

**Procedure for Soldering  
SSC Collider Dipole Magnet  
Quench Protection Heater Leads**

**TS-SSC 91-115  
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June 13, 1991**

**This procedure applies to the lead and return end heater strips for 50 mm aperture SSC collider dipoles (DCA series.)**

A. Trim each of the four heater strips so that they extend 2" ( $\pm 1/16$ ") beyond the end of the collet end clamp insulator.

B. For each of the four heater strip stub:

1. Using 37/63 Kester solder or equivalent, and a 500 F soldering iron, tin about 1/2" of the heater strip stub along the **outside** surface, that is, the surface that faces away from the beam tube if the stub is stretched out straight. (See Figure 1a.)

2. Curl the tinned portion of the heater strip stub as shown in Figure 1b, to provide a tube for the heater strip wires.

3. Cut 4' ( $\pm 1/4$ ") lengths of
- a- 14 AWG ETFE/Kapton (current lead wire)
  - b- 22 AWG Teflon EE 16878E/5 (voltage tap wire)

in the colors shown in the table below. (For quadrant definitions, see Figures 2a and 2b.):

| Quadrant | Current Wire                 | Voltage Tap |
|----------|------------------------------|-------------|
| 1        | White / Black, Red Stripes   | Red         |
| 2        | White / Black, Brown Stripes | Black       |
| 3        | White / Black, Red Stripes   | Yellow      |
| 4        | White / Black, Brown Stripes | Blue        |

**Color Codes for Heater Strip Wires (Current and Voltage Tap)**

4. Strip insulation from a 1/2" length section of each wire.
5. Twist stripped sections of wires together into a single bundle.
6. Tin twisted, stripped section of wires using same solder and iron as in Step 1 above.

7. Insert the tinned section of wires into the rolled up heater strip stub. **MAKE SURE THE ORIENTATION OF THE WIRES WITH RESPECT TO THE SLOT IS CORRECT, AS SHOWN IN FIGURE 1c.**

8. Heat the rolled up heater strip stub (with additional solder if necessary) so that the wires and heater strip stub are soldered together.

9. Roll the heater strip stub around wires, and place in the azimuthal slot cut in the G10 insulator (See Figure 3a.)

10. Bend the wires so that they lie in the radial slot (See Figure 3b.)

11. Place a small amount of "green putty" in the locations marked in Figure 3c. **MAKE THE GREEN PUTTY FLUSH WITH THE SURFACE OF THE G10 INSULATOR.**

12. Place 3 mil adhesive-backed kapton tape over the area shown in Figure 3d.

13. Put mylar shrink wrap over approximately 1' of the pair of wires (enough to reach beyond the stainless steel end plate when it is installed.)

14. Label the wires as follows:

current wire - "Quench Protection Heater  
Current"

voltage tap wire- "Quench Protection Heater  
Voltage Tap"

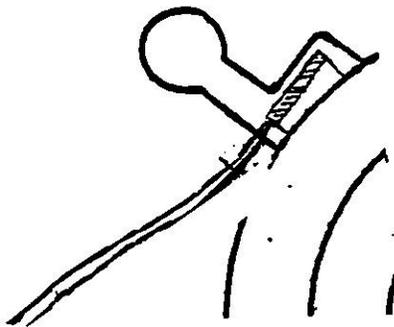


**Figure 1a. Heater Strip Stub**

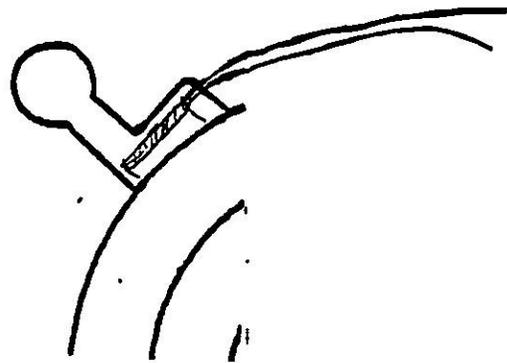


**Figure 1b. Rolled Up Heater Strip Stub**

**Showing Tinned Portion**



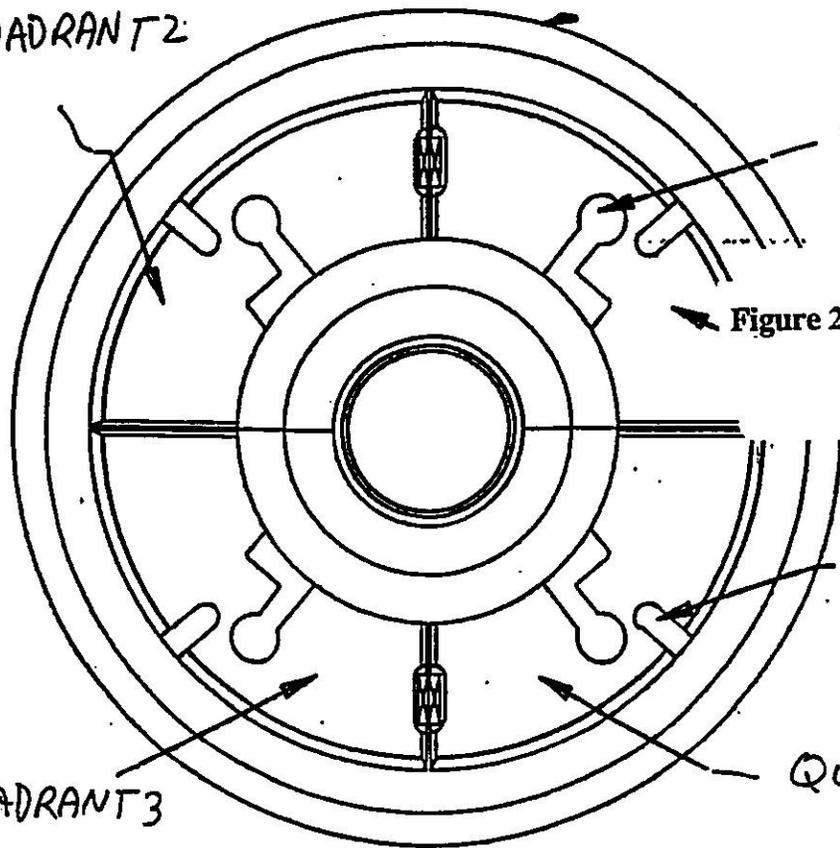
**Correct**



**Incorrect**

**Figure 1c. Correct and Incorrect Orientation of Heater Strip Stub Wires with Respect to Azimuthal and Radial Slots**

QUADRANT 2



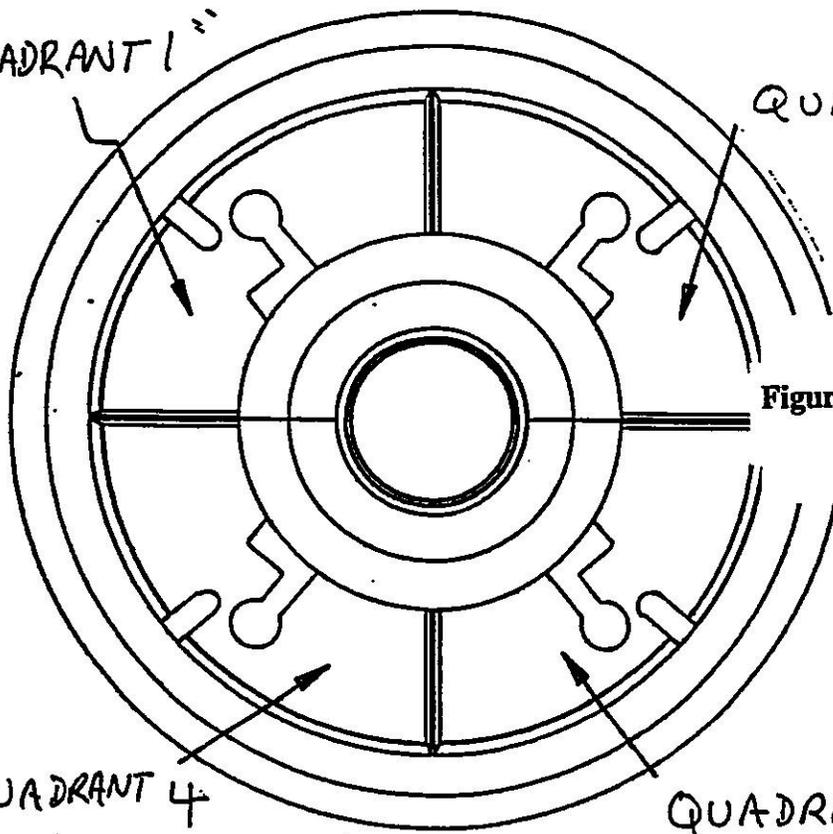
QUADRANT 1

Figure 2a. Lead End View Showing Quadrant Definitions

QUADRANT 3

QUADRANT 4

QUADRANT 1

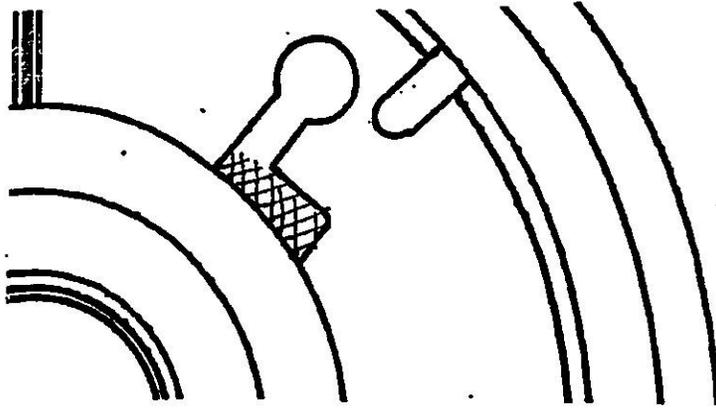


QUADRANT 2

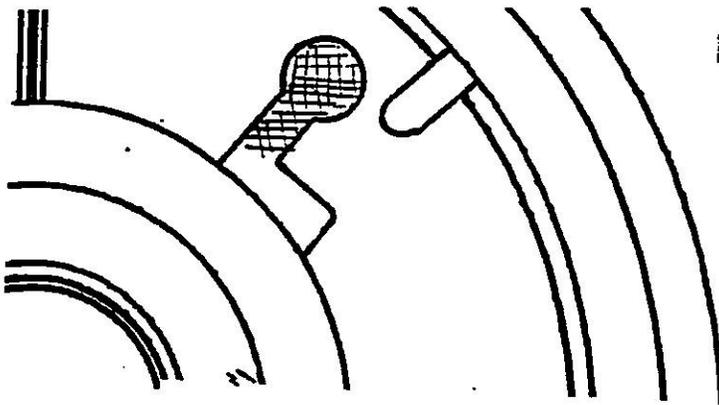
Figure 2b. Return End View Showing Quadrant Definitions

QUADRANT 4

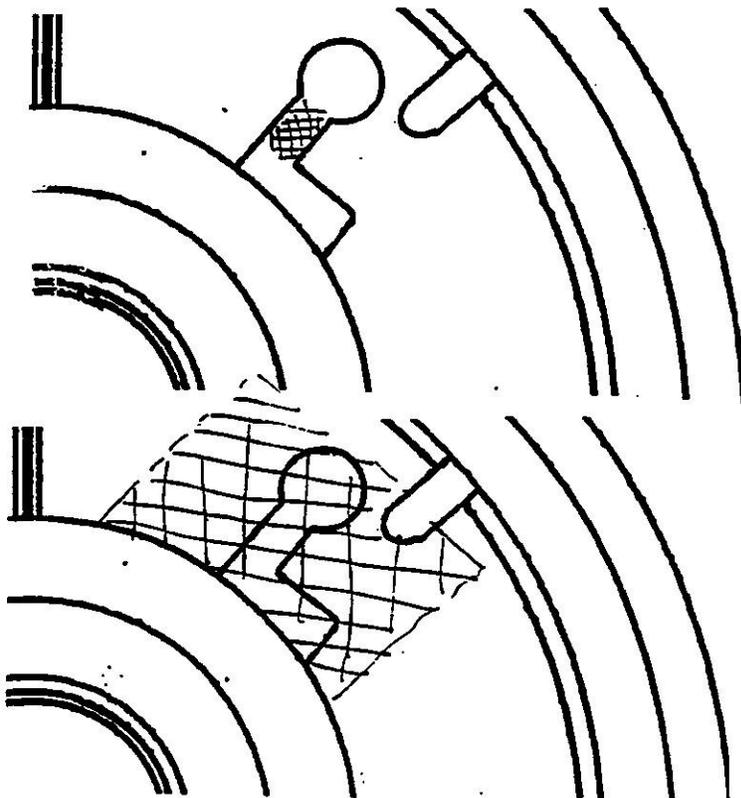
QUADRANT 3



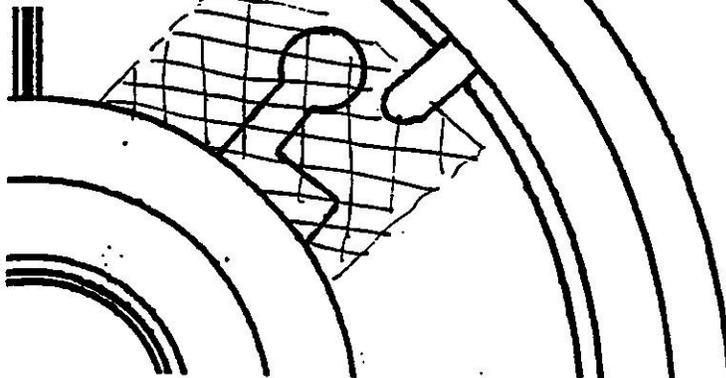
**Figure 3a. Shaded Region is Azimuthal Slot for Rolled Up Heater Strip Stub**



**Figure 3b. Shaded Region is Radial Slot for Heater Strip Wires**



**Figure 3c. Shaded Region is Location for Green Putty**



**Figure 3d. Shaded Region Shows Location of 3 mil Kapton Tape Cover**