

Apollo 13, April 1970

At the Goldstone Manned Space Flight Network station the Unified S-band group was divided up into four operating crews, designated A, B, C and D. For mission support two crews worked at the Apollo Prime station while the other two crews were assigned to the DSS-12 Pioneer station. This provided a complete backup means of communicating with the Apollo spacecraft during the lunar missions.

For the Apollo 13 mission my C-crew drew the second 12-hour shift at the DSS-12 Wing station. This meant that we would be responsible for the tracking of the Instrument Unit package attached to the third stage S-IVB rocket until it impacted the Moon. This should occur shortly after the Command and Service module, and its attached Lunar Module, would enter lunar orbit. Then we would turn the 26-meter diameter Pioneer big dish to begin tracking the Lunar Module, which operated on the same 2282.5 MHz downlink.

By the afternoon of April 13, the second day after the Apollo 13 launch, the Pioneer station settled into a rather uneventful routine. It was a clear spring afternoon when the C-crew worked our way up the winding road to the station. At the guard gate "Pioneer," the half-Coyote, half-German Shepard, station mascot, welcomed us. The diesel generators in the power plant building were puffing away and the big dish was tipping over in the western sky following the S-IVB on its way out.

After we put our lunches in the refrigerator we relieved the early shift and settled down for a quiet afternoon and evening tracking the Instrument Unit on the S-IVB. As was his routine, Ed Smith, the intersite microwave engineer, had the mission "air-to-ground" voice circuit up on monitor speakers so the crew could keep up with what was going on at the Prime site and between Houston and the Apollo 13 crew.

Things were very quiet, even boring until 7:07 Pacific Standard Time. Then something caused the Prime station to lose lock on the CSM downlink. When a weak signal was reacquired I heard Jim Lovell say, "Houston – we have a problem!" Thus started the crises aboard Apollo 13.

At the Pioneer station all we could do was to continue our tracking of the S-IVB. A few minutes later, after Houston realized the Service Module was dying, the crew fired up the Lunar Module to use as a lifeboat so the crew might possibly make it back Earth. Soon the Prime station was directed to bring up their backup S-band system on the Lunar Module 2282.5 MHz downlink.

Tom Jonas, our crew Receiver-Exciter lead engineer immediately said that we would have to keep our two-way lock on the S-IVB 2282.5 MHz link away from the Lunar Module's S-band transponder or we would end up locked on both spacecraft at the same time. We could see both carriers on our spectrum display units.

Then the Houston MSFN controllers requested that Goldstone move the Lunar Module downlink to the other side of the S-IVB downlink to allow for expected Doppler changes. Tom Jonas yelled to me "that is not going to work! We will end up locking both spacecraft to one uplink and wipe out the telemetry and voice contact with the crew."

I jumped on the station intercom circuit and strongly requested Bill Sheridan, the station M&O Console operator, to tell Houston what will happen. Bill tried to do this but the

Houston controller insisted that we follow his instructions to switch the S-IVB and the Lunar Module downlink frequencies.

So, in spite of our strong objections, we set about tuning our S-IVB uplink frequency while watching the two downlinks converge on the spectrum display until they became one blip. At that time Houston lost telemetry data from both the S-IV and the Lunar Module and voice communications with the crew.

Luckily the big 64-meter DSN Mars antenna was in the process of switching from a Deep Space track over to the rapidly changing Apollo 13 emergency. The much narrower beam width of the big dish allowed the Mars station S-band crew to discriminate between the S-IVB and the Lunar Module downlinks on exactly the same frequency. Once things settled down both voice and telemetry links were restored.

Thus the situation stabilized until it was time for us to hand this “mess” over to the Honeysuckle Creek MSFN station in Australia. After much haggling with Goddard Space Flight Center Honeysuckle was able to devise a working procedure to separate the two spacecraft from one another until the S-IVB impacted the Moon.

The rest of the mission was spent chewing our fingernails and pulling very weak signals out of thin air. All station personnel breathed a collective sigh of relief when the crew finally descended to the Pacific Ocean on three good parachutes.