INSTRUCTIONS

FOR

MANUAL SELECTOR

MASTR-MTS

LBI-8618

~~[redacted]~~

DE-9017

COMMUNICATION PRODUCTS DEPARTMENT

GENERAL ELECTRIC

LYNCHBURG, VIRGINIA

MANUAL SELECTOR UNIT

DESCRIPTION

The Selector unit is located in the rear section of the MTS Radio Unit. Figure 1 shows the mounting position with the cover removed. The Selector is made up of two circuit boards that are mounted back to back in the center of the wrap around chassis with access to the component sides. The circuits are described below and on the following pages. The Decoder Board PL-19D402575-G1 is mounted on the top for easy access to the number strapping jack field. Information on how to set up a number or change numbers for the Mobile are given in the Decoder instructions. The second board is Component Board PL-19D402713-G1, or 2 or 3 depending on the facilities included in the Mobile.

The function of each of the circuit boards is as follows:

1. Component Board PL-19D402713-G1 includes a 600/1500 cycle Tone Detector, a Control Logic circuit, Channel Switches, and an Audio Equalizer circuit for use with the carbon microphone. The Tone Detector converts the incoming 600 and 1500 cps tones to positive and negative shifts in voltage for the Decoder. The Control Logic accepts an input from the Decoder on receipt of the proper number and controls the Sounder and Call Light. When the call is completed it provides control of the circuits to reset the Mobile for receipt of other calls.

2. Component Board PL-19D402713-G2 includes the same circuits but in addition includes a Channel Search and Search Diode Matrix circuit. This Board working with the Reverting Board of the Control Unit provides the Search function for the Unit. When 600/1500 cps signalling appears on a channel the search is held until the signalling is complete. If the call is for another mobile the search will be resumed. If the call is for the mobile unit the channel is held.

3. Component Board PL-19D402713-G3 provides only the carbon microphone and Audio Equalizer circuits and the Oscillator switching circuits. The board when used limits the facilities available to Manual Selection of channels.

4. Decoder PL-19D402575-G1 accepts incoming voltage shifts and counts the transitions, stores them until the bit train is complete, and stores the digits when correct. When the number is correct it triggers the Control Logic Board. If the called number is incorrect the call will be dropped. The Unit call number is determined by the strapping on the number jackfield.

The interconnections between the circuit boards are shown on Interconnection Diagram 19R620762 along with the connections to the rest of the Mobile Unit.

DISASSEMBLY OF THE SELECTOR

To service the selector from the top or bottom the unit must be removed from the frame and the cover removed from the rear of the unit. The procedure is as follows:

1. Unlock the Radio Unit, pull the handle down and slide the unit out of the mounting frame.

2. Remove the screws on the top and bottom holding the rear cover in place.

3. The circuit boards are exposed and can be serviced except for servicing of the printed wiring. If the printed wiring must be exposed the mounting screws holding the two boards must be removed.

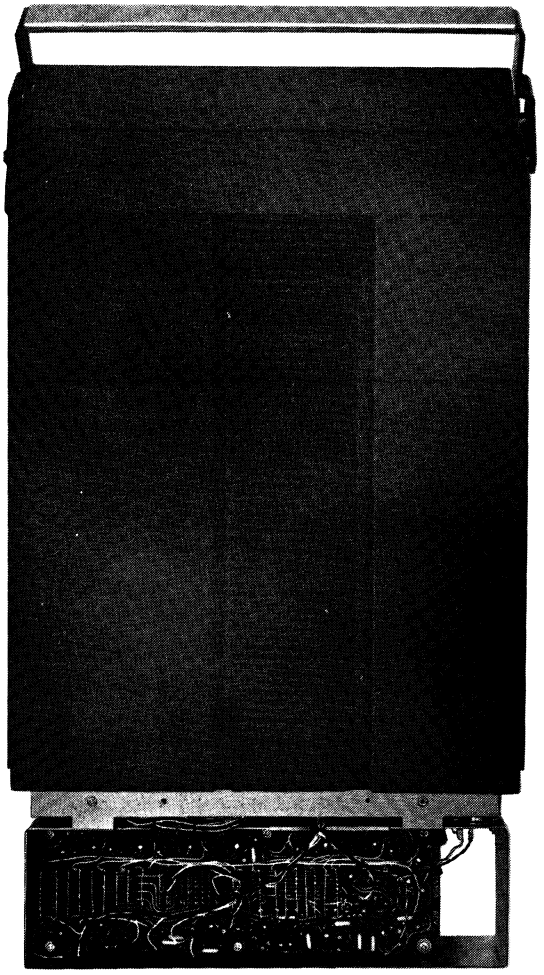


Figure 1 Selector Unit - Cover Removed

CIRCUIT ANALYSIS

COMPONENT BOARD PL-19D402713-G1 thru 3

The three groups of this board work in conjunction with other circuit boards in the Mobile Unit to provide control functions required in the Mobile Telephone Service. Since many of the circuits are repeated from one group to another the following discussion is arranged to cover the circuit once rather than two or three times.

Tone Detector PL-19D402713-G1 and 2

The 600/1500 cps signalling tones received by the mobile receiver are fed to J2 the input jack to the Tone Detector. These tones are coupled through C9 to the base of the buffer transistor Q1. This transistor is an emitter follower and the tones are fed through to the tone amplifier-limiter chain consisting of transistors Q2, Q3 and Q4. Transistor Q4 is in series with the primary winding of the Discriminator Transformer T1. The Discriminator Transformer is resonated to the tone frequencies used in signalling. The tones, 600 and 1500 cps, are rectified and filtered by the Discriminator bridge circuits and applied to the DC amplifier chains consisting of Q5 and Q7 and Q6 and Q8. These DC amplifiers provide trigger voltages for the Decoder. The Audio signalling tones sent out by the base station are thus converted to DC pulses that are the bit information for the Decoder and it's register, and used to stop the channel search.

The jack connections for this portion of the board are as follows:

+10 volts is connected through J1
A- is connected through J5
Tone input is through J2
600 cps trigger output is through J3
1500 cps trigger output is through J4.

The Decoder analysis is covered in LBI-8597 consequently it will not be covered here. As mentioned above the Decoder is provided with DC pulses that are used to trigger the bit and digit counters to obtain the called number. When the number is correct the Decoder returns a positive voltage to J14 on the component board and the Control Logic circuits.

Control Logic PL-19D402713, G1 and 2

When the Decoder is decoded by receipt of the proper bit information from the Tone Detector it returns a positive voltage to the Control Logic circuit at J14. A positive voltage applied at this point performs two functions:

1. The Ringer Driver Amplifier Q10 conducts resulting in the conduction of Q9, the Sounder switch. This results in positive voltage being applied to the Sounder through J12.

2. The positive voltage from the Decoder also causes Q11 to conduct. When Q11 conducts Q12 is turned off and Q13 is turned on. This results in the turning on of the switching transistors Q14 and

Q15. These two transistors serve as a switch for the call light in the control unit. When they conduct the call light is illuminated indicating the receipt of a call for the mobile.

The removal of the handset from the cradle results in a number of control functions. The Flip-Flop circuit composed of Q12 and Q13 resets so Q12 conducts. This resets the call light circuit so the light is extinguished. The Decoder is reset by the application of a negative shift to J16 and this in turn removes the ringing voltage from the Sounder by turning the Ringer Drive Amplifier off. The removal of the Handset from it's hanger also results in the application of a negative shift to the negative OR gate on the input to the slow clock in the Channel Search circuit.

When a call remains unanswered the handset is not removed from the cradle consequently the Decoder is not reset by actuating the hookswitch. Under these conditions, the operator dials the digit 1 to reset the Decoder. This results in the sounder being silenced but leaves the Call Light on to indicate the fact that the mobile was called.

Channel Search PL-19D402713-G2

The Channel Search circuit consists of two clocks, two bistable counter circuits, appropriate triggers and a diode matrix circuit. In operation the clocks determine which leg of the diode matrix will be positive and select transmitter and receiver oscillators. The two bistable counters have their outputs arranged so that only one leg of the diode matrix can be positive at any given moment. This arrangement permits the selection of one transmitter and one receiver oscillator.

In the following discussion it is assumed the Revert-Non Revert switch is on Revert the receiver is ready for a call and that no call is in process. The Slow Clock operates at a ten pulse per second rate. Each 100 ms the clock provides a negative impulse to the Driver Amplifier Q29 through the coupling capacitor C24. Each negative pulse applied to the base of transistor Q29 results in the turning off of the Driver Amplifier and turning on the Trigger Q30. When Q30 fires the bistable Q31-Q32 is changed in state. The bistables operate to count the bit information provided by the Trigger under control of the Slow Clock. As the Bistable Counters operate one leg of the Search Diode Matrix is allowed to go positive at a time. The specific leg is determined by the combined outputs of the bistables back biasing two of the diodes in the series CR41-CR48. The positive voltage is supplied by the control unit to J37 in the Search condition or to J33-J36 when a specific channel is chosen as the Revert channel.

When signalling occurs the pulse shifts on the output of the Tone Detectors are used to stop the Slow Clock. The duration of the tone is sufficient to assure that the channel on which the tone appears will be the channel selected. When the clock is stopped the counting by the bistables is also stopped and the stepping from one leg of the diode matrix to the other is also stopped. One leg of the matrix, that leg representing the channel, goes positive and the Receiver Oscillator switches associated with the channel conduct. An analysis of the cirtuits involved shows that the Slow Clock has a negative OR gate with

four possible inputs. Two of the inputs are from the Tone Detectors one from the Call light circuit and the fourth from the Hookswitch circuit. In the normal sequence of receiving a call the presence of signalling results in a hold on the Slow Clock, when signalling ceases the Call Light comes on and picks up the hold on the clock. When the handset is removed from the cradle to answer the call, the hookswitch supplies a negative voltage which holds the clock off and the unit on the channel until the call is completed. If the signalling is intended for some other mobile the Call light circuit would not supply the negative required to hold the Slow Clock. In this case the search would be resumed as soon as the signalling was complete.

With the Revert-Non Revert switch on the Control Unit in the OFF position the positive voltage required for search is not present. Under these circumstances the control of the channel is with the Channel Selector Switch. With a given channel selected on the switch a positive voltage is supplied to one of the jacks J33-J36. Assuming channel 1 is selected the positive voltage appears at J33. This positive voltage back biases CR33 and sets up the condition where the channel 1 leg of the diode matrix can go positive when the Slow Clock cycles the bistables to provide positive voltage at CR41 and CR45. When the bistables provide the positive voltage to these diodes, the channel 1 leg goes positive and CR37 feeds this voltage to the Fast Clock Trigger Q26. The appearance of a positive voltage at this point prevents the Fast Clock from cycling. When the channel 1 leg goes positive the Receiver Oscillator switches Q35 and Q36 conduct. The channel remains selected for the duration of the Slow Clock interval. At the end of the interval the Slow Clock steps the bistables off channel 1 to the next channel. Since no other leg on the diode matrix is allowed to go positive, the hold on the Fast clock is removed and the Fast Clock starts to cycle. The Fast Clock cycles the bistables at a high rate through the legs of the diode matrix and returns to channel 1 where the positive voltage is present which again stops the Fast Clock. The effect is that Channel 1 is locked on. The time required to rapid scan the undesired channels is so small that any signal transmitted on these channels would not be received by the mobile. If the mobile is equipped with the Speaker Option and the squelch control is set to listen to noise, the cycling of the Channel Search would be heard. Under these conditions the appearance of a transmitted signal on one of the undesired channels would be noticeable but unreadable.

One other mode of operation is used. When a call is to be initiated from the mobile the channel search circuits must lock on channel. The channel selected is determined by the Channel Selector Switch on the Control Unit. The moment the handset is removed from it's hanger a negative voltage is fed to the negative OR gate on the input of the Slow Clock. This negative voltage stops the clock and the mobile locks on to the channel that has been selected by the Channel Selector Switch. The operation is similar to that discussed above with the difference that the Clocks are inoperative and as a consequence no search is possible.

Search Strapping

When channels are to be searched the diode matrix must be connected to search the specific channels assigned. The pin plugs P1-P4 should be connected to jacks J38-J45 as required for proper operation. The connections are given in the Outline Diagram in a table.

Oscillator Switches PL-19D402713-G1 and 3

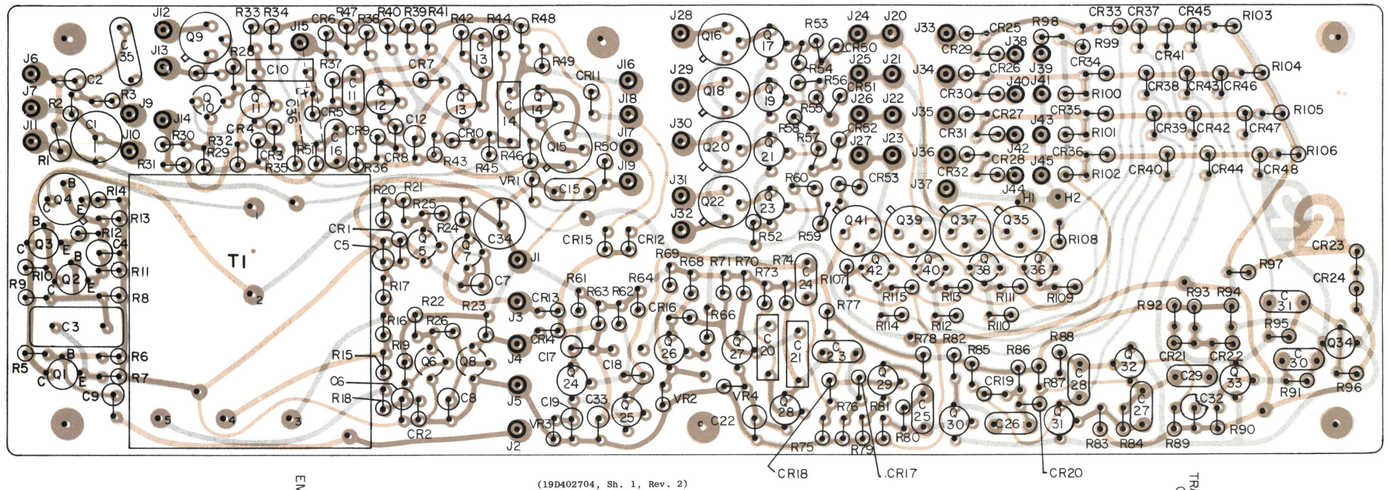
In non search systems the Channel Selector Switch channel leads are connected through to J20-J23. The positive voltage required to select the desired channel is supplied on these leads to the switching transistors Q16-Q23. The receiver associated with these boards requires a positive voltage to turn the oscillators on and the transmitter requires a battery ground. The Channel 1 transistor for the receiver is Q17 and for the transmitter Q16. Channel 2, 3, and 4 switching circuits are identical to the Channel 1 circuit consequently the circuit for channel 1 will be the only one discussed here. As stated above the Channel Selector Switch is connected to J20. J20 is directly connected to J24 which goes to the receiver oscillator. At the Junction of J20 and J24 diode CR50 connects through R53 to the base circuit of Q17 and to the -20 volt keyed source. With this circuit arrangement when a positive voltage is fed to J20 to select channel 1 the receiver oscillator will be activated. Since the -20 volts is only keyed when the Push-to-Talk switch is pressed the switching transistor Q17 is not turned on. When the Push-to-Talk button is pressed the -20 volts is connected to the base and completes the bias circuit for the switching transistor. When transistor Q17 conducts the transmitter oscillator switching transistor Q16 is driven into conduction resulting in the application of a ground for the transmitter oscillator. The receiver is inoperative since the Push-to-Talk relay transfers, the antenna to the transmitter and also turns off the +10 volts for the receiver.

Oscillator Switches PL-19D402713-G2

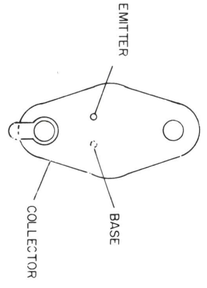
In Search systems the channel selector switches operate in much the same fashion. A second set of transistors are introduced in the circuit to permit the Search Diode Matrix channel leads to provide the positive voltage required for channel selection. In Search systems the Channel Selector Switch leads are connected to J33-J36 instead of J20-J23. This effectively changes the channel selection from direct selection to selection through the Diode Matrix. In either the Revert or Non-Revert condition the voltage for channel selection is placed on one leg of the diode matrix. Assuming that the positive control voltage appears on the channel 1 leg switching transistor Q36 will conduct since the base circuit is completed when the voltage appears. The conduction of Q36 will result in the firing of Q35. These two transistors are directly coupled. When Q35 conducts a positive voltage appears at J20 and J24. This positive voltage turns the receiver oscillator on in the manner described above. When the Push-to-Talk button is pressed to transmit the transmitter oscillator is turned on. This sequence is described in the preceding section.

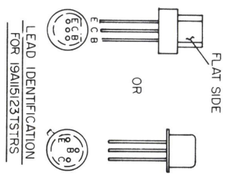
Microphone and Audio Equalizer PL-19D402713-G1, 2 and 3

The microphone used with the mobile unit in MTS combinations is a carbon microphone with relatively high output. In non-MTS applications a reluctance microphone is used. The frequency response and audio output levels of the two microphones are not identical, consequently it is desireable to provide similar responses since the receivers used in conjunction with these systems, are equipped with a standardized response characteristic. In the case of the carbon microphone it is necessary to adjust the audio input to the transmitter by inserting a network consisting of C2, R2, R3 and C35. This network de-emphasizes the low frequencies so the input to the transmitter is essentially the same as the input from a dynamic mircophone without the filter network.



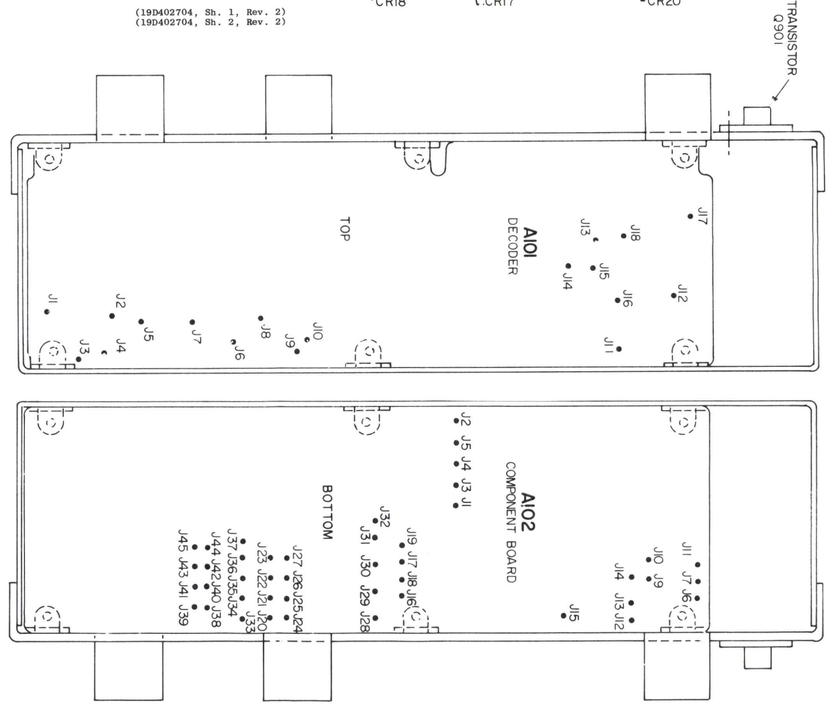
(19D402704, Sh. 1, Rev. 2)
(19D402704, Sh. 2, Rev. 2)

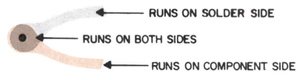




CONNECT H1 AND H2 LEADS TO EVEN NUMBERED JACKS TO SEARCH

FROM	TO
H1	J38 OR J39
H1	J40 OR J41
H2	J42 OR J43
H2	J44 OR J48

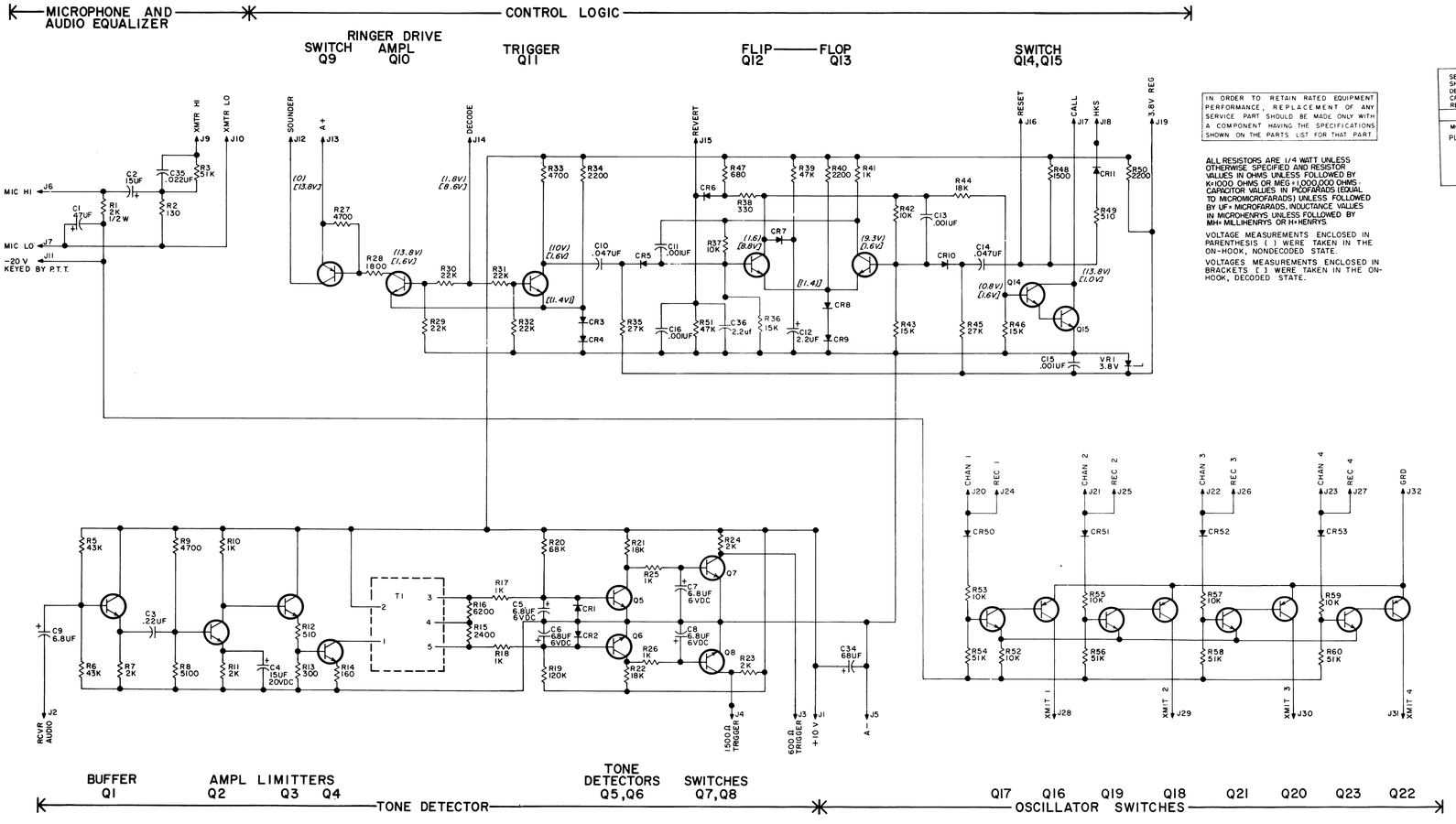




OUTLINE DIAGRAM

SELECTOR UNIT

(19D402801, Rev. 2)



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

VOLTAGE MEASUREMENTS ENCLOSED IN PARENTHESIS ( ) WERE TAKEN IN THE ON-HOOK, NONDECODED STATE.

VOLTAGES MEASUREMENTS ENCLOSED IN BRACKETS [ ] WERE TAKEN IN THE ON-HOOK, DECODED STATE.

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
PL19D402713G1	A

(DF-9017)

WIRING DIAGRAM

COMPONENT BOARD
PL-19D402713-G1

(19R620764, Rev. 2)

PARTS LIST

COMPONENT BOARD WITHOUT 600/1500 SEARCH
19D402713G1
REV A

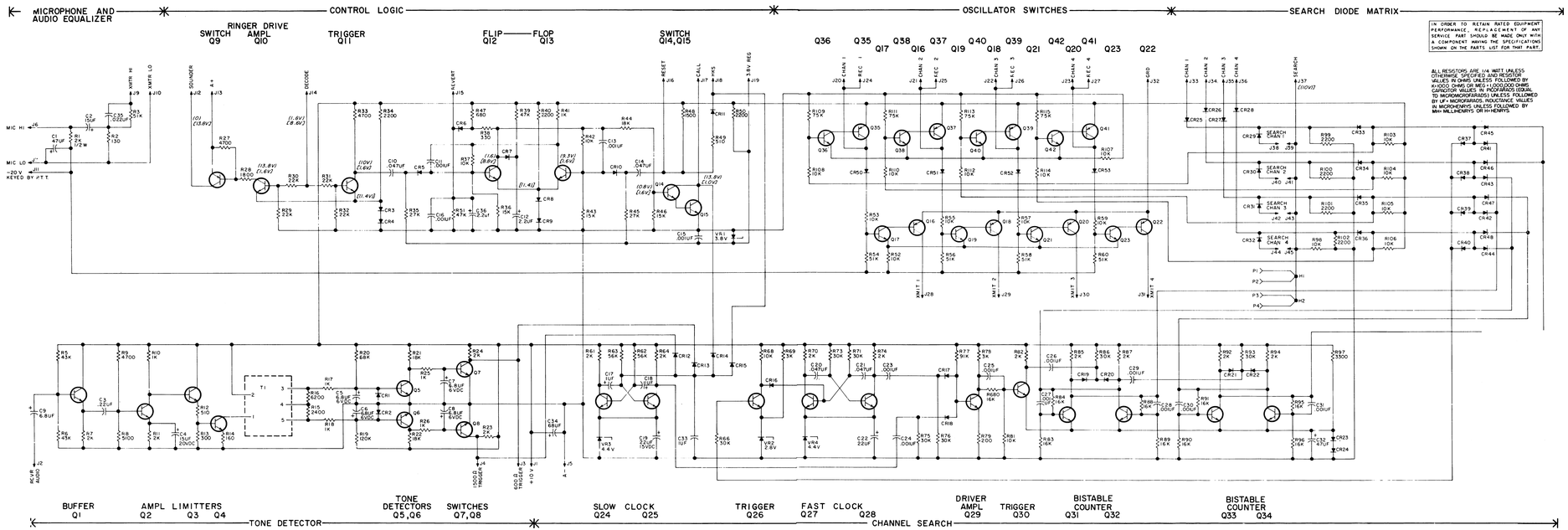
SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1	5496267P120	Tantalum: 47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C2	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C3	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C4	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C5 thru C9	5496267P1	Tantalum: 6.8 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C10	19A116080P5	Polyester: .047 µf ±20%, 50 VDCW.
C11	5494481P111	Ceramic disc: .001 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C12	5496267P13	Tantalum: 2.2 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C13	5494481P111	Ceramic disc: .001 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C14	19A116080P5	Polyester: .047 µf ±20%, 50 VDCW.
C15 and C16	5494481P111	Ceramic disc: .001 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C34	5496267P111	Tantalum: 68 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C35	19A116080P103	Polyester: .022 µf ±10%, 50 VDCW.
C36	5496267P13	Tantalum: 2.2 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 thru CR11	19A115250P1	Silicon.
CR50 thru CR53	19A115250P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J7	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
J9 thru J32	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
J37	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1 thru Q3	19A115889P1	Silicon, NPN; sim to Type 2N2712.
Q4	19A115300P2	Silicon, NPN; sim to Type 2N3053.
Q5 thru Q8	19A115889P1	Silicon, NPN; sim to Type 2N2712.
Q9	19A115562P2	Silicon, PNP.
Q10 thru Q14	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q15	19A115300P2	Silicon, NPN; sim to Type 2N3053.
Q16	19A115562P2	Silicon, PNP.
Q17	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q18	19A115562P2	Silicon, PNP.
Q19	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q20	19A115562P2	Silicon, PNP.
Q21	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q22	19A115562P2	Silicon, PNP.
Q23	19A115123P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77P202J	Composition: 2000 ohms ±5%, 1/2 w.
R2	3R152P131K	Composition: 130 ohms ±10%, 1/4 w.
R3	3R152P513K	Composition: 51,000 ohms ±10%, 1/4 w.
R5 and R6	3R152P433J	Composition: 43,000 ohms ±5%, 1/4 w.
R7	3R152P202J	Composition: 2000 ohms ±5%, 1/4 w.
R8	3R152P512J	Composition: 5100 ohms ±5%, 1/4 w.
R9	3R152P472J	Composition: 4700 ohms ±5%, 1/4 w.
R10	3R152P103J	Composition: 1000 ohms ±5%, 1/4 w.
R11	3R152P202J	Composition: 2000 ohms ±5%, 1/4 w.
R12	3R152P511J	Composition: 510 ohms ±5%, 1/4 w.
R13	3R152P301J	Composition: 300 ohms ±5%, 1/4 w.
R14	3R152P161J	Composition: 160 ohms ±5%, 1/4 w.
R15	3R152P242K	Composition: 2400 ohms ±10%, 1/4 w.
R16	3R152P622K	Composition: 6200 ohms ±10%, 1/4 w.
R17 and R18	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
R19	3R152P124K	Composition: 0.12 megohm ±10%, 1/4 w.
R20	3R152P683J	Composition: 68,000 ohms ±5%, 1/4 w.
R21 and R22	3R152P183J	Composition: 18,000 ohms ±5%, 1/4 w.
R23 and R24	3R152P202J	Composition: 2000 ohms ±5%, 1/4 w.
R25 and R26	3R152P102K	Composition: 1000 ohms ±10%, 1/4 w.
R27	3R152P472J	Composition: 4700 ohms ±5%, 1/4 w.
R28	3R152P182J	Composition: 1800 ohms ±5%, 1/4 w.
R29 thru R32	3R152P223K	Composition: 22,000 ohms ±10%, 1/4 w.
R33	3R152P472K	Composition: 4700 ohms ±10%, 1/4 w.
R34	3R152P222K	Composition: 2200 ohms ±10%, 1/4 w.
R35	3R152P273K	Composition: 27,000 ohms ±10%, 1/4 w.
R36	3R152P153K	Composition: 15,000 ohms ±10%, 1/4 w.
R37	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R38	3R152P331J	Composition: 330 ohms ±5%, 1/4 w.
R39	3R152P473K	Composition: 47,000 ohms ±10%, 1/4 w.
R40	3R152P222K	Composition: 2200 ohms ±10%, 1/4 w.
R41	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
R42	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R43	3R152P153J	Composition: 15,000 ohms ±5%, 1/4 w.
R44	3R152P183K	Composition: 18,000 ohms ±10%, 1/4 w.
R45	3R152P273K	Composition: 27,000 ohms ±10%, 1/4 w.
R46	3R152P153J	Composition: 15,000 ohms ±5%, 1/4 w.
R47	3R152P681J	Composition: 680 ohms ±5%, 1/4 w.
R48	3R152P152J	Composition: 1500 ohms ±5%, 1/4 w.
R49	3R152P511J	Composition: 510 ohms ±5%, 1/4 w.
R50	3R152P222K	Composition: 2200 ohms ±10%, 1/4 w.
R51	3R152P473K	Composition: 47,000 ohms ±10%, 1/4 w.
R52 and R53	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R54	3R152P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R55	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R56	3R152P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R57	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R58	3R152P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R59	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R60	3R152P513J	Composition: 51,000 ohms ±5%, 1/4 w.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T1		DISCRIMINATOR 19B206203G1
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1	19C307114P2203G	Polystyrene: 220,000 pf ±2%, 100 VDCW.
C2	19C307114P1003G	Polystyrene: 100,000 pf ±2%, 100 VDCW.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 thru CR8	19A115250P1	Silicon.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	19C300501G410	Ferrite coil.
L2	19C300501G411	Ferrite coil.
		- - - - - - - - VOLTAGE REGULATORS - - - - - - - -
VR1	4036887P3	Silicon, Zener.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	4036555P1	Insulator, washer: nylon. (Used with Q4, 9, 15, 16, 18, 20, 22).

*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 19D402713G1
To prevent CALL LIGHT falsing caused by vehicle buzzer.
Added C36.



(DF-9017)

WIRING DIAGRAM

COMPONENT BOARD
PL-19D402713-G2

(19R620763, Rev. 2)

PARTS LIST

LBI-8615A

COMPONENT BOARD WITH 600/1500 SEARCH
19D402713G2
REV A

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5496267P120	Tantalum: 47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C2	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C3	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C4	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C5 thru C9	5496267P1	Tantalum: 6.8 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C10	19A116080P5	Polyester: .047 µf ±20%, 50 VDCW.
C11	5494481P111	Ceramic disc: .001 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C12	5496267P13	Tantalum: 2.2 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C13	5494481P111	Ceramic disc: .001 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C14	19A116080P5	Polyester: .047 µf ±20%, 50 VDCW.
C15 and C16	5494481P111	Ceramic disc: .001 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C17 and C18	5496267P17	Tantalum: 1 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C19	5496267P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C20 and C21	19A116080P5	Polyester: .047 µf ±20%, 50 VDCW.
C22	5496267P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C23 thru C31	5494481P111	Ceramic disc: .001 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C32	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C33	5496267P17	Tantalum: 1 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C34	5496267P111	Tantalum: 68 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C35	19A116080P103	Polyester: .022 µf ±10%, 50 VDCW.
C36	5496267P13	Tantalum: 2.2 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 thru CR48	19A115250P1	Silicon.
CR50 thru CR53	19A115250P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J7	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
J9 thru J37	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
J38 thru J45	4033513P15	Contact, electrical: sim to Bead Chain B40-1A.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1 thru Q3	19A115888P1	Silicon, NPN; sim to Type 2N2712.
Q4	19A115300P2	Silicon, NPN; sim to Type 2N3053.
Q5 thru Q8	19A115888P1	Silicon, NPN; sim to Type 2N2712.
Q9	19A115563P2	Silicon, PNP.
Q10 thru Q14	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q15	19A115300P2	Silicon, NPN; sim to Type 2N3053.
Q16	19A115563P2	Silicon, PNP.
Q17	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q18	19A115563P2	Silicon, PNP.
Q19	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q20	19A115563P2	Silicon, PNP.
Q21	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q22	19A115563P2	Silicon, PNP.
Q23 thru Q34	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q35	19A115563P2	Silicon, PNP.
Q36	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q37	19A115563P2	Silicon, PNP.
Q38	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q39	19A115563P2	Silicon, PNP.
Q40	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q41	19A115563P2	Silicon, PNP.
Q42	19A115123P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1	3R77P200J	Composition: 2000 ohms ±5%, 1/2 w.
R2	3R152P131K	Composition: 130 ohms ±10%, 1/4 w.
R3	3R152P513K	Composition: 51,000 ohms ±10%, 1/4 w.
R5 and R6	3R152P433J	Composition: 43,000 ohms ±5%, 1/4 w.
R7	3R152P202J	Composition: 2000 ohms ±5%, 1/4 w.
R8	3R152P513J	Composition: 5100 ohms ±5%, 1/4 w.
R9	3R152P473J	Composition: 4700 ohms ±5%, 1/4 w.
R10	3R152P103J	Composition: 1000 ohms ±5%, 1/4 w.
R11	3R152P203J	Composition: 2000 ohms ±5%, 1/4 w.
R12	3R152P511J	Composition: 510 ohms ±5%, 1/4 w.
R13	3R152P301J	Composition: 300 ohms ±5%, 1/4 w.
R14	3R152P161J	Composition: 160 ohms ±5%, 1/4 w.
R15	3R152P243J	Composition: 2400 ohms ±5%, 1/4 w.
R16	3R152P623J	Composition: 6200 ohms ±5%, 1/4 w.
R17 and R18	3R152P103J	Composition: 1000 ohms ±5%, 1/4 w.
R19	3R152P124K	Composition: 0.12 megohm ±10%, 1/4 w.
R20	3R152P683J	Composition: 68,000 ohms ±5%, 1/4 w.
R21 and R22	3R152P183J	Composition: 18,000 ohms ±5%, 1/4 w.
R23 and R24	3R152P203J	Composition: 2000 ohms ±5%, 1/4 w.
R25 and R26	3R152P102K	Composition: 1000 ohms ±10%, 1/4 w.

SYMBOL	GE PART NO.	DESCRIPTION
R27	3R152P473J	Composition: 4700 ohms ±5%, 1/4 w.
R28	3R152P182J	Composition: 1800 ohms ±5%, 1/4 w.
R29 thru R32	3R152P223K	Composition: 22,000 ohms ±10%, 1/4 w.
R33	3R152P472K	Composition: 4700 ohms ±10%, 1/4 w.
R34	3R152P222K	Composition: 2200 ohms ±10%, 1/4 w.
R35	3R152P273K	Composition: 27,000 ohms ±10%, 1/4 w.
R36	3R152P153K	Composition: 15,000 ohms ±10%, 1/4 w.
R37	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R38	3R152P331J	Composition: 330 ohms ±5%, 1/4 w.
R39	3R152P473K	Composition: 47,000 ohms ±10%, 1/4 w.
R40	3R152P222K	Composition: 2200 ohms ±10%, 1/4 w.
R41	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
R42	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R43	3R152P153J	Composition: 15,000 ohms ±5%, 1/4 w.
R44	3R152P183K	Composition: 18,000 ohms ±10%, 1/4 w.
R45	3R152P273K	Composition: 27,000 ohms ±10%, 1/4 w.
R46	3R152P153J	Composition: 15,000 ohms ±5%, 1/4 w.
R47	3R152P681J	Composition: 680 ohms ±5%, 1/4 w.
R48	3R152P152J	Composition: 1500 ohms ±5%, 1/4 w.
R49	3R152P511J	Composition: 510 ohms ±5%, 1/4 w.
R50	3R152P222K	Composition: 2200 ohms ±10%, 1/4 w.
R51	3R152P473K	Composition: 47,000 ohms ±10%, 1/4 w.
R52 and R53	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R54	3R152P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R55	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R56	3R152P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R57	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R58	3R152P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R59	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R60	3R152P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R61	3R152P203J	Composition: 2000 ohms ±5%, 1/4 w.
R62 and R63	3R152P563J	Composition: 56,000 ohms ±5%, 1/4 w.
R64	3R152P202J	Composition: 2000 ohms ±5%, 1/4 w.
R66	3R152P303J	Composition: 30,000 ohms ±5%, 1/4 w.
R68	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R69	3R152P302J	Composition: 3000 ohms ±5%, 1/4 w.
R70	3R152P202J	Composition: 2000 ohms ±5%, 1/4 w.
R71	3R152P303J	Composition: 30,000 ohms ±5%, 1/4 w.
R73	3R152P303J	Composition: 30,000 ohms ±5%, 1/4 w.
R74	3R152P202J	Composition: 2000 ohms ±5%, 1/4 w.
R75 and R76	3R152P303J	Composition: 30,000 ohms ±5%, 1/4 w.
R77	3R152P913J	Composition: 91,000 ohms ±5%, 1/4 w.
R78	3R152P302J	Composition: 3000 ohms ±5%, 1/4 w.
R79	3R152P201J	Composition: 200 ohms ±5%, 1/4 w.
R80	3R152P163J	Composition: 16,000 ohms ±5%, 1/4 w.
R81	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R82	3R152P203J	Composition: 2000 ohms ±5%, 1/4 w.
R83 and R84	3R152P163J	Composition: 16,000 ohms ±5%, 1/4 w.

SYMBOL	GE PART NO.	DESCRIPTION
R85	3R152P202J	Composition: 2000 ohms ±5%, 1/4 w.
R86	3R152P303J	Composition: 30,000 ohms ±5%, 1/4 w.
R87	3R152P203J	Composition: 2000 ohms ±5%, 1/4 w.
R88 thru R91	3R152P163J	Composition: 16,000 ohms ±5%, 1/4 w.
R92	3R152P203J	Composition: 2000 ohms ±5%, 1/4 w.
R93	3R152P303J	Composition: 30,000 ohms ±5%, 1/4 w.
R94	3R152P202J	Composition: 2000 ohms ±5%, 1/4 w.
R95 and R96	3R152P163J	Composition: 16,000 ohms ±5%, 1/4 w.
R97	3R152P332J	Composition: 3300 ohms ±5%, 1/4 w.
R98	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R99 thru R102	3R152P222J	Composition: 2200 ohms ±5%, 1/4 w.
R103 thru R108	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R109	3R152P753J	Composition: 75,000 ohms ±5%, 1/4 w.
R110	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R111	3R152P753J	Composition: 75,000 ohms ±5%, 1/4 w.
R112	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R113	3R152P753J	Composition: 75,000 ohms ±5%, 1/4 w.
R114	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R115	3R152P753J	Composition: 75,000 ohms ±5%, 1/4 w.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T1		DISCRIMINATOR 19D902303G1
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	19C307114P2203G	Polystyrene: 220,000 pf ±2%, 100 VDCW.
C2	19C307114P1003G	Polystyrene: 100,000 pf ±2%, 100 VDCW.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 thru CR8	19A115250P1	Silicon.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L1	19C300501G410	Ferrite coil.
L2	19C300501G411	Ferrite coil.
		- - - - - - - - VOLTAGE REGULATORS - - - - - - - -
VR1	403688TP3	Silicon, Zener.
VR2	403688TP2	Silicon, Zener.
VR3 and VR4	403688TP4	Silicon, Zener.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	4036555P1	Insulator, washer: nylon. (Used with Q4, 9, 15, 16, 18, 20, 22, 35, 37, 39, 41).

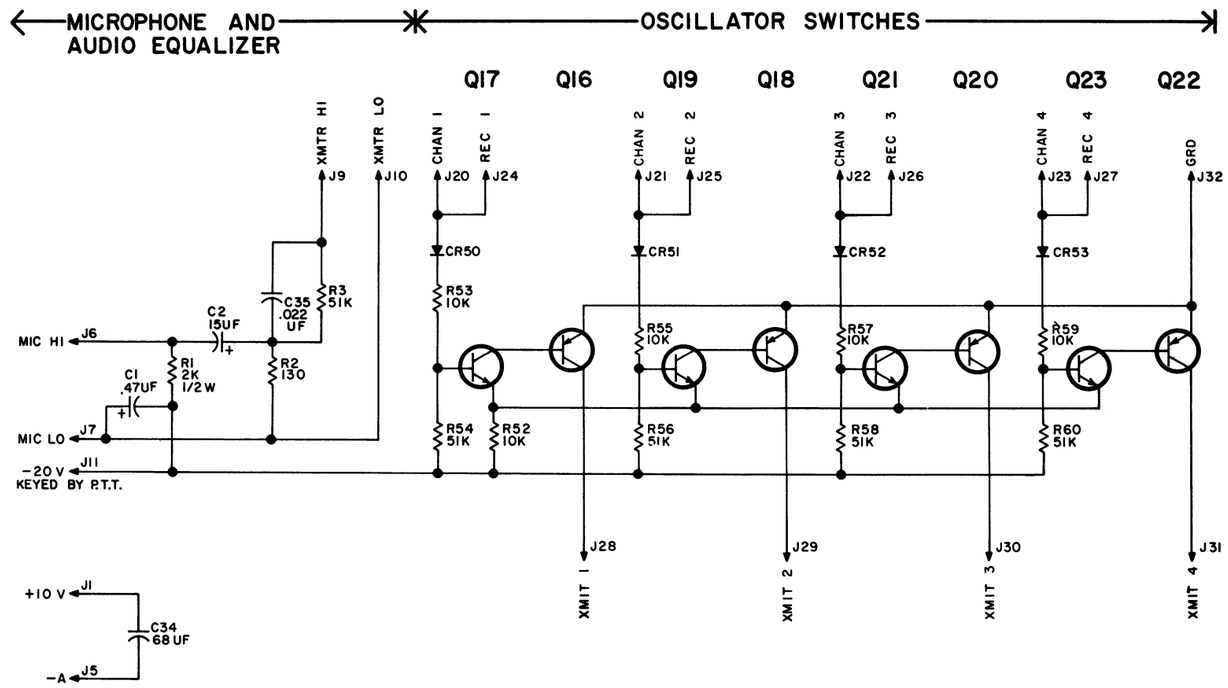
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

COMPONENT BOARD WITHOUT 600/1500 SIGNALLING
PL-19D402713-G3

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5496267-P115	Tantalum, dry solid: 47 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C2	5496267-P14	Tantalum, dry solid: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C34	5496267-P111	Tantalum, dry solid: 68 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C35	19B209243-P103	Polyester: .022 µf ±10%, 40 VDCW.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR50 thru CR53	19A115250-P1	Silicon.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1 thru J7	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
J9 thru J37	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q16	19A115562-P2	Silicon, PNP.
Q17	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q18	19A115562-P2	Silicon, PNP.
Q19	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q20	19A115562-P2	Silicon, PNP.
Q21	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q22	19A115562-P2	Silicon, PNP.
Q23	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77-P202J	Fixed composition: 2000 ohms ±5%, 1/2 w.
R2	3R152-P131K	Fixed composition: 130 ohms ±10%, 1/4 w.
R3	3R152-P513K	Fixed composition: 51,000 ohms ±10%, 1/4 w.
R52 and R53	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R54	3R152-P513J	Fixed composition: 51,000 ohms ±5%, 1/4 w.
R55	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R56	3R152-P513J	Fixed composition: 51,000 ohms ±5%, 1/4 w.
R57	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R58	3R152-P513J	Fixed composition: 51,000 ohms ±5%, 1/4 w.
R59	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R60	3R152-P513J	Fixed composition: 51,000 ohms ±5%, 1/4 w.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	4036555-P1	Insulator, washer: nylon. (Used with Q16, 18, 20, 22).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.



WIRING DIAGRAM

COMPONENT BOARD
PL-19D402713-G3

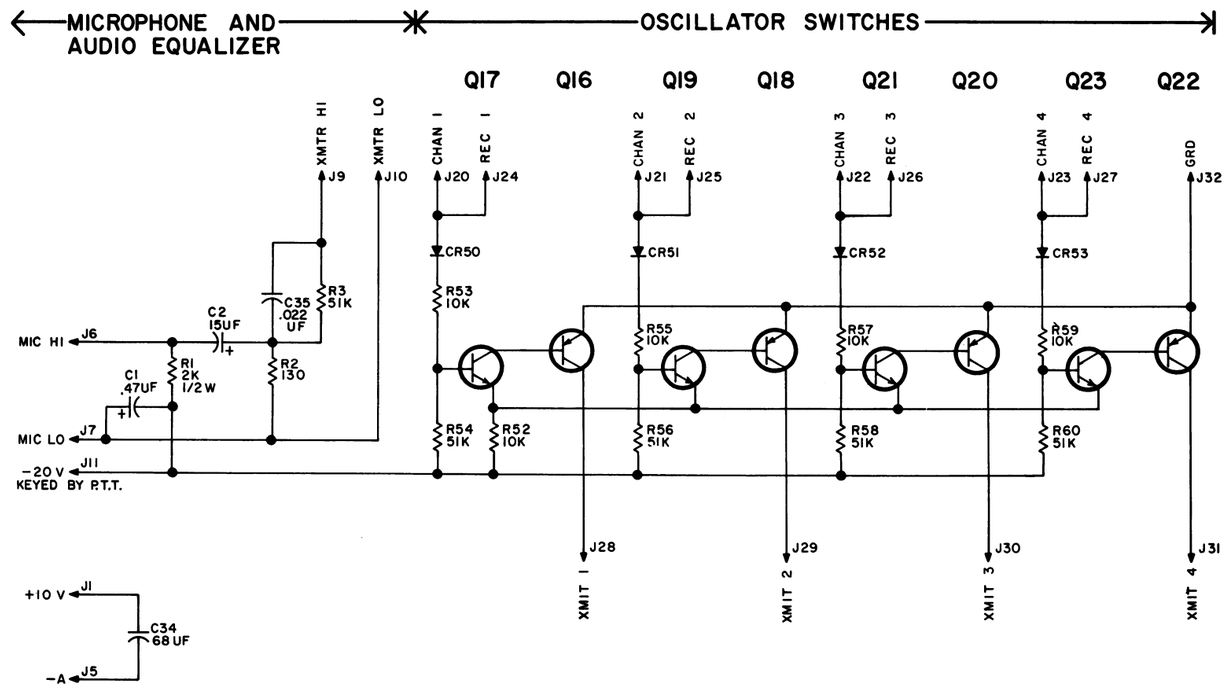
(19C311074, Rev. 1)

PARTS LIST

COMPONENT BOARD WITHOUT 600/1500 SIGNALLING
PL-19D402713-G3

SYMBOL	G-E PART NO.	DESCRIPTION
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5496267-P115	Tantalum, dry solid: 47 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C2	5496267-P14	Tantalum, dry solid: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C34	5496267-P111	Tantalum, dry solid: 68 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C35	19B209243-P103	Polyester: .022 µf ±10%, 40 VDCW.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR50 thru CR53	19A115250-P1	Silicon.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1 thru J7	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
J9 thru J37	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q16	19A115562-P2	Silicon, PNP.
Q17	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q18	19A115562-P2	Silicon, PNP.
Q19	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q20	19A115562-P2	Silicon, PNP.
Q21	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
Q22	19A115562-P2	Silicon, PNP.
Q23	19A115123-P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77-P202J	Fixed composition: 2000 ohms ±5%, 1/2 w.
R2	3R152-P131K	Fixed composition: 130 ohms ±10%, 1/4 w.
R3	3R152-P513K	Fixed composition: 51,000 ohms ±10%, 1/4 w.
R52 and R53	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R54	3R152-P513J	Fixed composition: 51,000 ohms ±5%, 1/4 w.
R55	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R56	3R152-P513J	Fixed composition: 51,000 ohms ±5%, 1/4 w.
R57	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R58	3R152-P513J	Fixed composition: 51,000 ohms ±5%, 1/4 w.
R59	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R60	3R152-P513J	Fixed composition: 51,000 ohms ±5%, 1/4 w.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	4036555-P1	Insulator, washer: nylon. (Used with Q16, 18, 20, 22).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.



WIRING DIAGRAM

COMPONENT BOARD
PL-19D402713-G3

(19C311074, Rev. 1)

DECODER PL-19D402575-G1

CIRCUIT ANALYSIS

The output of the Tone Receiver consists of negative shifts or pulses which are applied to the input jacks, J4 and J6, on the Decoder. A1603. The alternating pulses applied to these two jacks trigger the Decoder bistable Q16 and Q17. Each pulse shift in the output of the Decoder bistable fires the Pulse One-Shot Multivibrator Q18-Q19. Each pulse output of the One-Shot Multivibrator shifts the state of the bit counter chain Q1-Q2, Q3-Q4, Q5-Q6, Q7 and Q8. The first pulse shifts bistable Q1-Q2, to the condition where Q1 is conducting. The second pulse shifts bistable, Q1-Q2, to the condition where Q2 conducts. Conduction of Q2 shifts the state of bistable, Q3-Q4, so Q3 conducts. The third pulse shifts the state of Q1-Q2 so Q1 conducts and does not change the state of Q3-Q4. Thus at the end of three pulses Q1, Q3, Q6 and Q8 are conducting. This results in the voltage on all legs of the diode matrix being shunted through the conducting transistors except leg number three.

The leading edge of the first pulse in the digit triggers the Intergrated Schmitt Triggers, Q20, Q21 and Q22. This circuit remains operated as long as the pulse train continues. At the end of the pulse train the circuit returns to its original state after a 145 millisecond delay.

If the number strapping in the register is correct (i.e. P1 connected to leg number three) the digit will enter the digit register and trigger the Interdigit Schmitt Triggers, Q31 and Q32, during the 145 ms. delay interval. When Q32 fires a positive potential is applied to the cathode of CR133. This prevents the Digit Reset One-Shot, Q28 and Q29 from being fired by the Intergrating Schmitt Trigger output at the end of the 145 ms. delay period. If the number strapping is incorrect the positive potential will not appear at CR133 and the Digit Reset One-Shot will fire and reset the register.

When the number strapping is correct the conduction of Q22 at the end of the 145 ms. interval cuases the Digit Counter Bistables, Q9 and Q10, to change state so Q9 is conducting. Thus the first digit of the number is registered. When any subsequent digit is incorrect the register will be cleared by the Digit Reset One-Shot since the positive potential on CR133 required to offset the negative pulse from the Intergrating Schmitt Trigger will not appear. The bit register is cleared 10 ms. after the Intergrating Schmitt Trigger returns to its normal state. The return to normal state causes the Delay One-Shot, Q23 and Q24, to pulse the bit Reset One-Shot, Q25, Q26 and Q27, thus clearing the bit register.

When all digits of the number have been registered in the digit register the transistor switch Q33 will conduct. The voltage at J14 and J15 will increase to 9 volts. The Decoder is then decoded and the voltage applied to the Logic Board, at P4. In the operation of the system this results in the audible alarm thus alerting the subscriber of an incoming call. The removal of the handset from it's cradle to answer the call supplies a negative pulse to the Bit Reset

and Digit Reset One-Shot circuits thus resetting the Decoder. This pulse is inserted through J11, Command Reset Jack.

In the event the call remains unanswered the Call Lamp stays lit and the sounder is deactivated by the digit one transmitted by the base station which clears the Decoder. Since the digit one is used to clear the decoder it cannot be used as the first Digit in the call number assigned to the mobiles. The digit one may, however, be used in any other position in the number. The use of Digit one is arbitrary in that any number, as long as it's a wrong first digit for all mobiles, can be used to accomplish the reset function.

The Decoder is designed to accomodate three, five or seven digit call numbers. The wiring changes necessary to modify the board for operation with three or five digits are shown on the schematic diagram in a note.

The call number for the Mobile Unit can be changed to suit system requirements by changing the strapping to the jackfield in the center of the board. The pins are numbered from 1 to 10 and the digit leads A, B, C, X, X, X, X. To strap in a number connect the first digit lead (A) to one of the pin jacks in the row with the proper number for the first digit. In like fashion connect the second digit lead (B) to one of the pin jacks in the row for the second digit. (i.e., if number 8382345 is to be strapped in connect as follows: Lead A to Row 8; Lead B to row 3; Lead C to row 8; etc.).

COMMUNICATION PRODUCTS DEPARTMENT
GENERAL ELECTRIC COMPANY
LYNCHBURG, VIRGINIA

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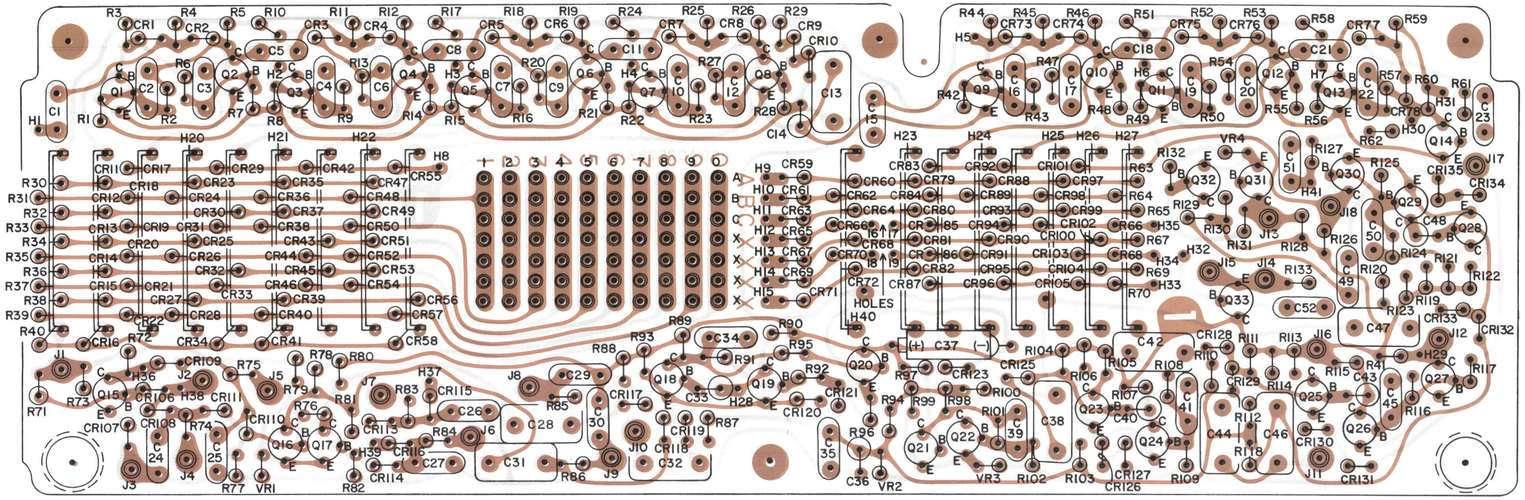


(19D402579, Sh. 1, Rev. 1)
(19D402579, Sh. 2, Rev. 1)

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

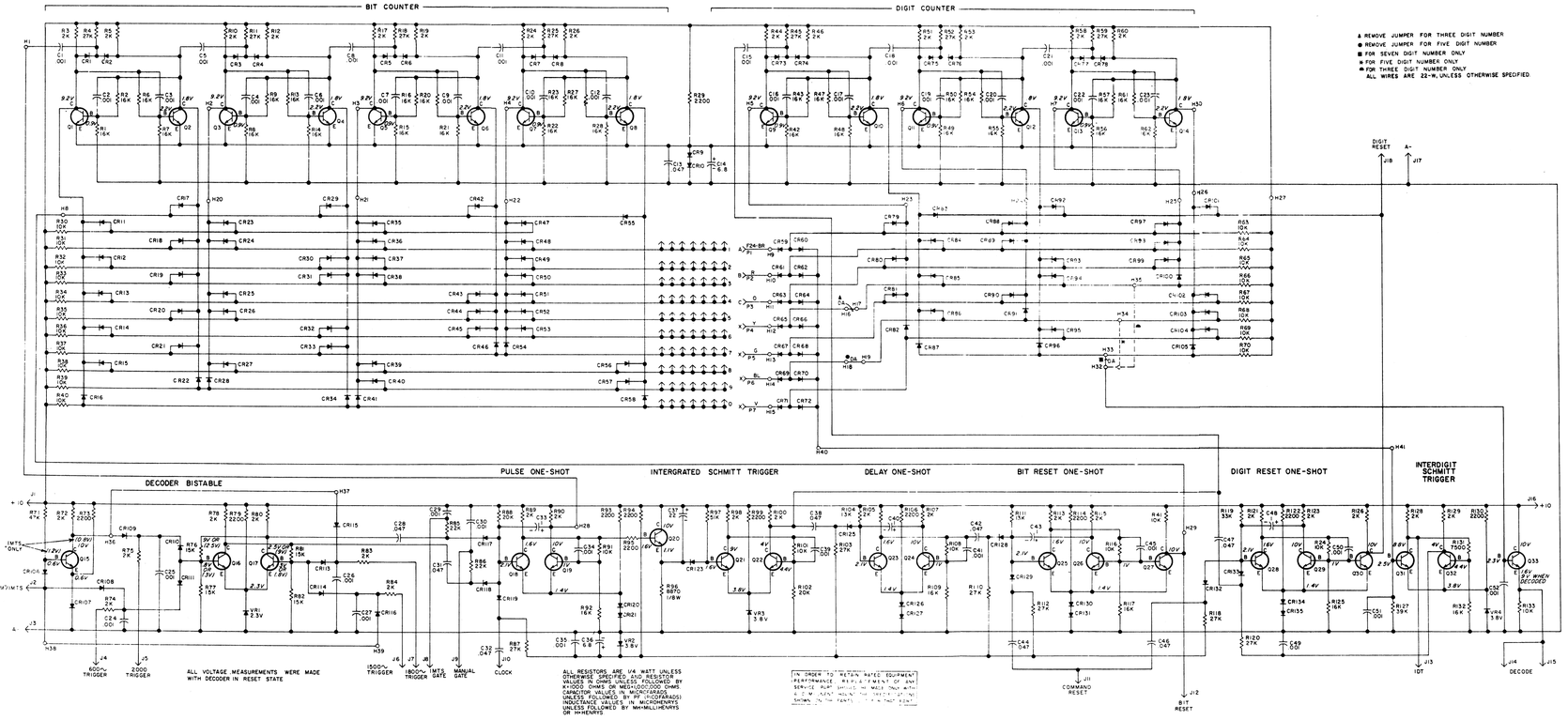
CONNECTIONS CHART

FROM	WIRE IDENT.	TO	REMARKS	FROM	WIRE IDENT.	TO	REMARKS
H1	22-W	H28		H13	F24-G	P5	LET HANG
H2		H20		H14	F24-BL	P6	LET HANG
H3		H21		H15	F24-V	P7	LET HANG
H4		H22		H16	DA	H17	REMOVE JUMPER FOR THREE DIGIT NUMBER
H5		H23		H18	DA	H19	REMOVE JUMPER FOR FIVE DIGIT NUMBER
H6		H24		H26	22-W	H30	
H7		H25		H27	22-W	H31	
H8	22-W	H29		H32	DA	H33	FOR SEVEN DIGIT NO.
H9	F24-BR	P1	LET HANG	H36	22-W	H37	
H10	F24-R	P2		H38	22-W	H39	
H11	F24-O	P3		H40	22-W	H41	
H12	F24-Y	P4	LET HANG				

OUTLINE DIAGRAM

DECODER PL-19D402575-G1

(19D402723, Rev. 0)



SCHEMATIC DIAGRAM

DECODER PL-19D402575-G1

(19R640705, Rev. 3)

PARTS LIST

DECODER - A1903
PL-19B903570-G1

SYMBOL	G-E PART NO.	DESCRIPTION
		---------- CAPACITORS ----------
C1 thru C13	5496481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C13	19B209243-P6	Polyester: .047 µf ±20%, 40 VDCW.
C14	5496367-P1	Tantalum, dry solid: 6.8 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C15 thru C27	5496481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C28	19B209243-P6	Polyester: .047 µf ±20%, 40 VDCW.
C29 and C30	5496481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C31 and C32	19B209243-P6	Polyester: .047 µf ±20%, 40 VDCW.
C33	5496367-P217	Tantalum, dry solid: 1 µf ±10%, 35 VDCW; sim to Sprague Type 150D.
C34 and C35	5496481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C36	5496367-P1	Tantalum, dry solid: 6.8 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C37	5496367-P410	Tantalum, dry solid: 22 µf ±5%, 15 VDCW; sim to Sprague Type 150D.
C38	19B209243-P6	Polyester: .047 µf ±20%, 40 VDCW.
C39	5496481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C40	5496367-P17	Tantalum, dry solid: 1 µf ±10%, 35 VDCW; sim to Sprague Type 150D.
C41	5496481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C42	19B209243-P5	Polyester: .047 µf ±20%, 40 VDCW.
C43	5496367-P17	Tantalum, dry solid: 1 µf ±10%, 35 VDCW; sim to Sprague Type 150D.
C44	19B209243-P6	Polyester: .047 µf ±20%, 40 VDCW.
C45	5496481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C46 and C47	19B209243-P5	Polyester: .047 µf ±20%, 40 VDCW.
C48	5496367-P17	Tantalum, dry solid: 1 µf ±10%, 35 VDCW; sim to Sprague Type 150D.
C49 thru C52	5496481-P111	Ceramic disc: .001 µf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		---------- DIODES AND RECTIFIERS ----------
CR1 thru CR111	19A115250-P1	Silicon.
CR113 thru CR131	19A115250-P1	Silicon.
CR133	19A115250-P1	Silicon.
CR135 thru CR235	19A115250-P1	Silicon.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

SYMBOL	G-E PART NO	DESCRIPTION
		---------- PLUGS ----------
P1 thru P7	4036634-P1	Contact, electrical: sim to AMP 42428-2.
		---------- TRANSISTORS ----------
Q1 thru Q17	19A115730-P1	Silicon, NPN.
Q18	19A115728-P1	Silicon, NPN.
Q19 thru Q22	19A115730-P1	Silicon, NPN.
Q23	19A115728-P1	Silicon, NPN.
Q24	19A115730-P1	Silicon, NPN.
Q25	19A115728-P1	Silicon, NPN.
Q26 and Q27	19A115730-P1	Silicon, NPN.
Q28	19A115728-P1	Silicon, NPN.
Q29 thru Q32	19A115730-P1	Silicon, NPN.
		---------- RESISTORS ----------
R1 and R2	3R152-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R3	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R4	3R152-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.
R5	3R153-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R6 thru R9	3R152-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R10	3R153-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R11	3R153-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.
R12	3R153-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R13 thru R16	3R153-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R17	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R18	3R152-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.
R19	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R20 thru R23	3R153-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R24	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R25	3R152-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.
R26	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R27 and R28	3R153-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R29	3R153-P222K	Fixed composition: 2200 ohms ±10%, 1/4 w.
R30 thru R41	3R152-P103K	Fixed composition: 10,000 ohms ±10%, 1/4 w.
R42 and R43	3R153-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R44	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R45	3R152-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.
R46	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R47 thru R50	3R153-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.

SYMBOL	G-E PART NO	DESCRIPTION
		---------- RESISTORS(Cont'd) ----------
R51	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R52	3R152-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.
R53	3R153-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R54 thru R57	3R152-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R58	3R153-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R59	3R152-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.
R60	3R153-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R61 and R62	3R153-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R63 thru R70	3R152-P103K	Fixed composition: 10,000 ohms ±10%, 1/4 w.
R71	3R152-P473K	Fixed composition: 47,000 ohms ±10%, 1/4 w.
R72	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R73	3R152-P222K	Fixed composition: 2200 ohms ±10%, 1/4 w.
R74 and R75	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R76 and R77	3R152-P153J	Fixed composition: 15,000 ohms ±5%, 1/4 w.
R78	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R79	3R152-P222K	Fixed composition: 2200 ohms ±10%, 1/4 w.
R80	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R81 and R82	3R152-P153J	Fixed composition: 15,000 ohms ±5%, 1/4 w.
R83 and R84	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R85 and R86	3R152-P223J	Fixed composition: 22,000 ohms ±5%, 1/4 w.
R87	3R152-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.
R88	3R152-P203J	Fixed composition: 20,000 ohms ±5%, 1/4 w.
R89 and R90	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R91	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R92	3R152-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R93 thru R95	3R152-P222K	Fixed composition: 2200 ohms ±10%, 1/4 w.
R96	19B209050-P33	Deposited carbon: 8870 ohms ±1%, 1/8 w; sim to IRC Type RCA or CEA-TO.
R97	3R152-P513J	Fixed composition: 51,000 ohms ±5%, 1/4 w.
R98	3R152-P203J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R99	3R152-P222K	Fixed composition: 2200 ohms ±10%, 1/4 w.
R100	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R101	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R102	3R152-P203J	Fixed composition: 20,000 ohms ±5%, 1/4 w.
R103	3R152-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.
R104	3R152-P133J	Fixed composition: 13,000 ohms ±5%, 1/4 w.
R105	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R106	3R152-P222K	Fixed composition: 2200 ohms ±10%, 1/4 w.
R107	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R108	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R109	3R152-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R110	3R152-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.

SYMBOL	G-E PART NO	DESCRIPTION
		---------- RESISTORS(Cont'd) ----------
R111	3R152-P133J	Fixed composition: 13,000 ohms ±5%, 1/4 w.
R112	3R152-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.
R113	3R152-P203J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R114	3R152-P222K	Fixed composition: 2200 ohms ±10%, 1/4 w.
R115	3R152-P203J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R116	3R152-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R117	3R152-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R118	3R152-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.
R119	3R152-P333J	Fixed composition: 33,000 ohms ±5%, 1/4 w.
R120	3R152-P273K	Fixed composition: 27,000 ohms ±10%, 1/4 w.
R121	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R122	3R152-P222K	Fixed composition: 2200 ohms ±10%, 1/4 w.
R123	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R124	3R153-P103J	Fixed composition: 10,000 ohms ±5%, 1/4 w.
R125	3R152-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R126	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R127	3R152-P393K	Fixed composition: 39,000 ohms ±10%, 1/4 w.
R128 and R129	3R152-P202J	Fixed composition: 2000 ohms ±5%, 1/4 w.
R130	3R152-P222K	Fixed composition: 2200 ohms ±10%, 1/4 w.
R131	3R152-P752J	Fixed composition: 7500 ohms ±5%, 1/4 w.
R132	3R152-P163J	Fixed composition: 16,000 ohms ±5%, 1/4 w.
R133	3R152-P103K	Fixed composition: 10,000 ohms ±10%, 1/4 w.
		---------- VOLTAGE REGULATORS ----------
VR1	4036887-P1	Silicon, Zener.
VR2 thru VR4	4036887-P3	Silicon, Zener.
		COMPONENT BOARD PL-19B205113-G1
		---------- JACKS AND RECEPTACLES ----------
J1 thru J18	4033513-P4	Contact, electrical: sim to Bead Chain L93-3.

NEGATIVE GROUND	
PIN NO. AND COLOR	IGNITION SWITCH TERMINAL
PIN 10 BLACK	GROUND
PIN 30 RED	HOT
PIN 29 BROWN	ACC

POSITIVE GROUND	
PIN NO. AND COLOR	IGNITION SWITCH TERMINAL
PIN 10 BLACK	HOT
PIN 30 RED	GROUND
PIN 29 BROWN	ACC

▲C901 APPEARS IN K901 ONLY (MIT C901 IN K903 AND K00 DOTTED CONNECTION

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

NOTES:
1. ALL WIRES ARE N24 EXCEPT AS OTHERWISE SHOWN
2. SEE 15D602676 FOR ORIENTATION AND LOCATION OF COMPONENTS AND ROUTING OF CABLE
3. SEE 19A121837P1 FOR CONNECTIONS OF P101
4. FOR 600-1500 SEARCH: MOVE W-WHT FROM J22 TO J39
   MOVE W-BR FROM J21 TO J74
   MOVE W-RED FROM J22 TO J25
   MOVE W-GY-WHT FROM J23 TO J26
5. PART OF HARDWARE KIT 19A122360G1

ALL RESISTORS ARE 1/2 WATT UNLESS OTHERWISE NOTED. RESISTANCE 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 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.

INTERCONNECTION DIAGRAM
(19R620762, Rev. 3)