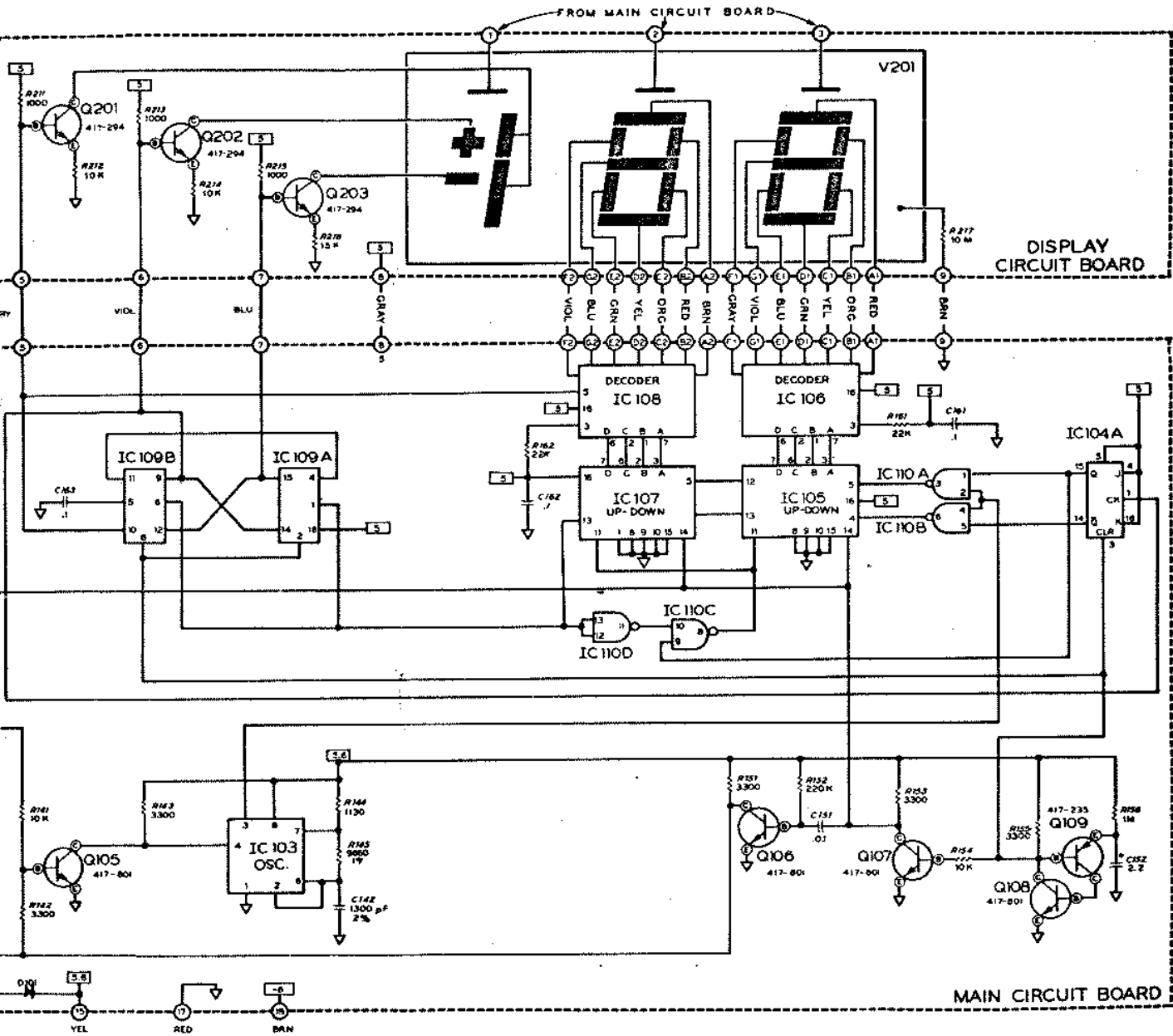


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SCHEMATIC OF THE MODEL ID-1390 ELECTRONIC DIGITAL THERMOMETER

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NOTES:

1. COMPONENTS ARE NUMBERED IN THE FOLLOWING GROUPS:

100-199	PARTS ON THE MAIN CIRCUIT BOARD.
200-299	PARTS ON THE DISPLAY CIRCUIT BOARD.
300-399	PARTS ON THE REGULATOR CIRCUIT BOARD.
1-99	PARTS NOT PHYSICALLY MOUNTED TO ANY CIRCUIT BOARD.
2. RESISTORS AND CAPACITORS ON THE MAIN CIRCUIT BOARD HAVE BEEN NUMBERED IN GROUPS BY FUNCTIONS. REFER TO THE NUMBERING INDEX DRAWING TO LOCATE RESISTORS AND CAPACITORS.
3. ALL RESISTOR VALUES ARE IN OHMS. K=1,000, M=1,000,000.
4. ALL CAPACITOR VALUES ARE IN μ F UNLESS MARKED OTHERWISE.
5. ∇ INDICATES GROUND ON A CIRCUIT BOARD.
6. $\textcircled{1A}$ INDICATES A CIRCUIT BOARD CONNECTION. THE NUMBER IS PRINTED ON THE CIRCUIT BOARD.
7. \square INDICATES A POSITIVE SUPPLY VOLTAGE.
8. INTEGRATED CIRCUITS IC104, IC109, AND IC110, PERFORM MULTIPLE FUNCTIONS. SEGMENTS OF THESE ICs ARE SHOWN WHERE THEY PERFORM IN THE CIRCUIT.



CALIBRATION

To perform the following calibration steps, you will need a container of ice water (at least 50% ice) and a container of hot tap water (at least 48°C on the calibration thermometer). The container of hot water should be large enough in volume to prevent rapid cooling in Thermos® bottle works* (see

It is advisable to perform the calibration steps twice. The first time through these steps, you will overcome familiar with the calibration procedure and your digital thermometer will be roughly calibrated. The second time through, you will obtain a finer calibration.

Refer to Figure 1-1 (fold-out from page 55) for the following steps:

- 1) Connect the indoor and outdoor temperature sensors to the Digital Thermometer.
- 1) Place the temperature sensors close together and wrap a piece of solder or a rubber band around them, to hold them together. Then place both sensors on your work surface.

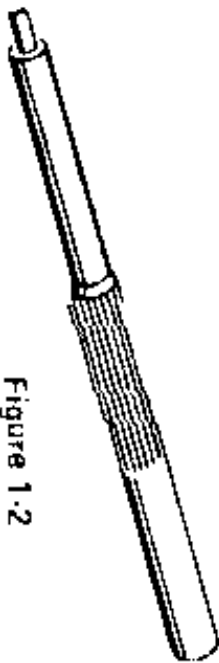


Figure 1-2

- 1) Refer to Figure 1-2 and insert the metal blade into the small end of the nut starter. Use this tool to adjust the controls in the following steps.

Present the following controls on the main circuit board as they are viewed from the front of the unit.

- 1) °C CORRECT – Full counterclockwise
- 1) °F CORRECT – Full counterclockwise.
- 1) °C DIFFERENCE – Center of rotation.
- 1) °F DIFFERENCE – Center of rotation.
- 1) BALANCE – Center of rotation.
- 1) Position the 3 lug switch slider toward the lug with the gray wire.

NOTE: When the line cord is connected to an AC outlet, AC voltage is present on the power supply circuit board (See Figure 3-2 from fold-out Page 64). Touch only the places specified in the following steps. If the unit does not operate as indicated in the following steps, unplug the line cord and refer to the "In Case Of Difficulty" section on Page 61.

- 1) Plug the line cord into an AC outlet. The neon lamps should alternately light and the readout tube should light.
- 1) Allow the Digital Thermometer to operate for several minutes to allow it to stabilize before you continue with the calibration.



NOTE: When the upper neon lamp is lit, the reading that appears on the readout tube is for the indoor temperature sensor; when the lower neon lamp is lit, the reading that appears is for the outdoor temperature sensor. In the next step, you will adjust the balance so that both sensors read the same. As you adjust the balance control, it will affect both sensor readings. Adjust the control a little at a time until both readings are exactly the same.

- 1) Adjust the **BALANCE** control until both sensor readings are the same.
- 1) Remove the solder or rubber band that is holding the sensors together. Place the outdoor sensor into the ice water and place the indoor sensor in the hot water.

°C CALIBRATE

- 1) Position the 6-lug switch slider toward the lugs with the blue and brown wires.
- 1) Stir the ice water for one minute.
- 1) Adjust the °C **DIFFERENCE** control until the outdoor reading is between 0° and +5°.

WARNING: The calibration thermometer supplied with this kit is accurately calibrated at 120° F. However, hot water can soften the glue holding the thermometer tube and affect the accuracy of the thermometer. **DO NOT** submerge the thermometer past the 20° C mark. Also handle the thermometer carefully.

NOTE: Use the calibration thermometer and make sure that the hot water is at least 48° C. Stir the hot water and ice water often during the calibration procedure.

- () Read the hot water temperature on the calibration thermometer. Write this temperature in the space at the right. _____

- () Subtract one degree from this reading. -1

Calculated difference = _____

NOTE: In the next step you will adjust the °C **DIFFERENCE** control to obtain a difference between the indoor and outdoor sensor reading that is equal to the calculated difference. Example: If the indoor reading is 58°, and the outdoor reading is 9°, then 58° - 9° = 49° difference.

- () Adjust the °C **DIFFERENCE** control clockwise to obtain a difference between the indoor and outdoor sensor readings that is equal to the calculated difference.

- () Stir the ice water.

- () Adjust the °C **CORRECT** control until the outdoor sensor reading is -1°.

If this was the first time through the °C Calibration procedure, you may want to repeat the procedure for greater accuracy. Then proceed to the °F Calibration.



F CALIBRATION

() Position the 6-1/2" switch slider toward the lugs with the yellow and orange wires.

() Stir the ice water for approximately 1/2 minute.

() Adjust the °F DIFFERENCE control until the outdoor reading is approximately 33°.

NOTE: The hot water must be at least 110°F on the calibration thermometer.

() Read the hot water temperature on the calibration thermometer. Write this temperature in the space at the right.

() Subtract 33 degrees (the temperature of the ice water) from this reading.

Calculated difference = _____

NOTE: In the next step you will adjust the °F DIFFERENCE control to obtain a difference between the indoor and outdoor sensor reading that is equal to the calculated difference. Example: If the indoor reading is 111° and the outdoor reading is 33°, then $111° - 33° = 78$ difference.

() Adjust the °F DIFFERENCE control clockwise to obtain a difference between the indoor and outdoor sensor readings that is equal to the calculated difference.

() Adjust the °F CORRECT control until the outdoor sensor reading is +33°.

If this was the first time through the °F Calibration procedure, you may want to repeat the procedure for greater accuracy.

() Disconnect the line cord plug from the AC outlet. Then proceed to "Find Assembly."