DATA SET CATALOG # 115

OGO -2 Ephemeris

65-081A-00D 1 tape
65-081A-00E 1 tape

May 12, 1971

MEMORANDUM

TO: J. Johns
F. Richter

FROM: L. Dubach

SUBJ: Data Sets 65-081A-00D and 65-081A-00E

In reviewing data sets 65-081A-00D (tape no. DD206) and 65-081A-00E (DD1001) from OGO 2, with F. Richter, it was determined that these are less accurate and more abbreviated forms than are available from refined world maps on hand. Determination was made from file correspondence and from a phone call to the contact, J. H. Steffel (Computer Sciences - 533-8877, ext. 562, or GSFC ext. 2296). Request these tapes be removed from our files.

LD
L. Dubach

65-081A-00D
OGO-2 EPHEMERIS

This data set consists of one 556 BPI, BINARY, 7-track tape created on the IBM/7094. Each record, both header and logical, appears as two records in a dump of this tape, the first record being 256 words long, and the second record being 200 words long. The first word of each record is a control word which indicates the length of the record.

D#	C#	Start	Stop
D-01009	C-01191	10/14/65	10/3/67

65-081A-00E
OGO-2 EPHEMERIS

This data set consists of one 556 BPI, BINARY, 7-track tape created on the IBM/7094. Each record, both header and logical, appears as two records in a dump of this tape, the first record being 256 words long and the second record being 200 words long. The first word of each record is a control word which indicates the length of the record.

D#	C#	Start	Stop
D-00206	C-00090	10/14/65	12/22/66

Note: The header data stop time is erroneous.

UNITED STATES GOVERNMENT

Memorandum

TO : Data Center

DATE: August 15, 1967

FROM : J. Staffel

SUBJECT: OGO-2 Data Note No. 4 "Orbital Ephemeris Tape"

We are transmitting herewith a compressed orbital tape and position retrieval program using orbits supplied to us by Dr. Siry, June, 1967. We understand that these orbits are not final since they fit the SAO optical data to only about one minute of arc and were fit to range data which did not have the final time corrections. It is expected that later orbits will be available to replace the positions given and that further information will be available concerning orbital accuracy. We are thus supplying these data as being of possible value to users of OGO-2 data without assuming responsibility for the accuracy of the positions given.

Generation of Orbital Ephemeris Tape

The orbital ephemeris tape is a conversion from and a condensation of several minute vector tapes. (See AOPB Systems Manual [X542-66-291], Jones, 1966, p.112, for minute vector tape formats). The values of X, Y, and Z in celestial coordinates at one minute intervals from the minute vector tapes were converted to X, Y, and Z earth-fixed* geocentric values at two minute intervals using the following relationships:

λ = SIDT + (FJD-EDAY)*0.01720214 + FJDT* 6.3003874

XG = X cos λ + Y sin λ

YG = Y cos λ - X sin λ

ZG = Z

X, Y, Z - celestial coordinates (X to vernal equinox)

XG, YG, ZG - earth-fixed geocentric coordinates

SIDT - apparent sidereal time in radians

EDAY - coordinate system reference date time

*X is to Greenwich meridian
X-Y is in plane of instantaneous equator
Z is to instantaneous north pole

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FJD, FJDT - modified* Julian day and day fraction

All values of $\dot{X}$, Y, and $\dot{Z}$ contained on the minute vector tapes were eliminated along with all time intervals for which no magnetic field data were available. (See Tables 1 and 2 for listing of time intervals used on present tape and Figure 1 for tape format.)

Use of Tape

Two programs (EPHM and STIR) have been written to provide the user of this ephemeris tape with a rapid and accurate means of obtaining an X, Y, Z value for any given time. (See attached program descriptions, listings, and flow charts for exact operation of EPHM and STIR.) Subroutine EPHM will locate the record whose time interval includes the desired time, and routine STIR will perform a five-point Stirling interpolation to provide values at the exact time requested. An error flag is provided to indicate an invalid time request or the absence of data at the desired time.

J. H. Sterrel
Fields & Plasmas Branch

*FJD = JD - 2400000.5

GEOCENTRIC EPHEMERIS TAPE FORMAT

Word #	Header Record	
1-2	Satellite Identification (BCD)	
3-4	Data Start Time	Double precision modified Julian day and day fraction
5-6	Data Stop Time	
7	Data Interval (Δt)	(Time between data points - floating fraction of day)
8-454	Vertal ID	(BCD)

Word #	Data Record	
1-2	Data Start Time	Double precision modified Julian day and day fraction
3-4	Data Stop Time	
5-154	X Data (km)	First & last 2 points are overlap
155-304	Y Data (km)	Start and stop times apply to 3rd and 148th points
305-454	Z Data (km)	Missing data filled with nines All values are floating point

X, Y, Z is earth-fixed geocentric coordinate system with X to Greenwich meridian, X-Y in plane of instantaneous equator, Z to instantaneous north pole.

This tape was written on an IBM 7094 with Fortran binary write statements.

Figure 1. Format of Orbital Ephemeris Tape