BROWNING MARK IV TRANSMITTER

TROUBLESHOOTING

SYMPTOM:

The Channel Number display is blank and the transmit relay will not key. The reset "low limit" LED comes on but there is no channel display.

POSSIBLE SOLUTIONS:

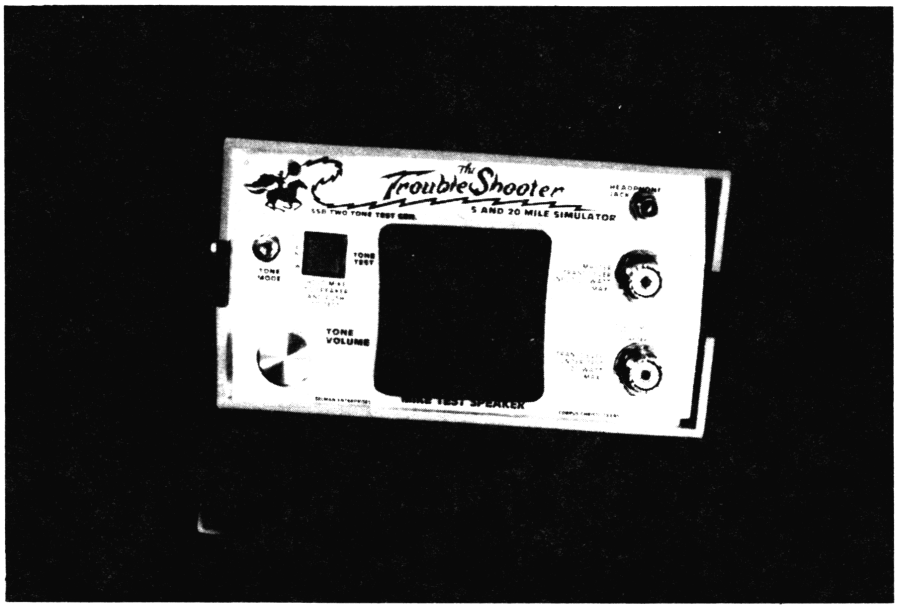
1. In the synthesizer circuit (PLL section) C121 should be 10pF N750 and C123, 39pF N750. The early 23 channel models employed NPO's. Also R101 and R102 should be changed to 330 ohms, and a 1 megohm resistor should be added from the base of Q101 to ground.

2. The changes noted in paragraph 1 have been incorporated in the 40 channel units. All units should be checked to insure that the following changes are included. (Refer to Figures 1 and 2)

   a. 3, 1N914 diodes and a 10uH choke (or 2 18uH chokes in parallel) and a 220 ohm resistor in series from the base of Q104 to ground.

   b. R129 should be 2.2K

   c. 3 1N914 diodes, a 10uH choke (or 2 18uH chokes in parallel) and a 220 ohm resistor



BROWNING MARK IV TRANSMITTER

SERVICE HINTS

SYMPTOM:

The Channel Number display is blank and the transmit relay will not key. The reset "low limit" LED comes on but there is no channel display.

POSSIBLE SOLUTIONS:

1. In the synthesizer circuit (PLL section) C121 should be 10pF N750 and C123 39pF N750. The early 23 channel models employed NPO's. Also R101 and R102 should be changed to 330 ohms, and a 1 megohm resistor should be added from the base of Q101 to ground.

2. The changes noted in paragraph 1 have been incorporated in 40 channel units. All units should be checked to insure that the following changes are included. (Refer to Figures 1 and 2)

   a. 3 1N914 diodes and a 10uH choke (or 2 18uH chokes in parallel) in series from the base of Q103 to ground.

   b. R129 should be 2.2K

   c. 3 1N914 diodes, a 10uH choke (or 2 18uH chokes in parallel) and a 220 ohm resistor in series from the base of Q104 to ground.

   d. R127 should be 680 to 1000 ohms (normally 1K)

   e. R131 should be 47 ohms. If a 100 ohm resistor exists, it is acceptable to add another 100 ohm resistor in parallel on the bottom side of the circuit board.

3. In those units where the symptom is still present after the foregoing changes have been made, proceed with the following:

   a. The color stripes on Q102, Q103 and Q104, MPS6514 transistors should be checked. If the 2nd or middle stripe is yellow, it should be replaced. The transistors with the yellow stripe have lower gain and can be employed elsewhere in the unit, but cannot be used for Q102, Q103, or Q104.

4. After the unit has been checked to insure that all of the changes have been incorporated, the following measurement should be made:

NOTE: AN OSCILLOSCOPE WITH A BANDWIDTH OF AT LEAST 25 MHz MUST BE USED OR THE P.P. READINGS WILL NOT BE ACCURATE.

The RF voltage on the emitter of Q104 should be between 2-3 volts P.P. (preferably closer to 3V.) If this measurement indicates a reading of less than 2 volts check the modifications again to insure that all changes are correct or that the transistors involved are not of the low gain type. Should the reading be above 3 volts select a value of R127 between 680 and 1000 ohms to obtain the desired reading. If the reading is above 3 volts when a 680 ohm resistor is used, add a 10pF NPO from the base to the collector of Q103.

5. The foregoing changes in part, or in their entirety, should restore the functioning of the channel number display. In rare instances the symptom may still exist and in those cases the circuits involved should be checked for heat sensitive components - particularly IC105 - 108. Further, the Mark IV service manual should be used for further trouble shooting information.

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THIS SPACE FOR YOUR NOTES;

CORRECTION FOR VOLUME 5, Page 28:
Remove D304 (not D309) and D306 (not D310), and install Super Diode.

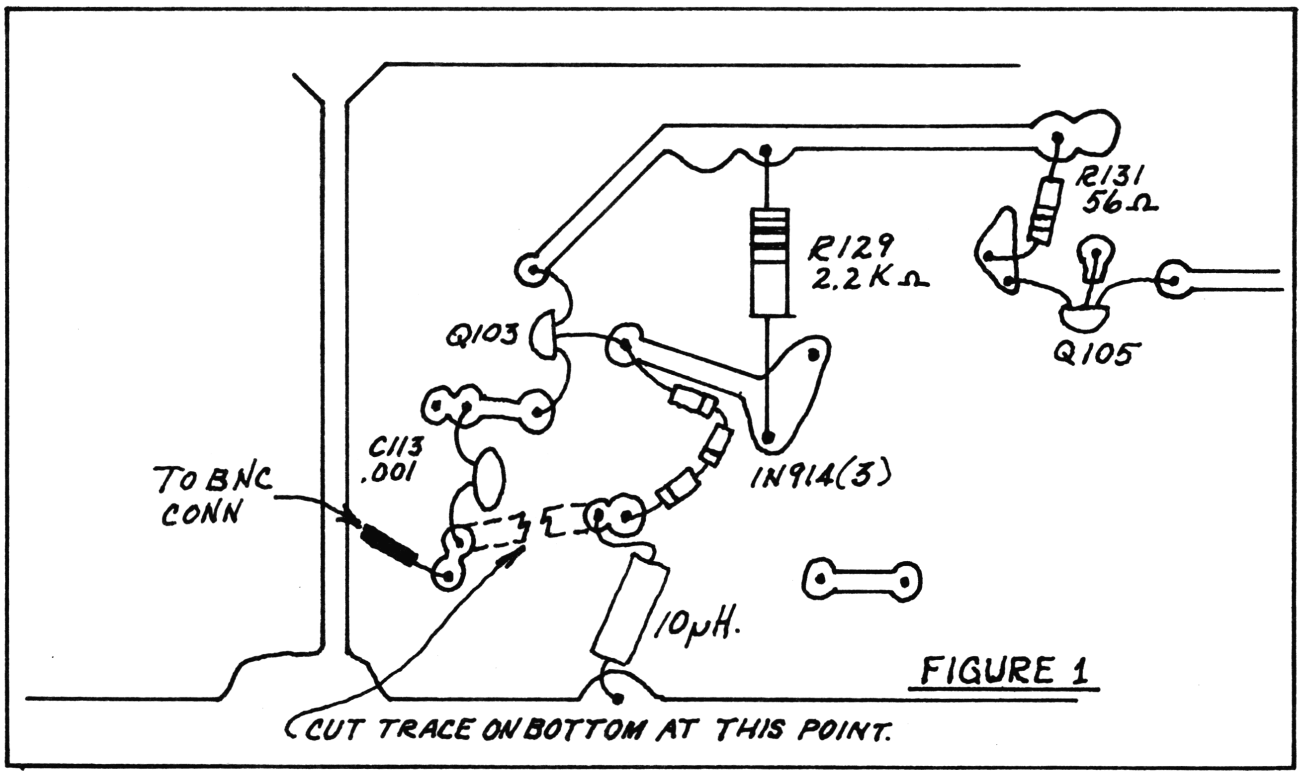


FIGURE 1

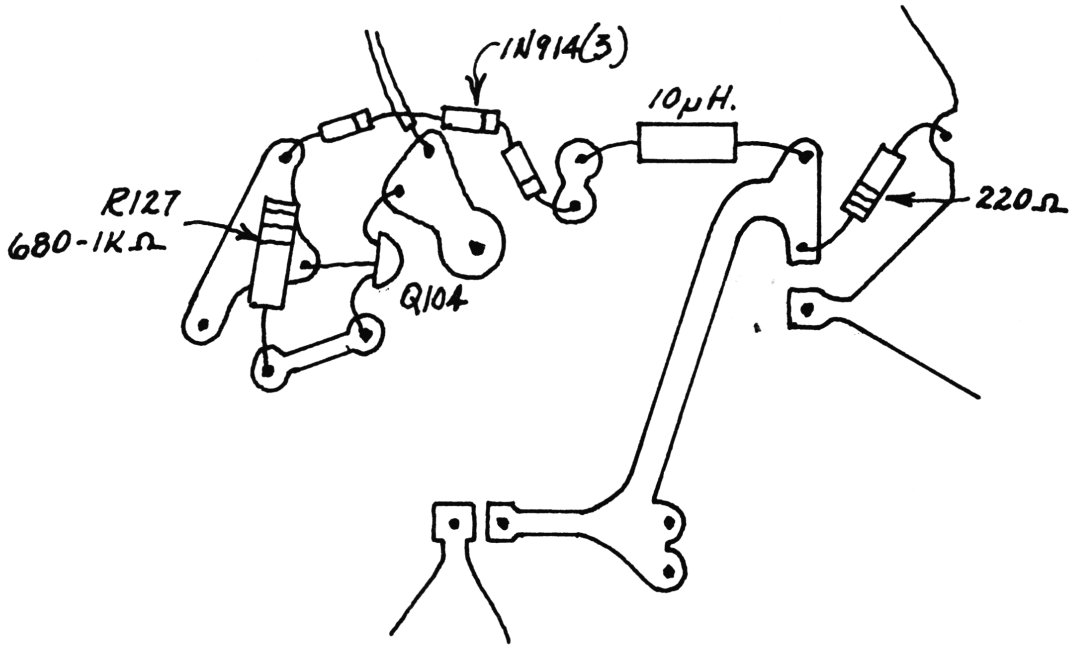


FIGURE 2

SYMPTOM: Garbled transmit on SSB - especially the upper channels, making it difficult or impossible to clarify it. It has also been described as sounding as if under water.

SOLUTION: Refer to attached diagram.

1. Carefully cut the printed circuit as shown at points A - H - removing the tube filament grounds from the rest of the circuit board ground pattern.

2. Using 18 ga. wire (nothing smaller) connect the filament grounds from points A - H. ROUTE THE WIRES EXACTLY AS SHOWN IN THE DIAGRAM! Any deviation can cause problems such as hum, feedback, etc.

3. Add two small jumper wires at points G and H to connect together the ground pattern on each side of the isolated filament grounds. Keep these jumpers as short as possible without shorting to the tube socket pins.

4. Remove the black wire coming from the meter light socket from where it connects to ground at point K and connect it to the filament ground at point E.

5. Remove C212 (68pF) from its present position on the top side of the circuit board and solder it on the bottom side at point L.

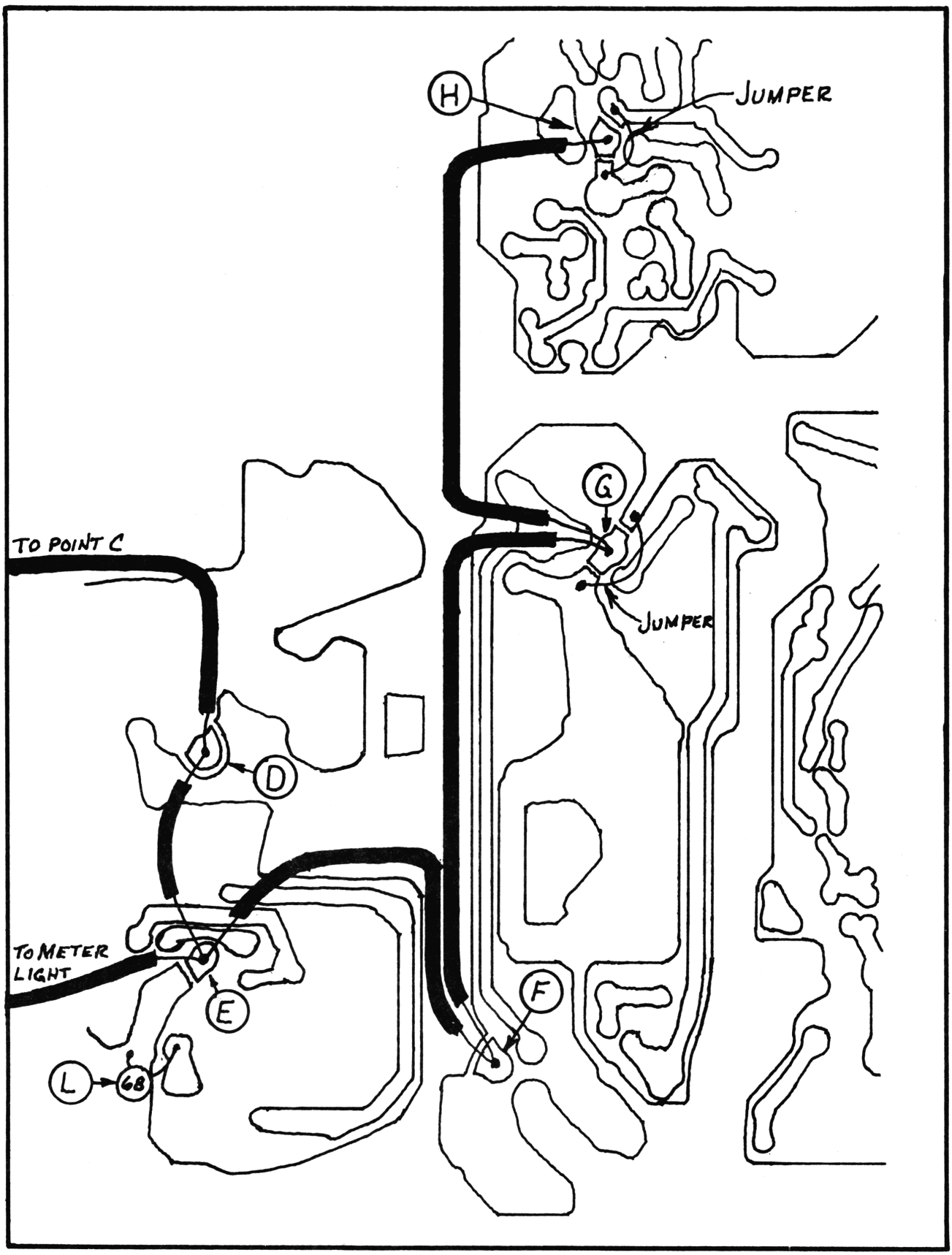
6. Remove the end of the 10 ohm resistor that connects to ground at point M and extending its length with a buss wire and solder it to filament ground at point A.

7. Remove the short wire from the relay socket to terminal strip ground shown by dotted line at point I. Connect a wire as shown from the relay to filament ground at point C.

8. At this point turn the set on. The filaments and meter light should not come on. If they do there is a short between the filament ground and circuit board ground which must be removed.

9. Disconnect the black wire from the control cable, shown by dotted line at point J, where it connects to ground on a terminal strip, and connect it to filament ground at point B. You may have to lengthen it with a piece of 18 ga. or larger wire.

10. Open the synthesizer cover and on the bottom of the circuit board add a 10pF NPO ceramic disc capacitor from base to collector of Q103. Keep the leads as short as possible.



http://www.cbtricks.com

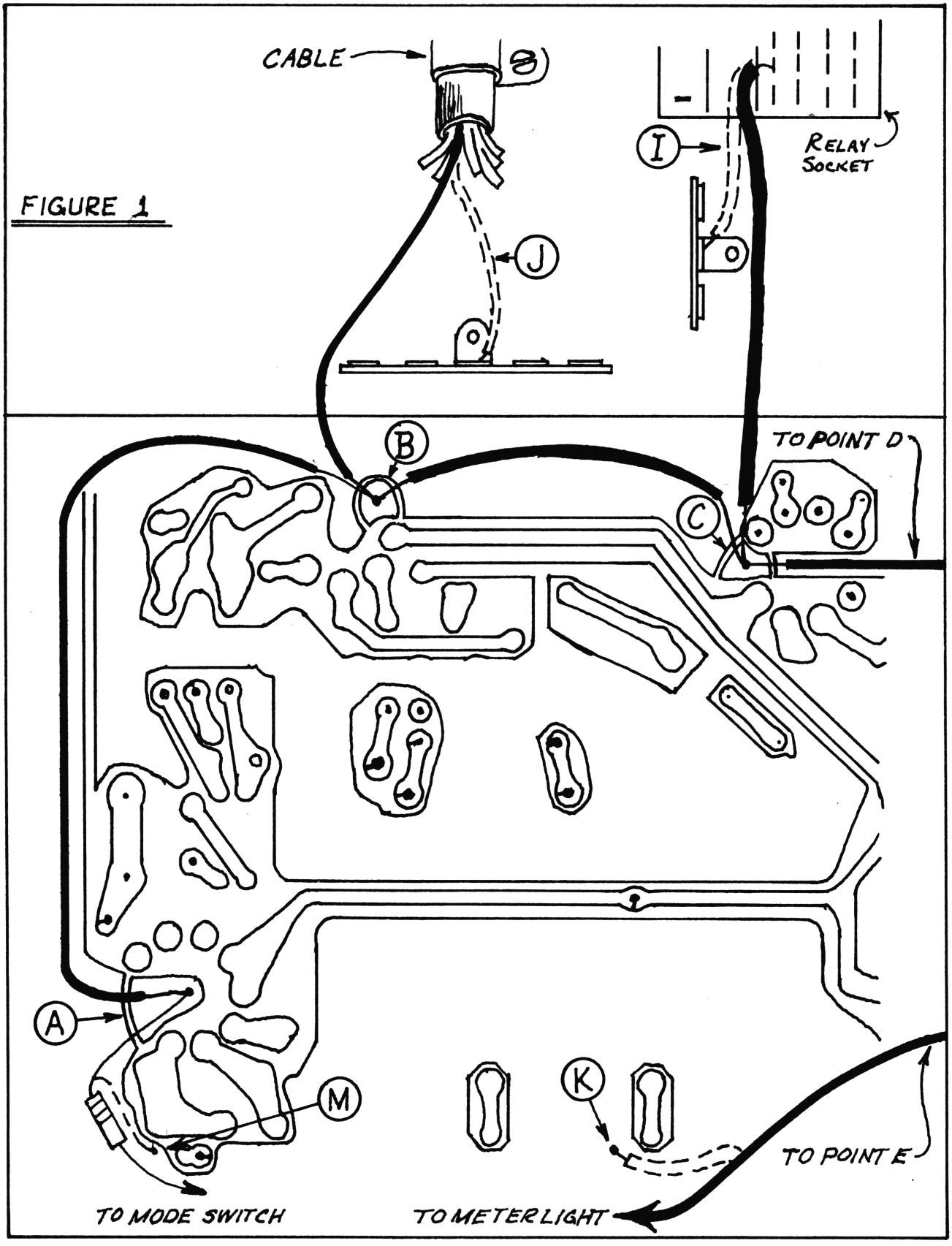

CABLE
B
I
RELAY SOCKET
J
TO POINT D
B
C
A
M
K
TO POINT E
TO MODE SWITCH
TO METER LIGHT

FIGURE 1

11. Add a .001 ceramic disc capacitor from base to ground of Q101 (some sets may already have a .002 capacitor there. Remove it before adding the .001).

12. Adjust C122 for 1.8V at control voltage test point. (See service manual).

This completes the modification. In a few sets it may also be necessary to place the receiver on the left side of the transmitter. If the signal is still not clear change Q105.

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MARK IV SERVICE HINTS

SYMPTOM: Excessive arcing of the high voltage contacts of the relay.

SOLUTION: Remove CD601, a 1N4005 diode, presently connected with its cathode to the junction of R317 and R319, and its anode to ground.

Reconnect the cathode to the junction of R316 (1.5K, 5W), and the orange and pink wires that go to the mode switch and relay. Connect the anode to ground. This will shunt to ground a negative pulse that can exceed the voltage rating of the contact.