

VLBA Electronics Memo No. 27

NATIONAL RADIO ASTRONOMY OBSERVATORY
Charlottesville, Virginia 22903

October 31, 1984

MEMORANDUM:

TO: Model 22 Users
FROM: H. Dill
SUBJECT: Symptom Notes for the Model 22

Two recent overhauls of Model 22 refrigerators have provided some useful insight into some of the inherent problems of the Model 22's design. Excessive wear was apparent on the carbon bushings. Brass particles were found in addition to the carbon particles from the bushings inside the drive assembly housing. Wear was also noted on the disk that holds the eccentric bearing to drive the yoke block, and on the yoke block. In order to determine the exact cause of the wear problems, several items should be noted whenever a future refrigerator is overhauled.

Some definitions need to be determined before any further details are presented. A front view will be defined as looking at the refrigerator with the cold station pointing down, and the motor pointing away from the viewer. (In the Model 21 this would be looking in the glass window with the helium lines off to the left.) A top view is defined as looking down at the motor with the helium lines to the left and the cold station pointing away from the viewer. Top, used to refer to bushings, will designate the end farthest from the cold station.

The bushings in one of our units were worn along the side that would be ten o'clock from the top view. The top bushing showed the most wear, and both bushings showed wear along the same side. In addition to wear on the bushings, there was also wear of the brass sealing cap that closes off the top bushing port. It is this wear that seems to be generating the brass debris.

The yoke and eccentric mount seems to rub as the yoke block pivots about the shaft axis. This wear dust, along with the carbon from the bushings and the brass dust, created additional abrasives to do more damage elsewhere in the system.

When disassembling a unit, there are several items to note. The first item involves the sealing cap. It should be marked with reference to the drive housing so that its assembled orientation can be determined after it is removed. The orientation of any wear inside the cap should be noted. This will aid in determining where the wear on the cap is in relation to the wear on the bushings. If the cap is causing the side loading, the wear on the cap would be opposite to the wear on the bushings, and if the cap and bushing are worn on the same side, then something else is causing the side loading.

The orientation of the bushing wear should also be noted. If this orientation varies from unit to unit, then the problem is probably due to an assembly error, but if the wear is in the same location, then the error is probably in the design.

The hours that a unit has been run and any other noticeable wear patterns or looseness in the system should also be noted. In addition, any service or replacement of parts should be noted.

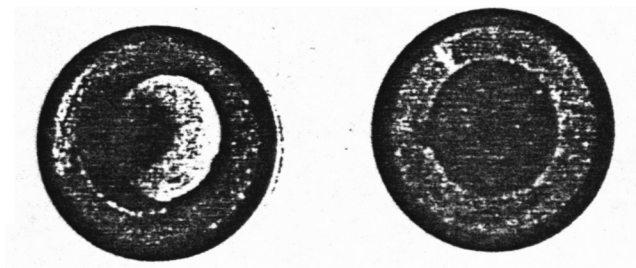
With careful inspection of each unit and well-monitored records of their operation, we can determine the performance and reliability of the Model 22 refrigerator.

Distribution:

H. Brown (Bendix)
J. Cochran
T. Henderson
R. Latasa
D. Williams

Attachment

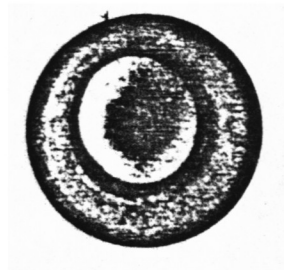
MODEL 22 REFRIGERATOR
SERIAL # 11693291



TOP
(SHORT)

BOTTOM
(LONG)

10-30-84



TOP (SHORT) BUSHING
10-30-84