Velcro pile pad was bonded to the Kapton bag and the Velcro hook strap was bonded to the Kapton flaps. The bond of the Velcro pads for both flaps had already failed before the Lunar Module Pilot configured the receiver at the end of the first extravehicular activity, thus resulting in dust accumulation on the mirror surface under both flaps. The bond of the Velcro pads to the Kapton failed, leaving no trace of the adhesive on the Kapton, and the pads remained attached to the straps. The polyurethane FR-127 A and B bonding material used was acceptable and recommended for bonding Velcro to Kapton. The failure most likely resulted from a weak bond caused by improper bonding preparation or procedure. The mixing and timing of the bonding application and mating are critical, as well as maintaining the surface free of contamination.

This experiment is not scheduled for a future mission; however, similar bonding configurations will require stringent quality control of the bonding process.

This anomaly is closed.

15.4.3 Lunar Ejecta And Meteorite Experiment Temperature High

The temperature of the lunar ejecta and meteorite experiment was higher than predicted during the first and second lunar days (fig. 15-21). The high temperatures occurred with all combinations of experiment modes: on, off, and standby, with all dust covers on, with only the sensor covers on, and with all covers off. Whenever the experiment was in the "operate-on" mode, the science data indicated normal operation of the experiment. The maximum allowable temperature for survival of the electronic components has not been exceeded, however, it was necessary to command the experiment from "operate-on" to "off" at a sun angle of about 153 degrees during the first lunar day and at a sun angle of about 16 degrees during the second lunar day. Following sunrise of the second lunar day, the temperature rose from 0° F at 0° sun angle to about 168° F at 15° sun angle (fig. 15-21). The instrument was commanded to standby and then to off because the temperature continued to rise. In the off mode, with no power to the instrument, the temperature rise rate was lower.

The experiment temperature was cooler during the morning of the third lunar day as compared to the second. This could be attributed to the procedural change which turned the experiment off for 1 1/2 hours through sunrise and sunset. Data from the suprathermal ion detector and charged particle lunar environment experiments, deployed on previous Apollo missions, indicate that a flux of -100 to -750 volts can occur near the optical terminator (before optical sunrise and after optical sunset). During the lunar day, the surface is stable with photo electron layering at

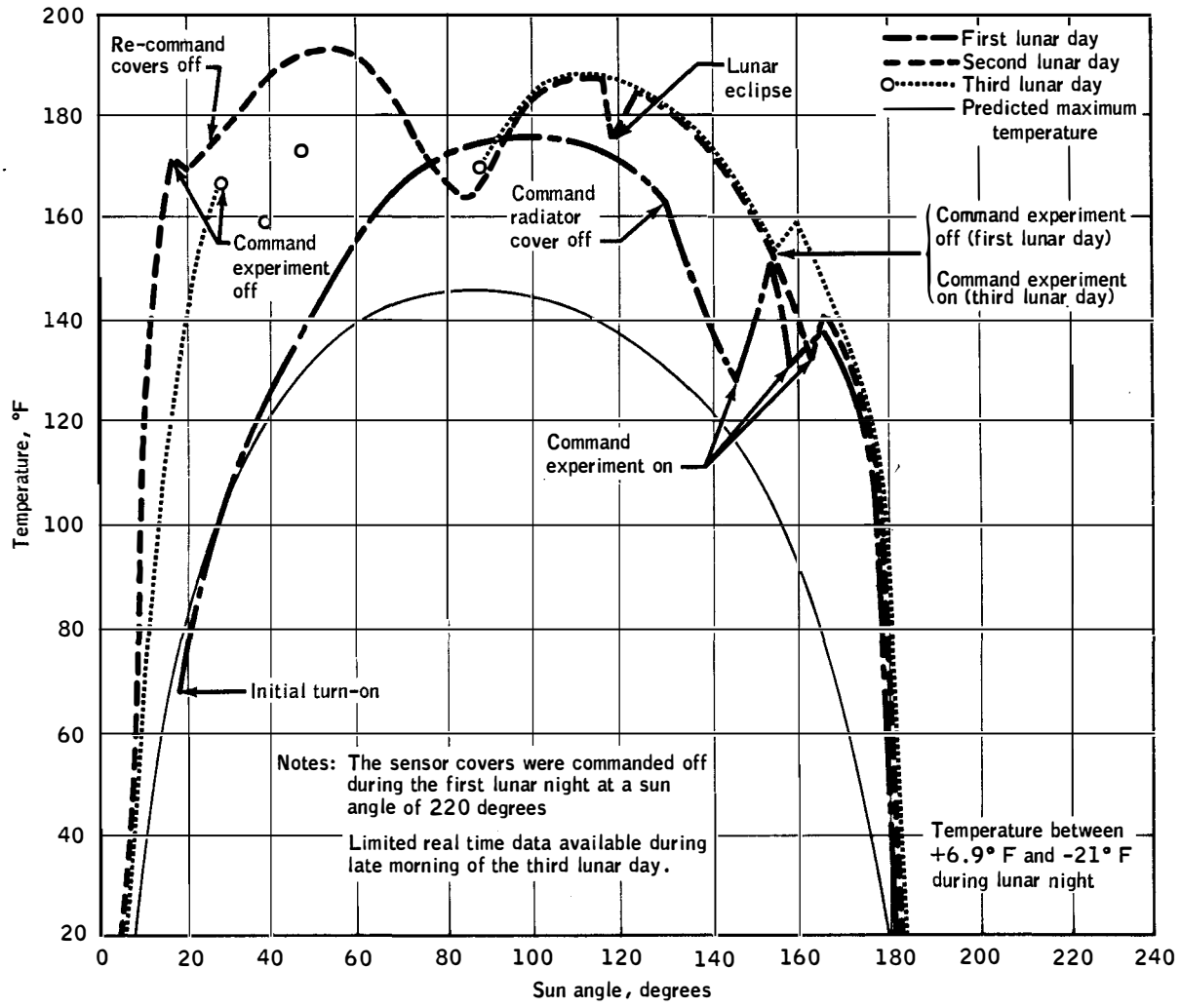

Figure 15-21.- Lunar ejecta and meteorites experiment temperature data.

+10 to +20 volts. It is postulated that when the experiment is on (sensor film at -3 volts and suppressor grid at -7 volts), the charge differential observed at these times may result in an accretion of lunar dust on the east and west sensors. Based on this, the experiment was turned off each sunset and sunrise after the second lunar day. The presence of dust on the sensor film and grid would degrade the thermal control system and result in higher experiment temperatures during the lunar day.

The current thermal profile permits experiment operation for 100-percent of the nighttime and 30 percent during the lunar day. If the thermal profile does not improve, consideration will be given to thermal testing on the qualification unit to ascertain whether or not the temperature limits can be raised to permit additional daytime operation. Preliminary

results from an examination of the science data indicate that the instrument is operating properly.

Since the experiment is not scheduled for future missions, no corrective actions will be taken.

This anomaly is closed.

15.4.4 Cask Dome Removal Was Difficult

The Lunar Module Pilot was not able to remove the cask dome with the removal tool.

The socket on the removal tool can engage the nut on the dome before the pins on the tool lock into the recess in the dome (fig. 15-22). The Lunar Module Pilot did not verify that the pins were locked. In this configuration, rotating the tool clockwise will rotate the nut on the dome. A 90-degree rotation of the nut releases the dome retaining straps, as noted by the crew. This release allows the dome to rotate when the tool is rotated another 60 degrees, thus disengaging the threaded dome/cask interface. However, with the pins not locked into the dome recess, the dome could be cocked, but not withdrawn. The dome was easily wedged off the cask with the hammer. The sequence can be duplicated with either broken pins or by incomplete insertion and locking of the tool pins.

No further investigation will be performed since the cask will not be flown on future missions.

This anomaly is closed.

15.4.5 Background Noise in the Lunar Atmospheric Composition Experiment Data

A zero offset was noted in part of the lunar atmospheric composition experiment data on the mid-mass and low-mass channels (fig. 15-23), and occasionally on the high mass channel. This offset was the result of background noise in the detector system. The condition is stable and has caused no loss of data. However, it will require additional processing during data reduction.

Analysis of the data and the sensor circuit indicates that the offset is the result of electronic noise coupling between the unshielded high voltage wires (fig. 15-24) and the unshielded collectors in the sensor package. Commands to either of the sensor ion sources or the sensor electronic multipliers does not affect a change in the offset; however, the presence of the offset is affected by the voltage level to the sensors (fig. 15-23).