of the beam and function of the instrument. However, the spring constant of the mass spring considerably reduces the sensitivity of the system.

This anomaly is closed.

15.4.2 Surface Electrical Properties Receiver Temperature Higher Than Predicted

The receiver temperature was about 5° F less than normal at the end of the first extravehicular activity as shown in figure 15-19. However, during the rest period between the first and second extravehicular activities, the temperature rose to 80° F instead of dropping to about 28° F

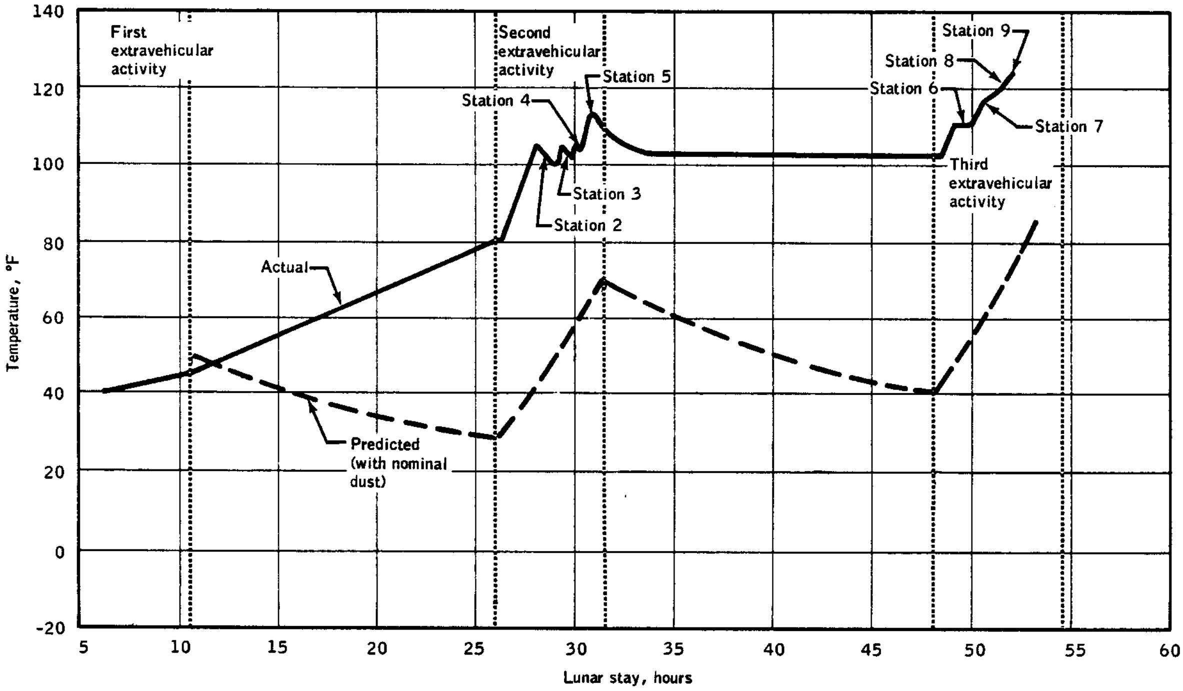

Figure 15-19.- Surface electrical properties experiment receiver temperature data.

as predicted. Between the second and third extravehicular activities, the temperature dropped about 8° F instead of the expected drop of about 50° to 60° F.

The receiver was protected by a multilayered aluminized Kapton thermal bag (fig. 15-20). The thermal bag had two flaps which protected the optical solar reflector (mirror) on top of the receiver from lunar dust accumulation. A dust film of about 10 percent on the mirror surface could result in the indicated degradation of thermal control and a film of this amount may not be apparent to the crew.

Folding back one, or both, flaps during rest periods was to result in cooling of the receiver by radiation of heat energy to deep space. With normal system efficiency, and the experiment turned off, opening the tab A cover (fig. 15-20) at the end of the first extravehicular activity should have resulted in the predicted temperature drop to about minus 14° F by the start of the second extravehicular activity. Opening both the A and B flaps was provided for contingencies requiring more rapid cooling. This procedure was used throughout the remainder of the mission when the lunar roving vehicle was not in motion.

Cover design depended upon Velcro straps and pads to hold the Kapton flaps tightly closed to keep out dust and sunlight (fig. 15-20). The

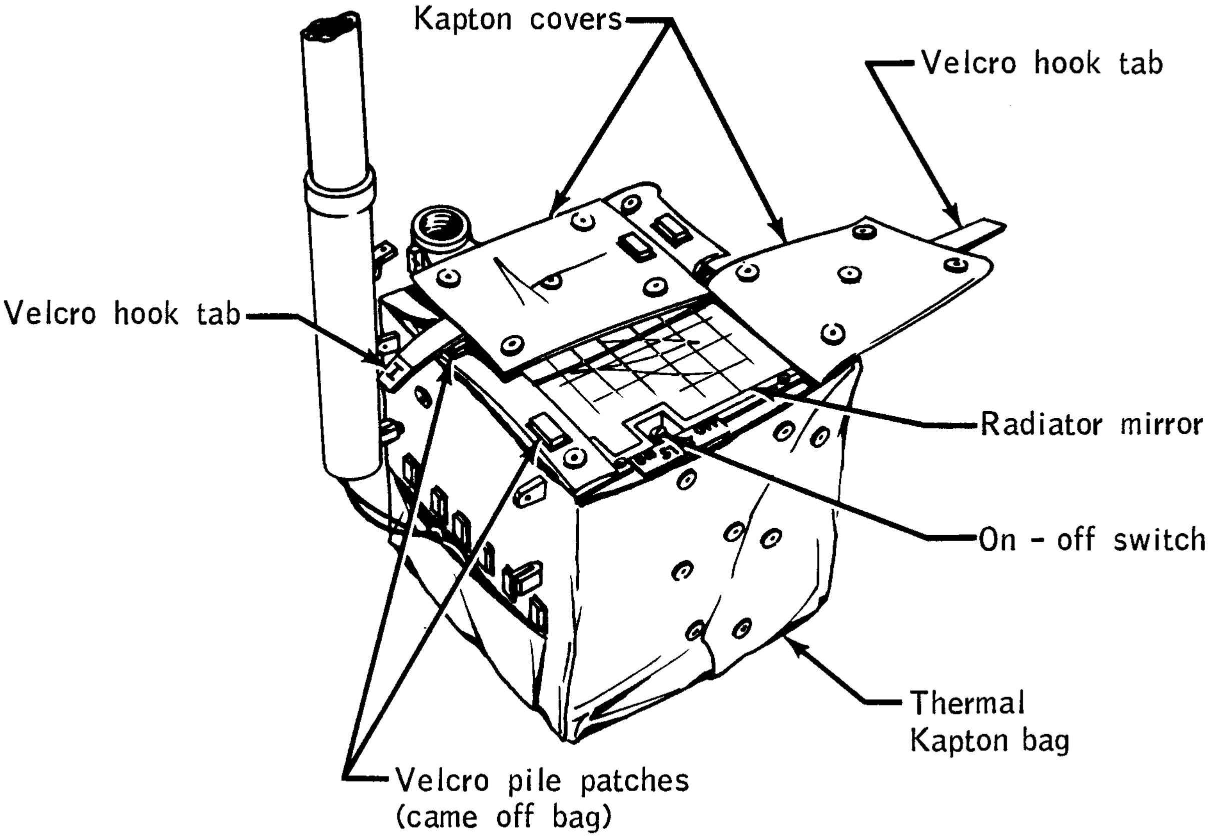

Figure 15-20.- Surface electrical properties experiment receiver.

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