JPL Doppler File Format Description

Glen Langston
93 August 23

OVERVIEW

This memo describes a phone conversation between Gene Goltz [1] at JPL and myself (Glen Langston) on 1993 August 18, concerning the Doppler file format used for satellite orbit determination. Gene Goltz kindly returned my call concerning questions about the NASA/JPL document entitled "DSN Tracking System 26-M and 9-M Antenna DSN Tracking Data Interface", with code number TRK-2-30. That document specifies Variable Data Blocks (VDBs), which are normally used to transmit Doppler data. The VDBs consists of 4800 bit blocks. Each block has three major components, *1)* a header/block identifier, *2)* data, called a Block Information Field (BIF), and *3)* error correction codes. My question concerned whether the header data and error correction needed to be transmitted to JPL.

Gene Goltz indicated that an internal JPL DSN Navigation Group file format call System Performance Record (SPR), would be more convenient for both JPL and the Green Bank Earth Station (GBES). Since the GBES will be communicating with JPL via Internet, the header and error correction information are not needed.

At the end of each satellite tracking pass, the GBES will create a file in the SPR format containing the doppler tracking information.

System Performance Record (SPR) Format

The SPR format file contains only the Block Information Fields (BIFs) of the Variable Data Blocks (VDBs).

The BIF data have a number of different allowed formats and lengths, but the GBES will always generate "Radio Metric Data: HRDR Recall Data" (Data Type 7). The SPR format consists of 112 fixed length BIF records, where each BIF record consists of 576 bits. However the Data Type 7 BIFs are 420 bits long and will be left justified into a zero filled logical record 576 bits long (*ie.* there will be 156 zero bits between BIFs). The total block length is 64512 bits, which is 8064 bytes. If the Doppler data do not contain a multiple of 112 BIF records, the last SPR record will contain zeros in all the unused BIF records.

The 42 fields in a BIF Data Type 7 record are described in TRK-2-30. The fields relevant to the GBES DopPost offline program are described in the DopPost Design document.

The Doppler file will be placed in the GBES anonymous ftp directory where it will be available to JPL and other orbit determination centers. The Doppler file will have an name identified by the satellite and tracking pass start time.

[1] NRAO contact at JPL questions concerning the the content of the Doppler file is Jordan Ellis, (818-354-2788), a contact for format questions is Gene Goltz, (818-354-7066), JPL Mail Stop 301-276, Fax: 1-818-393-6558