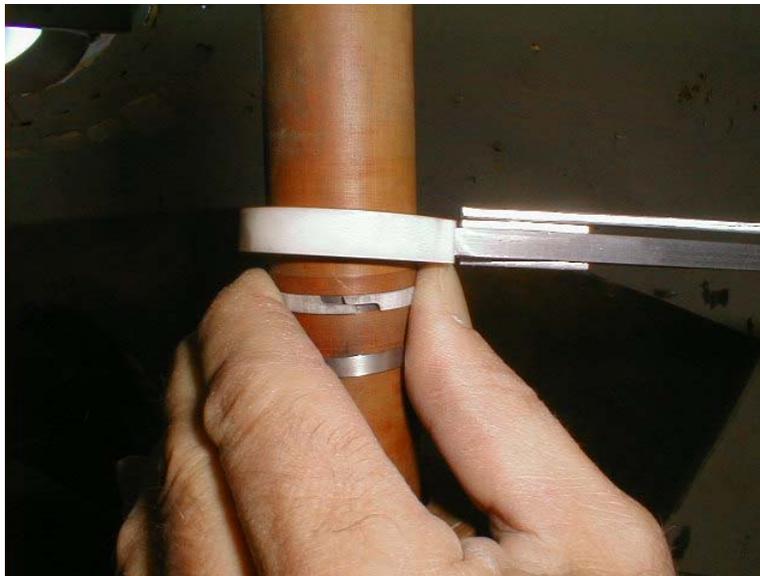


Changing stage3 seal

(Dick Plambeck, 21mar2008)

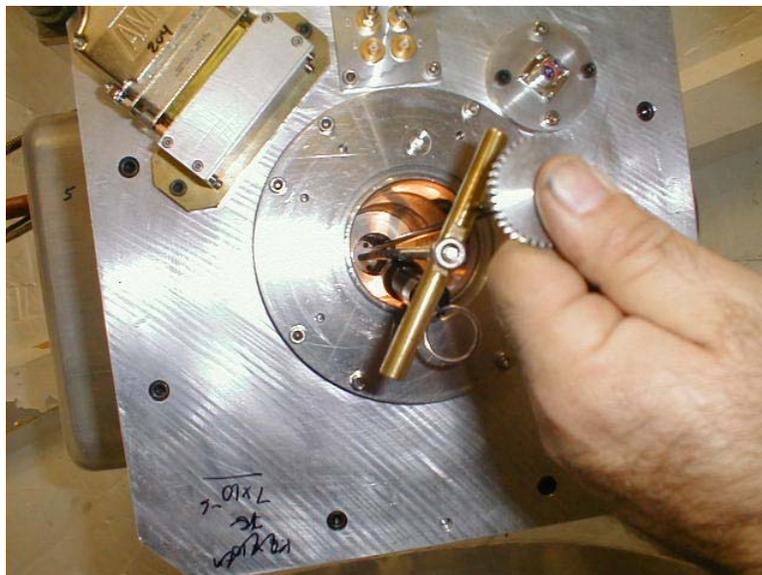
The BIMA refrigerators use a Bal-Seal for the 3rd stage. This seal is installed inside the refrigerator cylinder, not on the displacer. The seal may be changed without removing the dewar from the antenna.

1. Warm up refrigerator, disconnect helium lines, vent both inlet and exhaust lines.
2. Remove six 10-32 screws holding cold head motor onto the cylinder (*not* the screws holding the cylinder onto the dewar baseplate!), pull displacers out of the cylinder.
3. Clean displacers with alcohol and wipes.
4. Reinstall stage2 seal. Compress seal with tool (or roll up a business card around it), slide seal compression ring up over the seal. The seal compression ring is pushed backward when the displacers are reinserted into the cylinder.





5. Remove stage 3 seal using the Mercury-space-capsule shaped tool and long 3-32 hex wrench. Put a long 4-40 screw into one of the two holes in the tool, push the tool into the cylinder and twist until the dowel pin(s) snap into place – the screw holes should now line up. Tighten the long 4-40 screw to connect the stage 3 seal clamp ring to the tool. Then loosen all six 4-40 screws holding the clamp ring in place and remove the tool, with clamp ring attached, from the cylinder.



6. Clean inside of cylinder with Kimwipes (wrap around a long wooden stick) and alcohol. Blow out alcohol and any debris with air or helium.
7. Push the worn seal out of the clamp ring and clean the clamp ring. Save the screws (4-40 x 5/16 alloy steel) and lock washers, or replace with new.

8. Push a new Bal-Seal onto the tapered aluminum tool, then push it into the clamp ring until it snaps into place. Place the clamp ring seal side down on the white plastic block, insert 4-40 screws and lock washers into all 6 holes.



9. Now push Mercury tool into the clamp ring, locating it with the dowel pin(s).



10. Insert the Mercury tool and clamp ring into the cylinder. Rotate until dowel pins snap into place. Use long 3/32 wrench to tighten all six 4-40 screws uniformly.
11. Remove Mercury tool.
12. Pump out cold head or flush many times with helium. Be careful not to run the cold head motor if cold head is evacuated – windings may arc. Fill with helium and cool as usual.

