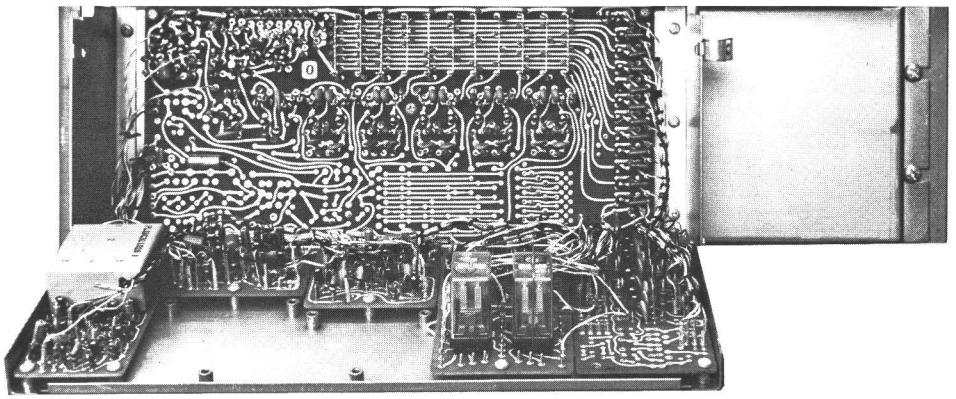
communications

MASTR Progress Line

DECODER PANEL MODEL 4KC17A10



SPECIFICATIONS *

Transmitter Keying	3000 cps tone
Function Selection	Frequency-shift keying (1500, 2000 and 2500 cps)
Number of Functions	12 maximum
Frequency Response	±3 db from 300 to 2750 cps, reference 1000 cps
Temperature Range	-30°C to +60°C (-22°F to +140°F)
Dimensions (H x W x D)	5-1/4" x 19" x 4-3/4"

KC-17-A

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

GENERAL ELECTRIC

TABLE OF CONTENTS

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

Decoder Panel Model 4KC17A10 provides up to 12 switching functions in MASTR Progress Line Remote and Repeater Base Station systems utilizing the Transistorized Control Console (XC Series) Model 4EC72A10.

The Decoder Panel contains the solid-state logic circuitry to decode the binary codes from the remote console for high-speed function switching, and to detect the 3-KC tone for keying the transmitter. The panel uses silicon transistors and diodes for added reliability. The Decoder Panel requires no adjustment.

An optional relay board is available for controlling a second receiver or other external functions as desired.

INTRODUCTION TO LOGIC CIRCUITS

A complete description of the logic circuits used in the Decoder Panel is available for the serviceman who may be unfamiliar with the operation of these circuits. This information is contained in LBI-3800, which is the Maintenance Manual for the Transistorized Control Console (XC Series). The manual includes a discussion of the following subjects:

- Solid-state switches
- Multivibrator circuits
- Binary counting and logic
- Logic circuits

It is suggested that anyone unfamiliar with these subjects study the information carefully, as a good understanding of the basic circuitry is essential in servicing the Decoder Panel.

CIRCUIT ANALYSIS

The Decoder Panel consists of the transistorized decoder circuitry, band-pass and low-pass filters FL1 and FL2, and terminal boards for power and station interconnections. The decoder circuitry is located in a hinged assembly on the front of the panel. The filters and terminal boards are located on the back of the panel.

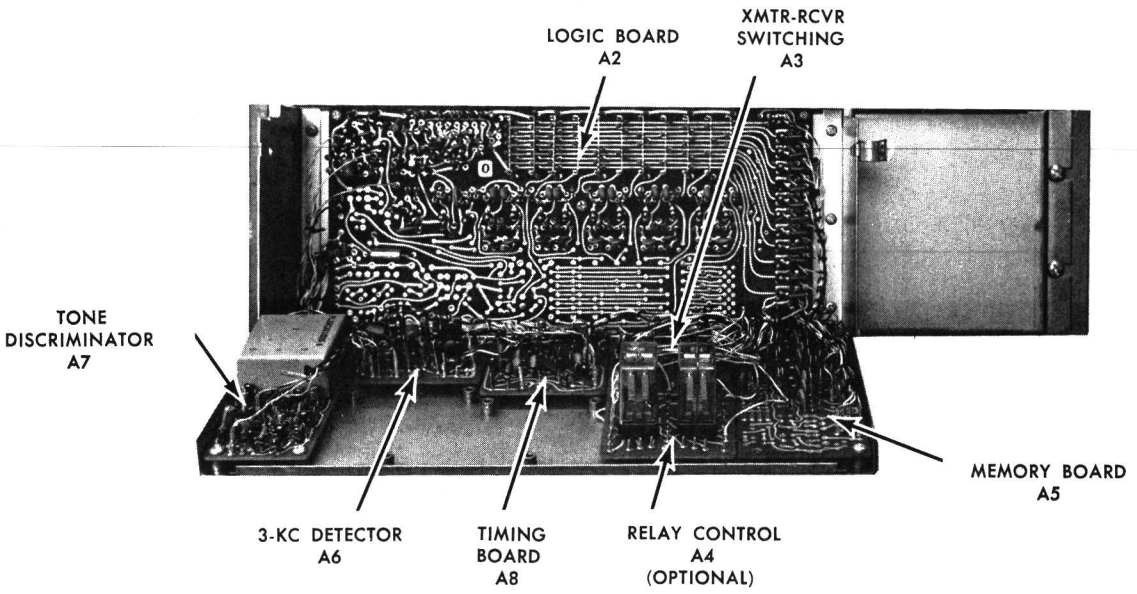


Figure 1 - Module Layout of Decoder Panel

In remote stations, the panel is normally mounted directly below the remote control panel. In repeater base stations, the panel is normally mounted below the repeater panel.

References to symbol numbers mentioned in this section can be found on the applicable Schematic Diagram, Outline Diagram and Parts List as listed in the Table of Contents.

POWER CIRCUITS

All operating voltages for the Decoder Panel are supplied by transmitter-receiver power supply Model 4EP38A10, and are applied to the panel through TB708.

+13.4 VDC

The 13.4 volts DC is connected from TB708-3 to TB2-4 where it is filtered by C702 and R702 before being applied to the decoder circuits.

-5.4 VDC

A -45 volts DC is connected from TB708-4 to TB1-1 where the voltage is dropped by resistor R701 and regulated by zener diode VR701 to provide a -5.4 volts DC bias voltage. Filtering is provided by C702.

+18 VDC

When the optional relay control board is used, +18 volts is taken from TB708-1 as a supply voltage for relays K1 and K2.

CONTROL METHODS

Through the use of binary codes and tones, the Decoder Panel can provide up to 12 switching functions in addition to transmitter keying (see Figure 2).

Binary codes are used for multi-frequency, Channel Guard and other switching functions. A coded 3000-cps tone keys the transmitter.

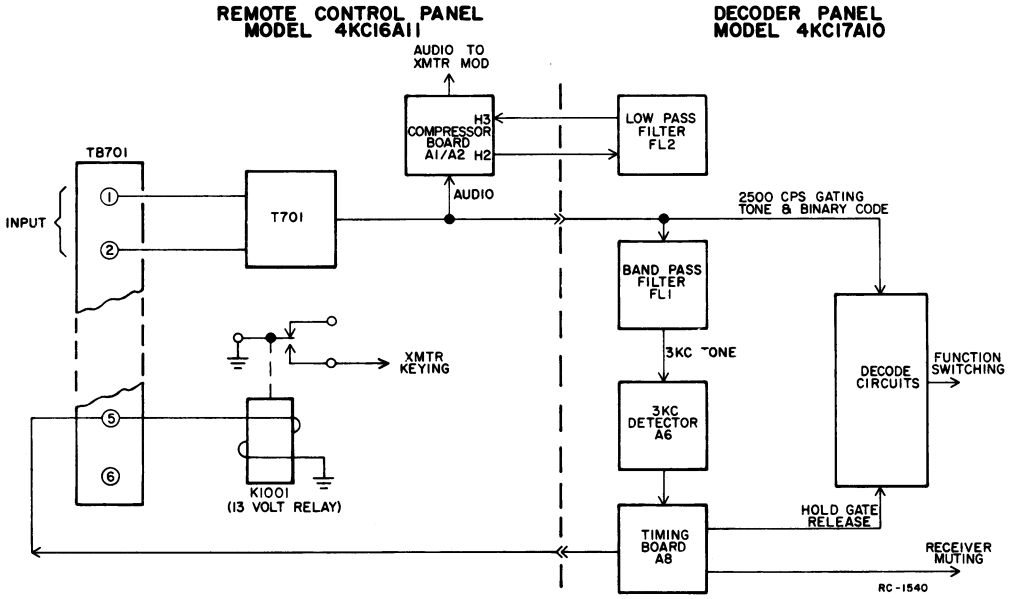


Figure 2 - Simplified Remote Switching & Keying Diagram

FUNCTION SELECTION

Pressing one of the function selection pushbuttons at the Transistorized Control Console applies a 3000-cps tone to the Decoder Panel for a minimum of 50 milliseconds (125 milliseconds for Repeater Base Stations). The tone is detected by 3-KC Detector Board A3, and applied to Timing Board A8. A switching circuit on the Timing Board grounds the receiver audio amplifier stage, muting the station receiver. A second switching circuit releases a hold gate so that the decode circuitry can accept a 2500-cps gating tone.

Releasing the pushbutton applies the 2500-cps gating tone to the panel for approximately 100 milliseconds. The gating tone releases a second hold gate so that the decoder circuitry can accept a binary code. A 40-millisecond, 2000-cps carrier tone follows the gating tone, and the carrier tone is followed by the binary tone code. The code is applied to the decoder circuitry to perform the desired switching function. A tone and code sequence waveform for the code 1 - 0 - 0 - 0 - 1 is shown in Figure 3.

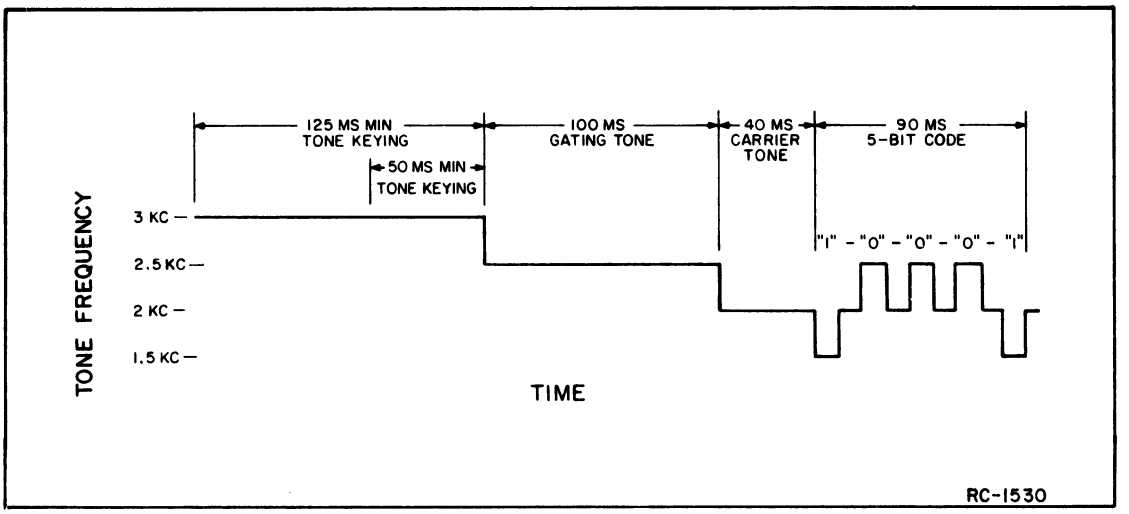


Figure 3 - Tone Sequence Waveform

TRANSMITTER KEYING

Keying the microphone at the remote console applies a 3000-cps coded tone to the Decoder Panel. The tone is coded at the remote console by switching it on for 60 milliseconds, switching it off for 60 milliseconds, and switching it on again for the duration of the transmission. A 100-millisecond switching interval is used in Repeater Base Stations. The 3000-cps keying tone is coded to prevent the transmitter from being keyed by the 3000-cps receiver muting tone that is applied to the Decoder Panel each time a function selection pushbutton is pressed at the remote console.

The coded 3000-cps tone is detected and converted to a DC voltage. The resultant DC voltage energizes a relay, keying the transmitter.

DECODE FUNCTION

The Decoder Panel contains the circuitry for changing a tone or code to a DC voltage for switching the transmitter or receiver frequency, disabling Channel Guard, or keying the transmitter. The following chart (Figure 4) contains a brief description of each circuit board in the Decoder Panel.

CIRCUIT BOARD	CIRCUIT DESCRIPTION
3 KC Detector A3	Contains the circuits to detect 3000-cps tones for driving the Timing Board.
Timing Board A8	Contains the circuits for muting the receiver, keying the transmitter, and releasing the hold gate on the Tone Discriminator board so that a code can be accepted.
Tone Discriminator A7	Contains the 1500 and 2500-cps tone detectors, the 2500-cps input hold gate, and 1500-cps and 2500-cps pulse generator circuits to drive the shift register.
Logic Board A2	Includes the decode matrix, 5-bit shift register, memory drivers, pulse delay and gating circuits.
Memory Board A5	Contains an encode gate, memory flip-flops and decode gate to drive the Transmitter-Receiver Switching board.
Transmitter-Receiver Switching Board A3	Contains the transistor Switching circuits for remote switching functions.
Relay Control Board A4 (Optional)	Contains two relays for controlling two receivers, and other external functions.

Figure 4 - Decode Function Chart

3-KC DETECTOR BOARD A6

Pressing one of the function selection pushbuttons at the Transistorized Control Console applies a 3000-cps tone to bandpass filter FL1 and then to the 3-KC Detector board. The tone is amplified by Q1 and Q2 and applied to the base of transistor Q3. Figure 5 contains simplified receiver muting waveforms.

The first positive half cycle of tone turns on Q3, and the positive emitter voltage back biases CR1. With CR1 back biased, C6 starts charging through R12. CR1 remains back biased for the duration of the tone, allowing C6 to charge up to a level sufficient to turn on Q4 in the "one-shot" (Schmitt Trigger). The time delay in turning on Q4 prevents noise falsing.

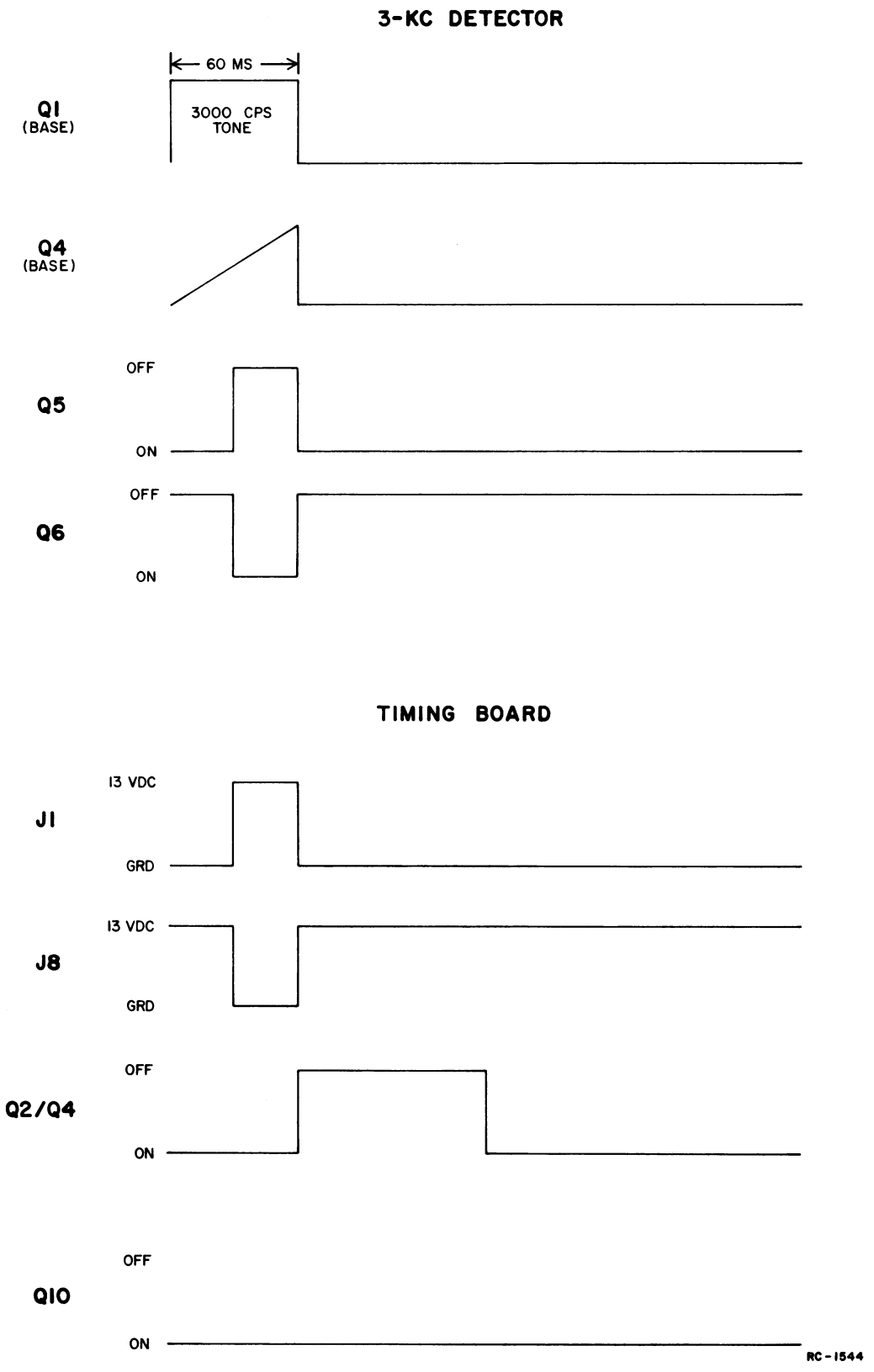


Figure 5 - Receiver Muting Waveforms

Turning on Q4 turns off Q5, and the collector voltage of Q5 rises to approximately 13 volts. The positive collector voltage is applied to the Timing Board through J9. The voltage also turns on Q6, causing its collector voltage to drop to near ground potential. This output is used for 3-KC keying only. The "one-shot" will remain switched for the duration of the 3000-cps tone (Q4 on and Q5 off).

TIMING BOARD A8

The positive pulse from the 3-KC Detector is applied to J1 on the Timing Board, charging C1. The instant the pulse ends, C1 begins to charge in the opposite direction. This forward biases CR1 which turns off Q2 and turns on Q3. Turning Q2 off applies a positive voltage to the base of Q1, turning it on. This grounds the base of the receiver audio PA stage and mutes the receiver. Q2 will remain off and Q3 on for approximately 250 milliseconds, keeping the receiver muted until the entire code has been received. Turning Q3 on turns off Q4 which removes a ground from the Tone Discriminator board so that the 2500-cps gating tone will be accepted.

TONE DISCRIMINATOR A7

The incoming tone and code is connected to tone input jack J1 on the Tone Discriminator where it is coupled through a limiter circuit (CR9, CR10 and R34) amplifiers Q1 and Q2. DC feedback through R2, R6, and R35 provides a symmetrical squarewave output (proportional to the input) that is applied to the base of emitter-follower Q13.

Discriminator transformer T1 has a 2500-cps output and a 1500-cps output. The 2500-cps gating tone preceding the code is fed from pin 5 of T1 to the base of emitter-follower Q3 as a series of pulses. The first pulse turns on Q3, shorting capacitor Q3. The positive voltage at the emitter of Q3 back biases CR1 and turns on Q5. In the interval between pulses, Q3 turns off but C3 charging through R10 keeps CR1 back biased and Q5 on until the next pulse. Q5 and Q7 are connected as a "one-shot" multivibrator, and turning Q5 on turns Q7 off. The 2500-cps tone pulses have been converted to a single positive pulse at the collector of Q7. Figure 6 contains simplified waveforms of the code 1 - 0 - 0 - 0 - 1 applied to the Tone Discriminator Board.

The 100-millisecond gating pulse turns on Q9 and back biases CR5. This allows C7/C12 to start charging through R25. The capacitor charges up to approximately 5 volts in a minimum of 40 milliseconds to turn on Q10. Turning Q10 on discharges C8 and keeps it discharged until the gating pulse ends. Then Q10 cuts off and C8 starts charging through R26 so that a positive pulse appears at the junction of C8 and R28. The positive pulse forward biases CR8 and switches the "one-shot" (turns Q12 on and Q11 off). With W11 off, the positive collector voltage is applied from the decode gate jack (J7) to the Delay circuit input (J6) on the Logic Board, releasing the hold on the Delay circuit. The "one-shot" remains triggered (Q11 off and Q12 on) for approximately 200 milliseconds, keeping the Delay circuit open to accept an entire code that follows the gating tone. The 40-millisecond minimum charging time for C7/C12 prevents a noise pulse from triggering the one-shot.

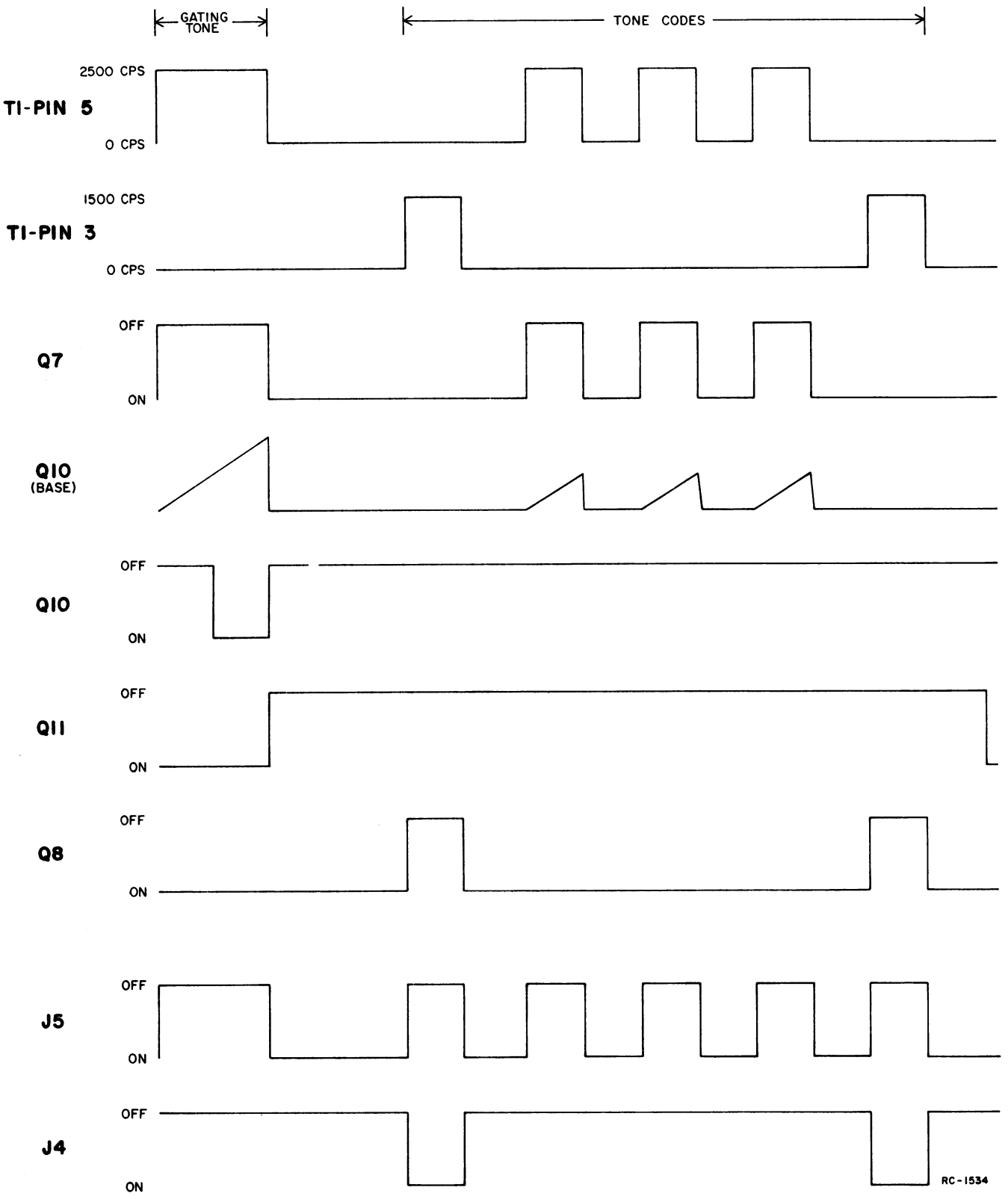


Figure 6 - Tone Discriminator Waveforms

With the 1 - 0 - 0 - 0 - 1 applied to the Tone Discriminator, a 10-millisecond, 1500-cps tone burst from T1-pin 3 is applied to Q4, Q6 and Q8, which is identical to the 2500 cps circuit Q3, Q5 and Q7. The positive pulse at the collector of Q8 is coupled through "OR" gate diode CR4 to the decode clock jack J5.

Following the 1500-cps tone, a 2500-cps tone burst from T1-pin 5 is applied to Q3, Q5 and Q7, resulting in a 10-millisecond positive pulse at the collector of Q7. The pulse is coupled through "OR" gate diode CR3 to the decode clock output jack J5. The entire 5-bit code is converted by the two circuits and "added" by the "OR" gate diodes to supply five positive clock pulses to drive the shift register.

In addition to the clock pulses, a negative pulse from the collector of Q6 is applied to "1" output jack J4 whenever a 1500-cps tone is applied to the Tone Discriminator. This negative pulse is connected to J3 on the Logic Board.

LOGIC BOARD A2

Both the positive clock pulses and the negative "1" pulses are applied to the Logic Board simultaneously. The negative "1" pulse from input jack J3 turns off Q13 which turns on Q14 in the 0/1 Load circuit. This sets the circuit to load a "1" into the shift register whenever the first pulse is applied to the shift register pulse line. Refer to Figure 7 for the Logic Board decode waveforms for the code 1 - 0 - 0 - 0 - 1.

Pulse shaper Q1 is normally off, keeping C1 discharged through CR2. The first clock pulse applied to the base of Q1 turns the transistor on. This back biases CR2, so that C1 charges through R3 and turns on Q2 in the Delay one-shot, turning off Q3. The pulse delay due to C1 charging protects the stage against noise falsing. Switching Q3 off applies a positive pulse to Pulse Mixer Q12 where it is inverted and applied to the shift register pulse line to shift in the first code bit.

The decode clock pulses are also fed from J2 to the base of Q4 in the Interpulse Timer circuit. The first pulse turns on Q4, which acts as a short across C3. The positive voltage at the emitter of Q4 back biases CR5 which turns on Q5 and turns off Q6. In the interval between clock pulses, Q4 turns off and C3 charges through R11 to keep CR5 back biased and Q5 turned on. Keeping Q5 turned on applies a ground through CR8 to the base of Q9, keeping it turned off. This releases the zero hold on Reset Gate diodes CR26, CR45, CR58, CR69 and CR82. The ground also forward biases CR9 and Read Gate diodes CR14 through CR25, disabling the Decode Matrix until a complete code has been shifted into the register. As long as Q5 is kept on by the five clock pulses and the charging of C3, the code will be shifted into the register. However, if a code should be interrupted or a clock pulse missing, Q5 will turn off and Q9 will turn on as soon as the Read One-Shot releases. This restores the zero hold on the Decode Matrix and releases the ground on the Read Gate diodes, and another code will have to be received to restart the cycle.

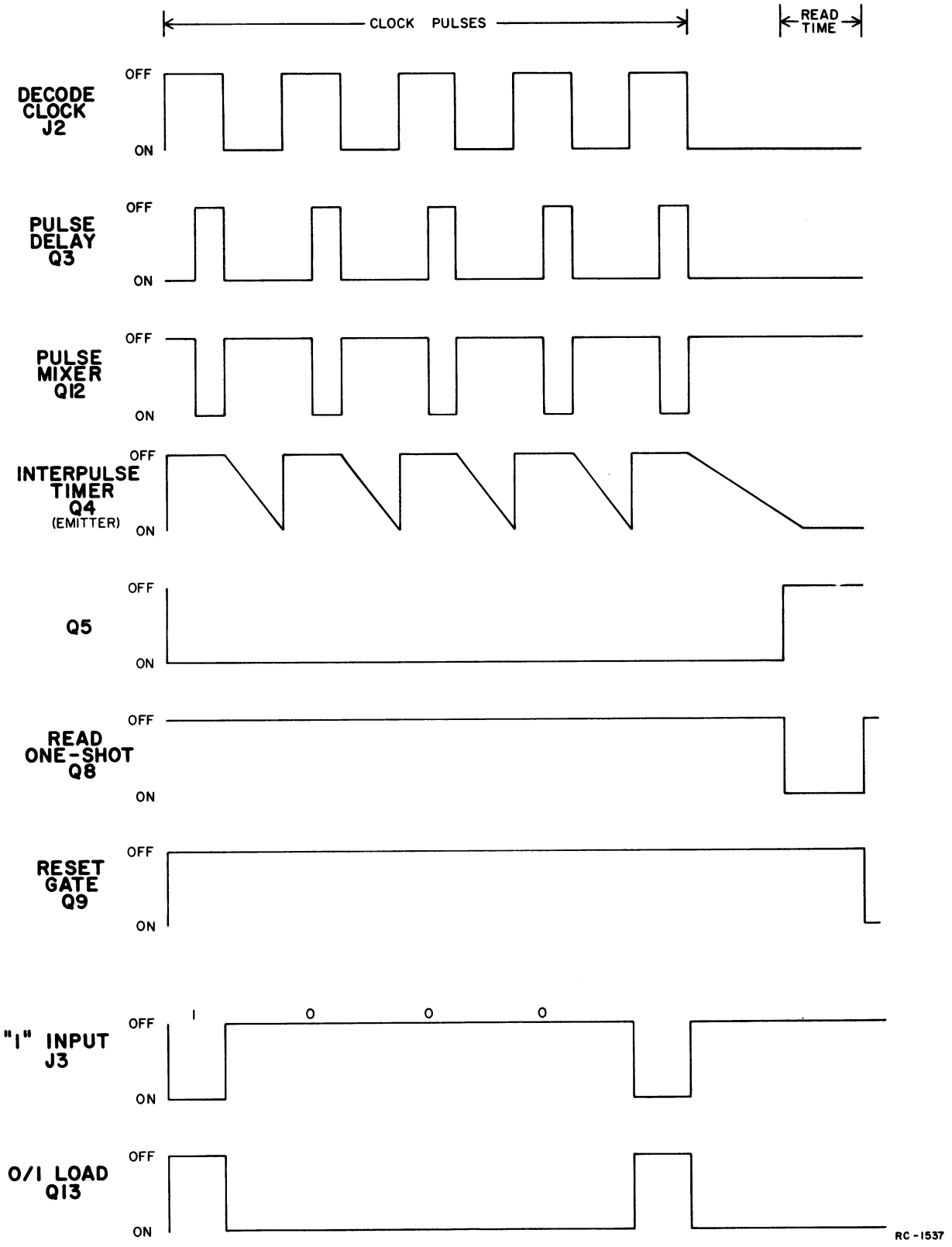


Figure 7 - Logic Board Waveforms

At the end of the clock pulses, Q4 and Q5 turn off. This lets Q6 turn on and discharges C4, which starts charging in the opposite direction through CR6. This turns off Q7 and turns on Q8 in the Read One-Shot, forward biasing CR7 and keeping Q9 turned off and keeping the zero hold off in the matrix. The one-shot remains switched for 30 milliseconds which is the read time for the matrix. The code that has been shifted into the register is applied to the Decode Matrix and appears as a positive pulse at the base of one of the Memory Drivers (Q35-Q46) where it is inverted and applied to the Memory Board as a negative-going pulse. After 30 milliseconds, the one-shot switches back to its original state (Q7 and Q8 off). Q9 turns on and switches the shift register back to the "0" state.

MEMORY BOARD A5

The Memory Board contains two, four or six flip-flops for four, eight or twelve remote switching functions. Each of the flip-flops has an input and output diode "AND" Gate Matrix. By adding or deleting these diodes, the flip-flops can be connected for four interlocked functions (only one of the four functions on at a time), for groups of two interlocked functions (only one transistor on in each pair), or for a combination of two and four interlocked functions.

Applying binary code 1 - 0 - 0 - 0 - 1 to the Decoder Panel results in a negative-going, 30-millisecond pulse at J25 on the Logic Board. The pulse is connected to J4 on the Memory Board where it forward biases diodes CR2 and CR6, turning on transistors Q2 and Q3 which turns off Q1 and Q4. The 13 volts at the collector of the OFF transistors reverse biases CR26 and CR30, allowing the potential at output jack J16 to rise to 13 volts. J16 will remain at this potential as long as Q1 and Q4 are turned off. Q1 and Q4 will remain off with Q2 and Q3 on until a different code is applied to the Decoder Panel. Output jacks J17, J18, and J19 are held at ground potential by the collectors of the ON transistors.

TRANSMITTER-RECEIVER SWITCHING BOARD A3

Receiver Switching

The positive voltage from the Memory Board is connected to J2 on the Transmitter-Receiver Switching Board. From J2, the voltage is connected through J1 to the receiver oscillator circuit to turn on the F1 oscillator.

In Channel Guard applications, "OR" Gate diodes CR1 thru CR4 and transistors Q1, Q2 and Q3 are provided for turning the Channel Guard on or off. For example, if the F1 frequency is selected, the positive voltage at J2 forward biases diode CR1 and turns on Q1. If the Channel Guard pushbutton at the Remote Console is pressed in, a positive voltage from the Memory Board is applied to the base of Q2, keeping the transistor on. This keeps Q3 turned on (its collector at ground potential), allowing the receiver Channel Guard circuit to operate.

Pressing the Channel Guard OFF pushbutton at the Remote Control Console switches off the positive voltage at the base of Q2, turning off Q2 and Q3. Removing the ground at the collector of Q3 disables the receiver Channel Guard. The receiver operates on noise squelch only, permitting the dispatcher to monitor the channel.

The Channel Guard function can be disabled for a particular receiver frequency by removing one of the "OR" Gate diodes.

Transmitter Switching

Pressing one of the transmitter frequency pushbuttons at the Remote Control Console causes a positive voltage to be applied to one of the transmitter switching input jacks (J13 through J16). Pressing the Tx-F1 pushbutton applies 13 volts to J13, turning on Q4. The collector of Q4 drops to near ground potential, and is connected through J9 to the transmitter oscillator circuit, to turn on the oscillator.

In Channel Guard applications, "OR" Gate diodes CR7 through CR10 and transistors Q8 and Q9 are provided for automatically turning on the Channel Guard whenever a frequency is selected. The positive voltage at J13 forward biases CR7, which turns on Q8 and Q9. The collector of Q9 goes to approximately +10 volts DC, turning on the Channel Guard.

The Channel Guard function can be disabled for a particular transmitter frequency by removing one of the "OR" Gate diodes.

RELAY CONTROL BOARD A4 (Optional)

The optional Relay Control Board is required for stations equipped with two separate receivers. A positive voltage from the Memory Board applied to the base of relay drivers Q1 or Q2 turns the transistor on, completing the ground path for the relay. Energizing the relay switches the selected receiver audio to output terminal TB710-2.

Each relay has four form "C" contacts connected to jacks on the Relay Control Board to permit connections for other external switching functions. The relays are rated at 1 amp with an inductive load at 29 volts DC, 2 amps with a resistive load, or 1 amp with a 115-volt AC load.

3-KC KEYING

3-KC DETECTOR

Keying the microphone at the Transistorized Control Console applies a coded 3000-cps tone to the Detector Board. This tone is detected in the same manner as the muting tone and results in a positive pulse at J9 and a ground at J6. Waveforms for the 3-KC keying are shown in Figure 8.

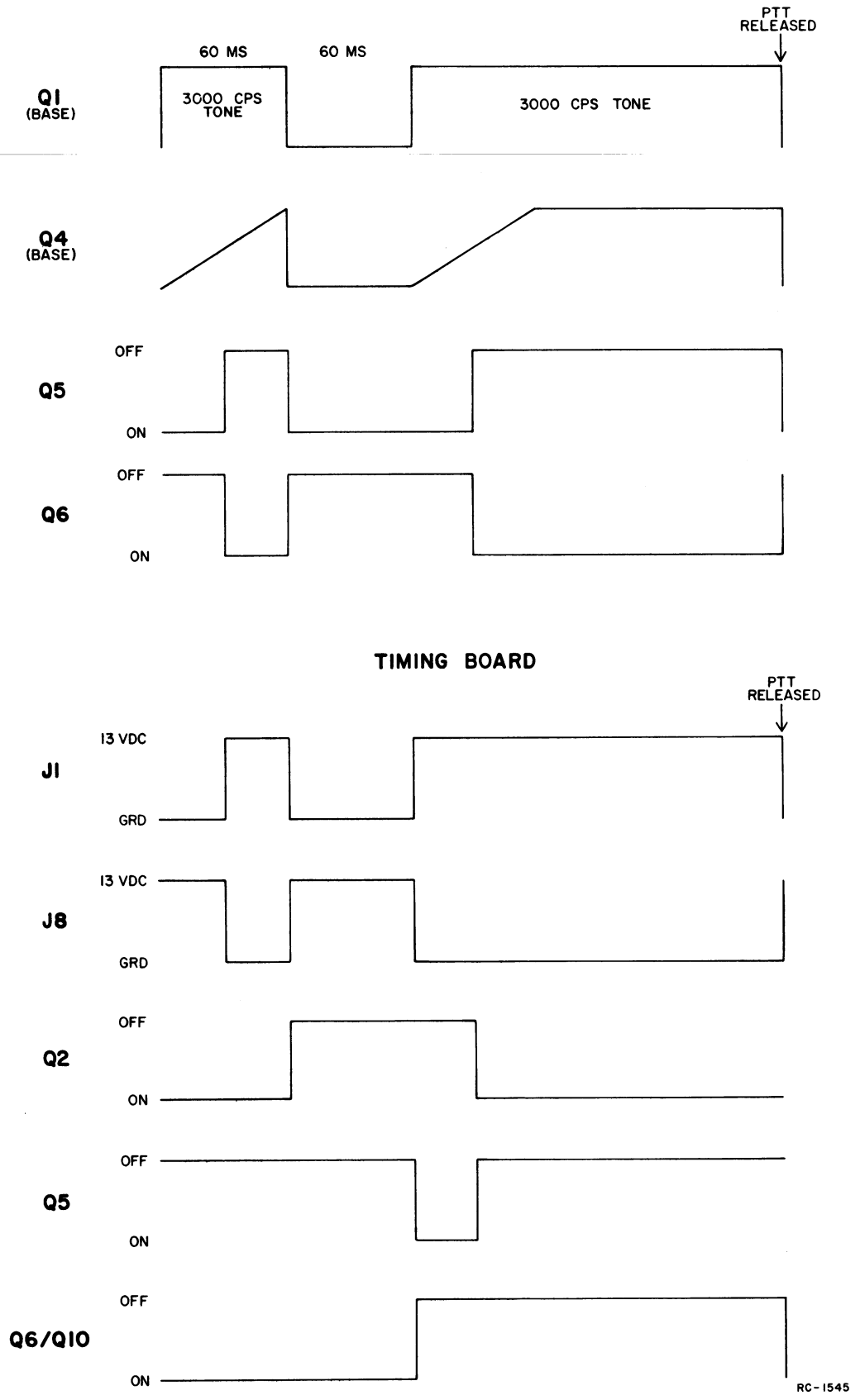


Figure 8 - 3 KC Keying Waveforms

TIMING BOARD

The positive pulse from the first portion of the 3000-cps tone switches Q2 off and Q3 on, which mutes the receiver and applies a positive voltage to the base of Q5. The second portion of the tone is detected and the ground at J8 turns on Q5. This causes C5 to charge, forward biasing CR3 which turns off Q6. The ground at J8 also disables Q7 which allows Q8 to turn on.

Turning Q6 off applies a positive voltage to the base of Q9, turning it on. This turns on Q10 and its collector voltage rises to 13 volts. In Remote Stations, this 13 volts is connected from J7 to the Remote Control Panel 4KC16A11 where it energizes relay K1001, keying the station transmitter.

In Radio Control Base Station Systems, the 13 volts is applied from the Decoder Panel on the Repeater Base Station to the Repeater Panel on the Repeater Control Station. The voltage is applied to a voltage divider and energizes the Carrier Operated Relay, keying the transmitter. A simplified tone keying diagram for repeater stations is shown in Figure 9.

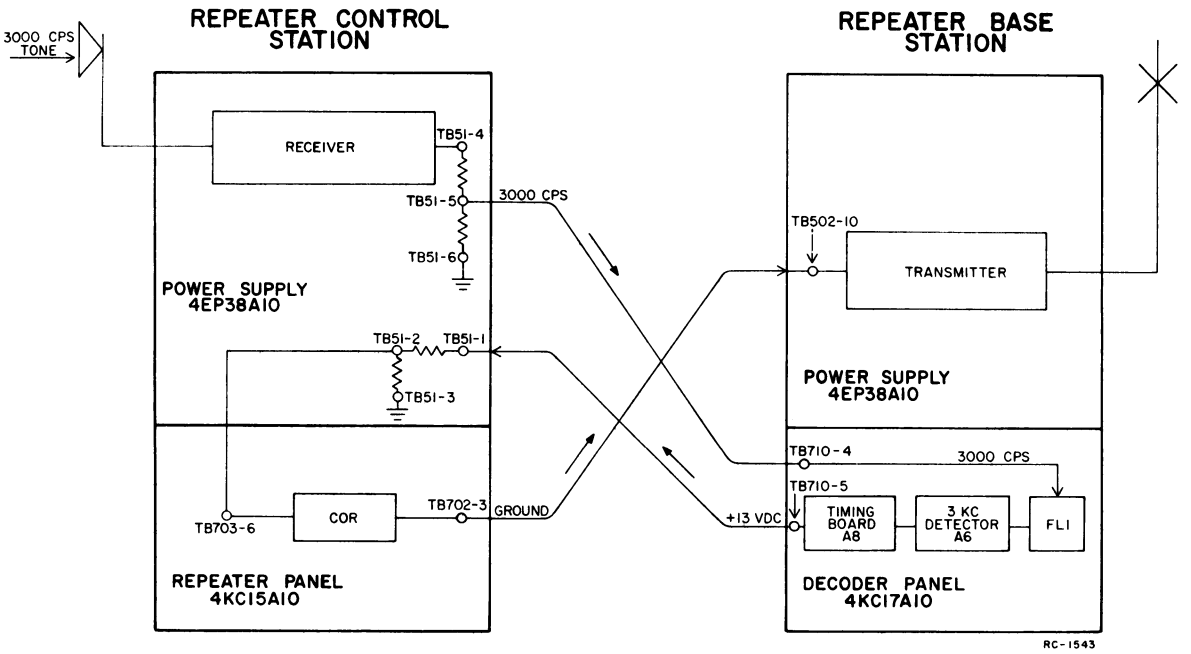


Figure 9 - Repeater Tone Keying Diagram

POWER SUPPLY MODIFICATIONS

In tone keying applications, filter-amplifier assembly FL1-A1 and terminal board TB51 are added to power supply Model 4EP38A10. In stations with second receivers, a second filter-amplifier assembly is added to receiver power supply Model 4EP39A10.

Audio from the receiver is taken from the volume control (R511 on the EP-38-A or R502 on the EP-39-A), and is coupled through emitter-follower Q1 to low-pass filter FL1. The filter attenuates any 3000-cps signal from the station receiver to prevent noise from keying the transmitter or muting the receiver. The filter output is amplified by Q2 and applied to emitter-follower Q3. In remote stations, the output of Q3 is connected back to the station receiver. In repeater stations, the output connects to the audio coupler on the repeater panel.

MAINTENANCE

DISASSEMBLY

To gain access to the component boards in the Decoder Panel, spring open the retaining clips on each side of the assembly and lower the hinged front cover.

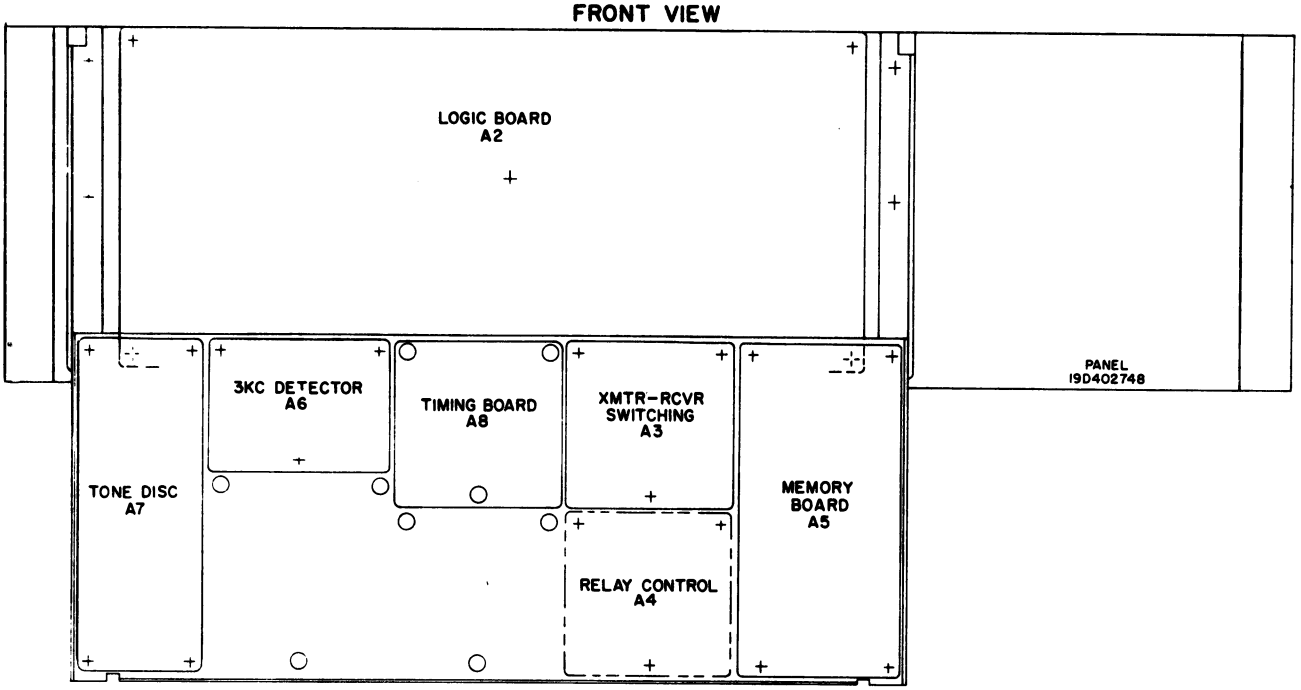
TROUBLESHOOTING

Specific troubleshooting procedures are available for the Decoder circuitry (see Table of Contents). The procedures include:

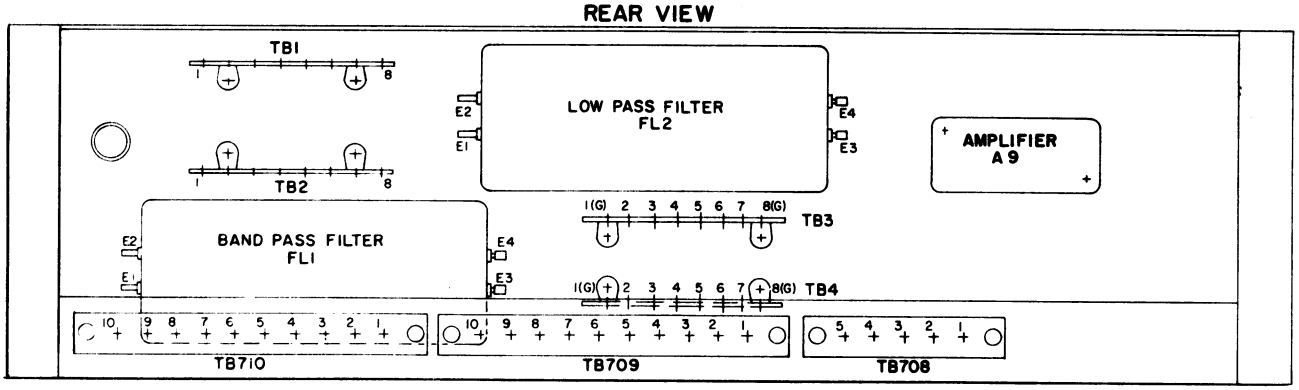
- DC voltage checks using a VTVM
- Waveform checks using an externally triggered oscilloscope.

(19D402894, Rev. 1)

FRONT VIEW



REAR VIEW



MULTI-FREQUENCY CONNECTIONS

HARNESS 19A122455G1-G6

FROM MEMORY BOARD A5	WIRE COLOR	TO XMTR-RCVR SWITCHING BOARD A3					
		3-OR 4-FREQ XMTR & RCVR (G1)	2-FREQ XMTR 2-FREQ RCVR (G2)	2-FREQ XMTR 1-FREQ RCVR W OR W/O C.G. (G3)	1-FREQ XMTR 2-FREQ RCVR (G4)	2-FREQ XMTR 1-FREQ RCVR NO C.G. (G5)	2-FREQ XMTR 2-RECEIVERS (G6) *
J16	G	J2	J2	J13	J2	J2	
J17	G	J4	J4			J13	
J18	G	J6	J6		J21	J14	
J19	G	J8		J14	J4	J4	
J20	G	J13	J13				J13
J21	G	J14					
J22	G	J15	J21				
J23	G	J16	J14				J14
J24	G	J21					

* ALSO REQUIRES G4 HARNESS

RC-1539

OUTLINE DIAGRAM

DECODER PANEL
MODEL 4KC17A10

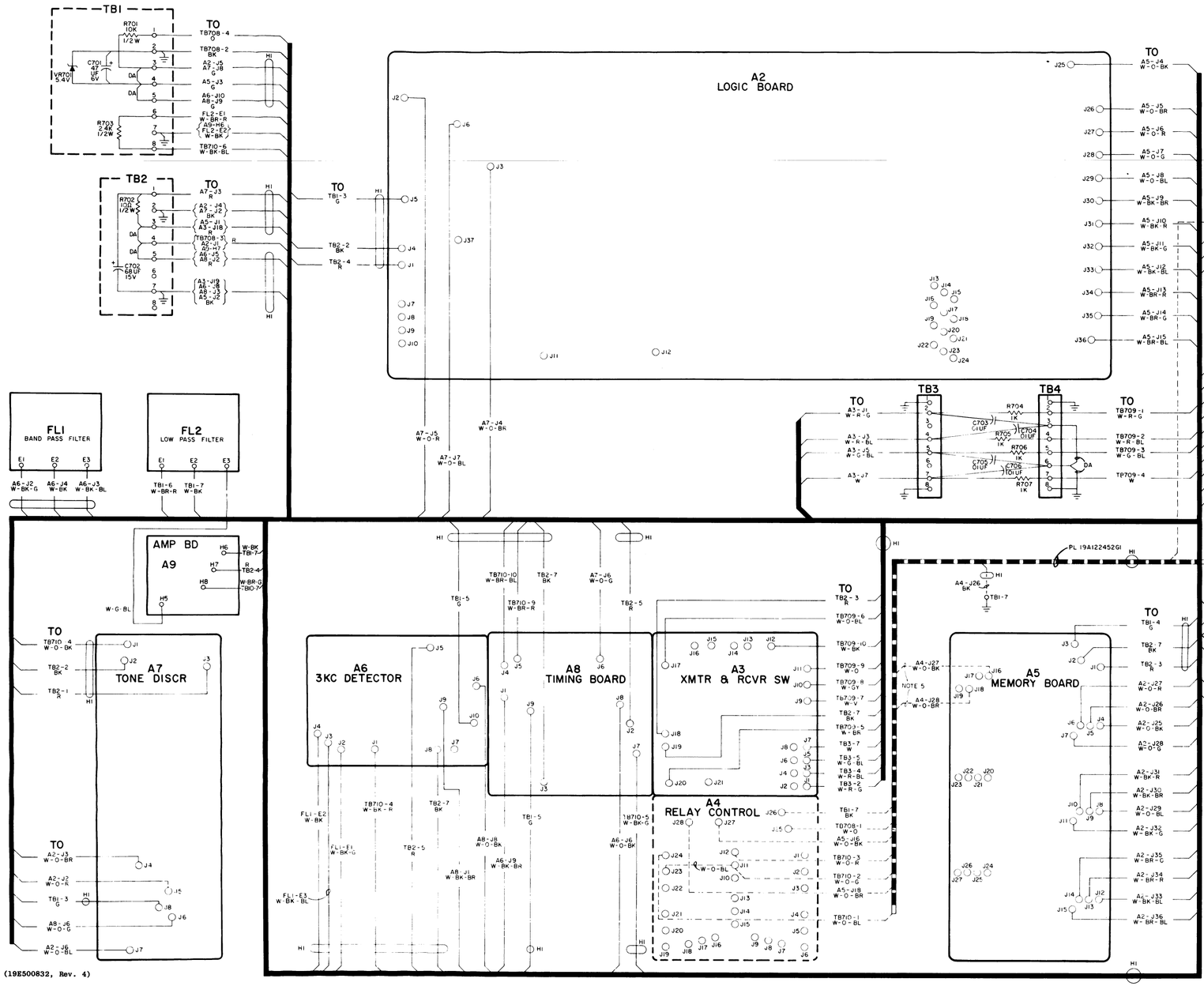
PARTS LIST

LBI-3818

CHASSIS
MODEL 4KC17A10
PL-19D402748-G1

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C701	5496267-P2	Tantalum: 47µf ±20%, 6VDCW; sim to Sprague Type 150D.
C702	5496267-P11	Tantalum: 68 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C703 thru C706	5494481-P21	Ceramic disc: .01 µf ±20%, 500 VDCW; sim to RMC Type JF Discap.
		- - - - - - - - - - FILTERS - - - - - - - - - -
FL1	PL-19C304251-G1	Bandpass filter.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R701	3R77-P103J	Composition: 10,000 ohms ±5%, 1/2 w.
R702	3R77-P510J	Composition: 51 ohms ±5%, 1/2 w.
R703	3R77-P242J	Composition: 2400 ohms ±5%, 1/2 w.
R704 thru R707	3R77-P102J	Composition: 1000 ohms ±5%, 1/2 w.
		- - - - - - - - - TERMINAL BOARDS - - - - - - - - -
TB1 and TB2	7775500-P24	Phen: 8 terminals.
TB3 and TB4	7775500-P18	Phen: 8 terminals.
TB708	7117710-P5	Phen: 5 terminals; sim to Cinch 1775.
TB709 and TB710	7117710-P10	Phen: 10 terminals; sim to Cinch 1799.
		- - - - - - - - - VOLTAGE REGULATORS - - - - - - - - -
VR701	4036887-P5	Silicon, Zener

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

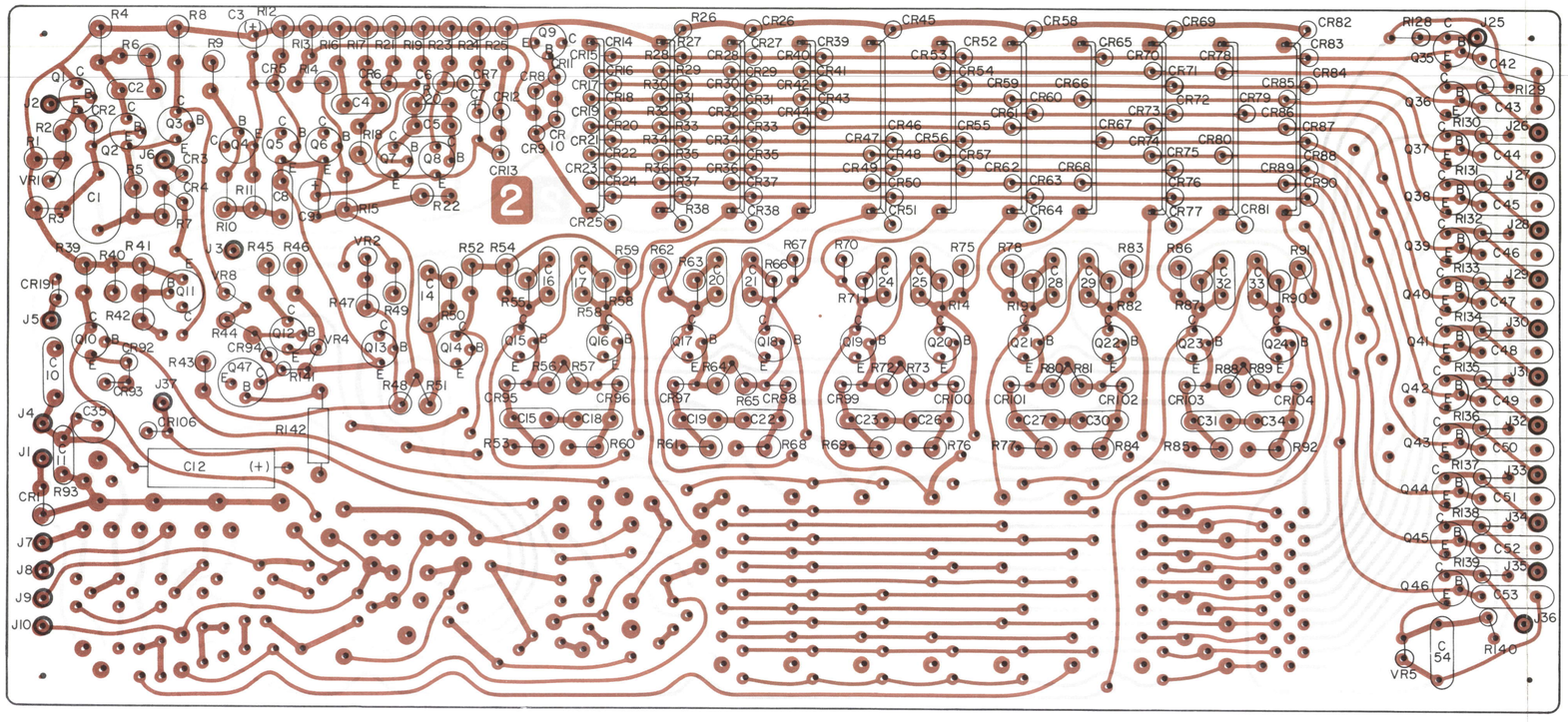


NOTES
1. ALL WIRES ARE F24 UNLESS OTHERWISE SPECIFIED.
2. CABLES SHOULD BE CONSTRUCTED IN ACCORDANCE WITH WIRING INSTRUCTIONS (19A121850).
3. TERMINATE ALL WIRES CONNECTING TO JACKS WITH A4036634P1 TERMINALS, OTHERWISE STRIP AND TIN.
4. WHEN FILTER FL-2 & A9 BD ARE NOT USED CLIP WIRES WHICH TERMINATE AT FL2 & A9 CLOSE TO HARNESS.
5. IF WIRES ARE ALREADY CONNECTED TO A5-J16 & J18, THEY MUST BE REMOVED BEFORE INSTALLING HARNESS (19A122452G1).

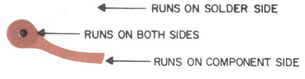
(19E500832, Rev. 4)

SCHEMATIC DIAGRAM

DECODER PANEL
MODEL 4KC17A10

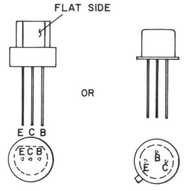


(19D402881, Rev. 0)
(19D402739, Sh. 1, Rev. 2)
(19D402739, Sh. 2, Rev. 2)



LEAD ORIENTATION FOR
FOR CR26, CR45, CR58,
CR59 & CR82

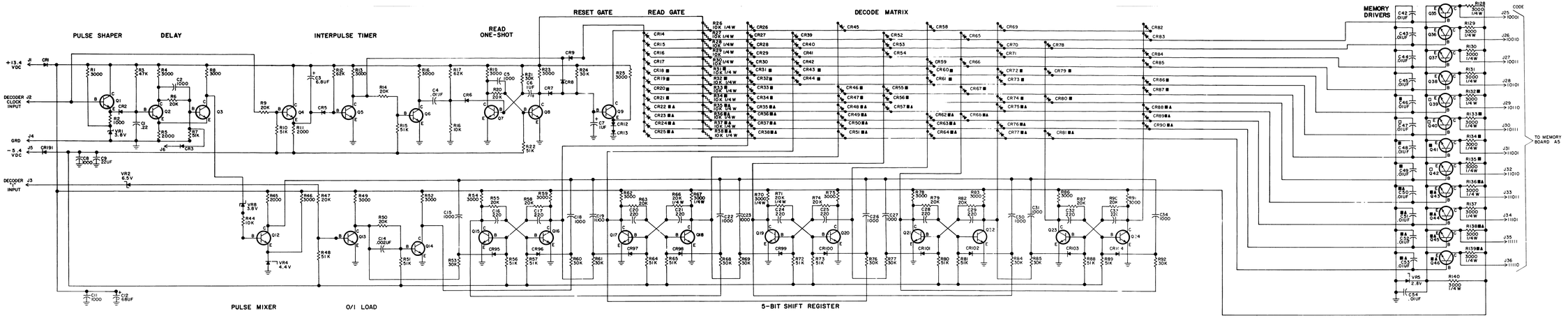
LEAD ORIENTATION FOR
CR27 THRU CR44
CR46 THRU CR57
CR59 THRU CR68
CR70 THRU CR81
CR83 THRU CR90
CR14 THRU CR25



LEAD IDENTIFICATION
FOR Q1 THRU Q47

OUTLINE DIAGRAM

LOGIC BOARD A2
DECODE ONLY



(198620772, Rev. 3)

A OMIT IN GROUP 8, 8 FUNCTION DECODE.

■ OMIT IN GROUP 9, 4 FUNCTION DECODE.

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 MICROFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF= MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR MH=HENRYS.

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 INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.

THIS ELEM DIAG APPLIES TO	
MODEL NO	REV LETTER
PLI9040274207	
PLI9040274208	
PLI9040274209	

SCHEMATIC DIAGRAM

LOGIC BOARD A2
DECODE ONLY

PARTS LIST

LBI-3805

LOGIC BOARD - A3
3BD0262
PL-19D402743-G7 - 9

SYMBOL	G-E PART NO.	DESCRIPTION
		PL-19D402743-G7 12 Function PL-19D402742-G8 8 Function PL-19D402742-G9 4 Function
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19B209243-P109	Polyester: 0.22 µf ±10%, 40 VDCW.
C3	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C3	5496267-P218	Tantalum: 6.8 µf ±10%, 35 VDCW; sim to Sprague Type 150D.
C4	5491189-P201	Polyester: .01 µf ±5%, 50 VDCW.
C5	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C6 and C7	5496267-P217	Tantalum: 1.0 µf ±10%, 35 VDCW; sim to Sprague Type 150D.
C8	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C9	5496267-P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C11	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C12	5496267-P11	Tantalum: 68 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C14	5494481-P113	Ceramic disc: .002 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C15	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C16 and C17	5494481-P103	Ceramic disc: 220 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C18 and C19	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C20 and C21	5494481-P103	Ceramic disc: 220 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C22 and C23	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C24 and C25	5494481-P103	Ceramic disc: 220 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C26 and C27	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C28 and C29	5494481-P103	Ceramic disc: 220 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C30 and C31	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C32 and C33	5494481-P103	Ceramic disc: 220 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C34	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C43 thru C45	19B209243-P1	Polyester: .01 µf ±20%, 40 VDCW.
C46 thru C49	19B209243-P1	Polyester: .01 µf ±20%, 40 VDCW. (Used in 8 and 12 Function only).
C50 thru C53	19B209243-P1	Polyester: .01 µf ±20%, 40 VDCW. (Used in 12 Function only).
C54	19B209243-P1	Polyester: .01 µf ±20%, 40 VDCW.

SYMBOL	G-E PART NO	DESCRIPTION
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1	4037822-P1	Silicon.
CR2 and CR3	19A115250-P1	Silicon.
CR5 thru CR9	19A115250-P1	Silicon.
CR12 thru CR17	19A115250-P1	Silicon.
CR18 thru CR21	19A115250-P1	Silicon. (Used in 8 and 12 Function only).
CR22 thru CR25	19A115250-P1	Silicon. (Used in 12 Function only).
CR26 thru CR30	19A115250-P1	Silicon.
CR31 thru CR34	19A115250-P1	Silicon. (Used in 8 and 12 Function only).
CR35 thru CR38	19A115250-P1	Silicon. (Used in 12 Function only).
CR39 thru CR42	19A115250-P1	Silicon.
CR43 and CR44	19A115250-P1	Silicon. (Used in 8 and 12 Function only).
CR45	19A115250-P1	Silicon.
CR46 and CR47	19A115250-P1	Silicon. (Used in 8 and 12 Function only).
CR48 thru CR51	19A115250-P1	Silicon. (Used in 12 Function only).
CR52 thru CR54	19A115250-P1	Silicon.
CR55 and CR56	19A115250-P1	Silicon. (Used in 8 and 12 Function only).
CR57	19A115250-P1	Silicon. (Used in 12 Function only).
CR58 and CR59	19A115250-P1	Silicon.
CR60 and CR61	19A115250-P1	Silicon. (Used in 8 and 12 Function only).
CR62 thru CR64	19A115250-P1	Silicon. (Used in 12 Function only).
CR65 and CR66	19A115250-P1	Silicon.
CR67	19A115250-P1	Silicon. (Used in 8 and 12 Function only).
CR68	19A115250-P1	Silicon. (Used in 12 Function only).
CR69 thru CR71	19A115250-P1	Silicon.
CR72 thru CR74	19A115250-P1	Silicon. (Used in 8 and 12 Function only).
CR75 thru CR77	19A115250-P1	Silicon. (Used in 12 Function only).
CR78	19A115250-P1	Silicon.
CR79 and CR80	19A115250-P1	Silicon. (Used in 8 and 12 Function only).
CR81	19A115250-P1	Silicon. (Used in 12 Function only).
CR82 thru CR85	19A115250-P1	Silicon.
CR86 and CR87	19A115250-P1	Silicon. (Used in 8 and 12 Function only).

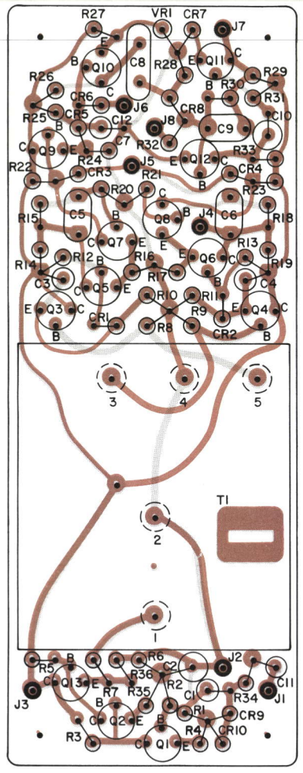
SYMBOL	G-E PART NO	DESCRIPTION
CR88 thru CR90	19A115250-P1	Silicon. (Used in 12 Function only).
CR95 thru CR104	19A115250-P1	Silicon.
CR105	19A115250-P1	Silicon.
VR1	4036887-P3	Silicon, Zeners.
VR2	4036887-P6	Silicon, Zeners.
VR4	4036887-P4	Silicon, Zeners.
VR5	4036887-P2	Silicon, Zeners.
VR6	4036887-P3	Silicon, Zeners.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J37	4033513-P15	Contact, electrical: sim to Bead Chain 840-1A.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1 thru Q5	19A115123-P1	Silicon, NPN; sim to Type 2N3712.
Q13 thru Q24	19A115123-P1	Silicon, NPN; sim to Type 2N3712.
Q25 thru Q38	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q39 thru Q42	19A115123-P1	Silicon, NPN; sim to Type 2N2712. (Used in 8 and 12 Function only).
Q43 thru Q46	19A115123-P1	Silicon, NPN; sim to Type 2N3712. (Used in 12 Function only).
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R2	3R77-P103J	Composition: 1000 ohms ±5%, 1/2 w.
R3	3R77-P473J	Composition: 47,000 ohms ±5%, 1/2 w.
R4	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R5	3R77-P203J	Composition: 2000 ohms ±5%, 1/2 w.
R6	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R7	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R8	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R9	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R10	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R11	3R77-P433J	Composition: 4300 ohms ±5%, 1/2 w.
R12	3R77-P623J	Composition: 62,000 ohms ±5%, 1/2 w.
R13	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R14	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R15	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R16	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R17	3R77-P623J	Composition: 62,000 ohms ±5%, 1/2 w.
R18	3R77-P103J	Composition: 10,000 ohms ±5%, 1/2 w.
R19	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R20	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R21	3R77-P303J	Composition: 30,000 ohms ±5%, 1/2 w.
R22	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R23	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R24	3R77-P303J	Composition: 30,000 ohms ±5%, 1/2 w.
R25	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R26 thru R30	3R77-P103J	Composition: 10,000 ohms ±5%, 1/2 w.

SYMBOL	G-E PART NO	DESCRIPTION
R31 thru R34	3R77-P103J	Composition: 10,000 ohms ±5%, 1/2 w. (Used in 8 and 12 Function only).
R35 thru R38	3R77-P103J	Composition: 10,000 ohms ±5%, 1/2 w. (Used in 12 Function only).
R44	3R77-P103J	Composition: 10,000 ohms ±5%, 1/2 w.
R45	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R46	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R47	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R48	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R49	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R50	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R51	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R52	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R53	3R77-P303J	Composition: 30,000 ohms ±5%, 1/2 w.
R54	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R55	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R56 and R57	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R58	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R59	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R60 and R61	3R77-P303J	Composition: 30,000 ohms ±5%, 1/2 w.
R62	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R63	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R64 and R65	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R66	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R67	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R68 and R69	3R77-P303J	Composition: 30,000 ohms ±5%, 1/2 w.
R70	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R71	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R72 and R73	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R74	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R75	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R76 and R77	3R77-P303J	Composition: 30,000 ohms ±5%, 1/2 w.
R78	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R79	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R80 and R81	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R82	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R83	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R84 and R85	3R77-P303J	Composition: 30,000 ohms ±5%, 1/2 w.
R86	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R87	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R88 and R89	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R90	3R77-P303J	Composition: 30,000 ohms ±5%, 1/2 w.
R91	3R77-P303J	Composition: 3000 ohms ±5%, 1/2 w.
R92	3R77-P303J	Composition: 30,000 ohms ±5%, 1/2 w.

SYMBOL	G-E PART NO	DESCRIPTION
R128 thru R131	3R153-P303J	Composition: 3000 ohms ±5%, 1/4 w.
R132 thru R135	3R153-P303J	Composition: 3000 ohms ±5%, 1/4 w. (Used in 8 and 12 Function only).
R136 thru R139	3R153-P302J	Composition: 3000 ohms ±5%, 1/4 w. (Used in 12 Function only).
R140	3R153-P303J	Composition: 3000 ohms ±5%, 1/4 w.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

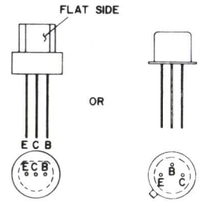
OUTLINE DIAGRAM



RUNS ON SOLDER SIDE

RUNS ON BOTH SIDES

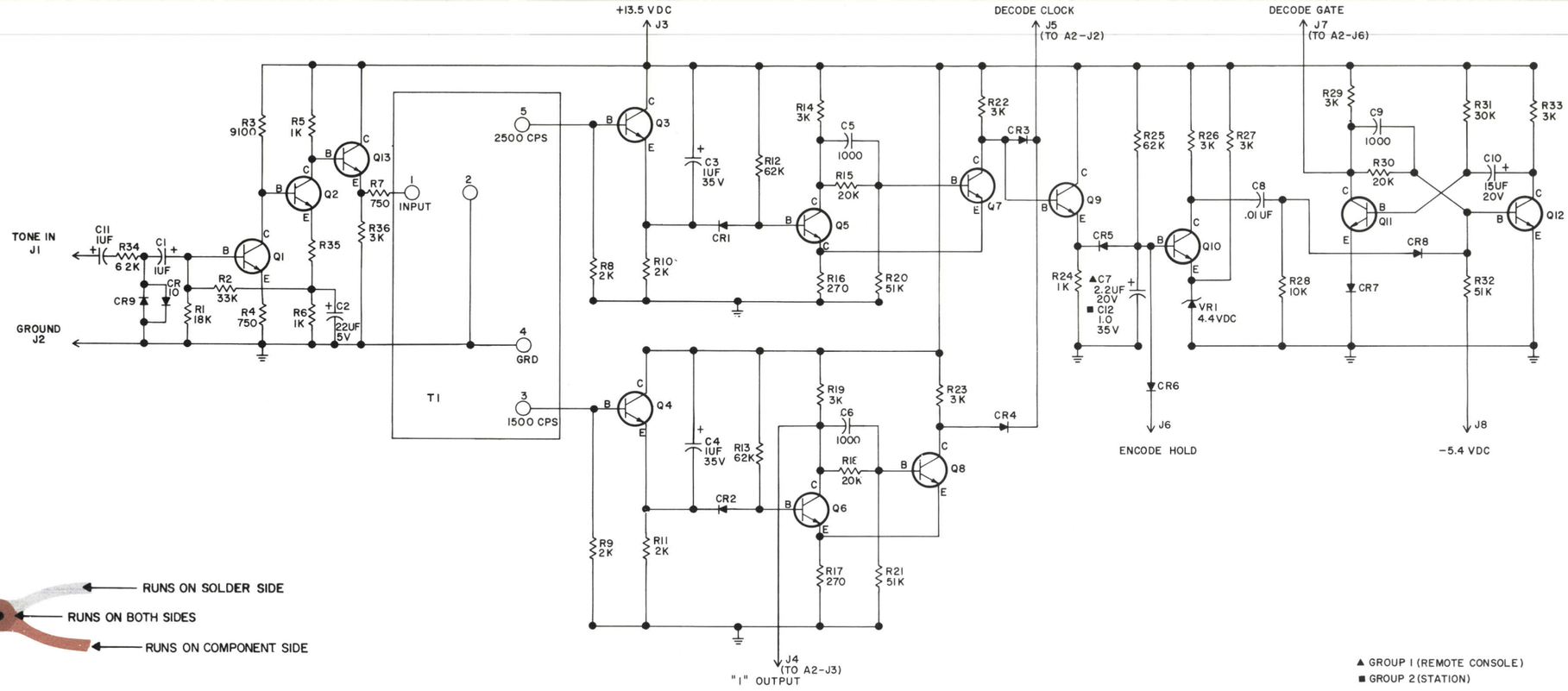
RUNS ON COMPONENT SIDE



LEAD IDENTIFICATION
FOR Q1 - Q13

(19C311359, Rev. 0)
(19B205443, Sh. 1, Rev. 1)
(19B205443, Sh. 2, Rev. 1)

SCHEMATIC DIAGRAM



▲ GROUP 1 (REMOTE CONSOLE)
■ GROUP 2 (STATION)

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
PL19C311026G1	
PL19C311026G2	

(19D402729, Rev. 3)

SCHEMATIC & OUTLINE DIAGRAM

TONE DISCRIMINATOR A7

Issue 1

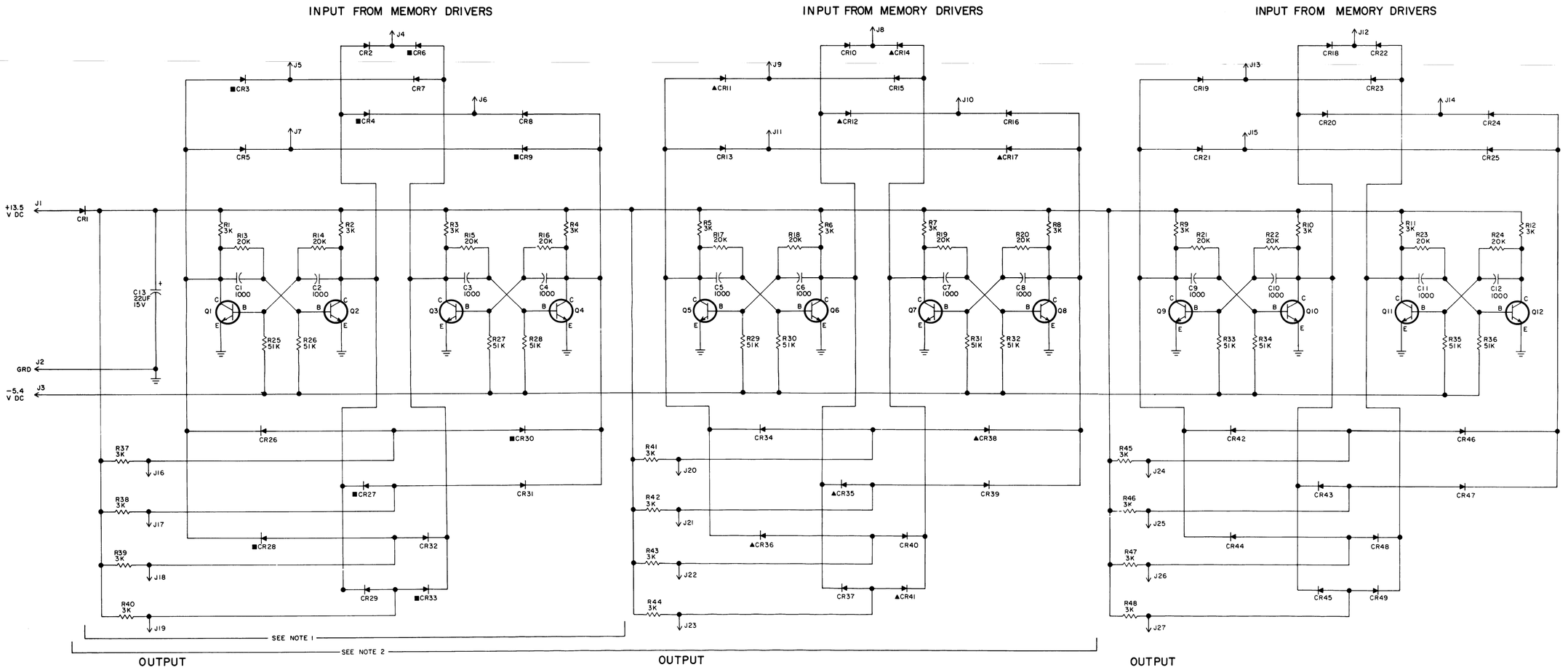
PARTS LIST

LBI-3811

TONE DISCRIMINATOR - A7
PL-19C311026-G1-2

SYMBOL	G-E PART NO.	DESCRIPTION
		PL-19C311026-G1 Console PL-19C311026-G2 Station Panel
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5496267-P17	Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C2	5496267-P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C3 and C4	5496267-P17	Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C5 and C6	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C7	5496267-P213	Tantalum: 2.2 µf ±10%, 20 VDCW; sim to Sprague Type 150D. (Used in PL-19C311026-G1).
C8	19B209243-P101	Polyester: .01 µf ±10%, 40 VDCW.
C9	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C10	5496267-P214	Tantalum: 15 µf ±10%, 20 VDCW; sim to Sprague Type 150D.
C11	5496267-P17	Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C12	5496267-P217	Tantalum: 1.0 µf ±10%, 35 VDCW; sim to Sprague Type 150D. (Used in PL-19C311026-G2).
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR1 thru CR10	19A115250-P1	Silicon.
VR1	4036887-P4	Silicon, Zener.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1 thru J8	4033513-P15	Contact, electrical: sim to Bead Chain R40-1A.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 thru Q13	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R152-P183J	Composition: 18,000 ohms ±5%, 1/4 w.
R2	3R152-P333J	Composition: 33,000 ohms ±5%, 1/4 w.
R3	3R152-P912J	Composition: 9100 ohms ±5%, 1/4 w.
R4	3R152-P751J	Composition: 750 ohms ±5%, 1/4 w.
R5 and R6	3R152-P102J	Composition: 1000 ohms ±5%, 1/4 w.
R7	3R152-P751J	Composition: 750 ohms ±5%, 1/4 w.
R8 thru R11	3R152-P202J	Composition: 2000 ohms ±5%, 1/4 w.
R12 and R13	3R152-P623J	Composition: 62,000 ohms ±5%, 1/4 w.
R14	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
R15	3R152-P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R16 and R17	3R152-P271J	Composition: 270 ohms ±5%, 1/4 w.
R18	3R152-P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R19	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
R20 and R21	3R152-P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R22 and R23	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
R24	3R152-P102J	Composition: 1000 ohms ±5%, 1/4 w.
R25	3R152-P623J	Composition: 62,000 ohms ±5%, 1/4 w.
R26 and R27	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
R28	3R152-P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R29	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
R30	3R152-P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R31	3R152-P303J	Composition: 30,000 ohms ±5%, 1/4 w.
R32	3R152-P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R33	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
R34	3R152-P622J	Composition: 6200 ohms ±5%, 1/4 w.
R35	3R152-P101J	Composition: 100 ohms ±5%, 1/4 w.
R36	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - - -
T1	PL-19B206719-G1	Discriminator assembly.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	4035306-P40	Fiber washer. (Used between T1 and board).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.



(19R620766, Rev. 1)

NOTES:

1. THESE COMPONENTS PRESENT IN GROUPS 3 & 5 COMPONENTS MARKED WITH ■ ARE OMITTED IN GROUP 5 ONLY.
2. THESE COMPONENTS PRESENT IN GROUPS 2 & 4 COMPONENTS MARKED WITH ▲ ARE OMITTED IN GROUP 4 ONLY.

G1-12 FUNCTIONS (4+4+4)
G2-8 FUNCTIONS (4+4)
G3-4 FUNCTIONS
G4-8 FUNCTIONS (4+2+2)
G5-4 FUNCTIONS (2+2)

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.

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 INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.

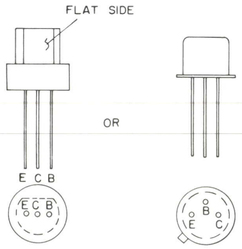
THIS ELEM DIAG APPLIES TO

MODEL NO	REV LETTER
PL19C311029G1	
PL19C311029G2	
PL19C311029G3	
PL19C311029G4	
PL19C311029G5	

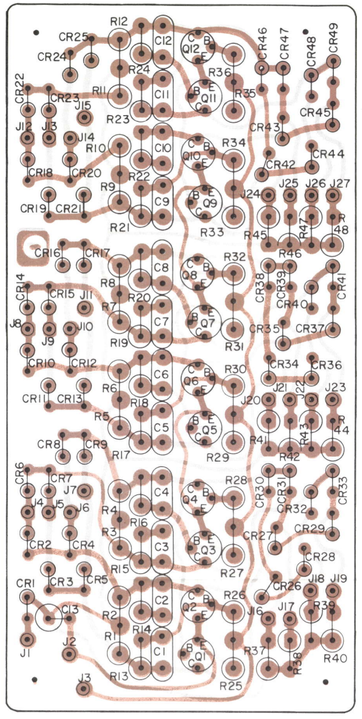
SCHEMATIC DIAGRAM

MEMORY BOARD A5

Issue 1



LEAD IDENTIFICATION
FOR Q1 THRU Q12



(19C311358, Rev. 0)
(19E205444, Sh. 1, Rev. 0)
(19E205444, Sh. 2, Rev. 0)

RUNS ON SOLDER SIDE
RUNS ON BOTH SIDES
RUNS ON COMPONENT SIDE

OUTLINE DIAGRAM

MEMORY BOARD A5

PARTS LIST

LBI-3806

MEMORY BOARD - A5
PL-19C311029-G1-5

SYMBOL	G-E PART NO.	DESCRIPTION
		PL-19C311029-G1 12 Functions (4 + 4 + 4) PL-19C311029-G2 8 Functions (4 + 4) PL-19C311029-G3 4 Functions PL-19C311029-G4 8 Functions (4 + 2 + 2) PL-19C311029-G5 4 Functions (2 + 2)
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1 thru C4	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C5 thru C8	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap. (Used in PL-19C311029-G1, 2 and 4).
C9 thru C12	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap. (Used in PL-19C311029-G1).
C13	5496267-P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR1 and CR2	19A115250-P1	Silicon.
CR3 and CR4	19A115250-P1	Silicon. (Used in PL-19C311029-G1-4).
CR5	19A115250-P1	Silicon.
CR6	19A115250-P1	Silicon. (Used in PL-19C311029-G1-4).
CR7 and CR8	19A115250-P1	Silicon.
CR9	19A115250-P1	Silicon. (Used in PL-19C311029-G1-4).
CR10	19A115250-P1	Silicon. (Used in PL-19C311029-G1, 2 and 4).
CR11 and CR12	19A115250-P1	Silicon. (Used in PL-19C311029-G1 and 2).
CR13	19A115250-P1	Silicon. (Used in PL-19C311029-G1, 2 and 4).
CR14	19A115250-P1	Silicon. (Used in PL-19C311029-G1 and 2).
CR15 and CR16	19A115250-P1	Silicon. (Used in PL-19C311029-G1, 2 and 4).
CR17	19A115250-P1	Silicon. (Used in PL-19C311029-G1 and 2).
CR18 thru CR25	19A115250-P1	Silicon. (Used in PL-19C311029-G1).
CR26	19A115250-P1	Silicon.
CR27 and CR28	19A115250-P1	Silicon. (Used in PL-19C311029-G1-4).
CR29	19A115250-P1	Silicon.
CR30	19A115250-P1	Silicon. (Used in PL-19C311029-G1-4).
CR31 and CR32	19A115250-P1	Silicon.
CR33	19A115250-P1	Silicon. (Used in PL-19C311029-G1-4).
CR34	19A115250-P1	Silicon. (Used in PL-19C311029-G1, 2 and 4).
CR35 and CR36	19A115250-P1	Silicon. (Used in PL-19C311029-G1 and 2).
CR37	19A115250-P1	Silicon. (Used in PL-19C311029-G1, 2 and 4).
CR38	19A115250-P1	Silicon. (Used in PL-19C311029-G1 and 2).
CR39 and CR40	19A115250-P1	Silicon. (Used in PL-19C311029-G1, 2 and 4).
CR41	19A115250-P1	Silicon. (Used in PL-19C311029-G1 and 2).
CR42 thru CR49	19A115250-P1	Silicon. (Used in PL-19C311029-G1).
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1 thru J27	4033513-P15	Contact, electrical: sim to Bead Chain R40-1A.
		- - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 thru Q4	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q5 thru Q8	19A115123-P1	Silicon, NPN; sim to Type 2N2712. (Used in PL-19C311029-G1, 2 and 4).
Q9 thru Q12	19A115123-P1	Silicon, NPN; sim to Type 2N2712. (Used in PL-19C311029-G1).
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1 thru R4	3R77-P302J	Composition: 3000 ohms ±5%, 1/2 w.
R5 thru R8	3R77-P302J	Composition: 3000 ohms ±5%, 1/2 w. (Used in PL-19C311029-G1, 2 and 4).
R9 thru R12	3R77-P302J	Composition: 3000 ohms ±5%, 1/2 w. (Used in PL-19C311029-G1).
R13 thru R16	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R17 thru R20	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w. (Used in PL-19C311029-G1, 2 and 4).
R21 thru R24	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w. (Used in PL-19C311029-G1).
R25 thru R28	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w.
R29 thru R32	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w. (Used in PL-19C311029-G1, 2 and 4).
R33 thru R36	3R77-P513J	Composition: 51,000 ohms ±5%, 1/2 w. (Used in PL-19C311029-G1).
R37 thru R40	3R77-P302J	Composition: 3000 ohms ±5%, 1/2 w.
R41 thru R44	3R77-P302J	Composition: 3000 ohms ±5%, 1/2 w. (Used in PL-19C311029-G1, 2 and 4).
R45 thru R48	3R77-P302J	Composition: 3000 ohms ±5%, 1/2 w. (Used in PL-19C311029-G1).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

PARTS LIST

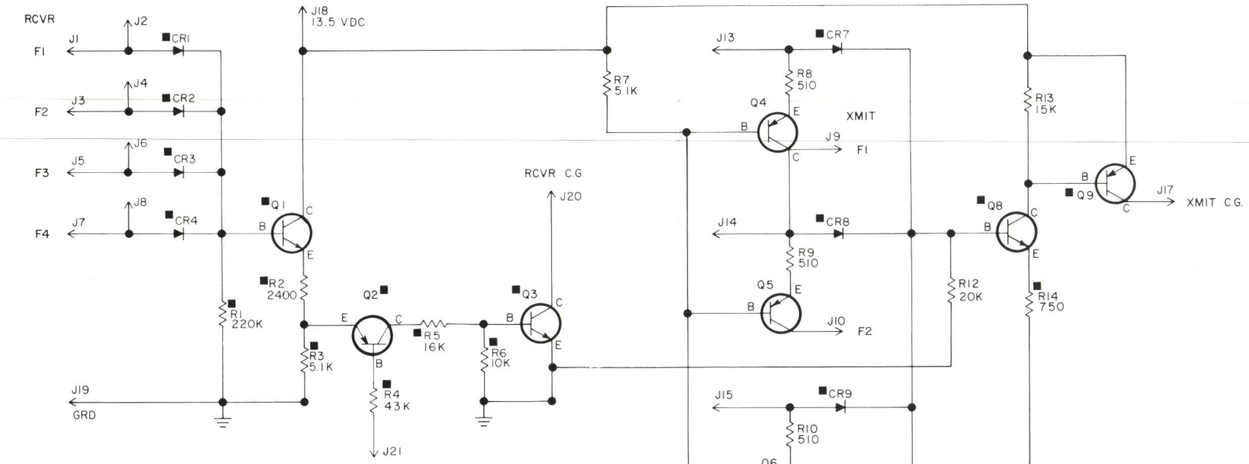
LBI-3822

TRANSMITTER - RECEIVER SWITCHING - A3
PL-19B205497-G1

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 thru CR10	19A115250-P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J21	4033513-P15	Contact, electrical: sim to Bead Chain R40-1A.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q2	19A115706-P1	Silicon, PNP; sim to Type 2N3638.
Q3	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q4 thru Q7	19A115706-P1	Silicon, PNP; sim to Type 2N3638.
Q8	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q9	19A115706-P1	Silicon, PNP; sim to Type 2N3638.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77-P224J	Composition: 0.22 megohm ±5%, 1/2 w.
R2	3R77-P242J	Composition: 2400 ohms ±5%, 1/2 w.
R3	3R77-P512J	Composition: 5100 ohms ±5%, 1/2 w.
R4	3R77-P433J	Composition: 43,000 ohms ±5%, 1/2 w.
R5	3R77-P163J	Composition: 16,000 ohms ±5%, 1/2 w.
R6	3R77-P103J	Composition: 10,000 ohms ±5%, 1/2 w.
R7	3R77-P512J	Composition: 5100 ohms ±5%, 1/2 w.
R8 thru R11	3R77-P511J	Composition: 510 ohms ±5%, 1/2 w.
R12	3R77-P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R13	3R77-P153J	Composition: 15,000 ohms ±5%, 1/2 w.
R14	3R77-P751J	Composition: 750 ohms ±5%, 1/2 w.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	4036555-P1	Insulator, washer: nylon. (Used with Q2, Q4, Q5, Q6, Q7 and Q9).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SCHEMATIC DIAGRAM



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.

■ OMIT IN GROUP 2

G1- XMTR & RCVR WITH CHAN. GUARD
G2- XMTR & RCVR ONLY

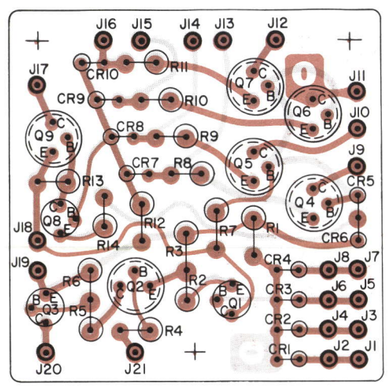
SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER

THIS ELEM DIAG APPLIES TO	
MODEL NO	REV LETTER
PL19B205497G1	
PL19B205497G2	

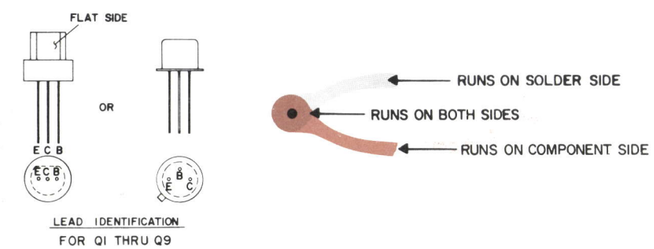
IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

(19C311089, Rev. 2)

OUTLINE DIAGRAM



(19B205892, Rev. 0)
(19B205496, Sh. 1, Rev. 0)
(19B205496, Sh. 2, Rev. 0)

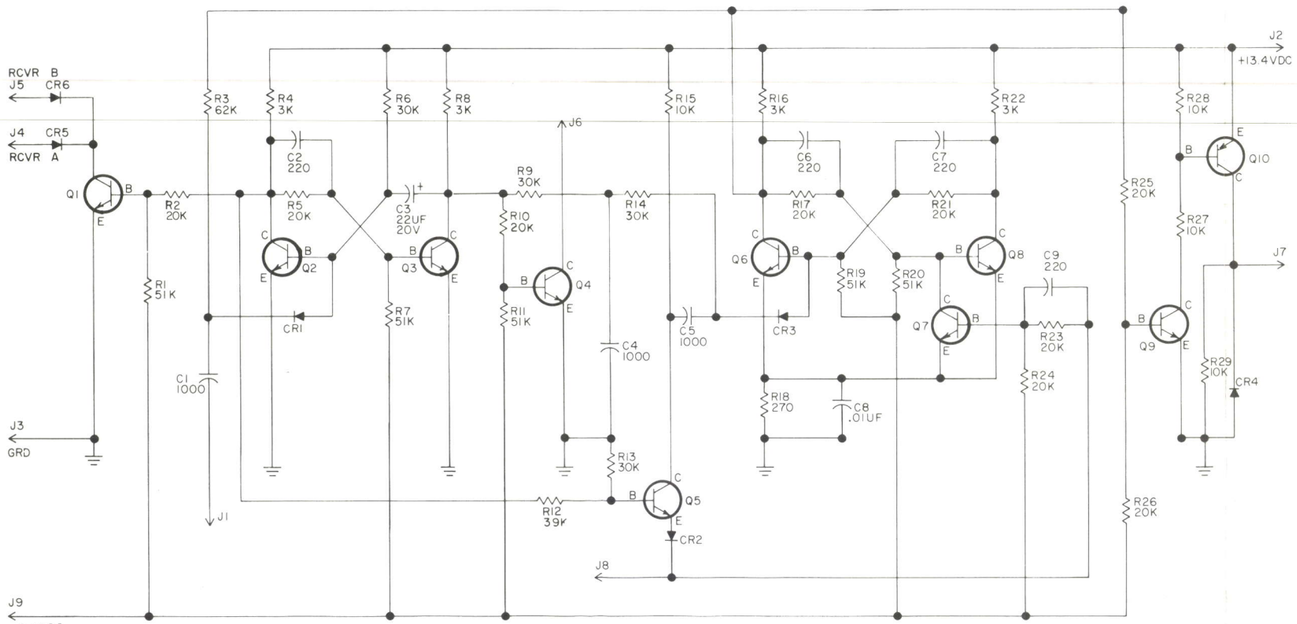


SCHEMATIC & OUTLINE DIAGRAM

TRANSMITTER-RECEIVER SWITCHING BOARD A3

Issue 1

SCHEMATIC DIAGRAM



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
PLI9B205649G1	

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.

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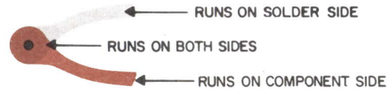
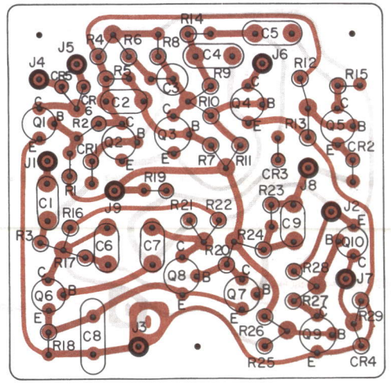
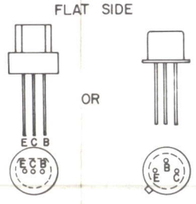
(19C311198, Rev. 3)

OUTLINE DIAGRAM







LEAD IDENTIFICATION FOR Q1 THRU Q10

SCHEMATIC & OUTLINE DIAGRAM

TIMING BOARD A8

26 Issue 1

(19B205894, Rev. 0)
(19B205647, Sh. 1, Rev. 0)
(19B205647, Sh. 2, Rev. 0)

PARTS LIST

LBI-3821

TIMING BOARD - A8
PL-19B205649-G1

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C2	5494481-P103	Ceramic disc: 220 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C3	5496267-P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C4 and C5	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C6 and C7	5494481-P103	Ceramic disc: 220 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C8	19B209243-P101	Polyester: .01 µf ±10%, 40 VDCW.
C9	5494481-P103	Ceramic disc: 220 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 thru CR6	19A115250-P1	Silicon.
		- - - - - - - - - - TRANSISTORS - - - - - - - - -
Q1 thru Q9	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q10	19A115768-P1	Silicon, PNP; sim to Type 2N3702.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R152-P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R2	3R152-P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R3	3R152-P623J	Composition: 62,000 ohms ±5%, 1/4 w.
R4	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
R5	3R152-P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R6	3R152-P303J	Composition: 30,000 ohms ±5%, 1/4 w.
R7	3R152-P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R8	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
R9	3R152-P303J	Composition: 30,000 ohms ±5%, 1/4 w.
R10	3R152-P202J	Composition: 20,000 ohms ±5%, 1/4 w.
R11	3R152-P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R12	3R152-P393J	Composition: 39,000 ohms ±5%, 1/4 w.
R13 and R14	3R152-P303J	Composition: 30,000 ohms ±5%, 1/4 w.
R15	3R152-P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R16	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
R17	3R152-P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R18	3R152-P271J	Composition: 270 ohms ±5%, 1/4 w.
R19 and R20	3R152-P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R21	3R152-P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R22	3R152-P302J	Composition: 3000 ohms ±5%, 1/4 w.
R23 thru R26	3R152-P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R27 thru R29	3R152-P103J	Composition: 10,000 ohms ±5%, 1/4 w.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

PARTS LIST

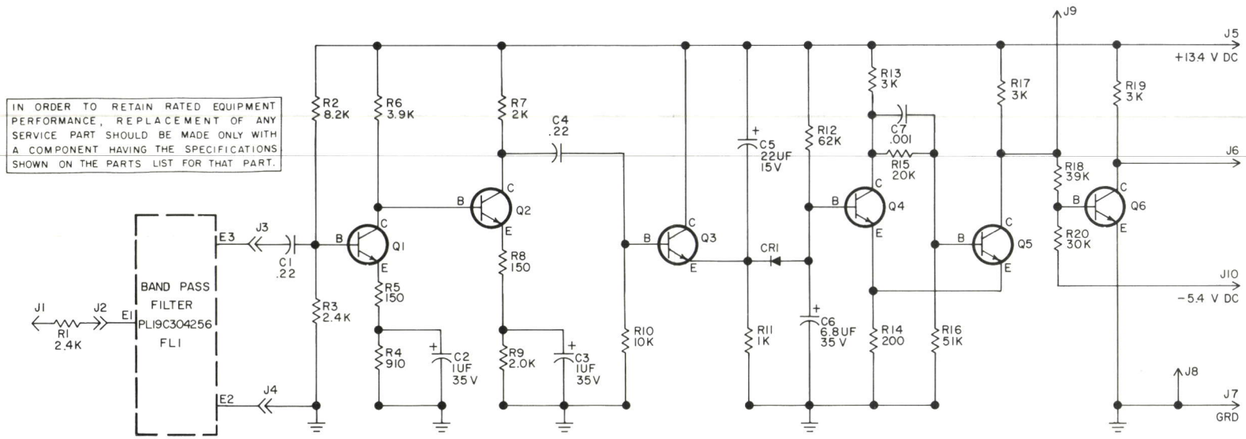
LBI-3820

3-KC DETECTOR - A6
PL-19B205509-G1

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19B209243-P9	Polyester: 0.22 µf ±20%, 40 VDCW.
C2 and C3	5496267-P217	Tantalum: 1.0 µf ±10%, 35 VDCW; sim to Sprague Type 150D.
C4	19B209243-P9	Polyester: 0.22 µf ±20%, 40 VDCW.
C5	5496267-P210	Tantalum: 22 µf ±10%, 15 VDCW; sim to Sprague Type 150D.
C6	5496267-P218	Tantalum: 6.8 µf ±10%, 35 VDCW; sim to Sprague Type 150D.
C7	5494481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1	19A115250-P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J10	4033513-P15	Contact, electrical: sim to Bead Chain R40-1A.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 thru Q6	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77-P242J	Composition: 2400 ohms ±5%, 1/2 w.
R2	3R77-P822J	Composition: 8200 ohms ±5%, 1/2 w.
R3	3R77-P242J	Composition: 2400 ohms ±5%, 1/2 w.
R4	3R77-P911K	Composition: 910 ohms ±10%, 1/2 w.
R5	3R77-P151K	Composition: 150 ohms ±10%, 1/2 w.
R6	3R77-P392K	Composition: 3900 ohms ±10%, 1/2 w.
R7	3R77-P202K	Composition: 2000 ohms ±10%, 1/2 w.
R8	3R77-P151K	Composition: 150 ohms ±10%, 1/2 w.
R9	3R77-P202K	Composition: 2000 ohms ±10%, 1/2 w.
R10	3R77-P103K	Composition: 10,000 ohms ±10%, 1/2 w.
R11	3R77-P102K	Composition: 1000 ohms ±10%, 1/2 w.
R12	3R77-P623K	Composition: 62,000 ohms ±10%, 1/2 w.
R13	3R77-P302J	Composition: 3000 ohms ±5%, 1/2 w.
R14	3R77-P201J	Composition: 200 ohms ±5%, 1/2 w.
R15	3R77-P203K	Composition: 20,000 ohms ±10%, 1/2 w.
R16	3R77-P513K	Composition: 51,000 ohms ±10%, 1/2 w.
R17	3R77-P302J	Composition: 3000 ohms ±5%, 1/2 w.
R18	3R77-P393J	Composition: 39,000 ohms ±5%, 1/2 w.
R19	3R77-P302J	Composition: 3000 ohms ±5%, 1/2 w.
R20	3R77-P303J	Composition: 30,000 ohms ±5%, 1/2 w.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SCHEMATIC DIAGRAM



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.

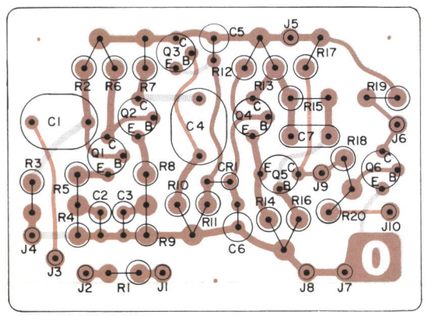
(19C311096, Rev. 1)

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

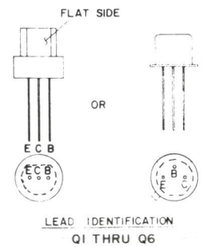
THIS ELEM DIAG APPLIES TO

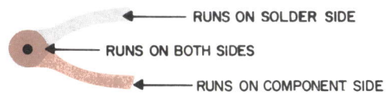
MODEL NO PLI9B205509G1 — REV LETTER

OUTLINE DIAGRAM



(19B205885, Rev. 0)
(19B205508, Sh. 1, Rev. 0)
(19B205508, Sh. 2, Rev. 0)



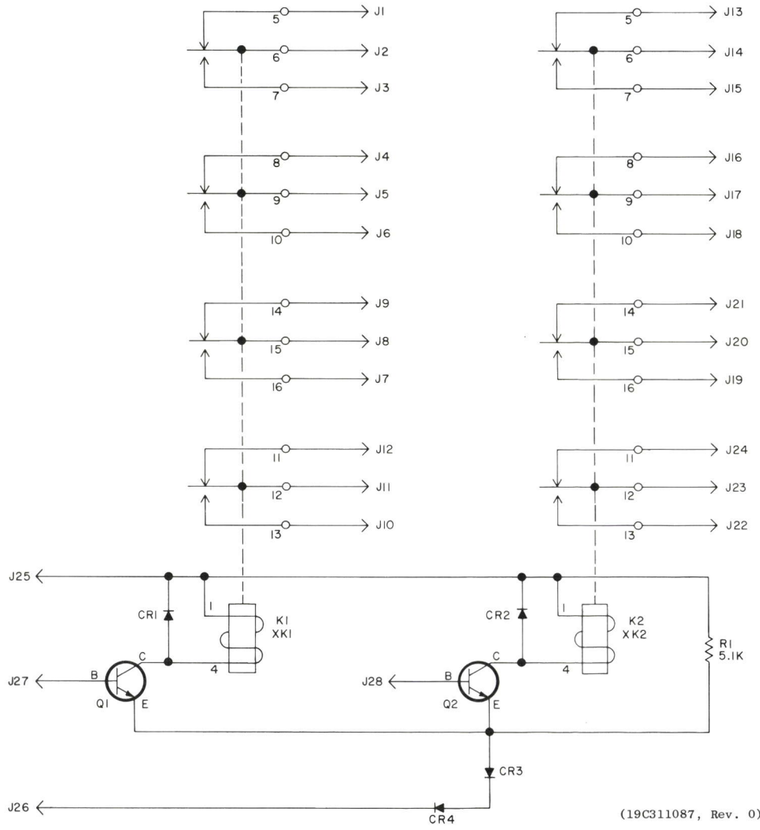


SCHEMATIC & OUTLINE DIAGRAM

3-KC DETECTOR A8

Issue 1

SCHEMATIC DIAGRAM



(19C311087, Rev. 0)

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.

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.

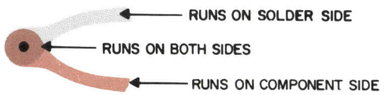
SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.

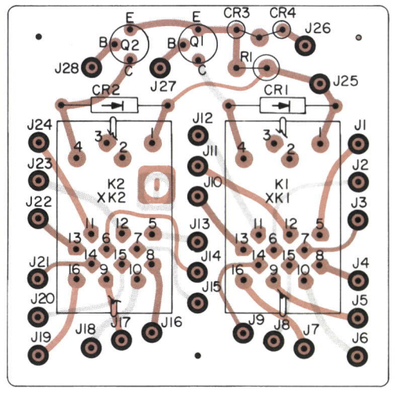
THIS ELEM DIAG APPLIES TO

MODEL NO. REV LETTER

PL19B205495G1

OUTLINE DIAGRAM





(19E205893, Rev. 0)
(19E205494, Sh. 1, Rev. 0)
(19E205494, Sh. 2, Rev. 0)

SCHEMATIC & OUTLINE DIAGRAM

RELAY CONTROL BOARD A4

PARTS LIST

LBI-3823

RELAY CONTROL - A4
PL-19A122460-G3

SYMBOL	G-E PART NO.	DESCRIPTION
		COMPONENT BOARD PL-19B205495-G1
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 thru CR4	19A115250-P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J28	4033513-P15	Contact, electrical: sim to Bead Chain R40-1A.
		- - - - - - - - - - - RELAYS - - - - - - - - - - -
K1 and K2	5491595-P14	Armature: 1.5 w operating, 520 ohms ±15% coil res 4 form C contacts; sim to Allied Control T154-X-131.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1 and Q2	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77-P512K	Composition: 5100 ohms ±10%, 1/2 w.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XK1 and XK2	5491595-P7	Relay: 10 contacts; sim to Allied Control 30054-4.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	5491595-P9	Retainer: sim to Allied Control 30040-2. (Used with K1 and K2).
		HARNESS ASSEMBLY PL-19A122452-G1
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	4036634-P1	Contact, electrical; sim to AMP 42428-2.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

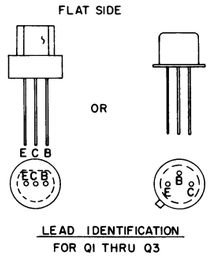
PARTS LIST

LBI-3829

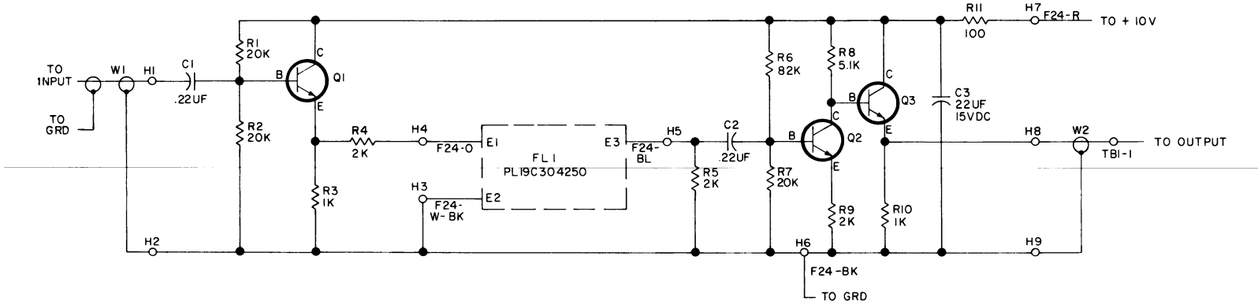
POWER SUPPLY MODIFICATION KIT
PL-19A122460-G1 and G5

SYMBOL	G-E PART NO.	DESCRIPTION
		FILTER ASSEMBLY PL-19B205663-G1
A1		COMPONENT BOARD PL-19B205665-G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1 and C2	19B209243-P15	Polyester: 0.22 µf ±20%, 250 VDCW.
C3	5496267-P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
		- - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 thru Q3	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1 and R2	3R152-P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R3	3R152-P102J	Composition: 1000 ohms ±5%, 1/4 w.
R4 and R5	3R152-P202J	Composition: 2000 ohms ±5%, 1/4 w.
R6	3R152-P823J	Composition: 82,000 ohms ±5%, 1/4 w.
R7	3R152-P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R8	3R152-P512J	Composition: 5100 ohms ±5%, 1/4 w.
R9	3R152-P202J	Composition: 2000 ohms ±5%, 1/4 w.
R10	3R152-P102J	Composition: 1000 ohms ±5%, 1/4 w.
R11	3R152-P101J	Composition: 100 ohms ±5%, 1/4 w.
		- - - - - - - - - - CABLES - - - - - - - - - -
W1	PL-19A122579-G1	RF: approx 7 inches.
W2	PL-19A122579-G2	RF: approx 10 inches.
		- - - - - - - - - - FILTERS - - - - - - - - - -
FL1	PL-19C304250-G1	Lowpass.
		- - - - - - - - - TERMINAL BOARDS - - - - - - - - -
TB51	19C301086-P4	Feed-thru, phen: 6 terminals; sim to G-E CR151D75406AB.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	7150186-P7	Spacer. (Used with A1).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.



SCHEMATIC DIAGRAM



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

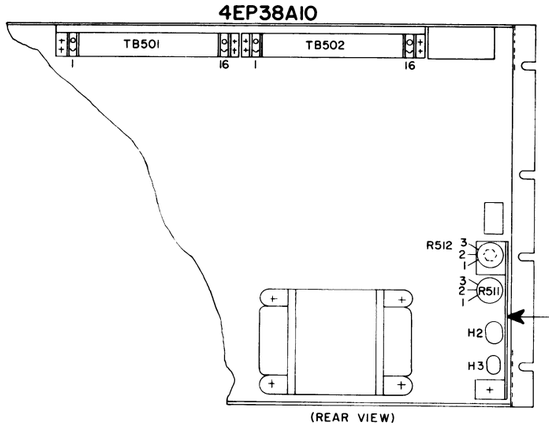
MODEL NO	REV LETTER
PL19B205655G1	

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.

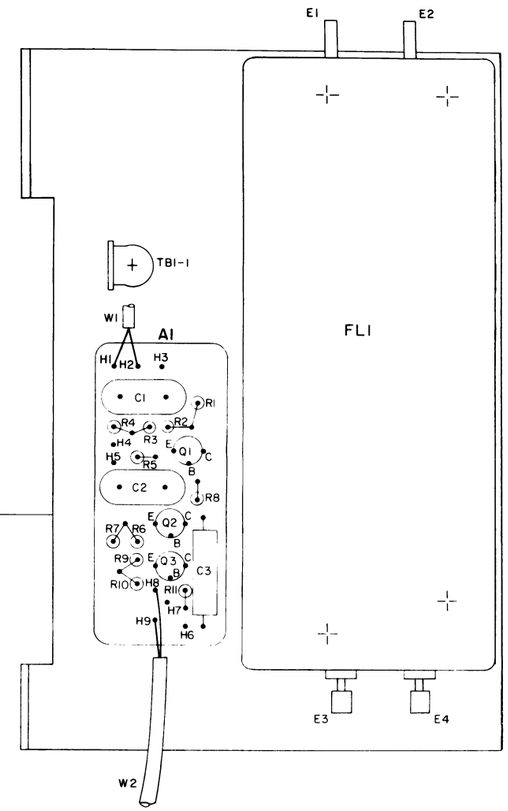
ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS.

NOTES:
1. TERMINATE RED AND BLACK WIRES W1 19B209260P103.

OUTLINE DIAGRAM



(19C311205, Rev. 2)

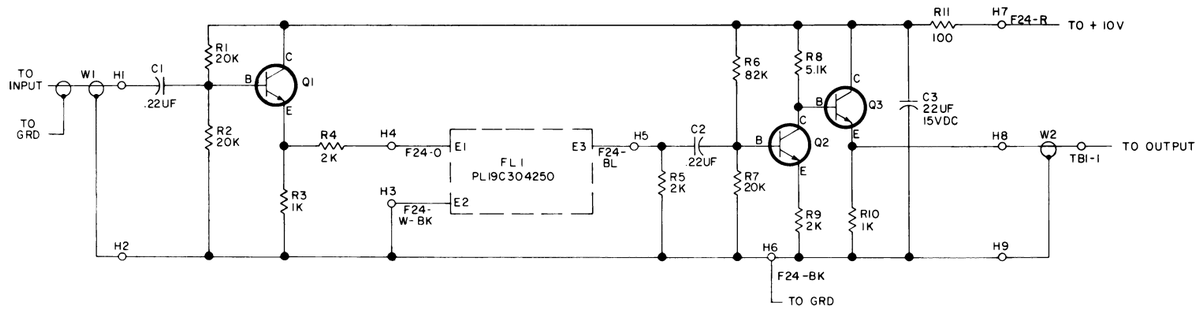


(19D402883, Rev. 0)

SCHEMATIC & OUTLINE DIAGRAM

FILTER-AMPLIFIER MODIFICATION
MODEL 4EP38A10

SCHEMATIC DIAGRAM



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
PL19B205655G1	

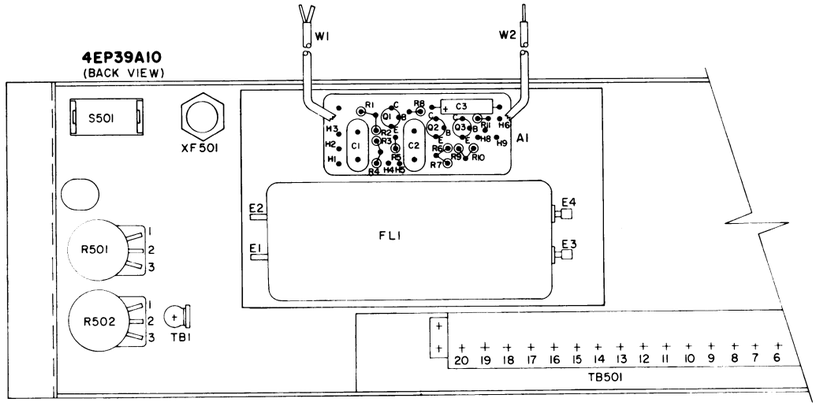
IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

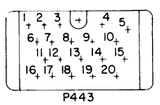
ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS.

NOTES:
1. TERMINATE RED AND BLACK WIRES WITH 19B209260P103.

(19C311205, Rev. 2)

OUTLINE DIAGRAM





(19C311695, Rev. 0)

SCHEMATIC & OUTLINE DIAGRAM

FILTER-AMPLIFIER MODIFICATION
MODEL 4EP39A10

PARTS LIST

LBI-3830

SECOND RECEIVER MODIFICATION KIT
PL-19A122460-G4

SYMBOL	G-E PART NO.	DESCRIPTION
		FILTER ASSEMBLY PL-19B205660-G1
A1		COMPONENT BOARD PL-19B205665-G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1 and C2	19B209243-P15	Polyester: 0.22 µf ±20%, 250 VDCW.
C3	5496267-P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 thru Q3	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1 and R2	3R152-P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R3	3R152-P102J	Composition: 1000 ohms ±5%, 1/4 w.
R4 and R5	3R152-P202J	Composition: 2000 ohms ±5%, 1/4 w.
R6	3R152-P823J	Composition: 82,000 ohms ±5%, 1/4 w.
R7	3R152-P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R8	3R152-P512J	Composition: 5100 ohms ±5%, 1/4 w.
R9	3R152-P202J	Composition: 2000 ohms ±5%, 1/4 w.
R10	3R152-P102J	Composition: 1000 ohms ±5%, 1/4 w.
R11	3R152-P101J	Composition: 100 ohms ±5%, 1/4 w.
		- - - - - - - - - - CABLES - - - - - - - - - -
W1	PL-19A122579-G1	RF: approx 7 inches.
W2	PL-19A122579-G2	RF: approx 10 inches.
		- - - - - - - - - - FILTERS - - - - - - - - - -
FL1	PL-19C304250-G1	Lowpass.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - - -
	7150186-P7	Spacer. (Used with A1).
	7775500-P144	Phen: 2 terminals.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

ORDERING SERVICE PARTS

Each component appearing on the schematic diagram is identified by a symbol number, to simplify locating it in the parts list. Each component is listed by symbol number, followed by its description and G-E Part Number.

Service parts may be obtained from Authorized G-E Communication Equipment Service Stations or through any G-E Radio Communication Equipment Sales Office. When ordering a part, be sure to give:

1. G-E Part Number for component
2. Description of part
3. Model number of equipment
4. Revision letter stamped on unit

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance.

Should further information be desired; or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact the nearest Radio Communication Equipment Sales Office of the General Electric Company.

MAINTENANCE MANUAL

LBI-3819

DF-4072

Progress Is Our Most Important Product

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