MOBILE RADIO

INSTRUCTIONS

FOR

RECEIVER CONTROL BOARDS 19D416658G1-G3

TABLE OF CONTENTS

DESCRIPTION

The 19D416658 Receiver Control Board is required in MASTR® II Tone Remote Control Base Station two-frequency receive applications. The 19D416658G1 Board is used in two-frequency receive with Priority Search Lock Monitor (PSLM) applications. The 19D416658G2 Board is used in two-frequency receive applications without PSLM. When two receivers with simultaneous monitor capability are used in the system, the 19D416658G3 Board is required.

CIRCUIT ANALYSIS

In the 19D416658G2 Receiver Control Board, the desired receive frequency may be selected by either applying the RX F1 tone frequency (1750 Hz) to the LIMITED AUDIO path or by selecting TX F1 in two-frequency transmit and receive systems.

Applying 1750 Hz to the LIMITED AUDIO path (A10) on the G2 Board results in detection at filter L1-C1. CR1 is back biased, turning on Q1. Conduction of Q1 sets flip-flop U5A, U5B and the resultant high output of U1-D turns on Q3. Conduction of Q3 grounds the RX F1 lead A6 to select the station receiver F1 oscillator. Conduction of Q3 also applies ground to the REC F1 Indicator LED CR7, turning on the light.

Applying the RX F2 tone frequency (1650 Hz) to the LIMITED AUDIO path results in detection at filter L2-C3, back biasing CR2 and turning on Q6. The low output of Q6 sets flip-flop U1-B, U1-C. This low input to U1-B is also connected to pin 2 of U1-A, resetting the RX F1 flip-flop if previously set. Similarly, setting the F1 flip-flop resets the F2 flip-flop by applying a low to pin 10 of U1-C.

The high output of U1-B (when the RX F2 flip-flop is set) turns on Q7 applying ground to the RX F2 lead A3 to select the F2 receiver oscillator. Conduction of Q7 also applies ground to the REC F2 Indicator LED CR8, turning on the light.

In two-frequency transmit applications, when TX F1 is selected at the Transmitter Control Board, a high is applied to the TX F1 INTERCONNECT lead D10. This forward biases CR5, turning on Q12. Conduction of Q12 applies a low to the F1 flip-flop, selecting the F1 receiver oscillator. When TX F2 is selected at the Transmitter Control Board, a high is applied to the TX F2 INTERCONNECT lead D11. This forward biases CR6, turning on Q13 and setting the RX F2 flip-flop to select the F2 receiver oscillator. The transmit interconnect function may be disabled if desired by clipping out diodes CR5 and CR6.

When F1-F2 service switch S1 is in the F1 position, ground is applied to the input of U1-D, selecting the F1 receiver oscillator. Placing the switch in the F2 position grounds the input to U1-B, selecting the F2 receiver oscillator. S1 is a momentary switch, preventing the serviceman from inadvertently leaving the station inoperative.

Two Frequency Receive with PSLM (Options 9552-9554)

The Priority Search Lock Monitor option provides two-channel monitoring by alternately searching a priority channel and a non-priority channel. The PSLM assures reception of all signals received on the priority channel.

Receiver Control Board 19D416658G1 is used in the Control Shelf for controlling this option. Individual selection of the F1 receive frequency and F2 receive frequency are accomplished in the same manner as described for the G2 board. When the PSLM tone frequency (1050 Hz) is applied to the LIMITED AUDIO lead A10, the 1050 Hz filter (composed of L3-C5) detects the signal and back biases CR4. Q9 is turned on. Conduction of Q9 latches flip-flop U3-A, U3-D and turns on Q10. Conduction of Q10 applies a ground to the PSLM lead A12. This lead connects to the input of the PSLM.

If the RC F1 tone (1750 Hz) is subsequently selected, the low applied to the RX F1 flip-flop also appears at pin 3 of gate U2-B. The high output of U2-B is connected to NAND gate U2-A. Pin 2 of U2-A is high so that the resultant output is low. U2-C inverts the output of U2-A to high and U3-C inverts the output of U2-C to low. Q15 is normally conducting. Applying the low from U3-C to the base of Q15 turns the transistor off, resulting in a high at the input of U3-B. U2-C, U3-C, Q15 and U3-B are connected in a one-shot configuration. The low output of U3-B is capacitively coupled to pin 1 of U4-A. This momentary low causes the output of U4-A to go high. This high is inverted by U4-B and the negative transition is capacitively coupled to the base of Q16, turning the transistor off. The resultant high at the collector of Q16 is inverted by U4-C and is applied back to pin 2 of U4-A. This holds the output high as U4-A, U4-B, Q16 and U4-C are connected in a one-shot configuration.

After 125 milliseconds, C10 charges through R35 to a positive voltage which turns Q16 on again. The low at the collector of Q16 results in a high at the output of U4-C and the one-shot returns to its quiescent state. The RX F1, RX F2 and PSLM flip-flops are reset in this manner each time a new function is selected. Service switch S1 allows selection of RX F1 or RX F2. This is a momentary switch which prevents the serviceman from inadvertently disabling the station. Service switch S2, when operated to the PSLM position, allows the serviceman to select PSLM operation at the station. Instructions for the PSLM Board are provided in the Maintenance Manual for Options 9552-9554. Refer to the Table of Contents.

Two Receivers with Simultaneous Monitor (Option 9541)

When a second receiver option is added to the station, Receiver Control Board 19D416658G3 is required for simultaneously monitoring both receivers.

Applying 1750 Hz to the LIMITED AUDIO path results in detection at filter L1-C. CR1 is turned off, turning on Q1. Conduction of Q1 sets flip-flop U5-A, U5-B and the resultant high output of U1-D turns on Q3, applying ground to REC F1 Indicator LED CR7 and turning on the light. The low output of U1-A turns off Q5, removing ground from the REC #1 MUTE lead to select the No. 1 receiver.

Applying the RX F2 tone frequency (1650 Hz) to the LIMITED AUDIO path results in detection at L2-C3, turning off CR2 and turning on Q6. The low at the collector of Q6 sets flip-flop U1-B, U1-C. The resultant high output of U1-B turns on Q7 and operates CR8. The low output of U1-C turns off Q14, removing ground from the REC #2 MUTE lead to select the No. 2 receiver.

The low input to U1-B is also connected to pin 3 of U2-B. The high output of U2-B is connected to NAND gate U2-A. Pin 2 of U2-A is high so that the resultant output is low. U2-C inverts the output of U2-A to high and U3-C inverts the output of U2-C to low. Q15 is normally conducting. Applying the low from U3-C to the base of Q15 turns the transistor off, resulting in a high at the input of U3-B. U2-C, U3-C, Q15 and U3-B are connected in a one-shot configuration. The low output of U3-B is capacitively coupled to pin 1 of U4-A. This momentary low causes the output of U4-A to go high. This high is inverted by U4-B and the negative transition is capacitively coupled to the base of Q16, turning the transistor off. The resultant high at the collector of Q16 is inverted by U4-C and is applied back to pin 2 of U4-A. This holds the output high as U4-A, U4-B, Q16 and U4-C are connected in a one-shot cinfiguration. Thus REC #1 flip-flop is reset.

After 125 milliseconds, C10 charges through R35 to a positive voltage which turns Q16 on again. The low at the collector of Q16 results in a high at the output of U4-C and the one-shot returns to its quiescent state.

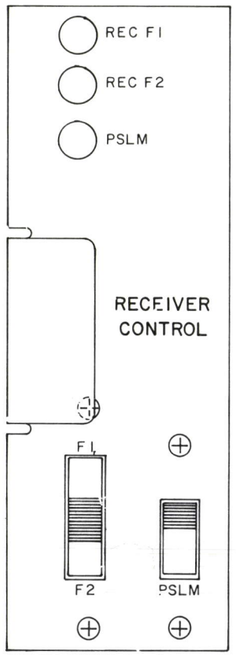
When simultaneous monitor function tone (1050 Hz) is applied to the LIMITED AUDIO path, the tone is detected at L3-C5, turning on Q9. Conduction of Q9 sets flip-flop U3-D, U3-A. The low input to U3-D also operates the reset circuit to reset the F1 or F2 flip-flops if one of them is set. The high output of U3-D operates Q10, applying ground to the cathodes of CR10 and CR3. This simultaneously over-

rides the high at the base of Q5 and Q14, keeping the transistors turned off. Ground is thus removed from the REC #1 and REC #2 leads to select both receivers. Conduction of Q10 also operates Q11, applying a high to the bases of Q3 and Q7. Conduction of these transistors operates both CR7 and CR8. Conduction of Q10 also applies ground to the SIM MON Indicator LED CR9, turning on this light also.

When the transmitter is keyed, the No. 1 receiver audio is muted as previously described. The high applied to the AUDIO MUTE lead D2 turns on Q17, grounding the RCVR 2 lead and muting the second receiver also.

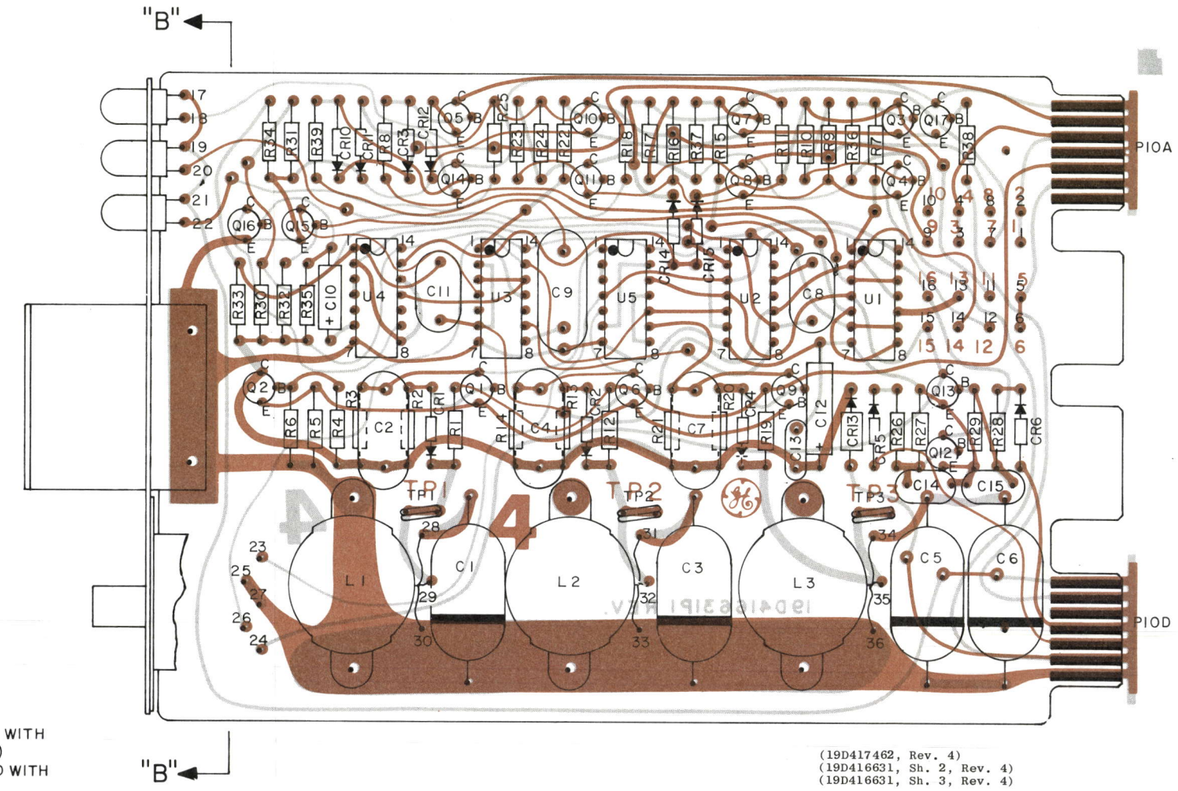
GENERAL ELECTRIC COMPANY • MOBILE COMMUNICATIONS DIVISION
WORLD HEADQUARTERS • LYNCHBURG, VIRGINIA 24502 U.S.A.

GENERAL ELECTRIC*
U.S.A.

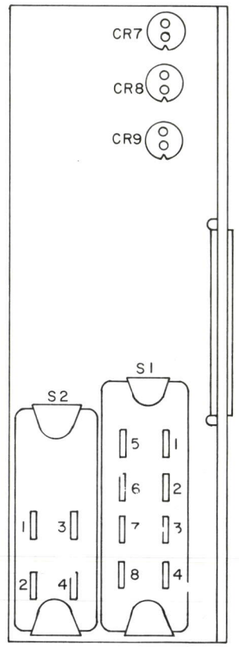


FRONT PANEL: 19B219702P1 (USED WITH 19D416658G1 & G3)
19B219702P2 (USED WITH 19D416658G2)
HANDLE: 19B219690G1

FRONT PANEL SUPPLIED WITHOUT ELECTRICAL COMPONENTS OR LABELS

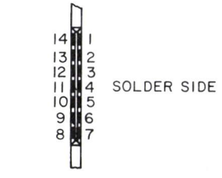


(19D417462, Rev. 4)
(19D416631, Sh. 2, Rev. 4)
(19D416631, Sh. 3, Rev. 4)

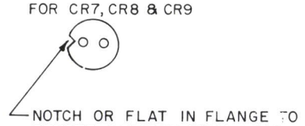


SECTION B-B

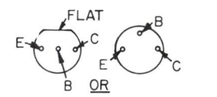
REFER TO WIRING DIAGRAM FOR THE FOLLOWING CONNECTIONS				
FROM	TO	GP 1	GP 2	GP 3
H11	H5	X	X	
H16	H13		X	
H15	H14		X	
H9	H3	X		
H7	H1	X	X	
CR7 - ANODE	H17	X	X	X
CR7 - CATHODE	H18	X	X	X
CR8 - ANODE	H19	X	X	X
CR8 - CATHODE	H20	X	X	X
CR9 - ANODE	H21	X		X
CR9 - CATHODE	H22	X		X
S2-1	H26	X		X
S2-2	H27	X		X
S1-5	H23	X	X	X
S1-6	S1-7	X	X	X
S1-7	H25	X	X	X
S1-8	H24	X	X	X
L1-Y	H28	X	X	X
L1-R OR GY	H29	X	X	X
L1-BK	H30	X	X	X
L2-Y	H31	X	X	X
L2-R OR GY	H32	X	X	X
L2-BK	H33	X	X	X
L3-Y	H34	X		X
L3-R OR GY	H35	X		X
L3-BK	H36	X		X
H13	H14	X		X



TYP. NUMBERING OF CONT. FINGERS

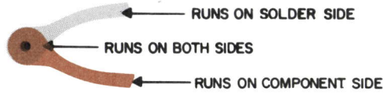


LEAD IDENTIFICATION FOR CR7, CR8 & CR9



LEAD IDENTIFICATION FOR Q1 - Q17

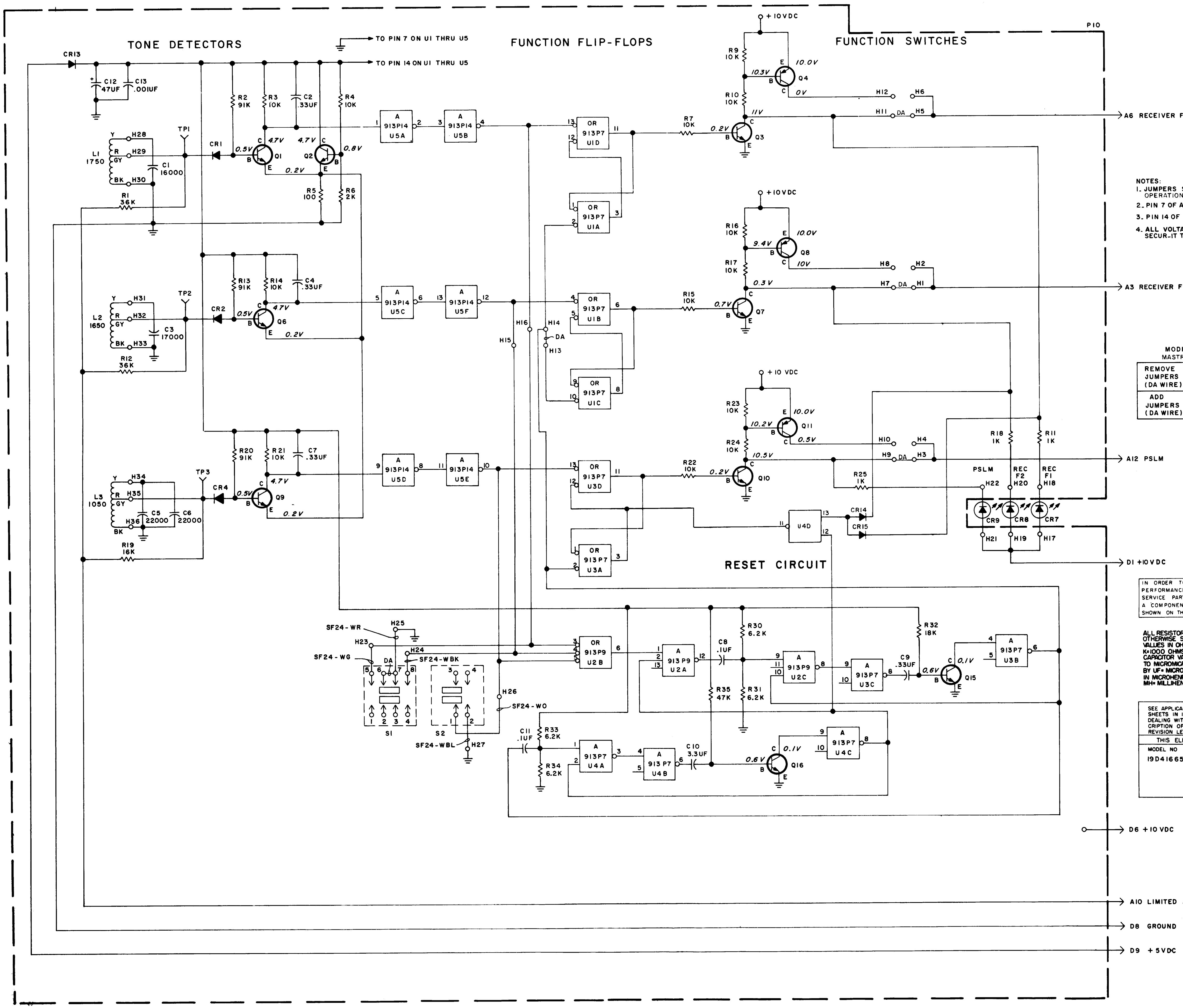
NOTE: LEAD ARRANGEMENT, AND NOT CASE SHAPE, IS DETERMINING FACTOR FOR LEAD IDENTIFICATION.



OUTLINE DIAGRAM

RECEIVER CONTROL BOARD 19D416658

G1 2 FREQUENCY RECEIVE WITH PSLM



NOTES:
1. JUMPERS SHOWN ON DIAGRAM FOR MASTER II OPERATION.
2. PIN 7 OF ALL U'S ARE CONNECTED TO GROUND.
3. PIN 14 OF ALL U'S ARE CONNECTED TO +5VDC.
4. ALL VOLTAGE READINGS MEASURED WITH SECUR-IT TONE UNDETECTED.

MODIFICATION FOR MASTR PRO 72 OPERATION

REMOVE JUMPERS (DA WIRE)	H11 TO H5 H7 TO H1 H9 TO H3
ADD JUMPERS (DA WIRE)	H12 TO H6 H8 TO H2 H10 TO H4

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	
MODEL NO	REV LETTER
19D416658G1	B

SCHEMATIC DIAGRAM

RECEIVER CONTROL BOARD
19D416658G1

Issue 3

(19E501116, Rev. 8)

PARTS LIST

LBI4501B

RECEIVER CONTROL BOARD
19D416658G1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1	19A116738P6	Polystyrene: 0.016 µf ±2.5%, 33 VDCW; sim to Mial Series 617.
C2	19A116080P10	Polyester: 0.33 µf ±20%, 50 VDCW.
C3	19A116738P7	Polystyrene: 0.017 µf ±2.5%, 33 VDCW; sim to Mial Series 617.
C4	19A116080P10	Polyester: 0.33 µf ±20%, 50 VDCW.
C5 and C6	19A116738P9	Polystyrene: 0.022 µf ±2.5%, 33 VDCW; sim to Mial Series 617.
C7	19A116080P10	Plyester: 0.33 µf ±20%, 50 VDCW.
C8	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C9	19A116080P10	Polyester: 0.33 µf ±20%, 50 VDCW.
C10	5496267P9	Tantalum: 3.3 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C11	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C12	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C13	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 thru CR2	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR4	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR7 thru CR9	19A134354P6	Diode, optoelectronic: red; sim to HEW. Packard 5082-4650.
CR13	4037822P1	Silicon, 1000 mA, 400 PIV.
CR14* and CR15*	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV. Added by REV B.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1 thru L3	19B205354G6	Coil.
		- - - - - - - - - - - - PLUGS - - - - - - - - -
P11		(Part of printed board 19D416631P1).
		- - - - - - - - - - TRANSISTORS - - - - - - - -
Q1 thru Q3	19A115889P1	Silicon, NPN.
Q4	19A115852P1	Silicon, PNP; sim to Type 2N3906.
Q6 and Q7	19A115889P1	Silicon, NPN.
Q8	19A115852P1	Silicon, PNP; sim to Type 2N3906.
Q9 and Q10	19A115889P1	Silicon, NPN.
Q11	19A115852P1	Silicon, PNP; sim to Type 2N3906.
Q15 and Q16	19A115889P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R152P363J	Composition: 36K ohms ±5%, 1/4 w.
R2	3R152P913J	Composition: 91K ohms ±5%, 1/4 w.
R3 and R4	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R5	3R152P101J	Composition: 100 ohms ±5%, 1/4 w.
R6	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
R7	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R9 and R10	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R11	3R152P102J	Composition: 1K ohms ±5%, 1/4 w.
R12	3R152P363J	Composition: 36K ohms ±5%, 1/4 w.
R13	3R152P913J	Composition: 91K ohms ±5%, 1/4 w.
R14 thru R17	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R18	3R152P102J	Composition: 1K ohms ±5%, 1/4 w.
R19	3R152P163J	Composition: 16K ohms ±5%, 1/4 w.
R20	3R152P913J	Composition: 91K ohms ±5%, 1/4 w.
R21 thru R24	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R25	3R152P102J	Composition: 1K ohms ±5%, 1/4 w.
R30 and R31	3R152P622J	Composition: 6.2K ohms ±5%, 1/4 w.
R32	3R152P183J	Composition: 18K ohms ±5%, 1/4 w.
R33 and R34	3R152P622J	Composition: 6.2K ohms ±5%, 1/4 w.
R35	3R152P473J	Composition: 47K ohms ±5%, 1/4 w.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1	19B209261P12	Slide: 2 poles, 3 positions, .5 amp VDC or 3 amps VAC at 125 v; sim to Switchcraft 46313MDR.
S2	19B209231P11	Slide: 2 poles, 2 positions, .5 amp VDC or 3 amps VAC at 125 v; sim to Switchcraft 46204MR.
		- - - - - - - - - TEST POINTS - - - - - - - - -
TP1 thru TP3	19B211379P1	Spring (Test Point).
		- - - - - - - INTEGRATED CIRCUITS - - - - - - - -
U1	19A115913P7	Digital, Quad 2-Input Gate: Identification No. 946.
U2	19A115913P9	Digital, Triple 3-Input Gate: Identification No. 962.
U3 and U4	19A115913P7	Digital, Quad 2-Input Gate: Identification No. 946.
U5	19A115913P14	Digital, Hex Inverter: Identification No. 936.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	4032480P1	Nut, sheet spring: sim to Vector Electronic 440. (Secures S1 & S2).
	19B201074P204	Tap screw, Phillips POZIDRIV®: No. 4-40 x 1/4. (Secures S1 & S2).

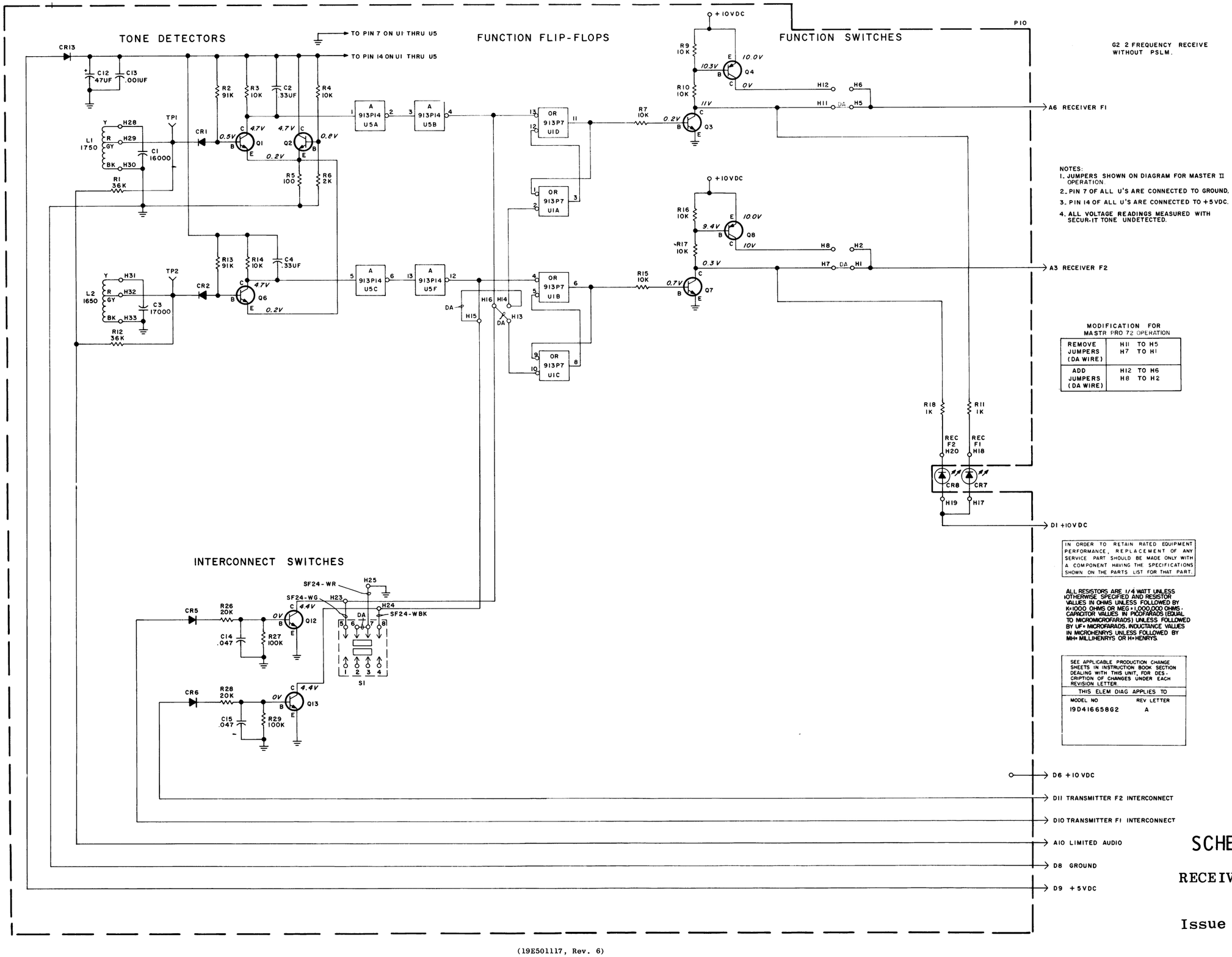
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

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 - Changed board to facilitate manufacturing.

REV. B - To prevent no receiver selection after a supply line glitch or power failure. Added CR14 and CR15.



G2 2 FREQUENCY RECEIVE WITHOUT PSLM.

NOTES:
1. JUMPERS SHOWN ON DIAGRAM FOR MASTER II OPERATION.
2. PIN 7 OF ALL U'S ARE CONNECTED TO GROUND.
3. PIN 14 OF ALL U'S ARE CONNECTED TO +5VDC.
4. ALL VOLTAGE READINGS MEASURED WITH SECUR-IT TONE UNDETECTED.

MODIFICATION FOR MASTR PRO 72 OPERATION

REMOVE JUMPERS (DA WIRE)	H11 TO H5 H7 TO H1
ADD JUMPERS (DA WIRE)	H12 TO H6 H8 TO 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 1/4 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

MODEL NO	REV LETTER
19D416658G2	A

SCHEMATIC DIAGRAM

RECEIVER CONTROL BOARD 19D416658G2

Issue 2

PARTS LIST

LBI-4502A

RECEIVER CONTROL BOARD
19D416658G2

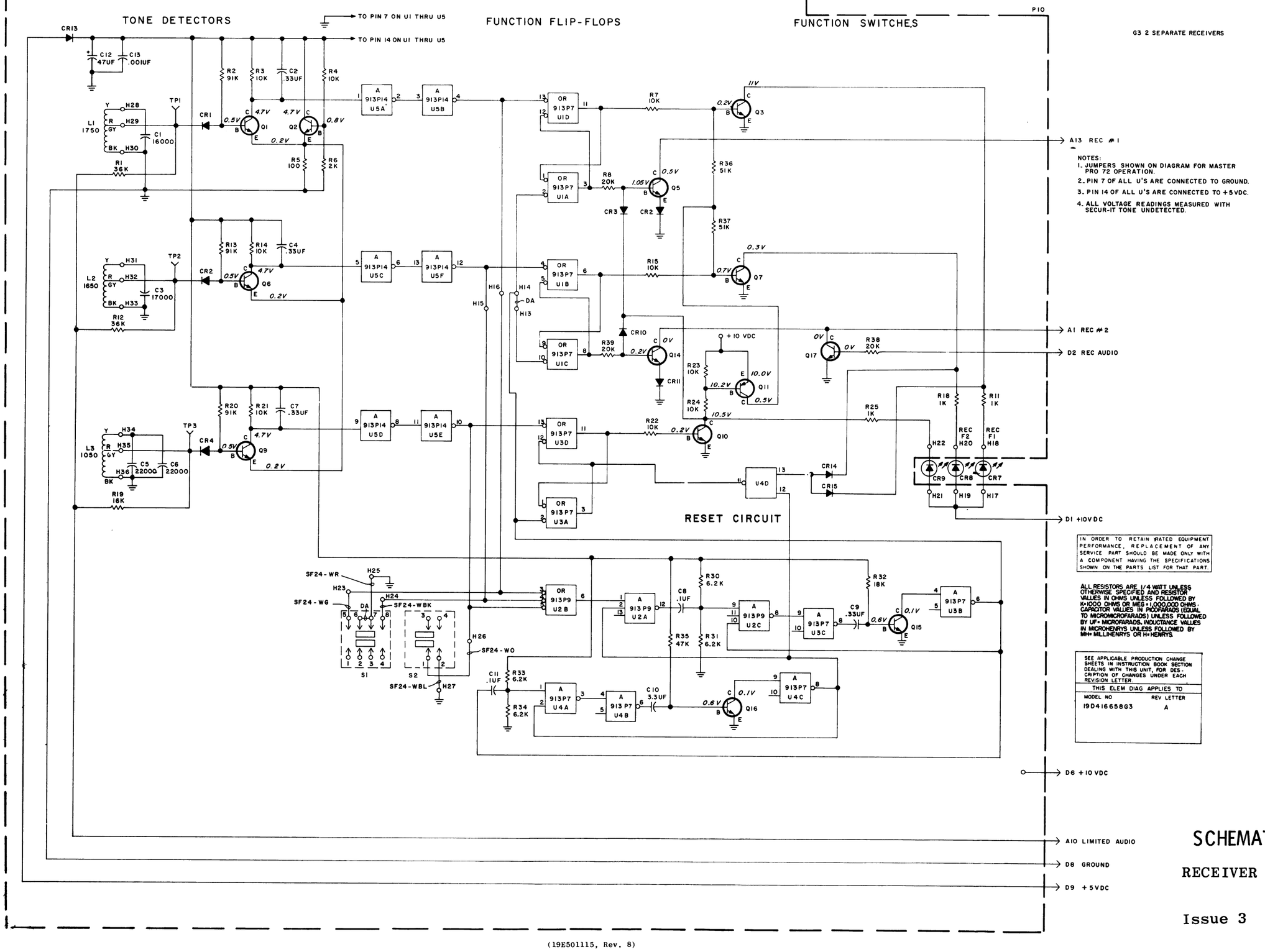
SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1	19A116738P6	Polystyrene: 16,000 pf ±2.5%, 33 VDCW; sim to Mial Series 617.
C2	19A116080P10	Polyester: 0.33 µf ±20%, 50 VDCW.
C3	19A116738P7	Polystyrene: 17,000 pf ±2.5%, 33 VDCW; sim to Mial Series 617.
C4	19A116080P10	Polyester: 0.33 µf ±20%, 50 VDCW.
C12	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C13	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C14 and C15	19A116080P5	Polyester: 0.047 µf ±20%, 50 VDCW.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 and CR2	19A115250P1	Silicon.
CR5 and CR6	19A115250P1	Silicon.
CR7 and CR8	19A129291P1	Diode, light emitting: red.
CR13	4037822P1	Silicon.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1 and L2	19B205354G6	Coil.
		- - - - - - - - - - - - PLUGS - - - - - - - - - -
P11		(Part of printed board 19D416631P1).
		- - - - - - - - - - TRANSISTORS - - - - - - - -
Q1 thru Q3	19A115889P1	Silicon, NPN; sim to Type 2N2712.
Q4	19A115852P1	Silicon, PNP; sim to Type 2N3906.
Q6 and Q7	19A115889P1	Silicon, NPN; sim to Type 2N2712.
Q8	19A115852P1	Silicon, PNP; sim to Type 2N3906.
Q12 and Q13	19A115889P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152P363J	Composition: 36,000 ohms ±5%, 1/4 w.
R2	3R152P913J	Composition: 91,000 ohms ±5%, 1/4 w.
R3 and R4	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R5	3R152P101J	Composition: 100 ohms ±5%, 1/4 w.
R6	3R152P202J	Composition: 2000 ohms ±5%, 1/4 w.
R7	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R9 and R10	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R11	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
R12	3R152P363J	Composition: 36,000 ohms ±5%, 1/4 w.
R13	3R152P913J	Composition: 91,000 ohms ±5%, 1/4 w.
R14 thru R17	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R18	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
R26	3R152P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R27	3R152P104J	Composition: 0.10 megohm ±5%, 1/4 w.
R28	3R152P203J	Composition: 20,000 ohms ±5%, 1/4 w.
R29	3R152P104J	Composition: 0.10 megohm ±5%, 1/4 w.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1	19B209261P12	Slide: 2 poles, 3 positions, .5 amp VDC or 3 amps VAC at 125 v; sim to Switchcraft 46313MDR.
		- - - - - - - - - - TEST POINTS - - - - - - - - -
TP1 and TP2	19B211379P1	Spring (Test Point).
		- - - - - - - - INTEGRATED CIRCUITS - - - - - - - -
U1	19A115913P7	Digital, Quad 2-Input Gate; sim to Fairchild DTL 946.
U5	19A115913P14	Digital, Hex Inverter; sim to Fairchild DTL 936.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	4032480P1	Nut, sheet spring: sim to Vector Electronic 440. (Secures S1).
	19B201074P204	Tap screw: No. 4-40 x 1/4. (Secures S1).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

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 - Changed board to facilitate manufacturing.



NOTES:
1. JUMPERS SHOWN ON DIAGRAM FOR MASTER PRO 72 OPERATION.
2. PIN 7 OF ALL U'S ARE CONNECTED TO GROUND.
3. PIN 14 OF ALL U'S ARE CONNECTED TO +5 VDC.
4. ALL VOLTAGE READINGS MEASURED WITH SECUR-IT TONE UNDETECTED.

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	
MODEL NO	REV LETTER
19D416658G3	A

SCHEMATIC DIAGRAM

RECEIVER CONTROL BOARD
19D416658G3

Issue 3

(19E501115, Rev. 8)

PARTS LIST

LBI4503B

RECEIVER CONTROL BOARD
19D416658G3

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1	19A116738P6	Polystyrene: 0.016 µf ±2.5%, 33 VDCW; sim to Mial Series 617.
C2	19A116080P10	Polyester: 0.33 µf ±20%, 50 VDCW.
C3	19A116738P7	Polystyrene: 0.017 µf ±2.5%, 33 VDCW; sim to Mial Series 617.
C4	19A116080P10	Polyester: 0.33 µf ±20%, 50 VDCW.
C5 and C6	19A116738P9	Polystyrene: 0.022 µf ±2.5%, 33 VDCW; sim to Mial Series 617.
C7	19A116080P10	Plyester: 0.33 µf ±20%, 50 VDCW.
C8	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C9	19A116080P10	Polyester: 0.33 µf ±20%, 50 VDCW.
C10	5496267P9	Tantalum: 3.3 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C11	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C12	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C13	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 thru CR4	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR7 thru CR9	19A134354P6	Diode, optoelectronic: red; sim to HEW. Packard 5082-4650.
CR10 thru CR12	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV. Added by
CR13	4037822P1	Silicon, 1000 mA, 400 PIV.
CR14* and CR15*	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV. Added by REV A.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1 thru L3	19B205354G6	Coil.
		- - - - - - - - - - - - PLUGS - - - - - - - - -
P11		(Part of printed board 19D416631P1).
		- - - - - - - - - - TRANSISTORS - - - - - - - -
Q1 thru Q3	19A115889P1	Silicon, NPN.
Q5 thru Q7	19A115889P1	Silicon, NPN.
Q9 and Q10	19A115889P1	Silicon, NPN.
Q11	19A115852P1	Silicon, PNP; sim to Type 2N3906.
Q14 thru Q17	19A115889P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152P363J	Composition: 36K ohms ±5%, 1/4 w.
R2	3R152P913J	Composition: 91K ohms ±5%, 1/4 w.
R3 and R4	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R5	3R152P101J	Composition: 100 ohms ±5%, 1/4 w.
R6	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
R7	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R8	3R152P203J	Composition: 20K ohms ±5%, 1/4 w.
R11	3R152P102J	Composition: 1K ohms ±5%, 1/4 w.
R12	3R152P363J	Composition: 36K ohms ±5%, 1/4 w.
R13	3R152P913J	Composition: 91K ohms ±5%, 1/4 w.
R14 and R15	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R18	3R152P102J	Composition: 1K ohms ±5%, 1/4 w.
R19	3R152P163J	Composition: 16K ohms ±5%, 1/4 w.
R20	3R152P913J	Composition: 91K ohms ±5%, 1/4 w.
R21 thru R24	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R25	3R152P102J	Composition: 1K ohms ±5%, 1/4 w.
R30 and R31	3R152P622J	Composition: 6.2K ohms ±5%, 1/4 w.
R32	3R152P183J	Composition: 18K ohms ±5%, 1/4 w.
R33 and R34	3R152P622J	Composition: 6.2K ohms ±5%, 1/4 w.
R35	3R152P473J	Composition: 47K ohms ±5%, 1/4 w.
R36 and R37	3R152P513J	Composition: 51K ohms ±5%, 1/4 w.
R38 and R39	3R152P203J	Composition: 20K ohms ±5%, 1/4 w.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1	19B209261P12	Slide: 2 poles, 3 positions, .5 amp VDC or 3 amps VAC at 125 v; sim to Switchcraft 46313MDR.
S2	19B209261P11	Slide: 2 poles, 2 positions, .5 amp VDC or 3 amps VAC at 125 v; sim to Switchcraft 46204MR.
		- - - - - - - - - TEST POINTS - - - - - - - - -
TP1 thru TP3	19B211379P1	Spring (Test Point).
		- - - - - - - INTEGRATED CIRCUITS - - - - - - - -
U1	19A115913P7	Digital, Quad 2-Input Gate: Identification No. 946.
U2	19A115913P9	Digital, Triple 3-Input Gate: Identification No. 962.
U3 and U4	19A115913P7	Digital, Quad 2-Input Gate: Identification No. 946.
U5	19A115913P14	Digital, Hex Inverter: Identification No. 936.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - -
	4032480P1	Nut, sheet spring: sim to Vector Electronic 410. (Secures S1 & S2).
	19B201074P204	Tap screw, Phillips POZIDRIV®: No. 4-40 x 1/4. (Secures S1 & S2).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PRODUCTION CHANGES

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REV. A - To prevent no receiver selection after a supply line glitch or power failure. Added CR14 and CR15.