

ADDENDUM: The following notes and corrections will help you install the kit.

STEP 11 -- should read "green 5-1/2 turns (#85218) and red 6-1/2 turns (#85217) #16....."

STEP 14 -- colors are reversed -- 9-1/2 turns (#85215) is green and 8-1/2 turns (#85216) is red.

DIAGRAM 3 -- on right side, all three capacitors should be under can.

BOTTOM OF SAME PAGE -- Schematic, C1 is upper left, C2 is lower left, C3 is on right side and goes to ground.

TO: Owners of 545 or 546 (up to #2800) OMNI transceivers.

SUBJECT: Modification to permit operation on 10 MHz band only.

The 546-30M kit is a quick fix to put the earlier OMNI transceivers on the 30M band. Since it is much easier and quicker to install only the 30M transmit capability than the entire WARC update, many owners are doing the mod themselves. Typical installation time is less than an hour. The instructions are written to cover the entire WARC mod so only the following steps need be done for 30M.

INSTALLATION: 1 to 11, 16 to 20, 38 to 50.

ALIGNMENT: 8, 11, 16 to 22.

DIAGRAMS: 1, 3, 5, 7.

FIGURES: 1A, 1B.

TESTING: Wattmeter, dummy load.

TO: Owners of Analog Model 545 or Digital Model 546 (below serial #2800) OMNI transceivers.

SUBJECT: Modification and alignment instructions to add 10 MHz transmit and 24.5 MHz transceive capability. (It is not possible to modify these rigs for 18 MHz operation due to transmit mixer design.)

Before attempting this rather complicated procedure, please read all instructions carefully and be certain you understand them. Your OMNI manual will be helpful and should be kept with you as you proceed.

The total modification and alignment time should be 3-1/2 to 5 hours. If you prefer, you may send your OMNI to the factory. Contact us for details.

EQUIPMENT NEEDED: 20 or 30 W soldering iron with small 700°F tip.
3/16" screwdriver.
#2 Phillips screwdriver.
3/16" Hex driver.
Long-nosed pliers.
24 inches #18 gauge 60-40 solder, rosin core.
.062 Hex wrench (Allen).
Wire cutters.
Solder removing wick or bulb.

TESTING: Signal Generator: for 24.5 MHz receiver alignment.
Wattmeter: 100 watt minimum.
Dummy Load: 50 ohm, 100 watts.
.01 uf capacitor

PROCEDURE

1. Remove top and bottom cover -- be careful with speaker leads: unsolder them at the speaker terminals.
2. Remove top and bottom cover plate to Low Pass Filter compartment. Three screws each.
3. Locate the 3/8" hole cover opposite the end of the bandswitch shaft on the rear panel (beside the coax jack). Remove it by gently squeezing the lock tabs with a pair of long-nosed pliers.
4. Rotate the bandswitch to either 10.0 MHz or 29.0 MHz to expose the set screws on the band switch extension shaft couplers. LOOSEN the set screws only enough to free the shaft. Before removing the shafts, turn the band switch to 29.0.
5. Unsolder both coax lines and the brown wire from the Low Pass Filter sub-assembly. Note carefully the location where the coax braid was soldered to the board foil so it can be replaced in exactly the same way.

LOW PASS FILTER MODIFICATIONS

6. Slide the LP Filter out of the bottom of the compartment after removing the long fiber switch shaft. Be careful of the protruding receive antenna jack.
7. From the parts kit, locate ceramic capacitors 2-330 pf, 1-560 pf and two ferrite core coils #85217 and #85218.
8. Unsolder and remove the insulated wire jumper from the 10 MHz LPF position and clean excess solder from the holes. See Diagram 1.
9. Install 560 pf ceramic capacitor in the center of the 10 MHz filter. Bend leads as shown in Diagram 1 so one lead can be soldered on the bottom and the other on the top of the board.

10. Install the 2-330 pf capacitors in similar fashion at the positions indicated in Diagram 1.
11. Locate the two 10 MHz coils - 5-1/2 turns and 5-1/2 turns #16 on ferrite core- and install them as shown in Diagram 1.

24.5 MHz Components - Refer to Diagram 2

12. Locate 2-120 pf, 1-220pf capacitors and two air wound coils #85215 and #85216. Install one 120 pf on the input switch and the other 120 pf capacitor on the output side switch.
13. Install center capacitor (220 pf), on the LPF board.
14. Install the 9-1/2 turns (red) and 8-1/2 turns (green) coils as shown on Diagram 2: Red on the input side, green on the output.
15. Check your work. This completes modification of the LPF assembly. Set board aside-do not reinstall at this time.

BANDPASS FILTER MODIFICATION

16. Remove the four screws holding the BP Filter assembly.
17. Unsolder the two ground lugs along the outside edge.
18. Tip the BPF assembly on its side. Locate coil #85171 and 2-82 pf and 1-470 pf capacitors which comprise the 10 MHz BP filter.
19. Refer to Diagram 3. A 47 ohm loading resistor covers the 10 MHz coil position on most units (serial # greater than 150). Carefully unsolder it and reattach it on the bottom side from the 40M input trace to the ground foil on the left hand edge.
20. Install the 10 MHz components and shield can as shown in Diagram 3.
21. Locate coil #84173 and 2-47 pf and 1-180 pf capacitors which comprise the 24.5 MHz BP filter. Install the 24.5 MHz components and shield can as shown in Diagram 3.

OSC - MIXER BOARD MODIFICATION

22. Remove the screws securing the TX MIXER board and the VFO AMP board and unplug these boards. Note which one is which since they are physically interchangeable. Be careful not to disturb the settings on the two potentiometers on the TX MIXER.
23. Remove 5 screws securing the OSC MIXER board. Loosen the front set screw on the shaft coupler and uncouple it. See Diagram 4.
24. Carefully unsolder all wire connections to the board except the eight wires going to pins at the rear end of the board. It is best to unsolder the grounding braids (3 places) where they are attached to the chassis.
25. When the wires are removed, slide the board to the rear and off the bandswitch shaft. NOTE: Do not disturb the settings of the three potentiometers.
26. Turn the board over and solder in the two jumpers as shown in Diagram 4A.
27. Lift the tape on the right crystal bank and plug in the 10.5 MHz crystal next to #48031. Replace the tape.
28. When replacing the OSC-MIXER board it is important that all of the bandswitch wafers are aligned in the same position. Turn the bandswitch to 29.0 and make certain that all of the bandswitch wafer notches on the OSC-MIXER are pointing away from the board. See Diagram 5.
29. Re-solder the connecting wires. See Diagram 4.

30. When replacing the shaft extension, observe the wafer alignment. Replace with screw holes accessible at the 29.0 MHz position. Be sure to keep the flats on the extension shaft parallel with those on the front of the shaft.
31. After the wires and the shaft have been replaced, replace the five mounting screws. (Do not tighten screws.)
32. Replace the VFO AMP and TX MIXER (4 screws).

TRIMMER BOARD

33. Remove the 3 screws securing the RX TRIMMER board. Unsolder the ground lug on the bottom outside edge. This will free the board. Unsolder the wire on the rear wafer and slide the board off the switch shaft.
34. Turn the board over and solder in a 60 pf yellow trimmer and a 15 pf capacitor in the holes provided. See Diagram 6.
35. Turn the bandswitch to 29.0. Align the two switch wafers as shown in Diagram 5 and replace the board.
36. Reattach the wire to the rear wafer common and replace the 3 screws. (Do not tighten screws.)
37. Check your work. Replace the BPF. Replace screws. (Do not tighten screws.)

LPF INSTALLATION

38. Align both switch wafer index notches to point down.
39. Slide the LPF into the edge guides and check to see that it is seated in all four guides.
40. Solder the center of the output coax to the rear pin and the braid to the foil below it. See Diagram 7.
41. Solder the brown wire and the input coax (from the final amplifier) to the front pin and the braid to the front side foil.

SWITCH SHAFT ALIGNMENT

42. Smooth operation, proper detenting and freedom from intermittent contact are the reward for careful switch shaft alignment.
43. Place the bandswitch in the 29.0 MHz position.
44. Check each of the ten white vertically mounted switch wafers to see that the index notch points away from the board as shown in Diagram 5.
45. The two switch wafers on the LP Filter are of different construction. The index notch on these two must point down, opposite from all other switch wafers.
46. Feed the long fiber extension shaft into the hole next to the coax jack on the rear panel and through the wafers of the LPF, BPF and RX TRIMMER.
47. Replace the shaft coupling and tighten the set screws making sure that the flats on the bandswitch remain parallel with those of the extension.
48. Rotate the bandswitch to see that none of the wafers or boards are binding the switch shaft. Now tighten the mounting screws on the BP filter (4), RX TRIMMER (3), and OSC-MIXER (5).
49. Solder the two ground tabs under the BP filter and one under the RX TRIMMER.
50. This completes the modification procedure—the alignment procedure follows.

ALIGNMENT

A - Receiver:

1. Apply power to the radio.

2. Rotate the bandswitch to the AUX position. The counter display should read 24.5 to 25.0 as the PTO is tuned through its range. If not, there is an error in bandswitch wafer alignment or wiring on the OSC-MIXER board.
3. Feed a signal at 24.9 MHz into the antenna jack and tune the VFO to this frequency. Refer to page 3-12 in the OMNI manual regarding alignment of the 80460 RF AMPLIFIER trimmer capacitors.
4. Attach a .01 uf capacitor temporarily between the wiper of S1B (rear wafer on the 80446 RX TRIMMER board) and ground. Rotate the RESONATE control for maximum response. Remove the .01 cap.
5. Tune the 24.5 MHz trimmer for maximum response. It is located behind the 21 MHz trimmer as shown on page 3-14 in the manual.
6. Check the sensitivity at this frequency if a calibrated signal generator and audio voltmeter are available. It should be better than .25 uV for 10 dB S+N/N.
7. 10 MHz receive does not require alignment since this is a feature of the original unit.

B - Transmitter:

8. Attach a wattmeter and dummy load to the antenna jack. Tune the OMNI to 24.9 MHz.
9. Turn the radio so the bottom is up, front forward.
10. The 24.5 MHz bandpass filter can is the right rear. See Figure 1A and page 3-44 of the manual.
11. NOTE: The bandwidth of the two new bands is very narrow, 50 kHz on 10 MHz, 100 kHz on 24.5 MHz. Consequently, the two new BP filters can each be aligned at a single frequency and proper operation will be assured over the entire band. Do Not adjust the other filters! Special equipment is required to properly align them.
12. Adjust the cores in the 24.5 MHz BPF can so the top core is at the top end and the bottom core is at the bottom of the coil. See Figure 1B. Use the alignment tool provided (long end for the bottom core, short end for the top). Do not force the cores.
13. Put the MODE switch in LOCK position and advance the DRIVE control for an indication of 10 to 20 watts on the wattmeter.
14. Adjust both 24.5 MHz coil cores for maximum output. Reduce the drive as necessary to keep the output power below 40W (below ALC threshold).
15. When the peak is reached, advance the DRIVE to full ALC indication. The output should be greater than 85W and the total current drawn from the power supply less than 18 A. If the efficiency is low, check the LP filter coils - They may have been installed improperly.
16. Turn the bandswitch to 10 MHz and VFO to 10.075 MHz.
17. The 10 MHz BP filter is the front-most can next to the bandswitch shaft. Again, pre-position the cores so the top one is at the extreme top and bottom core at the bottom.
18. Turn the LOCK and advance drive to 20 watts output. Adjust the cores as in step 14.
19. When no further improvement is noted, apply full drive (to ALC light) and check for 90W or more at less than 18A.
20. This completes the alignment. Before replacing the covers, check for proper operation on all bands.
21. Replace the covers on the LP filter box and the top and bottom cover on the transceiver. Remember to reattach the speaker leads. Replace the bandswitch shaft hole cover on the rear panel.
22. This completes the alignment procedure.

DIAGRAM 1 10 MHz LOWPASS FILTER INSTALLATION

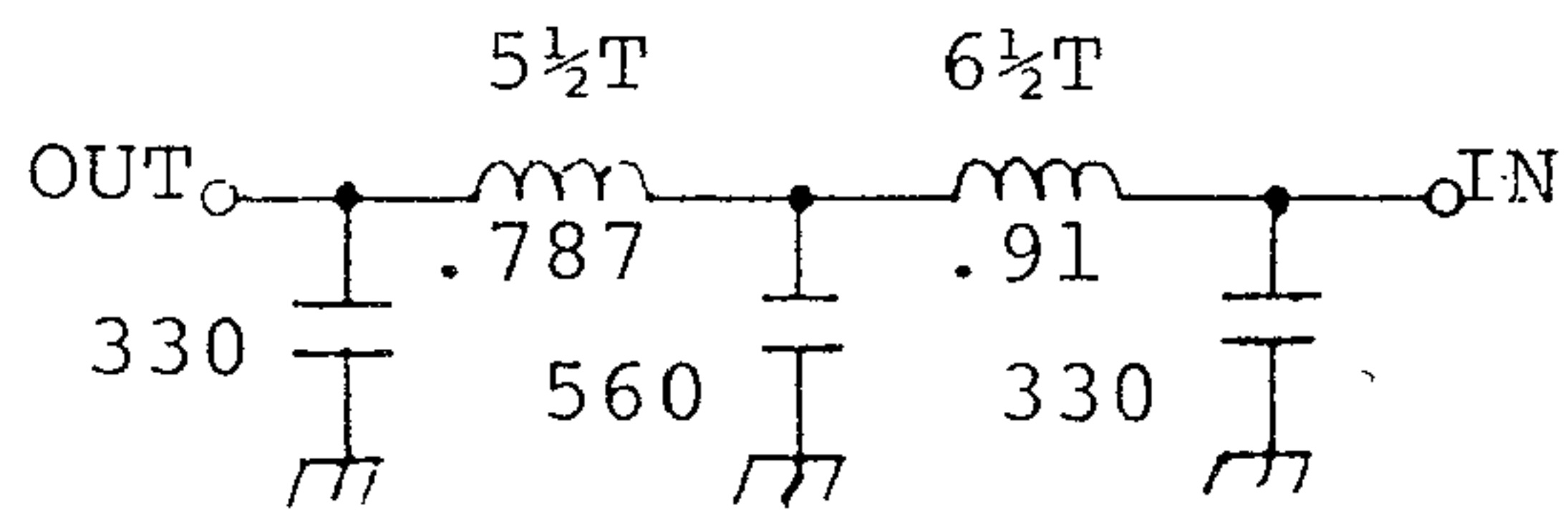
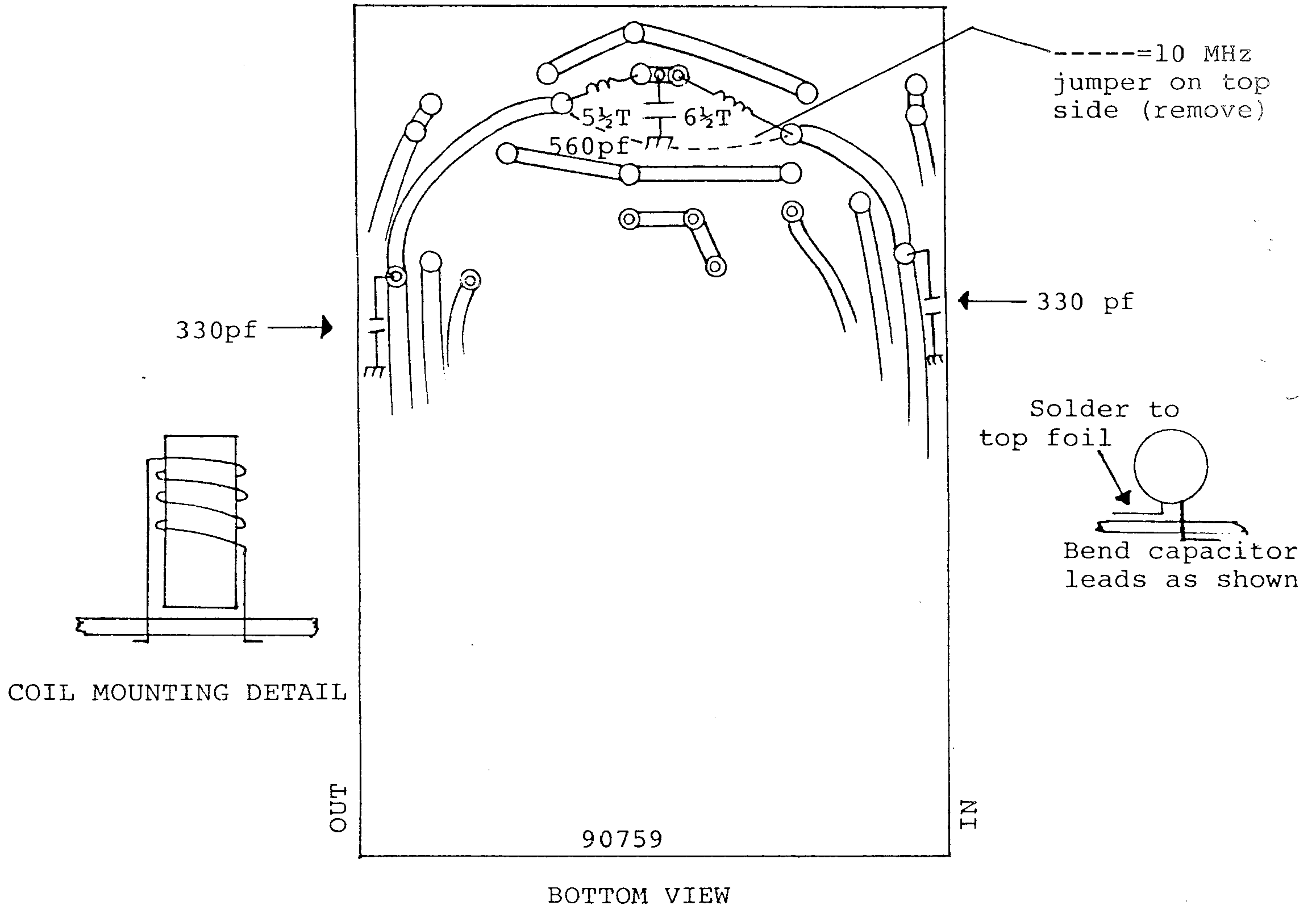


DIAGRAM 2 24.5 MHz LOWPASS FILTER INSTALLATION

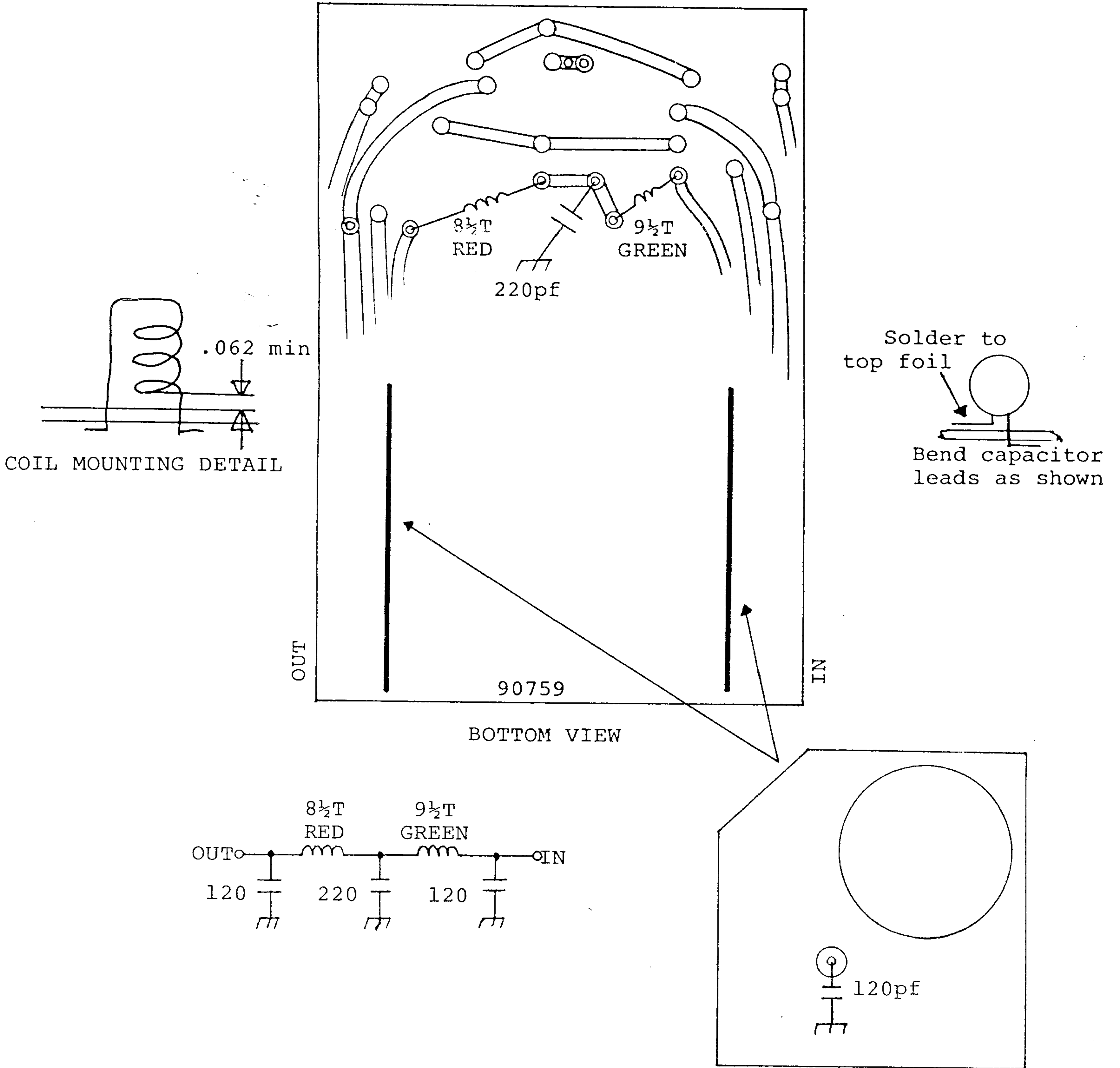
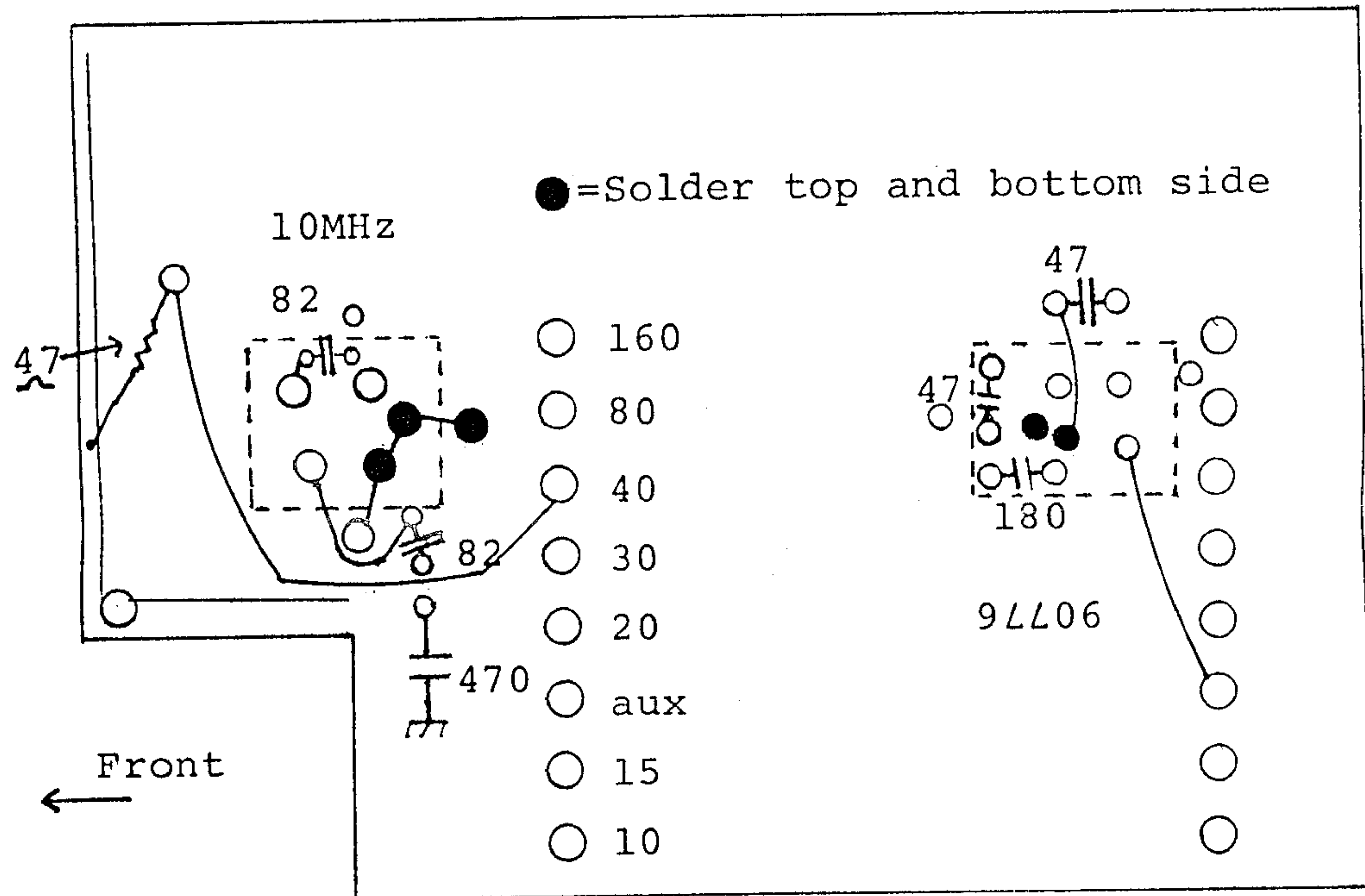


DIAGRAM 3 BANDPASS FILTER



BOTTOM SIDE VIEW

10 MHz COIL 85171 red wire

24.5 MHz COIL 85173 green wire

SCHEMATIC, EACH FILTER

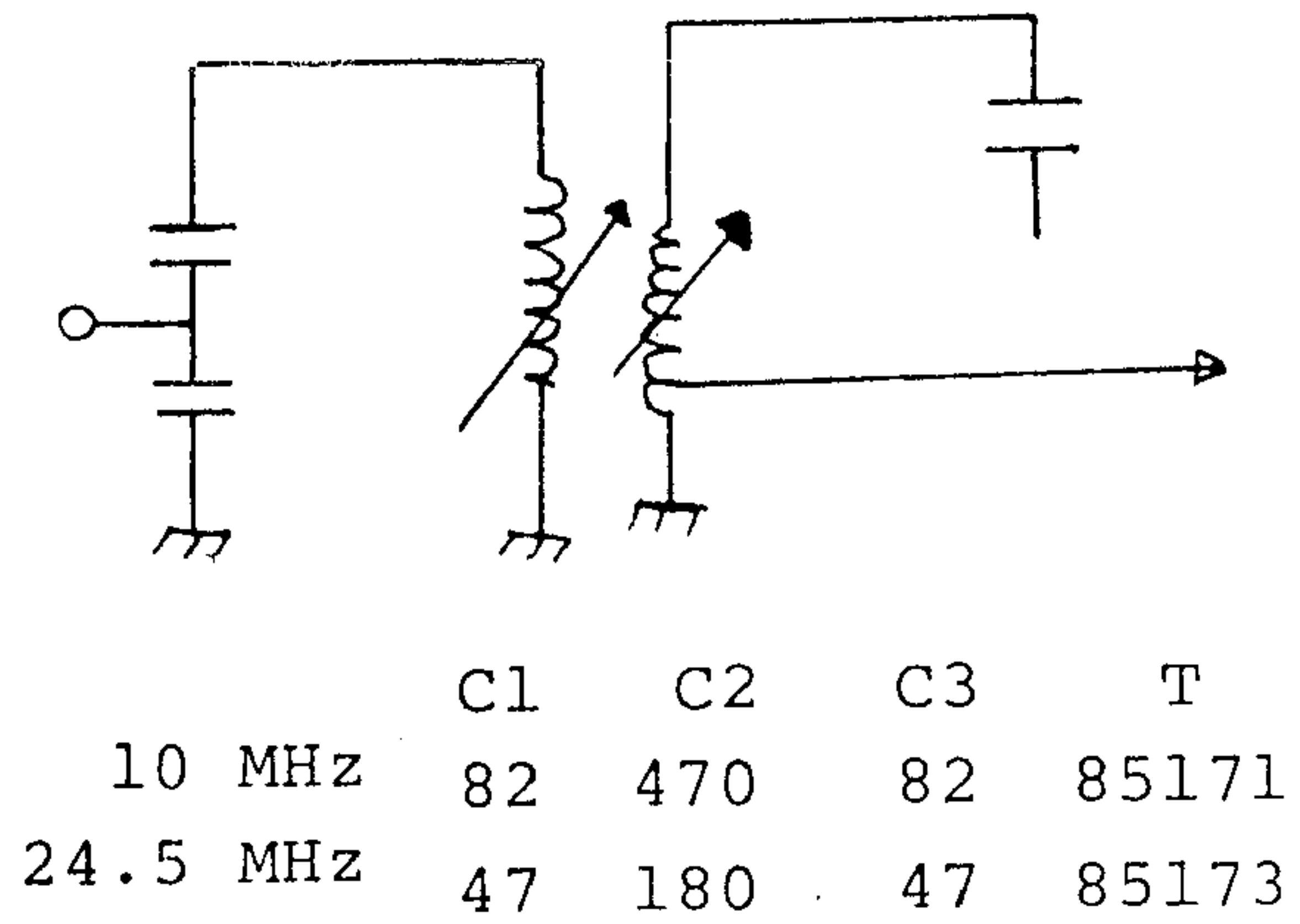


DIAGRAM 4 OSCILLATOR-MIXER

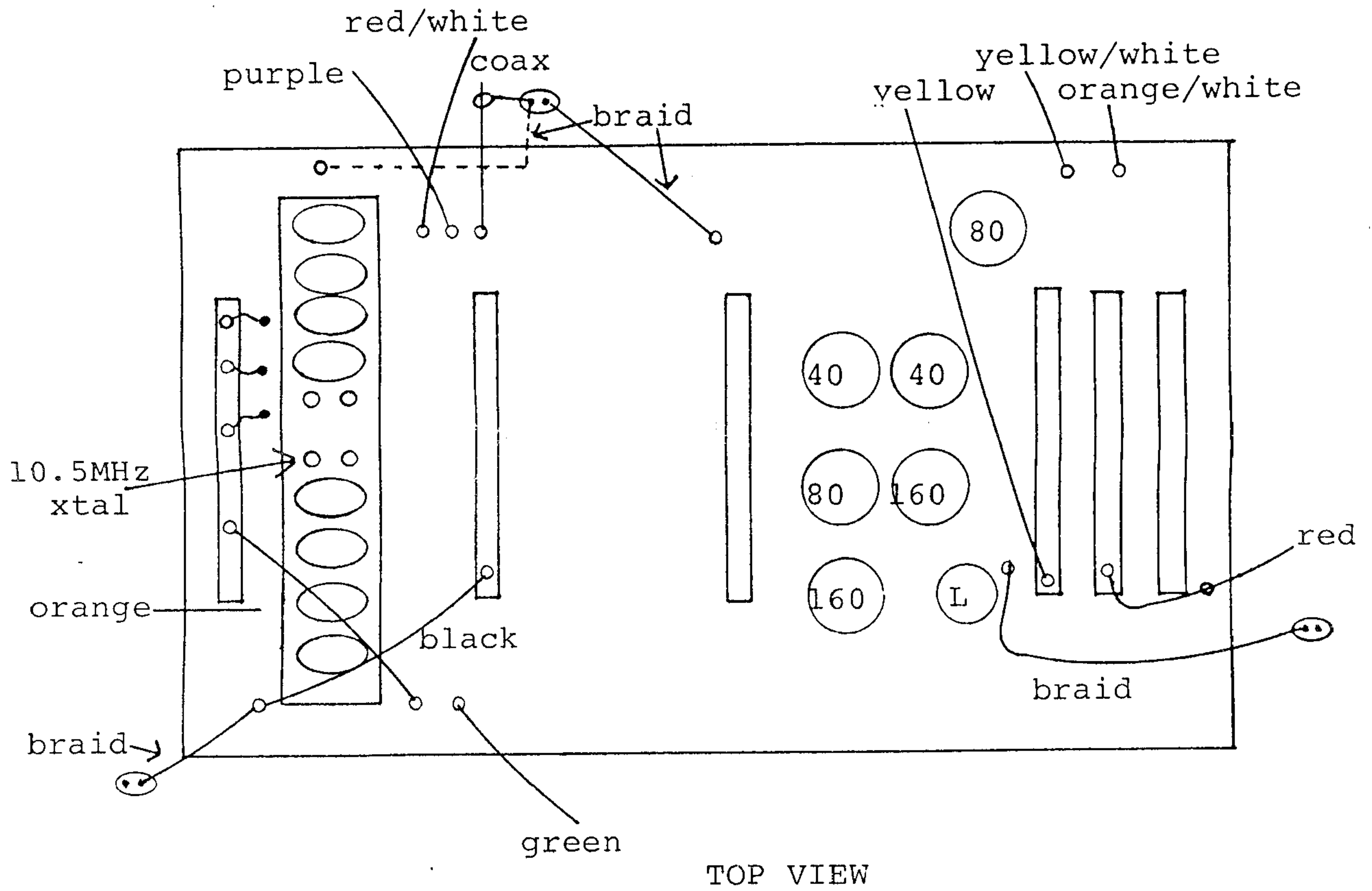


DIAGRAM 4A OSCILLATOR-MIXER

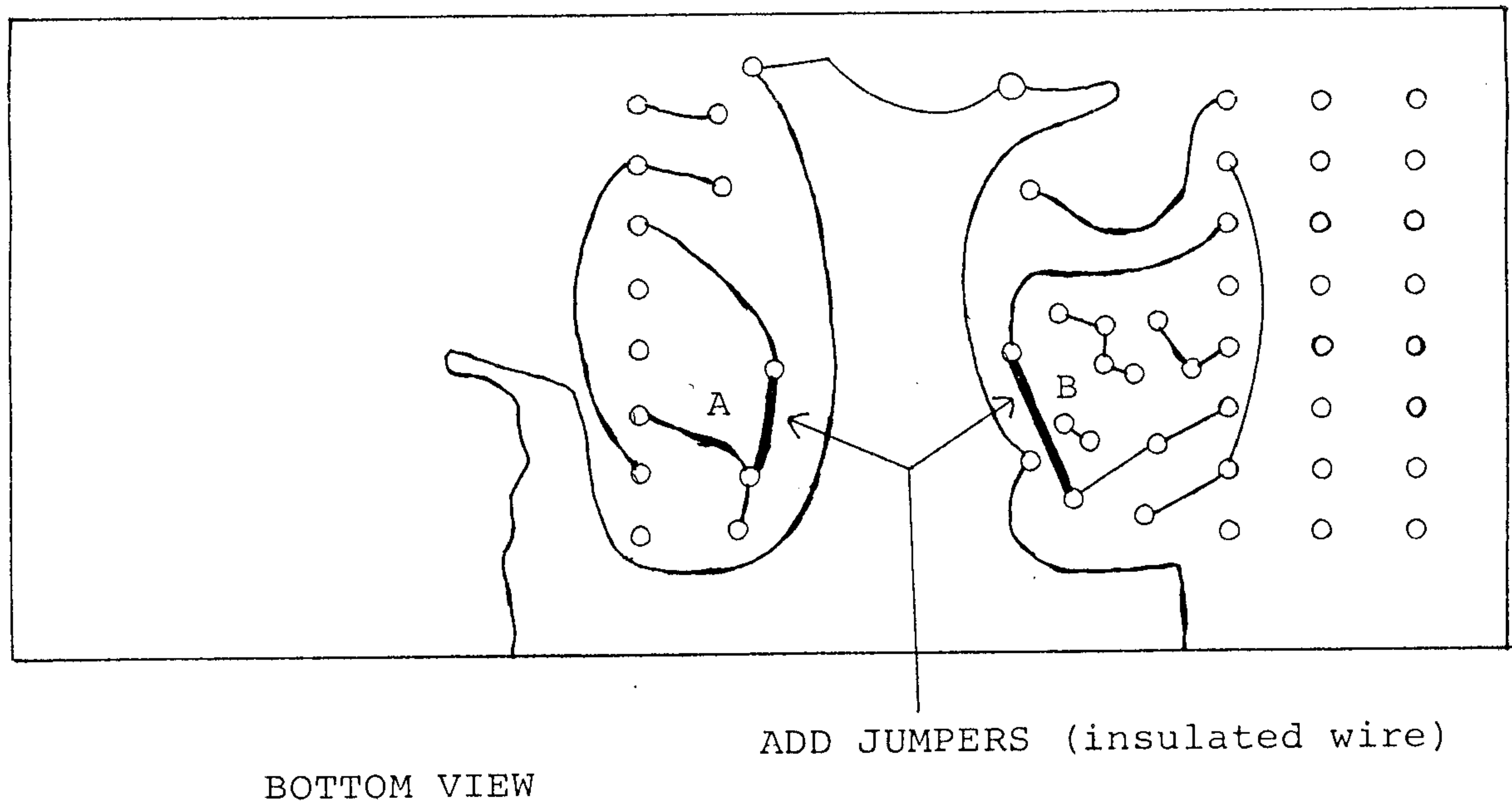


FIGURE 1A

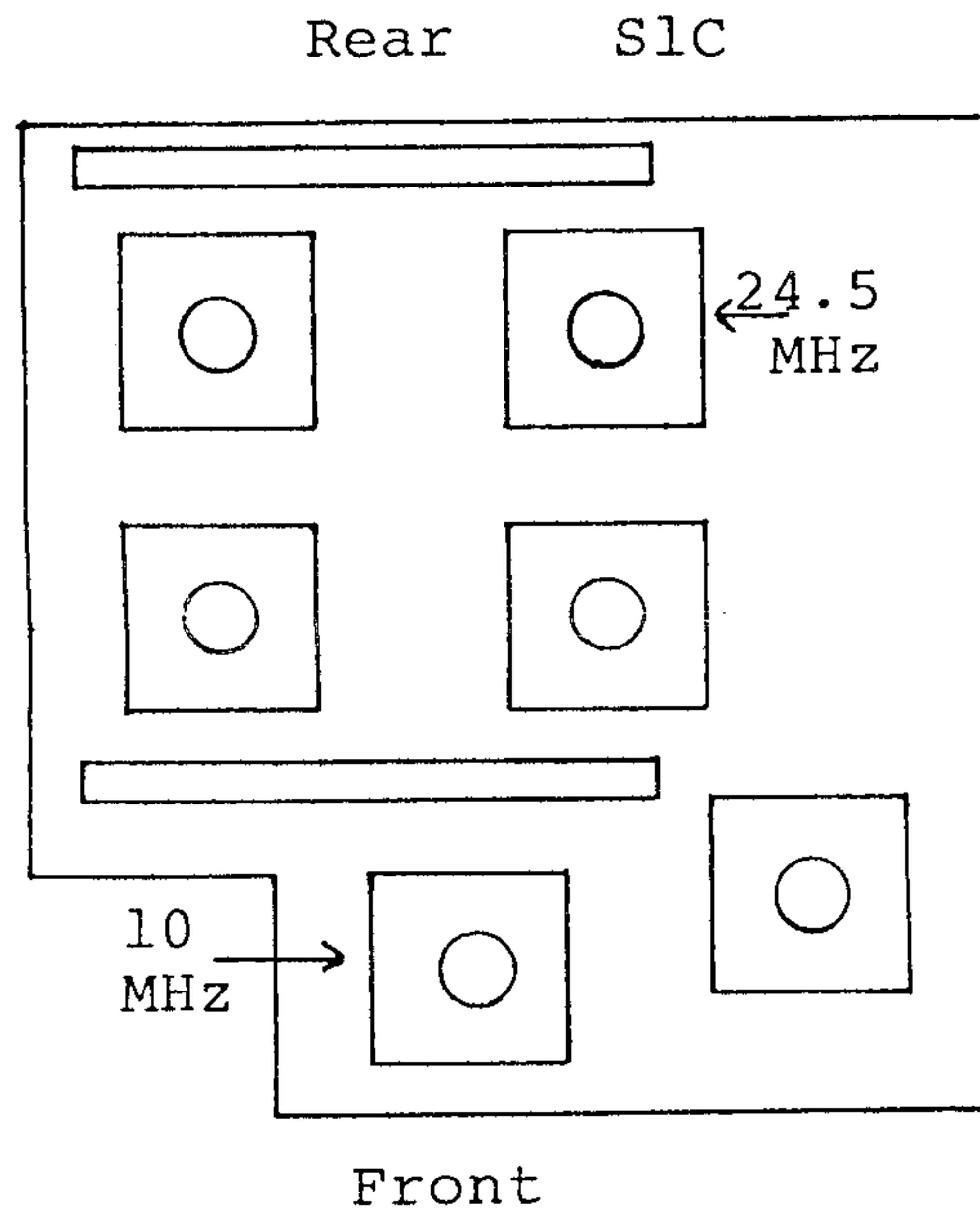


FIGURE 1B

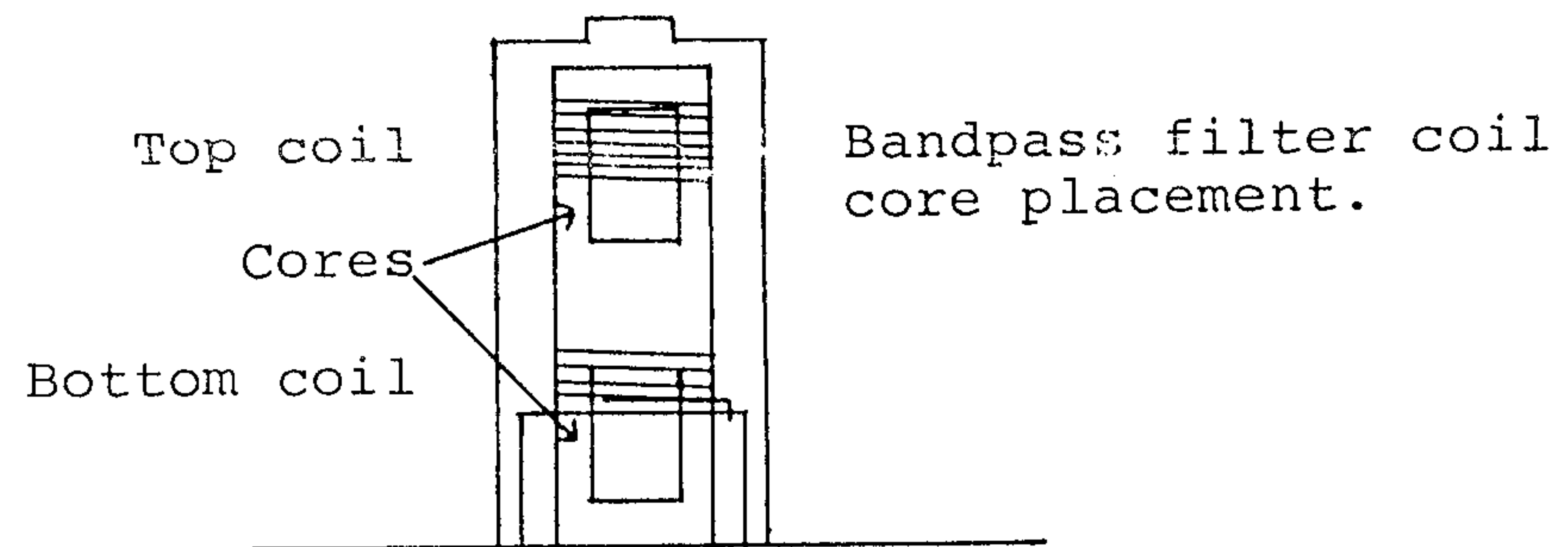


DIAGRAM 5 BANDSWITCH WAFER POSITION

29.0

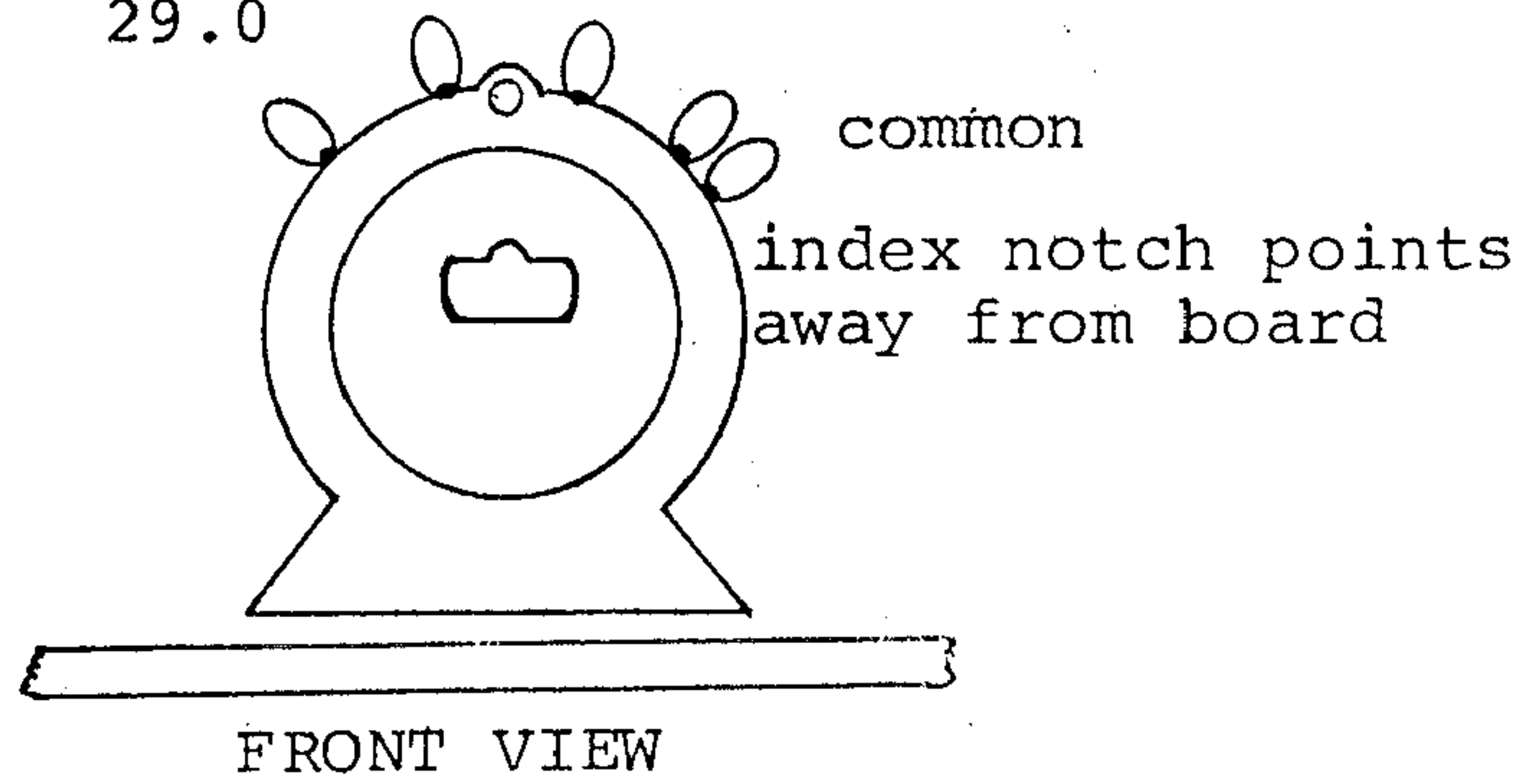
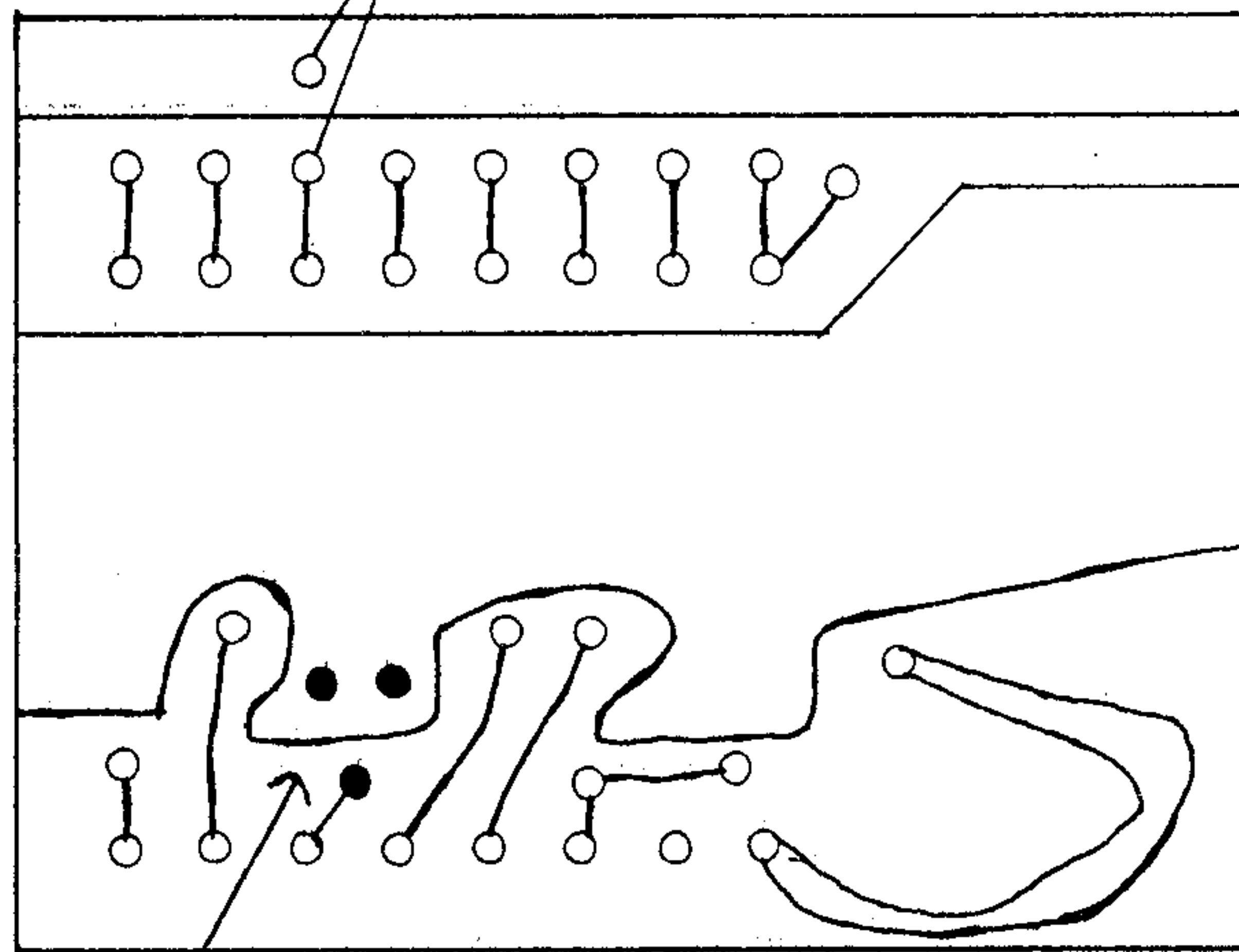


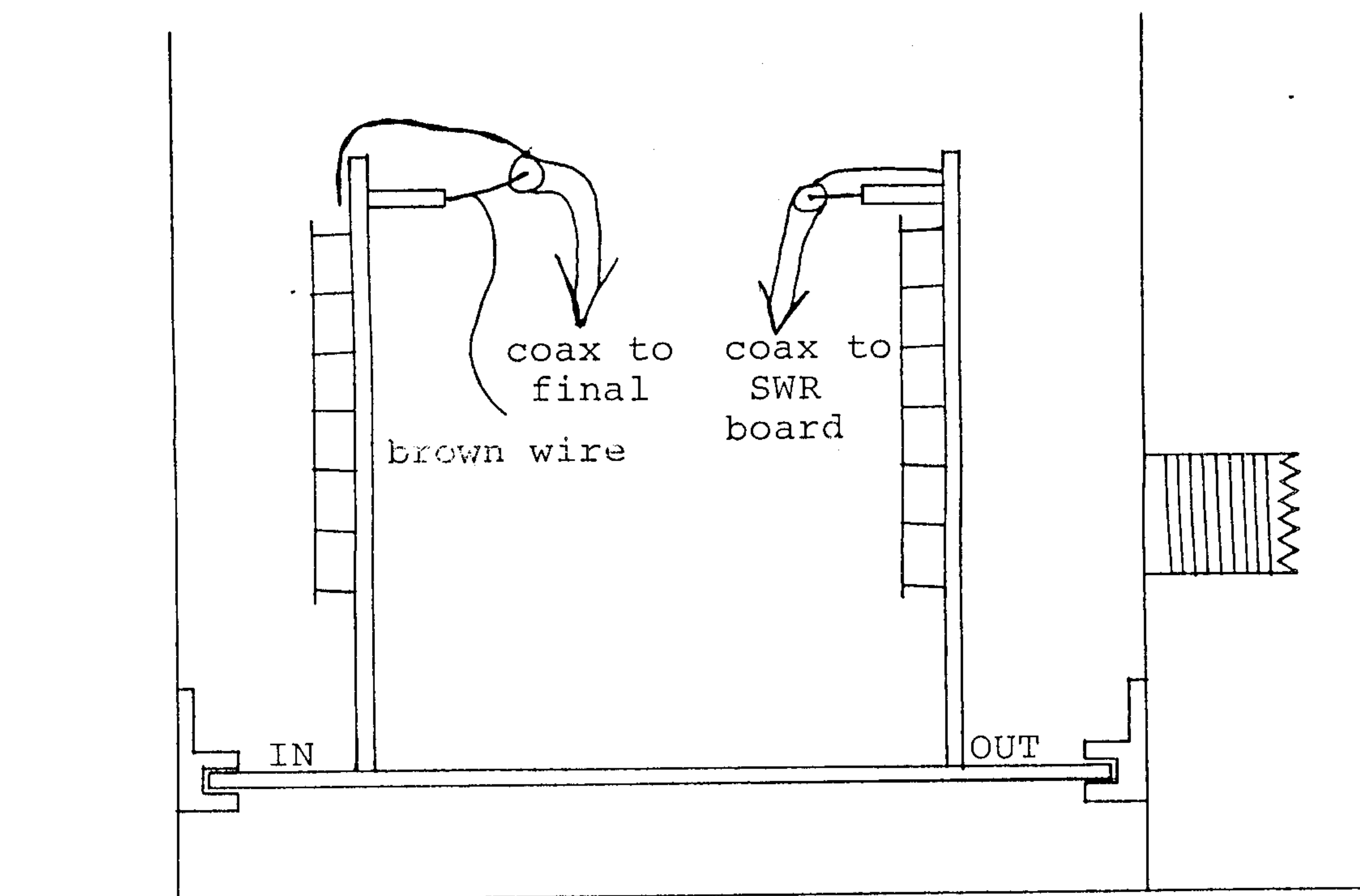
DIAGRAM 6 RX TRIMMER BOARD

15pf cap (mounts on top of board)



●=60pf trim cap (mounts on top of board)

DIAGRAM 7 LOWPASS FILTER CONNECTIONS



BOTTOM VIEW

