

Customer \_\_\_\_\_

G. E. Req. No. \_\_\_\_\_

Customer Order No. \_\_\_\_\_

## INSTRUCTIONS

FOR

GENERAL ELECTRIC 100 CALL DISPATCHER

MODEL 4EC40A1  
REV. C

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LBI-10405

DF-5015



**GENERAL**  **ELECTRIC**

COMMUNICATION PRODUCTS DEPARTMENT  
LYNCHBURG, VIRGINIA

Printed in U.S.A.

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GENERAL ELECTRIC 100 CALL DISPATCHER  
MODEL 4EC40A1

Tone Dispatcher Model 4EC40A1 is a selective signaling unit which provides a means of alerting any one or all of the mobile units in a system by transmitting audio tones at various frequencies corresponding to codes assigned to the mobile units. The 4EC40A1 is a self-contained tone dispatch console capable of signaling up to 100 individual units, one or more groups of units, or all units in a system.

The tone dispatcher is a tone generating and switching device permitting the selection of 100 combinations of two sequential audio frequency tones, with provision for keying the station ratio transmitter which, in turn, transmits the tones for a pre-determined period.

Power is provided by a self-contained AC power supply. Provision for connecting a 12-volt battery is included for use in case of emergency. A diode switch in the power supply circuit allows the battery to take over automatically in the event of power line failure.

### INSTALLATION

Position the dispatcher in a location convenient for the operator. Connect the line cord to the nearest 117-volt, 50/60-cps outlet. The 10-foot output cable connects to J1221 and to the station audio input circuit. The microphone cable connects to J1222. The microphone and output jacks on the dispatcher are compatible with General Electric Progress Line Station Combinations.

The emergency battery may be connected permanently to TB1201. Accidental reversing of the battery leads will cause no damage or blown fuses. No provision is made for charging the battery; thus periodic checks of the battery condition are necessary and separate facilities for battery charging should be available.

The dispatcher is supplied with an 'L' pad (R1246 and R1247) in the tone output circuit. This pad limits the tone to approximately 25 millivolts. R1246 may be clipped out of the circuit if more output is required.

### ADJUSTMENT

#### Tone Level

Each tone generator must be adjusted individually in the dispatcher to the level necessary to properly modulate the transmitter. These adjustments are made on the basis of each tone being adjusted to equal voltage levels. This voltage is measured at the radio transmitter and equals that voltage required when a 967.5-cps generator produces a 3-KC swing in narrow band transmitters or a 6-KC swing in wide band transmitters.

1. The transmitter must be adjusted for full limiting at 5.0 KC (narrow band) or 13 KC (wide band). Refer to the transmitter instructions.
2. Release all push-buttons on the dispatcher.
3. Depress B9. This will be the highest tone frequency used in the system.
4. Test switch S1207 by-passes the timing circuits and permits transmission of the selected tones in the B group continuously for these adjustments. The test switch should be released periodically while making the adjustments, in keeping with the rated duty cycle of the transmitter.
5. Adjust the level potentiometer (R7) on the top of the tone generator to a position 10° of rotation from its minimum position.
6. Place the test switch (S1207) in the TEST position. Adjust the master level potentiometer (R1201) to produce a deviation of 3 KC (narrow band) or 6 KC (wide band) as measured with a modulation monitor at the transmitter. Do not exceed this deviation. Measure the r.m.s. tone voltage at the radio transmitter. Note reading.
7. Release B9. Select another tone frequency in the B group. Adjust the level potentiometer (R7) on this generator to produce the same amount of tone voltage at the radio transmitter as noted in Step 6.
8. Selecting one tone frequency at a time in the B group, set R7 on each generator to obtain the same tone voltage as obtained in Step 6.
9. Release S1207.
10. Operate the TEST switch (S1203) for the A group and adjust each tone in the A group for the same voltage as obtained in Step 6.

NOTE: The procedure for adjusting the dispatcher for use with the EC-28 Remote Control unit is the same as outlined above. The EC-28 should be properly adjusted according to instructions in the RC-4 Instruction Book. Once this unit has been adjusted, and the tone levels set as outlined above, the MIKE level control in the EC-28 should not be changed.

#### Timing

1. Adjust R1202 for approximately 1 second. This is the tone "ON" time for the first tone.
2. Adjust R1211 for approximately 1-1/2 seconds. This is the tone "ON" time for the second tone.

## OPERATION

The dispatcher has two vertical rows of pushbuttons on the front panel. One button in each row must be used for each call, as each function is composed of two sequential tones. To signal the unit he is calling, the operator selects the proper combination of buttons indicated by the assigned tone frequencies.

After selecting the proper combination, the operator presses the SEND switch which automatically transmits the selected tones. Once the SEND switch has been depressed, the timing circuit takes over the transmission and the duration of holding down the SEND switch has no effect on the timing of the tone transmission.

## CIRCUIT DESCRIPTION

### Tone Generator

The tone generator (PL-19B200236) consists of a transistorized oscillator circuit utilizing a vibrating-reed tone governing device that provides the frequency selective component of the oscillator circuit, and also provides feedback for proper oscillator operation.

Energy is coupled from the collector of Q1 to terminals 1 and 2 of the tone governing device, where transformer action between the two coils takes place, returning the energy to the base of Q1. The vibrating reed responds only to the specific frequency to which it is resonant; therefore, only the desired frequency appears at the output jack P1. R7 provides an adjustment of the output level.

Twenty tone generators, each resonant to a specific audio frequency, are operated continuously when power is applied to the dispatcher. Selector switches S1204 and S1205 are interlocked so that only one tone generator may be selected in each bank at one time.

### Tone Amplifier

The selected tones are fed from the selector switches, through the timing relays, to the input of the tone amplifier, Q1201. The output of Q1201 is coupled through a filter consisting of C1205-C1210, L1201 and L1202. This filter suppresses harmonics. The tone signals are fed from the filter, through master level control R1210, to the transmitter jack J1221.

### Timing Circuit

Once the tone transmission is initiated by closing the momentary contacts of SEND switch S1202, a timing circuit controls the duration of the transmission regardless of how long S1202 is held down.

Timing capacitor C1211 is normally charged through contacts 11 and 12 of K1203, through the normally closed contacts of S1202, and through R1208 to the regulated 11 volts positive from the power supply. When the SEND switch, S1202, is operated, C1211 discharges through R1202 into the base of Q1202. Q1202 conducts. K1201 is then operated by Q1202. K1201 remains operated until C1211 is discharged. R1202 provides adjustment of the time constant of this circuit.

When K1201 operates, the following events take place:

- a) The regulated positive 11 volts is connected through K1201 contacts 5 and 6 to R1251 and R1250. This voltage is applied to the base of Q1204, causing the transistor to turn on and operate K1203.
- b) The first tone is connected through K1201 contacts 7 and 8 to the tone amplifier.
- c) C1212 is charged through K1201 contacts 13 and 14, through R1212, to the positive voltage. The return circuit is completed through contacts 1 and 2 of S1202.

When K1201 releases, C1212 is connected through K1201-12 and 13, through R1249, thus charging C1247. In approximately 150 milliseconds, C1247 has sufficient charge to turn on Q1203. This in turn operates K1202.

When K1202 operates, the following events take place:

- a) The second tone is connected through K1202 contacts 7 and 8 to the tone amplifier.
- b) The positive voltage is connected to the base of Q1204 through K1202-5 and 6. The transistor holds K1203 operated.
- c) Charged capacitor C1248 is connected through K1202-13 and 14, through R1211 (the timing adjustment potentiometer) to the base of Q1203. This provides additional ON time for K1202.

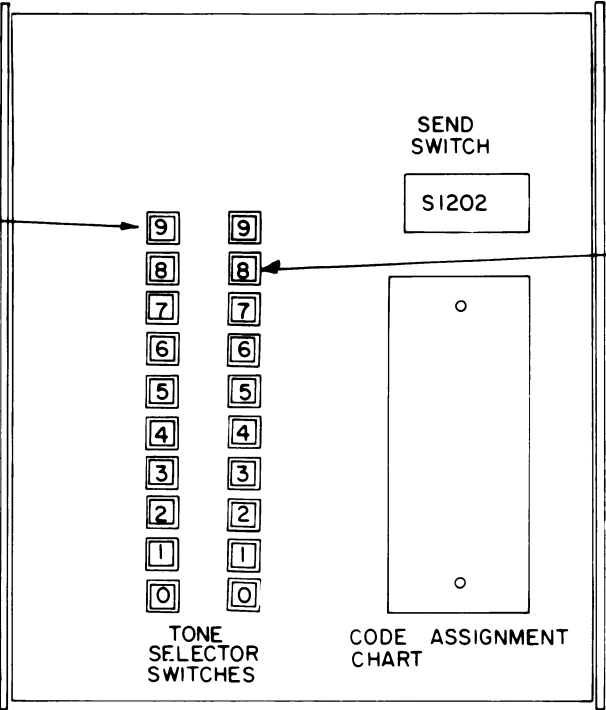
Because of the presence of C1246 in the base circuit of Q1204, K1203 does not drop out during the 150 millisecond interval between the drop out of K1201 and the operation of K1202.

When K1203 is operated, the following events take place:

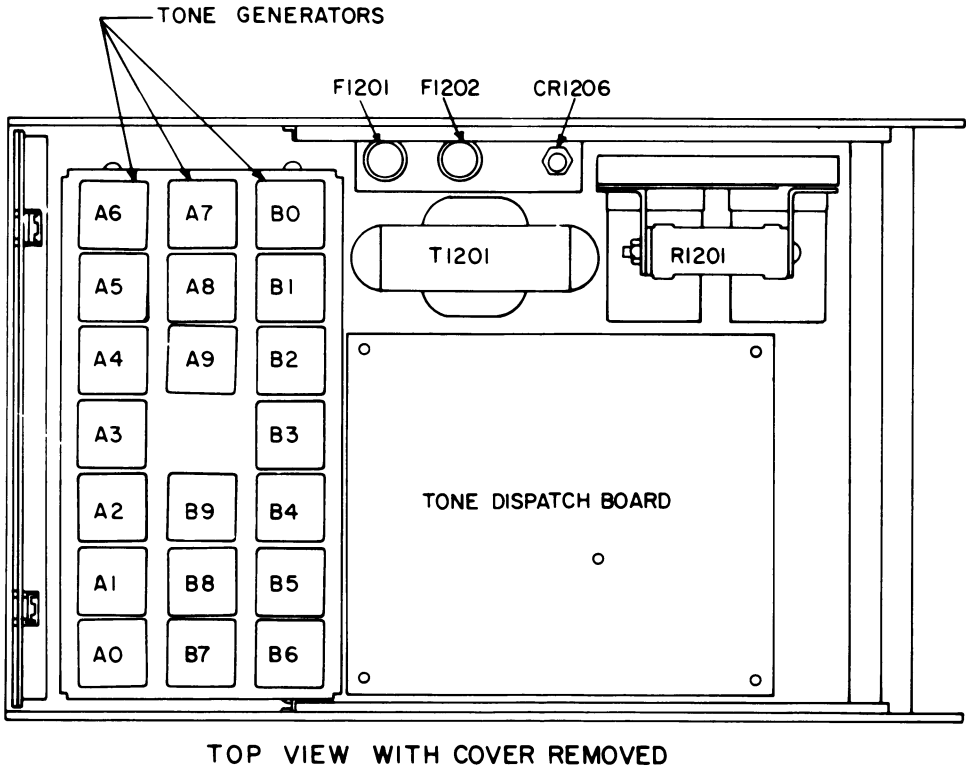
- a) A ground is provided through K1203 contacts 6 and 7 to key the radio transmitter.
- b) K1203 contacts 9 and 10 switch the panel lights from white to red. This indicates that tone is being transmitted.

- c) The transmitter input is switched from the microphone to the tone output of the dispatcher through contacts 14, 15 and 16.
- d) The timing cycle is "locked-in" and the SEND switch (S1202) is disconnected through contacts 11, 12 and 13, so that the timing of the transmission will not be effected by the manual operation of the SEND switch.

TONE FREQUENCY CHART			
PUSHBUTTON NO.	P1	P2	P3
	SERIES 0	SERIES 1	SERIES 2
A0	892.5	562.5	532.5
A1	877.5	607.5	547.5
A2	862.5	622.5	577.5
A3	847.5	652.5	592.5
A4	832.5	667.5	637.5
A5	817.5	697.5	682.5
A6	802.5	742.5	727.5
A7	787.5	787.5	772.5
A8	772.5	832.5	817.5
A9	757.5	877.5	862.5

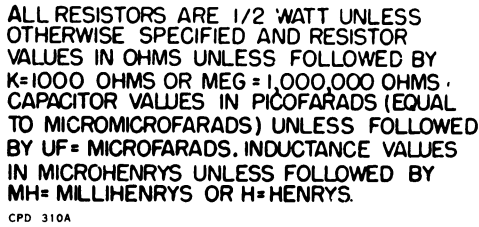


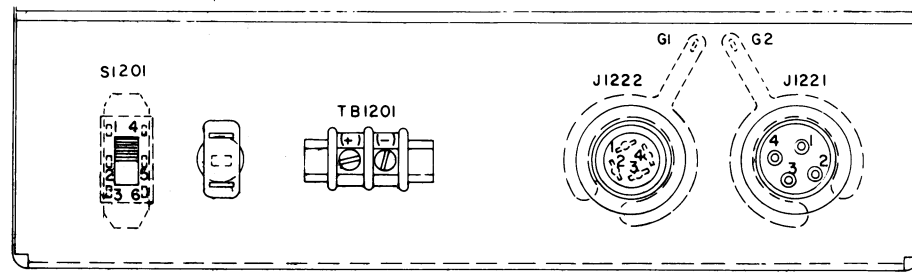
TONE FREQUENCY CHART			
PUSHBUTTON NO.	P1	P2	P3
	SERIES 0	SERIES 1	SERIES 2
B0	517.5	712.5	712.5
B1	532.5	757.5	757.5
B2	547.5	802.5	802.5
B3	562.5	847.5	847.5
B4	577.5	892.5	892.5
B5	592.5	907.5	907.5
B6	607.5	922.5	922.5
B7	622.5	937.5	937.5
B8	637.5	952.5	952.5
B9	652.5	967.5	967.5



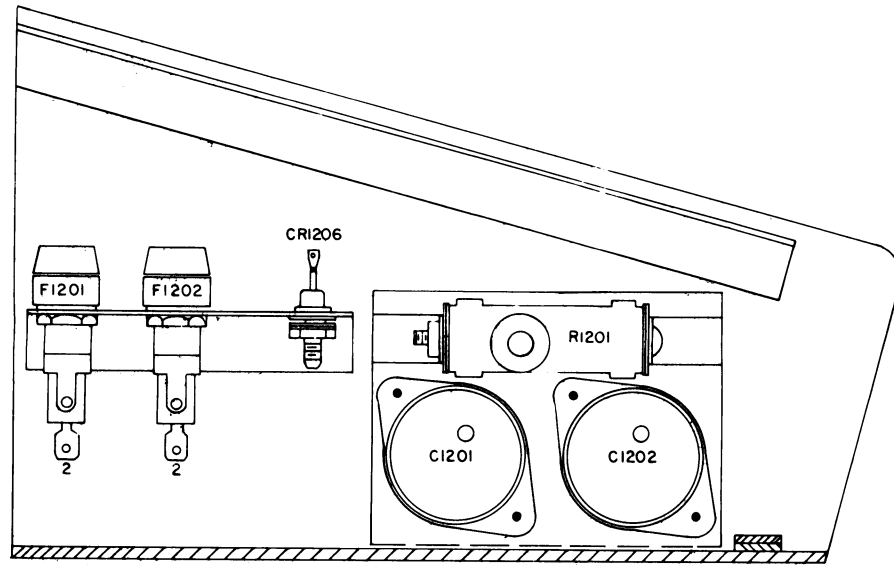
TO DETERMINE FREQUENCY LISTED IN TONE FREQUENCY CHARTS (ABOVE), CHECK THE TONE GENERATOR FREQUENCIES AS TO THEIR LOCATION ON THE TONE GENERATOR MOUNTING PANEL (AT LEFT).



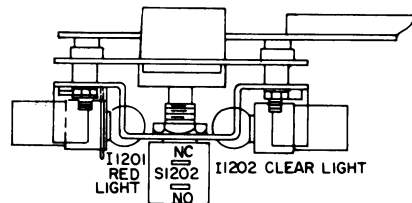




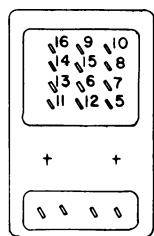
REAR PANEL OF DISPATCHER



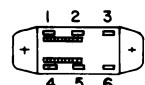
SIDE VIEW OF DISPATCHER COMPONENT



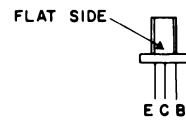
SIDE VIEW OF SEND SWITCH ASSEMBLY



BOTTOM VIEW OF XKI201-2-3



BOTTOM VIEW OF S1203 & 7

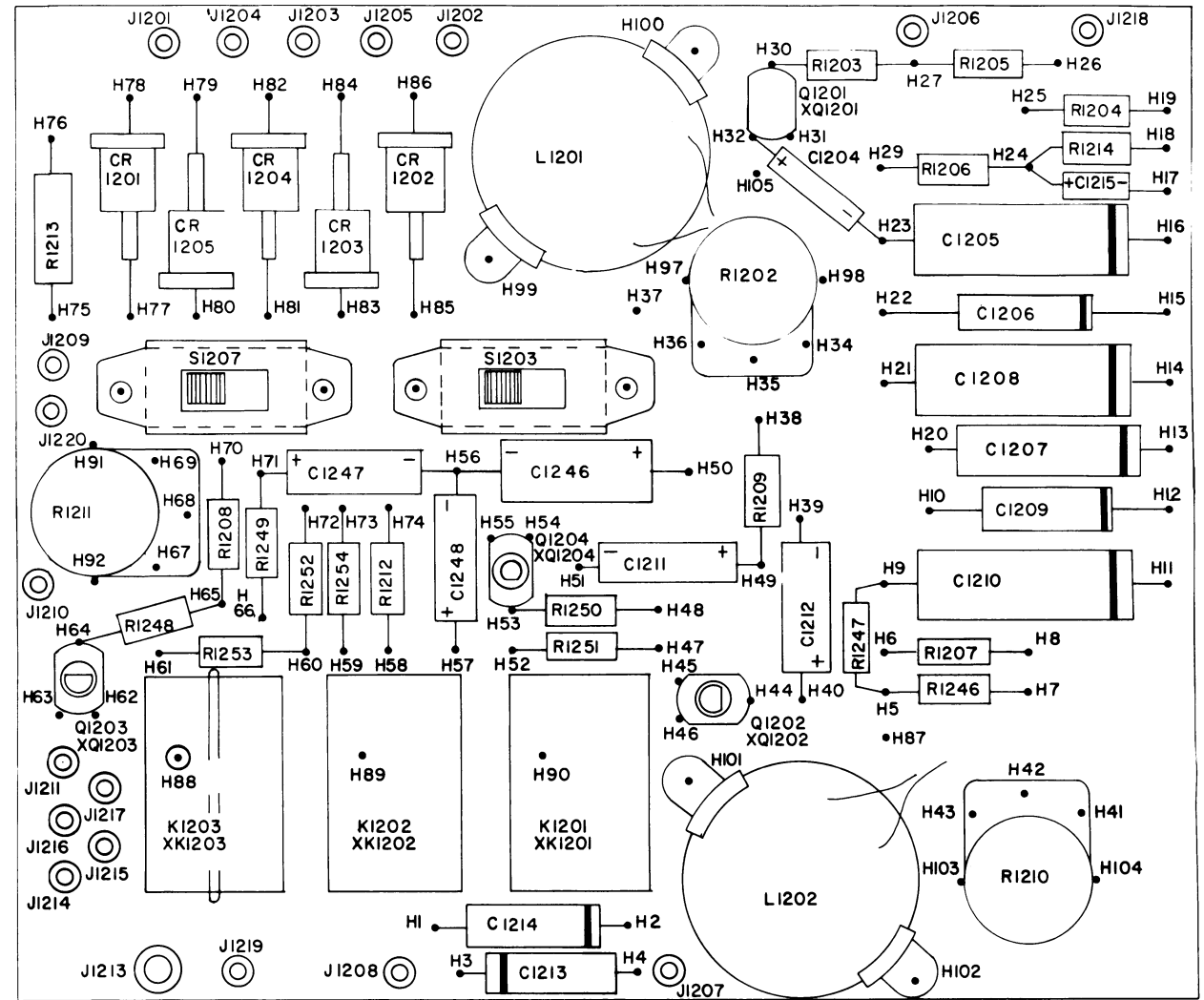


LEAD FORMING FOR QI202, QI203, QI204



TYP SOCKET FOR XQI202, XQI203, XQI204

SERVICE OUTLINE  
TONE DISPATCHER  
MODEL 4EC40A1  
(RC-698C)



TONE DISPATCHER BOARD PL-19C303306-G1

Service Outline  
DISPATCHER BOARD  
PL-5496988-G1  
(RC-698C)



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