DATA SET CATALOG #88

OSO - 3

Celestial Gamma-Ray Detector

67-020A-01A 19 tapes

67-020A-01A

OSO-3 CELESTIAL GAMMA-RAY DETECTOR

This data set consists of 19 BCD, 7-track, 556 BPI tapes. Each tape contains one file and they are IBM 7094 compatible. Each physical record contains 100 logical records. The logical records are 80 character card images. The time spans for the tapes are:

| TAPE NO. | | START TIME | STOP TIME |
|---|---|---|---|
| D-2393 | (C-1858) | 03/08/67 | 05/17/67 |
| D-2394 | (C-1859) | 05/17/67 | 07/21/67 |
| D-2395 | (C-1860) | 07/21/67 | 09/24/67 |
| D-2396 | (C-1861) | 09/24/67 | 12/18/67 |
| D-2397 | (C-1862) | 12/18/67 | 03/06/68 |
| D-2398 | (C-1863) | 03/06/68 | 05/26/68 |
| D-2399 | (C-1864) | 05/26/68 | 06/28/68 |
| D-2400 | (C-1865) | 03/08/67 | 04/20/67 |
| D-2401 | (C-1866) | 04/20/67 | 05/29/67 |
| D-2402 | (C-1867) | 05/29/67 | 07/07/67 |
| D-2403 | (C-1868) | 07/07/67 | 08/14/67 |
| D-2404 | (C-1869) | 08/14/67 | 09/22/67 |
| D-2405 | (C-1870) | 09/22/67 | 11/12/67 |
| D-2406 | (C-1871) | 11/12/67 | 12/20/67 |
| D-2407 | (C-1872) | 12/20/67 | 01/28/68 |
| D-2408 | (C-1873) | 01/28/68 | 03/08/68 |
| D-2409 | (C-1874) | 03/08/68 | 04/16/68 |
| D-2410 | (C-1875) | 04/16/68 | 05/24/68 |
| D-2411 | (C-1876) | 05/24/68 | 06/28/68 |

The original tapes in this data set were processed at M.I.T. on an IBM 360/65 computer.

OSO-3

CELESTIAL GAMMA-RAY DETECTORS

FORMATS

If the ID (which is located in columns 69-72 of each logical record) is equal to either 3500 or 4500, the format for that record is as follows:

| COLUMN | ID | DESCRIPTION |
|---|---|---|
| 1-3 | DAY | DAY NUMBER WITH JANUARY 1, 1967 = DAY 1. |
| 4-10 | SEC | SECONDS OF DAY IN UNIVERSAL TIME |
| 11 | | BLANKS |
| 12 | MODE | |
| 13-16 | RAA (1) | EVENT RIGHT ASCENSION #1 |
| 17-20 | DECL (1) | EVENT DECLINATION #1 |
| 21-24 | RAA (2) | EVENT RIGHT ASCENSION #2 |
| 25-28 | DECL (2) | EVENT DECLINATION #2 |
| 29-31 | FLAT | LATITUDE ON EARTH WHICH SATELLITE IS OVER |
| 32-34 | FLONG | LONGITUDE " " " " " " |
| 35-38 | HEIGHT | ALTITUDE OF SATELLITE (KM) |
| 39-41 | ERA | RIGHT ASCENSION OF VECTOR TO EARTHS CENTER |
| 42-44 | EDECL | DECLINATION OF VECTOR TO EARTH'S CENTER |
| 45-47 | HOR | ANGLE BETWEEN EVENT DIRECT. AND HORIZON |
| 48-50 | EANG | ANGLE BETWEEN EVENT DIREC. AND SATELLITE |
| 51-53 | AZMUTH | ANGLE BETWEEN VECTOR OF N. POLE&TANGENT PLANE TO THE EARTH |
| 54-56 | SRA | RIGHT ASCENSION OF VECTOR FROM SAT. TO SUN |
| 57-59 | SDECL | DECLINATION OF VECTOR FROM SAT. TO SUN |
| 60-62 | GEOLAT | GEOMAGNETIC LATITUDE OF SATELLITE |
| 63-65 | GLAT | GALACTIC LATITUDE OF EVENT DIRECTION |
| 66-68 | GLONG | GALACTIC LONGITUDE OF EVENT DIRECTION |
| 69-72 | ID | IDENTIFICATION OF TYPE OF EVENT |
| 73-74 | S3 | 'S3' APPEARS ON ALL CARD IMAGES |
| 75-80 | NOUTCT | SEQUENCE NUMBER OF CARD |

If the ID is equal to either 3501 or 4501, the format for that logical record is as follows:

| COLUMN | ID | DESCRIPTION |
|---|---|---|
| 1-3 | DAY | DAY NUMBER WITH JANUARY 1, 1967 = DAY 1 |
| 4-10 | SEC | SECONDS OF DAY IN UNIVERSAL TIME |
| 11 | | BLANK |
| 12 | NITE | INTERGER; IF 1 = DAYTIME; 2 = NIGHTTIME |
| 13-15 | XMTS | TIME FROM EVENT TO NEXT SPACECRAFT SUN PIP. |
| 16-18 | TROTAT | PERIOD OF ROTATION OF SATELLITE |
| 19 | JTMSEV | NO. OF ROUTINE DATA LINES |
| 20-22 | XMTM | TIME FROM EVENT TO NEXT SPACECRAFT MAG. CROSSING |
| 23-25 | XMM | PREVIOUS VALUE OF M-M TELMETERED |
| 26 | JTMMEV | NO. OF ROUTINE DATA LINES |
| 27-29 | BXWM | PRODUCT OF VECTORS OF MAG. FD. & SPIN AXIS |
| 30-33 | ANTI | RATE OF PLASTIC ANTICOINCIDENCE DET. |

| COLUMN | ID | DESCRIPTION |
|---|---|---|
| 34 | JTMAEV | NO. OF ROUTINE DATA LINES |
| 35-39 | JBLAST | COUNTERS |
| 40-42 | PULSE (1) | PULSE HEIGHT VALUE AT EVENT (1) |
| 43-45 | PULSE (2) | " " " " " (2) |
| 46-48 | PULSE (3) | " " " " " (3) |
| 49-51 | PULSE (4) | " " " " " (4) |
| 52-54 | PULSE (5) | " " " " " (5) |
| 55-57 | PULSE (6) | " " " " " (6) |
| 58-60 | PULSE (7) | " " " " " (7) |
| 61-63 | PULSE (8) | " " " " " (8) |
| 64-68 | BWA | ANGLE BETWEEN SPIN AXIS & MAG FIELD DIR. |
| * 69-72 | ID | IDENTIFICATION OF TYPE OF EVENT |
| 73-74 | S3 | 'S3' APPEARS ON ALL CARD IMAGES |
| 75-80 | NOUTCT | SEQUENCE NUMBER OF CARD |

If any other number appears as the ID, one of the formats on the following page should fit the record.

* If the ID is a number in the 3000's, it is a real event
if the ID is a number in the 4000's, it is an artificial event.

# FORMATS

Artificial Event control card (for each run):

| | MEAN ARTIFICIAL EVENT FREQUENCY (MIN/EVENT) | | | | BEGIN TIME | | END TIME | | | ID | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | for mode1 | for mode2 | for mode3 | for mode4 | DAY | SECONDS | DAY | SECONDS | | 410053 | NOUTCT |
| | ^ | ^ | ^ | ^ | | ^ | | ^ | | | |

Satellite orbital elements:

| EPOCH | | MEAN ANOMALY | | | ECCENTRICITY | | | ID | |
|---|---|---|---|---|---|---|---|---|---|
| DAY | SECONDS | at EPOCH (Revolutions) | VARIATION (rev/day) | (VARIATION)² (rev/day²) | at EPOCH | VARIATION (day⁻¹) | | 320053 420053 | NOUTCT |
| | ^ | ^ | ^ | ^ | ^ | ^ | | | |

| EPOCH | | ARGUMENT OF PERIGEE | | | | ID | |
|---|---|---|---|---|---|---|---|
| DAY | SECONDS | at EPOCH (degrees) | VARIATION (deg/day) | (VARIATION)² (deg/day²) | | 320153 420153 | NOUTCT |
| | ^ | ^ | ^ | ^ | | | |

| EPOCH | | RIGHT ASCENSION OF ASCENDING MODE | | | INCLINATION | | ID | |
|---|---|---|---|---|---|---|---|---|
| DAY | SECONDS | at EPOCH (degrees) | VARIATION (deg/day) | (VARIATION)² (deg/day²) | (degrees) | | 320253 420253 | NOUTCT |
| | ^ | | | | | | | |

Satellite spin axis orientation:

| EPOCH | | SPIN AXIS ORIENTATION | | | | | ID | |
|---|---|---|---|---|---|---|---|---|
| DAY | SECONDS | DECLINATION (degrees) | RIGHT ASCENSION (degrees) | VARIATION IN DECLINATION (deg/day) | VARIATION IN RIGHT ASCENSION (deg/day) | | 330053 430053 | NOUTCT |
| | ^ | ^ | ^ | ^ | ^ | | | |

Periods of acceptable telemetry:

| ON-TIME BEGINS | | | ON-TIME ENDS | | | | ID | |
|---|---|---|---|---|---|---|---|---|
| DAY | SECONDS | | DAY | SECONDS | MODE | | 340253 or 440253 | NOUTCT |
| | ^ | | | ^ | | | | |

End of data (for each run):

| | ID | |
|---|---|---|
| | 302053 or 400053 | NOUTCT |

Figure 2. Images of cards used internally in the MIT programs.

^ indicates where decimal point goes.

67-020A-01A
OSO-3

The Gamma Ray Astronomy Experiment
on the Third Orbiting Solar Observatory OSO-3

(Description of Data Stored in the
National Space Sciences Data Center)

General Description of the Experiment

The Gamma Ray Astronomy Experiment on the OSO-3 discovered high energy cosmic gamma rays and mapped their intensity over the celestial sphere. The intensity is concentrated in a narrow band around the Milky Way and has a broad maximum in the direction of the galactic center. In addition, evidence is found for a general background of cosmic gamma rays at high galactic latitudes. A detailed description of the scientific results is given in Ref. 6.

The apparatus, which contains 15 photomultipliers and over 3000 transistors, is a system of radiation detectors and electronic circuits which occupy two segments of the wheel section of the satellite as shown in Figures [illegible] and 6 of Ref. 1. When operated in the electronic configuration designated "mode 3", it responds with great selectivity to gamma rays with energies above a detection threshold of about 70 MeV and arriving within about 12° of the forward direction. More complete descriptions of the apparatus and its characteristics are contained in Ref. 1, 2, and 3.

Gamma rays are produced in the interactions of high energy particles with matter and radiation. Since high energy particles (cosmic rays) and matter (mostly hydrogen) are known to exist in interstellar space, there was little doubt at the inception of the [illegible] cosmic gamma rays exist. However, the [illegible] indicated that