

#342

APOLLO 12, 14 + 15

SUPRATHERMAL ION DATA,
TOTAL ION DETECTOR DATA,
AND
MASS ANALYZER DATA

69-099C-05C, 05F

71-008C-06C, 06F

71-063C-05C, 05F

APOLLO 12 LM/ALSEP

MASS ANALYZER ION DATA ON TAPE

69-099C-05C

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 41 7-TRACK, 800 BPI TAPES WRITTEN IN BINARY. THERE ARE THREE RESTORED TAPES. THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THE ORIGINAL TAPES WERE CREATED ON A 7094 COMPUTER AND THE RESTORED TAPES WERE CREATED ON A IBM 9021 COMPUTER. THE D STACKED TAPE 108761 WAS CREATED WITH TAPES THAT WERE SENT BY THE P.I.. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS ARE AS FOLLOWS:

| DR# | DS# | D# | FILES | TIME SPAN |
|----------|----------|---------|-------|-------------------------|
| DR005021 | DS005021 | D017209 | 1 | 11/19/69 - 03/07/70 (a) |
| | | D017210 | 2 | 03/07/70 - 05/22/70 |
| | | D017208 | 3 | 05/22/70 - 08/08/70 (b) |
| | | D017274 | 4 | 08/08/70 - 10/30/70 (c) |
| | | D107275 | 5 | 10/30/70 - 01/23/71 |
| | | D017276 | 6 | 01/23/71 - 04/06/71 |
| | | D017277 | 7 | 04/06/71 - 06/30/71 (d) |
| DR005022 | DS005022 | D017690 | 1 | 06/30/71 - 09/14/71 |
| | | D017691 | 2 | 09/14/71 - 11/29/71 (e) |
| | | D017692 | 3 | 11/29/71 - 02/22/72 (f) |
| | | D017881 | 4 | 02/22/72 - 05/15/72 |
| | | D017880 | 5 | 05/15/72 - 08/06/72 (g) |
| | | D018309 | 6 | 08/06/72 - 11/06/72 |
| | | D108308 | 7 | 11/06/72 - 03/03/73 |

APOLLO 12 LM/ALSEP

MASS ANALYZER ION DATA ON TAPE

69-099C-05C

| DR# | DS# | D# | FILES | TIME SPAN |
|----------|----------|---------|-------|---------------------|
| DR006254 | DS006254 | D108761 | 1 | 03/02/73 - 03/08/73 |
| | | | 2 | 06/27/73 - 07/05/73 |
| | | | 3 | 07/28/73 - 08/02/73 |
| | | | 4 | 08/02/73 - 08/08/73 |
| | | | 5 | 08/08/73 - 08/27/73 |
| | | | 6 | 08/27/73 - 09/22/73 |
| | | | 7 | 09/22/73 - 09/28/73 |
| | | | 8 | 09/28/73 - 10/04/73 |
| | | | 9 | 10/03/73 - 10/18/73 |
| | | | 10 | 10/18/73 - 12/14/73 |
| | | | 11 | 11/05/73 - 11/20/73 |
| | | | 12 | 11/20/73 - 11/25/73 |
| | | | 13 | 01/01/74 - 04/04/74 |
| | | | 14 | 01/01/74 - 01/06/74 |
| | | | 15 | 01/21/74 - 01/27/74 |
| | | | 16 | 03/08/74 - 03/14/74 |
| | | | 17 | 04/08/74 - 04/12/74 |
| | | | 18 | 05/02/74 - 05/02/74 |
| | | | 19 | 05/06/74 - 05/12/74 |
| | | | 20 | 05/12/74 - 05/12/74 |
| | | | 21 | 05/27/74 - 06/12/74 |
| | | | 22 | 06/21/74 - 06/26/74 |
| | | | 23 | 08/11/74 - 08/27/74 |
| | | | 24 | 08/17/74 - 09/01/74 |
| | | | 25 | 09/01/74 - 09/05/74 |
| | | | 26 | 10/28/74 - 11/02/74 |
| | | | 27 | 11/19/74 - 03/14/75 |

- (a) D017209: READ ERRORS OCCURRED IN RECORDS 568, 569, OF FILE 1
- (b) D017208: READ ERRORS OCCURRED IN RECORDS 1141, 1142, OF FILE 1
- (c) D017274: READ ERRORS OCCURRED IN RECORD 1787 OF FILE 1.
- (d) D017277: READ ERRORS OCCURRED IN RECORDS 109, 383, 433, 434, 1724, OF FILE 1.
- (e) D017691: READ ERRORS OCCURRED IN RECORDS 217, 633, 1048, 1630, 1636, 1643 OF FILE 1
- (f) D017692: READ ERRORS OCCURRED IN RECORDS 946, 1447, 1528. 1529 OF FILE 1
- (g) D017880: READ ERRORS OCCURRED IN RECORDS 153, 510, 511, 818, OF FILE 1

REQ. AGENT
CMP

RAND NO.
RC2278

ACQ. AGENT
DJH

APOLLO 12 + 15

SUPRATHERMAL ION DATA

TOTAL ION DETECTOR DATA

AND

APOLLO 14

MASS ANALYZER DATA

TOTAL ION DETECTOR DATA

The Apollo 12 SID and TID data sets have 27 tapes total. Apollo 14 MA and TID data sets have 25 tapes total. Apollo 15 SID and TID data sets have 18 tapes total. All of these data set tapes are 7 track, 800 BPI, Binary, with 1 file per tape. The formats and time spans are on the following pages.

APOLLO 12
SUPRATHERMAL ION DATA
69-099C-05C

| <u>D#</u> | <u>C#</u> | <u>TIME SPAN</u> |
|-----------|-----------|---------------------|
| 17208 | 13529 | 05/22/70 - 08/08/70 |
| 17209 | 13530 | 11/19/69 - 03/07/70 |
| 17210 | 13531 | 03/07/70 - 03/19/70 |
| 17274 | 13561 | 08/08/70 - 10/30/70 |
| 17275 | 13562 | 10/30/70 - 01/27/71 |
| 17276 | 13563 | 01/23/71 - 04/05/71 |
| 17277 | 13564 | 04/06/71 - 06/29/71 |
| 17690 | 14169 | 05/23/71 - 06/19/71 |
| 17691 | 14170 | 09/14/71 - 11/28/71 |
| 17692 | 14171 | 11/29/71 - 02/22/72 |
| 17881 | 18723 | 02/22/72 - 05/15/72 |
| 17880 | 14473 | 05/15/72 - 08/06/72 |
| 18308 | 14897 | 11/06/72 - 03/03/73 |
| 18309 | 14898 | 08/06/72 - 11/06/72 |

APOLLO 12

TOTAL ION DETECTOR DATA

69-099C-05F

| <u>D#</u> | <u>C#</u> | <u>TIME SPAN</u> |
|-----------|-----------|---------------------|
| 17211 | 13526 | 11/19/69 - 03/10/70 |
| 17212 | 13527 | 03/10/70 - 05/31/70 |
| 17213 | 13528 | 05/31/70 - 08/31/70 |
| 17278 | 13565 | 04/19/71 - 07/04/71 |
| 17279 | 13566 | 01/29/71 - 04/19/71 |
| 17280 | 13567 | 11/04/70 - 01/09/71 |
| 17281 | 13568 | 08/13/70 - 11/04/70 |
| 17693 | 14199 | 07/05/71 - 09/23/71 |
| 17694 | 14200 | 09/24/71 - 12/18/71 |
| 17695 | 14201 | 12/18/71 - 03/12/72 |
| 17882 | 14474 | 06/01/72 - 08/17/72 |
| 17883 | 14475 | 03/13/72 - 06/01/72 |
| 18310 | 14899 | 11/17/72 - 03/14/73 |
| 18311 | 14900 | 08/17/72 - 11/17/72 |

APOLLO 14
MASS ANALYZER DATA
71-008C-06C

| <u>D#</u> | <u>C#</u> | <u>TIME SPAN</u> |
|-----------|-----------|---------------------|
| 15662 | 13521 | 02/06/71 - 05/06/71 |
| 16946 | 13522 | 05/07/71 - 07/21/71 |
| 16947 | 13523 | 07/21/71 - 09/28/71 |
| 16948 | 18724 | 09/28/71 - 11/29/71 |
| 16949 | 13524 | 11/30/71 - 01/30/72 |
| 16950 | 13525 | 01/24/72 - 03/20/72 |
| 18312 | 14891 | 05/14/72 - 07/09/72 |
| 18313 | 14892 | 03/20/72 - 05/14/72 |
| 18813 | 15073 | 07/09/72 - 09/03/72 |
| 18814 | 15074 | 09/03/72 - 10/28/72 |
| 18815 | 15075 | 10/28/72 - 12/22/72 |
| 18816 | 15076 | 12/22/72 - 02/14/73 |
| 18817 | 15077 | 02/14/73 - 04/11/73 |

APOLLO 14
TOTAL ION DETECTOR DATA
71-008C-06F

| <u>D#</u> | <u>C#</u> | <u>TIME SPAN</u> |
|-----------|-----------|---------------------|
| 15663 | 13515 | 02/06/71 - 05/07/71 |
| 16951 | 13516 | 05/07/71 - 07/21/71 |
| 16952 | 13517 | 07/21/71 - 09/29/71 |
| 16953 | 13518 | 09/29/71 - 11/30/71 |
| 16954 | 13519 | 11/30/71 - 01/25/72 |
| 16955 | 13520 | 01/25/72 - 03/21/72 |
| 18314 | 14887 | 07/11/72 - 09/04/72 |
| 18315 | 14888 | 05/15/72 - 07/11/72 |
| 18316 | 14889 | 03/21/72 - 05/15/72 |
| 18818 | 15069 | 09/04/72 - 10/29/72 |
| 18819 | 15070 | 10/29/72 - 12/23/72 |
| 18820 | 15071 | 12/23/72 - 02/14/73 |
| 18821 | 15072 | 02/15/73 - 04/11/73 |

APOLLO 15
SUPRATHERMAL ION
71-063C-05C

| <u>D#</u> | <u>C#</u> | <u>TIME SPAN</u> |
|-----------|-----------|---------------------|
| 17282 | 13644 | 08/03/71 - 10/28/71 |
| 17696 | 14202 | 10/28/71 - 01/11/72 |
| 17697 | 14203 | 01/11/72 - 03/16/72 |
| 17742 | 14438 | 03/16/72 - 05/19/72 |
| 17743 | 14439 | 05/20/72 - 07/20/72 |
| 17884 | 14498 | 02/24/73 - 06/02/73 |
| 17885 | 14499 | 12/30/72 - 02/09/73 |
| 17886 | 14500 | 11/04/72 - 12/30/72 |
| 17887 | 14501 | 09/09/72 - 11/04/72 |
| 17888 | 14502 | 07/20/72 - 09/09/72 |

APOLLO 15
TOTAL ION DETECTOR DATA
71-063C-05F

| <u>D#</u> | <u>C#</u> | <u>TIME SPAN</u> |
|-----------|-----------|---------------------|
| 17283 | 13645 | 08/03/71 - 10/28/71 |
| 17745 | 14465 | 11/04/72 - 12/29/72 |
| 17746 | 14466 | 09/09/72 - 11/04/72 |
| 17747 | 14467 | 07/15/72 - 09/09/72 |
| 17748 | 14468 | 05/20/72 - 07/16/72 |
| 17749 | 14469 | 03/17/72 - 05/20/72 |
| 17750 | 14470 | 01/11/72 - 03/17/72 |
| 17751 | 14471 | 10/28/71 - 01/11/72 |
| 17752 | 13725 | 10/28/72 - 2/22/73 |
| 17753 | 13726 | 2/22/73 - 4/19/73 |

71-0630-05 C
" 05 F

Description of NSSDC Data Tapes

Data tapes are standard 2400-foot, 1/2-inch, 7 track IBM-compatible tapes, recorded at 800 bpi with odd parity. Words are 24-bit binary integers, with negative numbers represented as 2's complement, with 28 such words per logical record (for both MA and TID). Physical records are fixed-length, blocked, with 100 logical records per physical record, and no record-length descriptors or control words. (There is only one file per reel, and the complete reel is used, resulting in the last physical record ending after the reflective end-of-reel marker is passed.) (Two standard tapemarks are written after the last physical record.) The last reel of a calendar year's data is the only one which will have less than a full reel, and the only one which will have less than 100 logical records in its last physical record. TID and MA data are written on separate tapes, but have almost identical formats; the first word in the logical record allows them to be distinguished from each other. The 28 words in a logical record contain time, twenty channels (mass for MA, energy for TID) of accumulated counts, and housekeeping parameters (including energy for the MA data). Where reliable data is not available the value -1 is inserted.

RICE UNIVERSITY

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DEPARTMENT OF SPACE PHYSICS
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January 14, 1976

RE: ALSEP/SIDE DATA GLITCH: Time Shown as Day 0

January 1 is considered as Day 1 of each year. If any data record shows Day 0 at any time it should be disregarded. It is possible for "Day 0" to appear on the data for the last minute of the year. In such cases this is readily recognized, as there will be only a few seconds worth of data with this incorrect day number on it, which will appear on only one frame of "NPAK" microfilm. The instrument data, and the hours, minute, and millisecond should be correct; only the day number is incorrect.



H. Kent Hills
Project Scientist

HKH:kph

ALSEP SIDE DATA USER'S INFORMATION PACKAGE

February, 1974

CONTENTS

1. Side section of Data User's Handbook compiled by JSC.
2. Modes of Operation
3. ALSEP SIDE DATA HANDBOOK
4. MA Edit and TID Edit Data Format

SUPRATHERMAL ION DETECTOR EXPERIMENT (SIDE)

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DESCRIPTION OF THE EXPERIMENT

The SIDE was designed to achieve the following objectives.

(1) Provide information on the energy and mass spectra of the positive ions close to the lunar surface (the lunar exosphere). (2) Measure the flux and energy spectra of positive ions in the magnetotail and magnetosheath during the periods when the Moon passes through the magnetic tail of the Earth. (3) Provide data on the plasma interaction between the solar wind and the moon. (4) Determine a preliminary value for the electric potential of the lunar surface.

Three SIDE instruments were deployed, at the Apollo 12, 14 and 15 sites. The SIDE consists of two positive-ion detectors, the mass analyzer (MA) and the total ion detector (TID). Both use curved plate analyzers for energy per unit charge discrimination. The MA also uses a Wien velocity filter (crossed electric and magnetic fields), since knowledge of the energy per unit charge and the velocity is sufficient to allow determination of the mass per unit charge. The MA measures a 20-channel mass spectrum at each of six energy levels; 48.6, 16.2, 5.4, 1.8, 0.6, and 0.2 eV. The mass ranges covered are approximately 10-1000 amu/q for the Apollo 12 unit, 6-750 amu/q

for Apollo 14, and 1-90 amu/q for Apollo 15. While each mass spectrum is being observed by the MA, the TID measures a 20-channel differential energy spectrum (including all masses) from 3500 eV/charge down to 10 eV/charge. Each 20-channel spectrum is obtained in 24 seconds, in normal mode.

The detectors each have a field of view which is roughly a square solid angle 6° on a side. Numerous commands are possible, some of which allow certain of the measurements to be omitted in order to devote more time to other measurements.

To establish electrical reference to the lunar surface, a wire screen ("lunar-surface ground plane" in Figure 1) is deployed on the surface beneath the SIDE. This screen is connected to the SIDE ground through a power supply which can cycle through 24 steps from -27.6 volts to 27.6 volts. The effects of stepping this voltage through its cycle can be used in certain circumstances to determine the lunar surface potential. A schematic diagram of the instrument is shown in Figure 1, while Figure 2 shows a cutaway view of the SIDE, and Figure 3 shows the SIDE as deployed at the Apollo 12 and 14 sites.

The look direction of each instrument was angled 15° east (Apollo 14 and 15) or west (Apollo 12) from the local meridian plane. The Apollo 15 instrument (at 26° N. latitude) was deployed tilted 26° from vertical toward the south, so that the sensor look directions of all three instruments include the ecliptic plane, as shown in Figure 4.

OPERATIONAL HISTORY

This section summarizes the time periods when the instruments were in full operation and returning science data. Periods when only housekeeping data were returned are not included. The design goal was full operation continuously after an initial period allowing for outgassing during the lunar daytime.

Apollo 12 SIDE

| | |
|---|--|
| November 19-20, 1969 | Deployment, and operation during mission activities. |
| December, 1969 - January, 1970 | Operation during lunar night (and a short time before and after). |
| February, 1970 - August, 1972 | Operation during lunar night, plus cyclic operation for approximately 10 days centered on local noon. Cyclic operation involves 2 hours on and 10 or more hours off. More coverage is obtained during continuous real-time support of ALSEP missions (i.e., the first 45 days of the mission). |
| September, 1972 - present (August, 1973) | Operation as above, but with intermittent loss of data during lunar night for periods of minutes to many days, during months of September, November, and December, 1972, and January, June, and August, 1973. |

Apollo 14 SIDE

| | |
|-----------------------------|--|
| February 5-7, 1971 | Deployment, and operation during mission activities. |
| February, 1971 - July, 1971 | Operation during night and part of the day, but off for approximately 8 days centered on noon. |

August, 1971 - October, 1971

Operation as above, plus short cycles of operation periodically for approximately 8 days near noon.

November, 1971 - March, 1973

Continuous operation.

April, 1973 - present
(August, 1973)

Operation during night, from approximately 1 day before sunset until sunrise.

Apollo 15 SIDE

July 31, 1971 - August 3, 1973

Deployment, and operation during mission activities.

August, 1971 - September, 1971

Operation except during approximately 10 days centered on local noon.

October, 1971 - November, 1971

Operation as above, plus short intervals of operation periodically for approximately 4-7 days near noon.

December, 1971 - April, 1972

Operation except during 3-5 days centered on local noon.

May, 1972 - present
(August, 1973)

Continuous operation.

DATA SETS AND AVAILABILITY

| <u>DATA SET</u> | <u>FORM</u> | <u>AVAILABILITY</u> |
|---|---------------------------|--|
| 1. Machine plots (MA and TID on same plot) of counting rates vs. frame number | 16 mm microfilm | Data for times after about August, 1972 are (or soon will be) available at NSSDC. Data for times about June, 1971 to August, 1972 will be available at NSSDC after production of copies. |
| 2. Listings of counting rates vs. frame number, with limited amount of housekeeping data. | | |
| 3. Machine plots (3-dimensional) of TID average energy spectra as a function of time. | 30"x36" paper | Eventually all data will be available at NSSDC. |
| 4. Machine plots (3-dimensional) of MA average mass spectra as a function of time. | | |
| 5. TID spectra vs. time | Digital, on magnetic tape | |
| 6. MA spectra vs. time | | |

- | | | |
|--|---------------------------|---|
| 7. Engineering parameters | Digital, on magnetic tape | Data for times after about June, 1971 will be available at NSSDC. |
| 8. TID and MA data, including everything telemetered from SIDE, plus evaluations of data quality and instrument mode of operation. Called "NPAK" by Rice University. | Digital, on magnetic tape | Data available only at Rice University. |

SUMMARY OF PRINCIPAL RESULTS

Observation of lunar ions accelerated by the solar wind induced field ($\vec{E} = -\vec{V} \times \vec{B}$).

Observation of 1-3 KeV protons during lunar night, considered to be protons from the bow shock of the earth.

Observation of ion mass spectra due to the LM exhaust gas, and determination of the intensity decay rate.

Multi-site observation of the energetic ion characteristics in the earth's magnetosheath and at its boundaries, and correlation with geomagnetic activity.

Observation of the effects of the LM ascent engine exhaust on magnetosheath ion fluxes.

Multi-site observations of apparent motions of ion "clouds" related to lunar impact events, and observations of mass spectra during the events.

Monitoring of ion fluxes during local solar eclipses; no changes observed.

Observation of energetic ions during lunar night, when site is shielded from the solar wind direction.

Observation of ion events near terminators suggests a turbulent region of solar wind plasma interaction with the solid moon.

Monitoring of positive ion fluxes while in the geomagnetic tail, and correlation with geomagnetic storm activity.

Observations of mass spectra of ions from the ambient atmosphere, including a single observation of water vapor ions, possibly of natural origin.

Determination of the electric potential of the lunar surface;
(a) in the magnetosheath or solar wind; and (b) near the terminators.

Observations of solar wind during interplanetary storms.

Observations of penetrating ions from solar flares.

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Description of NSSDC Data Tapes

Data tapes are standard 2400-foot, 1/2-inch, 7 track IBM-compatible tapes, recorded at 800 bpi with odd parity. Words are 24-bit binary integers, with negative numbers represented as 2's complement, with 28 such words per logical record (for both MA and TID). Physical records are fixed-length, blocked, with 100 logical records per physical record, and no record-length descriptors or control words. There is only one file per reel, ^{1850 records,} ~~and the complete reel is used,~~ resulting in the last physical record ending ^{before} ~~after~~ the reflective end-of-reel marker is passed. Two standard tapemarks are written after the last physical record. The last reel of a calendar year's data is the only one which will have less than ^{1850 records} ~~a full reel~~, and the only one which will have less than 100 logical records in its last physical record. TID and MA data are written on separate tapes, but have almost identical formats; the first word in the logical record allows them to be distinguished from each other. The 28 words in a logical record contain time, twenty channels (mass for MA, energy for TID) of accumulated counts, and housekeeping parameters (including energy for the MA data). Where reliable data is not available the value -1 is inserted.

MODES OF OPERATION

In each mode, the SIDE repeatedly cycles through a certain range of SIDE frames (full cycle, or "Normal Mode" is frames 0 - 127). The TID energy channel is uniquely determined by the frame number, except for frame 0, whose energy depends upon the mode. The ALSEP SIDE DATA HANDBOOK, called ASDH below, shows the frame numbers and TID energies on page 43. A "calibration cycle" is included in frames 121-127 and 0 for the TID. For the MA the calibration cycle is in frames 120-127. The calibration cycle adds an internally generated pulse rate to the output of the detector, while allowing the detector to continue its normal output. See ASDH, pages 44 and 58 for details of the calibration cycle. There is no calibration cycle if the instrument is in a mode which does not include frames 120 - 127. The MA utilizes a velocity filter which in "Normal Mode" has 20 steps in its cycle. However, there are two modes which use only the 1st 10 steps of the MA. These are "Reset Velocity Filter at 9" and "Reset Velocity Filter at 9 and SIDE Frame at 79". In these two modes the energy and mass channel correspondance with given SIDE frames is different from that in "Normal Mode", as shown in ASDH; pages 48-55 for the velocity filter, and page 57 for the energy of the MA. When reference is made to a mass channel (0-19), it normally is assumed to mean the mass channel which corresponds to the SIDE frame of the same number in "Normal Mode".

In "x10 Mode", (read as "Times 10 Mode"), the instrument cycles through the sequence of SIDE frames which it otherwise would follow, but it stays for 10 frame times on the same frame, before going to the next frame. The detector counts are telemetered as usual at each frame, but the register is not cleared, so that the counts accumulate for 10 frame times before the counter is

cleared. There is an offset, however, for the Mass Analyzer, which results in the peculiarity that the last read-out for a given frame number in the MA data appears as the first read-out of the next frame. Since it is executed by an "ON/OFF" command, the "x10 Mode" can be used in conjunction with any of the "MODE" commands, but the user can assume that it is never used except by itself (i.e., with normal SIDE Frame cycle). And even the normal "x10 Mode" occurs very infrequently except with the Apollo 12 SIDE, which can spontaneously change to "x10 Mode" when it gets too hot.

The instrument commands are summarized in ASDH, page 1. A "SIDE Command" requires a combination of up to 4 ALSEP commands to load the proper command number into the "Command Input Register", followed by an execution command. When a command is loaded into the instrument but not executed, the command number is found in the "Command Input Register". When it is executed, the number goes into the "Mode Register" and the "Command Input Register" is cleared. The "Mode Register" does not give the current mode of operation; it gives the last command executed. If a "Mode" command is executed, followed by an "ON/OFF" command, the instrument will revert to normal SIDE frame cycle when the "ON/OFF" command is executed. However, if a "Mode" command is executed after an "ON/OFF" command, the "ON/OFF" command status is preserved in the new mode, it does not reset the "ON/OFF" command. When the instrument operating power is commanded ON, from standby or OFF, the instrument automatically begins operation in "Normal Mode" (SIDE frame cycles through 0 - 127, velocity filter cycles through all 20 mass channels) with all voltage supplies on, and with the ground plane voltage on step 0. The "Command Input Register" and the "Mode Register" are also reset to zero. The ground plane voltage then steps through its cycle of 24 steps, advancing one step each time that frame 0 is reached. See ASDH, page 38, for the

voltages and numbering of the steps. The voltage given is the potential of the ground plane grid with respect to SIDE ground. SIDE ground and the entrance aperture grid are at the same potential.

The "Master Reset" command has the same effect as turning instrument power on, except that no "ON/OFF" commands previously in effect are altered. That is, "Master Reset" will not turn on a high voltage or a stepper which was off.

There is an analog output for each of the two detectors, in addition to the digital output. The analog outputs are sampled rather infrequently, but they eventually are sampled at all frames. The output counting rate is passed through a logarithmic converter before reaching the telemetry, so these two measurements are known as the Low Energy Log Count Rate Meter (LE LCRM) and the High Energy Log Count Rate Meter (HE LCRM). Pages 8-10 of ASDH give the telemetry locations and calibrations of the LCRM's.

ALSEP SIDE DATA HANDBOOK

February, 1974

The ALSEP SIDE DATA HANDBOOK was originally dated 12 November, 1969, and was intended for use by the SIDE group during real-time mission support operations at the Mission Control Center in Houston. Therefore some of the detailed material will not be needed by data users, and is deleted from the present version. This book describes the instrument, its commands, the telemetry format, and the calibrations of the various temperature measurements and other analog-to-digital conversions.

CONTENTS

| | |
|---|--------------|
| SIDE Commands ----- | Page 1 |
| Digital counts vs. analog voltage ----- | 2 |
| Physical Information | |
| Blivet Contents ----- | 3 |
| Temp. Sensor, Heater, and Heater Control Locations----- | 4 |
| SIDE/CCGE System Schematic----- | 5-1 thru 5-5 |
| Telemetry Format | |
| Bendix Frame ----- | 6 |
| Control Word ----- | 7 |
| Housekeeping Word ----- | 8 |
| Low Energy Log Count Rate Meter ----- | 9 |
| High Energy Log Count Rate Meter----- | 10 |
| SIDE Word 1, Frame Number ----- | 11 |
| SIDE Word 2, Analog Subcom ----- | 12 |
| +4500 VDC ----- | 13 |
| +60 VDC ----- | 14 |
| +30 VDC ----- | 15 |
| +12 VDC ----- | 16 |
| +A/D REF----- | 17 |
| +5 VDC (analog)----- | 18 |
| +5 VDC (digital)----- | 19 |
| +1 VDC ----- | 20 |
| +30 mV Cal ----- | 21 |
| GND VDC ----- | 22 |
| -30 mV Cal ----- | 23 |
| -1 VDC ----- | 24 |
| -5 VDC ----- | 25 |

| | |
|---|------------|
| -A/D REF ----- | 26 |
| -12 VDC ----- | 27 |
| -30 VDC ----- | 28 |
| -3500 VDC ----- | 29 |
| TEMP 1 ----- | 30 |
| TEMP 2 ----- | 31 |
| TEMP 3 ----- | 32 |
| TEMP 4 ----- | 33 |
| TEMP 5 ----- | 34 |
| TEMP 6 ----- | 35 |
| + Dust Cover/Seal----- | 36 |
| + Electrometer Range ----- | 37 |
| Ground Plane Volts ----- | 38 |
| +OTC Register ----- | 39 |
| + Pre-Regulator Duty Factor ----- | 40 |
| - Solar Cell Voltage ----- | 41 |
| High Energy Detector (TID) | |
| Curved Plate Analyzer ----- | 42 |
| Energy vs. Frame ----- | 43 |
| Accumulated Counts ----- | 44 |
| SIDE Word 6, Status Subcom ----- | 45 |
| Measurement Locations ----- | 46 |
| Measurement values ----- | 47 |
| Velocity Filter | |
| Voltage ----- | 48 |
| Readout vs. SIDE Frame ----- | 49 thru 55 |
| Low Energy Detector (MA) | |
| Curved Plate Analyzer ----- | 56 |
| Energy vs. Frame ----- | 57 |
| Accumulated Counts ----- | 58 |

| INITIAL | MODE | TIME | ON/OFF | MODE | RESET | COMMAND NOMENCLATURE | PRINT |
|---------|------|------|--------|------|-------|----------------------------------|-------------|
| 0 | | | 1 | | | REGISTER CLEARED (NORMAL MODE) | CLR |
| | 2 | | 2 | | | GROUND PLANE STEPPER ON/OFF ① | GPSP |
| | 3 | | 3 | | | RESET SIDE FRAME AFTER 10 ② | RSF10 |
| | 4 | | 4 | | | REMOVE CCIG SEAL ③ | RSF10 |
| | 5 | | 5 | | | RESET SIDE FRAME AFTER 30 ② | RSF39 |
| | 6 | | 6 | | | RESET VELOCITY FILTER AFTER 2 ② | RSF9 |
| | 7 | | 7 | | | RESET SIDE FRAME AFTER 79 ② | RSF79 |
| | 8 | | 8 | | | RESET SF AFTER 79 / VF AFTER 9 ② | RSF79 / VF9 |
| | 9 | | 9 | | | 10 TIMES NORM ACCUM INTERVAL ① | X10 |
| | 10 | | 10 | | | ARMATOR RESET | MRST |
| | 11 | | 11 | | | REMOVE DUST COVER ③ | MRST |
| | 12 | | 12 | | | VELOCITY FILTER ON/OFF ① | VFV |
| | 13 | | 13 | | | LOW ENERGY CPA ON/OFF ① | LEHIV |
| | 14 | | 14 | | | HIGH ENERGY CPA ON/OFF ① | HEHIV |
| | 15 | | 15 | | | CONTINUOUS CALIBRATION ② | RSF10 |
| | | | | | | CCGE HIGH VOLTAGE ON/OFF ① | CCIGHV |
| | | | | | | CHARACTERON HIGH VOLT ON/OFF ① | CHANHV |
| | | | | | | RESET COMMAND INPUT REGISTER | RCIR |
| | | | | | | EXECUTE ② | |

WARNING: (Applies at deployment before SIDE dust cover or CCGE seal are opened.)

DO NOT SEND PRIOR TO DUST/VEIL OR SEAL AC

DO NOT SEND PRIOR TO SEAL ACTIVATION

NOTES:

- ① ON/OFF CMNDS INITIALLY ON
- ② MODE CMNDS ACTIVE ONLY WHEN IN MODE REG.
- ③ ONE TIME CMNDS ACTIVE ONCE, TO RESET, OR PUR. TO STDBY
- ④ EXECUTE, WITH MODE CMND IN MR RESETS SF TO 000

BLIVET

CONTENTS

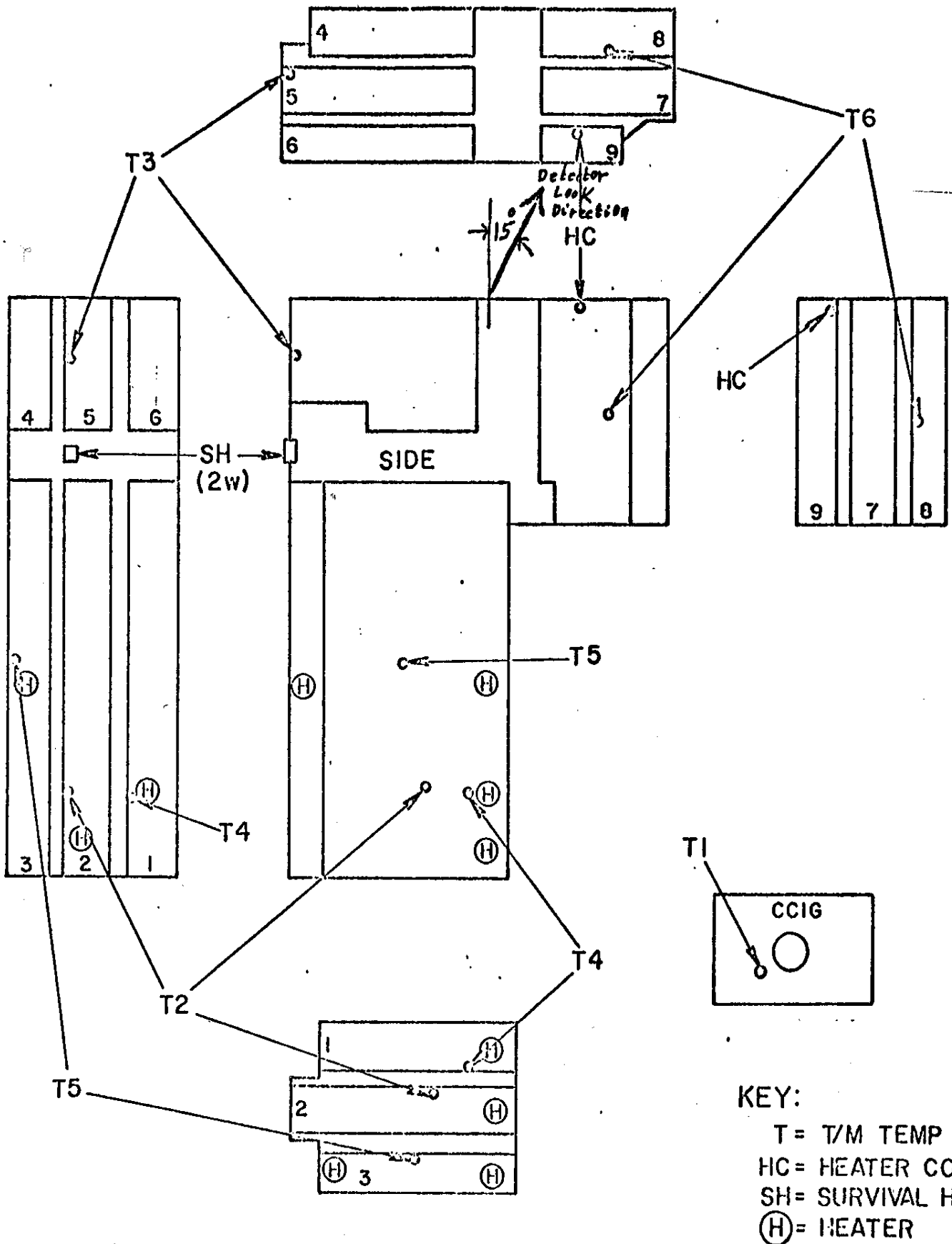
| | |
|---------|-----------------------------|
| 100 | DIGITAL DATA HANDLING |
| 200 | A/D CONVERTER |
| 300 | STEPPING POWER SUPPLIES |
| 400/500 | POWER SUPPLY |
| 600 | LOG COUNT RATE METERS |
| 700/900 | HIGH VOLTAGE POWER SUPPLIES |
| 800 | ELECTROMETER |

BLIVET CONTENTS

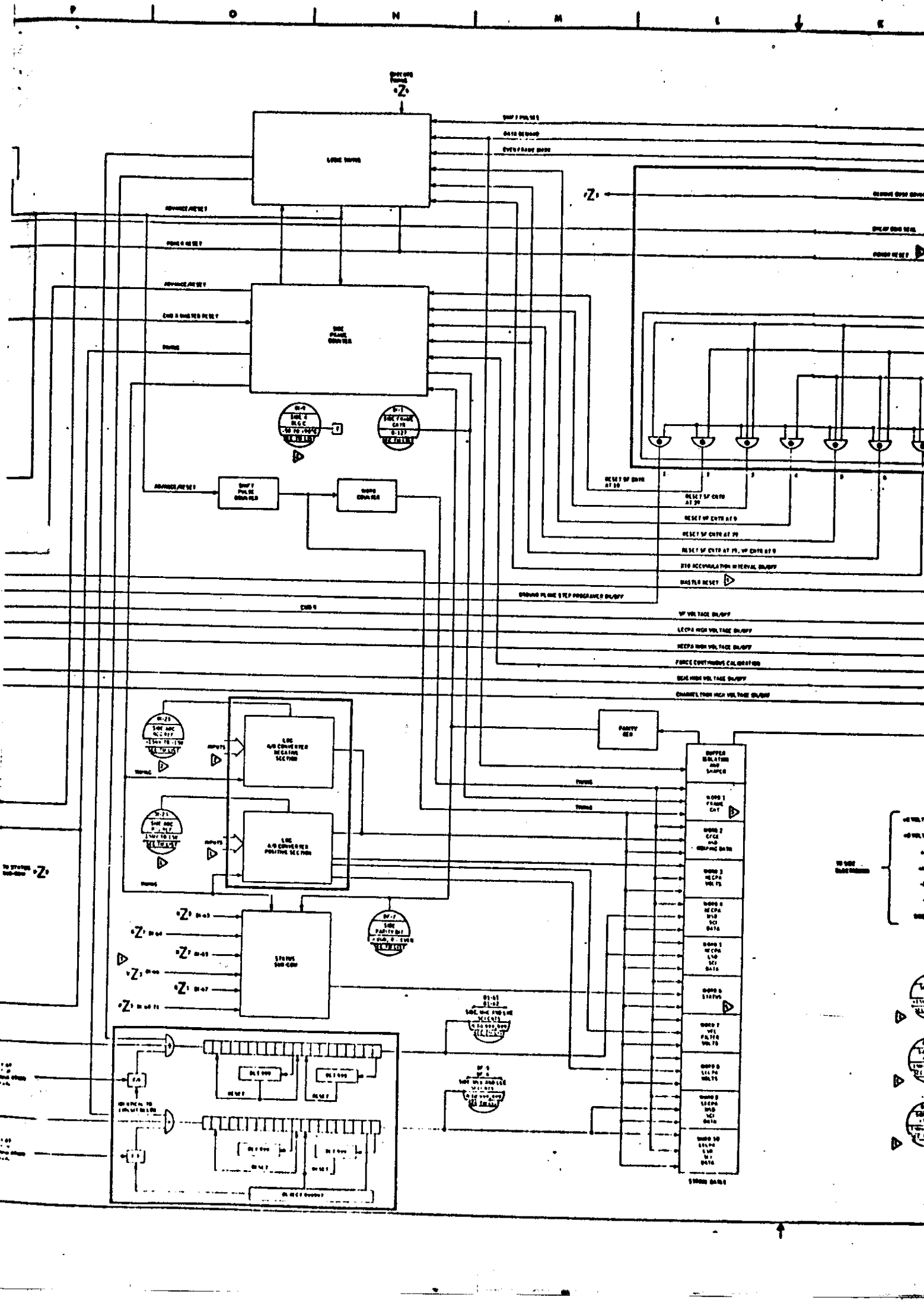
CONVERSION

| | | | | | | | |
|----|--------|-----|---------|-----|--------|-----|---------|
| 0 | C.0146 | 62 | C.01755 | 128 | C.4743 | 194 | 2.8551 |
| 1 | 0.0159 | 63 | C.0810 | 129 | C.4874 | 195 | 2.9338 |
| 2 | C.0154 | 64 | 0.0832 | 130 | C.5009 | 196 | 3.0147 |
| 3 | C.0158 | 65 | 0.0855 | 131 | C.5147 | 197 | 3.0978 |
| 4 | 0.0163 | 66 | 0.0879 | 132 | C.5289 | 198 | 3.1832 |
| 5 | C.0167 | 67 | 0.0903 | 133 | C.5434 | 199 | 2.2710 |
| 6 | 0.0172 | 68 | 0.0928 | 134 | C.5584 | 200 | 3.3611 |
| 7 | 0.0177 | 69 | 0.0953 | 135 | C.5738 | 201 | 3.4538 |
| 8 | C.0181 | 70 | 0.0980 | 136 | 0.5896 | 202 | 3.5490 |
| 9 | 0.0186 | 71 | 0.1007 | 137 | 0.6059 | 203 | 3.6469 |
| 10 | 0.0192 | 72 | C.1034 | 138 | 0.6226 | 204 | 3.7474 |
| 11 | 0.0197 | 73 | 0.1063 | 139 | 0.6398 | 205 | 3.8507 |
| 12 | C.0202 | 74 | C.1092 | 140 | C.6574 | 206 | 3.9569 |
| 13 | C.0208 | 75 | 0.1122 | 141 | C.6755 | 207 | 4.0660 |
| 14 | 0.0214 | 76 | C.1153 | 142 | C.6941 | 208 | 4.1780 |
| 15 | C.0220 | 77 | C.1185 | 143 | C.7133 | 209 | 4.2932 |
| 16 | 0.0226 | 78 | C.1218 | 144 | 0.7329 | 210 | 4.4116 |
| 17 | C.0232 | 79 | C.1251 | 145 | C.7531 | 211 | 4.5332 |
| 18 | 0.0238 | 80 | C.1286 | 146 | C.7739 | 212 | 4.6582 |
| 19 | 0.0245 | 81 | C.1321 | 147 | C.7952 | 213 | 4.7866 |
| 20 | 0.0251 | 82 | C.1358 | 148 | C.8172 | 214 | 4.9186 |
| 21 | 0.0258 | 83 | 0.1395 | 149 | 0.8397 | 215 | 5.0542 |
| 22 | C.0266 | 84 | C.1434 | 150 | C.8628 | 216 | 5.1935 |
| 23 | 0.0273 | 85 | C.1473 | 151 | C.8866 | 217 | 5.3367 |
| 24 | C.0280 | 86 | C.1514 | 152 | C.9111 | 218 | 5.4838 |
| 25 | C.0288 | 87 | C.1555 | 153 | C.9362 | 219 | 5.6350 |
| 26 | C.0296 | 88 | 0.1598 | 154 | C.9620 | 220 | 5.7904 |
| 27 | C.0304 | 89 | C.1642 | 155 | C.9885 | 221 | 5.9500 |
| 28 | C.0313 | 90 | 0.1688 | 156 | 1.0158 | 222 | 6.1140 |
| 29 | 0.0321 | 91 | C.1734 | 157 | 1.0438 | 223 | 6.2826 |
| 30 | C.0330 | 92 | C.1782 | 158 | 1.0726 | 224 | 6.4558 |
| 31 | 0.0339 | 93 | C.1831 | 159 | 1.1021 | 225 | 6.6338 |
| 32 | C.0349 | 94 | C.1882 | 160 | 1.1325 | 226 | 6.8167 |
| 33 | C.0358 | 95 | C.1933 | 161 | 1.1637 | 227 | 7.0046 |
| 34 | C.0368 | 96 | C.1987 | 162 | 1.1958 | 228 | 7.1977 |
| 35 | C.0378 | 97 | C.2042 | 163 | 1.2288 | 229 | 7.3961 |
| 36 | C.0389 | 98 | C.2098 | 164 | 1.2627 | 230 | 7.6000 |
| 37 | 0.0399 | 99 | C.2156 | 165 | 1.2975 | 231 | 7.8096 |
| 38 | C.0410 | 100 | 0.2215 | 166 | 1.3332 | 232 | 8.0249 |
| 39 | C.0422 | 101 | C.2276 | 167 | 1.3700 | 233 | 8.2461 |
| 40 | C.0433 | 102 | C.2339 | 168 | 1.4078 | 234 | 8.4734 |
| 41 | C.0445 | 103 | C.2403 | 169 | 1.4466 | 235 | 8.7070 |
| 42 | 0.0457 | 104 | C.2470 | 170 | 1.4865 | 236 | 8.9471 |
| 43 | C.0470 | 105 | C.2538 | 171 | 1.5274 | 237 | 9.1938 |
| 44 | C.0483 | 106 | C.2608 | 172 | 1.5696 | 238 | 9.4472 |
| 45 | 0.0496 | 107 | C.2680 | 173 | 1.6128 | 239 | 9.7077 |
| 46 | C.0510 | 108 | C.2753 | 174 | 1.6573 | 240 | 9.9753 |
| 47 | 0.0524 | 109 | C.2829 | 175 | 1.7030 | 241 | 10.2503 |
| 48 | C.0539 | 110 | C.2907 | 176 | 1.7499 | 242 | 10.5329 |
| 49 | C.0553 | 111 | C.2987 | 177 | 1.7982 | 243 | 10.8233 |
| 50 | 0.0569 | 112 | C.3070 | 178 | 1.8477 | 244 | 11.1217 |
| 51 | C.0584 | 113 | C.3154 | 179 | 1.8987 | 245 | 11.4283 |
| 52 | C.0600 | 114 | C.3241 | 180 | 1.9510 | 246 | 11.7433 |
| 53 | C.0617 | 115 | C.3331 | 181 | 2.0048 | 247 | 12.0671 |
| 54 | C.0634 | 116 | 0.3423 | 182 | 2.0601 | 248 | 12.3999 |
| 55 | C.0651 | 117 | C.3517 | 183 | 2.1169 | 249 | 12.7416 |
| 56 | C.0668 | 118 | 0.3614 | 184 | 2.1752 | 250 | 13.0929 |
| 57 | C.0688 | 119 | C.3714 | 185 | 2.2352 | 251 | 13.4539 |
| 58 | C.0707 | 120 | C.3816 | 186 | 2.2968 | 252 | 13.8248 |
| | | 121 | C.3921 | 187 | 2.3602 | 253 | 14.2059 |
| | | 122 | C.4029 | 188 | 2.4252 | 254 | 14.5976 |
| | | 123 | C.4140 | 189 | 2.4921 | 255 | 15.0000 |

DIGITAL COUNTS VS ANALOG VOLTAGE



TEMP SENSOR, HEATER & HEATER CONTROL LOCATIONS



020000
Z

SWP 7 PULSE 1

LINE DRIVER

DATA READY

OVER FLOW DATA

ADVANCE AND SET

STOP

ADVANCE AND SET

CMD 2 AND TEST RESET

STOP

ONE PULSE DRIVER

SW-4
LINE 4
R/S C
10 TO 1000
VCC (10V)

SW-1
LINE 1
R/S C
10 TO 1000
VCC (10V)

SHIFT REGISTER

COUNT

ADVANCE AND SET

CMD 0

GROUND PLANE 3 STEP PROGRAMMER DELAY

RESET OF CNTN AT 00

RESET OF CNTN AT 20

RESET OF CNTN AT 40

RESET OF CNTN AT 20

RESET OF CNTN AT 70

RESET OF CNTN AT 70

BIT ACCUMULATION IN TESTAL DELAY

MASTER RESET

10V VOLTAGE DELAY

LECPA HIGH VOLTAGE DELAY

HECPA HIGH VOLTAGE DELAY

FORCE CONTINUOUS CALIBRATION

SECPA HIGH VOLTAGE DELAY

CHANNEL FROM HIGH VOLTAGE DELAY

SW-25
LINE AND
P. 10-17
10 TO 1000
VCC (10V)

SW-21
LINE AND
P. 10-17
10 TO 1000
VCC (10V)

LINE A/D CONVERTER NEGATIVE SECTION

LINE A/D CONVERTER POSITIVE SECTION

PARITY DE

SIGNAL BANK

SIGNAL 1

SIGNAL 2

SIGNAL 3

SIGNAL 4

SIGNAL 5

SIGNAL 6

SIGNAL 7

SIGNAL 8

SIGNAL 9

SIGNAL 10

SIGNAL 11

SIGNAL 12

SIGNAL 13

SIGNAL 14

SIGNAL 15

SIGNAL 16

SIGNAL 17

SIGNAL 18

SIGNAL 19

SIGNAL 20

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

Z

SW-1
LINE
PARITY DE
10 TO 1000
VCC (10V)

SW-31
LINE
AND
P. 10-17
10 TO 1000
VCC (10V)

SW-3
LINE
AND
P. 10-17
10 TO 1000
VCC (10V)

SW-3
LINE
AND
P. 10-17
10 TO 1000
VCC (10V)

SW-3
LINE
AND
P. 10-17
10 TO 1000
VCC (10V)

SW-3
LINE
AND
P. 10-17
10 TO 1000
VCC (10V)

SW-3
LINE
AND
P. 10-17
10 TO 1000
VCC (10V)

TO SIGNAL BANK

TO SIGNAL BANK

TO SIGNAL BANK

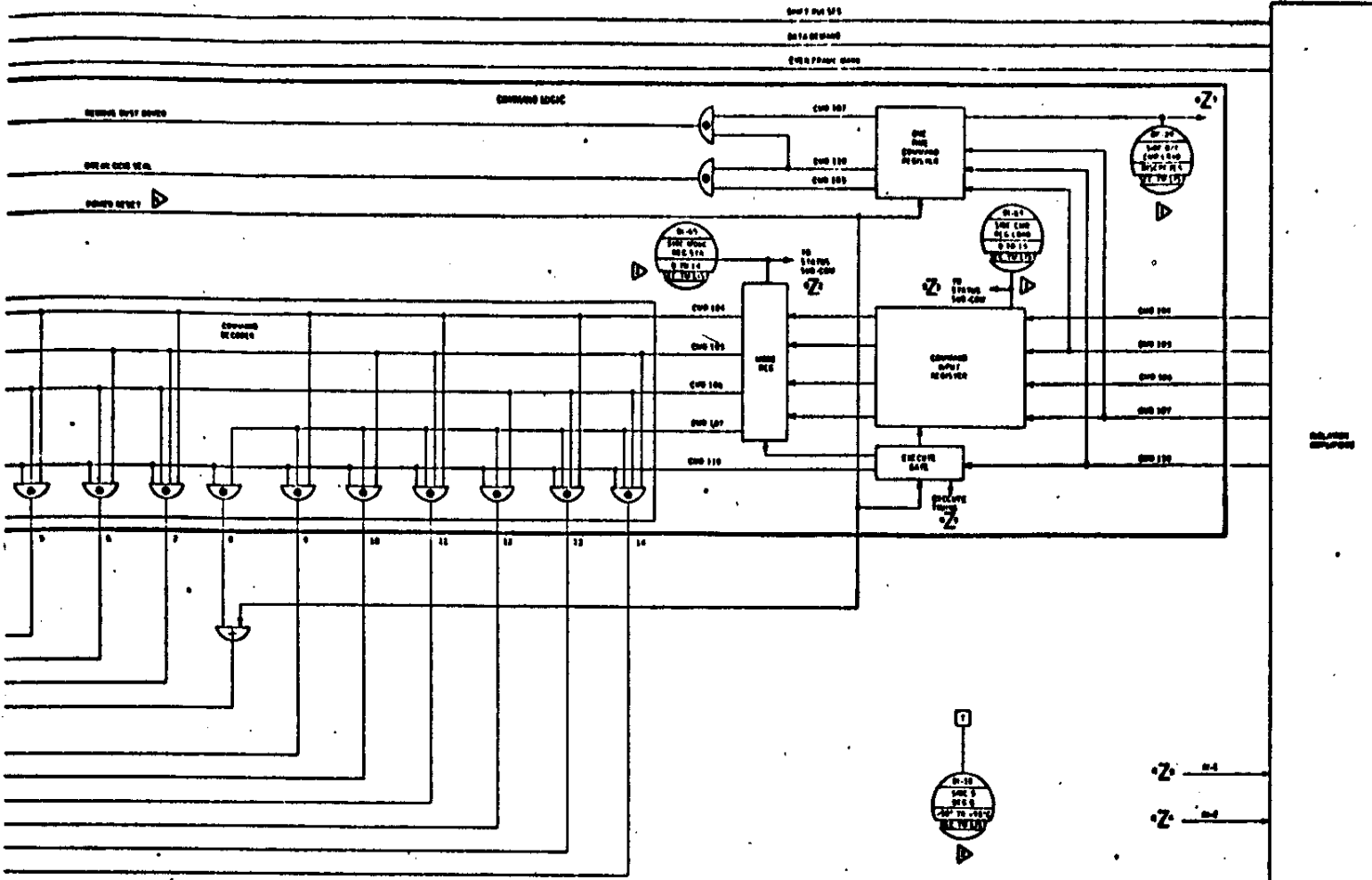
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TO SIGNAL BANK

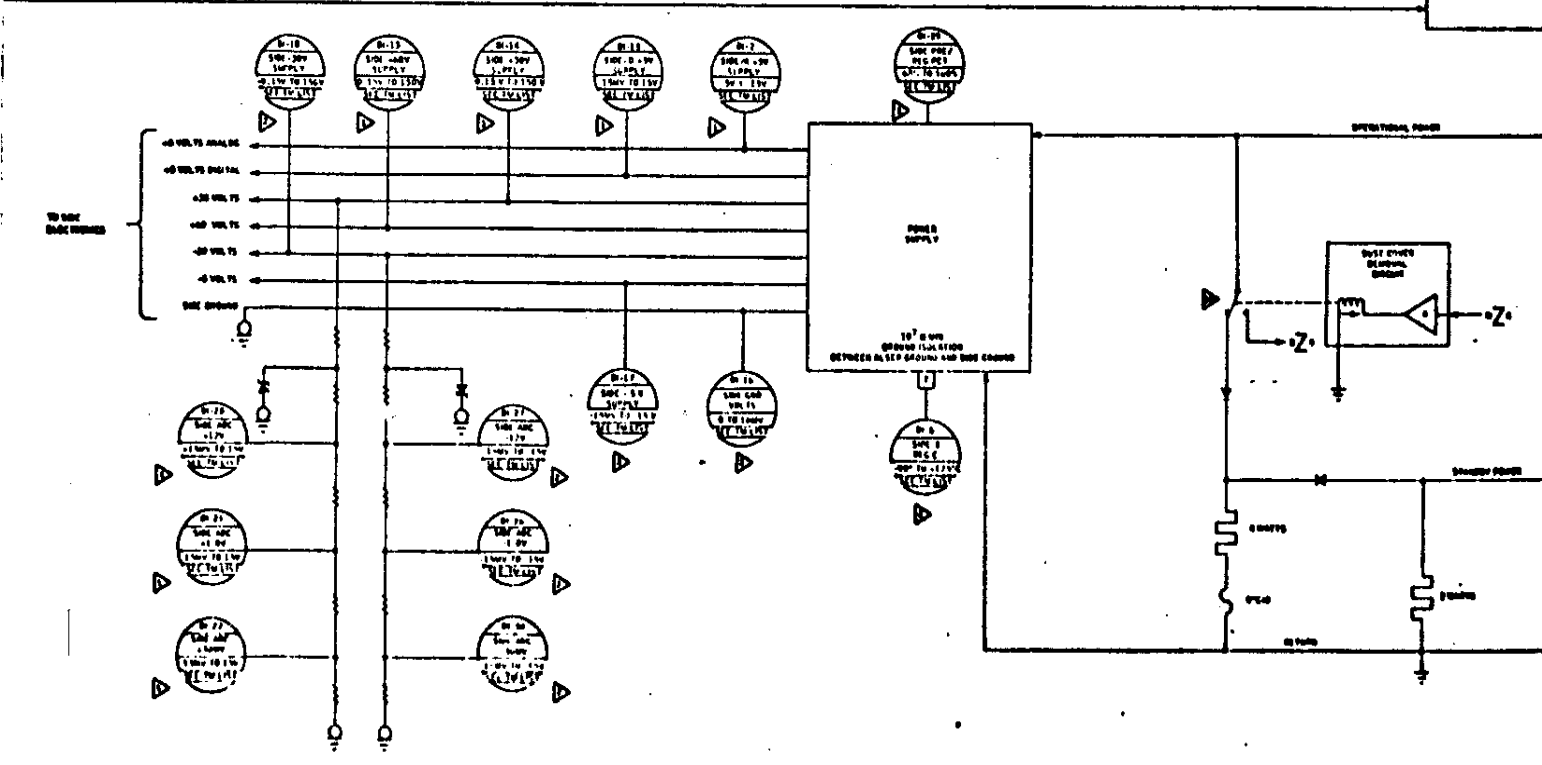
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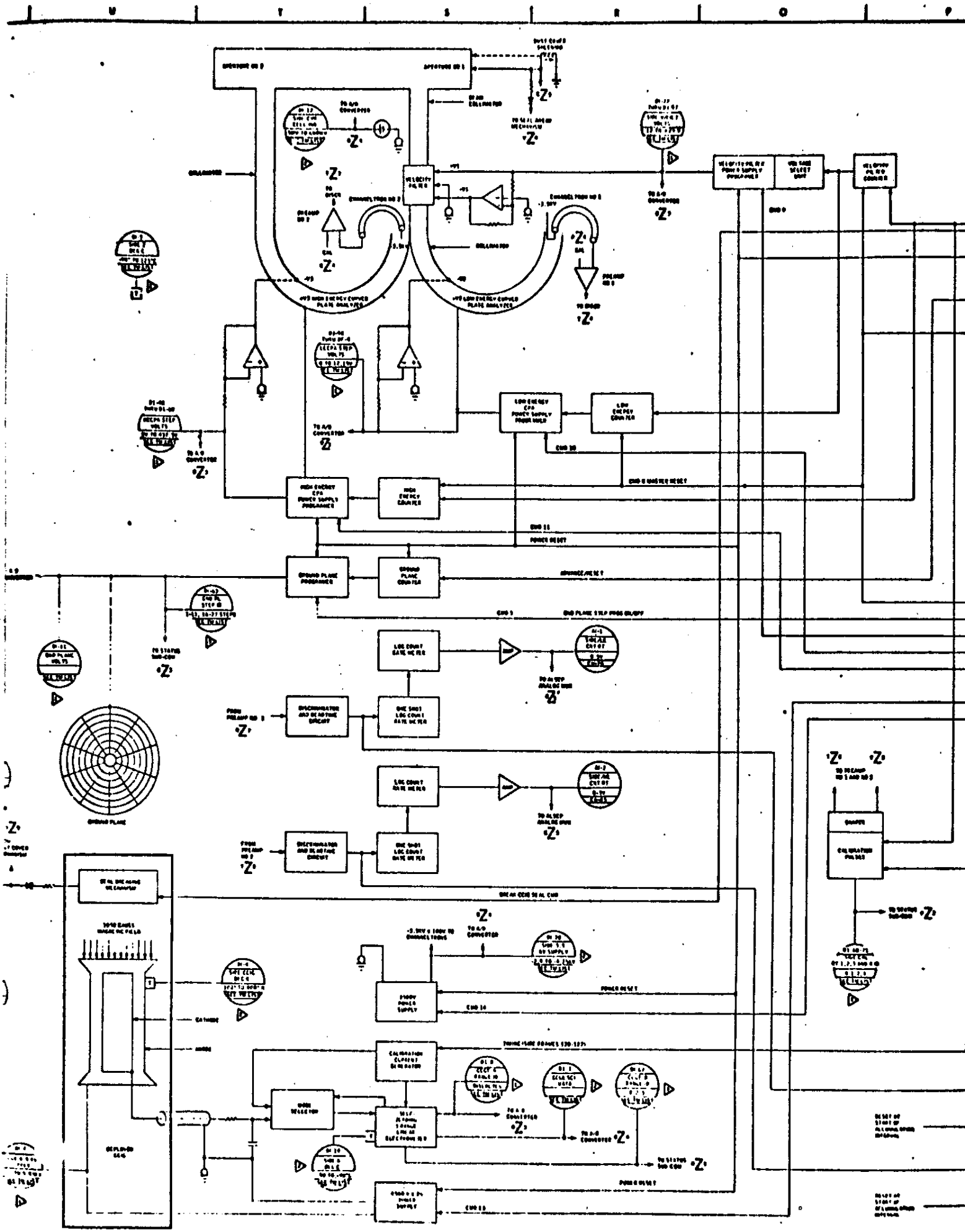
TO SIGNAL BANK

TO SIGNAL BANK



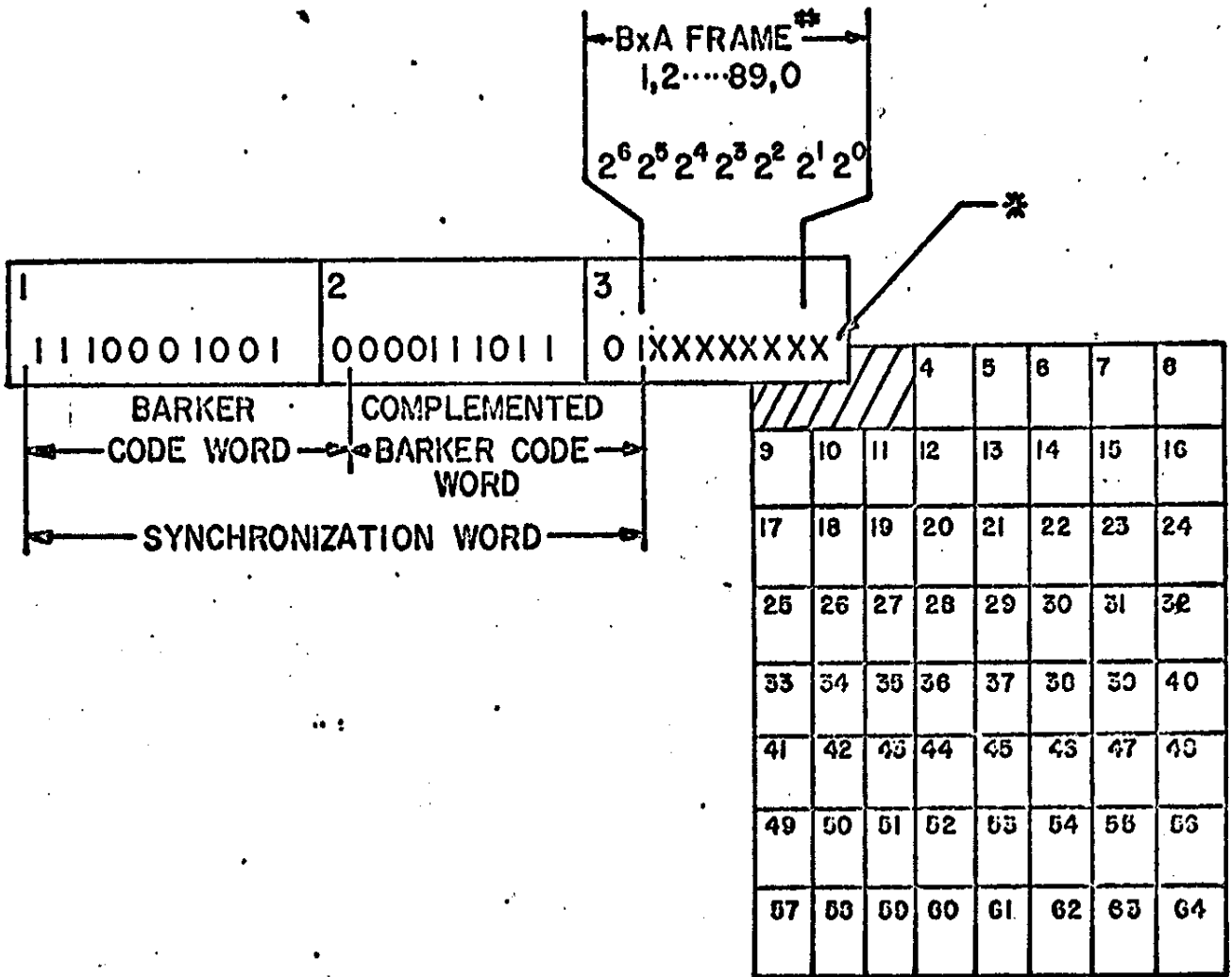
CONTROL DATA TO ALSEP DIGITAL DATA PORT





D1-11 TO A/D CONVERTER
 D1-12 TO A/D CONVERTER
 D1-13 TO A/D CONVERTER
 D1-14 TO A/D CONVERTER
 D1-15 TO A/D CONVERTER
 D1-16 TO A/D CONVERTER
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 D1-96 TO A/D CONVERTER
 D1-97 TO A/D CONVERTER
 D1-98 TO A/D CONVERTER
 D1-99 TO A/D CONVERTER
 D1-100 TO A/D CONVERTER

CONTROL WORD



※ BIT INFORMATION CONTENT IS BxA FRAME DEPENDENT AS FOLLOWS:

| BxA FRAME | X |
|------------------|--------------------------|
| 1 | 1=NORMAL MODE (1050 BPS) |
| 2 | 1=SLOW MODE (530 BPS) |
| 3 | $1=2^2$ DATA PROCESSOR |
| 4 | $1=2^1$ SERIAL NO. |
| 5 | $1=2^0$ |
| 6 THRU 89 & 0 | 0 |

TELEMETRY FORMAT BENDIX FRAME

BxA WORD #

WORD
CONTENT

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| X | X | X | | | | | |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | | | | | | S | |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | | | | | | | |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| | | | | | | S | |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| H | | | | | | | |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| | | | | | CV | S | |
| 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| | | | | | | | S |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |
| | | | | | | S | |

0.604 sec

WORD CONTENT CODE:

X = CONTROL

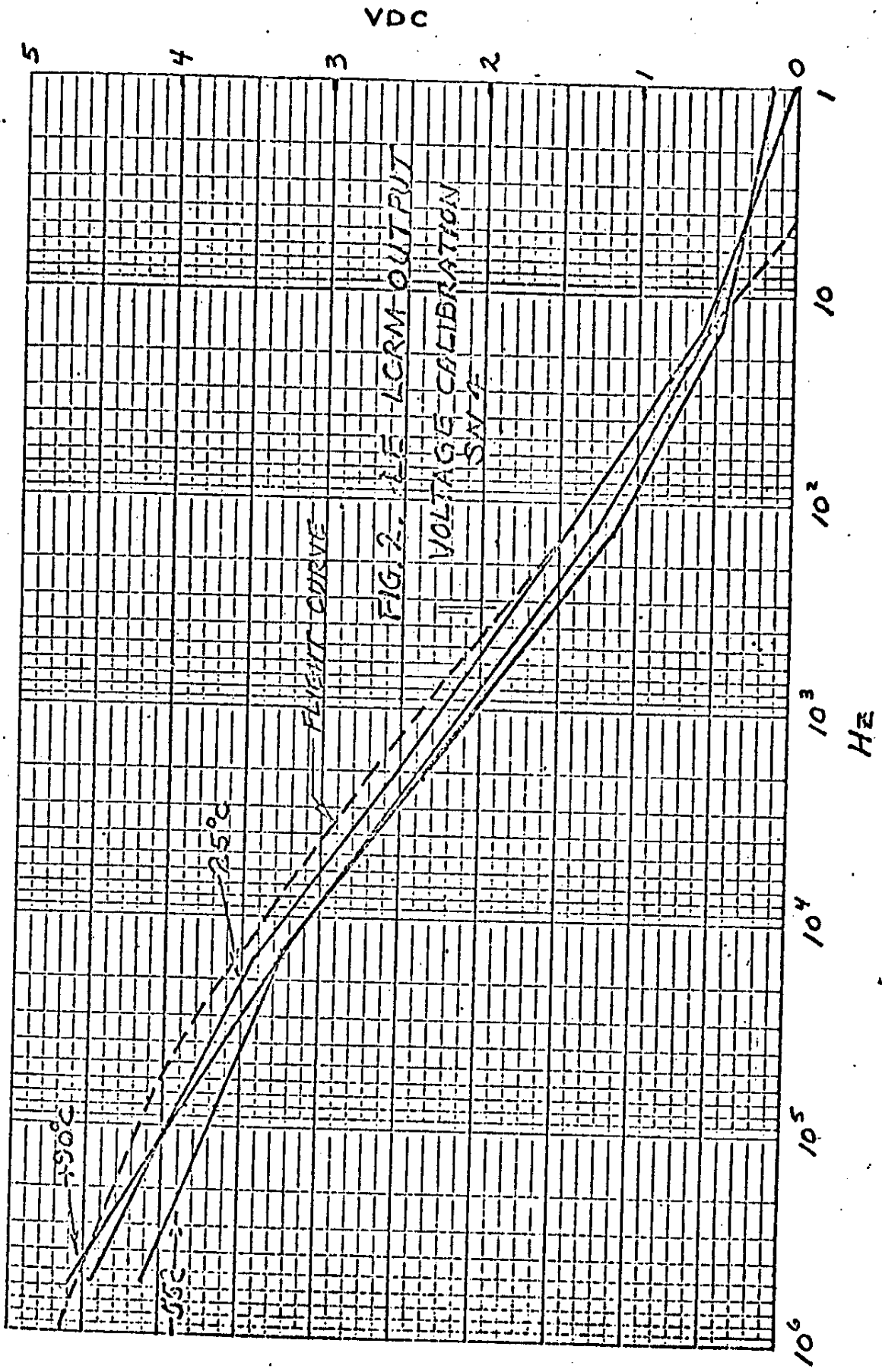
H = HOUSEKEEPING

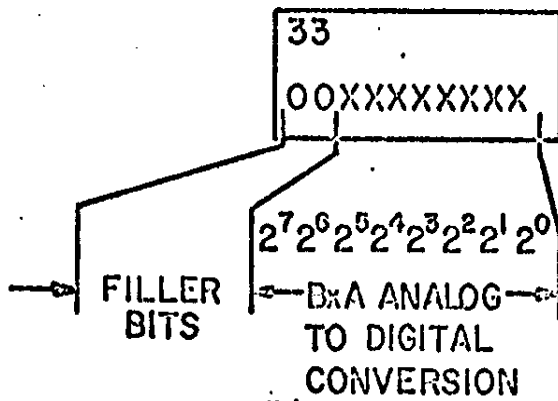
CV = COMMAND VERIFICATION

S = SIDE/CCGE DATA

1060 BPS

*SIDE WD1: EVEN
BxA FRAME*





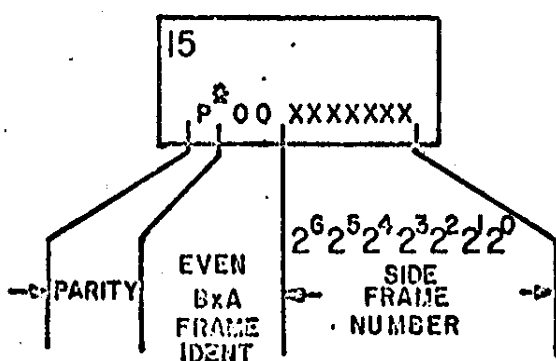
| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |

| BxA FRAME NO. | WORD CONTENT | R/O |
|---------------|-----------------------------------|--------|
| 2 | ADC CALIBRATION 0.25V | 13 ± 1 |
| 3 | ADC CALIBRATION 4.75V | 24 ± 1 |
| 10 | PCU OUTPUT VOLTAGE 29VDC | |
| 12 | POWER DISTRIBUTION EXP 1 & 2 | |
| 14 | POWER DISTRIBUTION EXP 3, 4 & 5 | |
| 70 | LOW ENERGY DET COUNT RATE (LCRM) | |
| 85 | HIGH ENERGY DET COUNT RATE (LCRM) | |

SIDE WORD 1 SIDE FRAME NUMBER

EVEN BxA FRAME

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |



SIDE FRAME NUMBER SEQUENCE

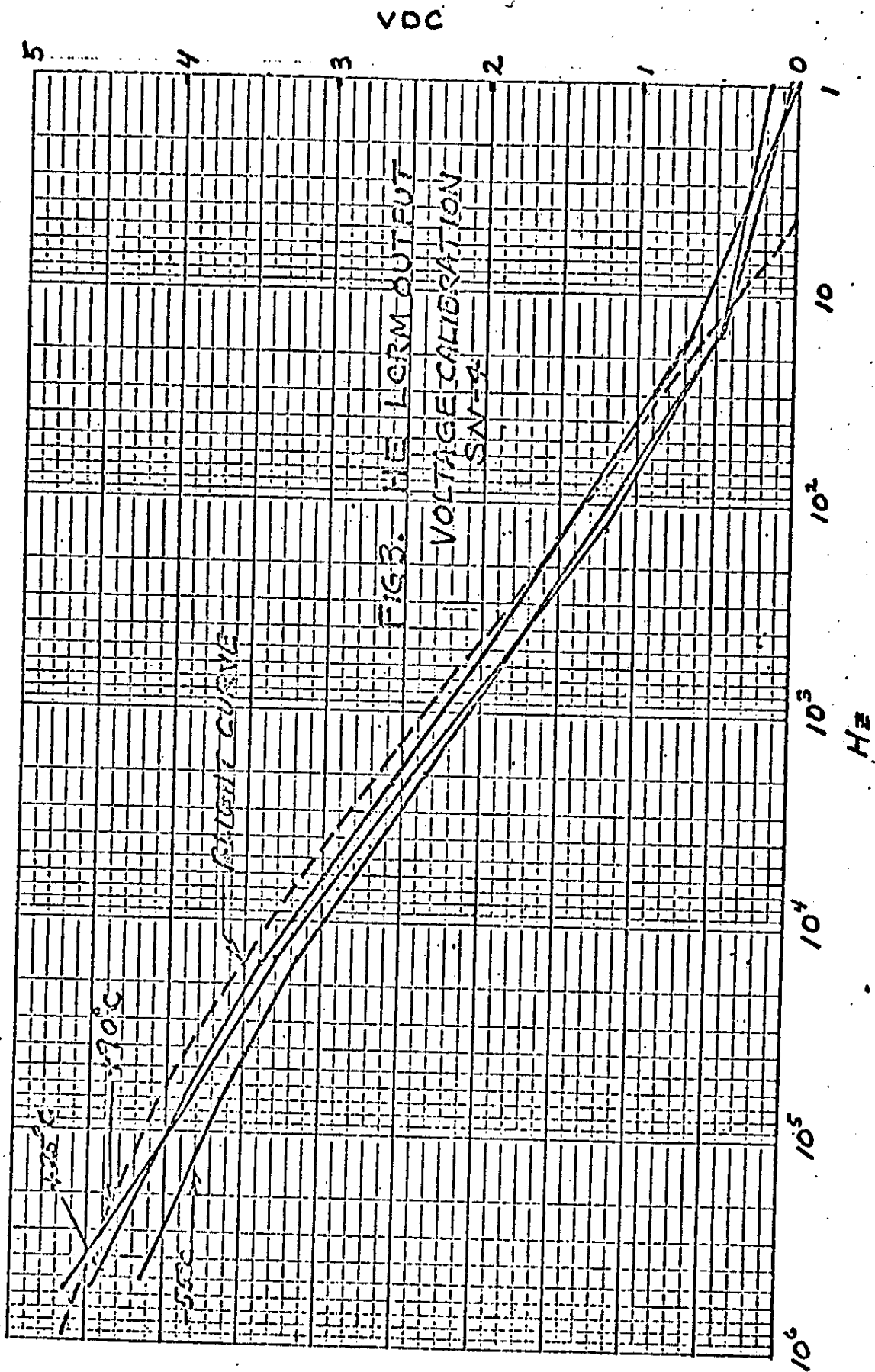
SIDE FRAME NUMBER MAY HAVE ANY ONE OF THE FOLLOWING SEQUENCES:

1. 0,1,2, ..., 126,127 - NORMAL MODE
FOLLOWING INITIAL TURN-ON OR SIDE COMMAND 8 EXECUTION.
2. 0,1,2, ..., 9,10 - CCGE MODE
FOLLOWING EXECUTION OF SIDE COMMAND 2
3. 0,1,2, ..., 38,39 - RESET AT 39 MODE
FOLLOWING EXECUTION OF SIDE COMMAND 3
4. 0,1,2, ..., 78,79 - RESET AT 79 MODE
FOLLOWING EXECUTION OF SIDE COMMAND 5 OR 6
5. 120,121, ..., 126,127 - CALIBRATION MODE
FOLLOWING EXECUTION OF SIDE COMMAND 12

§ PARITY BIT; EVEN

P=0; IF SUM OF BITS IN PRECEEDING FIVE SIDE WORDS IS EVEN.

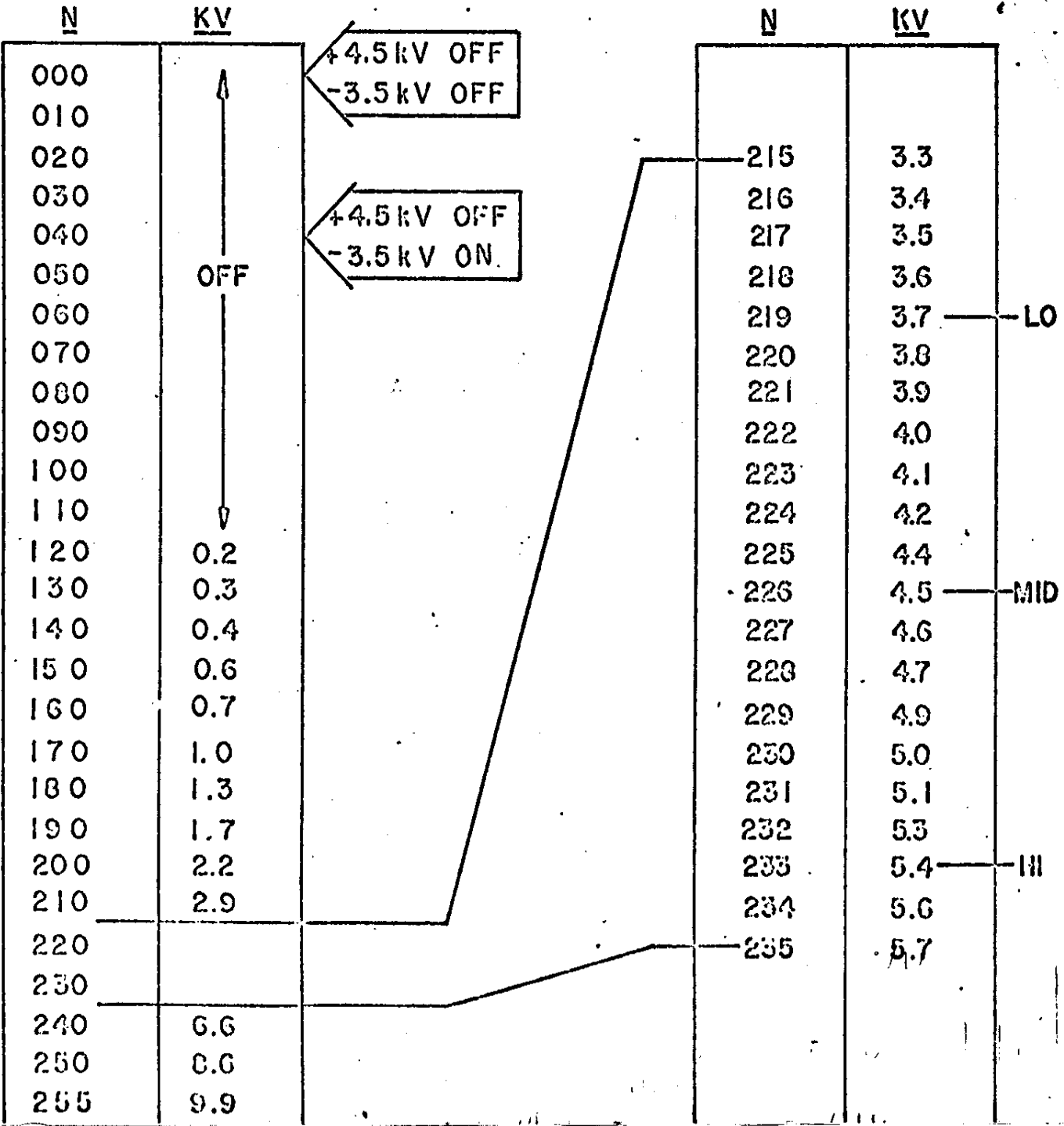
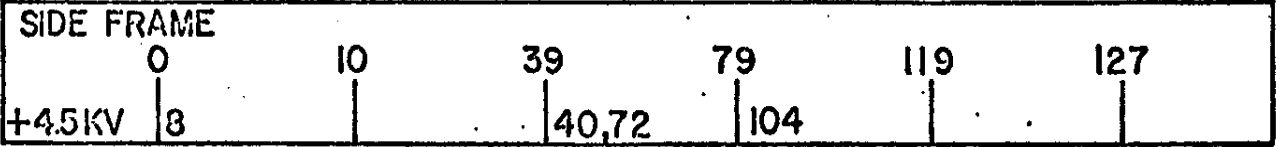
P=1; IF SUM OF BITS IN PRECEEDING FIVE SIDE WORDS IS ODD.



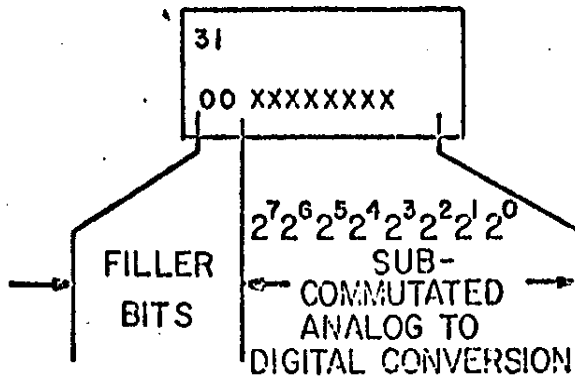
+4500 VDC

+4500 VDC

THIS IS AN ANALOG MEASUREMENT OF THE 4500 VOLT POWER SUPPLY OUTPUT (PRIOR TO THE CURRENT LIMITING RESISTOR) SUPPLIED TO THE COLD CATHODE IONIZATION GAUGE. A LOCK-OUT PLUG IS USED TO DISABLE THIS SUPPLY DURING CHECK-OUT UNDER AMBIENT PRESSURE. COMMAND NO.13 IS USED FOR ON/OFF CONTROL. INITIAL CONDITION (LOCKOUT PLUG REMOVED) IS WITH THIS VOLTAGE IN THE "ON" STATE.



SIDE WORD 2
(ANALOG SUBCOM)



(EVEN BxA FRAME)

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | | 32 |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |

| VOLTAGES | 0 | 10 | 39 | 79 | 119 | 127 |
|-------------------------|-----------|-------------|----|----------------------|---------------|-----|
| +4.5KV | 8 | | | 40,72 | 104 | |
| +60 V | | 16 | | 48 | 80,112 | |
| +30 V | | 17 | | 49 | 81,113 | |
| +12 V | | 28 | | 60 | 92 | |
| +A/D REF | | 26 | | 58 | 90 | |
| +5 V ANAL | 0 | 32 | | 64 | 96 | |
| +5 V DIGIT | | 18 | | 50 | 82,114 | |
| +1 V CAL | | 27 | | 59 | 91 | |
| +30 mV CAL | | 25 | | 57 | 89 | |
| .(-) GND | | 19 | | 51 | 83,115 | |
| -30 mV | | | | 46 | 110 | |
| -1 V CAL | | 37 | | | 101 | |
| -5 V | | 20 | | 52 | 84,116 | |
| -A/D REF | | 30 | | 62 | 94 | |
| -12 V CAL | | 39 | | | 103 | |
| -30 V | | 21 | | 53 | 85,117 | |
| -3.5KV | | 23 | | 55 | 87,119 | |
| <u>TEMPERATURES (+)</u> | | | | | | |
| 1 | 2 | 34 | | 66 | 98 | |
| 2 | 4 | 36 | | 68 | 100 | |
| 3 | 6 | 38 | | 70 | 102 | |
| 4 | | 11 | | 43,75 | 107 | |
| 5 | | 12 | | 44,76 | 108 | |
| 6 | | 22 | | 54 | 86,118 | |
| <u>DATA & MISC</u> | | | | | | |
| -CCGE | 1,3,5,7,9 | | | 41,73 | 105 | |
| +DST CVR/SEAL | | | | 67,71 | | |
| +ELECT RNG | 10 | 24 | | 42,56,74 | 80,106 | 120 |
| +GND PLN VOLT | | 13,15,29,31 | | 45,47,61,63,69,77,79 | 93,95,109,111 | |
| +OTC REG | | 33,35 | | | 97,99 | |
| +PRE REG D/F | | | | 65 | | |
| -SOL CELL | | 14 | | 70 | | |

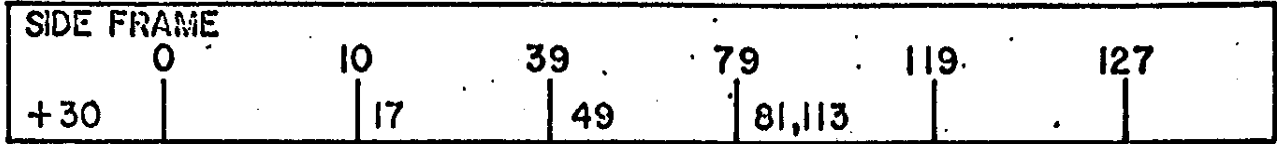
WORD CONTENT

3000 1/2 before
121,122 after
123,124 start bit
125,126,127 start and
at 1st col stand

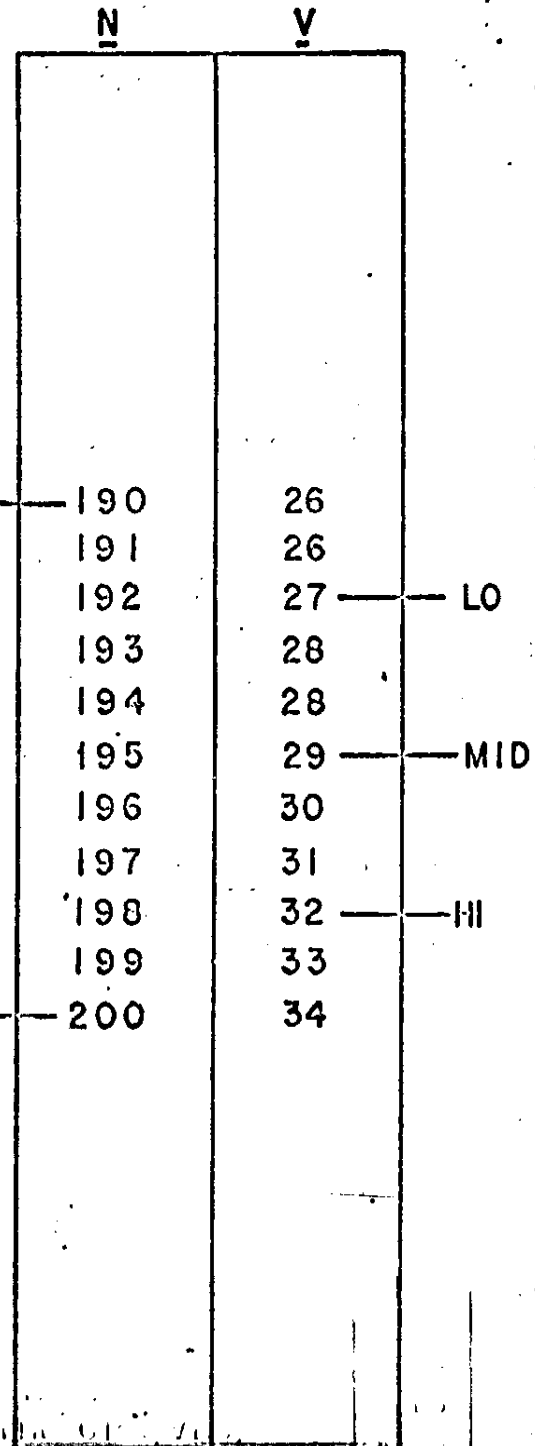
+30 VDC

+30 VDC

THIS IS AN ANALOG MEASUREMENT OF THE +30 VDC POWER SUPPLY WHICH SUPPLIES POWER TO THE GPS, VFS, LECPAS, HECPAS, A/D CONVERTER, CAL. PULSER, ELECTROMETER, +4.5 KV POWER SUPPLY, -3.5KV POWER SUPPLY, AND DIGITAL AND COMMAND CIRCUITRY.



| N | V |
|-----|-----|
| 000 | 0 |
| 010 | 0 |
| 020 | 0 |
| 030 | 0 |
| 040 | 0 |
| 050 | 1 |
| 060 | 1 |
| 070 | 1 |
| 080 | 1 |
| 090 | 2 |
| 100 | 2 |
| 110 | 3 |
| 120 | 4 |
| 130 | 5 |
| 140 | 7 |
| 150 | 9 |
| 160 | 11 |
| 170 | 15 |
| 180 | 20 |
| 190 | |
| 200 | |
| 210 | 44 |
| 220 | 53 |
| 230 | 76 |
| 240 | 100 |
| 250 | 130 |
| 255 | 150 |

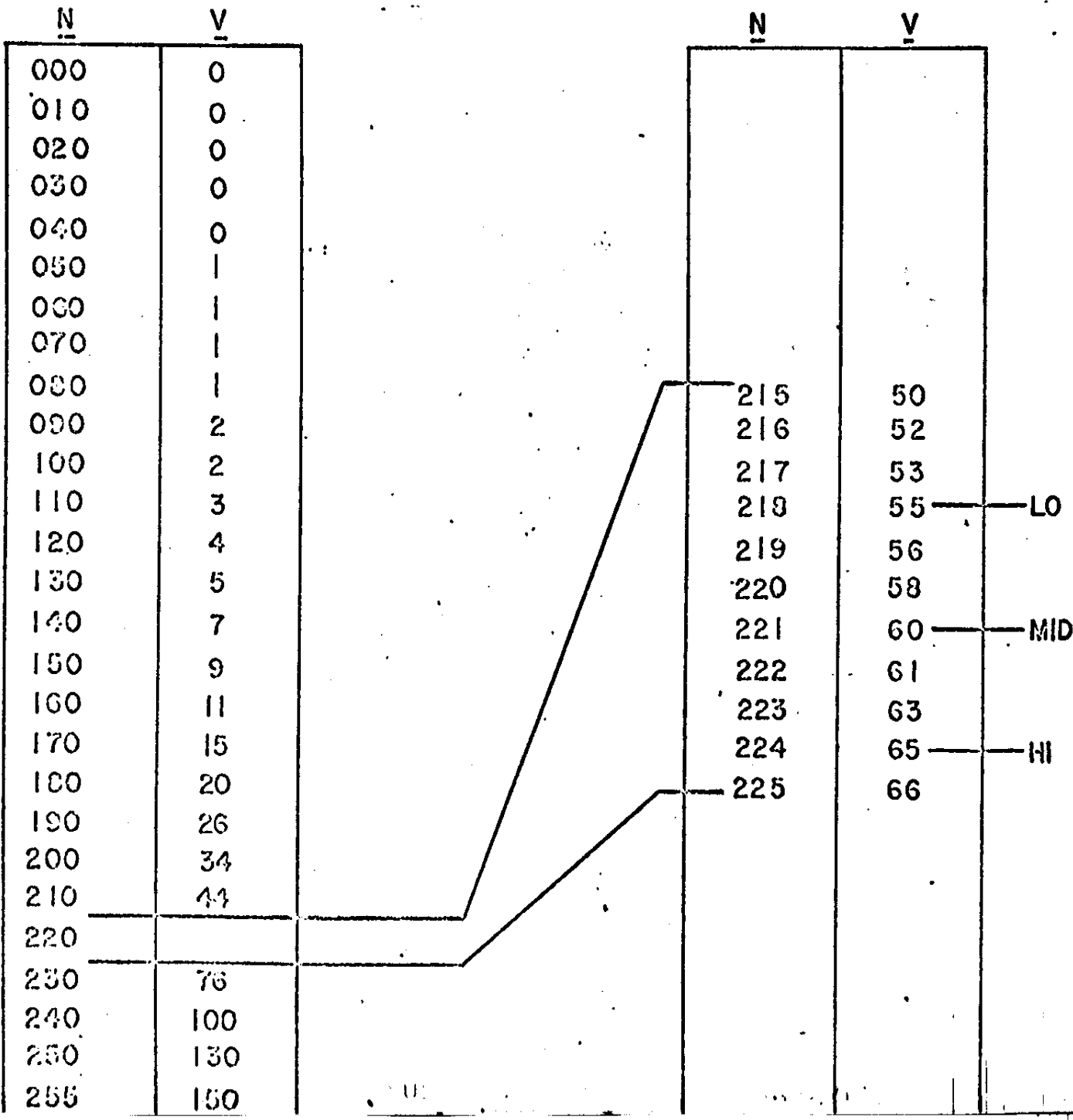


+60 VDC

THIS IS AN ANALOG MEASUREMENT OF THE +60 VDC POWER SUPPLY WHICH SUPPLIES POWER TO THE GPS,VFS, HECPAS, AND SOME OF THE DIGITAL AND COMMAND CIRCUITRY.

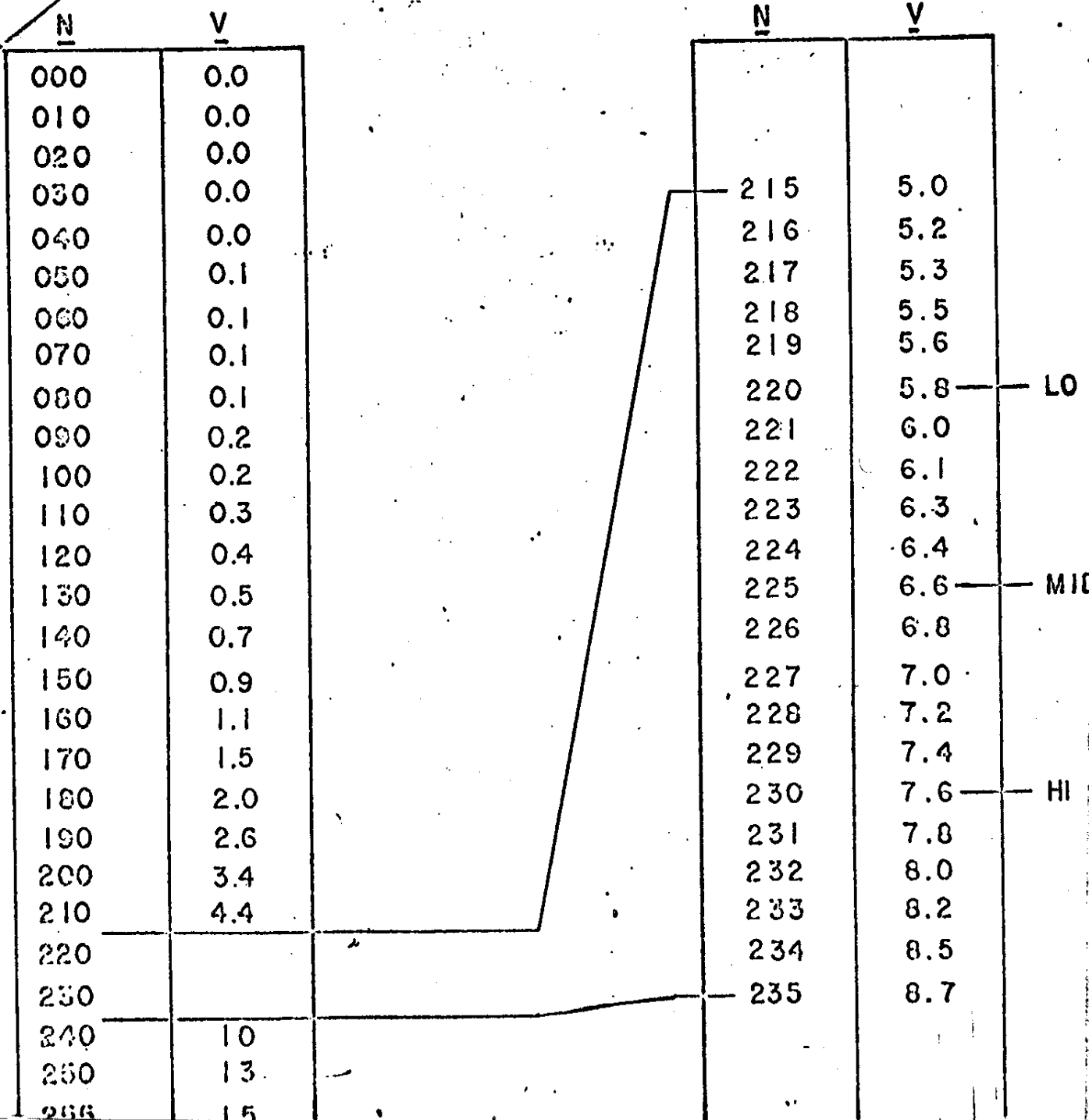
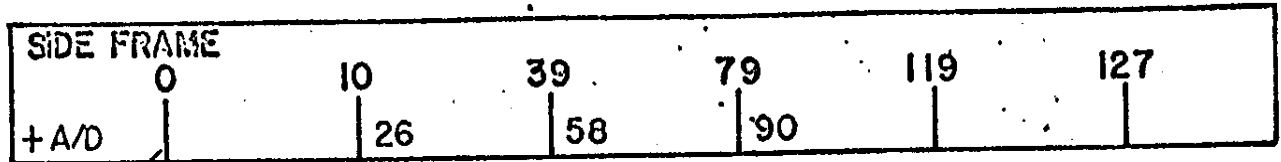
+60 VDC

| SIDE FRAME | |
|------------|--------|
| 0 | 10 |
| 39 | 79 |
| 119 | 127 |
| +60 | 16 |
| 48 | 80,112 |



THIS AN ANALOG MEASUREMENT OF A POSITIVE REFERENCE VOLTAGE FOR THE A/D CONVERTER.

+A/D REF VDC

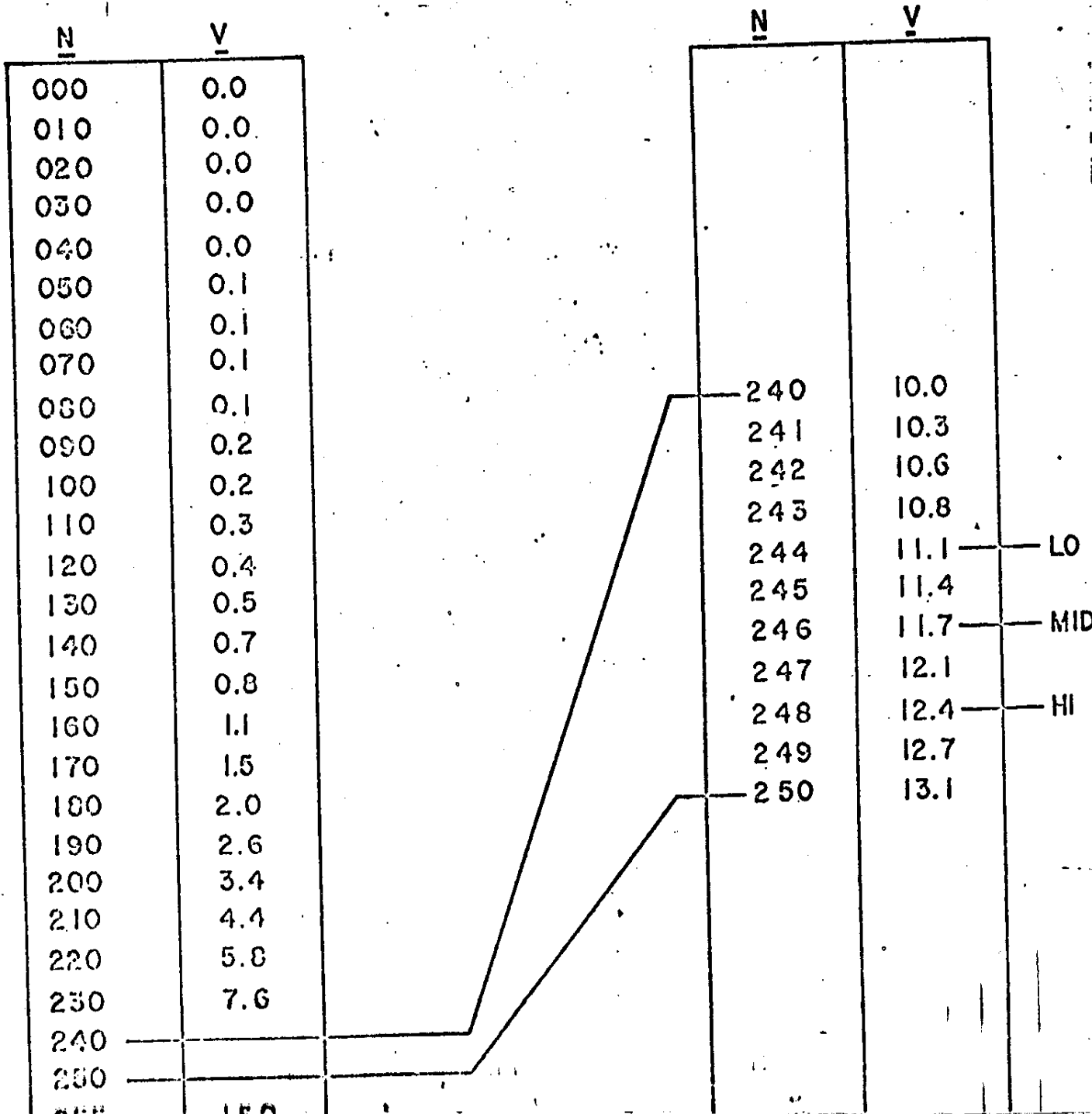


+12 VDC

THIS IS AN ANALOG MEASUREMENT OF THE +12 VDC POWER SUPPLY WHICH SUPPLIES POWER TO THE HIGH AND LOW ENERGY LOG COUNT RATE METERS.

+12 VDC

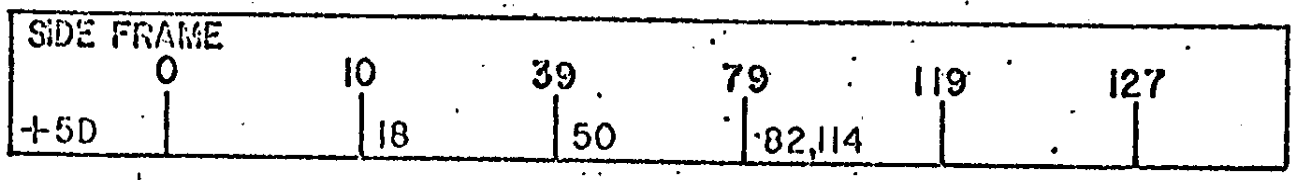
| | | | | | | |
|------------|---|----|----|----|-----|-----|
| SIDE FRAME | | | | | | |
| | 0 | 10 | 39 | 79 | 119 | 127 |
| +12 | | 28 | 60 | 92 | | |



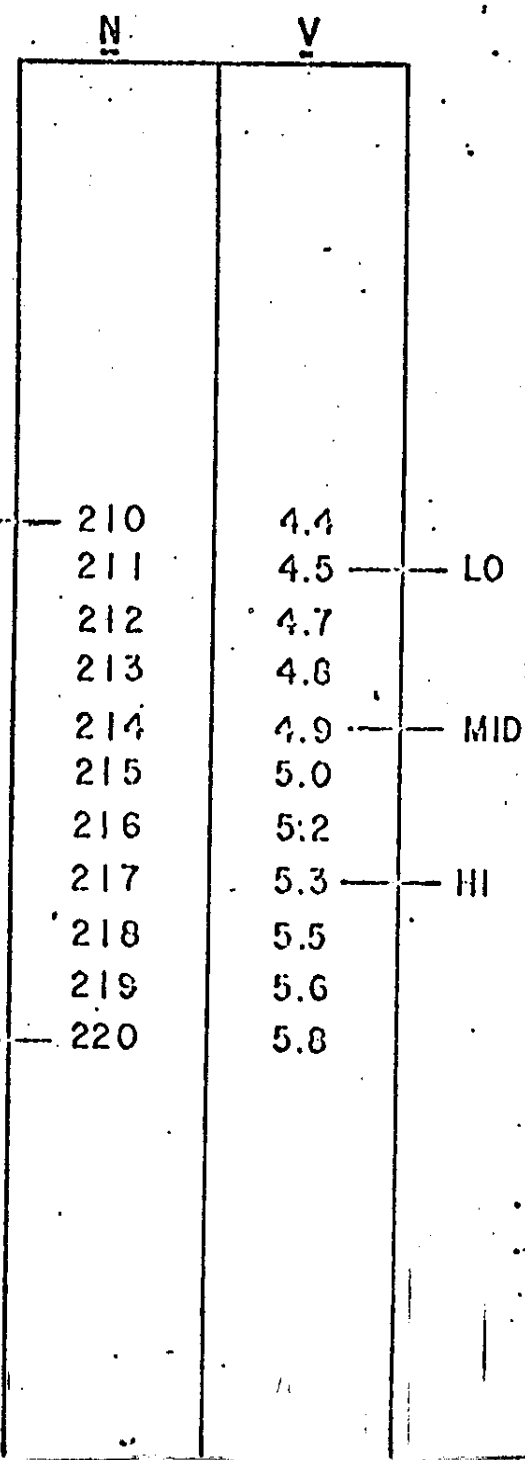
+ 5 VDC

THIS IS AN ANALOG MEASUREMENT OF THE +5 VDC POWER SUPPLY WHICH SUPPLIES POWER TO ALL DIGITAL CIRCUITRY WITHIN THE EXPERIMENT.

+5 VDC



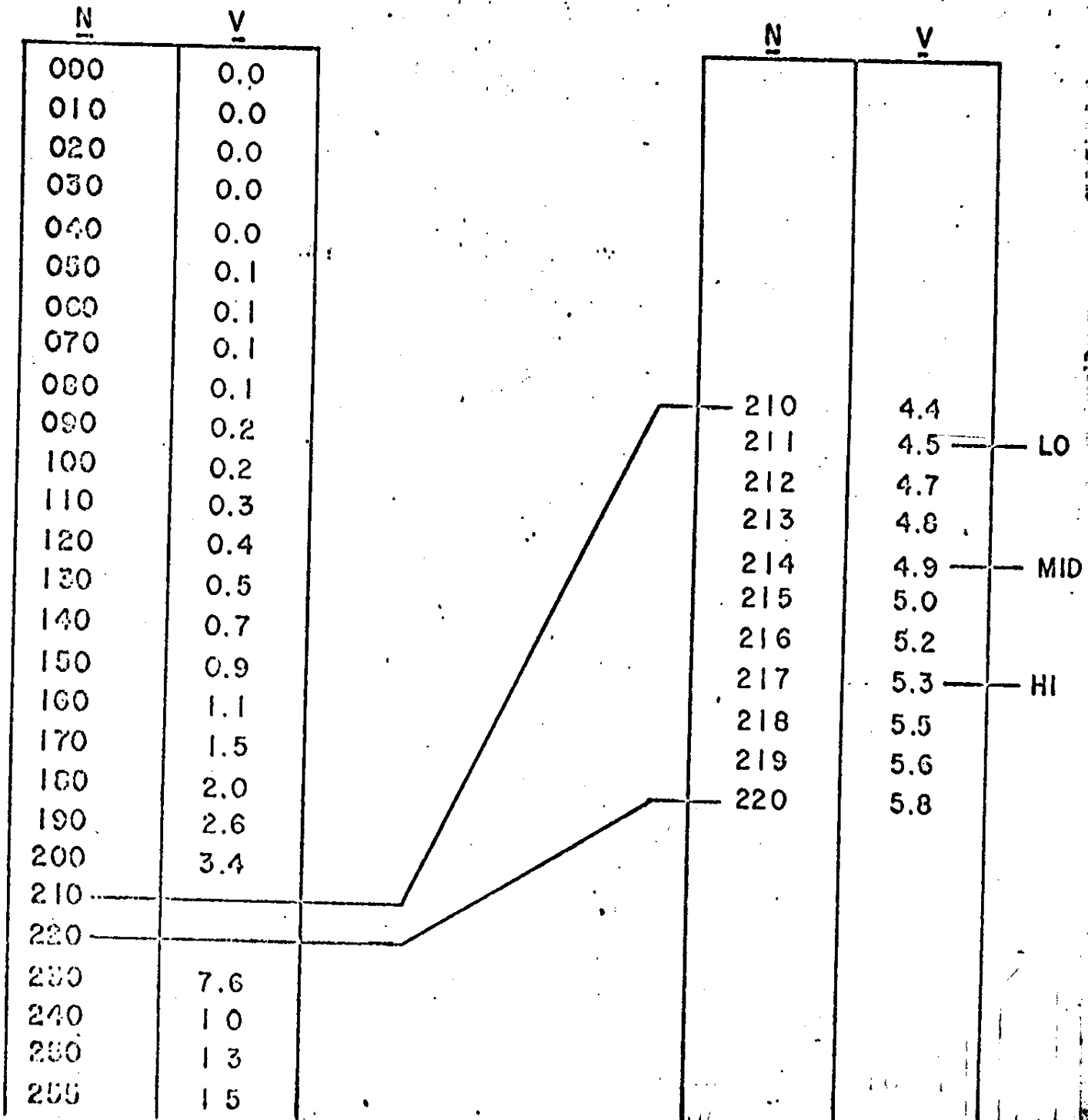
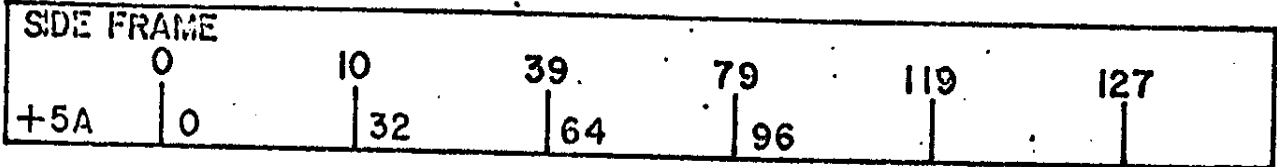
| <u>N</u> | <u>V</u> |
|----------|----------|
| 000 | 0.0 |
| 010 | 0.0 |
| 020 | 0.0 |
| 030 | 0.0 |
| 040 | 0.0 |
| 050 | 0.1 |
| 060 | 0.1 |
| 070 | 0.1 |
| 080 | 0.1 |
| 090 | 0.2 |
| 100 | 0.2 |
| 110 | 0.3 |
| 120 | 0.4 |
| 130 | 0.5 |
| 140 | 0.7 |
| 150 | 0.9 |
| 160 | 1.1 |
| 170 | 1.5 |
| 180 | 2.0 |
| 190 | 2.6 |
| 200 | 3.4 |
| 210 | |
| 220 | |
| 230 | 7.0 |
| 240 | 10 |
| 250 | 13 |
| 265 | 15 |



+5 VDC

THIS IS AN ANALOG MEASUREMENT OF THE +5 VDC POWER SUPPLY WHICH SUPPLIES POWER TO ANY ANALOG CIRCUITRY WHICH REQUIRES +5 VDC.

+5 VDC

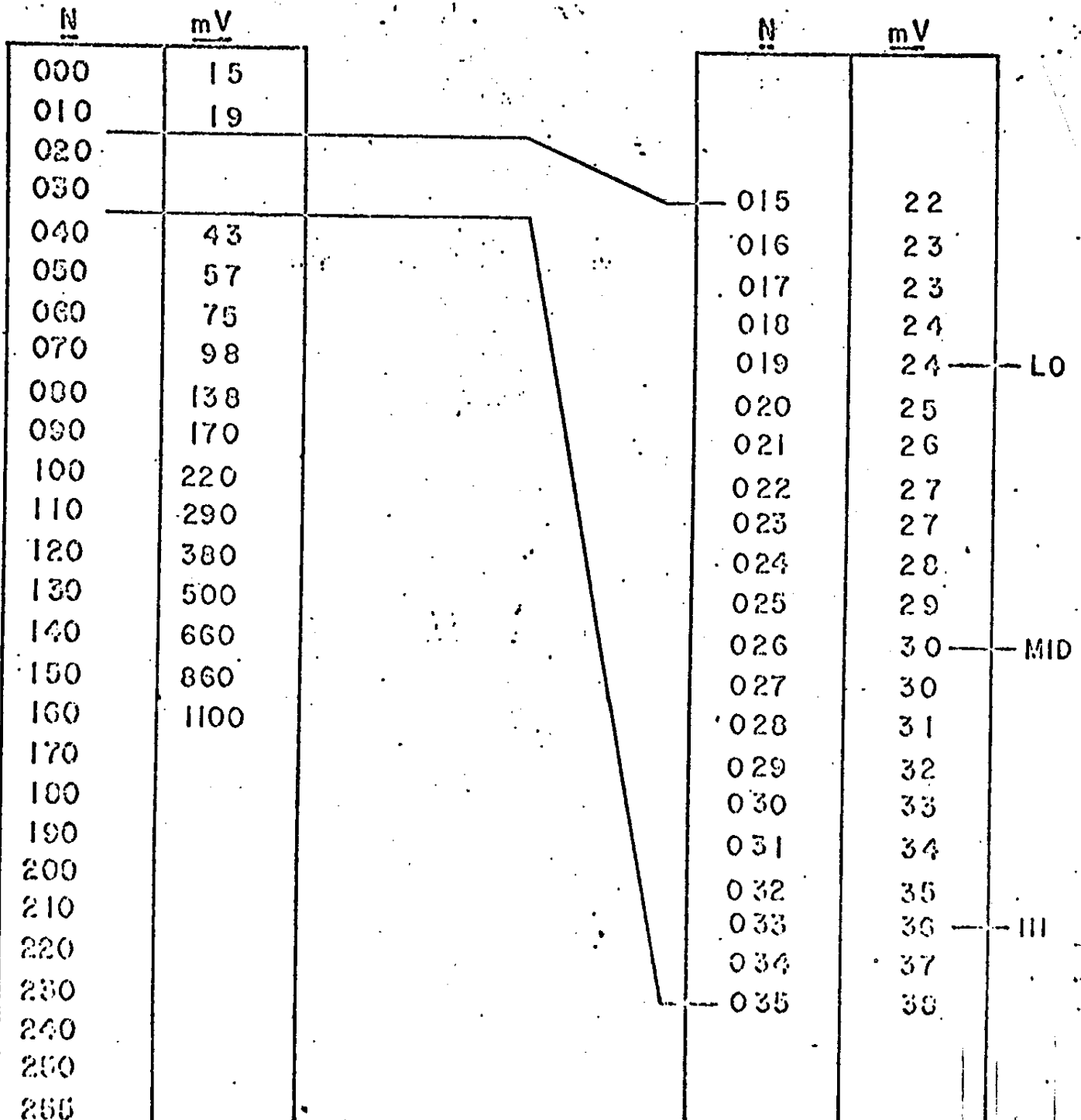
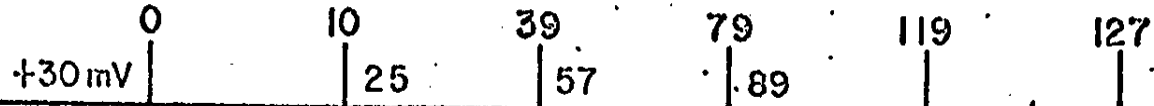


+ 30 mv CAL

THIS IS AN ANALOG MEASUREMENT OF A POSITIVE 30 MILLIVOLT CALIBRATION VOLTAGE FOR THE A/D CONVERTER.

+ 50 mv CAL

SIDE FRAME

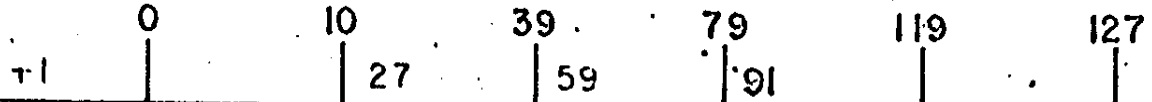


+1VDC

THIS IS AN ANALOG MEASUREMENT OF A POSITIVE 1VDC REFERENCE VOLTAGE FOR THE A/D CONVERTER.

+1VDC

SIDE FRAME



| <u>N</u> | <u>V</u> |
|----------|----------|
| 000 | 0.0 |
| 010 | 0.0 |
| 020 | 0.0 |
| 030 | 0.0 |
| 040 | 0.0 |
| 050 | 0.1 |
| 060 | 0.1 |
| 070 | 0.1 |
| 080 | 0.1 |
| 090 | 0.2 |
| 100 | 0.2 |
| 110 | 0.3 |
| 120 | 0.4 |
| 130 | 0.5 |
| 140 | 0.7 |
| 150 | |
| 160 | |
| 170 | 1.5 |
| 180 | 2.0 |
| 190 | 2.6 |
| 200 | 3.4 |
| 210 | 4.4 |
| 220 | 5.8 |
| 230 | 7.6 |
| 240 | 10 |
| 250 | 13 |
| 255 | 15 |

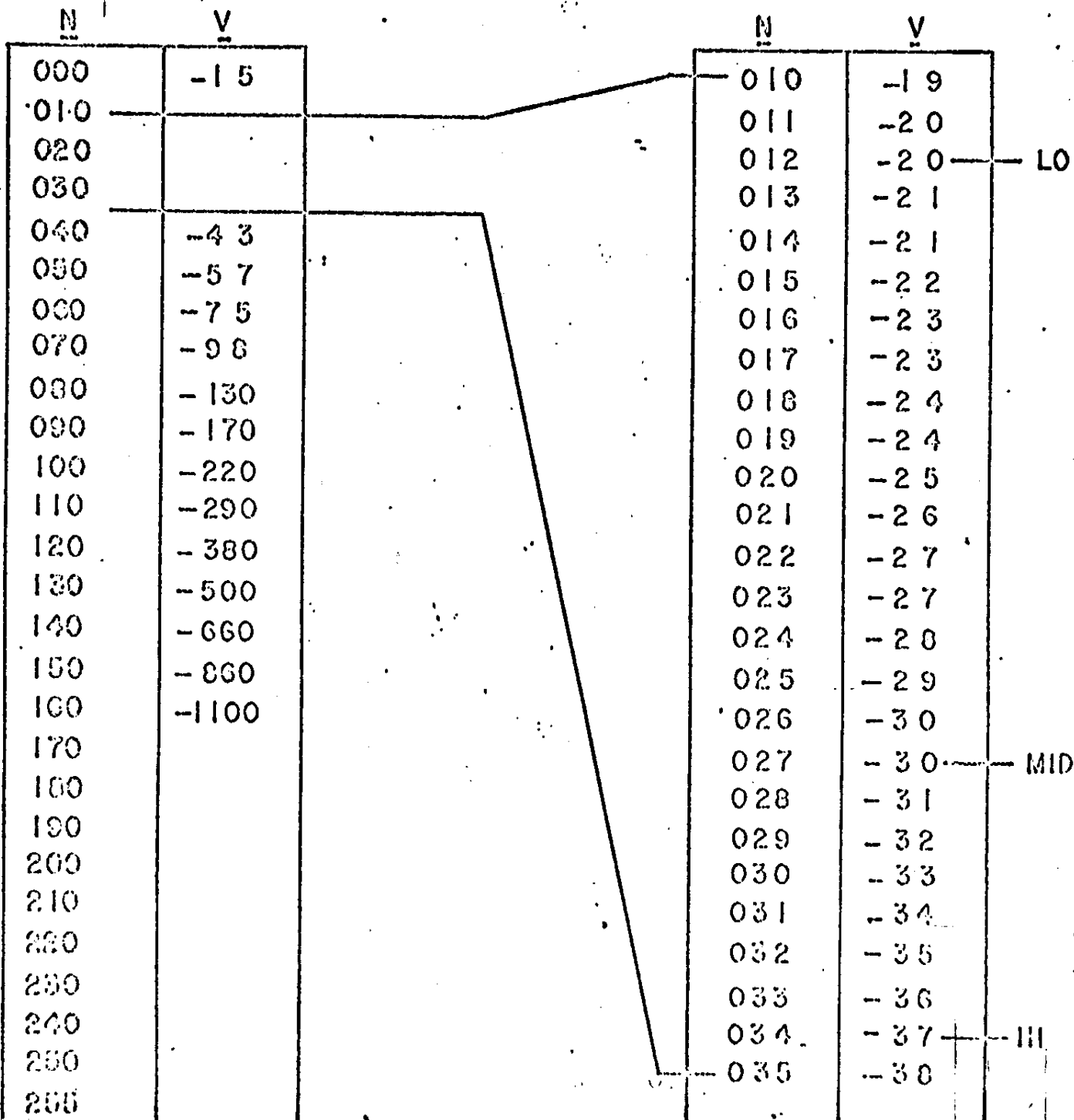
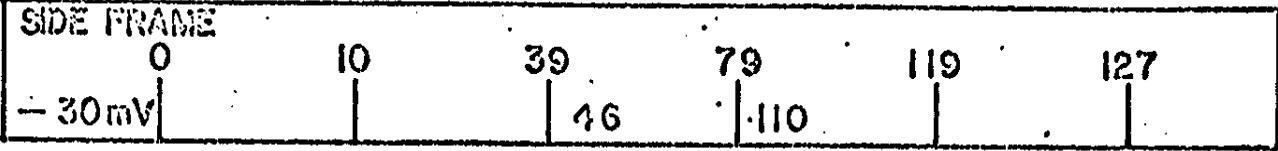
| <u>N</u> | <u>V</u> |
|----------|----------|
| 150 | 0.86 |
| 151 | 0.89 |
| 152 | 0.91 |
| 153 | 0.94 |
| 154 | 0.96 |
| 155 | 0.99 |
| 156 | 1.02 |
| 157 | 1.04 |
| 158 | 1.07 |
| 159 | 1.10 |
| 160 | 1.13 |

LO
MIC
HI

- 30 mv CAL

THIS IS AN ANALOG MEASUREMENT OF A NEGATIVE 30 MILLIVOLT CALIBRATION VOLTAGE FOR THE A/D CONVERTER.

- 30 mv CAL

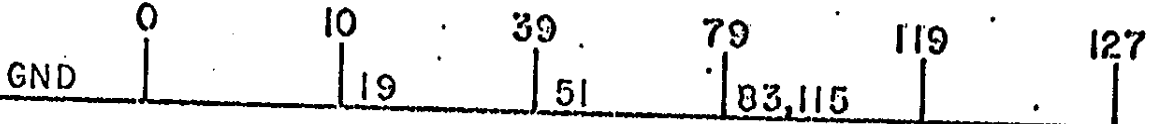


GND VDC

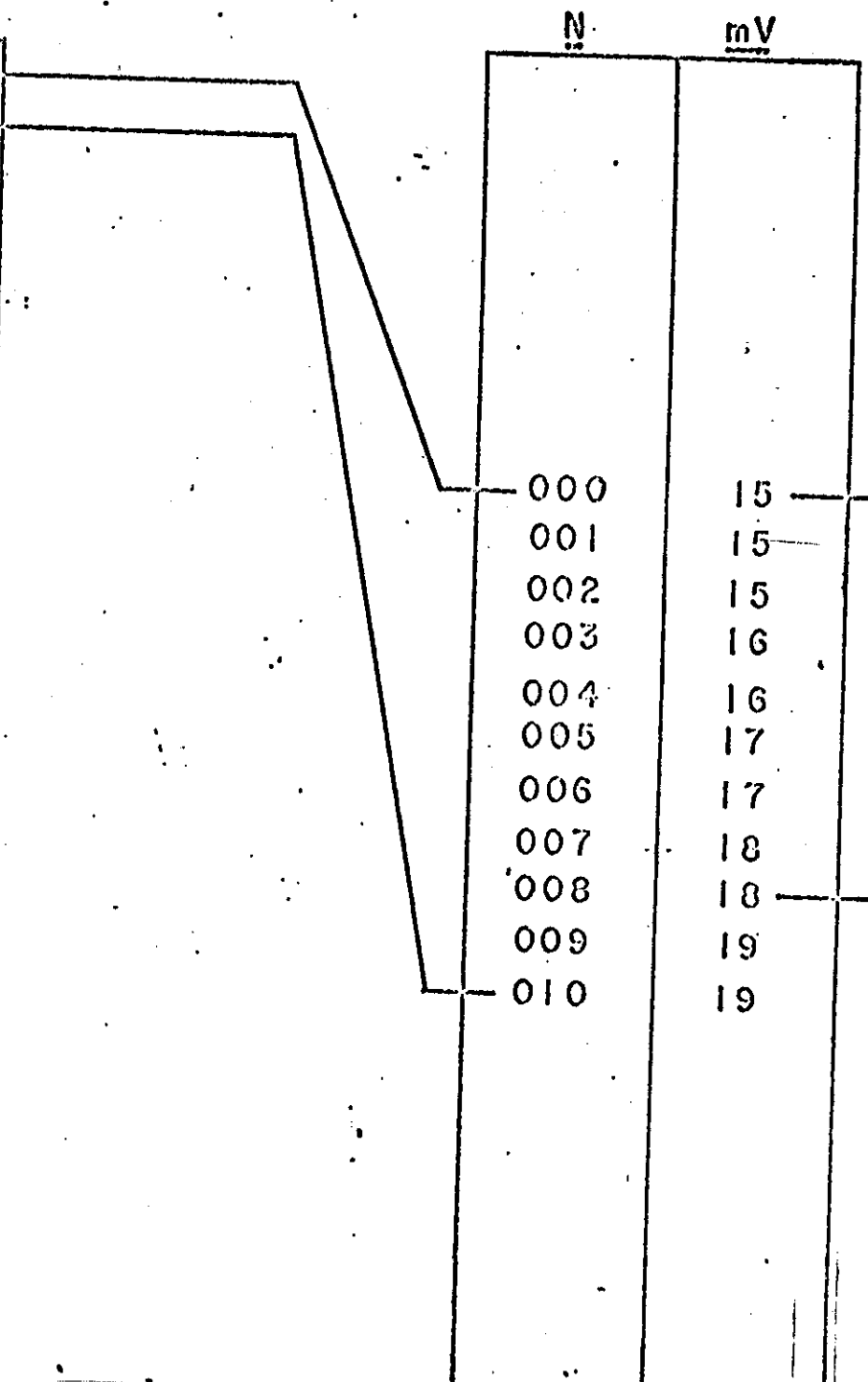
GND VDC

THIS IS AN ANALOG MEASUREMENT OF EXPERIMENT GROUND TO DETERMINE PRESENCE OF NOISE ON GROUND LINES.

SIDE FRAME



| N | mV |
|-----|------|
| 000 | |
| 010 | |
| 020 | 25 |
| 030 | 33 |
| 040 | 43 |
| 050 | 57 |
| 060 | 74 |
| 070 | 98 |
| 080 | 130 |
| 090 | 170 |
| 100 | 220 |
| 110 | 290 |
| 120 | 380 |
| 130 | 500 |
| 140 | 660 |
| 150 | 860 |
| 160 | 1100 |
| 170 | |
| 180 | |
| 190 | |
| 200 | |
| 210 | |
| 220 | |
| 230 | |
| 240 | |
| 250 | |
| 265 | |



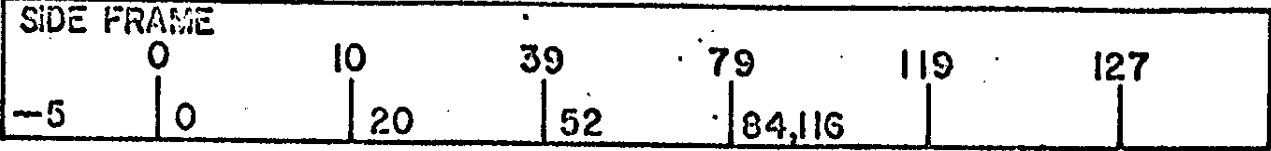
NOI

III

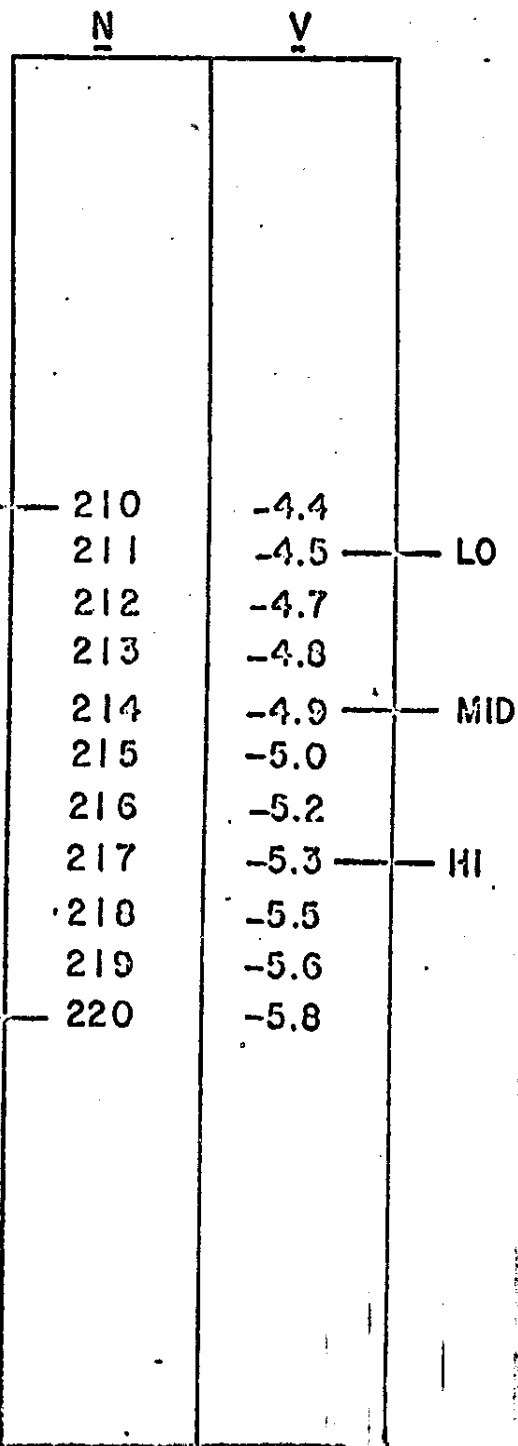
- 5 VDC

THIS IS AN ANALOG MEASUREMENT OF THE -5 VDC POWER SUPPLY WHICH SUPPLIES POWER TO THE VFS,LECPAS,HECPAS,A/D CONVERTER,CHANNELTRON PRE-AMPS AND DISCRIMINATORS,CAL. PULSER,ANDELECTROMETER.

-5 VDC



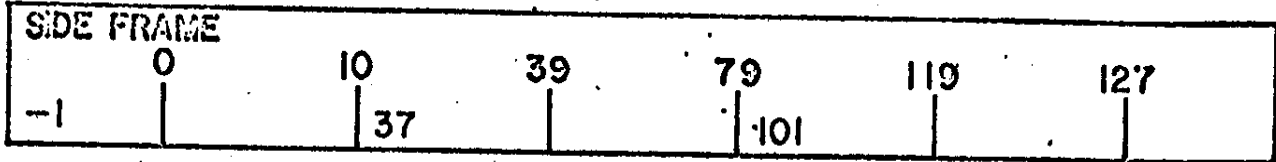
| <u>N</u> | <u>V</u> |
|----------|----------|
| 000 | -0.0 |
| 010 | -0.0 |
| 020 | -0.0 |
| 030 | -0.0 |
| 040 | -0.0 |
| 050 | -0.1 |
| 060 | -0.1 |
| 070 | -0.1 |
| 080 | -0.1 |
| 090 | -0.2 |
| 100 | -0.2 |
| 110 | -0.3 |
| 120 | -0.4 |
| 130 | -0.5 |
| 140 | -0.7 |
| 150 | -0.9 |
| 160 | -1.1 |
| 170 | -1.5 |
| 180 | -2.0 |
| 190 | -2.6 |
| 200 | -3.4 |
| 210 | |
| 220 | |
| 230 | -7.6 |
| 240 | -10 |
| 250 | -13 |
| 260 | -15 |



-1 VDC

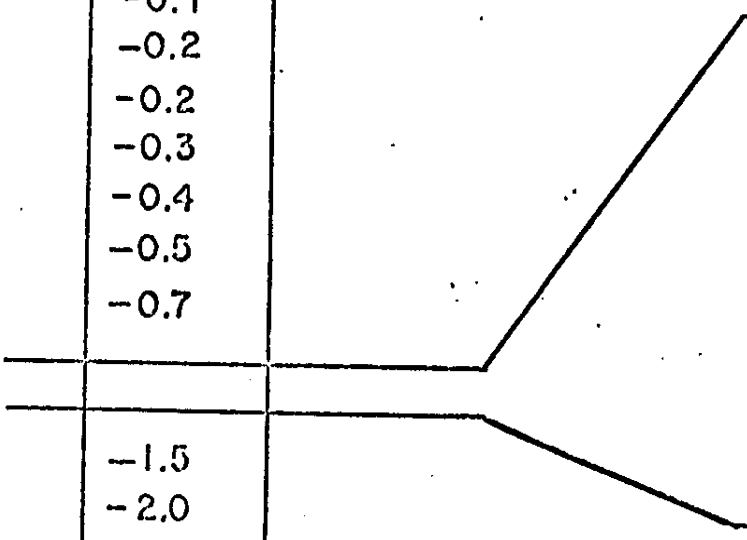
THIS IS AN ANALOG MEASUREMENT OF A NEGATIVE 1 VDC REFERENCE VOLTAGE FOR THE A/D CONVERTER.

-1VDC



| N | V |
|-----|------|
| 000 | -0.0 |
| 010 | -0.0 |
| 020 | -0.0 |
| 030 | -0.0 |
| 040 | -0.0 |
| 050 | -0.1 |
| 060 | -0.1 |
| 070 | -0.1 |
| 080 | -0.1 |
| 090 | -0.2 |
| 100 | -0.2 |
| 110 | -0.3 |
| 120 | -0.4 |
| 130 | -0.5 |
| 140 | -0.7 |
| 150 | |
| 160 | |
| 170 | -1.5 |
| 180 | -2.0 |
| 190 | -2.6 |
| 200 | -3.4 |
| 210 | -4.4 |
| 220 | -5.8 |
| 230 | -7.6 |
| 240 | -10 |
| 250 | -13 |
| 255 | -15 |

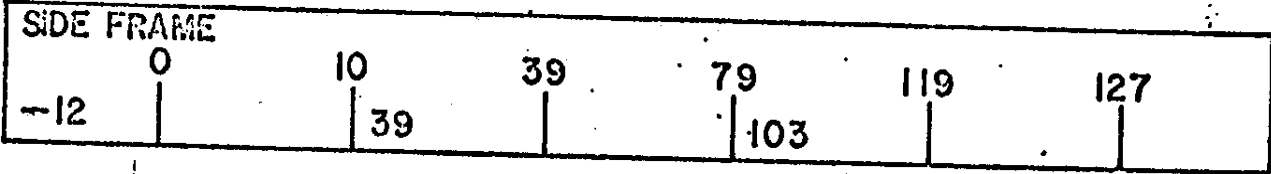
| N | V | |
|-----|-------|-----|
| 150 | -0.86 | |
| 151 | -0.89 | |
| 152 | -0.91 | |
| 153 | -0.94 | LO |
| 154 | -0.96 | |
| 155 | -0.99 | MID |
| 156 | -1.02 | |
| 157 | -1.04 | HI |
| 158 | -1.07 | |
| 159 | -1.10 | |
| 160 | -1.13 | |



-12 VDC

THIS IS AN ANALOG MEASUREMENT OF THE -12 VDC POWER SUPPLY WHICH SUPPLIES POWER TO THE HIGH AND LOW ENERGY LOG COUNT RATE METERS.

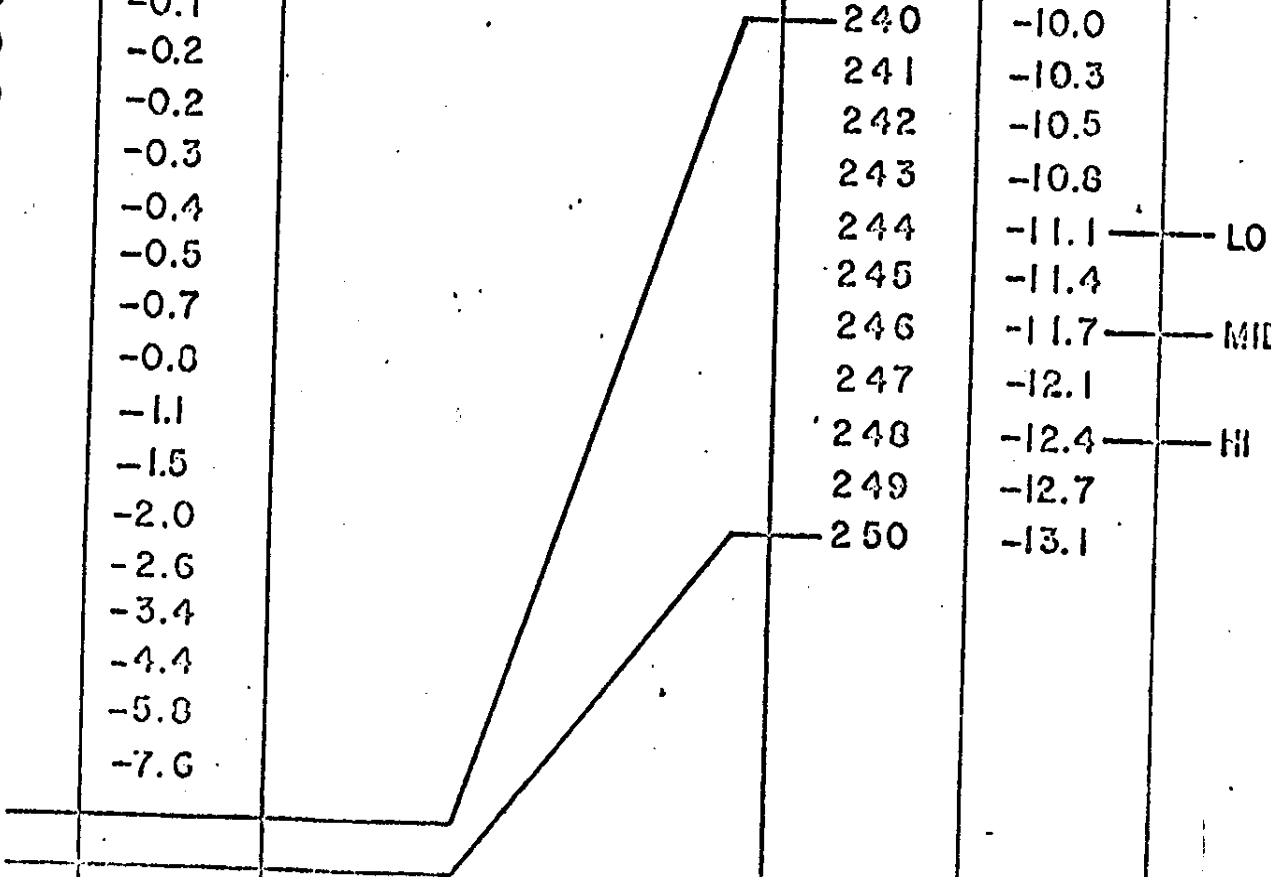
-12 VDC



| <u>N</u> | <u>V</u> |
|----------|----------|
| 000 | -0.0 |
| 010 | -0.0 |
| 020 | -0.0 |
| 030 | -0.0 |
| 040 | -0.0 |
| 050 | -0.1 |
| 060 | -0.1 |
| 070 | -0.1 |
| 080 | -0.1 |
| 090 | -0.2 |
| 100 | -0.2 |
| 110 | -0.3 |
| 120 | -0.4 |
| 130 | -0.5 |
| 140 | -0.7 |
| 150 | -0.8 |
| 160 | -1.1 |
| 170 | -1.5 |
| 180 | -2.0 |
| 190 | -2.6 |
| 200 | -3.4 |
| 210 | -4.4 |
| 220 | -5.8 |
| 230 | -7.6 |
| 240 | |
| 250 | |
| 255 | -15.0 |

| <u>N</u> | <u>V</u> |
|----------|----------|
| 240 | -10.0 |
| 241 | -10.3 |
| 242 | -10.5 |
| 243 | -10.8 |
| 244 | -11.1 |
| 245 | -11.4 |
| 246 | -11.7 |
| 247 | -12.1 |
| 248 | -12.4 |
| 249 | -12.7 |
| 250 | -13.1 |

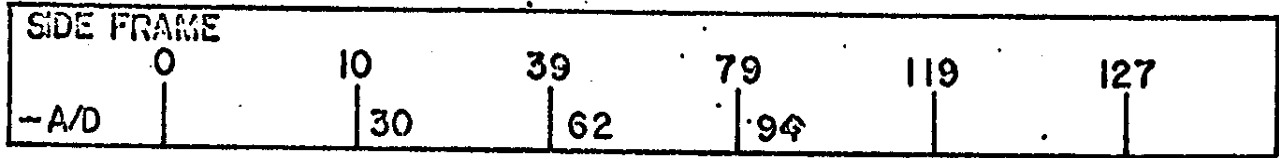
LO
MID
HI



-A/D REF VDC

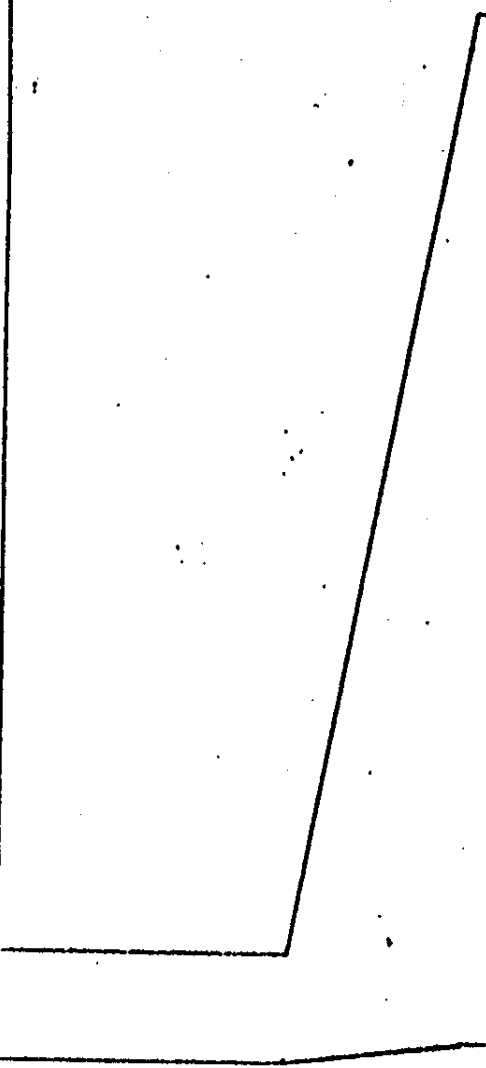
THIS IS AN ANALOG MEASUREMENT OF A NEGATIVE REFERENCE VOLTAGE FOR THE A/D CONVERTER.

-A/D REF VDC



| <u>N</u> | <u>V</u> |
|----------|----------|
| 000 | -0.0 |
| 010 | -0.0 |
| 020 | -0.0 |
| 030 | -0.0 |
| 040 | -0.0 |
| 050 | -0.1 |
| 060 | -0.1 |
| 070 | -0.1 |
| 080 | -0.1 |
| 090 | -0.2 |
| 100 | -0.2 |
| 110 | -0.3 |
| 120 | -0.4 |
| 130 | -0.5 |
| 140 | -0.7 |
| 150 | -0.9 |
| 160 | -1.1 |
| 170 | -1.5 |
| 180 | -2.0 |
| 190 | -2.6 |
| 200 | -3.4 |
| 210 | -4.4 |
| 220 | |
| 230 | |
| 240 | -10 |
| 250 | -13 |
| 255 | -15 |

| <u>N</u> | <u>V</u> |
|----------|----------|
| 215 | -5.0 |
| 216 | -5.2 |
| 217 | -5.3 |
| 218 | -5.5 |
| 219 | -5.6 |
| 220 | -5.8 |
| 221 | -6.0 |
| 222 | -6.1 |
| 223 | -6.3 |
| 224 | -6.4 |
| 225 | -6.6 |
| 226 | -6.8 |
| 227 | -7.0 |
| 228 | -7.2 |
| 229 | -7.4 |
| 230 | -7.6 |
| 231 | -7.8 |
| 232 | -8.0 |
| 233 | -8.2 |
| 234 | -8.5 |
| 235 | -8.7 |



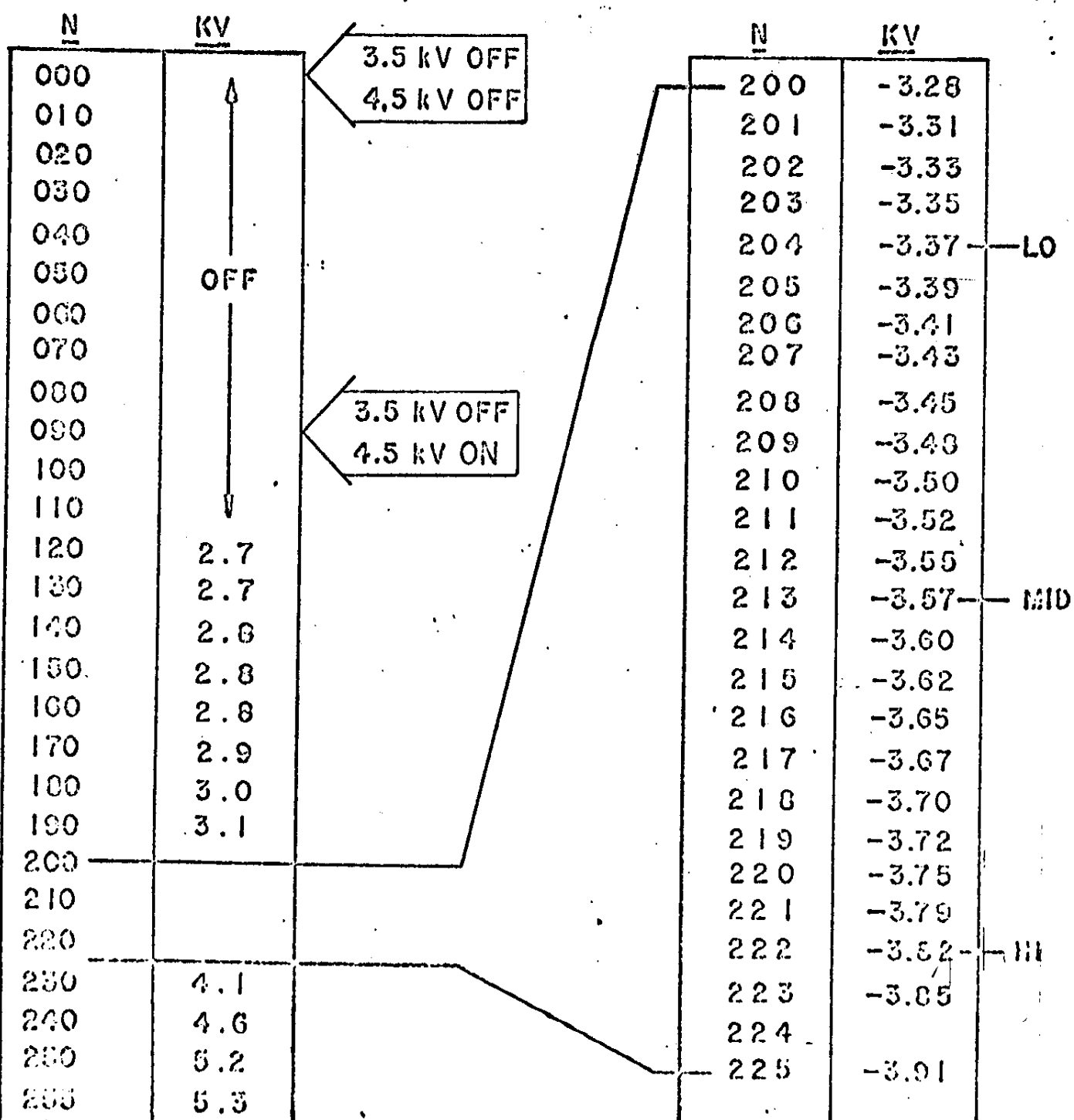
LO
MID
HI

- 3500 VDC

THIS IS AN ANALOG MEASUREMENT OF THE -3500 VDC POWER SUPPLY WHICH SUPPLIES ACCELERATION VOLTAGE TO THE HIGH AND LOW ENERGY CHANNELTRONS. A LOCK-OUT PLUG IS USED TO DISABLE THIS SUPPLY DURING CHECKOUT OF THE SIDE/CCGE UNDER AMBIENT PRESSURE. COMMAND #14 IS USED FOR ON/OFF CONTROL. INITIAL CONDITION (LOCKOUT PLUG REMOVED) IS WITH THIS VOLTAGE IN THE "ON" STATE.

-3500 VDC

| SIDE FRAME | |
|------------|--------|
| 0 | 10 |
| 39 | 79 |
| 119 | 127 |
| -3.5KV | 23 |
| 55 | 07,119 |



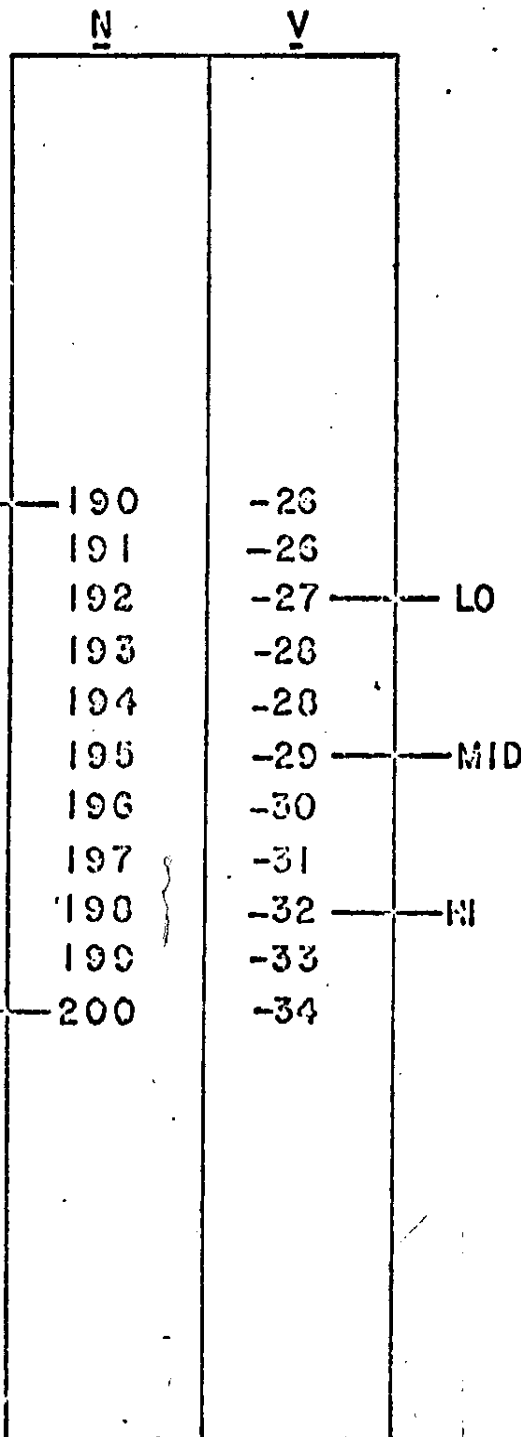
-30 VDC

THIS IS AN ANALOG MEASUREMENT OF THE -30 VDC POWER SUPPLY WHICH SUPPLIES POWER TO THE GPS,VFS, LECPAS,HECPAS, A/D CONVERTER, ELECTROMETER, AND DIGITAL AND COMMAND CIRCUITRY.

-30 VDC



| <u>N</u> | <u>V</u> |
|----------|----------|
| 000 | -0 |
| 010 | -0 |
| 020 | -0 |
| 030 | -0 |
| 040 | -0 |
| 050 | -1 |
| 060 | -1 |
| 070 | -1 |
| 080 | -1 |
| 090 | -2 |
| 100 | -2 |
| 110 | -3 |
| 120 | -4 |
| 130 | -5 |
| 140 | -7 |
| 150 | -9 |
| 160 | -11 |
| 170 | -15 |
| 180 | -20 |
| 190 | |
| 200 | |
| 210 | -44 |
| 220 | -53 |
| 230 | -76 |
| 240 | -100 |
| 250 | -130 |
| 255 | -150 |



TEMP 2

TEMPERATURE SENSOR LOCATED IN THE 200 BLIVET

TEMP 2

| | | | | | | |
|------------|---|----|----|----|-----|-----|
| SIDE FRAME | | | | | | |
| TEMP | 0 | 10 | 39 | 79 | 119 | 127 |
| | 2 | 4 | 36 | 68 | 100 | |

| N | °C | °C/N | N | °C | °C/N |
|-----|-----|------|-----|-----|------|
| 000 | 120 | 1.6 | 125 | 0 | .4 |
| 005 | 112 | 2.4 | 130 | -2 | .6 |
| 010 | 100 | 1.6 | 135 | -5 | .4 |
| 015 | 92 | 1.4 | 140 | -7 | .6 |
| 020 | 85 | | 145 | -10 | .4 |
| 025 | 80 | | 150 | -12 | .6 |
| 030 | 75 | | 155 | -15 | .4 |
| 035 | 68 | 1.6 | 160 | -17 | .6 |
| 040 | 63 | | 165 | -20 | .4 |
| 045 | 58 | | 170 | -22 | .6 |
| 050 | 54 | .8 | 175 | -25 | .4 |
| 055 | 50 | .8 | 180 | -27 | .6 |
| 060 | 45 | | 185 | -30 | .4 |
| 065 | 40 | | 190 | -32 | .6 |
| 070 | 37 | .6 | 195 | -35 | .4 |
| 075 | 32 | | 200 | -37 | .6 |
| 080 | 28 | .8 | 205 | -40 | .4 |
| 085 | 25 | .6 | 210 | -42 | .6 |
| 090 | 21 | .8 | 215 | -45 | .4 |
| 095 | 18 | .6 | 220 | -47 | .6 |
| 100 | 15 | .6 | 225 | -50 | .4 |
| 105 | 12 | .6 | 230 | -52 | .6 |
| 110 | 10 | .4 | 235 | -55 | .4 |
| 115 | 7 | .6 | 240 | -60 | .6 |
| 120 | 4 | .6 | 245 | -65 | .4 |
| 125 | 0 | .8 | 250 | -68 | .6 |
| | | | 255 | -78 | 2 |

TEMP 1

TEMPERATURE SENSOR LOCATED IN THE CCIG ATTACHED TO THE MAGNET

TEMP 1

| | | | | | | |
|------------|---|----|----|----|-----|-----|
| SIDE FRAME | | | | | | |
| TEMP | 0 | 10 | 39 | 79 | 119 | 127 |
| | 2 | 34 | 66 | 98 | | |

| N | °C | °K |
|-----|------|-----|
| 113 | -140 | 133 |
| 114 | -137 | 136 |
| 115 | -134 | 139 |
| 116 | -132 | 141 |
| 117 | -130 | 143 |
| 118 | -126 | 147 |
| 119 | -123 | 150 |
| 120 | -120 | 153 |
| 121 | -117 | 156 |
| 122 | -115 | 158 |
| 123 | -112 | 161 |
| 124 | -110 | 163 |
| 125 | -105 | 168 |
| 126 | -100 | 173 |
| 127 | -95 | 178 |
| 128 | -90 | 183 |
| 129 | -85 | 188 |
| 130 | -80 | 193 |
| 131 | -75 | 198 |
| 132 | -70 | 203 |
| 133 | -65 | 208 |
| 134 | -60 | 213 |
| 135 | -55 | 218 |
| 136 | -50 | 223 |
| 137 | -45 | 228 |

| N | °C | °K |
|-----|-----|-----|
| 137 | -45 | 228 |
| 138 | -40 | 233 |
| 139 | -35 | 238 |
| 140 | -30 | 243 |
| 141 | -20 | 253 |
| 142 | -10 | 263 |
| 143 | -5 | 268 |
| 144 | 0 | 273 |
| 145 | 5 | 278 |
| 146 | 10 | 283 |
| 147 | 20 | 293 |
| 148 | 25 | 298 |
| 149 | 30 | 303 |
| 150 | 40 | 313 |
| 151 | 50 | 323 |
| 152 | 60 | 333 |
| 153 | 70 | 343 |
| 154 | 80 | 353 |
| 155 | 85 | 358 |
| 156 | 90 | 363 |
| 157 | 100 | 373 |
| 158 | 110 | 383 |
| 159 | 120 | 393 |
| 160 | 130 | 403 |
| 161 | 140 | 413 |

TEMP 4

TEMPERATURE SENSOR, LOCATED IN THE 300 BLIVET.

TEMP 4

SIDE FRAME
 TEMP 0 10 39 79 119 127
 4 11 43,75 107

| N | °C | °C/N | N | °C | °C/N |
|-----|----|------|-----|-----|------|
| 000 | 92 | | 125 | 5 | |
| 005 | 88 | .8 | 130 | 3 | .4 |
| 010 | 84 | .8 | 135 | -1 | .8 |
| 015 | 78 | 1.2 | 140 | -3 | .4 |
| 020 | 74 | .6 | 145 | -6 | .6 |
| 025 | 70 | .8 | 150 | -9 | .6 |
| 030 | 65 | 1 | 155 | -12 | .6 |
| 035 | 61 | .8 | 160 | -14 | .4 |
| 040 | 57 | .8 | 165 | -16 | .4 |
| 045 | 53 | .8 | 170 | -19 | .6 |
| 050 | 50 | .6 | 175 | -21 | .4 |
| 055 | 47 | .6 | 180 | -24 | .6 |
| 060 | 43 | .8 | 185 | -26 | .4 |
| 065 | 40 | .6 | 190 | -28 | .4 |
| 070 | 36 | .8 | 195 | -31 | .6 |
| 075 | 33 | .6 | 200 | -32 | .2 |
| 080 | 30 | .6 | 205 | -35 | .6 |
| 085 | 27 | .6 | 210 | -36 | .2 |
| 090 | 25 | .4 | 215 | -39 | .6 |
| 095 | 22 | .6 | 220 | -42 | .6 |
| 100 | 19 | .6 | 225 | -43 | .2 |
| 105 | 16 | .6 | 230 | -45 | .4 |
| 110 | 13 | .6 | 235 | -46 | .2 |
| 115 | 10 | .6 | 240 | -47 | .2 |
| 120 | 8 | .4 | 245 | -50 | .4 |
| 125 | 5 | .6 | 250 | | |
| | | | 255 | | |

TEMPERATURE SENSOR LOCATED IN THE 500 BLIVET

TEMP 3

SIDE FRAME
 TEMP 0 10 39 79 119 127
 3 6 38 70 102

| N | °C | °C/N | N | °C | °C/N |
|-----|-----|------|-----|-----|------|
| 000 | 120 | 1.6 | 125 | 0 | .4 |
| 005 | 112 | 2.4 | 130 | -2 | .6 |
| 010 | 100 | 1.6 | 135 | -5 | .4 |
| 015 | 92 | 1.4 | 140 | -7 | .6 |
| 020 | 85 | 1 | 145 | -10 | .4 |
| 025 | 80 | 1 | 150 | -12 | .6 |
| 030 | 75 | 1.6 | 155 | -15 | .4 |
| 035 | 68 | 1 | 160 | -17 | .6 |
| 040 | 63 | 1 | 165 | -20 | .4 |
| 045 | 58 | .8 | 170 | -22 | .6 |
| 050 | 54 | .8 | 175 | -25 | .4 |
| 055 | 50 | 1 | 180 | -27 | .6 |
| 060 | 45 | 1 | 185 | -30 | .4 |
| 065 | 40 | .6 | 190 | -32 | .6 |
| 070 | 37 | 1 | 195 | -35 | .4 |
| 075 | 32 | .8 | 200 | -37 | .6 |
| 080 | 28 | .6 | 205 | -40 | .4 |
| 085 | 25 | .8 | 210 | -42 | .6 |
| 090 | 21 | .6 | 215 | -45 | .4 |
| 095 | 18 | .6 | 220 | -47 | .6 |
| 100 | 15 | .6 | 225 | -50 | .4 |
| 105 | 12 | .4 | 230 | -52 | .6 |
| 110 | 10 | .6 | 235 | -55 | 1 |
| 115 | 7 | .6 | 240 | -60 | 1 |
| 120 | 4 | .8 | 245 | -65 | .6 |
| 125 | 0 | .8 | 250 | -68 | 2 |
| | | | 255 | -78 | |

TEMP 6

TEMPERATURE SENSOR LOCATED IN THE 800 BLIVET

TEMP 6

SIDE FRAME
 TEMP 0 10 39 79 119 127
 6 22 54 86,118

| N °C °C/N | | | N °C °C/N | | |
|-----------|---|-----|-----------|-----|----|
| | DI-19 ALLSEP Flight CRIVE 85278 | | | | |
| 000 | 92 | | 125 | 5 | |
| 005 | 81.62 88 | .8 | 130 | 3 | .4 |
| 010 | 77.55 84 | .8 | 135 | -1 | .8 |
| 015 | 73.57 78 | 1.2 | 140 | -3 | .4 |
| 020 | 69.66 74 | .6 | 145 | -6 | .6 |
| 025 | 65.75 70 | .8 | 150 | -9 | .6 |
| 030 | 62.08 65 | 1 | 155 | -12 | .6 |
| 035 | 61 | .8 | 160 | -14 | .4 |
| 040 | 54.78 57 | .8 | 165 | -16 | .4 |
| 045 | 53 | .8 | 170 | -19 | .6 |
| 050 | 47.25 50 | .6 | 175 | -21 | .4 |
| 055 | 47 | .6 | 180 | -24 | .6 |
| 060 | 43 | .8 | 185 | -26 | .4 |
| 065 | 40 | .6 | 190 | -28 | .4 |
| 070 | 39.38 36 | .8 | 195 | -31 | .6 |
| 075 | 33 | .6 | 200 | -32 | .2 |
| 080 | 30 | .6 | 205 | -35 | .6 |
| 085 | 27 | .6 | 210 | -36 | .2 |
| 090 | 21.82 25 | .4 | 215 | -39 | .6 |
| 095 | 22 | .6 | 220 | -42 | .6 |
| 100 | 15.72 19 | .6 | 225 | -43 | .2 |
| 105 | 16 | .6 | 230 | -45 | .4 |
| 110 | 13 | .6 | 235 | -46 | .2 |
| 115 | 10 | .6 | 240 | -47 | .2 |
| 120 | 7.31 8 | .4 | 245 | -50 | .4 |
| 125 | 5 | .6 | 250 | | |
| | | | 255 | | |

TEMP 5

TEMPERATURE SENSOR LOCATED IN THE 300 BLIVET

TEMP 5

SIDE FRAME

| | | | | | |
|--------|----|-------|-----|-----|-----|
| TEMP 0 | 10 | 39 | 79 | 119 | 127 |
| 5 | 12 | 44,76 | 108 | | |

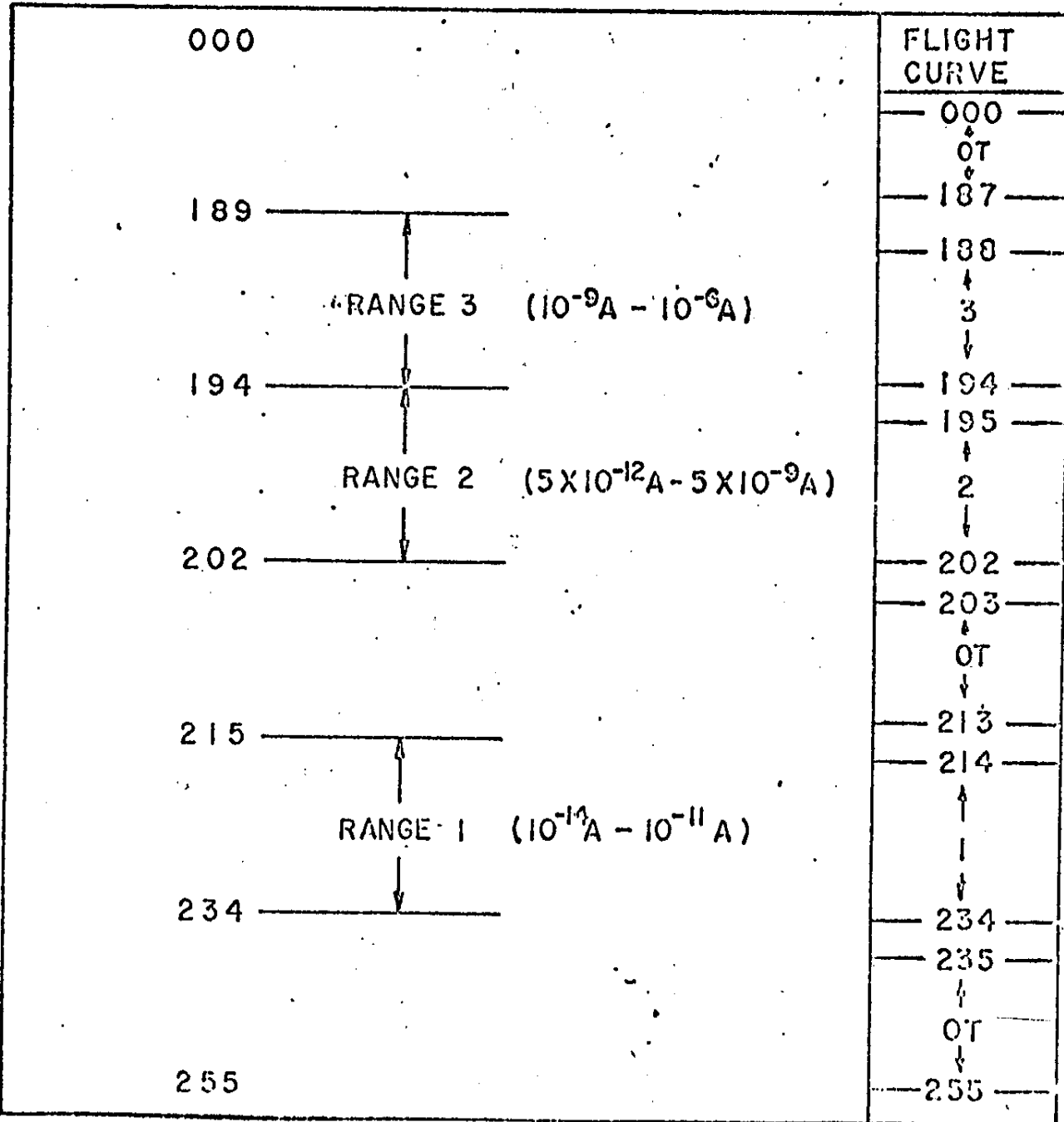
| N | °C | °C/N | N | °C | °C/N |
|-----|----|------|-----|-----|------|
| 000 | 92 | | 125 | 5 | |
| 005 | 88 | .8 | 130 | 3 | .4 |
| 010 | 84 | .8 | 135 | -1 | .8 |
| 015 | 78 | 1.2 | 140 | -3 | .4 |
| 020 | 74 | .6 | 145 | -6 | .6 |
| 025 | 70 | .8 | 150 | -9 | .6 |
| 030 | 65 | 1 | 155 | -12 | .6 |
| 035 | 61 | .8 | 160 | -14 | .4 |
| 040 | 57 | .8 | 165 | -16 | .4 |
| 045 | 53 | .8 | 170 | -19 | .6 |
| 050 | 50 | .6 | 175 | -21 | .4 |
| 055 | 47 | .6 | 180 | -24 | .6 |
| 060 | 43 | .8 | 185 | -26 | .4 |
| 065 | 40 | .6 | 190 | -28 | .4 |
| 070 | 36 | .8 | 195 | -31 | .6 |
| 075 | 33 | .6 | 200 | -32 | .2 |
| 080 | 30 | .6 | 205 | -35 | .6 |
| 085 | 27 | .6 | 210 | -36 | .2 |
| 090 | 25 | .4 | 215 | -39 | .6 |
| 095 | 22 | .6 | 220 | -42 | .6 |
| 100 | 19 | .6 | 225 | -43 | .2 |
| 105 | 16 | .6 | 230 | -45 | .4 |
| 110 | 13 | .6 | 235 | -46 | .2 |
| 115 | 10 | .6 | 240 | -47 | .2 |
| 120 | 8 | .4 | 245 | -50 | .4 |
| 125 | 5 | .6 | 250 | | |
| | | | 255 | | |

+ELECT RNG

+ELECT RNG

THIS IS AN ANALOG MEASUREMENT OF THE SUM OF A THREE(3) INPUT D/A CONVERTER WHICH DERIVES IT'S INPUTS FROM THE AUTO-RANGING ELECTROMETER LOGIC CONTROL CIRCUITS. RANGE 1 IS THE CURRENT RANGE OF APPROX 10^{-14} A TO 10^{-11} A. RANGE 2 IS THE CURRENT RANGE OF APPROX 5×10^{-12} A TO 5×10^{-9} A. RANGE 3 IS THE CURRENT RANGE OF APPROX 10^{-9} A TO 10^{-6} A.

| | | | | | | |
|------------|----|----|----------|--------|-----|-----|
| SIDE FRAME | | | | | | |
| +ELECT RNG | 0 | 10 | 39 | 79 | 119 | 127 |
| | 10 | 24 | 42,56,74 | 88,104 | 120 | |



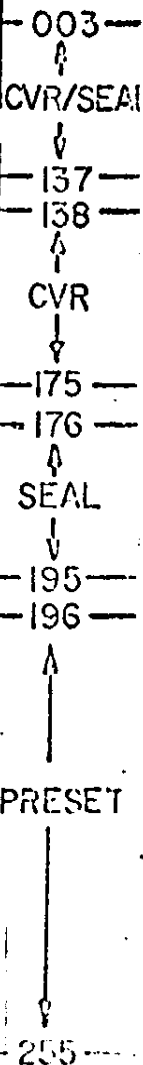
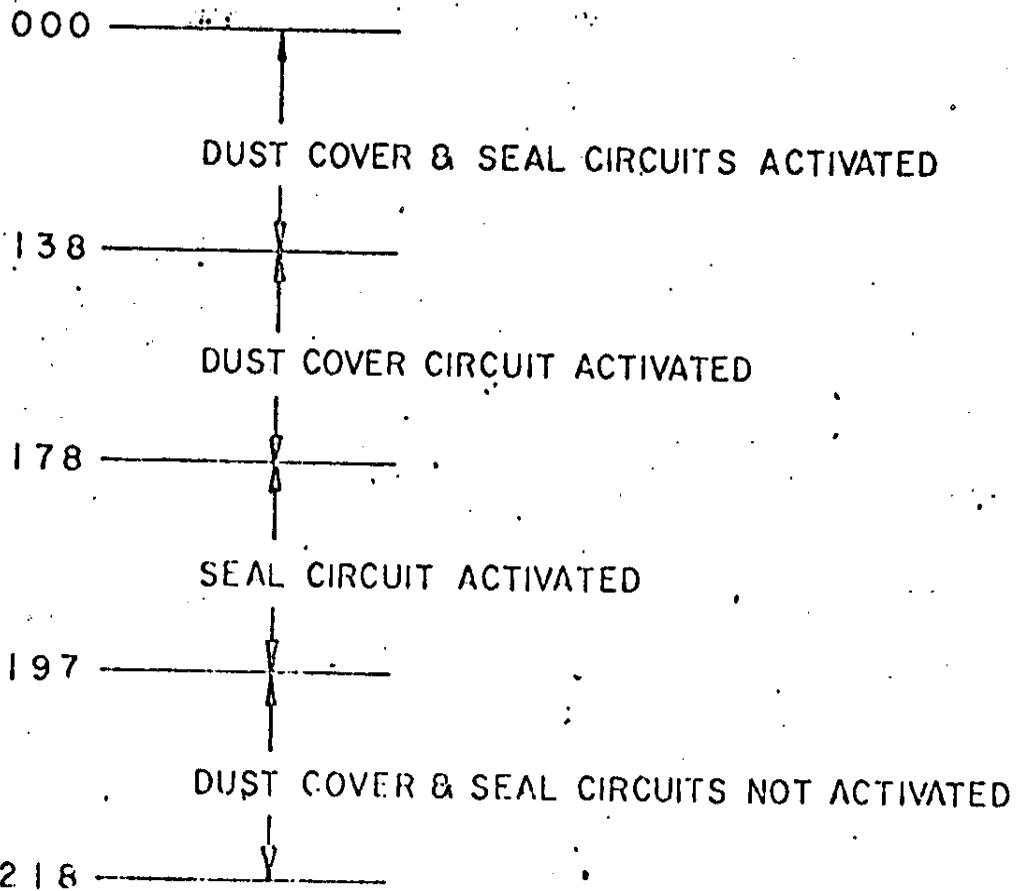
+DST CVR/SEAL

THIS AN ANALOG MEASUREMENT OF THE SUM OF A TWO (2) INPUT D/A CONVERTER WHICH DERIVES IT'S INPUTS FROM TWO(2) FLIP-FLOPS CONTROLLED BY COMMAND 105 AND 107 AFTER COMMAND EXECUTION OF EITHER COMMAND.

+DST CVR/SEAL

| | | | | | | |
|------------|---|----|-------|----|-----|-----|
| SIDE FRAME | | | | | | |
| +DST | 0 | 10 | 39 | 79 | 119 | 127 |
| CVR/SEAL | | | 67,71 | | | |

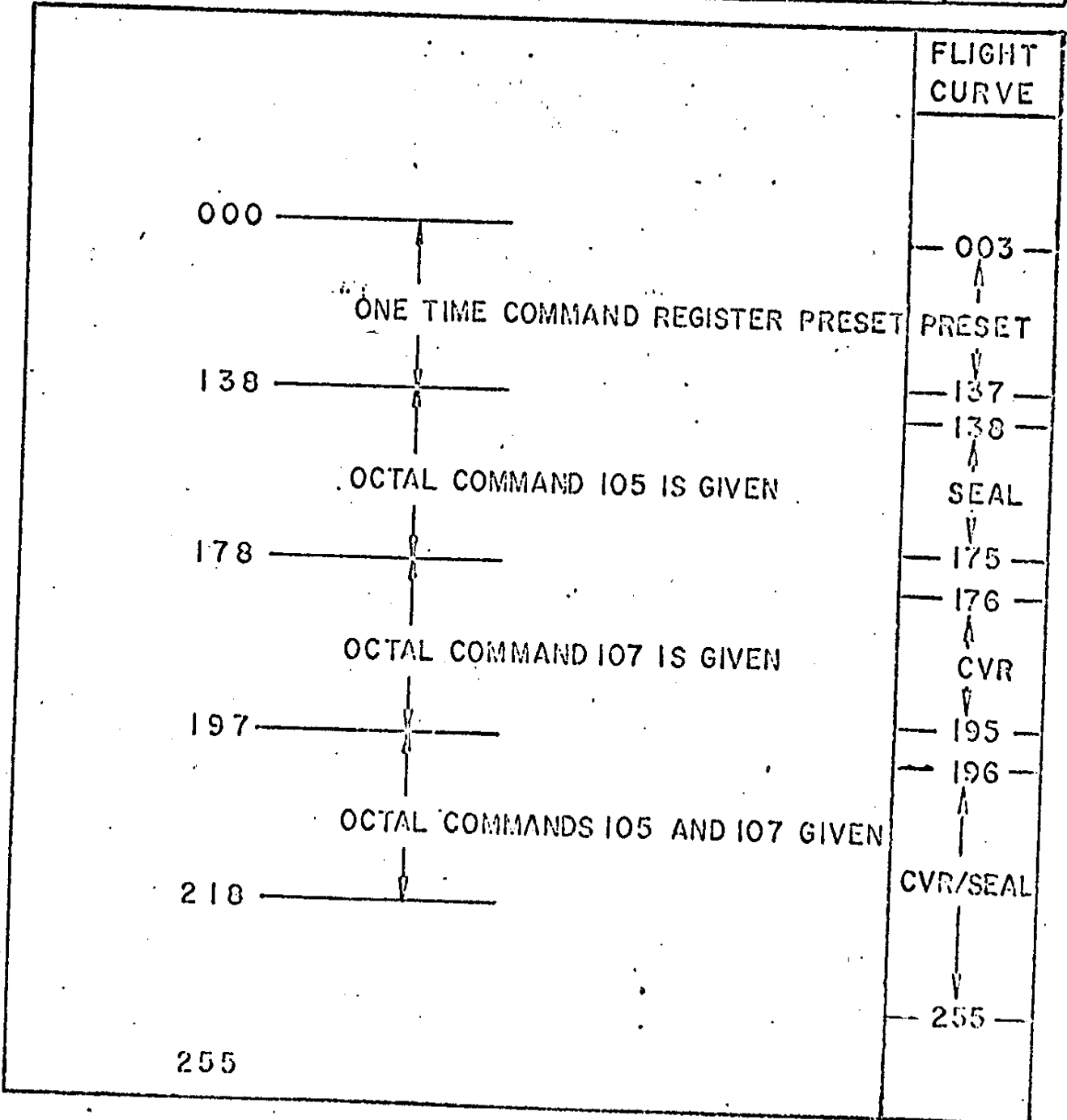
FLIGHT CURVES



255

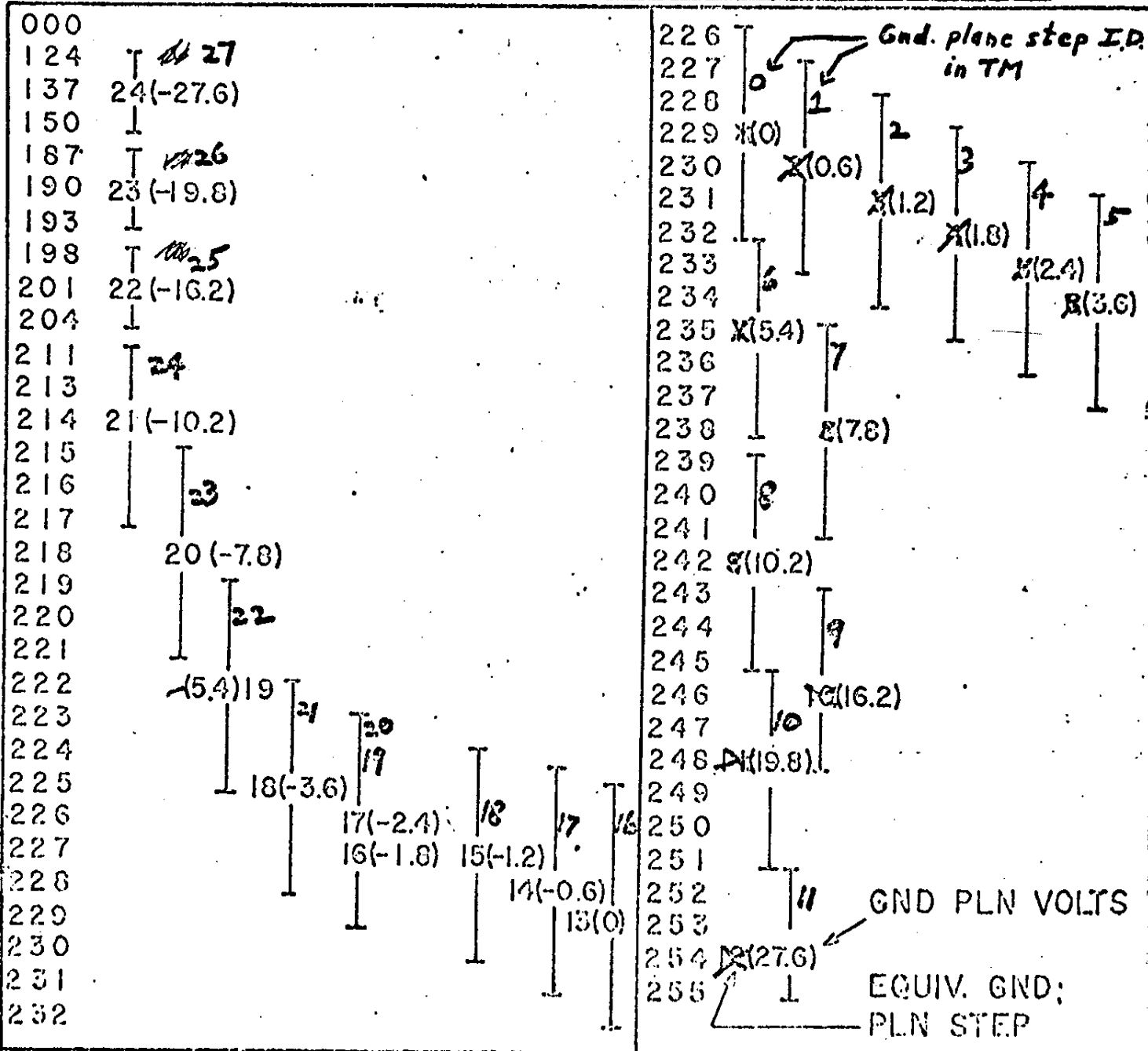
THIS IS AN ANALOG MEASUREMENT OF THE SUM OF A TWO (2) INPUT D/A CONVERTER WHICH DERIVES ITS INPUTS FROM TWO(2) FLIP-FLOPS CONTROLLED BY COMMANDS OCTAL 105 & 107 PRIOR TO COMMAND EXECUTION.

| SIDE FRAME | | | | | | |
|------------|---|-------|----|-------|-----|-----|
| +OTC REG. | 0 | 10 | 39 | 79 | 119 | 127 |
| | | 33,35 | | 97,99 | | |



THIS IS AN ANALOG MEASUREMENT OF THE POTENTIAL DIFFERENCE BETWEEN SIDE /CCGE GROUND VOLTAGE AND THE VOLTAGE ON THE LUNAR GROUND PLANE. POLARITY OF THIS VOLTAGE INDICATES GROUND PLANE VOLTAGE REFERENCED TO SIDE/CCGE GROUND.

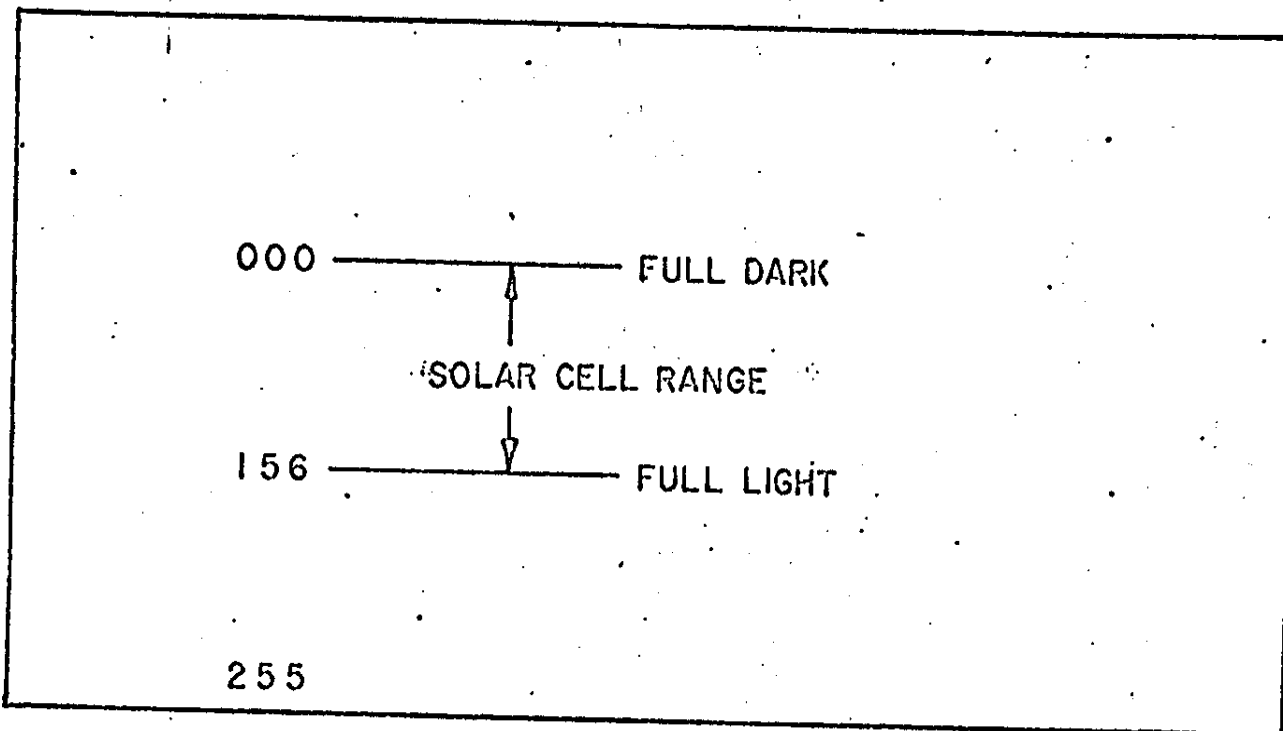
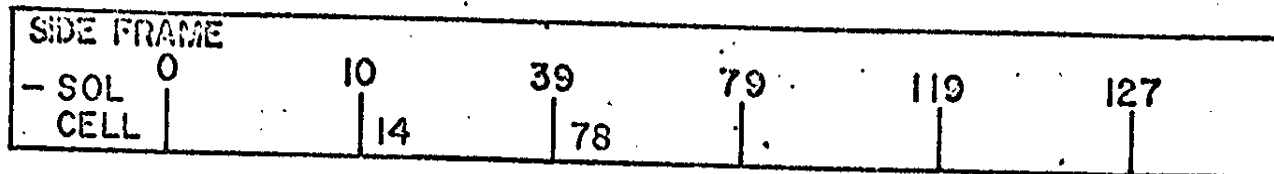
| SIDE FRAME | 10 | 13,15, 29,31 | 39 45,47, 61,63,69,77, 79 | 93,95, 109,111 | 119 | 127 |
|------------|----|--------------|---------------------------|----------------|-----|-----|
| +GND | 0 | | | | | |
| PLN VOLT | | | | | | |



- SOL CELL VDC

- SOL CELL VDC

THIS IS AN ANALOG MEASUREMENT OF THE SOLAR CELL WHICH IS MOUNTED ON THE TOP OF THE THERMAL SPACER. THE READOUT IS AN INDICATION OF DUST COVER REMOVAL DURING LUNAR DAY AND A RELATIVE INDICATION OF LIGHT INTENSITY



+PRE REG D/F

THIS IS AN ANALOG MEASUREMENT OF A DC LEVEL WHICH IS PROPORTIONAL TO THE DUTY CYCLE OF THE +30VDC PRE-REGULATOR CHOPPER. THE + 30 VDC PRE-REGULATOR DUTY CYCLE IS PROPORTIONAL TO THE ALSEP EXPERIMENT SUPPLY VOLTAGE

+PRE REG D/F

SIDE FRAME

+PRE
REG
D/F

0

10

39

79

119

127

65

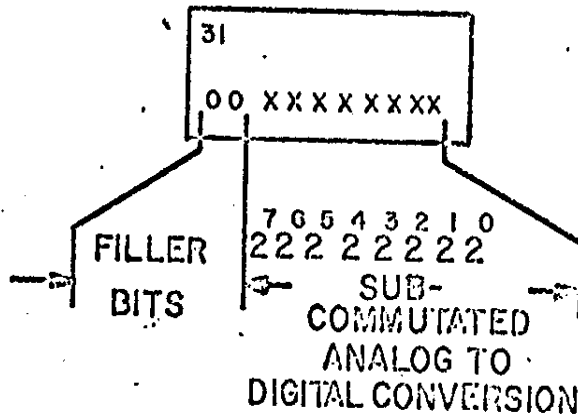
DECIMAL
READOUT

EQUIVALENT
EXPT SUPPLY
VOLTAGE

FLIGHT CURVE
%

| | | |
|-----|------------|------|
| 210 | ≤ 24.0 | |
| 209 | 24.0 | |
| 208 | 24.5 | 99.8 |
| 207 | 25.0 | 98.0 |
| 206 | 25.5 | 96.7 |
| 205 | 26.0 | 95.2 |
| 204 | 26.5 — HI | 93.8 |
| 203 | 27.0 | 92.5 |
| 202 | 27.5 | 91.2 |
| 201 | 28.0 | 90.0 |
| 200 | 28.5 — NOM | 88.8 |
| 199 | 29.0 | 87.8 |
| 198 | 29.5 | 86.8 |
| 197 | 30.0 | 85.5 |
| 196 | 31.0 | 84.4 |
| 195 | 31.5 — LO | 83.4 |
| 194 | 32.0 | 82.5 |
| 193 | 32.5 | 81.5 |
| 192 | 33.0 | 80.6 |
| 191 | 33.5 | 79.8 |
| 190 | 34.0 | 79.1 |
| 189 | 35.0 | 78.0 |
| 188 | 35.5 | 77.2 |
| 187 | 36.0 | 76.4 |
| 186 | > 36.0 | 75.8 |
| 183 | | 75.0 |
| 175 | | 73.0 |
| | | 67.7 |

SIDE WORD 3 (CONT)



| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | | 48 |
| 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |

(EVEN D/A FRAME)

HECPA OFF; COMMAND II EXECUTED ODD NO. OF TIMES:

| | |
|-----------------|-------------|
| ALL SIDE FRAMES | READOUT 280 |
|-----------------|-------------|

HECPA ON; COMMAND II EXECUTED EVEN NO. OF TIMES:

| SIDE FRAME NO. | ENERGY (ov) | | | | | | READOUT | | | |
|----------------|-------------|-----|----|-----|-----|-----|---------|-----|-----|-----|
| | LO | NOM | HI | LO | NOM | HI | LO | NOM | HI | |
| 0 | 1 | 21 | 41 | 61 | 81 | 101 | 3500 | 249 | 252 | 255 |
| | 2 | 22 | 42 | 62 | 82 | 102 | 3250 | 247 | 250 | 253 |
| | 3 | 23 | 43 | 63 | 83 | 103 | 3000 | 244 | 247 | 250 |
| | 4 | 24 | 44 | 64 | 84 | 104 | 2750 | 241 | 244 | 247 |
| | 5 | 25 | 45 | 65 | 85 | 105 | 2500 | 237 | 240 | 243 |
| | 6 | 26 | 46 | 66 | 86 | 106 | 2250 | 233 | 236 | 239 |
| | 7 | 27 | 47 | 67 | 87 | 107 | 2000 | 229 | 232 | 235 |
| | 8 | 28 | 48 | 68 | 88 | 108 | 1750 | 224 | 227 | 230 |
| | 9 | 29 | 49 | 69 | 89 | 109 | 1500 | 218 | 221 | 224 |
| ② | 10 | 30 | 50 | 70 | 90 | 110 | 1250 | 211 | 214 | 217 |
| 0 | 11 | 31 | 51 | 71 | 91 | 111 | 1000 | 203 | 206 | 209 |
| | 12 | 32 | 52 | 72 | 92 | 112 | 750 | 192 | 195 | 198 |
| | 13 | 33 | 53 | 73 | 93 | 113 | 500 | 178 | 181 | 184 |
| | 14 | 34 | 54 | 74 | 94 | 114 | 250 | 152 | 155 | 158 |
| | 15 | 35 | 55 | 75 | 95 | 115 | 100 | 245 | 248 | 251 |
| | 16 | 36 | 56 | 76 | 96 | 116 | 70 | 232 | 235 | 238 |
| | 17 | 37 | 57 | 77 | 97 | 117 | 50 | 220 | 223 | 226 |
| | 18 | 38 | 58 | 78 | 98 | 118 | 30 | 201 | 204 | 207 |
| ③ | 19 | 39 | 59 | 79 | 99 | 119 | 20 | 186 | 189 | 192 |
| ④ | 0 | 20 | 40 | 60 | 80 | 100 | 10 | 161 | 164 | 167 |
| 0 | | | | 121 | 127 | | <.12 | 0 | 0 | 0 |

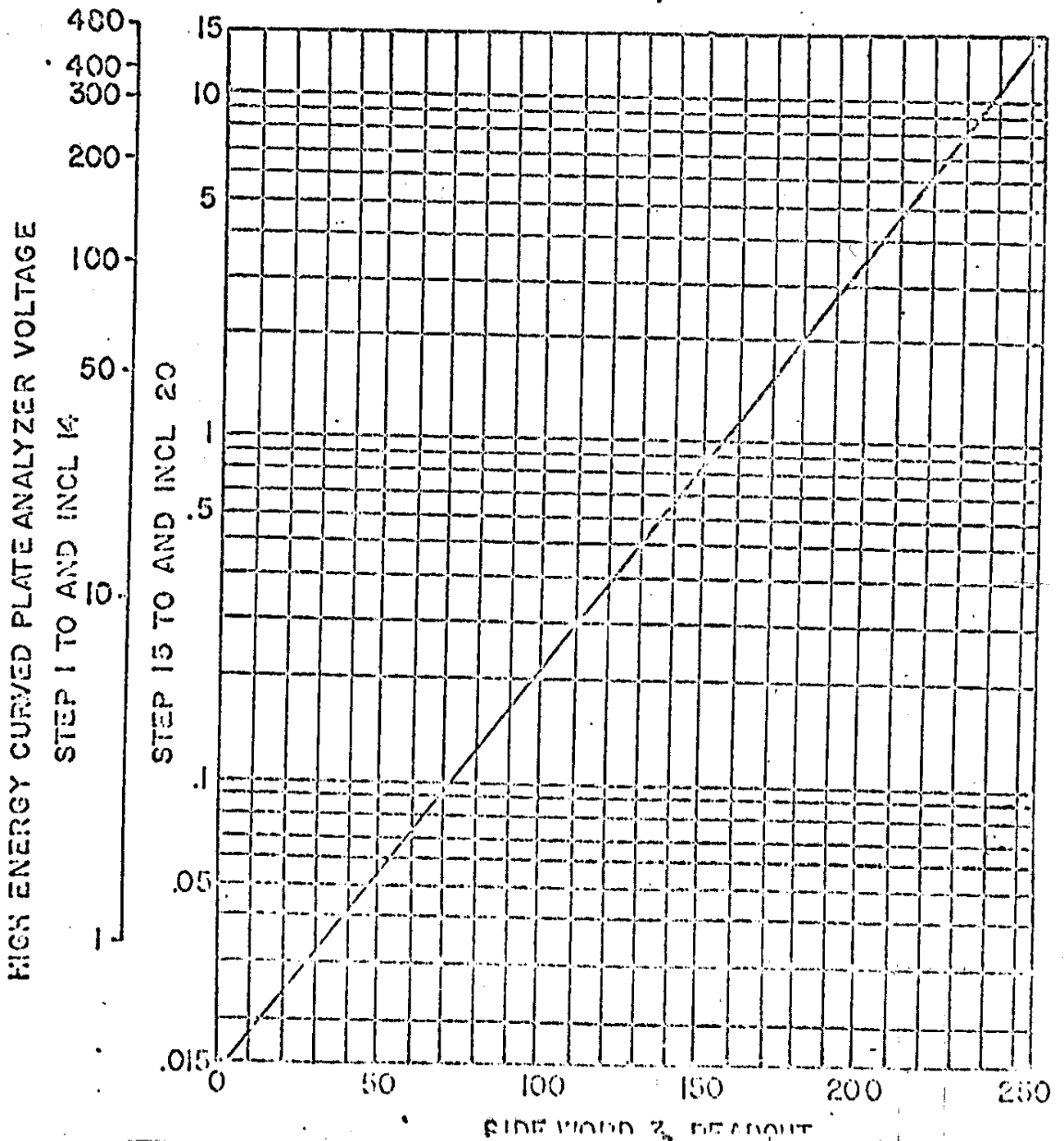
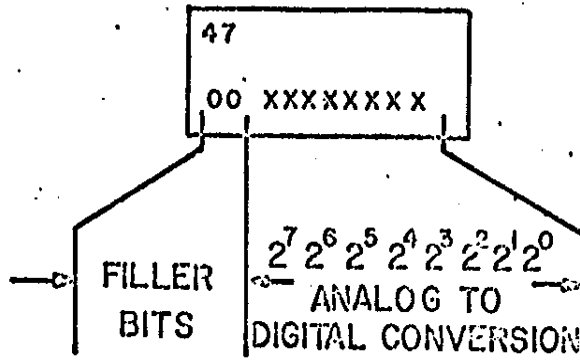
NOTES: FOR SIDE FRAME 0:

- ① FIRST CYCLE FOLLOWING EXPT TURN-ON
- ② RESET AT 10 MODE ONLY
- ③ RESET AT 30 OR 70 MODE ONLY
- ④ NORMAL MODE AND CAL MODE ONLY

(HIGH ENERGY CURVED PLATE ANALYZER VOLTAGE)

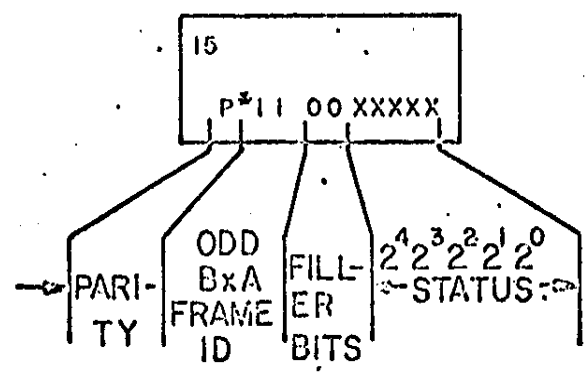
(EVEN D_XA FRAME)

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | | 48 |
| 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |



SIDE WORD C
(STATUS SUBCOM)

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |

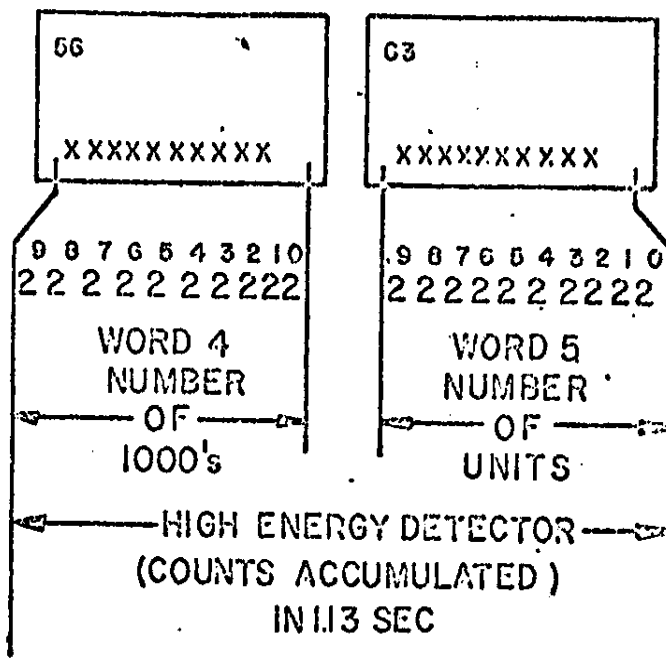


▲ EVEN PARITY BIT

P=0; IF SUM OF BITS, PREV. 5 SIDE WORDS IS EVEN
P=1; IF SUM OF BITS, PREV. 5 SIDE WORDS IS ODD

(HIGH ENERGY DETECTOR COUNTS)(EVEN DATA FRAME)

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 49 | 50 | 51 | 52 | 53 | 54 | 55 | / |
| 57 | 58 | 59 | 60 | 61 | 62 | / | 64 |



WORD CONTENT: WORD 4 WORD 5



NORMAL OPERATION:

| SIDE FRAME NO | READOUT RANGE | |
|---------------------|---------------|---------|
| | LO | HI |
| 001 TO AND INCL 120 | 000,000 | 999,999 |
| 121 AND 125 | BK | |
| 122 AND 126 | >000,150 | |
| 123 AND 127 | >019,375 | |
| 124 AND 000 | >618,800 | |

WITH -3.5 KV OFF (COMMAND 14):

| SIDE FRAME NO | READOUT RANGE | |
|---------------------|---------------|---------|
| | LO | HI |
| 001 TO AND INCL 120 | 000,000 | |
| 121 AND 125 | 000,000 | 000,004 |
| 122 AND 126 | 000,150 | 000,158 |
| 123 AND 127 | 019,375 | 020,175 |
| 124 AND 000 | 618,800 | 648,800 |

WITH BECPA VOLTAGE OFF (COMMAND 11)

| SIDE FRAME NO | READOUT RANGE | |
|---------------------|---------------|----|
| | LO | HI |
| 001 TO AND INCL 120 | BK | |
| 121 AND 125 | BK | |
| 122 AND 126 | >000,150 | |
| 123 AND 127 | >019,375 | |
| 124 AND 000 | >618,800 | |

NOTE:

BK= BACKGROUND COUNTS (000,000 TO 999,997)

SIDE WORD 6
(CONT)

SIDE FRAME ALLOCATION

| EVEN 0-118 | 9,25,41, 57,73,89, 105 | 7,39,71,103 | 120 THRU 124 AND 126,127 | ① | ② | READOUT | |
|---------------|------------------------------|---------------------|--------------------------------|----|-----|---------|-----|
| | | | | | | P | P |
| GPS | ELEC RNG | DUST COVER & SEAL | CAL RATE | MR | CIR | | |
| 0 | | CVR & SEAL - OPEN | 0 | 0 | 0 | 384 | 896 |
| 1 | 1 | SEAL - OPEN | 1 | 1 | 1 | 385 | 897 |
| 2 | 2 | DUST CVR - OPEN | 2 | 2 | 2 | 386 | 898 |
| 3 | 3 | CVR & SEAL - CLOSED | 3 | 3 | 3 | 387 | 899 |
| 4 | | | | 4 | 4 | 388 | 900 |
| 5 | | | | 5 | 5 | 389 | 901 |
| 6 | | | | 6 | 6 | 390 | 902 |
| 7 | | | | 7 | 7 | 391 | 903 |
| 8 | | | | 8 | 8 | 392 | 904 |
| 9 | | | | 9 | 9 | 393 | 905 |
| 10 | | | | 10 | 10 | 394 | 906 |
| 11 | | | | 11 | 11 | 395 | 907 |
| | | | | 12 | 12 | 396 | 908 |
| | | | | 13 | 13 | 397 | 909 |
| | | | | 14 | 14 | 398 | 910 |
| | | | | | 15 | 399 | 911 |
| 16 | | | | | | 400 | 912 |
| 17 | | | | | | 401 | 913 |
| 18 | | | | | | 402 | 914 |
| 19 | | | | | | 403 | 915 |
| 20 | | | | | | 404 | 916 |
| 21 | | | | | | 405 | 917 |
| 22 | | | | | | 406 | 918 |
| 23 | | | | | | 407 | 919 |
| 24 | | | | | | 408 | 920 |
| 25 | | | | | | 409 | 921 |
| 26 | | | | | | 410 | 922 |
| 27 | | | | | | 411 | 923 |

① 3, 11, 15, 19, 23, 27, 31, 35 43, 47, 51, 55, 59, 63, 67, 75, 79 83, 87, 91, 95, 99, 107, 111, 115, 119

② 1, 5, 13, 17, 21, 29, 33, 37 45, 49, 53, 61, 65, 69, 77 81, 85, 93, 97, 101, 109, 113, 117 125

RICE UNIVERSITY

HOUSTON, TEXAS

77001

DEPARTMENT OF SPACE SCIENCE
SPACE SCIENCE FACILITIES

April 19, 1968

ALSEP/SIDE/CCGE
STATUS SUBCOM
MEASUREMENT LOCATIONS

| DI # | SIDE Word | Measurement | SIDE Frame |
|------|-----------|------------------------|---|
| 63 | 6 | Gnd. Plane Step | 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 108, 110, 112, 114, 116, 118, 106 |
| 64 | 6 | Command Input Register | 1, 5, 13, 17, 21, 29, 33, 37, 45, 49, 53, 61, 65, 69, 77, 81, 85, 93, 97, 101, 109, 113, 117, 125 |
| 65 | 6 | Mode Register | 3, 11, 15, 19, 23, 27, 31, 35, 43, 47, 51, 55, 59, 63, 67, 75, 79, 83, 87, 91, 95, 99, 107, 111, 115, 119 |
| 66 | 6 | Dust Cover and Seal | 7, 39, 71, 103 |
| 67 | 6 | Electrometer Range | 9, 25, 41, 57, 73, 89, 105 |
| 68 | 6 | Cal. Rate #1 | 120, 124 |
| 69 | 6 | Cal. Rate #2 | 121 |
| 70 | 6 | Cal. Rate #3 | 122, 126 |
| 71 | 6 | Cal. Rate #4 | 123, 127 |

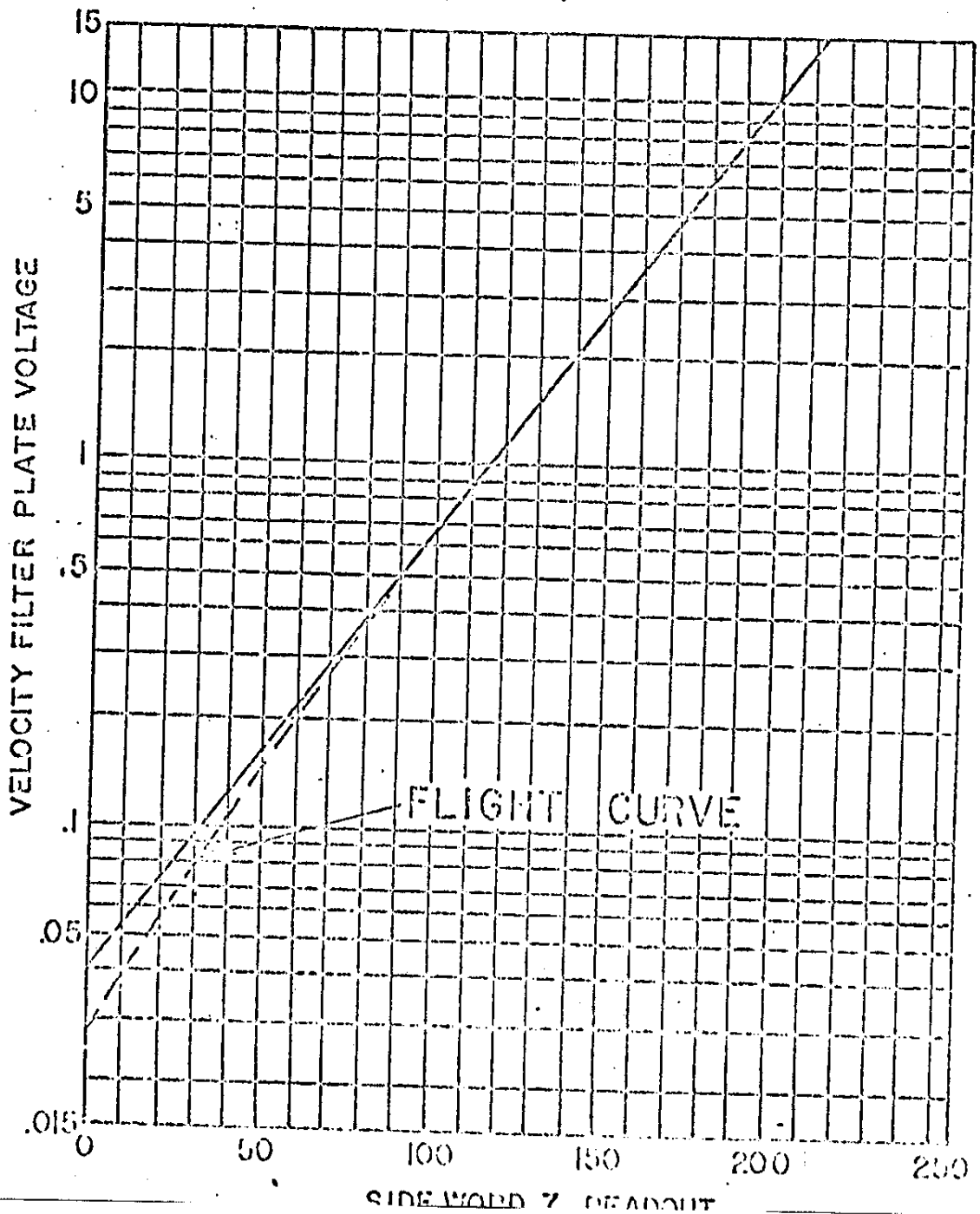
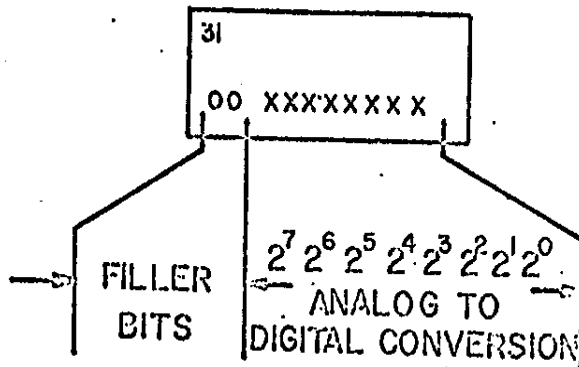
SIDE FRAME SEQUENCE

| CAL MODE | RESET SF @ 10 | RESET SF @ 39 | RESET SF @ 79 | RESET VF @ 9 AND SF @ 79 | RESET VF @ 9 | NORM MODE | SIDE WORD 7 READOUT | | |
|----------|---------------|---------------|---------------|-----------------------------|--------------|-----------|------------------------|-----|-----|
| | | | | | | | LO | NOM | HI |
| | 0 | 0 | 0 | 0 60 | 0 60 | 0 | 211 | 214 | 217 |
| | 1 | 1 | 1 | 1 61 | 1 61 | 1 | 207 | 210 | 213 |
| | 2 | 2 | 2 | 2 62 | 2 62 | 2 | 203 | 206 | 209 |
| | 3 | 3 | 3 | 3 63 | 3 63 | 3 | 199 | 202 | 205 |
| | 4 | 4 | 4 | 4 64 | 4 64 | 4 | 195 | 198 | 201 |
| | 5 | 5 | 5 | 5 65 | 5 65 | 5 | 191 | 194 | 197 |
| | 6 | 6 | 6 | 6 66 | 6 66 | 6 | 185 | 188 | 191 |
| | 7 | 7 | 7 | 7 67 | 7 67 | 7 | 181 | 184 | 187 |
| | 8 | 8 | 0 | 8 68 | 8 68 | 8 | 176 | 179 | 182 |
| | 9 | 9 | 9 | 9 69 | 9 69 | 9 | 171 | 174 | 177 |
| | 10 | 10 | 10 | | | 10 | 165 | 168 | 171 |
| | | 11 | 11 | | | 11 | 160 | 163 | 166 |
| | | 12 | 12 | | | 12 | 155 | 158 | 161 |
| | | 13 | 13 | | | 13 | 147 | 150 | 153 |
| | | 14 | 14 | | | 14 | 139 | 143 | 147 |
| | | 15 | 15 | | | 15 | 132 | 136 | 140 |
| | | 16 | 16 | | | 16 | 126 | 130 | 134 |
| | | 17 | 17 | | | 17 | 118 | 122 | 126 |
| | | 18 | 18 | | | 18 | 112 | 116 | 120 |
| | | 19 | 19 | | | 19 | 106 | 112 | 116 |

(VELOCITY FILTER VOLTAGE)

(ODD B&A FRAME)

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | | 32 |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |



SIDE FRAME SEQUENCE

| CAL MODE | RESET SF @ 10 | RESET SF @ 33 | RESET SF @ 79 | RESET VF @ 9 AND SF @ 79 | RESET VF @ 9 | NORM MODE | SIDE WORD 7 READOUT | | |
|----------|---------------|---------------|---------------|-----------------------------|--------------|-----------|------------------------|-----|-----|
| | | | | | | | LO | NOM | HI |
| | | | 40 | 20 | 20 80 | 40 | 170 | 173 | 176 |
| | | | 41 | 21 | 21 81 | 41 | 166 | 169 | 172 |
| | | | 42 | 22 | 22 82 | 42 | 162 | 165 | 168 |
| | | | 43 | 23 | 23 83 | 43 | 159 | 162 | 165 |
| | | | 44 | 24 | 24 84 | 44 | 155 | 158 | 161 |
| | | | 45 | 25 | 25 85 | 45 | 149 | 153 | 157 |
| | | ... | 46 | 26 | 26 86 | 46 | 143 | 147 | 151 |
| | | | 47 | 27 | 27 87 | 47 | 140 | 144 | 148 |
| | | | 48 | 28 | 28 88 | 48 | 136 | 140 | 144 |
| | | | 49 | 29 | 29 89 | 49 | 130 | 134 | 138 |
| | | | 50 | | | 50 | 124 | 128 | 132 |
| | | | 51 | | | 51 | 118 | 122 | 126 |
| | | | 52 | | | 52 | 113 | 117 | 121 |
| | | | 53 | | | 53 | 107 | 109 | 114 |
| | | | 54 | | | 54 | 097 | 102 | 107 |
| | | | 55 | | | 55 | 090 | 095 | 100 |
| | | | 56 | | | 56 | 083 | 088 | 093 |
| | | | 57 | | | 57 | 075 | 081 | 087 |
| | | | 58 | | | 58 | 069 | 076 | 083 |
| | | | 59 | | | 59 | 063 | 073 | 080 |

| SIDE FRAME SEQUENCE | | | | | | | SIDE WORD 7 READOUT | | |
|---------------------|---------------|---------------|---------------|-----------------------------|--------------|-----------|------------------------|--|--|
| CAL MODE | RESET SF @ 10 | RESET SF @ 39 | RESET SF @ 79 | RESET VF @ 9 AND SF @ 79 | RESET VF @ 9 | NORM MODE | | | |
| | | 20 | 10 70 | 20 | 189 | 192 | 195 | | |
| | | 21 | 11 71 | 21 | 187 | 190 | 193 | | |
| | | 22 | 12 72 | 22 | 183 | 186 | 189 | | |
| | | 23 | 13 73 | 23 | 179 | 182 | 185 | | |
| | | 24 | 14 74 | 24 | 175 | 178 | 181 | | |
| | | 25 | 15 75 | 25 | 170 | 173 | 176 | | |
| | | 26 | 16 76 | 26 | 166 | 169 | 172 | | |
| | | 27 | 17 77 | 27 | 161 | 164 | 167 | | |
| | | 28 | 18 78 | 28 | 155 | 159 | 163 | | |
| | | 29 | 19 79 | 29 | 150 | 154 | 158 | | |
| | | 30 | | 30 | 144 | 148 | 152 | | |
| | | 31 | | 31 | 138 | 142 | 146 | | |
| | | 32 | | 32 | 134 | 138 | 142 | | |
| | | 33 | | 33 | 126 | 130 | 134 | | |
| | | 34 | | 34 | 118 | 122 | 126 | | |
| | | 35 | | 35 | 112 | 116 | 120 | | |
| | | 36 | | 36 | 103 | 108 | 113 | | |
| | | 37 | | 37 | 097 | 102 | 107 | | |
| | | 38 | | 38 | 091 | 096 | 101 | | |
| | | 39 | | 39 | 087 | 092 | 097 | | |

SIDE FRAME SEQUENCE

| CAL MODE | RESET SF @ 10 | RESET SF @ 59 | RESET SF @ 79 | RESET VF @ 9 AND SF @ 79 | RESET VF @ 9 | NCRM MODE | SIDE WORD 7 READOUT | | |
|----------|---------------|---------------|---------------|-----------------------------|------------------|-----------|------------------------|-----|-----|
| | | | | | | | LO | NOM | HI |
| | | | | 40 | <u>40</u> 100 | 80 | 129 | 133 | 137 |
| | | | | 41 | <u>41</u> 101 | 81 | 125 | 129 | 133 |
| | | | | 42 | <u>42</u> 102 | 82 | 121 | 125 | 129 |
| | | | | 43 | <u>43</u> 103 | 83 | 118 | 122 | 126 |
| | | | | 44 | <u>44</u> 104 | 84 | 113 | 118 | 123 |
| | | | | 45 | <u>45</u> 105 | 85 | 103 | 113 | 118 |
| | | | | 46 | <u>46</u> 106 | 86 | 101 | 107 | 113 |
| | | | | 47 | <u>47</u> 107 | 87 | 097 | 103 | 109 |
| | | | | 48 | <u>48</u> 108 | 88 | 093 | 099 | 105 |
| | | | | 49 | <u>49</u> 109 | 89 | 087 | 093 | 099 |
| | | | | | | 90 | 082 | 088 | 094 |
| | | | | | | 91 | 075 | 082 | 089 |
| | | | | | | 92 | 071 | 078 | 085 |
| | | | | | | 93 | 059 | 068 | 077 |
| | | | | | | 94 | 053 | 062 | 071 |
| | | | | | | 95 | 043 | 054 | 065 |
| | | | | | | 96 | 034 | 046 | 058 |
| | | | | | | 97 | 026 | 041 | 056 |
| | | | | | | 98 | 020 | 035 | 050 |
| | | | | | | 99 | 014 | 032 | 050 |

SIDE FRAME SEQUENCE

| CAL MODE | RESET SF @ 10 | RESET SF @ 39 | RESET SF @ 79 | RESET VF @ 9 AND SF @ 79 | RESET VF @ 9 | NORM MODE | SIDE WORD 7 READOUT | | |
|----------|---------------|---------------|---------------|-----------------------------|--------------|-----------|------------------------|-----|-----|
| | | | | | | | LO | NOM | HI |
| | | | 60 | 30 | 30 90 | 60 | 147 | 152 | 157 |
| | | | 61 | 31 | 31 91 | 61 | 144 | 149 | 154 |
| | | | 62 | 32 | 32 92 | 62 | 141 | 146 | 151 |
| | | | 63 | 33 | 33 93 | 63 | 137 | 142 | 147 |
| | | | 64 | 34 | 34 94 | 64 | 132 | 137 | 142 |
| | | | 65 | 35 | 35 95 | 65 | 128 | 133 | 138 |
| | | | 66 | 36 | 36 96 | 66 | 122 | 127 | 132 |
| | | | 67 | 37 | 37 97 | 67 | 119 | 124 | 129 |
| | | | 68 | 38 | 38 98 | 68 | 114 | 119 | 124 |
| | | | 69 | 39 | 39 99 | 69 | 109 | 114 | 119 |
| | | | 70 | | | 70 | 102 | 108 | 114 |
| | | | 71 | | | 71 | 096 | 102 | 108 |
| | | | 72 | | | 72 | 091 | 097 | 103 |
| | | | 73 | | | 73 | 083 | 089 | 095 |
| | | | 74 | | | 74 | 075 | 082 | 089 |
| | | | 75 | | | 75 | 067 | 075 | 083 |
| | | | 76 | | | 76 | 060 | 068 | 076 |
| | | | 77 | | | 77 | 051 | 061 | 071 |
| | | | 78 | | | 78 | 045 | 056 | 067 |
| | | | 79 | | | 79 | 041 | 052 | 063 |

| SIDE FRAME SEQUENCE | | | | | | | SIDE WORD 7 READOUT | | |
|---------------------|--------------|--------------|--------------|---------------------------|-------------|------------|------------------------|------|------|
| CAL MODE | RESET SF Q10 | RESET SF Q39 | RESET SF Q79 | RESET VF Q9 AND SF Q79 | RESET VF Q9 | NORM. MODE | | | |
| 120 | | | | | 120 | 120 | 195 | >195 | ≤255 |
| 121 | | | | | 121 | 121 | 195 | >195 | ≤255 |
| 122 | | | | | 122 | 122 | 195 | >195 | ≤255 |
| 123 | | | | | 123 | 123 | 195 | >195 | ≤255 |
| 124 | | | | | 124 | 124 | 195 | >195 | ≤255 |
| 125 | | | | | 125 | 125 | 195 | >195 | ≤255 |
| 126 | | | | | 126 | 126 | 195 | >195 | ≤255 |
| 127 | | | | | 127 | 127 | 195 | >195 | ≤255 |

SIDE FRAME SEQUENCE

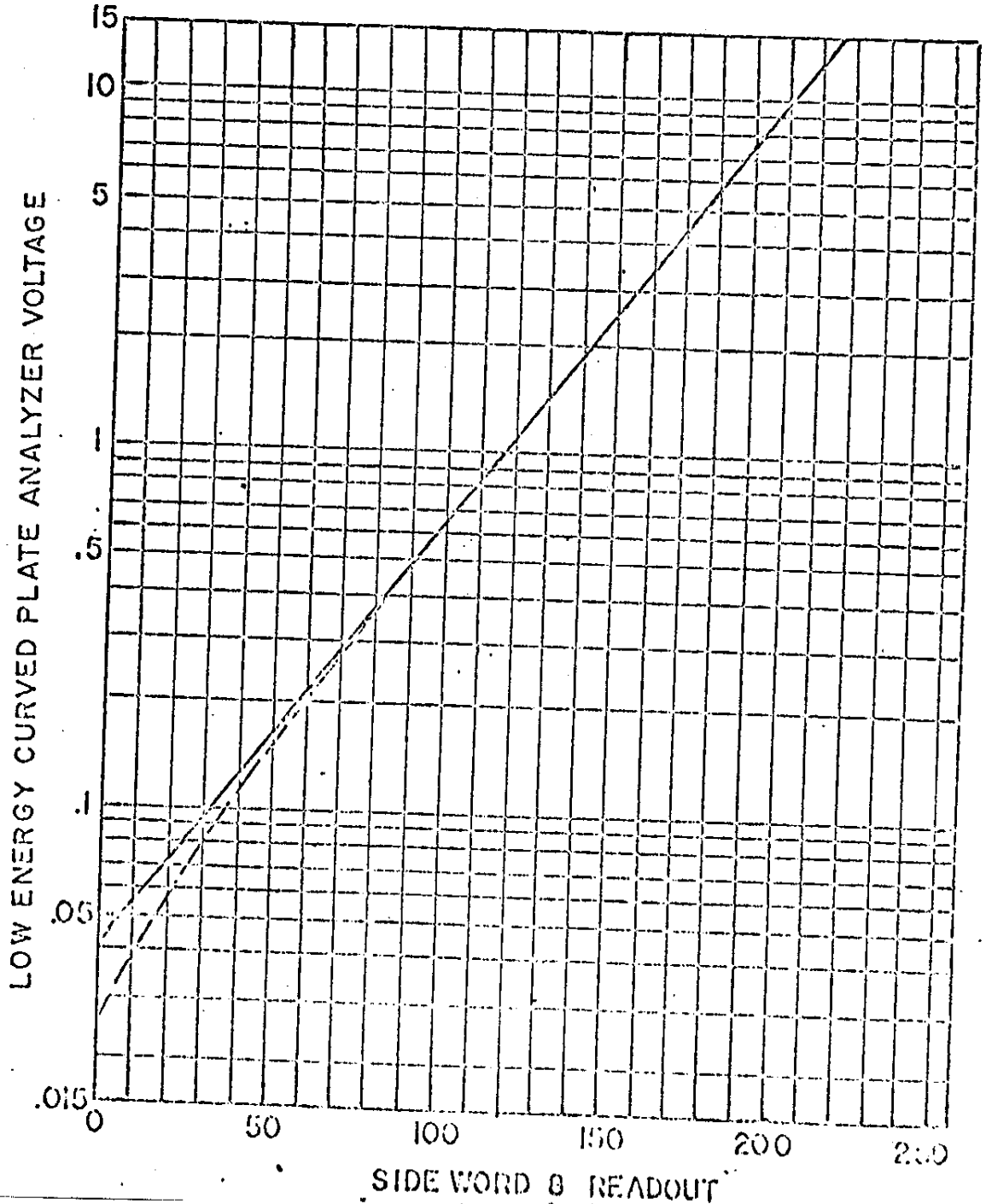
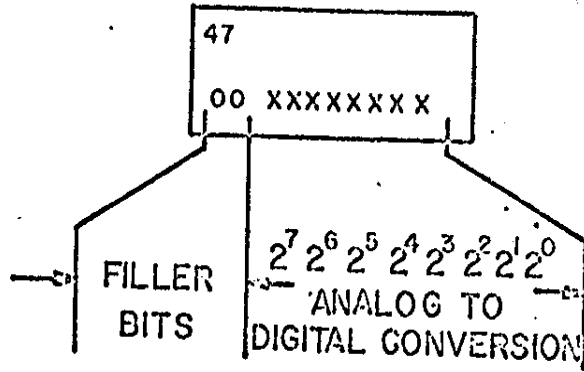
| CAL MODE | RESET SF @10 | RESET SF @39 | RESET SF @79 | RESET VF @9 AND SF @79 | RESET VF @9 | NORM MODE | SIDE WORD 7 READOUT | | |
|----------|--------------|--------------|--------------|---------------------------|-------------|-----------|------------------------|-----|-----|
| | | | | | | | LO | NOM | HI |
| | | | | 50 | 50 110 | 100 | 106 | 112 | 118 |
| | | | | 51 | 51 111 | 101 | 102 | 108 | 114 |
| | | | | 52 | 52 112 | 102 | 099 | 105 | 111 |
| | | | | 53 | 53 113 | 103 | 095 | 101 | 107 |
| | | | | 54 | 54 114 | 104 | 090 | 097 | 104 |
| | | | | 55 | 55 115 | 105 | 086 | 093 | 100 |
| | | | | 56 | 56 116 | 106 | 080 | 087 | 094 |
| | | | | 57 | 57 117 | 107 | 075 | 082 | 089 |
| | | | | 58 | 58 118 | 108 | 070 | 078 | 086 |
| | | | | 59 | 59 119 | 109 | 065 | 073 | 081 |
| | | | | | | 110 | 059 | 067 | 075 |
| | | | | | | 111 | 053 | 062 | 071 |
| | | | | | | 112 | 046 | 056 | 066 |
| | | | | | | 113 | 037 | 048 | 059 |
| | | | | | | 114 | 027 | 041 | 054 |
| | | | | | | 115 | 020 | 034 | 048 |
| | | | | | | 116 | 010 | 027 | 044 |
| | | | | | | 117 | 000 | 020 | 040 |
| | | | | | | 118 | 000 | 015 | 036 |
| | | | | | | 119 | 000 | 011 | 034 |

| SIDE FRAME NUMBER SEQUENCE | | | | | | | | | | |
|----------------------------|-----------------------------|-----------------------------|-----------------------------|---|-----------------------------|------------------|------------------------|-----|-----|--------------|
| CAL MODE (COMMAND 12) | RESET SF @10 (COMMAND 2) | RESET SF @39 (COMMAND 3) | RESET SF @79 (COMMAND 5) | RESET VF @ 3 AND SF @79 (COMMAND 6) | RESET VF @ 9 (COMMAND 4) | NORMAL MODE | SIDE WORD 8 READOUT | | | ENERGY eV |
| | | | | | | | LO | NOM | HI | |
| | 0 TO 10 | 0 TO 19 | 0 TO 19 | 0 TO 19 | 0 TO 19 | 0 TO 19 | 204 | 207 | 210 | 48.6 |
| | | 20 TO 39 | 20 TO 39 | 10 TO 19 | 70 TO 79 | 20 TO 39 | 162 | 166 | 170 | 16.2 |
| | | | 40 TO 59 | 20 TO 29 | 20-29 30-39 | 40 TO 59 | 122 | 127 | 132 | 5.4 |
| | | | 60 TO 79 | 30 TO 39 | 30-39 30-99 | 60 TO 79 | 077 | 086 | 095 | 1.8 |
| | | | | 40 TO 49 | 40-49 100-109 | 80 TO 99 | 033 | 046 | 059 | 0.6 |
| | | | | 50 TO 59 | 50-59 110-119 | 100 TO 119 | 000 | 005 | 030 | 0.2 |
| 120 TO 127 | | | | | 120 TO 127 | 120 TO 127 | 000 | 000 | 015 | <0.06 |

(LOW ENERGY CURVED
 PLATE ANALYZER VOLTAGE)

(ODD DATA FRAME)

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | | 48 |
| 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 |



MA Edit and TID Edit Data Format

MA (Mass Analyzer) and TID (Total Ion Detector) spectra are on these tapes in similar, but distinguishable formats. The MA and TID are sometimes called "Low Energy Detector" and "High Energy Detector", respectively.

Where reliable data is not available, the value -1 is inserted. Since this data was generated from a compressed format, time is available only at SIDE frame zero. Logical records not containing frame zero will have -1 in all of the time words. This does not indicate unreliable timing, and the time may be generated, if needed, by using the time last given and adding 1.208 seconds per frame (i.e., per data word). In "X10" mode add 12.08 seconds per frame. In normal mode there will be one logical record with time and five logical records without time in one complete SIDE cycle of frames 0-127.

Tape Description: 7-track, 800 bpi, binary (odd) parity
Words: 24-bit, binary integers, with negative values represented in 2's complement form.

Termination: Two standard tapemarks (octal 17, even parity)
Tape length: 1850 records, all one file, terminating before the reflective end-of-reel marker is passed.

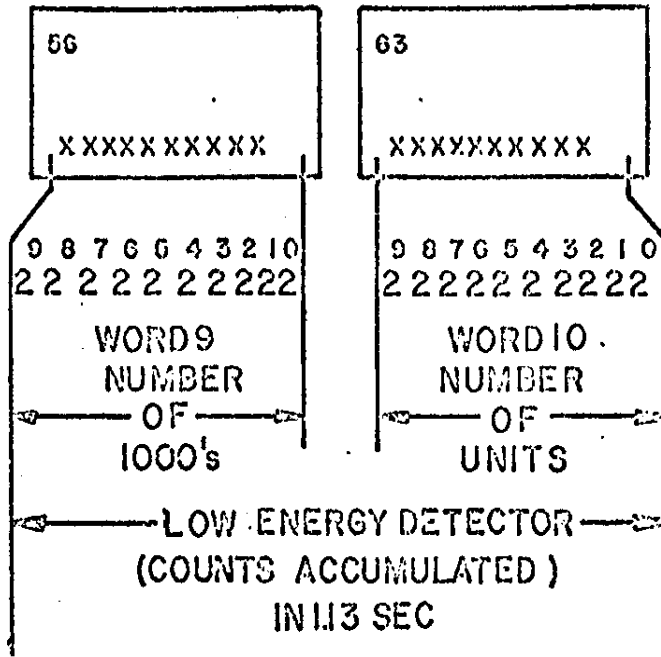
Label record: none

Physical record: 100 logical records

Logical record: 28 words, with contents as shown below

(LOW ENERGY DETECTOR COUNTS) (ODD BXA FRAME)

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| 49 | 50 | 51 | 52 | 53 | 54 | 55 | |
| 57 | 58 | 59 | 60 | 61 | 62 | | 64 |



WORD CONTENT: WORD 9 WORD 10



NORMAL OPERATION:

| SIDE FRAME NO | READOUT RANGE | |
|---------------------|---------------|---------|
| | LO | HI |
| 000 TO AND INCL 119 | 000,000 | 999,999 |
| 120 AND 124 | BK | |
| 121 AND 125 | >000,150 | |
| 122 AND 126 | >019,375 | |
| 123 AND 127 | >618,000 | |

WITH -3.5 KV OFF (COMMAND 14):

| SIDE FRAME NO | READOUT RANGE | |
|---------------------|---------------|---------|
| | LO | HI |
| 000 TO AND INCL 119 | 000,000 | |
| 120 AND 124 | 000,000 | 000,004 |
| 121 AND 125 | 000,150 | 000,153 |
| 122 AND 126 | 019,375 | 020,175 |
| 123 AND 127 | 618,000 | 646,800 |

WITH LEGRA VOLTAGE OFF (COMMAND 10) OR VEL FIL VOLTAGE OFF (COMMAND 9)

| SIDE FRAME NO | READOUT RANGE | |
|---------------------|---------------|----|
| | LO | HI |
| 000 TO AND INCL 119 | BK | |
| 120 AND 124 | BK | |
| 121 AND 125 | >000,150 | |
| 122 AND 126 | >019,375 | |
| 123 AND 127 | >618,000 | |

NOTE:

BK= BACKGROUND COUNTS (000,000 TO 999,997)

| <u>Word Number</u> | <u>MA</u> | <u>TID</u> | <u>Comments</u> |
|--------------------|--|------------------------------|---|
| 1 | Day | -1 | Times apply to frame zero. Word 6 of the MA data is from frame 0, while word 6 of the TID data is from frame 1. |
| 2 | Hour | Day | |
| 3 | Minute | Hour | |
| 4 | Millisecond | Minute | |
| 5 | 0 for 48.6 eV energy 1; 16.2 eV 2; 5.4 eV 3; 1.8 eV 4; 0.6 eV 5; 0.2 eV | Millisecond | |
| 6-25 | Mass Channels 0 thru 19 | Energy Channels 1 thru 20 | |
| 26 | TID Background | TID Background | Frame 121 or 125 |
| 27 | MA Background | MA Background | Frame 120 or 124 |
| 28 | Engineering data, in a cycle of up to 6 steps (below), depending on mode. Cycle starts with record containing time values. | | |
| | Ground Plane Step ID | | Consult the ALSEP |
| | CCIG Temperature (TEMP 1) | | SIDE DATA HANDBOOK |
| | Ground Volts (noise check) | | to convert to |
| | Solar Cell | | engineering units |
| | TEMP 6 | | |
| | TEMP 3 | | |

Words 6 - 25 contain detector counts per accumulation period (1.13 seconds).

APOLLO 14 LM/ALSEP
 MASS ANALYZER DATA ON TAPE
 71-008C-06C

This data set has been restored. There were originally 13 7-track, 800 bpi tapes written in binary. There are two restored tapes and one additional DD tape, received after completion of the restoration. The DR tapes are 3480 cartridges and the DS tapes are 9-track, 6250 bpi. The original tapes were created on an XDS 930 computer and the restored tapes were created on an IBM 9021 computer. The DR and DS numbers along with the corresponding D numbers are as follows:

| DR# | DS# | D# | FILES | TIME SPAN |
|----------|----------|---------|-------|-------------------------|
| DR004934 | DS004934 | D015662 | 1 | 02/06/71 - 05/07/71 (a) |
| | | D016946 | 2 | 05/07/71 - 07/21/71 |
| | | D016947 | 3 | 07/21/71 - 09/28/71 (b) |
| | | D016948 | 4 | 09/28/71 - 11/30/71 (c) |
| | | D016949 | 5 | 11/30/71 - 01/30/72 (d) |
| | | D016950 | 6 | 01/24/72 - 03/02/72 (e) |
| | | D018313 | 7 | 03/20/72 - 05/14/72 (f) |
| DR004935 | DS004935 | D018312 | 1 | 05/14/72 - 07/09/72 |
| | | D018813 | 2 | 07/09/72 - 09/03/72 |
| | | D018814 | 3 | 09/03/72 - 10/28/72 |
| | | D018815 | 4 | 10/28/72 - 12/22/72 |
| | | D018816 | 5 | 12/22/72 - 02/14/73 |
| | | D018817 | 6 | 02/14/73 - 04/11/73 |
| DD108751 | DC032848 | ----- | 10 | 07/07/73 - 06/28/74 (g) |

- (a) D015662: Read errors occurred in records 135 and 941 of file 1.
- (b) D016947: Read errors occurred in records 874, 1730, 1819 and 1847 of file 1.
- (c) D016948: Read errors occurred in records 144 and 152 of file 1.
- (d) D016949: Read errors occurred in records 838, 1353, 1809, 1815, 1828, 1832, 1837 - 1839, and 1841 - 1849 of file 1.
- (e) D016950: Read errors occurred in record 1334 of file 1.
- (f) D018313: Read errors occurred in records 3, 16, and 508 of file 1.
- (g) DD108751: There are data gaps between files 1 and 2, then 6 and 7.

refer to 69-099C-05C

Input tape file number: 1

Record 1 size = 25200 bytes.
Mass Analyzer

Start Day, Hour, Minute, Millisecond: 188 17 44 4833
Eof while skipping.

Approximate Stop Time: 189 3 22 52143
2 input records processed (including headers).
4 input records skipped.
0 records out.

End of File on Read.

Input tape file number: 2

Record 1 size = 25200 bytes.
Mass Analyzer

Start Day, Hour, Minute, Millisecond: 359 17 44 9251
Eof while skipping.

Record 2 size = 8064 bytes.
memsiz_old = 25200
nbytes = 8064
joff = 0
iblock = 225
newblock = 72
8064 0

Mass Analyzer

Approximate Stop Time: 0 0 0 0
2 input records processed (including headers).
80 input records skipped.
0 records out.

End of File on Read.

Input tape file number: 3

Record 1 size = 25200 bytes.
Mass Analyzer

Start Day, Hour, Minute, Millisecond: 365 10 0 57601
Eof while skipping.

Record 2 size = 18368 bytes.
memsiz_old = 25200
nbytes = 18368
joff = 0
iblock = 225
newblock = 164
18368 0
18368 0

Mass Analyzer

Approximate Stop Time: 365 23 58 9093
2 input records processed (including headers).
7 input records skipped.
0 records out.
End of File on Read.

Input tape file number: 4

Record 1 size = 25200 bytes.
Mass Analyzer

Start Day, Hour, Minute, Millisecond: 1 0 0 17076
Eof while skipping.

Record 2 size = 8736 bytes.
memsiz_old = 25200
nbytes = 8736
joff = 0
iblock = 225
newblock = 78
8736 0
Mass Analyzer

Approximate Stop Time: 18 17 41 57794
2 input records processed (including headers).
75 input records skipped.
0 records out.
End of File on Read.

Input tape file number: 5

Record 1 size = 25200 bytes.
Mass Analyzer

Start Day, Hour, Minute, Millisecond: 18 17 44 5788
Eof while skipping.

Record 2 size = 9968 bytes.
memsiz_old = 25200
nbytes = 9968
joff = 0
iblock = 225
newblock = 89
9968 0
Mass Analyzer

Approximate Stop Time: 24 17 41 46889
2 input records processed (including headers).
88 input records skipped.
0 records out.
End of File on Read.

Input tape file number: 6

Record 1 size = 25200 bytes.

Mass Analyzer

Start Day, Hour, Minute, Millisecond: 24 17 44 12995

Eof while skipping.

Record 2 size = 6720 bytes.

memsiz_old = 25200

nbytes = 6720

joff = 0

iblock = 225

newblock = 60

6720 0

Mass Analyzer

Approximate Stop Time: 30 6 3 30681

2 input records processed (including headers).

80 input records skipped.

0 records out.

End of File on Read.

Input tape file number: 7

Record 1 size = 25200 bytes.

Mass Analyzer

Start Day, Hour, Minute, Millisecond: 142 0 0 12804

Eof while skipping.

Record 2 size = 18480 bytes.

memsiz_old = 25200

nbytes = 18480

joff = 0

iblock = 225

newblock = 165

18480 0

Mass Analyzer

Approximate Stop Time: 147 2 14 9979

2 input records processed (including headers).

74 input records skipped.

0 records out.

End of File on Read.

Input tape file number: 8

Record 1 size = 25200 bytes.

Mass Analyzer

Start Day, Hour, Minute, Millisecond: 147 2 16 44538

Eof while skipping.

Record 2 size = 13888 bytes.

memsiz_old = 25200

nbytes = 13888

joff = 0

iblock = 225

newblock = 124

13888 0

Mass Analyzer

Approximate Stop Time: 168 12 14 30934
2 input records processed (including headers).
89 input records skipped.
0 records out.
End of File on Read.

Input tape file number: 9

Record 1 size = 25200 bytes.
Mass Analyzer

Start Day, Hour, Minute, Millisecond: 168 12 17 5491
Eof while skipping.

Record 2 size = 2576 bytes.
memsiz_old = 25200
nbytes = 2576
joff = 0
iblock = 225
newblock = 23
2576 0
Mass Analyzer

Approximate Stop Time: 173 23 26 42754
2 input records processed (including headers).
80 input records skipped.
0 records out.
End of File on Read.

Input tape file number: 10

Record 1 size = 25200 bytes.
Mass Analyzer

Start Day, Hour, Minute, Millisecond: 173 23 29 17312
Eof while skipping.

Record 2 size = 9520 bytes.
memsiz_old = 25200
nbytes = 9520
joff = 0
iblock = 225
newblock = 85
9520 0
Mass Analyzer

Approximate Stop Time: 179 13 27 58748
2 input records processed (including headers).
80 input records skipped.
0 records out.
End of File on Read.

JCL Used to create
D108751

JOB01003
29

```
1 //ZMBERMAE JOB (K1014,N390,25),'REBLOCK',TIME=(,59),
// MSGCLASS=X,MSGLEVEL=(1,1),CLASS=A,NOTIFY=ZMBER
// * =====
// * THIS WILL REBLOCK FROM 112 TO 25200, 7TR TO 9TR
// * =====
2 //STEP1 EXEC PGM=FATAR
3 //SYSPRINT DD SYSOUT=*
4 //TAPESUMM DD UNIT=IBM7TR,
5 //TAPEIN VOL=(PRIVATE,SER=BB1013),
// DISP=OLD,DCB=(TRTCH=,DEN=0,BLKSIZE=112,RECFM=F),
// LABEL=(,NL,,IN)
6 //TAPEOUT DD UNIT=6250,VOL=(PRIVATE,SER=BB9113),
// LABEL=(1,NL,,OUT),DISP=(NEW,KEEP)
7 //SYSIN DD *
```

FATAR
 PHYS DATASET NAME
 FILE (LAST 17 CHARS)
 1 ZMBERMAE.R0000553

TAPE SUMMARY FOR TAPE VOLUME -BB1020- AT DENSITY 200 BPI 8/19/96

| FILE | SERIAL | VOL# | CRDATE | EXPDATE | REC- FM | LRECL BLKSZ | CREATING JOB&STEP | SEC | BLOCKS READ | BYTES READ | PERM TEMP | ---BLOCKSIZES--- | EST- FEET | | | | |
|---------------|--------|------|--------|---------|------------|----------------|----------------------|-----|----------------|---------------|--------------|------------------|--------------|-----|------|--|------|
| | | | | | | | | | | | | MIN | AVG | MAX | FEET | | |
| | | | | | | | | | 18297 | 2049K | 0 | 112 | 112 | 112 | 1998 | | |
| TOTALS =====> | | | | | | | | | | | | 18297 | 2049K | 0 | | | 1998 |

D108751
 file 2

11

FATAR
 TAPE SUMMARY FOR TAPE VOLUME -BB1021- AT DENSITY 200 BPI 8/19/96

| PHYS DATASET NAME FILE (LAST 17 CHARS) | FILE SERIAL VOL# | CRDATE | EXPDATE | REC- FM | LRECL BLKSZ | CREATING JOB&STEP | SEC | BLOCKS READ | BYTES READ | PERM TEMP | ---BLOCKSIZES--- MIN AVG MAX | EST. FEET |
|---|---------------------|--------|---------|------------|----------------|----------------------|-----|----------------|---------------|--------------|---------------------------------|--------------|
| 1 ZMBERMAE.R0000565 | | | | | | | | 1964 | 220K | 0 | 112 112 112 | 215 |
| TOTALS =====> | | | | | | | | | | | 215 | |

HIGHEST EXPIRATION =====>

TOTALS =====>

1964 220K 0

215

D-108751
file 3

11

11

11

11

5

FATAR
 PHYS DATASET NAME
 FILE (LAST 17 CHARS)
 1 ZMBERMAE.R0000443

FILE SERIAL VOL#
 FILE SERIAL VOL#

CRDATE EXPDATE

REC- LRECL CREATING BLOCKS BYTES PERM
 FM BLKSZ JOB&STEP SEC READ READ TEMP

TAPE SUMMARY FOR TAPE VOLUME -BB1013- AT DENSITY 200 BPI

20114 2253K 0 14

---BLOCKSIZES---
 MIN 112 112 112 112 112 2196
 MAX 112 112 112 112 112 2196

8/19/96

D108751
 file 5

60

FATAR
 PHYS DATASET NAME
 FILE (LAST 17 CHARS)
 1 ZMBERMAE.R0000464

FILE SERIAL VOL#
 EXPDATE

REC- LRECL CREATING
 FM BLKSZ JOB&STEP SEC

BLOCKS READ
 18285

BYTES READ
 2048K

PERM TEMP
 0 0

---BLOCKSIZES---
 MIN 112
 AVG 112
 MAX 112

8/19/96
 EST. FEET
 112 1996

HIGHEST EXPIRATION =====>

TOTALS =====>

D108751
file 6

I
II
III

FATAR
 TAPE SUMMARY FOR TAPE VOLUME -BB1012- AT DENSITY 200 BPI 8/19/96

| PHYS DATASET NAME FILE (LAST 17 CHARS) | FILE SERIAL VOL# | CRDATE | EXPDATE | REC- FM | LRECL BLKSZ | CREATING JOB&STEP | SEC | BLOCKS READ | BYTES READ | PERM TEMP | ---BLOCKSIZES--- MIN AVG MAX | EST. FEET |
|---|---------------------|--------|---------|------------|----------------|----------------------|-----|------------------|------------------|--------------|---------------------------------|---------------------|
| 1 ZMBERMAE.R00000420 | | | | | | | | 17040 | 1908K | 0 | 112 112 112 | 112 1860 |
| 2 ZMBERMAE.R00000420 | | | | | | | | 17040 | 1908K | 0 | 112 112 112 | 112 1860 |
| <i>Removed Wrong data type</i> | | | | | | | | | | | | |
| TOTALS =====> | | | | | | | | 18126 | 2030K | 0 | | |
| HIGHEST EXPIRATION =====> | | | | | | | | | | | | 1979 |

D108751
 file 7

FATAR
 TAPE SUMMARY FOR TAPE VOLUME -BB1015- AT DENSITY 200 BPI 8/19/96

| PHYS DATASET NAME FILE (LAST 17 CHARS) | FILE SERIAL VOL# | CRDATE | EXPDATE | REC- FM | LRECL BLKSZ | CREATING JOB&STEP | SEC | BLOCKS READ | BYTES READ | PERM TEMP | ---BLOCKSIZES--- MIN AVG MAX | EST. FEET |
|---|---------------------|--------|---------|------------|----------------|----------------------|-----|----------------|---------------|--------------|---------------------------------|--------------|
| 1 ZMBERMAE.R0000471 | | | | | | | | 20374 | 2282K | 0 | 112 112 112 | 2224 |
| 2 ZMBERMAE.R0000471 | | | | | | | | 0 | 0 | 1 | 0 0 0 | 0 |
| TOTALS =====> | | | | | | | | | | | 2224 | |
| HIGHEST EXPIRATION =====> | | | | | | | | | | | 1 | |

D 108751
 file 8

FATAR
 PHYS DATASET NAME
 FILE (LAST 17 CHARS)
 1 ZMBERMAE.R0000673

TAPE SUMMARY FOR TAPE VOLUME -BB1001- AT DENSITY 200 BPI 8/19/96

| FILE | SERIAL | VOL# | CRDATE | EXPDATE | REC- FM | LRECL | CREATING JOB&STEP | SEC | BLOCKS READ | BYTES READ | PERM TEMP | ---BLOCKSIZES--- | EST. FEET | | |
|---------------|--------|------|--------|---------|------------|-------|----------------------|-----|----------------|---------------|--------------|------------------|--------------|-----|------|
| | | | | | | | | | | | | MIN | AVG | MAX | |
| | | | | | | | | | 18248 | 2044K | 0 | 112 | 112 | 112 | |
| TOTALS =====> | | | | | | | | | | | 18248 | 2044K | 0 | | 1993 |

HIGHEST EXPIRATION =====>

D108751
 file 9

FATAR
 PHYS DATASET NAME
 FILE (LAST 17 CHARS)
 1 ZMBERMAE.R0000687
 FILE SERIAL VOL#
 EXPDATE
 CRDATE
 TAPE SUMMARY FOR TAPE VOLUME -BB1002- AT DENSITY 200 BPI
 RECL CREATING BLOCKS BYTES PERM
 FM BLKSZ JOB&STEP SEC READ READ TEMP
 18310 2051K 0
 18310 2051K 0
 112 112 112 112
 ---BLOCKSIZES---
 MIN AVG MAX
 112 112 112
 EST. FEET
 1998
 HIGHEST EXPIRATION >>>>>
 TOTALS >>>>> 18310 2051K 0

D108751
 File 10

APOLLO 14 LM/ALSEP

TOTAL ION DETECTOR DATA ON TAPE

71-008C-06F

THIS DATA SET HAS BEEN RESTORED. THERE WERE ORIGINALLY 24 7-TRACK, 800 BPI TAPES WRITTEN IN BINARY. THERE ARE THREE RESTORED TAPES. THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THESE ORIGINAL TAPES WERE CREATED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS ARE AS FOLLOWS:

| DR# | DS# | D# | FILES | TIME SPAN |
|----------|----------|---------|-------|-------------------------|
| DR004991 | DS004991 | D015663 | 1 | 02/06/71 - 05/07/71 |
| | | D016951 | 2 | 05/07/71 - 07/21/71 |
| | | D016952 | 3 | 07/21/71 - 09/29/71 (a) |
| | | D016953 | 4 | 09/29/71 - 11/30/71 |
| | | D016954 | 5 | 11/30/71 - 01/24/72 (b) |
| | | D016955 | 6 | 01/24/72 - 03/20/72 (c) |
| | | D018316 | 7 | 03/20/72 - 05/14/72 |
| DR004992 | DS004992 | D018315 | 1 | 05/14/72 - 07/10/72 (d) |
| | | D018314 | 2 | 07/10/72 - 09/03/72 (e) |
| | | D018818 | 3 | 09/03/72 - 10/29/72 (f) |
| | | D018819 | 4 | 10/29/72 - 12/22/72 (g) |
| | | D018820 | 5 | 12/22/72 - 02/15/73 (h) |
| | | D018821 | 6 | 02/15/73 - 04/11/73 |
| DR006253 | DS006253 | D108746 | 1 | 02/05/71 - 02/25/71 |
| | | | 2 | 09/17/72 - 09/23/72 |
| | | | 3 | 12/25/73 - 12/31/72 |
| | | | 4 | 12/25/73 - 12/31/73 |
| | | | 5 | 01/01/74 - 01/18/74 |
| | | | 6 | 01/18/74 - 01/24/74 |
| | | | 7 | 01/24/74 - 01/30/74 |
| | | | 8 | 05/22/74 - 05/27/74 |
| | | | 9 | 05/27/74 - 06/17/74 |
| | | | 10 | 06/17/74 - 06/22/74 |
| | | | 11 | 06/22/74 - 06/22/74 |

- (a) D016952: READ ERRORS OCCURRED IN RECORDS 284, 292, 301, OF FILE 1
- (b) D016954: READ ERRORS OCCURRED IN RECORDS 2, 122, 134, 138, 139, 141, 1057 OF FILE 1
- (c) D016955: READ ERRORS OCCURRED IN RECORDS 404-406 OF FILE 1
- (d) D018315: READ ERRORS OCCURRED IN RECORDS 1785-1786 OF FILE 1
- (e) D018314: READ ERROR OCCURRED IN RECORD 419 OF FILE 1
- (f) D018818: READ ERROR OCCURRED IN RECORD 1445 OF FILE 1
- (g) D018819: READ ERRORS OCCURRED IN RECORDS 1630-1631 OF FILE 1
- (h) D018820: READ ERRORS OCCURRED IN RECORDS 1430,1443, OF FILE 1

refer to 69-099C-05C

APOLLO 12 LM/ALSEP

TOTAL ION DETECTOR DATA ON TAPE

69-099C-05F

This data set has been restored. There were originally 31 7-track, 800 BPI tapes written in Binary. There are three restored tapes. The DR tapes are 3480 cartridges and the DS tapes are 9-track, 6250 BPI. The original tapes were created on a 7094 computer and the restored tapes were created on an IBM 9021 computer. The DR and DS numbers along with the corresponding D numbers are as follows:

| DR# | DS# | D# | FILES | TIME SPAN |
|----------|----------|---------|-------|-------------------------|
| ----- | ----- | ----- | ----- | ----- |
| DR005027 | DS005027 | D017211 | 1 | 11/19/69 - 03/10/70 |
| | | D017212 | 2 | 03/10/70 - 05/31/70 (a) |
| | | D017213 | 3 | 05/31/70 - 08/13/70 |
| | | D017281 | 4 | 08/13/70 - 11/04/70 |
| | | D017280 | 5 | 11/04/70 - 01/29/71 (b) |
| | | D017279 | 6 | 01/29/71 - 04/19/71 (c) |
| | | D017278 | 7 | 04/19/71 - 07/05/71 (d) |
| DR005028 | DS005028 | D017693 | 1 | 07/05/71 - 09/24/71 (e) |
| | | D017694 | 2 | 09/24/71 - 12/18/71 (f) |
| | | D017695 | 3 | 12/18/71 - 03/11/72 (g) |
| | | D017883 | 4 | 03/12/72 - 05/31/72 (h) |
| | | D017882 | 5 | 05/31/72 - 08/16/72 (i) |
| | | D018311 | 6 | 08/16/72 - 11/16/72 (j) |
| | | D018310 | 7 | 11/16/72 - 03/14/73 (k) |
| DR006255 | DS006255 | D108762 | 1 | 05/06/73 - 05/12/73 |
| | | | 2 | 05/12/73 - 05/27/73 |
| | | | 3 | 05/27/73 - 06/12/73 |
| | | | 4 | 06/12/73 - 06/27/73 |
| | | | 5 | 06/27/73 - 07/05/73 |
| | | | 6 | 07/05/73 - 07/09/73 |
| | | | 7 | 07/09/73 - 07/24/73 |
| | | | 8 | 08/27/73 - 09/22/73 |
| | | | 9 | 09/28/73 - 10/04/73 |
| | | | 10 | 10/03/73 - 10/18/73 |
| | | | 11 | 10/18/73 - 10/25/73 |
| | | | 12 | 11/05/73 - 11/20/73 |
| | | | 13 | 11/20/73 - 11/25/73 |
| | | | 14 | 11/25/73 - 12/01/73 |
| | | | 15 | 12/01/73 - 12/18/73 |
| | | | 16 | 12/24/73 - 12/30/73 |
| | | | 17 | 12/26/73 - 12/31/73 |

refer to 69-099C-05C

APOLLO 12 CONT.

- (a) D017212: Read error occurred in record 242 of file 1.
- (b) D017280: Read error occurred in record 412 of file 1.
- (c) D017279: Read error occurred in record 551 of file 1.
- (d) D017278: Read error occurred in record 158 of file 1.
- (e) D017693: Read errors occurred in records 292, 696, 1374 of file 1.
- (f) D017694: Read error occurred in record 628 of file 1.
- (g) D017695: Read errors occurred in records 411, 1740, 1848, 1849
of file 1.
- (h) D017883: Read errors occurred in records 361, 1142 of file 1.
- (i) D017882: Read errors occurred in records 4, 490, 540, 1434, 1815,
1821 of file 1.
- (j) D018311: Read error occurred in record 15 of file 1.
- (k) D018310: Read errors occurred in records 51, 414 of file 1.

APOLLO 15 LM/ALSEP

TOTAL ION DETECTOR DATA ON TAPE

71-063C-05F

This data set has been restored. There were originally 10 7-track, 800 BPI tapes written in Binary. There are two restored tapes. The DR tapes are 3480 cartridges and the DS tapes are 9-track, 6250 BPI. An additional 59 7-track, 200 BPI tapes were stacked onto one 9-track. The original tapes were created on a 930 computer and the restored tapes were created on an IBM 9021 computer. The DR and DS numbers along with the corresponding D numbers are as follows:

| DR# | DS# | D# | FILES | TIME SPAN |
|----------|----------|---------|-------|-------------------------|
| ----- | ----- | ----- | ----- | ----- |
| DR005023 | DS005023 | D017283 | 1 | 08/03/71 - 10/28/71 (a) |
| | | D017751 | 2 | 10/28/71 - 01/11/72 (b) |
| | | D017750 | 3 | 01/11/72 - 03/16/72 |
| | | D017749 | 4 | 03/16/72 - 05/19/72 (c) |
| | | D017748 | 5 | 05/19/72 - 07/15/72 (d) |
| DR005024 | DS005024 | D017747 | 1 | 07/15/72 - 09/08/72 (e) |
| | | D017746 | 2 | 09/08/72 - 11/03/72 |
| | | D017745 | 3 | 11/03/72 - 12/28/72 |
| | | D028834 | 4 | 12/28/72 - 02/22/73 (f) |
| | | D028835 | 5 | 02/22/73 - 04/19/73 |
| D-108752 | C-032849 | | 1 | 04/18/73 - 04/24/73 |
| | | | 2 | 04/24/73 - 05/03/73 |
| | | | 3 | 05/07/73 - 05/13/73 |
| | | | 4 | 05/13/73 - 05/17/73 |
| | | | 5 | 05/17/73 - 05/22/73 |
| | | | 6 | 05/22/73 - 05/28/73 |
| | | | 7 | 05/28/73 - 06/02/73 |
| | | | 8 | 06/02/73 - 06/08/73 |
| | | | 9 | 06/08/73 - 06/13/73 |
| | | | 10 | 06/13/73 - 06/18/73 |
| | | | 11 | 06/19/73 - 06/23/73* |
| | | | 12 | 06/18/73 - 06/24/73 |
| | | | 13 | 06/24/73 - 06/30/73 |
| | | | 14 | 06/30/73 - 07/07/73 |
| | | | 15 | 07/07/73 - 07/11/73 |
| | | | 16 | 07/11/73 - 07/17/73 |
| | | | 17 | 07/17/73 - 07/23/73 |
| | | | 18 | 07/19/73 - 07/22/73 * |
| | | | 19 | 07/23/73 - 07/29/73 |
| | | | 20 | 07/29/73 - 08/04/73 |
| | | | 21 | 08/04/73 - 08/10/73 |
| | | | 22 | 08/10/73 - 08/16/73 |
| | | | 23 | 08/18/73 - 08/20/73* |

Ref to 69-099C-05C for fuller Documentation

| | |
|----|---|
| 24 | 08/16/73 - 08/22/73* |
| 25 | 08/22/73 - 08/28/73 |
| 26 | 08/28/73 - 09/03/73 |
| 27 | 09/03/73 - 09/09/73 |
| 28 | 09/09/73 - 09/16/73 |
| 29 | 09/16/73 - 09/20/73 |
| 30 | 09/20/73 - 09/22/73 |
| 31 | This file is currently a bad file from dout3 and must be replaced with DIN-30 when the 7-tk drive is reset to read 200 bpi tapes. Majames has input tape and scratch for duping. |
| 32 | 09/28/73 - 09/30/73 |
| 33 | 10/03/73 - 10/09/73 |
| 34 | 10/10/73 - 10/18/73* |
| 35 | 10/15/73 - 10/18/73* |
| 36 | 10/18/73 - 10/18/73* |
| 37 | 10/18/73 - 10/24/73 |
| 38 | 10/24/73 - 10/31/73 |
| 39 | 10/25/73 - 10/31/73* |
| 40 | 10/31/73 - 11/06/73 |
| 41 | 11/06/73 - 11/17/73 |
| 42 | 11/17/73 - 11/23/73 |
| 43 | 11/23/73 - 11/28/73** |
| 44 | 12/04/73 - 12/15/73 |
| 45 | 12/14/73 - 12/17/73 |
| 46 | 12/15/73 - 12/20/73** |
| 47 | 12/30/73 - 12/31/73 |
| 48 | 01/01/74 - 01/16/74 |
| 49 | 01/16/73 - 01/18/73 |
| 50 | 01/21/74 - 01/27/74** |
| 51 | 06/21/74 - 06/26/74** |
| 52 | 10/28/74 - 10/30/74** |
| 53 | 12/24/74 - 12/31/74 |
| 54 | 01/01/75 - 01/10/75** |
| 55 | 09/02/75 - 09/04/75 |
| 56 | 08/05/75 - 08/10/75 |
| 57 | 08/11/75 - 08/16/75 |
| 58 | 08/17/75 - 09/01/75 |
| 59 | 11/30/75 - 12/31/75 |

* Time spans overlap.

** Time gaps between files.

- (a) D017283: Read errors occurred in records 3, 5, 1136, 1494 of file 1.
- (b) D017751: Read errors occurred in records 89, 216, 218, 220, 305, 1846 of file 1.
- (c) D017749: Read errors occurred in records 714, 950, 1025, 1766, 1837, 1849 of file 1.
- (d) D017748: Read errors occurred in records 5, 300 of file 1.
- (e) D017747: Read errors occurred in records 269, 346, 347, 348, 349, 635, 1849 of file 1.
- (f) D028834: Read errors occurred in records 1622, 1786, 1842, 1843, 1845 of file 1.

APOLLO 15 LM/ALSEP
 MASS ANALYZER DATA ON TAPE
 71-063C-05C

THIS DATA SET HAS BEEN RESTORED THERE WERE ORIGINALLY 63 7-TRACK, 800 BPI TAPES WRITTEN IN BINARY. THERE ARE FOUR RESTORED TAPES. THE DR TAPES ARE 3480 CARTRIDGES AND THE DS TAPES ARE 9-TRACK, 6250 BPI. THE ORIGINAL TAPES WERE CREATED ON A 7094 COMPUTER AND THE RESTORED TAPES WERE CREATED ON AN IBM 9021 COMPUTER. DD108719 & 720 WERE CREATED FROM A GROUP OF TAPES PROVIDED BY THE PI SEVERAL YEARS AFTER THE INITIAL SHIPMENT OF THE 10 TAPES. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS ARE AS FOLLOWS:

| DR# | DS# | D# | FILES | TIME SPAN |
|----------|----------|---------|-------|-------------------------|
| DR004993 | DS004993 | D017282 | 1 | 08/03/71 - 10/28/71 |
| | | D017696 | 2 | 10/28/71 - 01/11/72 (a) |
| | | D017697 | 3 | 01/11/72 - 03/16/72 |
| | | D017742 | 4 | 03/16/72 - 05/19/72 (b) |
| | | D017743 | 5 | 05/19/72 - 07/20/72 (c) |
| DR004994 | DS004994 | D017888 | 1 | 07/20/72 - 09/09/72 |
| | | D017887 | 2 | 09/09/72 - 11/04/72 |
| | | D017886 | 3 | 11/04/72 - 12/29/72 (d) |
| | | D017885 | 4 | 12/29/72 - 02/24/73 |
| | | D107884 | 5 | 02/24/73 - 06/02/73 |

Ref to 69-099C-05C for further Documentation

APOLLO 15 LM/ALSEP

| DR# | DS# | D# | FILES | TIME SPAN |
|----------|----------|---------|-------|---------------------|
| ----- | ----- | ----- | ----- | ----- |
| DR006251 | DS006251 | 108719 | 1 | 05/21/73 - 05/24/73 |
| | | | 2 | 06/02/73 - 06/08/73 |
| | | | 3 | 06/08/73 - 06/13/73 |
| | | | 4 | 06/13/73 - 06/18/73 |
| | | | 5 | 06/18/73 - 06/23/73 |
| | | | 6 | 06/19/73 - 06/23/73 |
| | | | 7 | 06/24/73 - -6/30/73 |
| | | | 8 | 06/30/73 - 07/07/73 |
| | | | 9 | 07/07/73 - 07/11/73 |
| | | | 10 | 07/11/73 - 07/17/73 |
| | | | 11 | 07/17/73 - 07/19/73 |
| | | | 12 | 07/19/73 - 07/22/73 |
| | | | 13 | 07/23/73 - 07/29/73 |
| | | | 14 | 07/29/73 - 08/04/73 |
| | | | 15 | 08/04/73 - 08/10/73 |
| | | | 16 | 08/07/73 - 08/10/73 |
| | | | 17 | 08/16/73 - 08/22/73 |
| | | | 18 | 08/18/73 - 08/20/73 |
| | | | 19 | 08/22/73 - 08/28/73 |
| | | | 20 | 09/03/73 - 09/09/73 |
| | | | 21 | 09/16/73 - 09/20/73 |
| | | | 22 | 09/25/73 - 09/28/73 |
| | | | 23 | 09/25/73 - 09/27/73 |
| | | | 24 | 10/25/73 - 10/31/73 |
| | | | 25 | 11/14/73 - 11/17/73 |
| | | | 26 | 11/28/73 - 12/04/73 |
| | | | 27 | 12/14/73 - 12/17/73 |
| | | | 28 | 12/15/73 - 12/20/73 |
| | | | 29 | 12/15/73 - 12/20/73 |
| | | | 30 | 12/20/73 - 12/24/73 |
| | | | 31 | 12/25/73 - 12/30/73 |
| | | | 32 | 12/30/73 - 12/31/73 |
| DR006252 | DS006252 | D108720 | 1 | 01/12/74 - 01/14/74 |
| | | | 2 | 01/24/74 - 01/29/74 |
| | | | 3 | 01/29/73 - 02/04/73 |
| | | | 4 | 02/24/74 - 03/03/74 |
| | | | 5 | 02/26/74 - 03/03/74 |
| | | | 6 | 03/11/74 - 03/16/74 |
| | | | 7 | 05/10/74 - 05/14/74 |
| | | | 8 | 05/19/74 - 05/24/74 |
| | | | 9 | 05/24/74 - 05/30/74 |
| | | | 10 | 06/25/74 - 06/29/74 |
| | | | 11 | 07/07/74 - 07/11/74 |
| | | | 12 | 07/24/74 - 07/27/74 |
| | | | 13 | 08/22/74 - 08/25/74 |
| | | | 14 | 09/04/74 - 09/08/74 |
| | | | 15 | 09/10/74 - 09/12/74 |
| | | | 16 | 09/08/74 - 09/15/74 |
| | | | 17 | 09/16/74 - 09/18/74 |
| | | | 18 | 10/28/74 - 11/02/74 |
| | | | 19 | 12/13/74 - 12/18/74 |
| | | | 20 | 12/19/74 - 12/24/74 |
| | | | 21 | 10/30/74 - 10/31/74 |

APOLLO 15 LM/ALSEP

- a) D107696: READ ERROR OCCURRED IN RECORD 772 OF FILE 1
- (b) D017742: READ ERROR OCCURRED IN RECORD 1840 OF FILE 1
- (c) D017743: READ ERRORS OCCURRED IN RECORDS 734, 755, 1794 OF FILE 1
- (d) D017886: READ ERROR OCCURRED IN RECORD 1034 OF FILE 1

