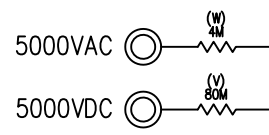


WHEN USING EITHER OF THESE TWO 5000V JACKS, THE OPPOSITE TEST LEAD GOES IN THE - JACK, AND THE 'FUNCTION/RANGE' SWITCH MUST BE IN THE 1000V POSITION



SIMPSON DOCUMENTATION, IN THE FORM OF THEIR SCHEMATIC DIAGRAM FOR THIS METER, DOES NOT PROVIDE POSITION TERMINAL DESIGNATIONS FOR THE TWO SWITCHES ('AC/DC' AND 'FUNCTION/RANGE'). THUS, THE FOUR DECKS/WAFERS OF THE 'FUNCTION/RANGE' SWITCH ARE NOT IDENTIFIED, AND POSITION TERMINALS AROUND THESE SWITCHES CAN ONLY BE IDENTIFIED BY WHICH ONES ON THE REAR DECK HAVE THE ASSOCIATED ROTOR 'WIPER' POINTING AT THEM WHEN THE SWITCH KNOB IS IN A GIVEN POSITION.

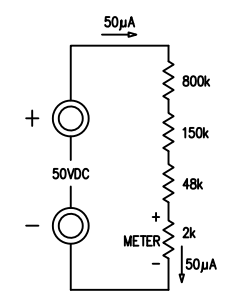
NOTE THAT WITH ALMOST ALL OF THIS METER'S CIRCUITRY BEING COMBINATIONS OF CARBON COMPOSITION RESISTORS, AND WITH THAT TYPE BEING PRONE TO DRIFTING IN VALUE OVER TIME, AND SINCE THERE ARE NO CALIBRATION ADJUSTMENTS ON THIS METER, IT IS UNLIKELY THAT A SIMPSON 260-1 WILL TODAY BE ACCURATE.

WHEN REPLACING THE CELLS AND/OR BATTERIES IN THIS METER, SOMETIMES THE METER WILL BE FOUND WITH THE CELLS/BATTERIES ALREADY REMOVED, LEAVING JUST THE UNMARKED BATTERY WIRING. THE CORRECT CONNECTIONS MAY BE RE-ESTABLISHED AS FOLLOWS. VIEW THE METER FROM THE REAR, WITH THE 'FUNCTION/RANGE' SWITCH AT THE BOTTOM AND THE METER MOVEMENT AT THE TOP. SEE THE REARMOST DECK/WAFER OF THE 'FUNCTION RANGE' SWITCH, AND FIND THE THREE POSITION TERMINALS SHORTED TOGETHER WITH A PIECE OF BARE WIRE; USE A CONTINUITY CHECKER FROM THIS SHORTING BARE WIRE TO THE TWO WIRES ENDING IN THE VICINITY OF THE 'C' CELL HOLDER ABOVE THE METER MOVEMENT, AND WHICHEVER OF THOSE TWO WIRES IS CONNECTED TO THE THREE SHORTED SWITCH POSITION TERMINALS SHOULD BE SOLDERED TO THE 'C' CELL'S + END, THE OTHER OF THE TWO WIRES GETS SOLDERED TO THE - END. CONTINUED AT RIGHT >>>

>>>> WITH THE METER IN THE SAME ORIENTATION DESCRIBED AT LEFT, WE WILL CALL THE AREA TO THE RIGHT OF THE METER MOVEMENT "BATTERY A" AND THE AREA TO THE LEFT OF THE METER MOVEMENT WILL BE "BATTERY B". THERE SHOULD BE TWO AVAILABLE WIRES AT EACH OF THESE TWO BATTERY LOCATIONS. USE A CONTINUITY CHECKER BETWEEN THE ENDS OF THESE FOUR WIRES, UNTIL THE WIRE THAT GOES BETWEEN THE TWO BATTERY POSITIONS HAS BEEN IDENTIFIED; THE END OF THIS WIRE AT "BATTERY A" SHOULD BE SOLDERED TO THE + END OF THAT BATTERY, AND THE END OF THIS WIRE AT "BATTERY B" SHOULD BE SOLDERED TO THE - END OF THAT BATTERY. THEN, SOLDER THE REMAINING WIRE AT "BATTERY A" TO THE + END OF THAT BATTERY, AND SOLDER THE REMAINING WIRE AT "BATTERY B" TO THE - END OF THAT BATTERY. (HENCEFORTH CALLED THE 'VOLT-METER') TO MEASURE BETWEEN THE - END OF "BATTERY A" AND THE + END OF "BATTERY B", AND IF THE WIRING IS CORRECT, A READING OF APPROXIMATELY 6V WILL BE MEASURED ON THE VOLTMETER. TO USE THE VOLTMETER TO VERIFY THE 'C' CELL WIRING, PUT THE 'FUNCTION/RANGE' SWITCH IN ANY POSITION OTHER THAN ANY OF THE THREE OHMS RANGES. CONNECT THE VOLTMETER'S + PROBE TO THE SAME THREE SHORTED POSITION TERMINALS ON THE REAR DECK OF THE 'FUNCTION/RANGE' SWITCH THAT WERE DESCRIBED ABOVE. CONNECT THE VOLTMETER'S - PROBE TO THE - TEST LEAD JACK ON THIS SIMPSON 260 METER. IF THE WIRING IS CORRECT, THE VOLTMETER WILL READ APPROXIMATELY 1.5 VOLTS. A NEGATIVE READING ON THE VOLTMETER IN ANY PART OF THE ABOVE PROCEDURE INDICATES AN ERROR IN BATTERY WIRING.

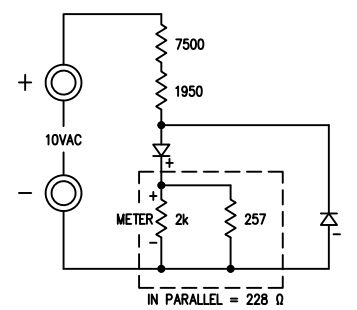
EXAMPLE CALCULATIONS USING SIMPLIFIED FUNCTION CIRCUITS

DC VOLTS



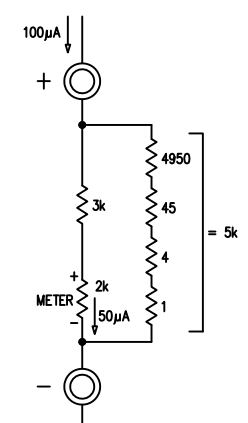
- USING 50VDC RANGE IN THIS EXAMPLE
- SERIES RESISTANCE = 800k + 150k + 48k + 2k = 1M
- 50V APPLIED / 1M = 50µA THROUGH METER, GIVING A FULL SCALE READING OF 50V

AC VOLTS



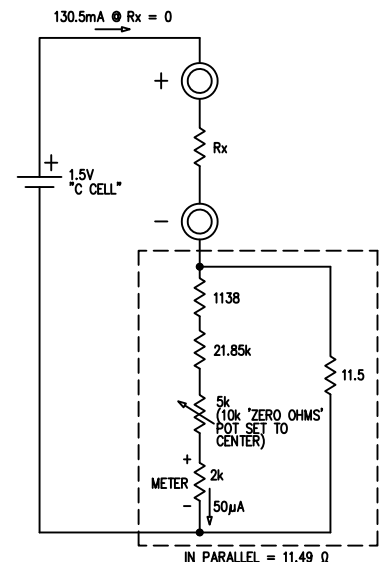
- SIMILAR TO DC VOLTS
- USING 10VAC RANGE IN THIS EXAMPLE
- RESISTANCES ARE CHANGED TO ACCOUNT FOR RECTIFIER VOLTAGE DROP, HALF WAVE RECTIFICATION WITH PASSIVE FILTERING VIA METER MOVEMENT'S DAMPING ACTION, ETC.
- METER SHUNT RESISTOR ADDED TO MAKE METER LESS SENSITIVE
- METER BYPASSED ON NEGATIVE HALF OF AC WAVEFORM
- CALCULATIONS ARE NOT SHOWN SINCE CHARACTERISTICS OF RECTIFIER ARE NOT KNOWN AND DEGREE OF METER DAMPING IS NOT KNOWN

DC AMPS



- USING 100µA RANGE IN THIS EXAMPLE
- 2k METER + 3k IN SERIES = 5k
- FOUR RESISTORS IN SERIES COMPRISE A 5k SHUNT
- 5k AND 5k IN PARALLEL = 2.5k
- 100µA x 2.5k = 0.25V ACROSS BOTH RESISTANCE PATHS (BRANCHES)
- 0.25V / 5k IN THE METER PATH (BRANCH) = 50µA THROUGH METER, GIVING FULL SCALE READING OF 100µA
- IN THE HIGHER AMPS (CURRENT) RANGES, SOME OF THE SHUNT RESISTORS ARE REMOVED FROM THE SHUNT AND ADDED IN SERIES WITH THE METER, CHANGING THE PROPORTION OF OVERALL CURRENT THAT PASSES THROUGH THE METER
- THIS METER CANNOT MEASURE AC CURRENT

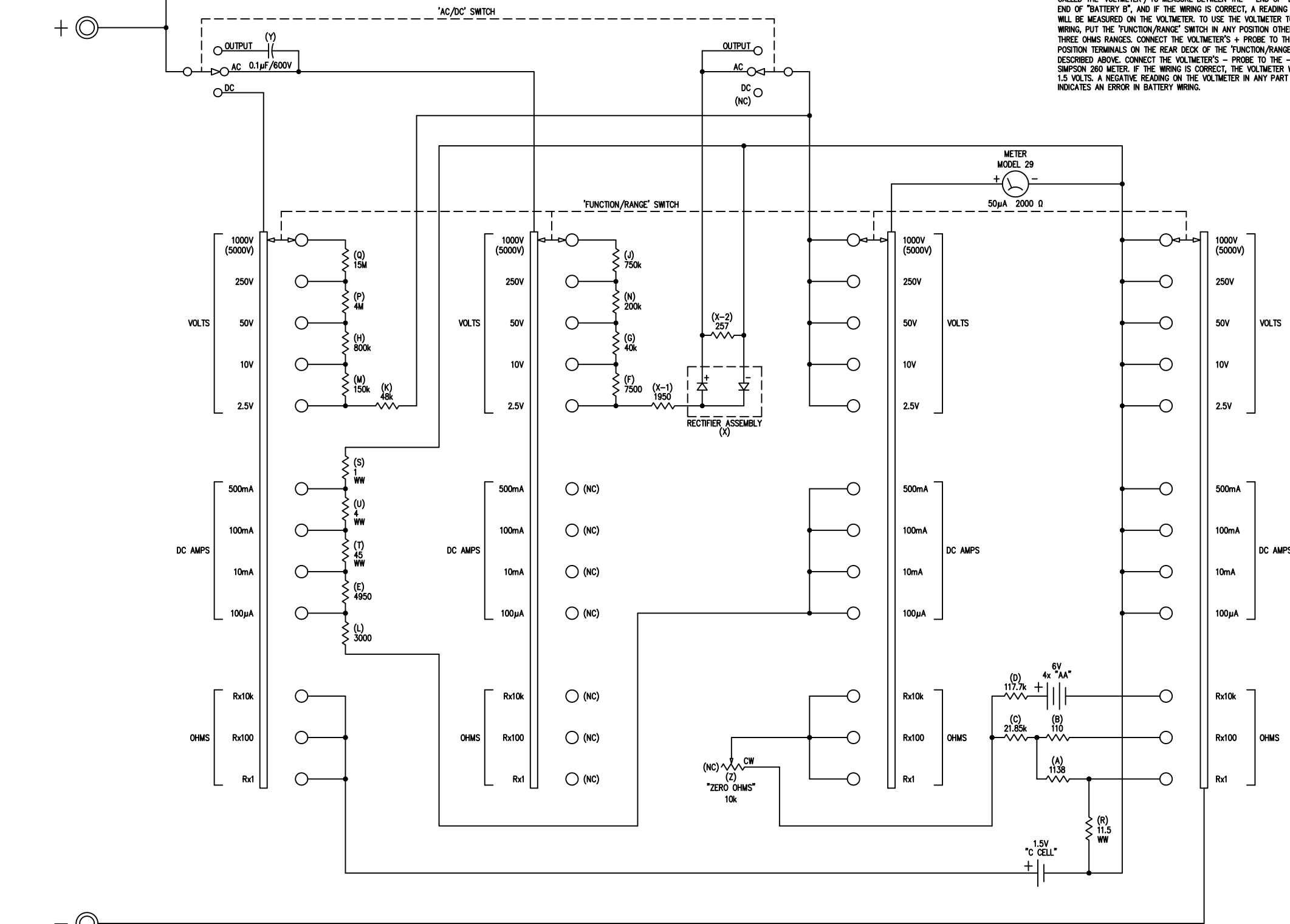
OHMS



- USING Rx1 RANGE IN THIS EXAMPLE
- ASSUMING Rx = 0 Ω
- ASSUMING "ZERO OHMS" POTENTIOMETER IS SET TO ABOUT 5k (OUT OF 10k POSSIBLE)
- 1138 + 21.85k + 5k POT + 2k METER = 29988 Ω
- 29988 Ω IN PARALLEL WITH 11.5 Ω = 11.49 Ω
- 1.5V / 11.49 Ω = 130.5mA
- 130.5mA x 0.00038 = 50µA THROUGH METER, GIVING FULL SCALE METER DEFLECTION, FOR A READING OF 0 Ω (EQUAL TO Rx)
- NOW ASSUMING Rx = 12.5 Ω, ALL OTHER ASSUMPTIONS ARE THE SAME AS ABOVE
- TOTAL RESISTANCE = 23.99 Ω, MAIN CURRENT = 62.5mA
- 62.5mA x 0.00038 = APPROXIMATELY 24µA THROUGH METER, GIVING APPROXIMATELY HALF SCALE READING, WHICH IS ABOUT 12.5 ON THE OHMS SCALE (EQUAL TO Rx)
- VARIOUS RESISTANCES ARE COMBINED IN DIFFERENT WAYS IN THE THREE OHMS RANGES, SUCH THAT THE 'METER CIRCUIT' AND THE PARALLEL SHUNT HAVE DIFFERENT RATIOS, THUS CURRENT THROUGH THE METER MOVEMENT IN RELATION TO THE VALUE OF Rx IS KEPT APPROPRIATE. IN THE Rx10k RANGE, AN ADDITIONAL BATTERY IS ADDED, 1.5V + 6V = 7.5V

IMPORTANT: WHEN COMPARING THIS SCHEMATIC TO THE ORIGINAL SIMPSON 260-1 SCHEMATIC (WHICH IS TITLED "WD-260" AND DATED AS "DRAWN" ON 4-16-40 AND "TRACED" ON 4-23-40), NUMEROUS ERRORS IN RESISTANCE VALUES WILL BE NOTED ON THE ORIGINAL VERSION'S TABLE OF VALUES. SPECIFICALLY, RESISTOR 'E' IS SHOWN AS 4050 Ω BUT IT IS ACTUALLY 4950 Ω, RESISTORS 'G', 'H', 'J', 'K', 'M' AND 'N' ARE GIVEN VALUES IN 'M' (MEGA) BUT THOSE SHOULD BE IN 'k' (KILO). LIKEWISE, THE "ZERO OHMS" POTENTIOMETER VALUE IS GIVEN AS 10M Ω BUT IT IS ACTUALLY 10k Ω. THE VALUES FOR THE "RECT. SERIES" RESISTOR 'X-1' AND THE "RECT. SHUNT" RESISTOR 'X-2' ARE NOT GIVEN; THEIR VALUES HAVE BEEN MEASURED ON A PROPERLY WORKING 260-1 AND FOUND TO BE 1950 Ω AND 257 Ω, RESPECTIVELY.

THE SIMPSON 260-1 IS THE ORIGINAL VERSION OF THE FAMOUS 260 MODEL SERIES, DATING FROM THE 1930'S AND WITH THE 260-1 BEING MADE UNTIL AROUND 1946.



- NOTES:
- 1) ALL RESISTANCES ARE SHOWN IN OHMS UNLESS MARKED 'k' (KILO) OR 'M' (MEGA).
 - 2) RESISTOR WATTAGES ARE NOT INDICATED IN THE ORIGINAL SIMPSON 260-1 SCHEMATIC. PHYSICAL INSPECTION SHOWS THAT MOST RESISTORS ARE CARBON COMPOSITION TYPES, APPARENTLY 1W. RESISTORS 'W' & 'Y' ARE COMPRISED OF MANY 1W CARBON COMPOSITION RESISTORS CONNECTED IN SERIES AND CONTAINED INSIDE HIGH TEMPERATURE INSULATING TUBES. THE TWO RESISTORS ASSOCIATED WITH THE RECTIFIER ASSEMBLY ARE BOBBIN TYPE WIRE-WOUND (WW) STYLE, WHILE THE OTHER FOUR RESISTORS IDENTIFIED AS 'WW' IN THIS SCHEMATIC, 'R', 'S', 'T', 'U' ARE MADE AS INSULATED RESISTANCE WIRE LOOSELY WOUND AROUND PHENOLIC CORES.
 - 3) PART IDENTIFICATION LETTERS IN () ARE ACCORDING TO THE ORIGINAL SIMPSON 260-1 SCHEMATIC.

- 4) THE BATTERY SHOWN AS 6V, 4x "AA" IS ACTUALLY TWO BATTERIES, EACH COMPRISED OF 2x "AA" CELLS, WIRED IN SERIES WITHIN EACH BATTERY AND ALSO IN SERIES BETWEEN THE TWO BATTERIES. ORIGINALLY THESE WERE TWO POTTED BATTERIES MADE USING THE SLIGHTLY LARGER "A" CELLS (NOW OBSOLETE), AND ARE TYPICALLY REPLACED USING A PAIR OF PLASTIC BATTERY HOLDERS, EACH DESIGNED TO HOLD TWO "AA" CELLS. THE 1.5V "C" CELL IS A NORMAL TYPE.
- 5) THIS SCHEMATIC WAS DRAWN, USING AUTOCAD, AS A MEANS TO GET A MORE LEGIBLE SCHEMATIC FOR THE SIMPSON 260-1. AN EFFORT HAS BEEN MADE TO SIZE AND SCALE COMPONENTS AND TEXT FOR THE LARGEST AND BEST VISIBILITY AND LEGIBILITY WHILE STILL FITTING ON A NORMAL 11 x 17" SHEET OF PAPER.
- 6) THE COPYRIGHT HOLDER HEREBY GIVES PERMISSION TO FREELY DISTRIBUTE THIS DOCUMENT, AS LONG AS NO ALTERATIONS ARE MADE AND CREDIT IS GIVEN, ALONG WITH THE COPYRIGHT NOTICE.

SIMPSON 260 SERIES 1 (260-1) VOM / MULTIMETER SCHEMATIC DIAGRAM