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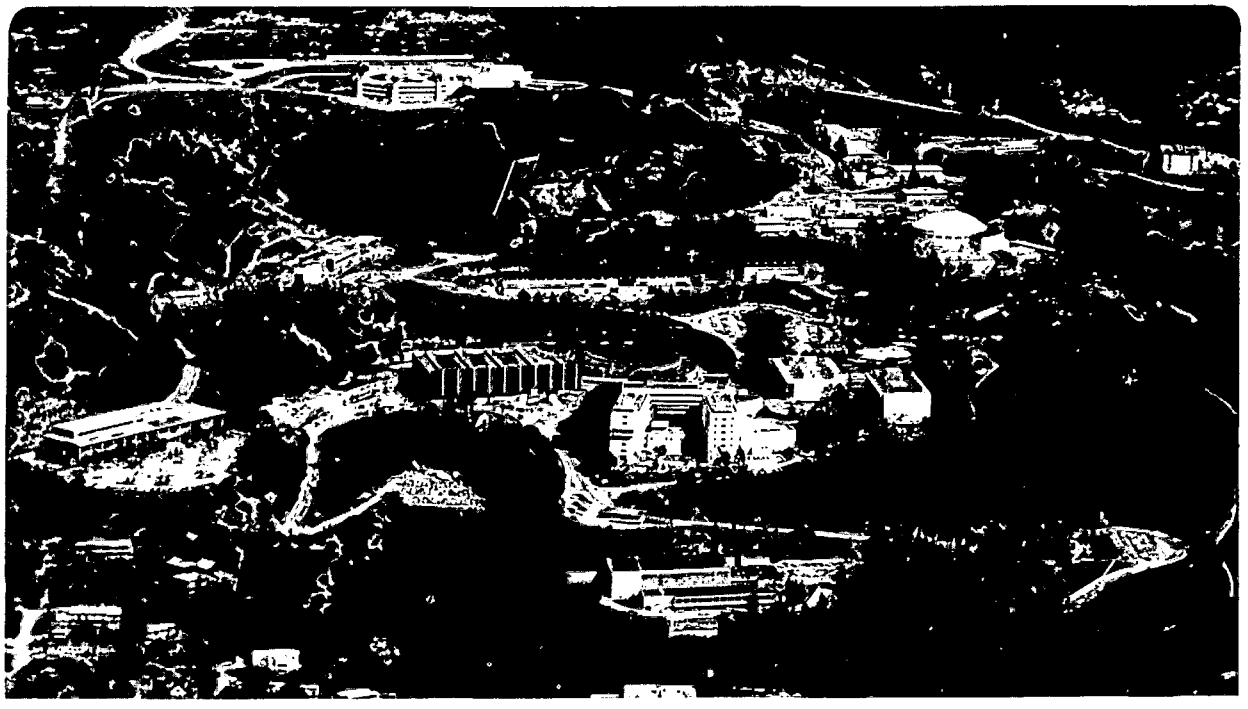

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ENGINEERING NOTE

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P40406	M5425C	1 OF 3

AUTHOR	DEPARTMENT	LOCATION	DATE
FRED PERRY	MECHANICAL ENGINEERING	BERKELEY	JANUARY 28, 1980

PROGRAM — PROJECT — JOB

PEP-4

SMALL COARSE FIELD CAGE

TITLE

CONSTRUCTION PROCEDURE

C Rev. 2/10/81

0. (Assembly Shop) Fill with solder connection between lines on P.C.B. on top and bottom.

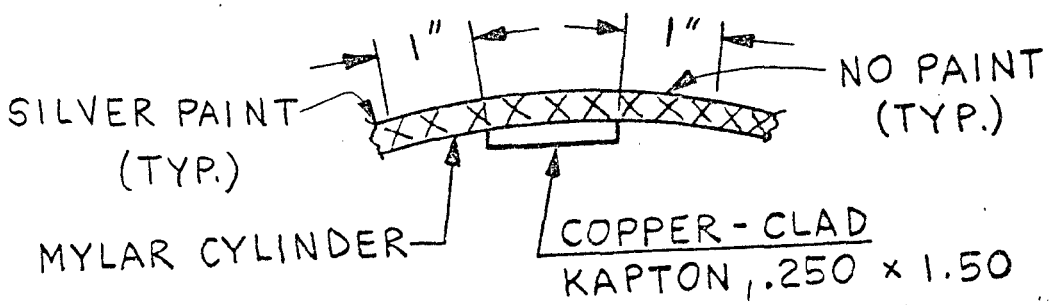
1. (Physics) Hi-pot ring to ring on insulator. Measure and record resistance of central and minor stripes on graded insulation.

2. (Physics) Clean both sides of P.C.B. with ethyl alcohol. After cleaning, always handle with clean gloves.

3. (Physics) Hi-pot board (each ring) before using.

4. (Machine Shop) Trim Mylar insulation to length (Drawing 20C3106). When trimming Mylar insulation to length, machine down to last layer, which is copper clad Kapton. Remove last few layers of Mylar by hand if necessary. (Leave copper clad Kapton and NEMA G-10 cylinder intact).

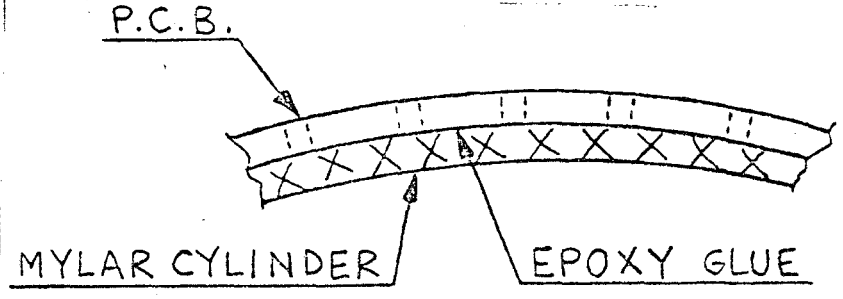
5. (Assembly Shop) Trim copper clad Kapton even with Mylar insulation, except leaving a small tab.



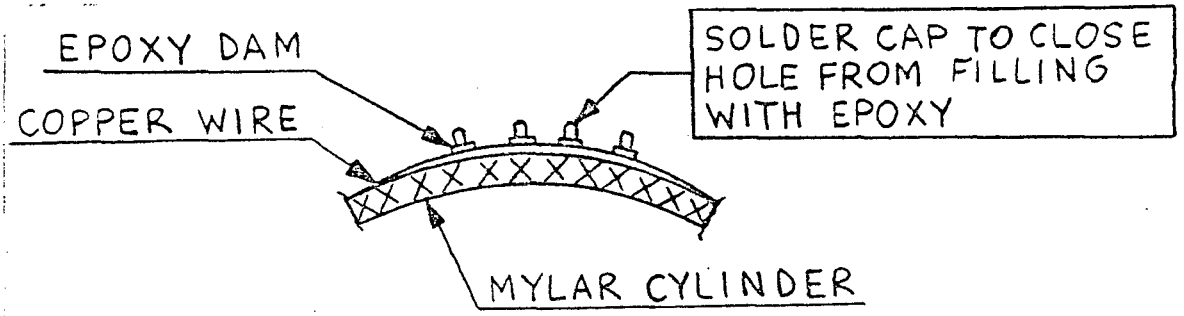
6. (Assembly Shop) Paint trimmed edge of Mylar insulator with conductive silver paint (supplied) except for 1" space either side of copper tap. Check for continuity.

7. (Assembly Shop) Rough up Mylar cylinder, use 320 or 400 garnet paper. Take care not to go too deep or hit silver painted center stripe. Clean cylinder with ethyl alcohol. Take care not to touch silver center line. After cleaning, always handle with gloves.

8. (Assembly) Locate predrilled printed circuit boards on Mylar cylinder, using P.C.B. aligning Bar Drawing 20C6214 taking care of alignment and orientation (Assy. Drawing 20C0046). Epoxy-glue on P.C.B. to Mylar cylinder (take care that no air is trapped between P.C.B. and Mylar cylinder during glueing). No air bubbles.



9. (Assembly Shop) Solder copper wires (supplied) to P.C.B., make sure 5mm spacing is uniform around cylinder, check for continuity. Press in brass tubes in holes. Check for straightness and angularity and solder to pads. Then place drop of solder on top of each tube to close off hole of tube (to prevent epoxy from filling hole during casting). Place a drop of epoxy around each brass tube and pad to form a dam for support.



10. Wrap insulator with .012 x 6" wide fiber glass tape 3/16 thick then place vacuum casting (Drawing 20C0516) cylinder over insulator and dummy rings and seal. Check for vacuum.

10a. Pull vacuum for one day in order to dry out insulator.

11. 100 micron vacuum induce epoxy, cure epoxy at room pressure and a temperature of 80°C (176°F).

12. After curing remove dummy ring and casting cylinder. Check for continuity.

13. Machine cylinder to proper diameter and trim ends to proper length and deburr holes in brass tubes. (DO NOT use a drill to deburr brass tubes, use small counter sink by hand with little pressure.)

13a. Break key in mandrel to partially collapse it.

14. Check for continuity, hi-pot between rings.

15. Outer Kapton preparation:

    a. Measure continuity of each line.
    b. Inspect sections - copper pieces, line width, delamination wrinkles etc.
    c. Cut out bad sections (lengthwise).
    d. Clean with ethyl alcohol.
    e. After cleaning handle with gloves.
    f. Hi-pot each ring.

16. Glue on 20mm spaced copper trace Kapton with epoxy Epon 820, Versamid 140 (no bubbles).

17. Solder in pins and solder to Kapton (with hi-temp solder).

18. Check continuity.

19. Solder wires between pins in same ring; solder copper lines (of same ring) together where Kapton meets itself.

20. Check continuity and hi-pot.

21. Glue on Nema end ring, membrane supports, fine field cage supports etc.

22. Remove mandrel.

23. Glue on stainless steel end rings.

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