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Satellite 1965-16 D Spinup

On 29 March, the telemetry data from Satellite 1965-16 D indicated that the spin rate of the satellite had been increased from 77.4 rpm to 135.9 rpm. Examination of available data indicated that the spinup occurred during orbit number 268 after the satellite had passed the reception and command range of the Hybla Valley ground station and before it arrived into reception range of orbit number 269.

On 13 April, a magnetic tape containing the telemetry data of pass 268 recorded by the NASA station at Winkfield, England was received. A strip chart record was made for analysis.

The spinup occurred during pass 268 on 29 March at 003717Z right above Iceland. Data previous to 003710 indicate normal telemetry data with no DL amplifiers operating. Following this, the first group of Relay Position Indicators in the 8 second frame show that the satellite has received the four address commands. The telltale on segment 16 indicates that some command is being received. The length of time of the telltale indicates manual operation of command. Approximately one second later, the satellite simultaneously received the command for spinup and the command to change the aspect circuitry from pulse width to pulse position operation. These are two new commands because these commands are effective immediately upon reception and the exact time is determined by the changes in the single mode of data presentation in Ch. 5, 6, 7 and 8. About 1.7 seconds later, a command was received to change the aspect circuitry from pulse position back to pulse width operation.

During the second group of RPI, 3.3 seconds after the last command, the execute command was received and the one-half second receive telltale is evident. This again indicates manual operation.

The third group of RPI shows that DL 3 and 4 are operating in the alternate mode. Data from the rest of the pass indicates that no other command was received.

Reception of the command that switches the pulse aspect system type of operation also switches the output of one of two detectors to the input of the sensitive amplifier in Channel 6. The resultant transient surge saturates the amplifier which remains in this state for approximately 20 seconds.

When the pulse width operation is switched to pulse position operation, the output of the detector that is sensitive to wavelengths of 0.5-3A is switched to the output of a detector that is sensitive to wavelengths of 2-8A. Reception of another aspect command simultaneously returns both operations to the previous mode. Saturation occurs with every change.

The information on Channels 6 and 7 is thought to be due to rotation of the satellite in a magnetic field.

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The reception of the correct address commands over Iceland signifies that the satellite operation was probably controlled from a station in [redacted] by NRL trained personnel. The available command encoder is capable of generating 10 tone pairs for automatic or manual operation. Desired tone pairs are selected by rotary switches. Up to ten tone pairs can be utilized by automatic operation in less than two seconds or each tone pair can be transmitted when desired. Great care must be exercised so that the correct tone pairs are selected and that selection is not made with the encoder connected to the operating transmitter. If the first tone switch remains on L while the second is turned consecutively to I, J, and K, the following commands LI (Fire Rockets) LJ (pulse position) and LK (pulse width) will be sent. These were the received undesired commands noted on the data.

Another explanation of erroneous reception might be the presence of stray tone pairs from unknown sources that occur after the satellite has been properly addressed. However, it seems unlikely that this would occur three times in less than two seconds.

A message has been dispatched to the suspected station requesting information in regards to transmitted commands during this pass. It is hoped that the reply may clear up the problem of commands performed by the satellite.

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