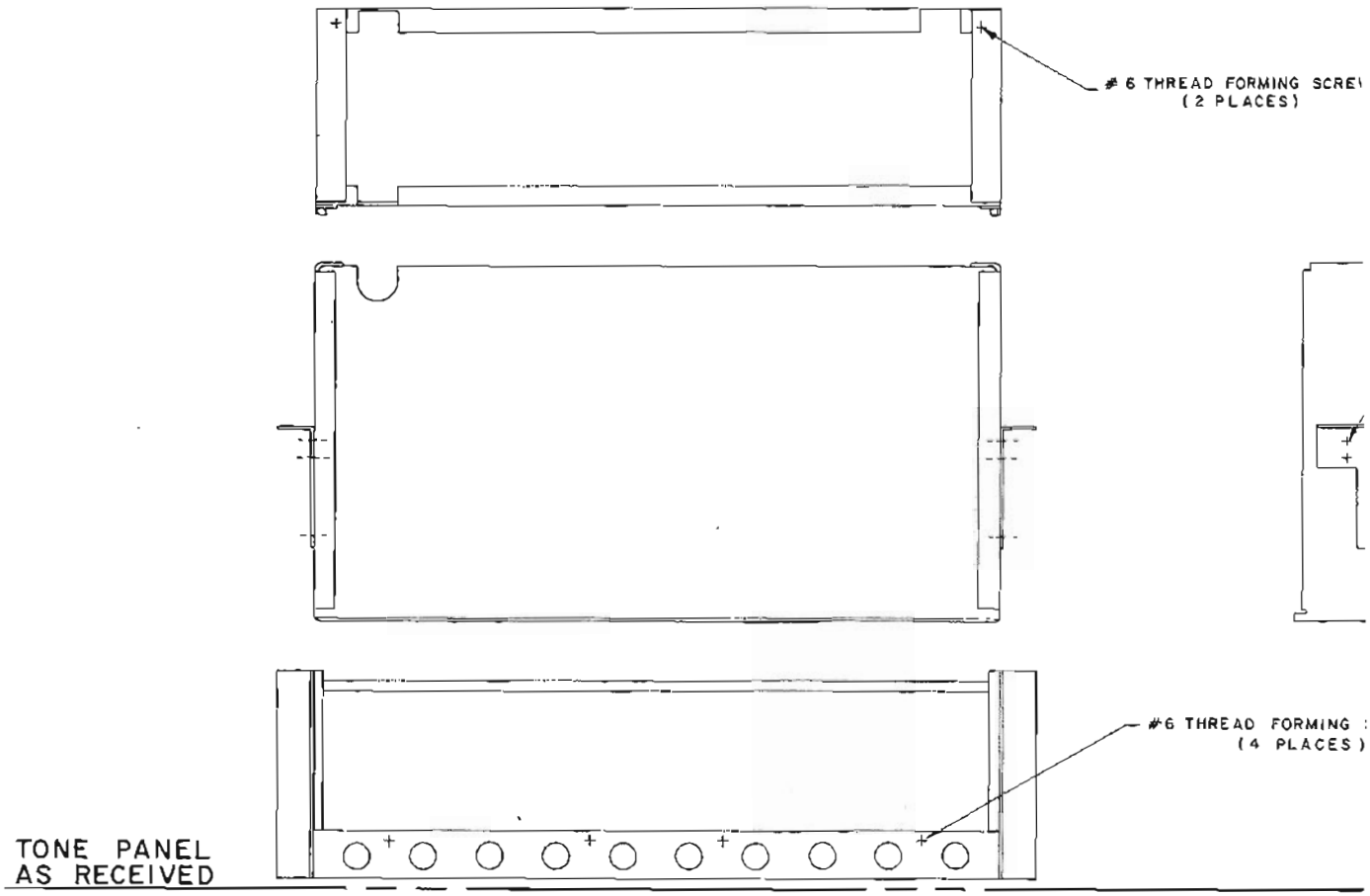
(17) SHARED REPEATER (UP TO 10 TONE)

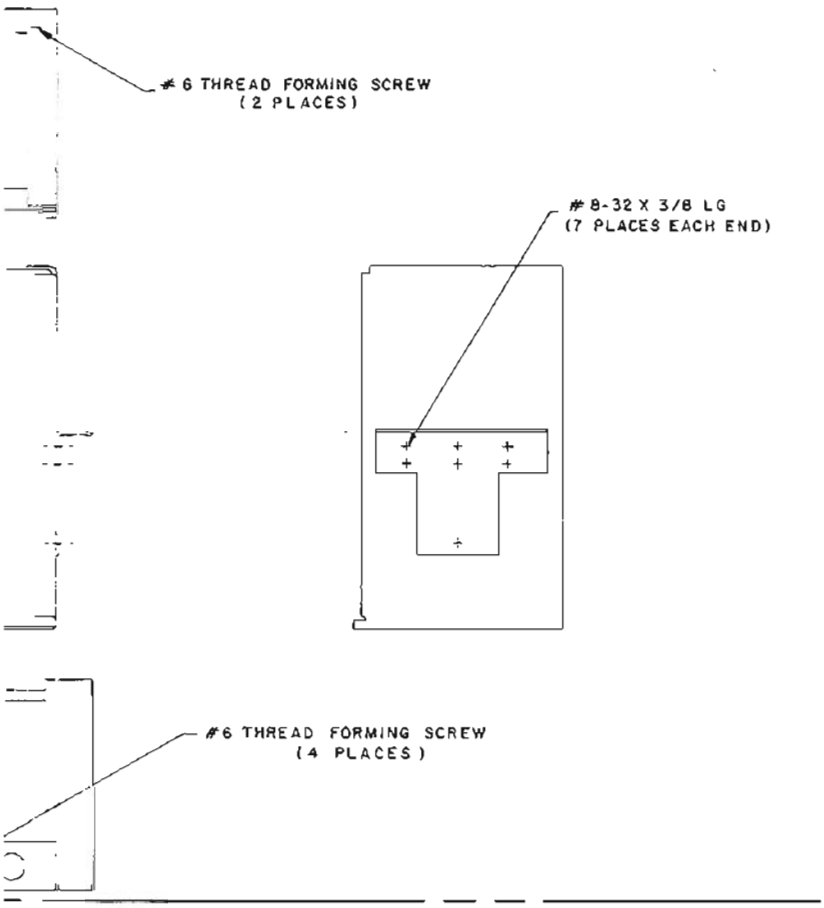
Rev. 4)

MODIFICATION INSTRUCT

AUDIO B

Issue 4


#6 THREAD FORMING SCRE
(2 PLACES)
#6 THREAD FORMING
(4 PLACES)
TONE PANEL
AS RECEIVED



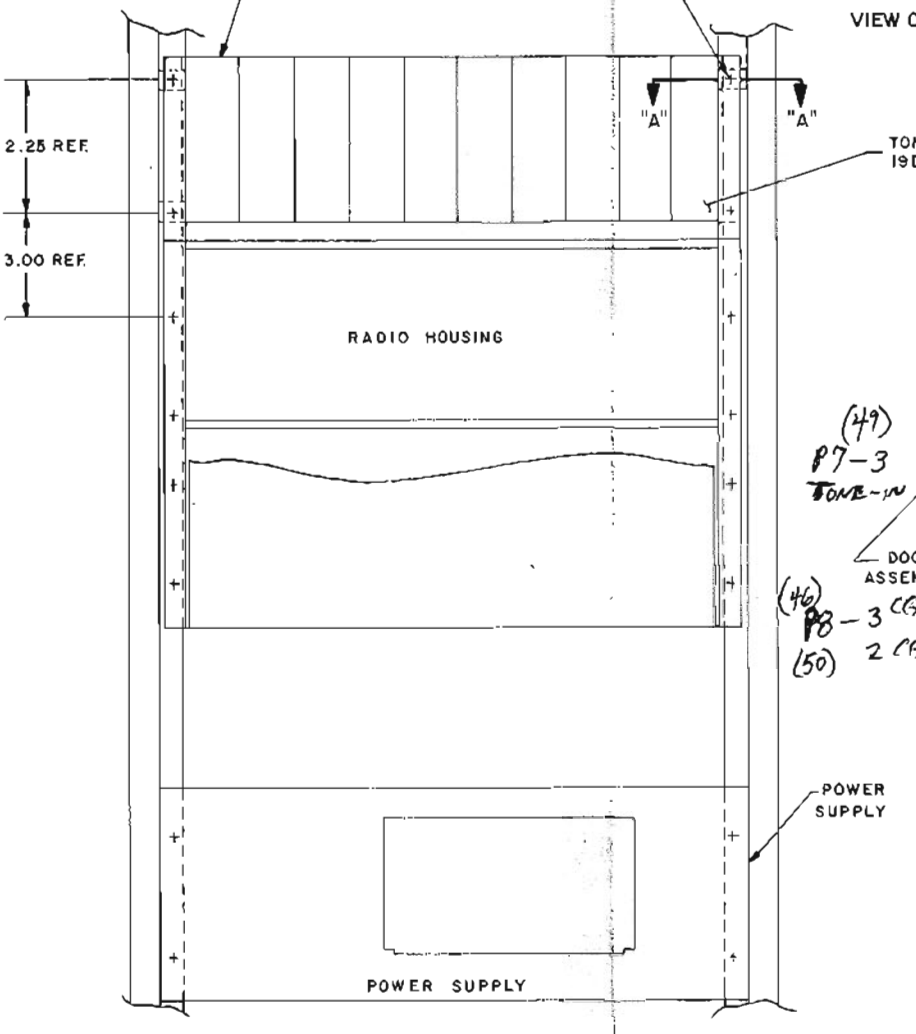
2.25 RE

3.00 RE

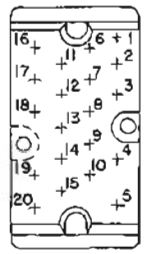
(1) THESE INSTRUCTIONS COVER THE MODIFICATION OF THE 19D402486G1 TONE PANEL FOR USE IN MASTER II CABINETS. ALSO THE INSTALLATION OF THE TONE PANEL AND 19A130047G1 HARNESS IN 44 INCH DESK MATE, POLE MOUNT & FLOOR MOUNT CABINETS

INSTRUCTIONS:

1. REMOVE 7 8-32 X 3/8 SCREWS SECURING MOUNTING BRACKETS ON EACH END OF SHELF. SAVE HARDWARE AND DISCARD MOUNTING BRACKETS.
2. REMOVE THE FOUR 6 THREAD FORMING SCREWS WHICH SECURE BOTTOM OF SHELF TO FRAME. SAVE HARDWARE.
3. REMOVE THE TWO 6 THREAD FORMING SCREWS IN EACH LOWER REAR CORNER. SWING SHELF BOTTOM CLEAR. SAVE HARDWARE
4. MOUNT THE TWO 19B226202P1 MOUNTING BRACKETS ON SHELF AS SHOWN USING FIVE 8-32 X 3/8 LG SCREWS AT EACH END DISCARD EXTRA BRACKET MOUNTING SCREWS.
5. REASSEMBLE SHELF BOTTOM TO SHELF.
6. INSTALL FOUR CLIPS ON CABINET MOUNTING RAILS AS SHOWN ON SHEET 2.
7. MOUNT TONE PANEL IN CABINET USING FOUR 19A134011P1 SCREWS SUPPLIED IN KIT
8. INSTALL 19A130047G1 HARNESS. SOLDER CONNECTIONS AT P7 & P8.
9. REFERENCE INTERCONNECTION DIAGRAM 19B622034
10. SPOT TIE OVERLAY HARNESS TO EXISTING HARNESS



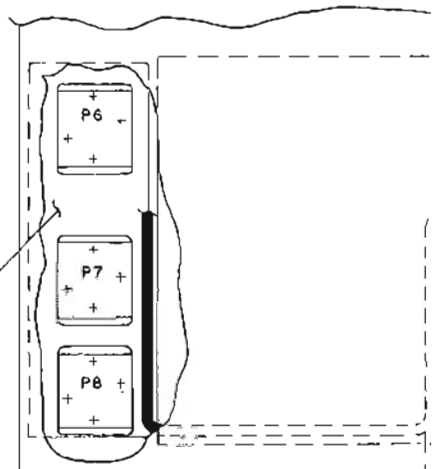
FRONT VIEW



VIEW OF WIRING END OF P7 & P8

VIEW OF

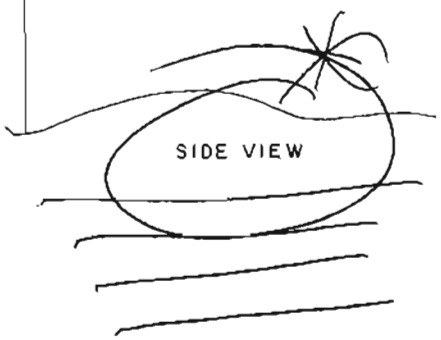
(LABEL)



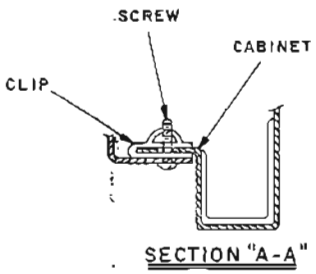
(49) P7-3 TONE-IN

(46) P8-3 CG Hi

(50) 2 CG Lo



SIDE VIEW



SECTION "A-A"

4024866I
NSTALL-
44 INCH

RACKETS ON
NTING

SECURE

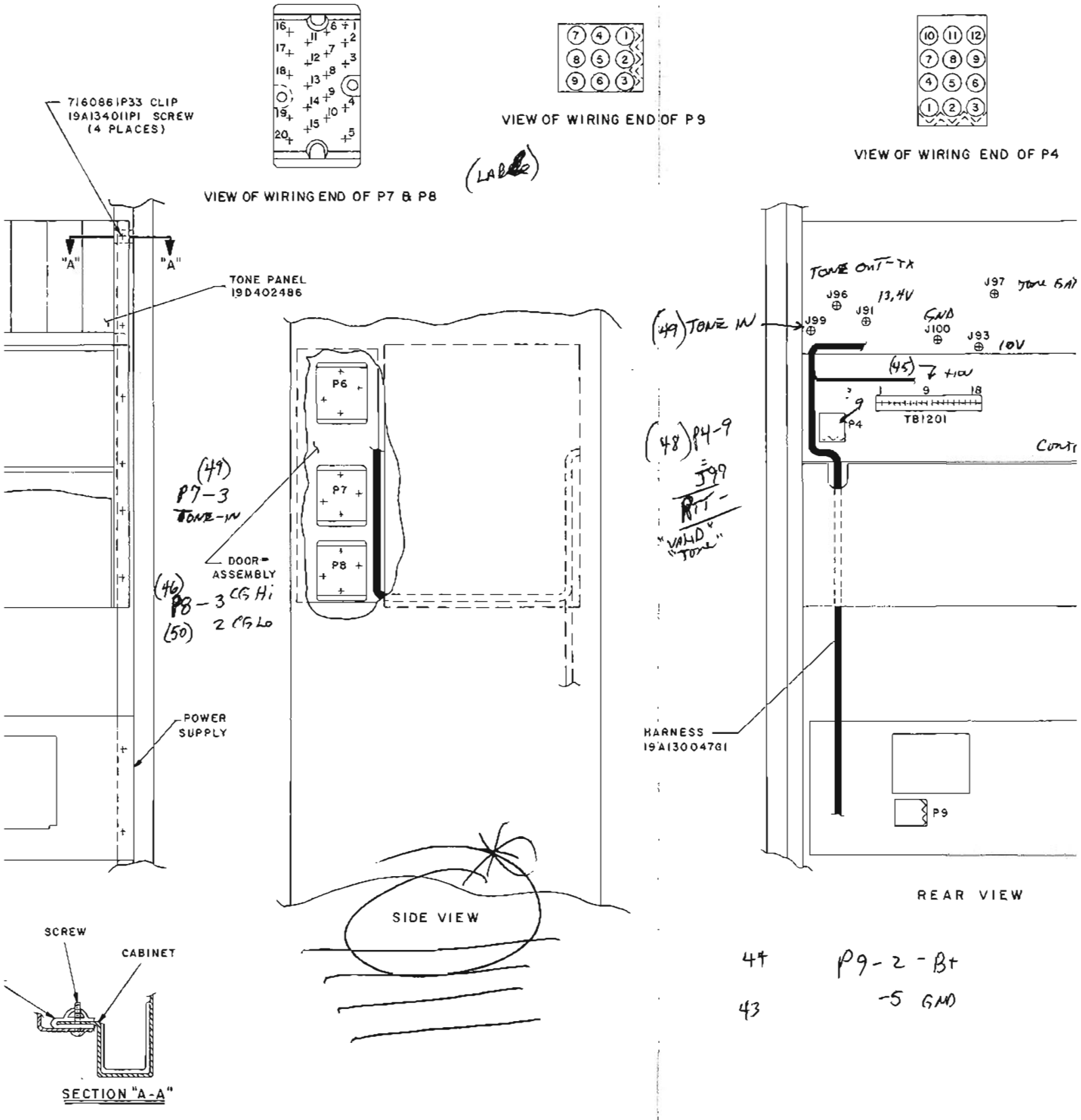
LOWER
RARE

ELF AS
END.

HOWN

SCREWS

AT P7 &



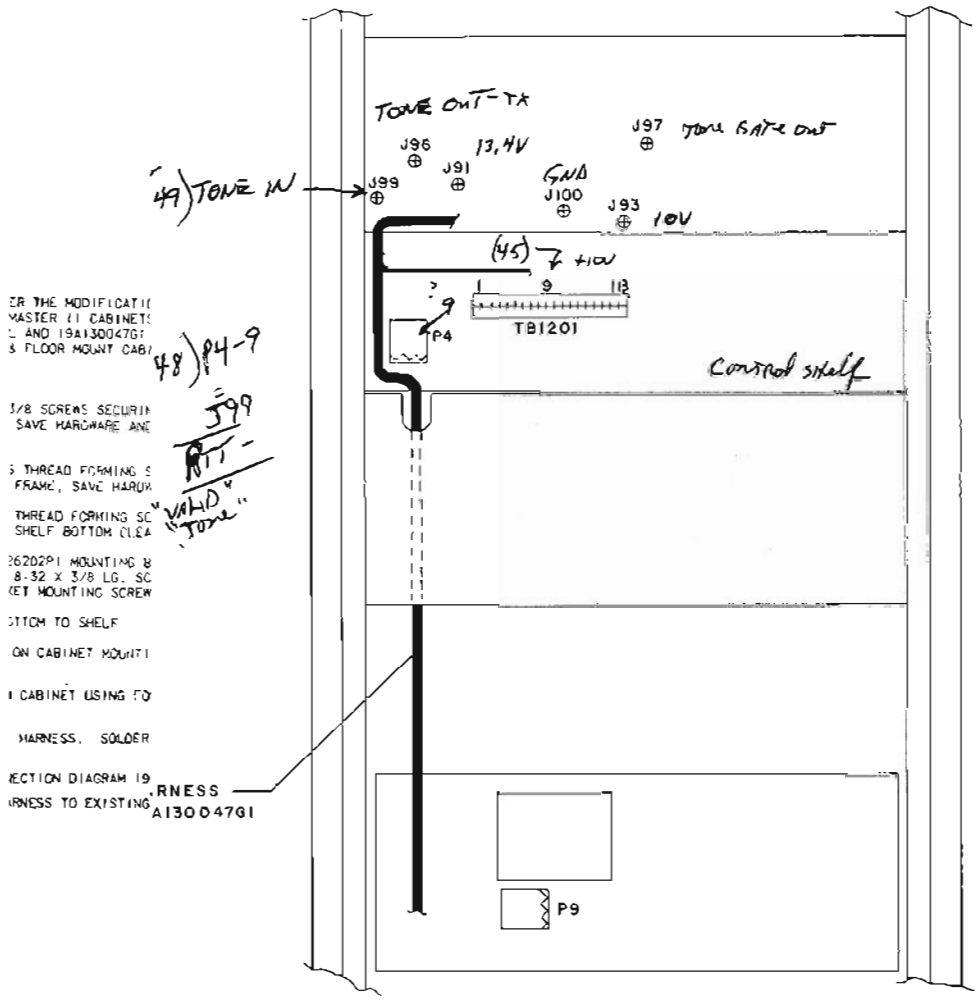
(19D417497, Sh. 2, Rev. 4)

MODIFICATION & INS

Issue 3

OF P9

VIEW OF WIRING END OF P4



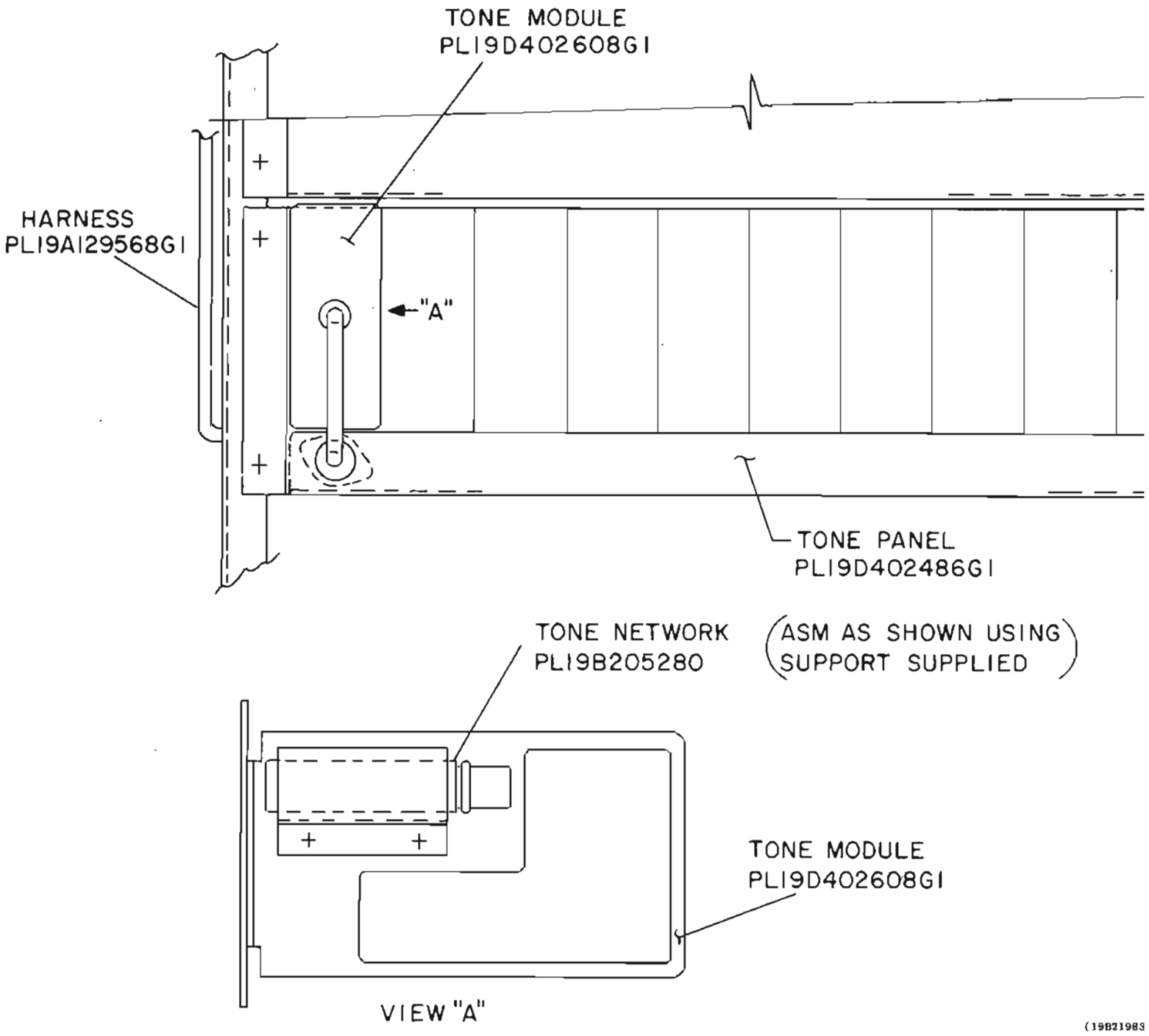
REAR VIEW

44 P9-2-Bt

43 -5 GND

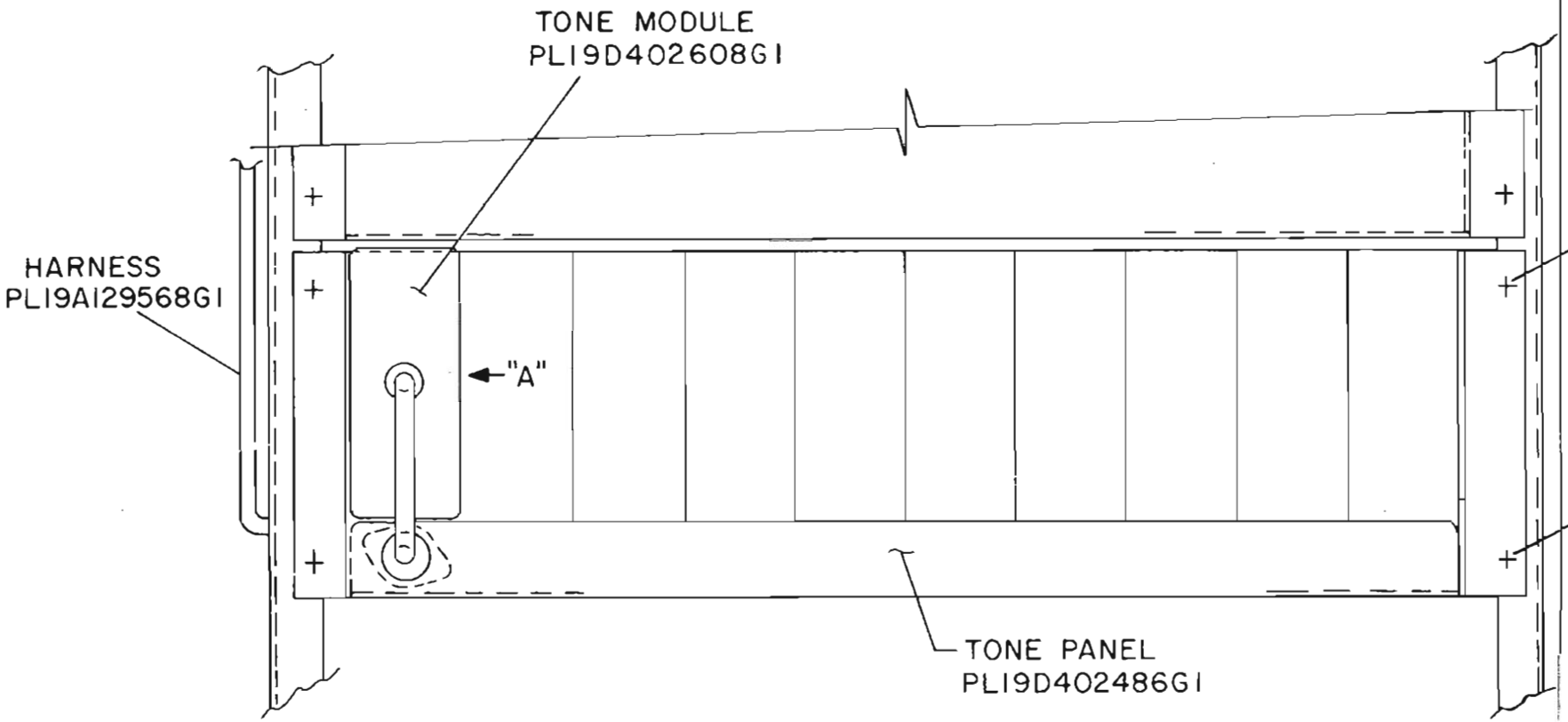
MODIFICATION & INSTALLATION

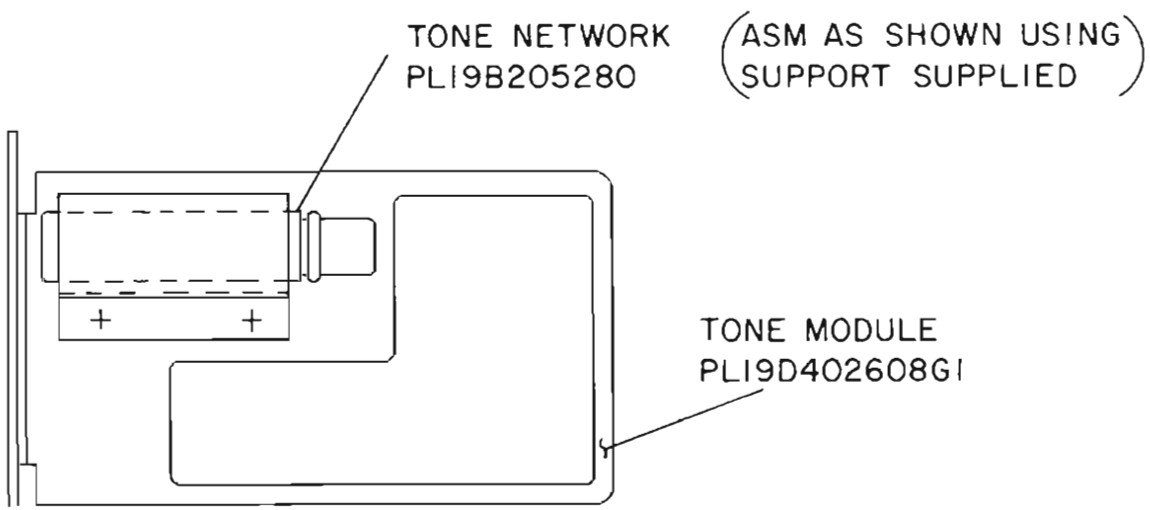
TONE PANEL



INSTALLATION INSTRUCTIONS

TONE PANEL


TONE MODULE
PLI9D402608GI
HARNESS
PLI9AI29568GI
"A"
TONE PANEL
PLI9D402486GI
MOUNT
UNDER
POLE
MOUNT
IN ME
PANEL
IN HA
N80PI9
N402PI
N402P2
NOTE:


TONE NETWORK
PLI9B205280
(ASM AS SHOWN USING
SUPPORT SUPPLIED)
TONE MODULE
PLI9D402608GI

1

2

MOUNT TONE PANEL (PL19D402486) IMMEDIATELY UNDER CONTROL SHELF (PL19D416725), IN DESK, POLE OR HIGH POWER VERTICAL STATIONS. MOUNT IT BELOW ACCESSORY PANEL 19B204588G1, IN MEDIUM POWER VERTICAL STATIONS. MOUNT PANEL WITH HARDWARE SUPPLIED WITH PANEL IN HARDWARE KIT PL403634866.

N80P19008C13 SCREW
N402P10C13 PLAIN WASHER
N402P21C13 LOCKWASHER

NOTE: FOR INSTALLATION OF SHARED REPEATER WITH MASTR REPEATER IN ALL CABINETS.

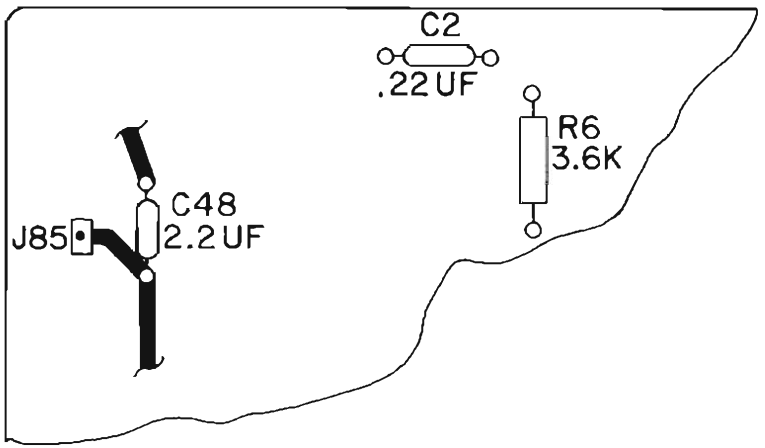
FOR INSTALLATION IN DESK MATE CABINET MOVE MOUNTING BRACKETS ON TONE PANEL TO FORWARD MOUNTING POSITION. MOUNTING SURFACE MUST BE 4.32 FROM FRONT OF PANEL.

(1) SHARED REPEATER INSTALLATION IN ALL CABINETS EXCEPT DESK MATE.

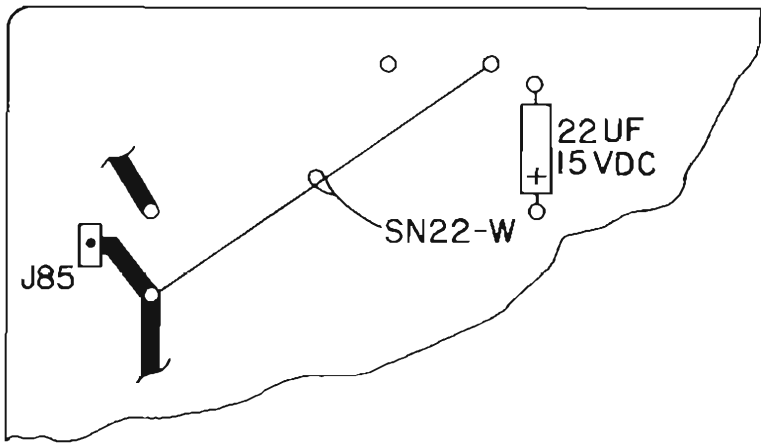
(2) SHARED REPEATER INSTALLATION IN DESK MATE.

PRINTED BOARD CHANGES

FROM:



TO:



THESE MODIFICATIONS TO TONE BOARD 19D402615G2 USED IN THE COMMUNITY REPEATER ARE TO BE APPLIED ONLY WHEN USED WITH ICOM EQUIPPED TRANSMITTERS. NO MODIFICATIONS TO THE 19D402615G2 BOARD ARE REQUIRED FOR THOSE TRANSMITTERS NOT USING THE ICOM MODULE.

INSTRUCTIONS FOR COMMUNITY REPEATER

ON TONE BOARD (A601) 19D402615G2:

1. REMOVE R6, C2, AND C48.
2. REPLACE C1 (.1UF) WITH CAP. 19B209243P103 (.022UF) SUPPLIED IN KIT.
3. REPLACE R2 (75K) WITH RES. C3R77P393K (39K) SUPPLIED IN KIT.
4. ADD CAPACITOR 5496267P10 (22UF) IN PLACE OF R6 AND CONNECT SN22-W WIRE AS SHOWN.

INSTRUCTIONS FOR COMMUNITY REMOTE

REPEAT STEPS 1 THRU 4 ABOVE, ALSO CHANGE R75, 76, 77, 78 79, 80, 81, 82, 83, 84 FROM 10K TO C3R77P223K (22K) SUPPLIED IN KIT.

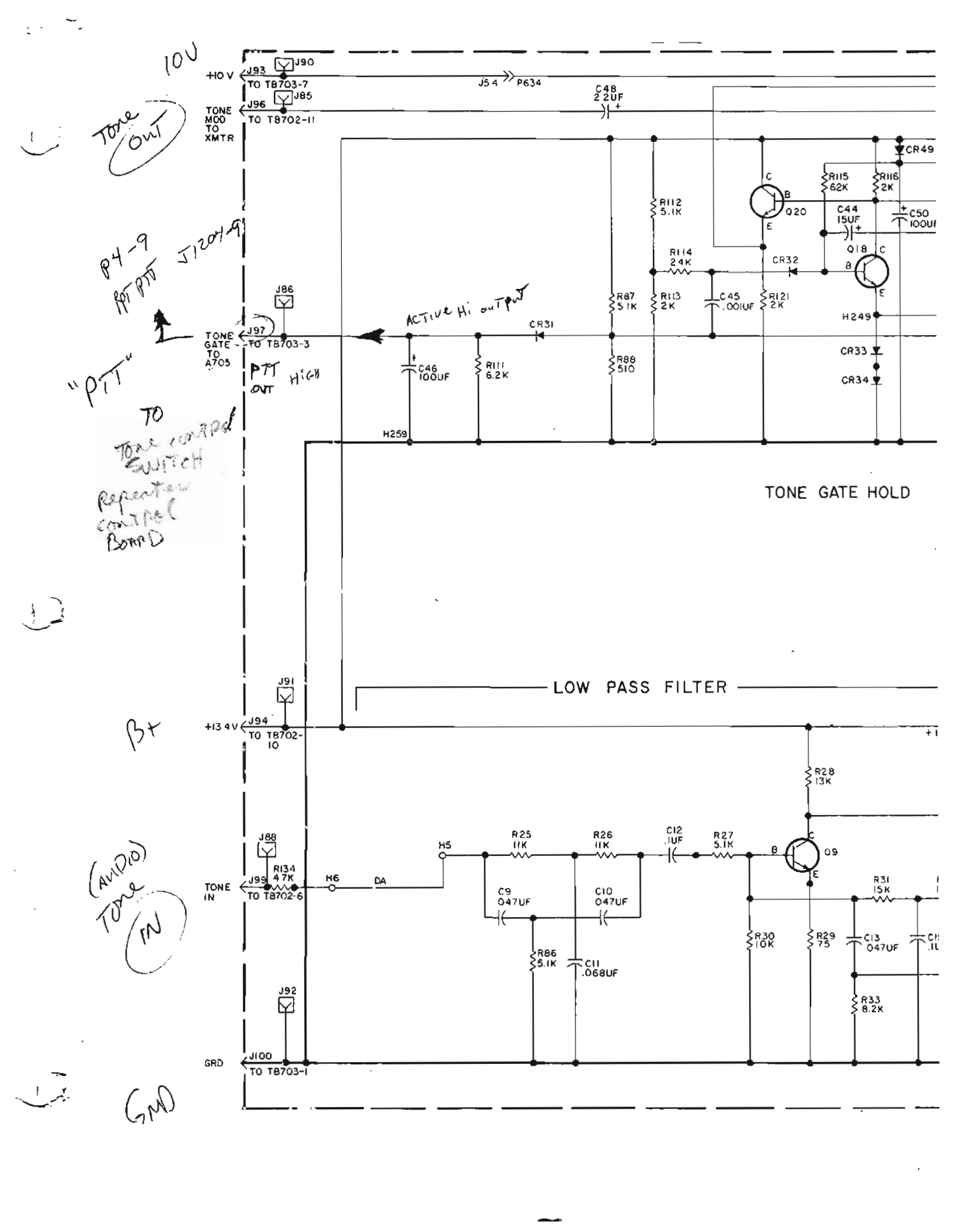
TEST

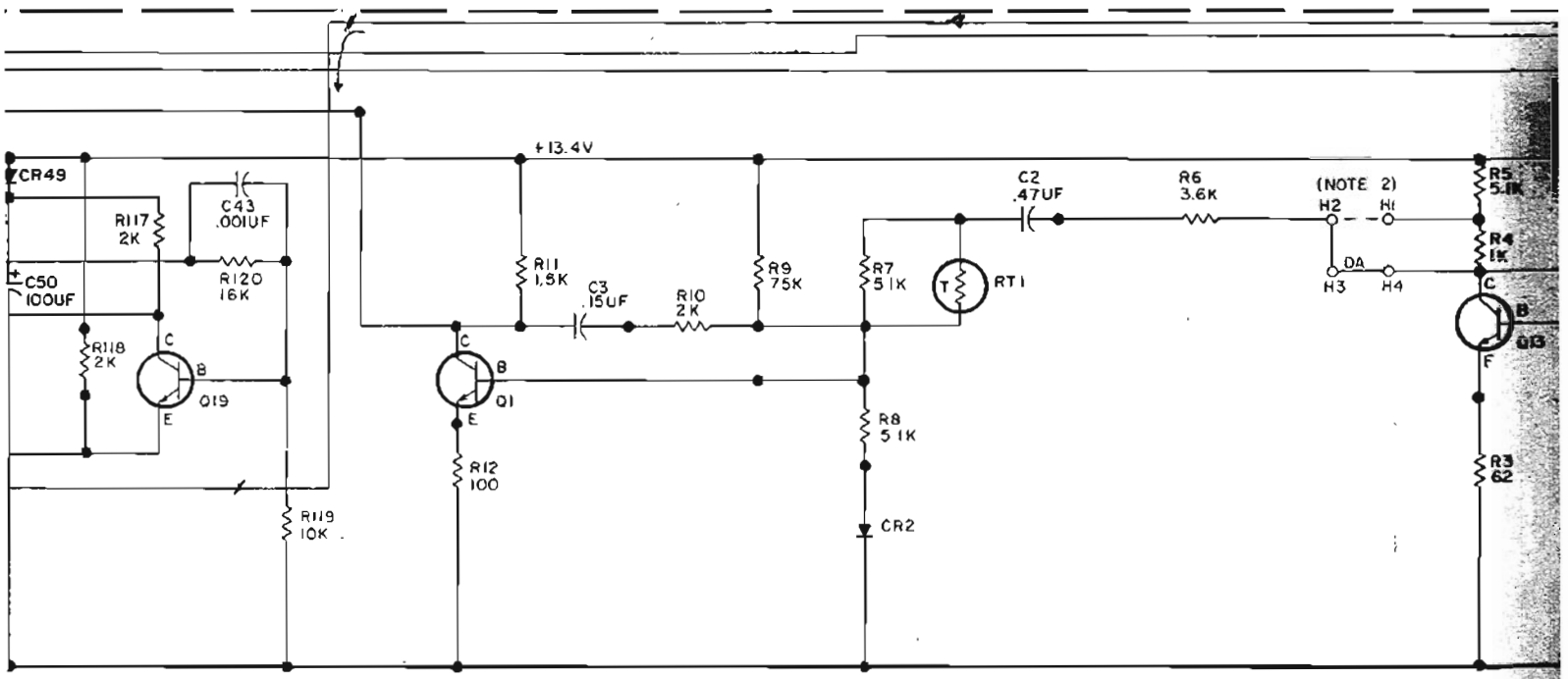
TEST IS STANDARD EXCEPT, THE TONE OUTPUT AT J85 SHALL BE WITHIN ± 1 dB OF THE 70 CPS REFERENCE.

RC-3262

MOBILE RADIO DEPARTMENT
GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

GENERAL ELECTRIC


+10 V
J90
J93
TO TB703-7
J54
P634
C48
2.2UF
TONE MOD TO XMTR
J96
J85
TO TB702-11
CR49
R115
62K
R116
2K
C
B
Q20
E
C44
15UF
C50
100UF
R112
5.1K
R114
24K
CR32
Q18
C
B
E
J86
J97
TO TB703-3
TONE GATE TO A705
ACTIVE HI OUTPUT
CR31
R87
5.1K
R113
2K
C45
.001UF
R121
2K
H249
CR33
CR34
C46
100UF
R111
6.2K
R88
510
H259
PTT OUT HIGH
TONE GATE HOLD
LOW PASS FILTER
J91
+13.4V
J94
TO TB702-10
R28
13K
J88
R134
47K
J99
TONE IN
TO TB702-6
H6
DA
H5
R25
11K
R26
11K
C12
.1UF
R27
5.1K
Q9
C
B
E
C9
.047UF
C10
.047UF
R31
15K
R30
10K
R29
75
C13
.047UF
R86
5.1K
C11
.068UF
R33
8.2K
J92
GRD
J100
TO TB703-1



D

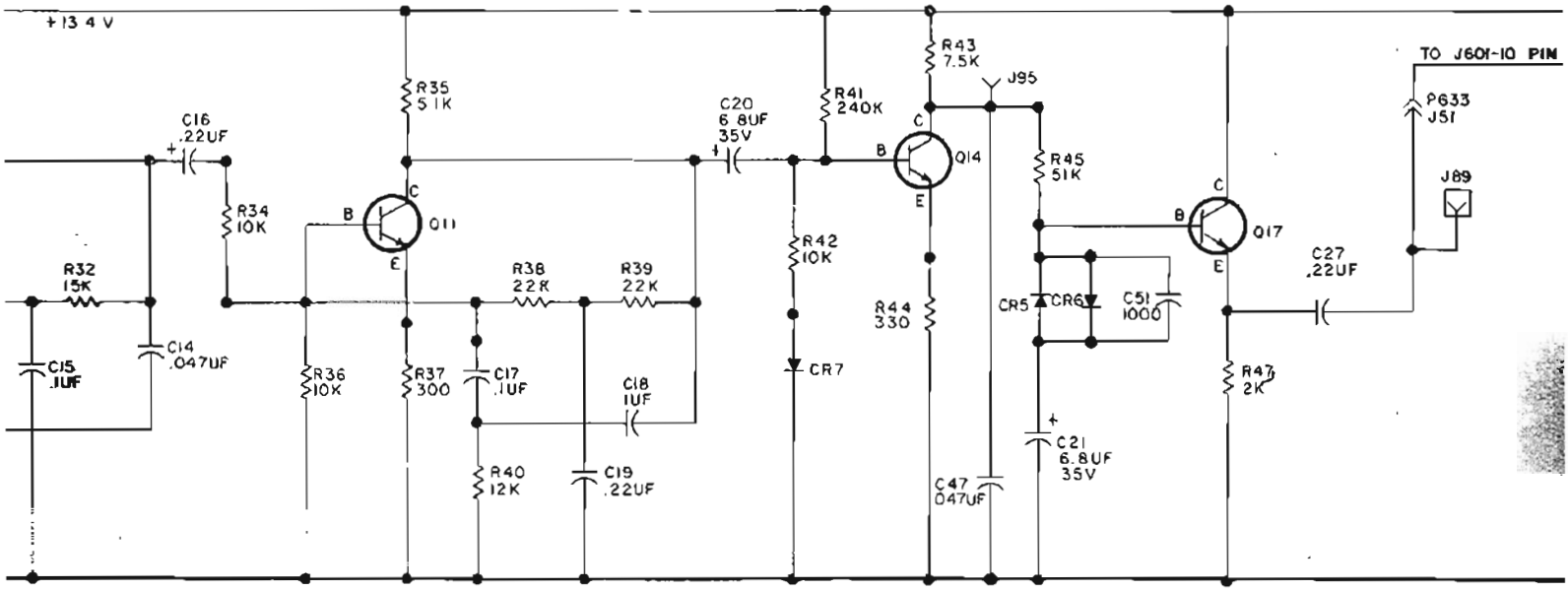
AMPLIFIER

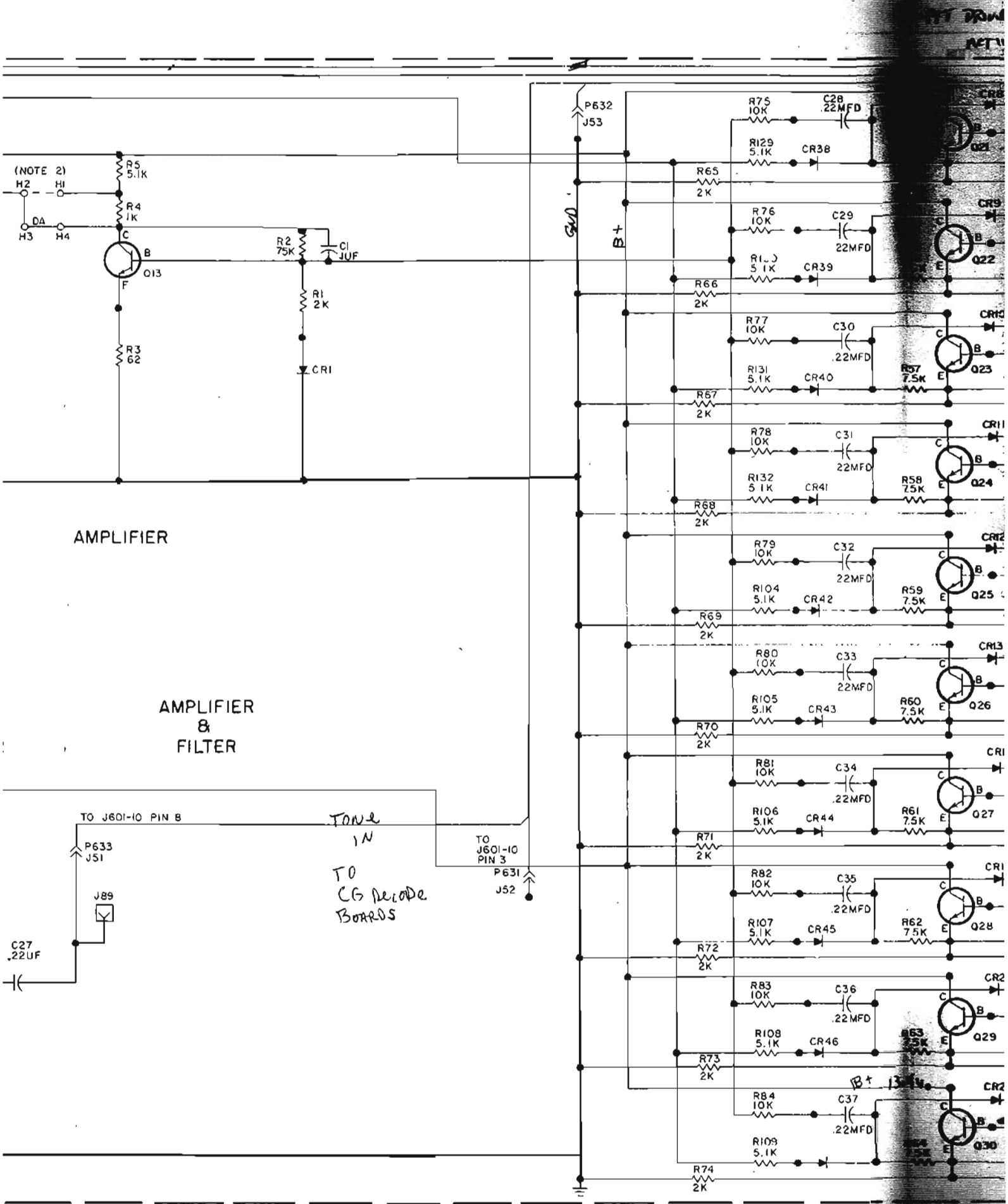
AMPLIFIER

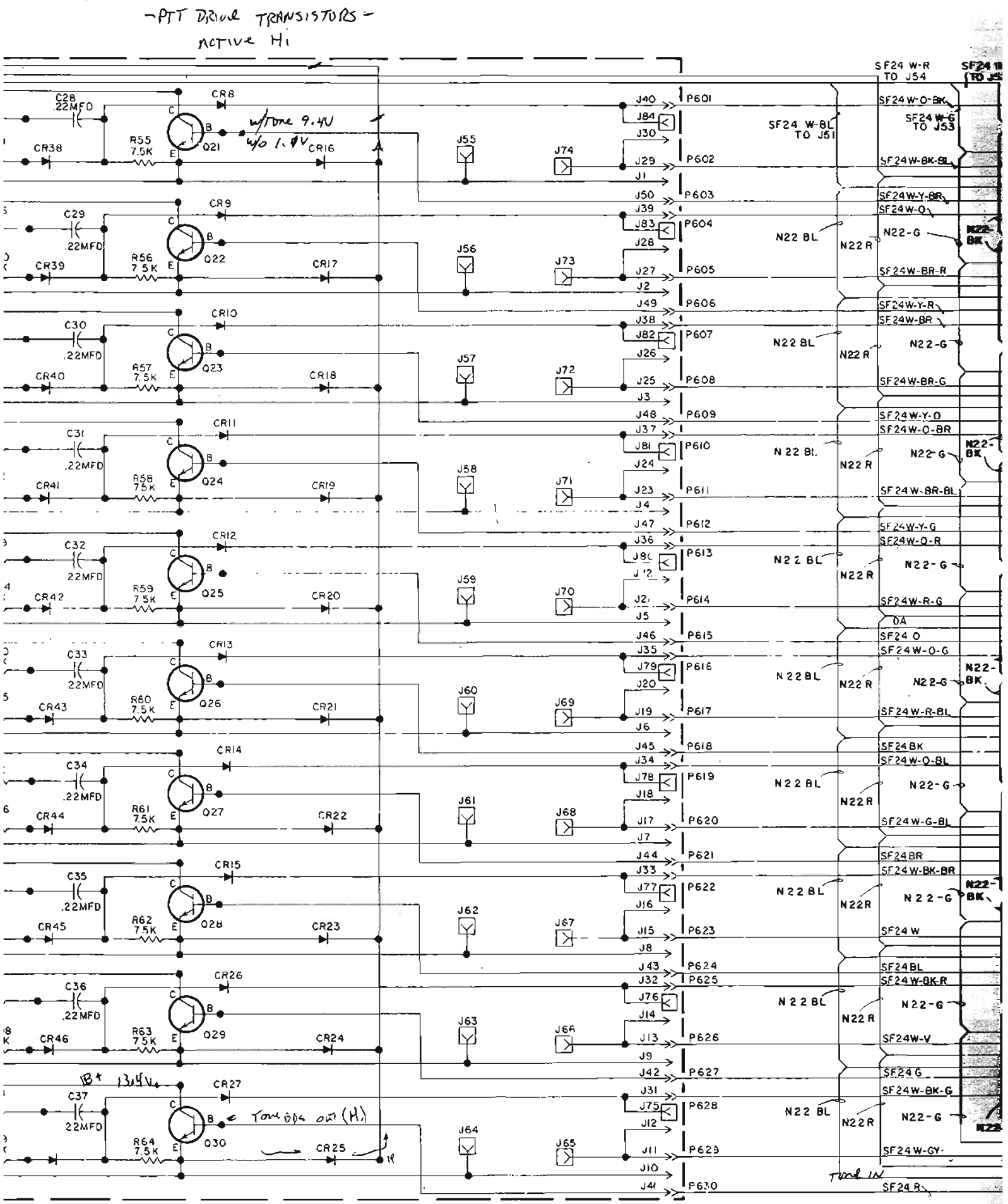
A

AMPLIFIER
CLIPPER

AMPLIFIER
FOLLOWER




(NOTE 2)
H2
H1
H3
DA
H4
R5 5.1K
R4 1K
Q13
R2 75K
C1 1UF
R1 2K
R3 62
CR1
AMPLIFIER
AMPLIFIER & FILTER
TO J601-10 PIN 8
P633 J51
J89
C27 .22UF
TONE IN
TO CG DECODE BOARDS
TO J601-10 PIN 3
P631 J52
P632 J53
GND
B+
R75 10K
C28 .22MFD
R129 5.1K
CR38
R65 2K
Q21
R76 10K
C29 .22MFD
R130 5.1K
CR39
R66 2K
Q22
R77 10K
C30 .22MFD
R131 5.1K
CR40
R67 2K
R57 7.5K
Q23
R78 10K
C31 .22MFD
R132 5.1K
CR41
R68 2K
R58 7.5K
Q24
R79 10K
C32 .22MFD
R104 5.1K
CR42
R69 2K
R59 7.5K
Q25
R80 10K
C33 .22MFD
R105 5.1K
CR43
R70 2K
R60 7.5K
Q26
R81 10K
C34 .22MFD
R106 5.1K
CR44
R71 2K
R61 7.5K
Q27
R82 10K
C35 .22MFD
R107 5.1K
CR45
R72 2K
R62 7.5K
Q28
R83 10K
C36 .22MFD
R108 5.1K
CR46
R73 2K
Q29
R84 10K
C37 .22MFD
R109 5.1K
R74 2K
Q30


-PTT Drive TRANSISTORS-
ACTIVE HI
C28 .22MFD
CR8
CR38
R55 7.5K
Q21
w/tone 9.4V
w/o 1.8V
CR16
C29 .22MFD
CR9
CR39
R56 7.5K
Q22
CR17
C30 .22MFD
CR10
CR40
R57 7.5K
Q23
CR18
C31 .22MFD
CR11
CR41
R58 7.5K
Q24
CR19
C32 22MFD
CR12
CR42
R59 7.5K
Q25
CR20
C33 22MFD
CR13
CR43
R60 7.5K
Q26
CR21
C34 .22MFD
CR14
CR44
R61 7.5K
Q27
CR22
C35 .22MFD
CR15
CR45
R62 7.5K
Q28
CR23
C36 .22MFD
CR26
CR46
R63 7.5K
Q29
CR24
B+ 13.4V
C37 22MFD
CR27
Tone out (H)
R64 7.5K
Q30
CR25
J55
J74
J56
J73
J57
J72
J58
J71
J59
J70
J60
J69
J61
J68
J62
J67
J63
J66
J64
J65
P601
P602
P603
P604
P605
P606
P607
P608
P609
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P611
P612
P613
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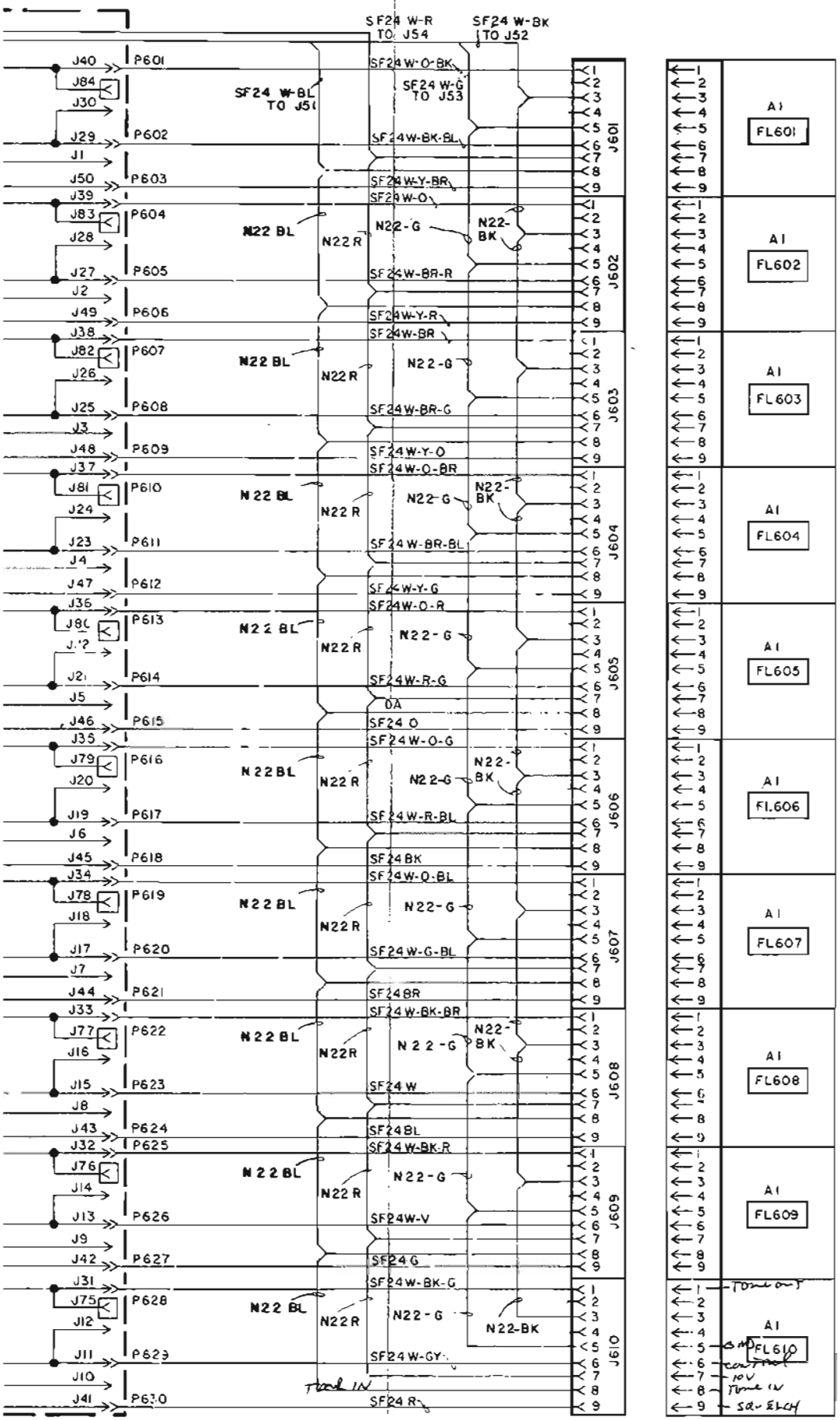
P615
P616
P617
P618
P619
P620
P621
P622
P623
P624
P625
P626
P627
P628
P629
P630
SF24 W-R TO J54
SF24 W-BL TO J51
SF24 W-G TO J53
SF24W-O-BK
SF24W-BK-BL
SF24W-Y-BR
SF24W-O
SF24W-BR-R
SF24W-Y-R
SF24W-BR
SF24W-BR-G
SF24W-Y-O
SF24W-O-BR
SF24W-R-G
SF24 O
SF24W-O-G
SF24W-R-BL
SF24 BK
SF24W-O-BL
SF24W-G-BL
SF24 BR
SF24W-BK-BR
SF24 W
SF24 BL
SF24W-BK-R
SF24W-V
SF24 G
SF24W-BK-G
SF24W-GY
SF24 R
N22 BL
N22 R
N22-G
N22-BK
Tone IN



NOTES.

1. ALL CIRCUITS PRINTED WIRING EXCEPT WHERE OTHERWISE SHOWN.
2. IN SHARED REMOTE STATION APPLICATIONS, DA WIRE IS REMOVED FROM BETWEEN H3 AND H4 AND CONNECTED BETWEEN H1 AND H2.

IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS

SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.

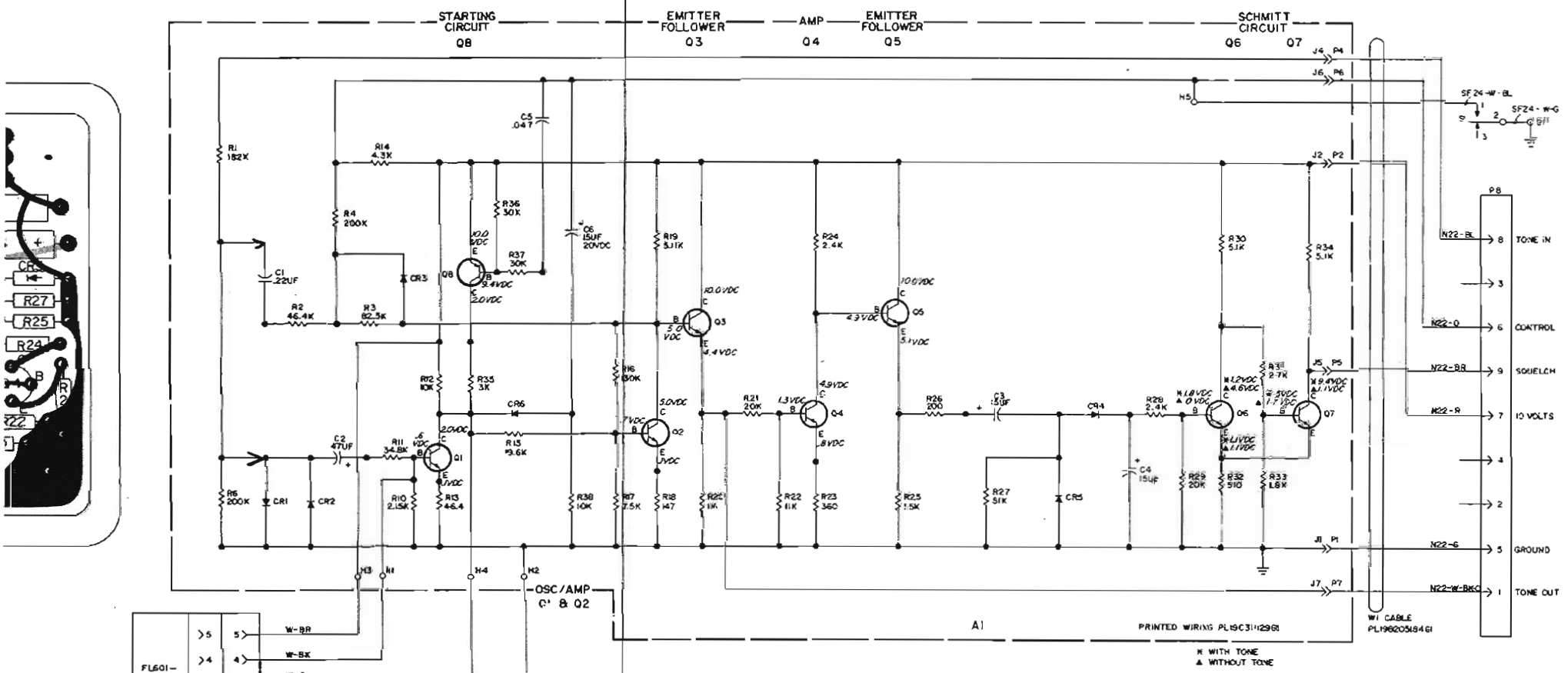
THIS ELEM DIAG APPLIES TO	
MODEL NO	REV LETTER
19D402486G1	F

SCHEMATIC DIAGRAM

TONE PANEL 19D402486G

Issue 4

SCHEMATIC DIAGRAM



IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

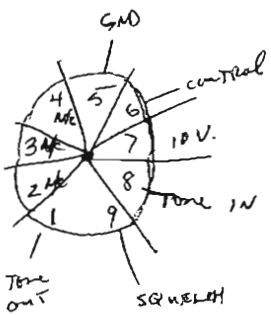
SEE APPLICABLE PRODUCTION CHANGE SHEETS IN ASSEMBLY BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.

THIS ELEM DIAG APPLIES TO	
MODEL NO.	REV LETTER
PL19D402608G1	B

VOLTAGE READINGS

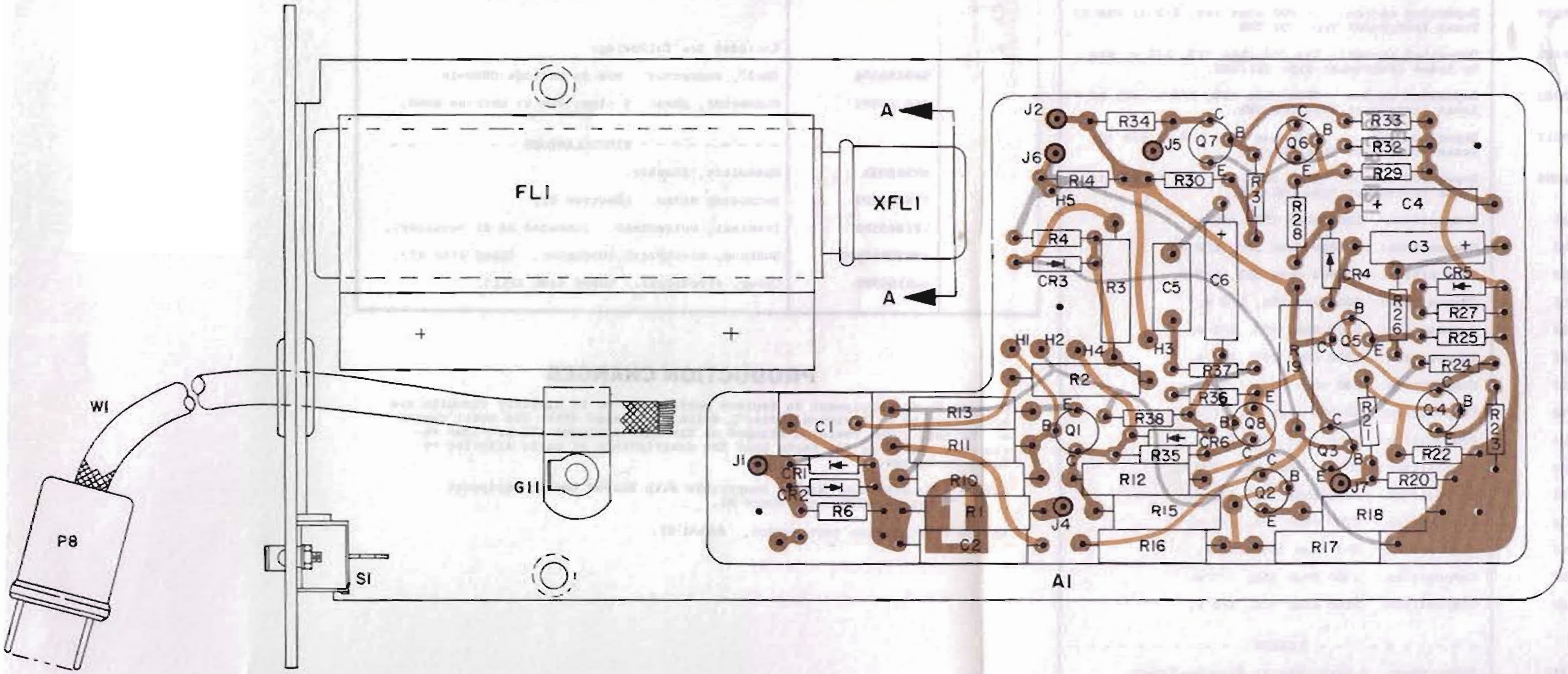
ALL READINGS ARE TYPICAL VOLTAGES MEASURED FROM TRANSISTOR PINS TO GROUND WITH A 20,000 OHM-PER-VOLT METER.

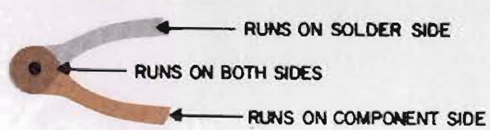
ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS



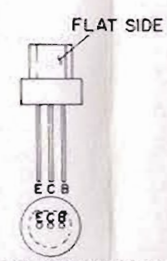
(19D402762, Rev. 3)

OUTLINE DIAGRAM





SECTION A-A



LEAD IDENTIFICATION
FOR Q1 THRU Q8

(19D402825, Rev. 1)
(19C311120, Sh. 1, Rev. 1)
(19C311120, Sh. 2, Rev. 1)