

410B

VACUUM TUBE VOLTMETER

SERIALS PREFIXED: 024-

OPERATING AND SERVICING MANUAL



PRINTED 12/60

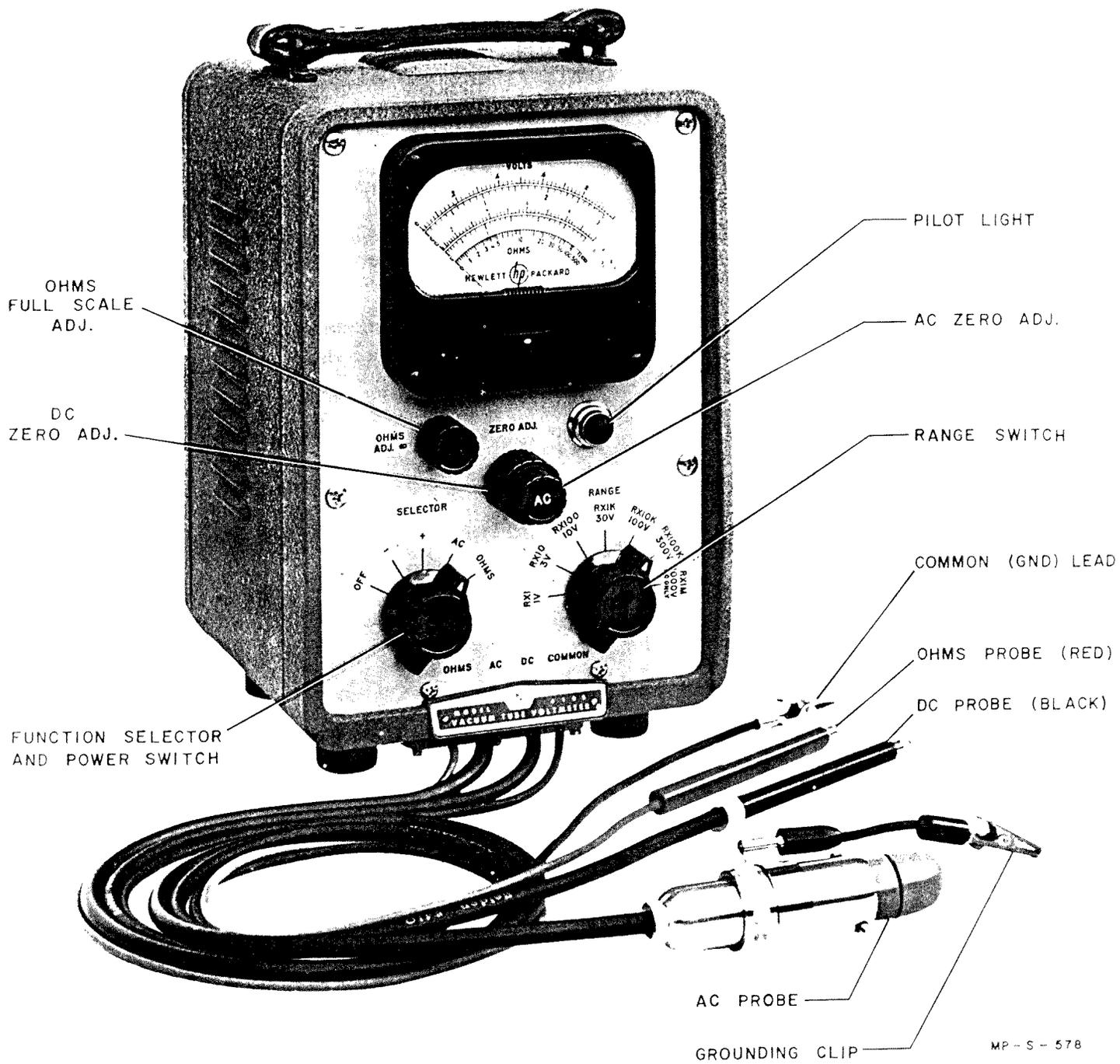


Figure 2-1. Model 410B Controls and Terminals Labeled

MP-S-578

SPECIFICATIONS

- RANGES:** 1 to 300 volts full scale in 6 ranges: 1, 3, 10, 30, 100, and 300 volts AC or DC and 0-1000 volt range DC. Resistance 0.2 ohm to 500 megohms in seven ranges. Mid-scale reading of 10, 100, 1,000, 10,000, 100,000 ohms, 1 megohm, and 10 megohms.
- ACCURACY:** $\pm 3\%$ of full scale on all ranges on sinusoidal AC voltages and DC voltages. The AC portion of the instrument is a peak-reading device, calibrated in rms volts. Ohmmeter accuracy is ± 1 ohm at mid-scale of RX1 range, $\pm 5\%$ at mid-scale of all other ranges.
- FREQUENCY RESPONSE:** Frequency response is flat within ± 1 db up to 700 mc and drops off less than 1 db at 20 cps. Probe resonant frequency is about 1,250 mc and an indication can be obtained up to 3,000 mc.
- INPUT IMPEDANCE:** Input capacity is 1.5 $\mu\mu$ f; input resistance is 10 megohms at low frequencies. At high frequencies resistance drops off due to dielectric losses. DC input resistance is approximately 122 megohms for all ranges.
- PROBE:** The probe is approximately 1" diameter and 4-1/2" long. It is equipped with a ground clip, and the connector may be soldered to the point under test. Adapting connectors are available to measure voltages in coaxial transmission lines.
- POWER SUPPLY:** 115/230 volts $\pm 10\%$, 50/1,000 cps, 40 watts.
- SIZE:** Cabinet Mount: 11-1/2" high, 7-3/8" wide, 8-3/4" deep. Compartment at rear of instrument stores probe and test leads when not in use.
- WEIGHT:** Cabinet Mount: 12 lbs.; shipping weight approximately 17 lbs.
Rack Mount: 12 lbs.; shipping weight approximately 26 lbs.
- RACK MOUNTING:** Available on standard RETMA 7" x 19" panel.
- ACCESSORIES AVAILABLE:**
- Ⓢ 452A Capacitive Voltage Divider, 25 KV max., requires Ⓢ 452A-95A Adapter.
 - Ⓢ 453A Capacitive Voltage Divider, 2 KV max.
 - Ⓢ 455A Probe Coaxial "T" Connector, for Type "N" systems.
 - Ⓢ 458A Probe Coaxial "N" Connector, terminates Type "N" systems.
 - Ⓢ 459A DC Resistive Voltage Multiplier, 30 KV max.

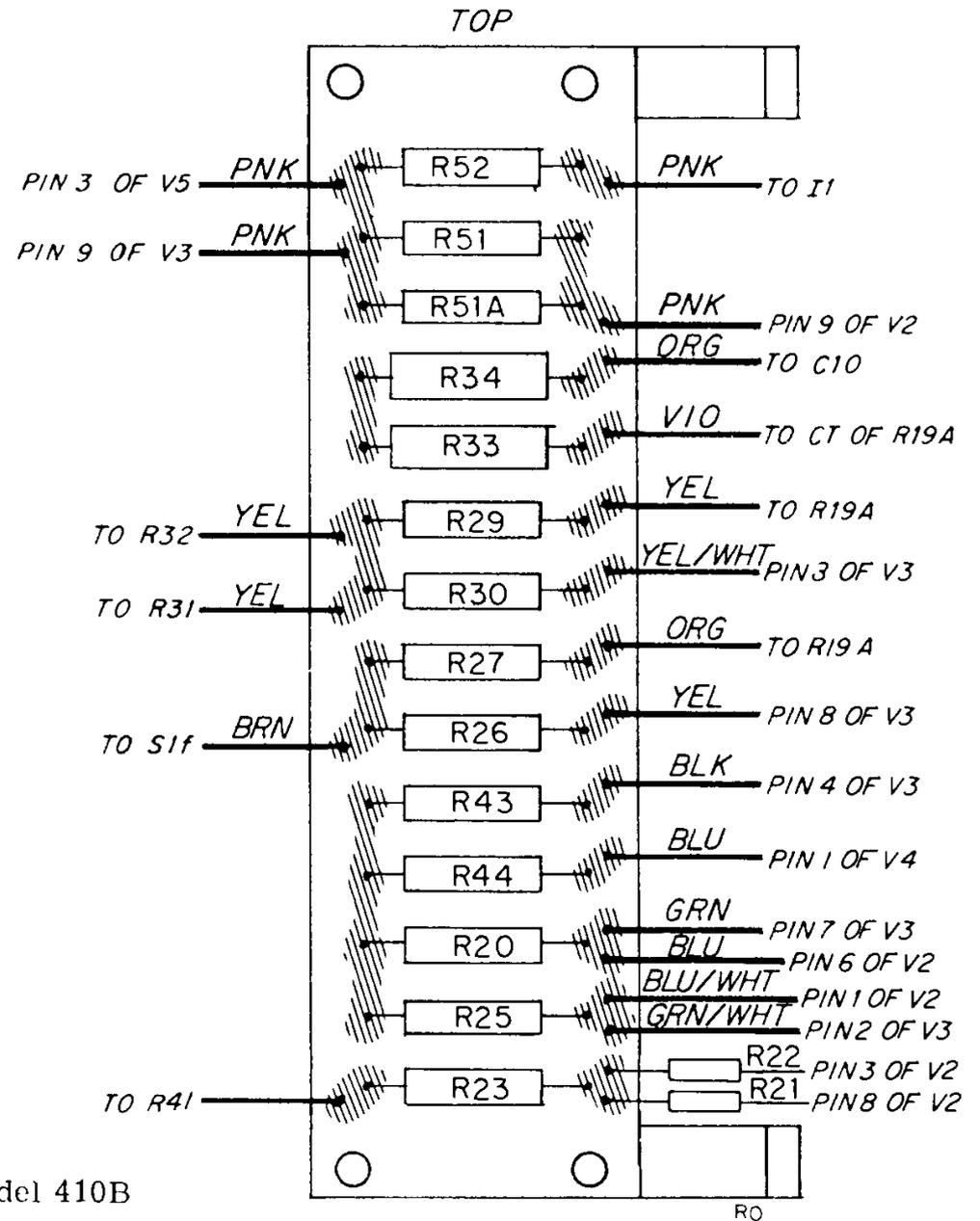
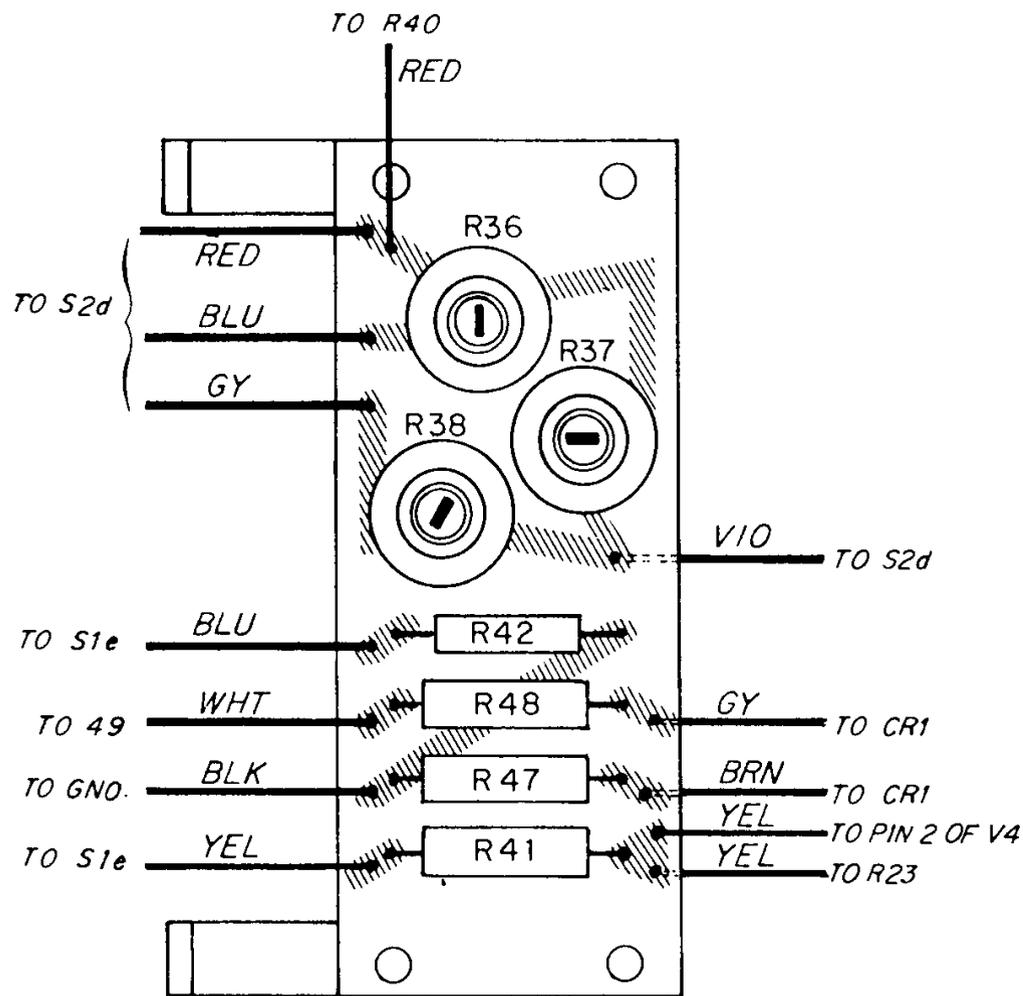
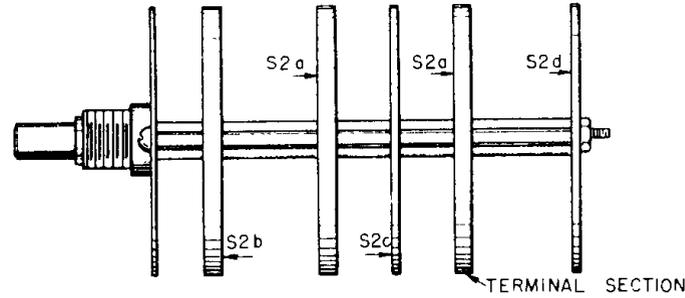
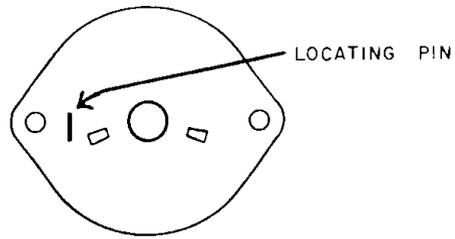


Figure 4-5. Resistor Board Details Model 410B

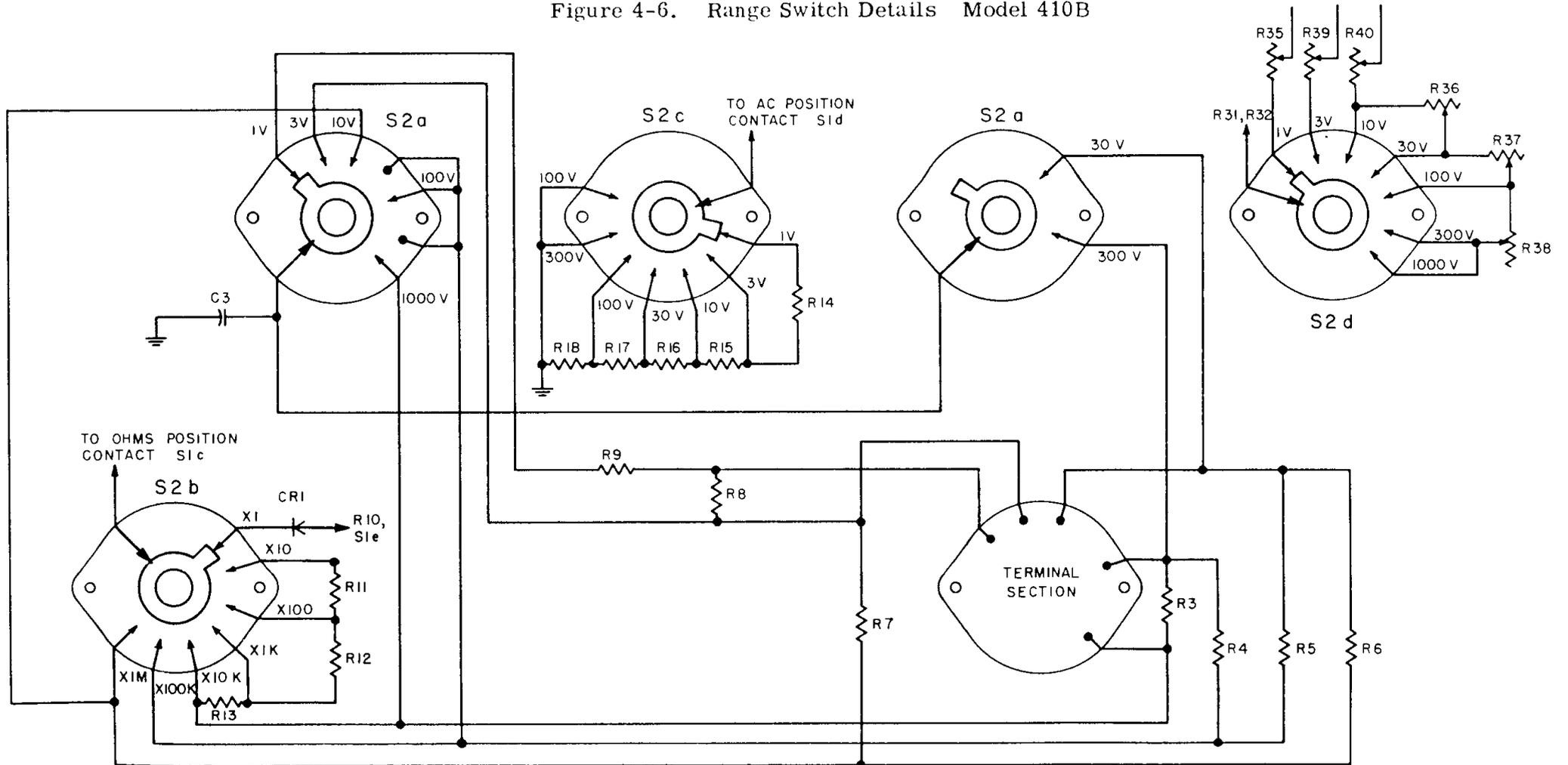


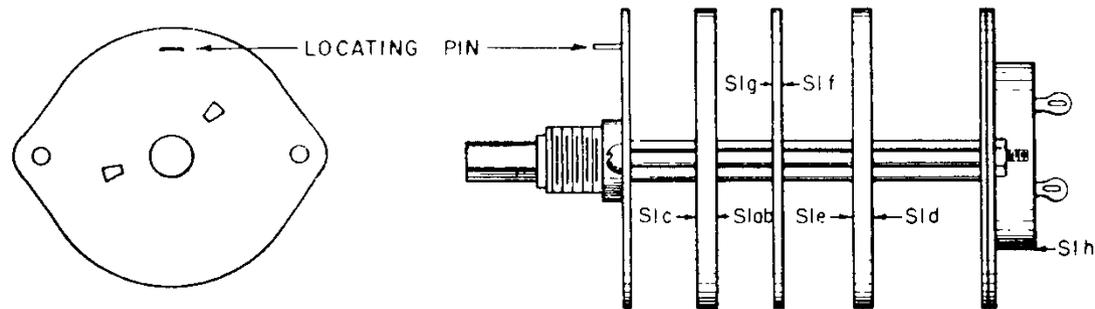
NOTES.

1. ALL CIRCUIT REFERENCES CORRESPOND TO THOSE IN THE SCHEMATIC WIRING DIAGRAM.

2. FRONT AND REAR SECTIONS OF SWITCH ARE VIEWED FROM THE BOTTOM OF THE INSTRUMENT AND THE KNOB END OF THE SWITCH. SWITCH SHOWN IN THE IV POSITION.

Figure 4-6. Range Switch Details Model 410B

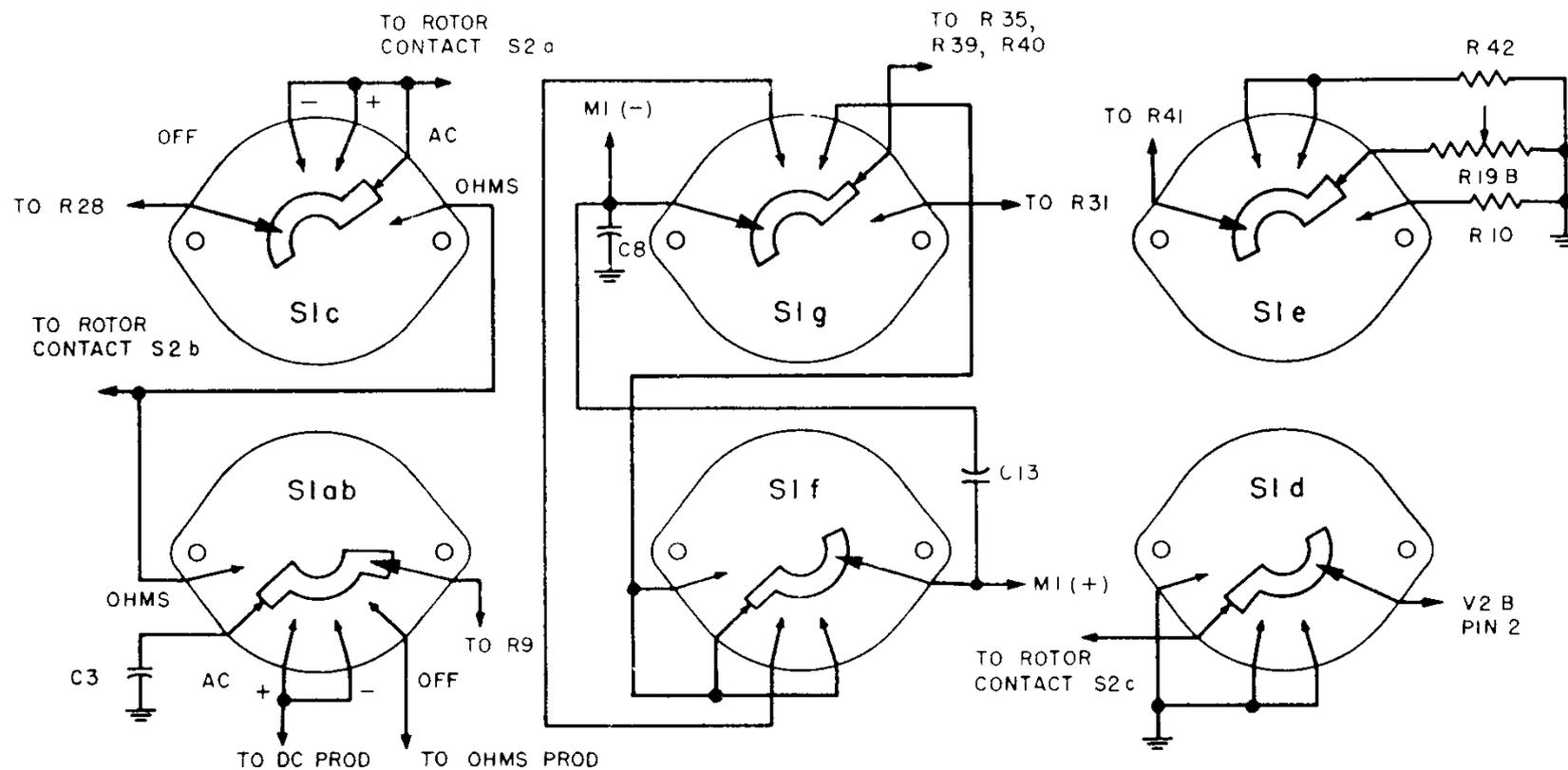




NOTES:

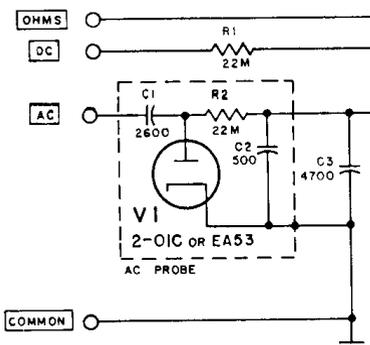
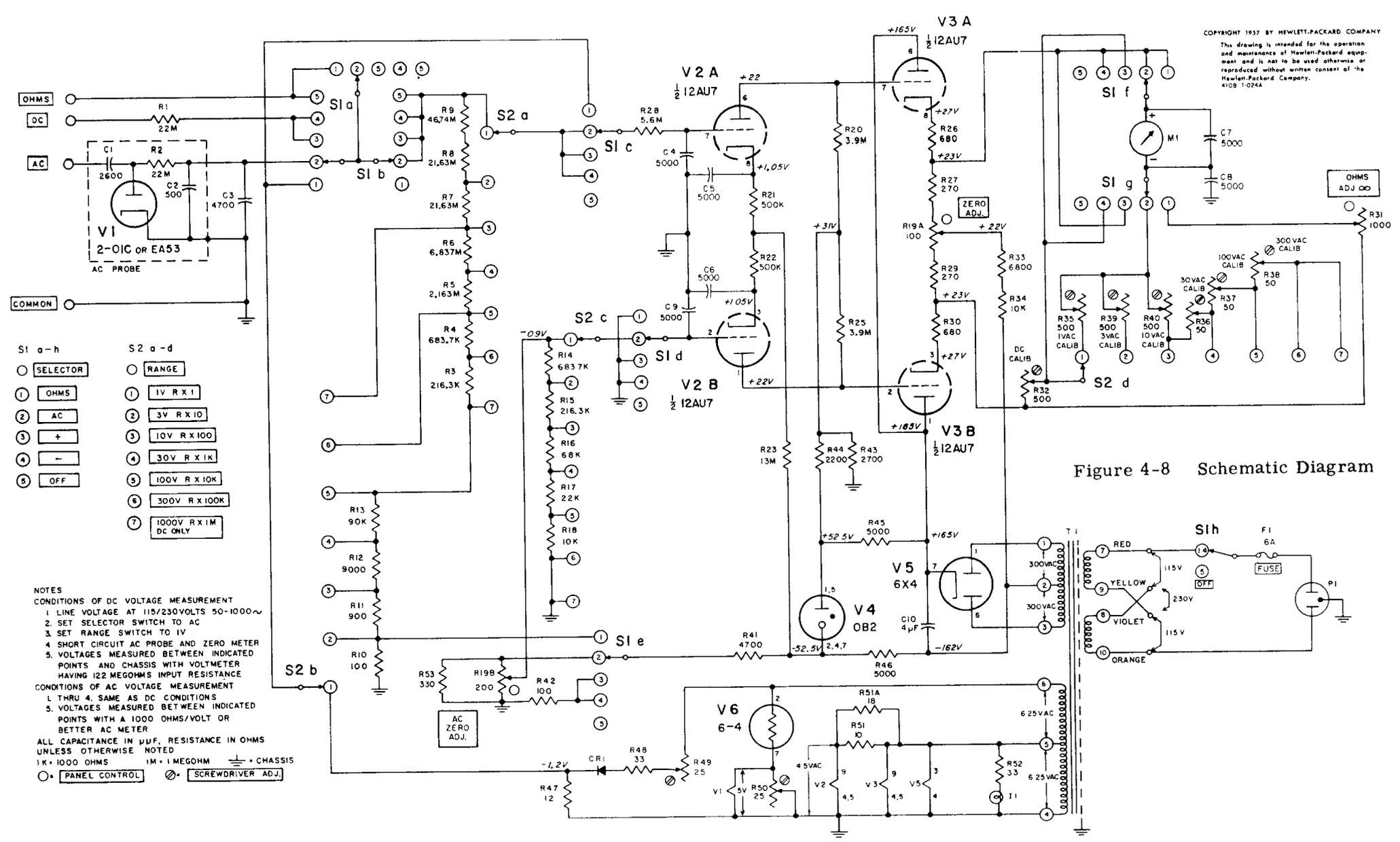
1. ALL CIRCUIT REFERENCES CORRESPOND TO THOSE IN THE SCHEMATIC WIRING DIAGRAM.
2. FRONT AND REAR SECTIONS OF SWITCH ARE VIEWED FROM THE BOTTOM OF THE INSTRUMENT AND THE KNOB END OF THE SWITCH. SWITCH SHOWN IN THE AC POSITION.

Figure 4-7. Selector Switch Details Model 410B



**MODEL 410 B
SELECTOR SWITCH DETAILS**

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 410B 1-024A



- | | |
|------------|---------------------------|
| S1 a-h | S2 a-d |
| ○ SELECTOR | ○ RANGE |
| ① OHMS | ① 1V R X 1 |
| ② AC | ② 3V R X 10 |
| ③ + | ③ 10V R X 100 |
| ④ - | ④ 30V R X 1K |
| ⑤ OFF | ⑤ 100V R X 10K |
| | ⑥ 300V R X 100K |
| | ⑦ 1000V R X 1M
DC ONLY |

NOTES
 CONDITIONS OF DC VOLTAGE MEASUREMENT
 1. LINE VOLTAGE AT 115/230VOLTS 50-1000~
 2. SET SELECTOR SWITCH TO AC
 3. SET RANGE SWITCH TO 1V
 4. SHORT CIRCUIT AC PROBE AND ZERO METER
 5. VOLTAGES MEASURED BETWEEN INDICATED POINTS AND CHASSIS WITH VOLTMETER HAVING 122 MEGOHMS INPUT RESISTANCE
 CONDITIONS OF AC VOLTAGE MEASUREMENT
 1. THRU 4. SAME AS DC CONDITIONS
 5. VOLTAGES MEASURED BETWEEN INDICATED POINTS WITH A 1000 OHMS/VOLT OR BETTER AC METER
 ALL CAPACITANCE IN μF. RESISTANCE IN OHMS UNLESS OTHERWISE NOTED
 1K = 1000 OHMS 1M = 1 MEGOHM ⏏ = CHASSIS
 ○ PANEL CONTROL Ⓢ SCREWDRIVER ADJ.

Figure 4-8 Schematic Diagram