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TELEMETRY DATA INTERPOLATION PROGRAM FOR OGO C&D EXPERIMENT 19

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GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

USERS MANUAL

TELEMETRY DATA INTERPOLATION PROGRAM FOR OGO C&D EXPERIMENT 19

PREPARED UNDER THE TECHNICAL
DIRECTION OF BARBARA WALTON

FEBRUARY 1967

TELEMETRY COMPUTATION BRANCH
INFORMATION PROCESSING DIVISION

GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

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CONTENTS

		Page
I.	INTRODUCTION	I-1
	A. PURPOSE	
	B. PROBLEM DEFINITION	I-1
II.	OPERATING INSTRUCTIONS	II-1
	A. REQUIREMENTS, LIMITATIONS, OPTIONS	II-1
	Requirements	II-1
	Limitations	II-2
	Options	II-2
	Output Suppression Options	II-2
	Output/Device Modifications	II-3
	Data Selection Option	II-3
	B. INPUT	II-4
	Run Deck Preparation	II-4
	Deck Structure	II-4
	General Procedures	II-6
	No-Change Procedure	II-6
	MASTER Change Procedure	II-6
	OPEP or SOEP Change Procedure	II-6
	NOCH Indicator Card	II-8
	MASTER Indicator Card	II-9
	MASTER Options Card	II-10
	OPEP or SOEP Indicator Card	II-12
	OPEP or SOEP Options Card	II-13
	END Indicator Card	II-15
	ENDALL Indicator Card	II-16
	Sample Deck	II-17
	C. SET-UP AND RUN PROCEDURE	II-18
	Run Set-Up	II-18
	Tape Arrangement	II-18
	On-Line Reader	II-18
	On-Line Printer	II-18
	Jump Switches	II-18
	Run Procedure	II-19
	Normal Procedure	II-19
	Tape Interlock Procedure	II-19
	Tape Error Procedure	II-19

D. OUTPUT II-20
On-Line Printer II-20
Plotter Output File II-20
IBM 7094 Output File II-20
History/Error Output File II-20

E. SAMPLE OUTPUT II-20
On-Line Printer II-20
Plotter File II-22
IBM 7094 Output File II-34
History/Error Output File II-38

III. PROGRAM DESCRIPTION III-1

A. CALCULATION PROCEDURE III-1

B. FLOWCHARTS III-1

I. INTRODUCTION

A. PURPOSE

The primary purpose of the OGO C&D Experiment 19 Program is to generate tabulations and plots (via the Stromberg - Carlson 4020 Plotter) of data obtained from two experiment packages aboard the spacecraft. These packages are the Orbital Plane Experiment Package (OPEP) and the Solar Orbital Experiment Package (SOEP). In addition, the program writes the data tabulations onto an IBM 7094 tape and produces a listing of erroneous input data.

B. PROBLEM DEFINITION

Figure 1 is a diagram of the OGO C&D data reduction system showing the position occupied by the Experiment 19 Program. Computationally, the program correlates the telemetry data (Decom tapes) and the spacecraft attitude and orbit data (Attitude/Orbit tapes). The objective is to show, in the program output, the orientation of the spacecraft at the time the telemetry data was transmitted.

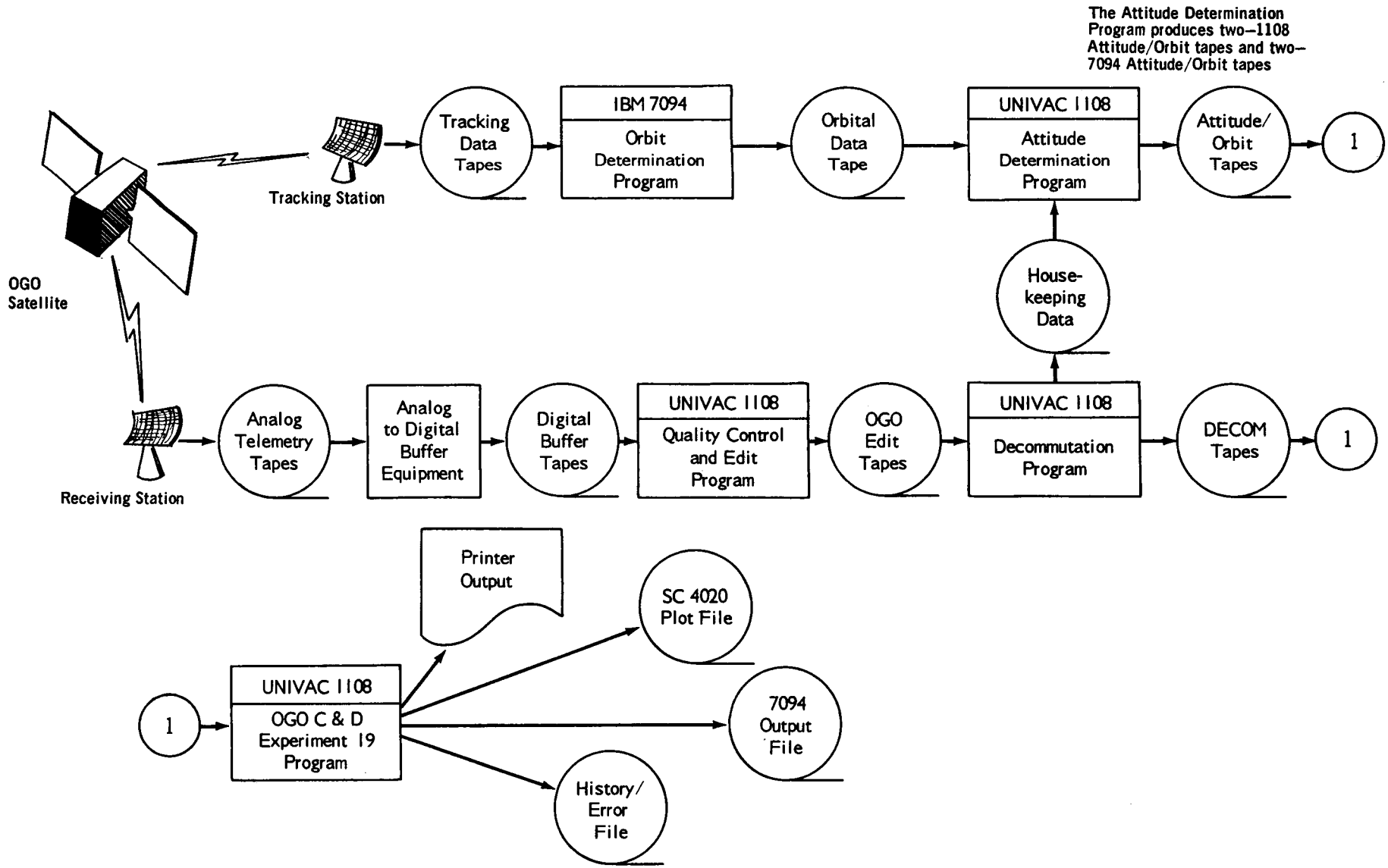


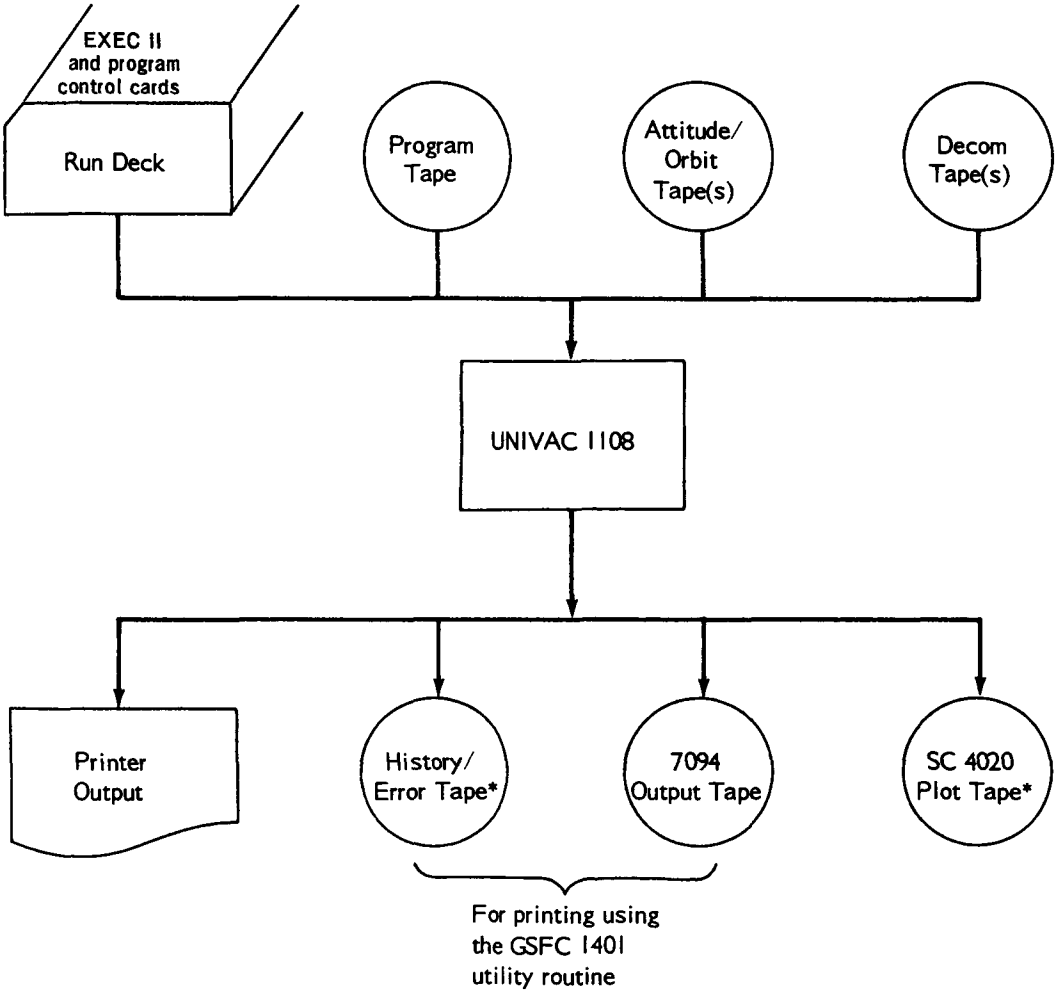
Figure 1. OGO Data Reduction Scheme

II. OPERATING INSTRUCTIONS

A. REQUIREMENTS, LIMITATIONS, OPTIONS

Requirements

This program is executed as a normal Univac 1108 EXEC II job. As illustrated by the process flow diagram below, it utilizes a minimum of eight (8) tape drives, the card reader, and the on-line printer.



* Mount at least two output tapes each

Limitations

(1) The Decom tape(s) and the Attitude/Orbit tape(s) must be mounted on different channels.

(2) No partial cycles can be obtained for the 64 kilobit transmission rate because of the difficulty of determining a cycle at this rate.

Options

In normal operation, the program is designed to:

(1) Write Orbital Plane Experiment Package (OPEP) tabulation and plot data on the plotter tape.

(2) Write Solar Orbital Experiment Package (SOEP) tabulations on the plotter tape.

(3) Write Attitude/Orbit tape and Decom tape labels on the on-line printer.

(4) Write an IBM 7094 tape containing the OPEP and SOEP tabulations.

(5) Write a History/Error tape containing erroneous Decom tape data, if any.

(6) Produce typewriter printouts of total number of data frames read and total used.

Using program control cards, the program user can either indicate that the program is to operate normally or define any of several processing options. These options are listed below:

Output Suppression Options. Options exist for suppressing the following outputs:

(1) SOEP tabulations

(2) OPEP tabulations or plots

(3) Decom or Attitude/Orbit tape labels

(4) All 7094 output

(5) Console printout of data frames read and data frames used.

Output/Device Modifications. Options may be elected to:

(1) Produce the OPEP tabulation or SOEP tabulation on the on-line printer instead of the plotter tape.

(2) Add a count on the plotter tape of the total number of plots produced.

Data Selection Options. The data selection options limit the processing of certain types of SOEP and/or OPEP to values within the range of specified parameters. The applicable data types are:

(1) Load Bus Voltage

(2) SOEP temperature

(3) OPEP temperature

(4) Panel temperature

B. INPUT

Input consists of the following:

(1) An EXEC II run deck.

(2) A Decom Tape produced by the Decommutation Program.

(3) An Attitude/Orbit Tape produced by the Attitude/Orbit Program.

(4) The OGO C&D Experiment 19 Program (program complex file).

RUN DECK PREPARATION

Deck Structure

The run deck consists of EXEC II control cards and one or more program control cards (see Figure 2). The program control cards are used to indicate that no processing options are to be exercised, or to define the options desired.

When no options are desired, the run deck contains only the NOCH (no changes) indicator card following the XQT START EXEC II control card. When options are desired, they are defined in MASTER, OPEP, and/or SOEP option decks. The types of options defined in each case are as follows:

(1) MASTER Option Deck: defines output processing options such as suppression of the SOEP tabulation, output of the OPEP tabulation on the on-line printer instead of the plot tape, etc.

(2) OPEP Options Deck: defines data selection options. This is done by supplying parameter values for load bus voltage, panel temperature, OPEP temperature, and/or SOEP temperature. Only those OPEP data values within the range of the parameters will be selected for processing.

(3) SOEP Options Deck: the same as the OPEP Options Deck, but for SOEP data selection.

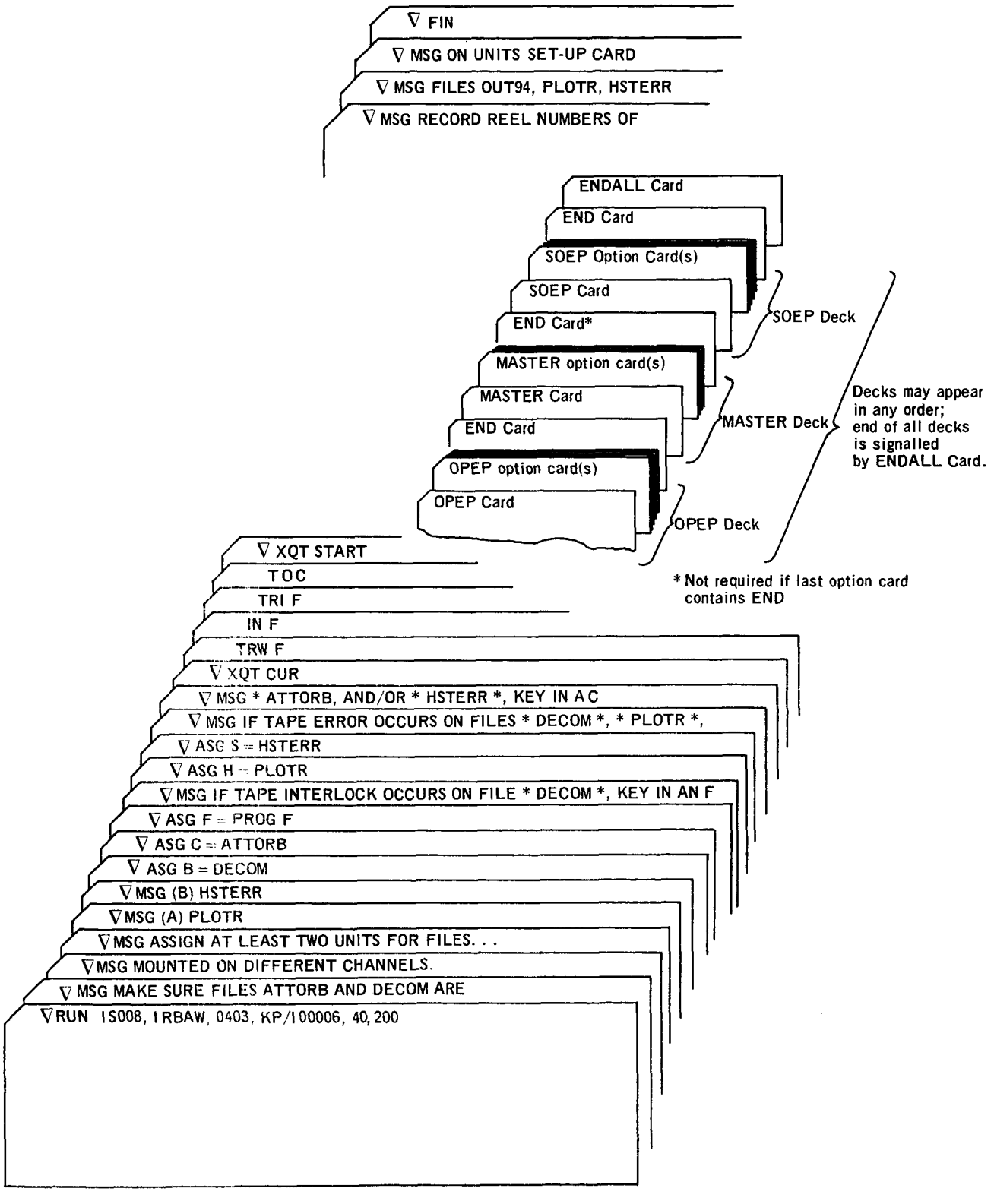


Figure 2. Run Deck Structure

An option deck consists of a leading indicator card (MASTER, SOEP, or OPEP), trailing option cards, and a terminal indicator (END). The indicator cards contain a mnemonic indicator word in columns 2-7; all other columns are blank. The options cards consist of up to six 6-character fixed fields in columns 2 through 42; each field is separated from the next by a blank column.

When more than one option deck is present, the decks may appear in any order; option cards may likewise appear in any order. The end of all option decks is signalled by an ENDALL indicator card.

General Procedures

The following are general procedures for exercising all permissible program control operations. The formats of the program control cards and sample run decks are given later in this section.

(a) No-change Procedure: Place a NOCH indicator card after the ΔXQT START card in the run deck; no other program control cards are required.

(b) MASTER Options Procedure: Prepare a MASTER options deck consisting of the following (in the order listed):

- A MASTER indicator card
- One or more MASTER options cards, in any order
- A deck termination indicator, which may be either 1) an END indicator card or 2) the word END entered in the last non-blank field of the last MASTER option card.

(c) OPEP or SOEP Option Procedure: OPEP and SOEP option decks must be prepared separately (although both may appear in the run deck). The deck consists of the following:

- An OPEP or SOEP indicator card
- From 1 to 4 OPEP or SOEP options cards, in any order
- An END indicator card

(d) Termination Procedure: the end of all program control cards (decks) is signalled by an ENDALL card, which must be the last program control card in the deck (except when NOCH is used).

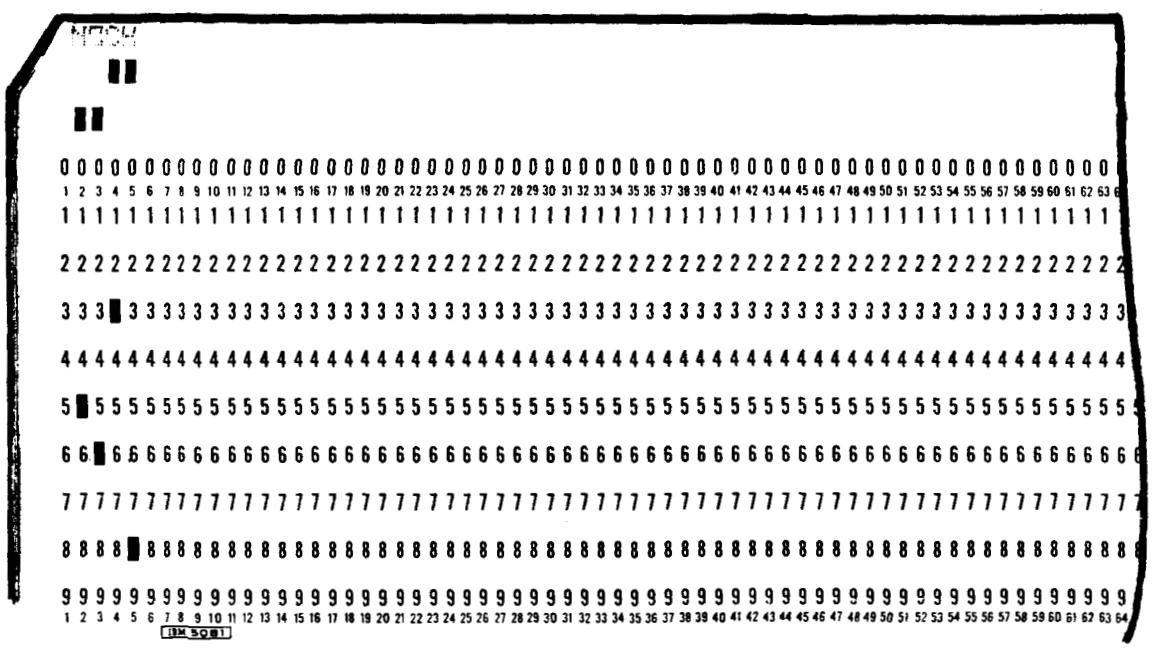
NOCH Indicator Card

(a) Usage: Indicates that no program control options (see Options, page II-2) are to be exercised. When NOCH is used, no other program control card is required.

(b) Format:

Column	Contents	Meaning
1	Blank	
2-5	NOCH	No changes
6-72	Blank	
73-80	Card ID (optional)	

(c) Example:



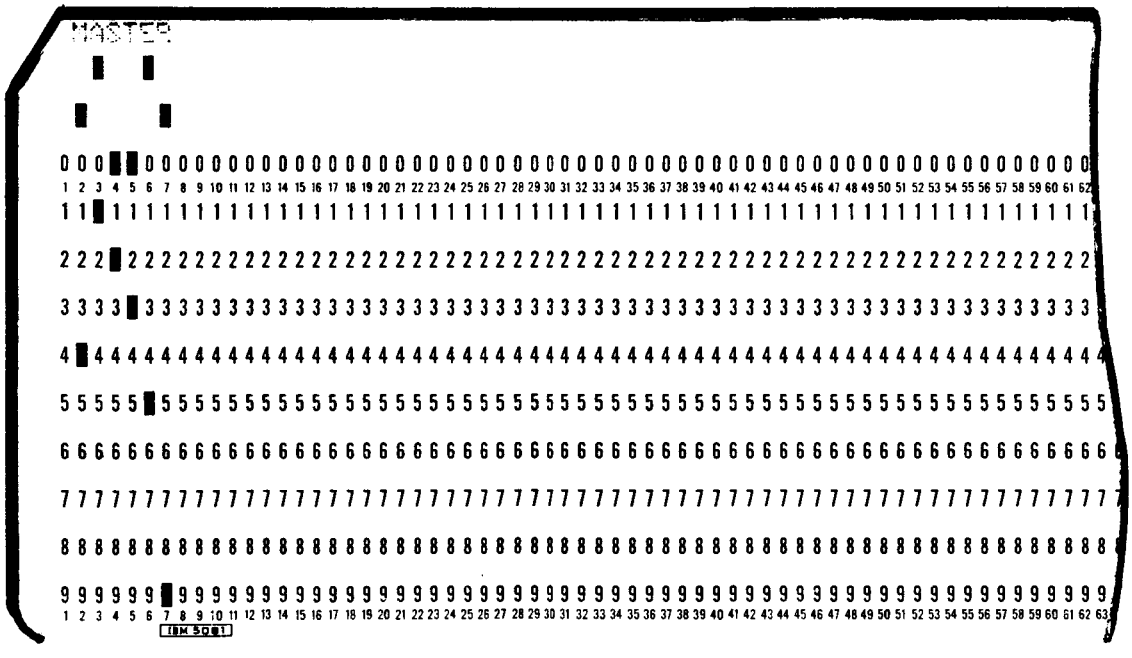
MASTER Indicator Card

(a) Usage: signals the beginning of a MASTER option deck.

(b) Format:

Column	Contents	Meaning
1	Blank	
2-7	MASTER	Output and/or device options are defined in a trailing MASTER Option Card.
8-72	Blank	
73-80	Card ID (optional)	

(c) Example:



MASTER Options Card

(a) Usage: defines from one to six MASTER processing options. The mnemonic option words (see the Option Table below) may appear in any order.

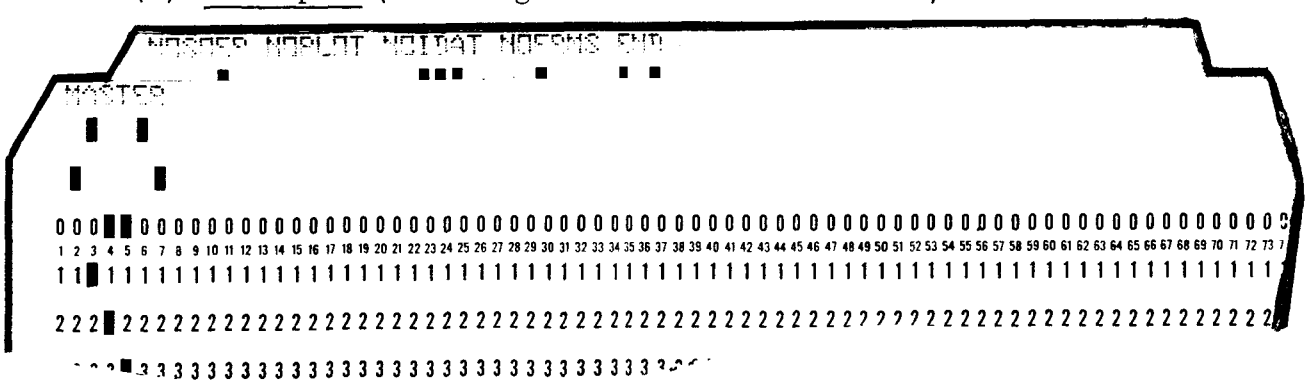
(b) Format:

Columns	Contents
1	Blank
2-7 9-14 16-21 23-28 30-35 37-42	1 to 6 of the options defined in the table below; the entry in each field should be left justified; blank fields and mispunched option words are ignored
8 15 22 29 36 43-72	Blank
73-80	Card ID (optional)

(c) Option Table:

MNEMONIC	Meaning
NOPLOT	Suppress OPEP plots.
NOSOEP	Suppress output of SOEP tabulation data.
NOOPEP	Suppress output of OPEP tabulation data and plots.
PRINTO	Print OPEP tabulation on the on-line printer instead of the plot tape.
PRINTS	Print SOEP tabulation on the on-line printer instead of the plot tape.
NO7094	Suppress output of IBM 7094 output file.
NOIDEC	Suppress on-line prints of Decom Tape record labels.
NOIDAT	Suppress on-line prints of Attitude/Orbit Tape record labels.
PLTNUM	Write the total number of plots (count) on the plot tape.
NOFRMS	Suppress on-line print of frames read and frames used.
END	End of MASTER options; must be the last nonblank entry in the last MASTER Option Card (see END Indicator Card).

(d) Examples (including MASTER indicator card)



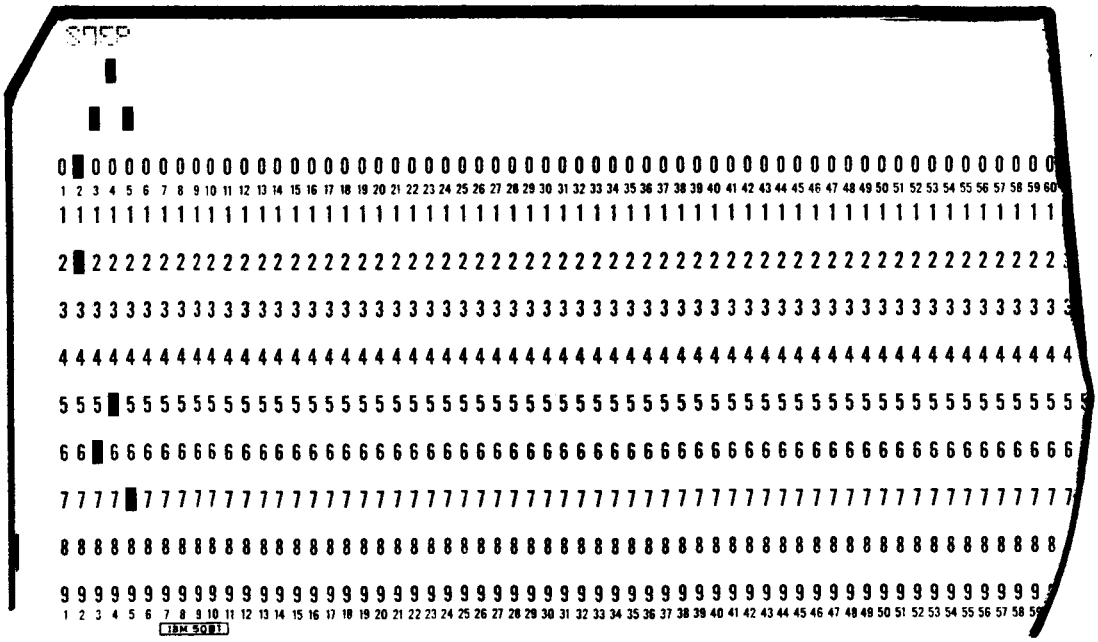
OPEP or SOEP Indicator Card

(a) Usage: signals the beginning of an OPEP or SOEP option deck. The card must be followed by at least one OPEP or SOEP options card.

(b) Format:

Columns	Contents	Meaning
1	Blank	
2-5	Either SOEP or OPEP	Trailing cards (option cards) define parameter values for suppressing processing of data not within the range of the specified values.
6-72	Blank	
73-80	Card ID (optional)	

(c) Example:



OPEP or SOEP Options Card

(a) Usage: defines one of four possible OPEP or SOEP data selection options. The form of the definition is,

NAME value1 value2

where

NAME = a mnemonic word identifying the type of data to be selected

value1 = minimum parameter value

value2 = maximum parameter value

For the data type named, only data values within the range of the two specified parameters will be selected for processing.

(b) Format:

Columns	Contents	Meaning
1	Blank	
2-6	LOAD OPEP SOEP PANEL	Identifies the type of data to be selected according to parameters in cols. 9-21, where LOAD = load bus voltage OPEP = OPEP temperature SOEP = SOEP temperature PANEL = panel temperature
7-8	Blank	
9-14	xxxx.xx	Minimum parameter value, right-justified with leading blanks
15	Blank	
16-21	xxxx.xx	Maximum parameter value, right-justified with leading blanks
22-72	Blank	
73-80	Card ID (optional)	

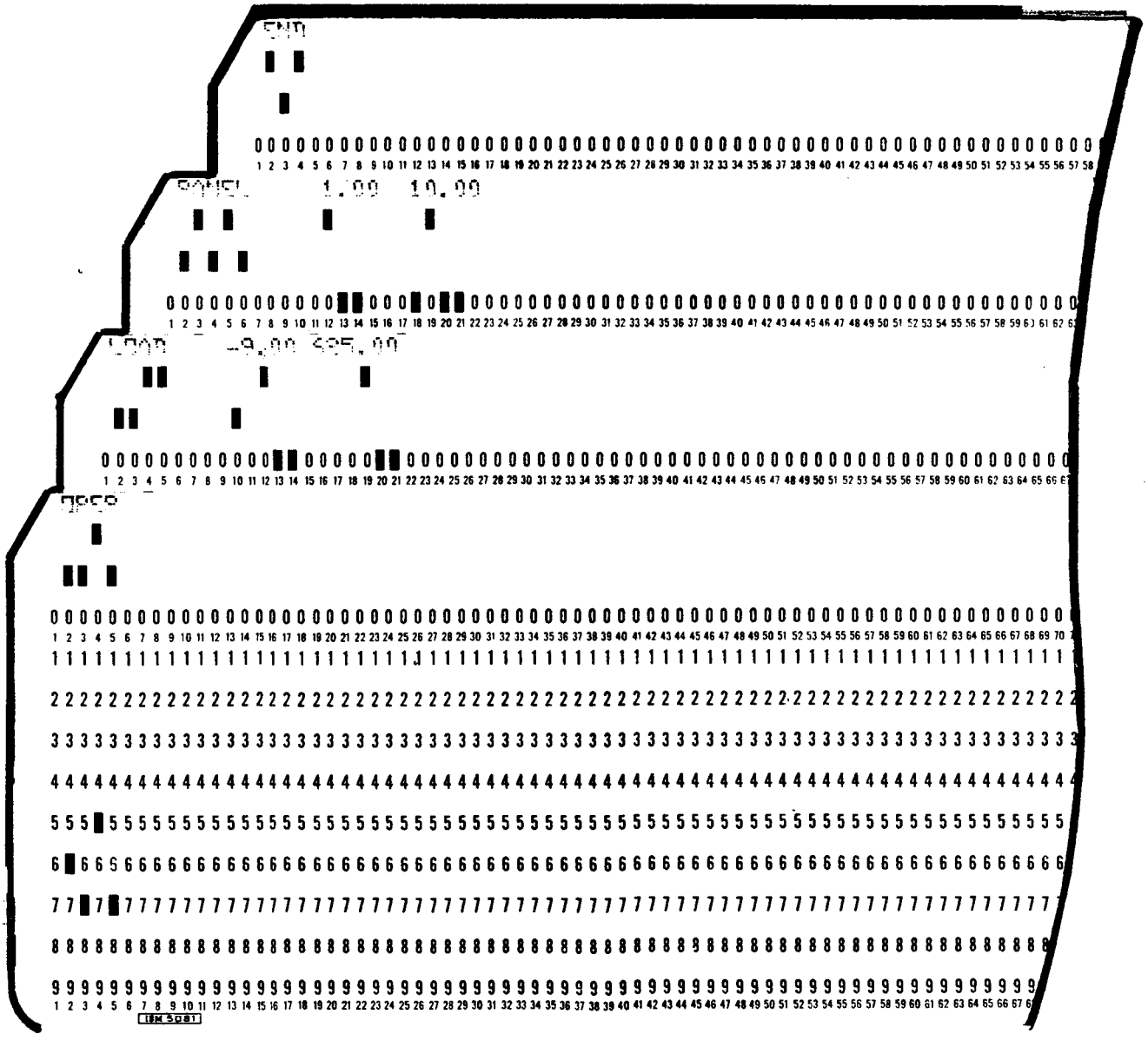
(c) Restrictions

(1) The parameter values may have a leading sign; no sign implies plus.

(2) A blank parameter field does not imply zero; zero parameters must be explicitly defined.

(3) The option cards may appear in any order following the applicable OPEP or SOEP indicator card.

(d) Examples (including indicator cards)



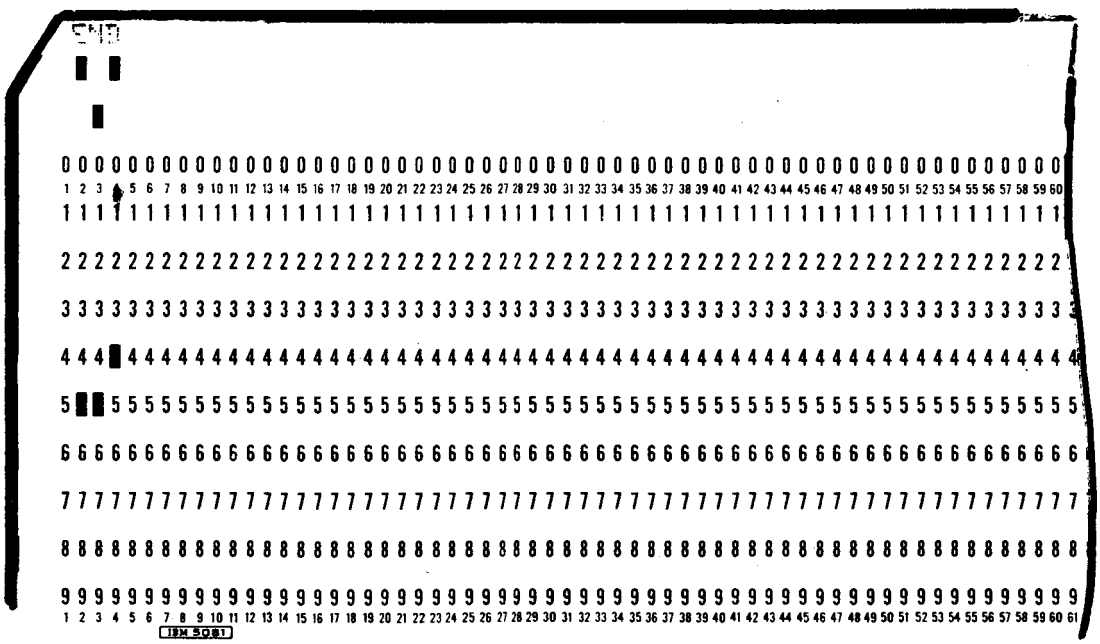
END Indicator Card

(a) Usage: signals the end of an OPEP, SOEP, or MASTER deck. Its use at the end of OPEP and SOEP decks is required. With MASTER decks, the END card is not required if END is the last entry in the last card of the deck.

(b) Format:

Column	Contents	Meaning
1	Blank	
2-4	END	End of an OPEP, SOEP, or MASTER options deck.
5-72	Blank	
73-80	Card ID (optional)	

(c) Example



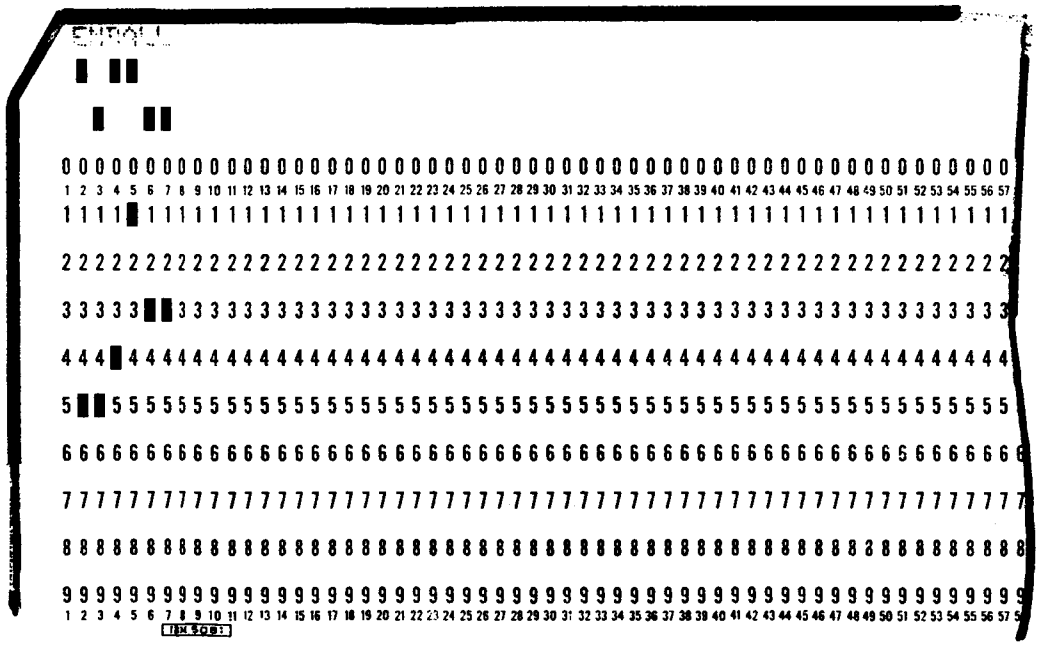
ENDALL Indicator Card

(a) Usage: signals the end of all program control cards (option decks). ENDALL is not required when the NOCH card is used.

(b) Format:

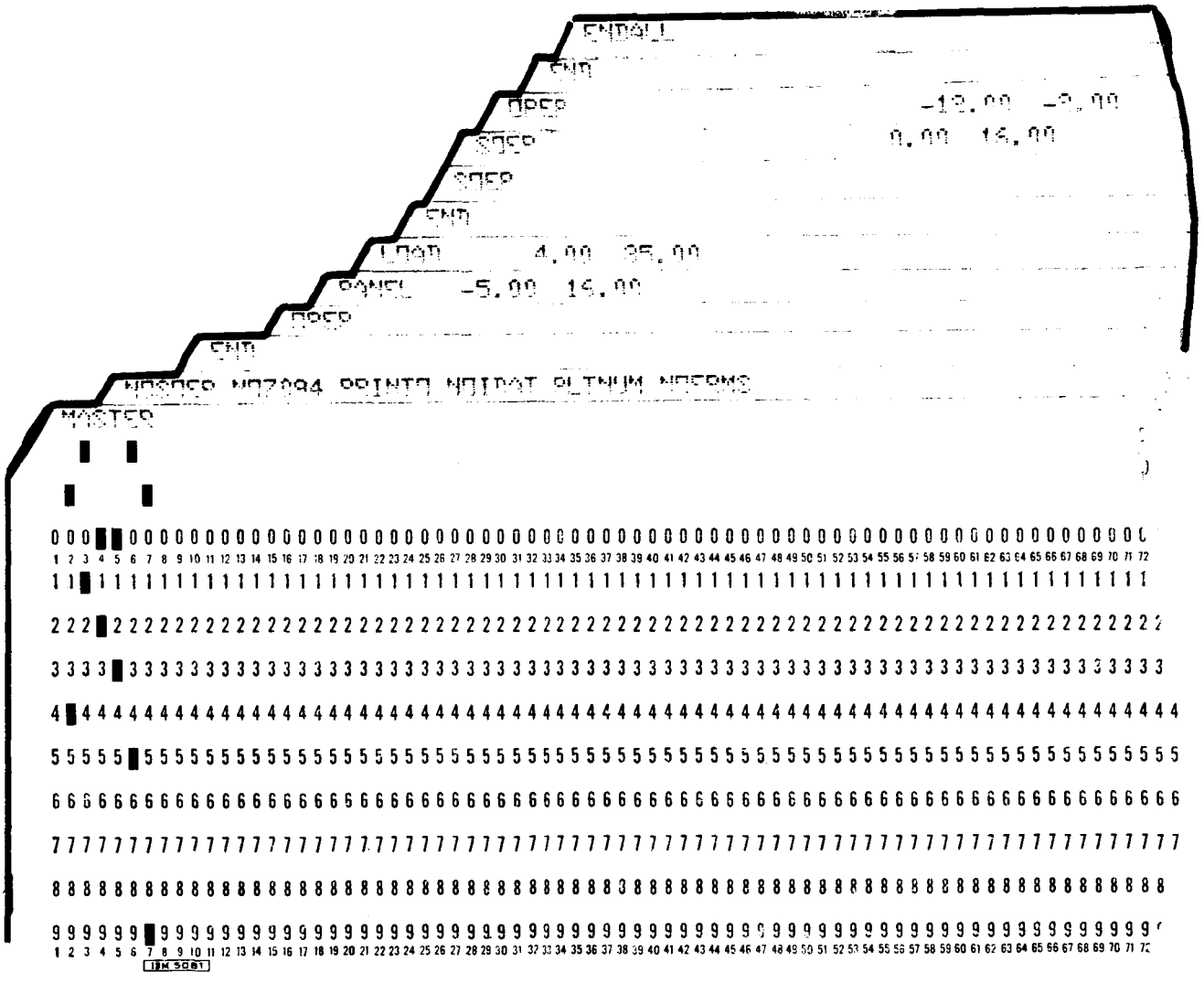
Columns	Contents	Meaning
1	Blank	
2-7	ENDALL	End of all program control cards.
8-72	Blank	
73-80	Card ID (optional)	

(c) Example



SAMPLE DECK

The sample deck below contains a MASTER Option Deck, an OPEP Option Deck and a SOEP Option Deck. As stated earlier, this deck is inserted behind the XQT START card (refer to Figure 2).



C. SET-UP AND RUN PROCEDURE

RUN SET-UP

Tape Arrangement

Logical Unit	Operational Label	Description
B*	DECOM	All S50 DECOM input files
C*	ATTORB	All S50 Attitude/Orbit input files
F	PROGF	Program complex file
H	PLOTR	Blank plotter output tape (ring-in)
R	OUT94	Blank IBM 7094 output tape (ring-in)
S	HSTERR	Blank History/Error output tape (ring-in)

*Must be mounted on different channels.

NOTE

Assign at least two units each for the plotter output and the History/Error output.

Card Reader

The run deck (refer to Figure 2) is read from the on-line card reader.

On-Line Printer

Error messages, routine operational messages, the program listing and some of the program output (when the printer option is selected) are produced on the on-line printer.

Jump Switches

No special jump switches are required.

RUN PROCEDURE

Normal Procedure

(1) Set up and ready the required tapes (refer to Tape Arrangement).

(2) Load the run deck and ready the reader.

(3) Ready the on-line printer.

(4) To initialize the program, initialize the card reader.

(5) After program initialization, the following messages will occur:

```
MAKE SURE FILES ATTORB AND DECOM ARE MOUNTED
ON DIFFERENT CHANNELS.

ASSIGN AT LEAST TWO UNITS FOR FILES (A) PLOTR
(B) HSTERR.

IF TAPE INTERLOCK OCCURS ON FILES*DECOM*,*ATTORB*,
KEY IN AN F

IF TAPE ERROR OCCURS ON FILES*DECOM*,*PLOTR*,
ATTORB*,*OUT94*,AND/OR*HSTERR*,KEY IN A C.
```

These messages are reminders to the operator.

Tape Interlock Procedure

When a tape interlock occurs, the program halts and types:

```
INTERLOCK ON CH/U
```

where,

CH = channel number

U = unit number

The operator must key-in F. If this procedure fails to remedy the interlock, terminate the run.

Tape Error Procedure

When a tape error occurs (other than the PROGF file), the program halts and types:

TAPE ERROR

The operator must key-in C. If this procedure fails to remedy the tape error, terminate the run.

If a tape error occurs on the PROGF file, terminate the run.

D. OUTPUT

On-Line Printer

Various frame numbers, record numbers and page totals may be displayed near conclusion of a program run. In addition, OPEP and SOEP tabulations are printed on the on-line printer when the option to do so is selected.

Plotter Output File

SOEP and OPEP tabulations and logarithmic plots are written on the plotter output files. These plots and tabulations are then displayed on the Stromberg - Carlson 4020 Plotter.

IBM 7094 Output File

The IBM 7094 output tape contains all SOEP and OPEP tabulations.

History/Error Output File

The History/Error output file contains erroneous DECOM input data.

E. SAMPLE OUTPUT

On-Line Printer. A sample of on-line printer output is shown on the following page.

```
  NDM =       1 NGOOD =       0 ISWN4 =       1 ISWN6 =       0 ISWFL =       0

65801 65    005   01    0048  01    0290        081   3     295   31236 00    0285  01    29    04

NEW ORBIT LABEL IS
  76799361.00000000        65.00000000        10.00000000        18.00000000          .00000000
          .00000000          .00000000       290.99999000  81906586.00000000       292.00000000
          .00000000          .00000000       298.99999000          .00000000     60000.00000000
         1.15086208          .07492860        87.35867400       279.91829000         -.28385863
        -3.04712680       104.31497200         -.00023384       287.00000000          .38970038

NEW ORBIT LABEL IS
  76799361.00000000        65.00000000        10.00000000        19.00000000          .00000000
          .00000000          .00000000       292.00000000   1773819.60000000       292.00000000
          .00000000          .00000000       298.99999000          .00000000     60000.00000000
         1.15086208          .07492860        87.35867400       279.91829000         -.28385863
        -3.04712680       104.31497200         -.00023384       287.00000000          .38970038

NEW ORBIT LABEL IS
  76799361.00000000        65.00000000        10.00000000        19.00000000          .00000000
          .00000000          .00000000       292.00000000   8041051.00000000       292.00000000
          .00000000          .00000000       298.99999000          .00000000     60000.00000000
         1.15086208          .07492860        87.35867400       279.91829000         -.28385863
        -3.04712680       104.31497200         -.00023384       287.00000000          .38970038

NEW ORBIT LABEL IS
  76799361.00000000        65.00000000        10.00000000        19.00000000          .00000000
          .00000000          .00000000       292.00000000  14308282.30000000       292.00000000
          .00000000          .00000000       298.99999000          .00000000     60000.00000000
         1.15086208          .07492860        87.35867400       279.91829000         -.28385863
        -3.04712680       104.31497200         -.00023384       287.00000000          .38970038

NEW ORBIT LABEL IS
  76799361.00000000        65.00000000        10.00000000        19.00000000          .00000000
          .00000000          .00000000       292.00000000  20575514.00000000       292.00000000
          .00000000          .00000000       298.99999000          .00000000     60000.00000000
         1.15086208          .07492860        87.35867400       279.91829000         -.28385863
        -3.04712680       104.31497200         -.00023384       287.00000000          .38970038
```

Plotter File

Samples of plotter file output (written on the Stromberg - Carlson 4020 Plotter) are shown below.

13

DATE 20 APR 67 TIME OF RUN 09823817

OGO-C (POGO) DATA

DATA DATE	22 OCT 65	
DATA TIME	8 HOURS 42 MINUTES	
ALTITUDE	.00	KILOMETERS
LATITUDE	.00	DEGREES
LONGITUDE	.00	DEGREES
L	.00	
G LATITUDE	.00	DEGREES
VELOCITY	.00	KM/SEC.
RECORD NUMBER	2	
OPEP TEMPERATURE	23.36	DEGREES
PANL TEMPERATURE	18.41	DEGREES
SOEP TEMPERATURE	29.63	DEGREES
LOAD BUS VOLTAGE	31.88	VOLTS

ATTITUDE - ACTUAL
PASS 108
ANGLES DEGREES
OPEP-VELOCITY - 90.00
OPEP-SUN 90.00
OPEP-MAG. 90.00
OPEP-BODY 90.00
SOEP-SUN 90.00
DATA MODE ION

OPEP TABULATIONS

STEP NUMBER	STATUS WORD	OPEP ANALOG	STEP VOLTAGE	CAL. CURRENT	TIME			
0	000-5	4.68	11.65	-.0000	8 HOURS	41 MINUTES	41.750	SECONDS
1	001-5	4.68	11.55	-.0000	8 HOURS	41 MINUTES	41.894	SECONDS
2	000-1	4.62	11.45	-.7947-11	8 HOURS	41 MINUTES	42.038	SECONDS
3	001-1	4.64	11.35	-.5298-11	8 HOURS	41 MINUTES	42.182	SECONDS
4	000-1	4.64	11.25	-.5298-11	8 HOURS	41 MINUTES	42.326	SECONDS
5	001-1	4.66	11.15	-.2649-11	8 HOURS	41 MINUTES	42.470	SECONDS
6	000-1	4.64	11.05	-.5298-11	8 HOURS	41 MINUTES	42.614	SECONDS
7	001-1	4.66	10.95	-.2649-11	8 HOURS	41 MINUTES	42.758	SECONDS
8	000-1	4.68	10.80	-.0000	8 HOURS	41 MINUTES	42.902	SECONDS
9	001-1	4.70	10.70	.2649-11	8 HOURS	41 MINUTES	43.046	SECONDS
10	000-1	4.70	10.60	.2649-11	8 HOURS	41 MINUTES	43.190	SECONDS
11	001-1	4.72	10.50	.5298-11	8 HOURS	41 MINUTES	43.334	SECONDS
12	000-1	4.70	10.45	.2649-11	8 HOURS	41 MINUTES	43.478	SECONDS
13	001-1	4.74	10.30	.7947-11	8 HOURS	41 MINUTES	43.622	SECONDS
14	000-1	4.74	10.20	.7947-11	8 HOURS	41 MINUTES	43.766	SECONDS
15	001-1	4.78	10.15	.1325-10	8 HOURS	41 MINUTES	43.910	SECONDS
16	010-1	4.80	10.05	.1589-10	8 HOURS	41 MINUTES	44.054	SECONDS
17	011-1	4.82	9.93	.1854-10	8 HOURS	41 MINUTES	44.198	SECONDS
18	010-1	4.86	9.83	.2384-10	8 HOURS	41 MINUTES	44.342	SECONDS
19	011-1	4.88	9.72	.2649-10	8 HOURS	41 MINUTES	44.486	SECONDS
20	010-1	4.90	9.63	.2914-10	8 HOURS	41 MINUTES	44.630	SECONDS
21	011-1	4.92	9.52	.3179-10	8 HOURS	41 MINUTES	44.774	SECONDS
22	010-1	4.96	9.42	.3709-10	8 HOURS	41 MINUTES	44.918	SECONDS
23	011-1	4.98	9.32	.3974-10	8 HOURS	41 MINUTES	45.062	SECONDS
24	010-1	5.04	9.21	.4768-10	8 HOURS	41 MINUTES	45.206	SECONDS
25	011-1	5.02	9.10	.4503-10	8 HOURS	41 MINUTES	45.350	SECONDS
26	010-1	5.08	9.00	.5298-10	8 HOURS	41 MINUTES	45.494	SECONDS
27	011-1	5.08	8.90	.5298-10	8 HOURS	41 MINUTES	45.638	SECONDS
28	010-1	5.10	8.80	.5563-10	8 HOURS	41 MINUTES	45.782	SECONDS
29	011-1	5.10	8.70	.5563-10	8 HOURS	41 MINUTES	45.926	SECONDS
30	010-1	5.10	8.60	.5563-10	8 HOURS	41 MINUTES	46.070	SECONDS
31	011-1	5.10	8.49	.5563-10	8 HOURS	41 MINUTES	46.214	SECONDS

*=ERROR

DATE 20 APR 67 TIME OF RUN 09:23:17

OGO-C (POGO) DATA

DATA DATE	22 OCT 65	
DATA TIME	8 HOURS	42 MINUTES
ALTITUDE	.00	KILOMETERS
LATITUDE	.00	DEGREES
LONGITUDE	.00	DEGREES
L	.00	
G LATITUDE	.00	DEGREES
VELOCITY	.00	KM/SEC.
RECORD NUMBER	2	
OPEP TEMPERATURE	23.36	DEGREES
PANL TEMPERATURE	18.41	DEGREES
SOEP TEMPERATURE	29.63	DEGREES
LOAD BUS VOLTAGE	31.88	VOLTS

ATTITUDE - ACTUAL
PASS 108

ANGLES	DEGREES
OPEP-VELOCITY -	90.00
OPEP-SUN	90.00
OPEP-MAG.	90.00
OPEP-BODY	90.00
SOEP-SUN	90.00

DATA MODE ION

OPEP TABULATIONS

STEP NUMBER	STATUS WORD	OPEP ANALOG	STEP VOLTAGE	CAL. CURRENT	TIME				0=ERROR
32	020+1	.38	8.61	.9272-10	8 HOURS	41 MINUTES	46.358	SECONDS	
33	021+1	.46	8.50	.1033-09	8 HOURS	41 MINUTES	46.502	SECONDS	
34	020+1	.48	8.40	.1060-09	8 HOURS	41 MINUTES	46.646	SECONDS	
35	021+1	.52	8.30	.1113-09	8 HOURS	41 MINUTES	46.790	SECONDS	
36	020+1	.56	8.20	.1166-09	8 HOURS	41 MINUTES	46.934	SECONDS	
37	021+1	.58	8.09	.1192-09	8 HOURS	41 MINUTES	47.078	SECONDS	
38	020+1	.62	8.00	.1245-09	8 HOURS	41 MINUTES	47.222	SECONDS	
39	021+1	.70	7.89	.1351-09	8 HOURS	41 MINUTES	47.366	SECONDS	
40	020+1	.74	7.78	.1404-09	8 HOURS	41 MINUTES	47.510	SECONDS	
41	021+1	.82	7.68	.1510-09	8 HOURS	41 MINUTES	47.654	SECONDS	
42	020+1	.88	7.58	.1589-09	8 HOURS	41 MINUTES	47.798	SECONDS	
43	021+1	.96	7.47	.1695-09	8 HOURS	41 MINUTES	47.942	SECONDS	
44	020+1	1.10	7.38	.1881-09	8 HOURS	41 MINUTES	48.086	SECONDS	
45	021+1	1.18	7.27	.1987-09	8 HOURS	41 MINUTES	48.230	SECONDS	
46	020+1	1.30	7.17	.2146-09	8 HOURS	41 MINUTES	48.374	SECONDS	
47	021+1	1.42	7.06	.2305-09	8 HOURS	41 MINUTES	48.518	SECONDS	
48	030+1	1.52	6.98	.2437-09	8 HOURS	41 MINUTES	48.662	SECONDS	
49	031+1	1.68	6.87	.2649-09	8 HOURS	41 MINUTES	48.806	SECONDS	
50	030+1	2.02	6.77	.3099-09	8 HOURS	41 MINUTES	48.950	SECONDS	
51	031+1	2.22	6.66	.3364-09	8 HOURS	41 MINUTES	49.094	SECONDS	
52	030+1	2.54	6.56	.3788-09	8 HOURS	41 MINUTES	49.238	SECONDS	
53	031+1	2.92	6.46	.4291-09	8 HOURS	41 MINUTES	49.382	SECONDS	
54	030+1	3.40	6.36	.4927-09	8 HOURS	41 MINUTES	49.526	SECONDS	
55	031+1	3.88	6.26	.5563-09	8 HOURS	41 MINUTES	49.670	SECONDS	
56	030+1	4.48	6.15	.6358-09	8 HOURS	41 MINUTES	49.814	SECONDS	
57	031+2	.86	6.04	.9440-09	8 HOURS	41 MINUTES	49.958	SECONDS	
58	030+2	.96	5.94	.1024-08	8 HOURS	41 MINUTES	50.102	SECONDS	
59	031+2	1.06	5.84	.1104-08	8 HOURS	41 MINUTES	50.246	SECONDS	
60	030+2	1.08	5.74	.1120-08	8 HOURS	41 MINUTES	50.390	SECONDS	
61	031+2	1.24	5.64	.1248-08	8 HOURS	41 MINUTES	50.534	SECONDS	
62	030+2	1.26	5.53	.1264-08	8 HOURS	41 MINUTES	50.678	SECONDS	
63	031+2	1.32	5.42	.1312-08	8 HOURS	41 MINUTES	50.822	SECONDS	

DATE 20 APR 67 TIME OF RUN 09¥23¥17

OGO-C (POGO) DATA

DATA DATE	22 OCT 65	
DATA TIME	8 HOURS	42 MINUTES
ALTITUDE	.00	KILOMETERS
LATITUDE	.00	DEGREES
LONGITUDE	.00	DEGREES
L	.00	
G LATITUDE	.00	DEGREES
VELOCITY	.00	KM/SEC.
RECORD NUMBER	2	
OPEP TEMPERATURE	23.36	DEGREES
PANL TEMPERATURE	18.41	DEGREES
SOEP TEMPERATURE	29.63	DEGREES
LOAD BUS VOLTAGE	31.88	VOLTS

ATTITUDE - ACTUAL
PASS 108

ANGLES	DEGREES
OPEP-VELOCITY -	90.00
OPEP-SUN	90.00
OPEP-MAG.	90.00
OPEP-BODY	90.00
SOEP-SUN	90.00

DATA MODE ION

OPEP TABULATIONS

STEP NUMBER	STATUS WORD	OPEP ANALOG	STEP VOLTAGE	CAL. CURRENT	TIME	*=ERROR
64	040+2	2.06	5.75	.1904-08	8 HOURS 41 MINUTES 50.966 SECONDS	
65	041+2	2.44	5.65	.2208-08	8 HOURS 41 MINUTES 51.110 SECONDS	
66	040+2	2.90	5.55	.2576-08	8 HOURS 41 MINUTES 51.254 SECONDS	
67	041+2	3.30	5.45	.2896-08	8 HOURS 41 MINUTES 51.398 SECONDS	
68	040+2	3.76	5.35	.3264-08	8 HOURS 41 MINUTES 51.542 SECONDS	
69	041+2	4.24	5.24	.3648-08	8 HOURS 41 MINUTES 51.686 SECONDS	
70	040+2	4.84	5.14	.4128-08	8 HOURS 41 MINUTES 51.830 SECONDS	
71	041+2	.78	5.04	.8800-09	8 HOURS 41 MINUTES 51.974 SECONDS	
72	040+3	.86	4.93	.5592-08	8 HOURS 41 MINUTES 52.118 SECONDS	
73	041+3	1.00	4.82	.6256-08	8 HOURS 41 MINUTES 52.262 SECONDS	
74	040+3	1.10	4.72	.6730-08	8 HOURS 41 MINUTES 52.406 SECONDS	
75	041+3	1.14	4.62	.6919-08	8 HOURS 41 MINUTES 52.550 SECONDS	
76	040+3	1.20	4.52	.7204-08	8 HOURS 41 MINUTES 52.694 SECONDS	
77	041+3	1.26	4.42	.7488-08	8 HOURS 41 MINUTES 52.838 SECONDS	
78	040+3	1.36	4.32	.7962-08	8 HOURS 41 MINUTES 52.982 SECONDS	
79	041+3	1.38	4.21	.8057-08	8 HOURS 41 MINUTES 53.126 SECONDS	
80	050+3	1.42	4.12	.8246-08	8 HOURS 41 MINUTES 53.270 SECONDS	
81	051+3	1.48	4.02	.8531-08	8 HOURS 41 MINUTES 53.414 SECONDS	
82	050+3	1.56	3.92	.8910-08	8 HOURS 41 MINUTES 53.558 SECONDS	
83	051+3	1.60	3.82	.9100-08	8 HOURS 41 MINUTES 53.702 SECONDS	
84	050+3	1.60	3.72	.9100-08	8 HOURS 41 MINUTES 53.846 SECONDS	
85	051+3	1.64	3.61	.9289-08	8 HOURS 41 MINUTES 53.990 SECONDS	
86	050+3	1.68	3.51	.9479-08	8 HOURS 41 MINUTES 54.134 SECONDS	
87	051+3	1.70	3.41	.9573-08	8 HOURS 41 MINUTES 54.278 SECONDS	
88	050+3	1.72	3.30	.9668-08	8 HOURS 41 MINUTES 54.422 SECONDS	
89	051+3	1.74	3.20	.9763-08	8 HOURS 41 MINUTES 54.566 SECONDS	
90	050+3	1.76	3.10	.9858-08	8 HOURS 41 MINUTES 54.710 SECONDS	
91	051+3	1.78	2.99	.9953-08	8 HOURS 41 MINUTES 54.854 SECONDS	
92	050+3	1.76	2.90	.9858-08	8 HOURS 41 MINUTES 54.998 SECONDS	
93	051+3	1.80	2.79	.1005-07	8 HOURS 41 MINUTES 55.142 SECONDS	
94	050+3	1.76	2.69	.9858-08	8 HOURS 41 MINUTES 55.286 SECONDS	
95	051+3	1.80	2.58	.1005-07	8 HOURS 41 MINUTES 55.430 SECONDS	

DATE 20 APR 67 TIME OF RUN 09:23:17

OGO-C (POGO) DATA

DATA DATE	22 OCT 65	
DATA TIME	8 HOURS	42 MINUTES
ALTITUDE	.00	KILOMETERS
LATITUDE	.00	DEGREES
LONGITUDE	.00	DEGREES
L	.00	
G LATITUDE	.00	DEGREES
VELOCITY	.00	KM/SEC.
RECORD NUMBER	2	
OPEP TEMPERATURE	23.36	DEGREES
PANL TEMPERATURE	18.41	DEGREES
SOEP TEMPERATURE	29.63	DEGREES
LOAD BUS VOLTAGE	31.88	VOLTS

ATTITUDE - ACTUAL
PASS 108

ANGLES	DEGREES
OPEP-VELOCITY -	90.00
OPEP-SUN	90.00
OPEP-MAG.	90.00
OPEP-BODY	90.00
SOEP-SUN	90.00

DATA MODE ION

OPEP TABULATIONS

STEP NUMBER	STATUS WORD	OPEP ANALOG	STEP VOLTAGE	CAL. CURRENT	TIME	*=ERROR
96	060+3	2.98	2.70	.1564-07	8 HOURS 41 MINUTES 55.574 SECONDS	
97	061+3	3.00	2.60	.1573-07	8 HOURS 41 MINUTES 55.718 SECONDS	
98	060+3	3.02	2.50	.1583-07	8 HOURS 41 MINUTES 55.862 SECONDS	
99	061+3	3.04	2.39	.1592-07	8 HOURS 41 MINUTES 56.006 SECONDS	
100	060+3	3.06	2.29	.1602-07	8 HOURS 41 MINUTES 56.150 SECONDS	
101	061+3	3.08	2.19	.1611-07	8 HOURS 41 MINUTES 56.294 SECONDS	
102	060+3	3.08	2.09	.1611-07	8 HOURS 41 MINUTES 56.438 SECONDS	
103	061+3	3.10	1.98	.1621-07	8 HOURS 41 MINUTES 56.582 SECONDS	
104	060+3	3.12	1.88	.1630-07	8 HOURS 41 MINUTES 56.726 SECONDS	
105	061+3	3.12	1.77	.1630-07	8 HOURS 41 MINUTES 56.870 SECONDS	
106	060+3	3.12	1.67	.1630-07	8 HOURS 41 MINUTES 57.014 SECONDS	
107	061+3	3.12	1.57	.1630-07	8 HOURS 41 MINUTES 57.158 SECONDS	
108	060+3	3.14	1.47	.1640-07	8 HOURS 41 MINUTES 57.302 SECONDS	
109	061+3	3.16	1.36	.1649-07	8 HOURS 41 MINUTES 57.446 SECONDS	
110	060+3	3.16	1.27	.1649-07	8 HOURS 41 MINUTES 57.590 SECONDS	
111	061+3	3.16	1.16	.1649-07	8 HOURS 41 MINUTES 57.734 SECONDS	
112	070+3	3.16	1.07	.1649-07	8 HOURS 41 MINUTES 57.878 SECONDS	
113	071+3	3.16	.97	.1649-07	8 HOURS 41 MINUTES 58.022 SECONDS	
114	070+3	3.16	.87	.1649-07	8 HOURS 41 MINUTES 58.166 SECONDS	
115	071+3	3.18	.76	.1659-07	8 HOURS 41 MINUTES 58.310 SECONDS	
116	070+3	3.18	.66	.1659-07	8 HOURS 41 MINUTES 58.454 SECONDS	
117	071+3	3.18	.56	.1659-07	8 HOURS 41 MINUTES 58.598 SECONDS	
118	070+3	3.18	.46	.1659-07	8 HOURS 41 MINUTES 58.742 SECONDS	
119	071+3	3.20	.36	.1668-07	8 HOURS 41 MINUTES 58.886 SECONDS	
120	070+3	3.20	.25	.1668-07	8 HOURS 41 MINUTES 59.030 SECONDS	
121	071+3	3.20	.14	.1668-07	8 HOURS 41 MINUTES 59.174 SECONDS	
122	070+3	3.20	.04	.1668-07	8 HOURS 41 MINUTES 59.318 SECONDS	
123	071+3	3.20	-.06	.1668-07	8 HOURS 41 MINUTES 59.462 SECONDS	
124	070+3	3.22	-.16	.1678-07	8 HOURS 41 MINUTES 59.606 SECONDS	
125	071+3	3.22	-.26	.1678-07	8 HOURS 41 MINUTES 59.750 SECONDS	
126	070+3	3.22	-.36	.1678-07	8 HOURS 41 MINUTES 59.894 SECONDS	
127	071+3	3.22	-.47	.1678-07	8 HOURS 42 MINUTES .038 SECONDS	

DATE 20 APR 67 TIME OF RUN 09¥23¥17

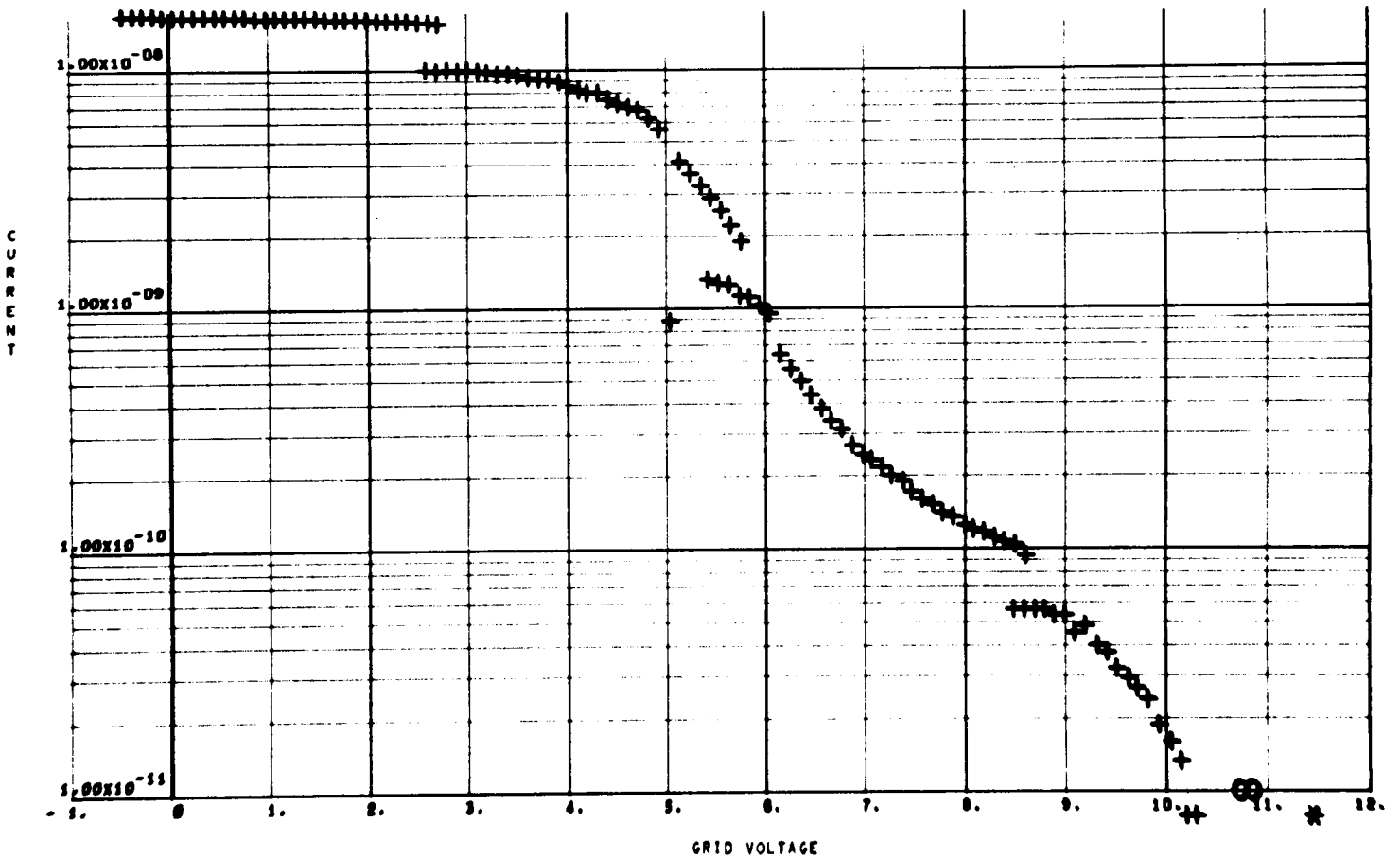
OGO-C (POGO) DATA

DATA DATE	22 OCT 65	
DATA TIME	8 HOURS 42 MINUTES	
ALTITUDE	.00	KILOMETERS
LATITUDE	.00	DEGREES
LONGITUDE	.00	DEGREES
L	.00	
G LATITUDE	.00	DEGREES
VELOCITY	.00	KM/SEC.
RECORD NUMBER	2	
OPEP TEMPERATURE	23.36	DEGREES
PANL TEMPERATURE	18.41	DEGREES
SOEP TEMPERATURE	29.63	DEGREES
LOAD BUS VOLTAGE	31.88	VOLTS

ATTITUDE - ACTUAL
PASS 108

ANGLES	DEGREES
OPEP-VELOCITY -	90.00
OPEP-SUN	90.00
OPEP-MAG.	90.00
OPEP-BODY	90.00
SOEP-SUN	90.00

DATA MODE ION



DATE 20 APR 67 TIME OF RUN 09¥23¥19

OGO-C (POGO) DATA

DATA DATE	22 OCT 65	
DATA TIME	8 HOURS	42 MINUTES
ALTITUDE	.00	KILOMETERS
LATITUDE	.00	DEGREES
LONGITUDE	.00	DEGREES
L	.00	
G LATITUDE	.00	DEGREES
VELOCITY	.00	KM/SEC.
RECORD NUMBER	2	
OPEP TEMPERATURE	23.36	DEGREES
PANL TEMPERATURE	18.41	DEGREES
SOEP TEMPERATURE	29.63	DEGREES
LOAD BUS VOLTAGE	31.88	VOLTS

ATTITUDE - ACTUAL
PASS 108

ANGLES	DEGREES
OPEP-VELOCITY -	90.00
OPEP-SUN	90.00
OPEP-MAG.	90.00
OPEP-BODY	90.00
SOEP-SUN	90.00

DATA MODE ION

SOEP TABULATIONS

*=ERROR

STEP NUMBER	SOEP ANALOG	STEP VOLTAGE	CAL. CURRENT	TIME
0	.04	1.97	.2486-07	8 HOURS 41 MINUTES 41.75 SECONDS
1	.04	1.57	.2486-07	8 HOURS 41 MINUTES 41.89 SECONDS
2	.04	1.17	.2486-07	8 HOURS 41 MINUTES 42.04 SECONDS
3	.06	.76	.2469-07	8 HOURS 41 MINUTES 42.18 SECONDS
4	.06	.36	.2469-07	8 HOURS 41 MINUTES 42.33 SECONDS
5	.08	-.10	.2452-07	8 HOURS 41 MINUTES 42.47 SECONDS
6	.10	-.50	.2435-07	8 HOURS 41 MINUTES 42.61 SECONDS
7	.48	-.90	.2113-07	8 HOURS 41 MINUTES 42.76 SECONDS
8	1.74	-1.30	.1045-07	8 HOURS 41 MINUTES 42.90 SECONDS
9	2.34	-1.70	.5895-08	8 HOURS 41 MINUTES 43.05 SECONDS
10	3.08	-2.10	.3775-08	8 HOURS 41 MINUTES 43.19 SECONDS
11	3.56	-2.50	.2399-08	8 HOURS 41 MINUTES 43.33 SECONDS
12	3.84	-2.90	.1597-08	8 HOURS 41 MINUTES 43.48 SECONDS
13	4.02	-3.30	.1081-08	8 HOURS 41 MINUTES 43.62 SECONDS
14	4.16	-3.70	.6802-09	8 HOURS 41 MINUTES 43.77 SECONDS
15	4.24	-4.10	.4510-09	8 HOURS 41 MINUTES 43.91 SECONDS
16	4.32	-4.50	.2218-09	8 HOURS 41 MINUTES 44.05 SECONDS
17	4.36	-4.90	.1072-09	8 HOURS 41 MINUTES 44.20 SECONDS
18	4.40	-5.30	-.7450-11	8 HOURS 41 MINUTES 44.34 SECONDS
19	4.42	-5.70	-.6476-10	8 HOURS 41 MINUTES 44.49 SECONDS
20	4.44	-6.10	-.1221-09	8 HOURS 41 MINUTES 44.63 SECONDS
21	4.46	-6.50	-.1794-09	8 HOURS 41 MINUTES 44.77 SECONDS
22	4.48	-6.90	-.2367-09	8 HOURS 41 MINUTES 44.92 SECONDS
23	4.48	-7.30	-.2367-09	8 HOURS 41 MINUTES 45.06 SECONDS
24	4.50	-7.70	-.2940-09	8 HOURS 41 MINUTES 45.21 SECONDS
25	4.52	-8.10	-.3513-09	8 HOURS 41 MINUTES 45.35 SECONDS
26	4.52	-8.50	-.3513-09	8 HOURS 41 MINUTES 45.49 SECONDS
27	4.52	-8.90	-.3513-09	8 HOURS 41 MINUTES 45.64 SECONDS
28	4.52	-9.30	-.3513-09	8 HOURS 41 MINUTES 45.78 SECONDS
29	4.54	-9.70	-.4086-09	8 HOURS 41 MINUTES 45.93 SECONDS
30	4.54	-10.10	-.4086-09	8 HOURS 41 MINUTES 46.07 SECONDS
31	4.56	-10.50	-.4659-09	8 HOURS 41 MINUTES 46.21 SECONDS

DATE 20 APR 67 TIME OF RUN 09:23:20

OGO-C (POGO) DATA

DATA DATE	22 OCT 65	
DATA TIME	8 HOURS	42 MINUTES
ALTITUDE	1259.04	KILOMETERS
LATITUDE	23.70	DEGREES
LONGITUDE	121.03	DEGREES
L	1.22	
G LATITUDE	12.39	DEGREES
VELOCITY	7.08	KM/SEC.
RECORD NUMBER	2	
OPEP TEMPERATURE	23.36	DEGREES
PANL TEMPERATURE	18.41	DEGREES
SOEP TEMPERATURE	29.63	DEGREES
LOAD BUS VOLTAGE	31.88	VOLTS

ATTITUDE - ACTUAL
PASS 108

ANGLES	DEGREES
OPEP-VELOCITY -	7.81
OPEP-SUN	115.50
OPEP-MAG.	32.86
OPEP-BODY	21.96
SOEP-SUN	3.28

DATA MODE ELECTRON

OPEP TABULATIONS

STEP NUMBER	STATUS WORD	OPEP ANALOG	STEP VOLTAGE	CAL. CURRENT	TIME			*=ERROR
0	171+5	.00	-3.11	.2349-07	8 HOURS	42 MINUTES	.182	SECONDS
1	170+5	.00	-3.02	.2349-07	8 HOURS	42 MINUTES	.326	SECONDS
2	171-1	3.76	-2.94	-.1457-09	8 HOURS	42 MINUTES	.470	SECONDS
3	170-1	3.74	-2.85	-.1483-09	8 HOURS	42 MINUTES	.614	SECONDS
4	171-1	3.74	-2.77	-.1483-09	8 HOURS	42 MINUTES	.758	SECONDS
5	170-1	3.74	-2.68	-.1483-09	8 HOURS	42 MINUTES	.902	SECONDS
6	171-1	3.76	-2.60	-.1457-09	8 HOURS	42 MINUTES	1.046	SECONDS
7	170-1	3.76	-2.52	-.1457-09	8 HOURS	42 MINUTES	1.190	SECONDS
8	171-1	3.72	-2.43	-.1510-09	8 HOURS	42 MINUTES	1.334	SECONDS
9	170-1	3.76	-2.34	-.1457-09	8 HOURS	42 MINUTES	1.478	SECONDS
10	171-1	3.72	-2.26	-.1510-09	8 HOURS	42 MINUTES	1.622	SECONDS
11	170-1	3.70	-2.17	-.1536-09	8 HOURS	42 MINUTES	1.766	SECONDS
12	171-1	3.68	-2.09	-.1563-09	8 HOURS	42 MINUTES	1.910	SECONDS
13	170-1	3.68	-2.00	-.1563-09	8 HOURS	42 MINUTES	2.054	SECONDS
14	171-1	3.70	-1.92	-.1536-09	8 HOURS	42 MINUTES	2.198	SECONDS
15	170-1	3.66	-1.84	-.1589-09	8 HOURS	42 MINUTES	2.342	SECONDS
16	161-1	3.66	-1.77	-.1589-09	8 HOURS	42 MINUTES	2.486	SECONDS
17	160-1	3.66	-1.68	-.1589-09	8 HOURS	42 MINUTES	2.630	SECONDS
18	161-1	3.68	-1.69	-.1563-09	8 HOURS	42 MINUTES	2.774	SECONDS
19	160-1	3.64	-1.51	-.1616-09	8 HOURS	42 MINUTES	2.918	SECONDS
20	161-1	3.64	-1.42	-.1616-09	8 HOURS	42 MINUTES	3.062	SECONDS
21	160-1	3.66	-1.34	-.1589-09	8 HOURS	42 MINUTES	3.206	SECONDS
22	161-1	3.64	-1.26	-.1616-09	8 HOURS	42 MINUTES	3.350	SECONDS
23	160-1	3.62	-1.17	-.1642-09	8 HOURS	42 MINUTES	3.494	SECONDS
24	161-1	3.64	-1.08	-.1616-09	8 HOURS	42 MINUTES	3.638	SECONDS
25	160-1	3.60	-.99	-.1669-09	8 HOURS	42 MINUTES	3.782	SECONDS
26	161-1	3.58	-.91	-.1695-09	8 HOURS	42 MINUTES	3.926	SECONDS
27	160-1	3.58	-.82	-.1695-09	8 HOURS	42 MINUTES	4.070	SECONDS
28	161-1	3.62	-.74	-.1642-09	8 HOURS	42 MINUTES	4.214	SECONDS
29	160-1	3.58	-.65	-.1695-09	8 HOURS	42 MINUTES	4.358	SECONDS
30	161-1	3.58	-.57	-.1695-09	8 HOURS	42 MINUTES	4.502	SECONDS
31	160-1	3.58	-.48	-.1695-09	8 HOURS	42 MINUTES	4.646	SECONDS

DATE 20 APR 67 TIME OF RUN 09:23:20

OGO-C (POGO) DATA

DATA DATE	22 OCT 65	
DATA TIME	8 HOURS	42 MINUTES
ALTITUDE	1259.04	KILOMETERS
LATITUDE	23.70	DEGREES
LONGITUDE	121.03	DEGREES
L	1.22	
G LATITUDE	12.39	DEGREES
VELOCITY	7.08	KM/SEC.
RECORD NUMBER	2	
OPEP TEMPERATURE	23.36	DEGREES
PANL TEMPERATURE	18.41	DEGREES
SOEP TEMPERATURE	29.63	DEGREES
LOAD BUS VOLTAGE	31.88	VOLTS

ATTITUDE - ACTUAL
PASS 108

ANGLES	DEGREES
OPEP-VELOCITY -	7.81
OPEP-SUN	115.50
OPEP-MAG.	32.86
OPEP-BODY	21.96
SOEP-SUN	3.28

DATA MODE ELECTRON

OPEP TABULATIONS

*=ERROR

STEP NUMBER	STATUS WORD	OPEP ANALOG	STEP VOLTAGE	CAL. CURRENT	TIME			
32	151-1	3.52	-.60	-.1775-09	8 HOURS	42 MINUTES	4.790	SECONDS
33	150-1	3.52	-.52	-.1775-09	8 HOURS	42 MINUTES	4.934	SECONDS
34	151-1	3.48	-.41	-.1828-09	8 HOURS	42 MINUTES	5.078	SECONDS
35	150-1	3.48	-.33	-.1828-09	8 HOURS	42 MINUTES	5.222	SECONDS
36	151-1	3.48	-.24	-.1828-09	8 HOURS	42 MINUTES	5.366	SECONDS
37	150-1	3.42	-.16	-.1907-09	8 HOURS	42 MINUTES	5.510	SECONDS
38	151-1	3.44	-.07	-.1881-09	8 HOURS	42 MINUTES	5.654	SECONDS
39	150-1	3.46	.02	-.1854-09	8 HOURS	42 MINUTES	5.798	SECONDS
40	151-1	3.42	.10	-.1907-09	8 HOURS	42 MINUTES	5.942	SECONDS
41	150-1	3.40	.19	-.1934-09	8 HOURS	42 MINUTES	6.086	SECONDS
42	151-1	3.38	.27	-.1960-09	8 HOURS	42 MINUTES	6.230	SECONDS
43	150-1	3.38	.36	-.1960-09	8 HOURS	42 MINUTES	6.374	SECONDS
44	151-1	3.36	.44	-.1987-09	8 HOURS	42 MINUTES	6.518	SECONDS
45	150-1	3.36	.53	-.1987-09	8 HOURS	42 MINUTES	6.662	SECONDS
46	151-1	3.32	.61	-.2040-09	8 HOURS	42 MINUTES	6.806	SECONDS
47	150-1	3.32	.70	-.2040-09	8 HOURS	42 MINUTES	6.950	SECONDS
48	141-1	3.32	.76	-.2040-09	8 HOURS	42 MINUTES	7.094	SECONDS
49	140-1	3.32	.85	-.2040-09	8 HOURS	42 MINUTES	7.238	SECONDS
50	141-1	3.30	.94	-.2066-09	8 HOURS	42 MINUTES	7.382	SECONDS
51	140-1	3.28	1.02	-.2093-09	8 HOURS	42 MINUTES	7.526	SECONDS
52	141-1	3.24	1.11	-.2146-09	8 HOURS	42 MINUTES	7.670	SECONDS
53	140-1	3.24	1.20	-.2146-09	8 HOURS	42 MINUTES	7.814	SECONDS
54	141-1	3.24	1.28	-.2146-09	8 HOURS	42 MINUTES	7.958	SECONDS
55	140-1	3.24	1.36	-.2146-09	8 HOURS	42 MINUTES	8.102	SECONDS
56	141-1	3.20	1.45	-.2199-09	8 HOURS	42 MINUTES	8.246	SECONDS
57	140-1	3.20	1.54	-.2199-09	8 HOURS	42 MINUTES	8.390	SECONDS
58	141-1	3.20	1.62	-.2199-09	8 HOURS	42 MINUTES	8.534	SECONDS
59	140-1	3.22	1.71	-.2172-09	8 HOURS	42 MINUTES	8.678	SECONDS
60	141-1	3.22	1.79	-.2172-09	8 HOURS	42 MINUTES	8.822	SECONDS
61	140-1	3.18	1.88	-.2225-09	8 HOURS	42 MINUTES	8.966	SECONDS
62	141-1	3.20	1.96	-.2199-09	8 HOURS	42 MINUTES	9.110	SECONDS
63	140-1	3.16	2.05	-.2252-09	8 HOURS	42 MINUTES	9.254	SECONDS

DATE 20 APR 67 TIME OF RUN 09:23:20

OGO-C (POGO) DATA

DATA DATE	22 OCT 65	
DATA TIME	8 HOURS	42 MINUTES
ALTITUDE	1259.04	KILOMETERS
LATITUDE	23.70	DEGREES
LONGITUDE	121.03	DEGREES
L	1.22	
G LATITUDE	12.39	DEGREES
VELOCITY	7.08	KM/SEC.
RECORD NUMBER	2	
OPEP TEMPERATURE	23.36	DEGREES
PANL TEMPERATURE	18.41	DEGREES
SOEP TEMPERATURE	29.63	DEGREES
LOAD BUS VOLTAGE	31.88	VOLTS

ATTITUDE - ACTUAL
PASS 108

ANGLES	DEGREES
OPEP-VELOCITY -	7.81
OPEP-SUN	115.50
OPEP-MAG.	32.86
OPEP-BODY	21.96
SOEP-SUN	3.28

DATA MODE ELECTRON

OPEP TABULATIONS

STEP NUMBER	STATUS WORD	OPEP ANALOG	STEP VOLTAGE	CAL. CURRENT	TIME				*=ERROR
64	131-2	3.48	1.73	-.1104-08	8 HOURS	42 MINUTES	9.398	SECONDS	
65	130-2	3.14	1.82	-.1376-08	8 HOURS	42 MINUTES	9.542	SECONDS	
66	131-2	2.46	1.94	-.1920-08	8 HOURS	42 MINUTES	9.686	SECONDS	
67	130-2	1.56	2.02	-.2640-08	8 HOURS	42 MINUTES	9.830	SECONDS	
68	131-2	.78	2.11	-.3264-08	8 HOURS	42 MINUTES	9.974	SECONDS	
69	130-3	3.98	2.20	-.4171-08	8 HOURS	42 MINUTES	10.118	SECONDS	
70	131-3	3.74	2.28	-.5308-08	8 HOURS	42 MINUTES	10.262	SECONDS	
71	130-3	3.40	2.37	-.6919-08	8 HOURS	42 MINUTES	10.406	SECONDS	
72	131-3	3.04	2.45	-.8626-08	8 HOURS	42 MINUTES	10.550	SECONDS	
73	130-3	2.82	2.54	-.9668-08	8 HOURS	42 MINUTES	10.694	SECONDS	
74	131-3	2.38	2.62	-.1175-07	8 HOURS	42 MINUTES	10.838	SECONDS	
75	130-3	1.78	2.72	-.1460-07	8 HOURS	42 MINUTES	10.982	SECONDS	
76	131-3	1.04	2.80	-.1810-07	8 HOURS	42 MINUTES	11.126	SECONDS	
77	130-4	3.34	2.88	-.4419-07	8 HOURS	42 MINUTES	11.270	SECONDS	
78	131-3	1.82	2.97	-.1441-07	8 HOURS	42 MINUTES	11.414	SECONDS	
79	130-3	.30	3.06	-.2161-07	8 HOURS	42 MINUTES	11.558	SECONDS	
80	121-4	4.28	3.12	-.1686-07	8 HOURS	42 MINUTES	11.702	SECONDS	
81	120-4	3.96	3.20	-.2616-07	8 HOURS	42 MINUTES	11.846	SECONDS	
82	121-4	4.06	3.29	-.2326-07	8 HOURS	42 MINUTES	11.990	SECONDS	
83	120-4	4.00	3.38	-.2500-07	8 HOURS	42 MINUTES	12.134	SECONDS	
84	121-4	3.90	3.46	-.2791-07	8 HOURS	42 MINUTES	12.278	SECONDS	
85	120-4	3.84	3.55	-.2965-07	8 HOURS	42 MINUTES	12.422	SECONDS	
86	121-4	3.60	3.64	-.3663-07	8 HOURS	42 MINUTES	12.566	SECONDS	
87	120-4	3.78	3.72	-.3140-07	8 HOURS	42 MINUTES	12.710	SECONDS	
88	121-4	3.84	3.81	-.2965-07	8 HOURS	42 MINUTES	12.854	SECONDS	
89	120-4	3.74	3.89	-.3256-07	8 HOURS	42 MINUTES	12.998	SECONDS	
90	121-4	3.76	3.98	-.3198-07	8 HOURS	42 MINUTES	13.142	SECONDS	
91	120-4	3.44	4.06	-.4128-07	8 HOURS	42 MINUTES	13.286	SECONDS	
92	121-4	3.66	4.15	-.3488-07	8 HOURS	42 MINUTES	13.430	SECONDS	
93	120-4	3.76	4.24	-.3198-07	8 HOURS	42 MINUTES	13.574	SECONDS	
94	121-4	3.70	4.32	-.3372-07	8 HOURS	42 MINUTES	13.718	SECONDS	
95	120-4	3.68	4.40	-.3430-07	8 HOURS	42 MINUTES	13.862	SECONDS	

DATE 20 APR 67 TIME OF RUN 09¥23¥20

OGO-C (POGO) DATA

DATA DATE	22 OCT 65	
DATA TIME	8 HOURS	42 MINUTES
ALTITUDE	1259.04	KILOMETERS
LATITUDE	23.70	DEGREES
LONGITUDE	121.03	DEGREES
L	1.22	
G LATITUDE	12.39	DEGREES
VELOCITY	7.08	KM/SEC.
RECORD NUMBER	2	
OPEP TEMPERATURE	23.36	DEGREES
PANL TEMPERATURE	18.41	DEGREES
SOEP TEMPERATURE	29.63	DEGREES
LOAD BUS VOLTAGE	31.88	VOLTS

ATTITUDE - ACTUAL
PASS 108
ANGLES DEGREES
OPEP-VELOCITY - 7.81
OPEP-SUN 115.50
OPEP-MAG. 32.86
OPEP-BODY 21.96
SOEP-SUN 3.28
DATA MODE ELECTRON

OPEP TABULATIONS

STEP NUMBER	STATUS WORD	OPEP ANALOG	STEP VOLTAGE	CAL. CURRENT	TIME				*=ERROR
96	111-5	2.94	4.28	-.3221-06	8 HOURS	42 MINUTES	14.006	SECONDS	
97	110-5	3.40	4.37	-.2450-06	8 HOURS	42 MINUTES	14.150	SECONDS	
98	111-5	3.36	4.47	-.2517-06	8 HOURS	42 MINUTES	14.294	SECONDS	
99	110-5	3.18	4.56	-.2819-06	8 HOURS	42 MINUTES	14.438	SECONDS	
100	111-5	2.96	4.64	-.3188-06	8 HOURS	42 MINUTES	14.582	SECONDS	
101	110-4	.00	4.72	-.1413-06	8 HOURS	42 MINUTES	14.726	SECONDS	
102	111-5	2.78	4.82	-.3490-06	8 HOURS	42 MINUTES	14.870	SECONDS	
103	110-5	2.96	4.90	-.3188-06	8 HOURS	42 MINUTES	15.014	SECONDS	
104	111-5	2.74	4.98	-.3557-06	8 HOURS	42 MINUTES	15.158	SECONDS	
105	110-5	2.56	5.07	-.3859-06	8 HOURS	42 MINUTES	15.302	SECONDS	
106	111-5	2.38	5.16	-.4161-06	8 HOURS	42 MINUTES	15.446	SECONDS	
107	110-5	2.70	5.24	-.3624-06	8 HOURS	42 MINUTES	15.590	SECONDS	
108	111-5	2.92	5.33	-.3255-06	8 HOURS	42 MINUTES	15.734	SECONDS	
109	110-5	2.54	5.42	-.3893-06	8 HOURS	42 MINUTES	15.878	SECONDS	
110	111-5	2.48	5.50	-.3993-06	8 HOURS	42 MINUTES	16.022	SECONDS	
111	110-5	2.28	5.58	-.4329-06	8 HOURS	42 MINUTES	16.166	SECONDS	
112	101-5	2.70	5.65	-.3624-06	8 HOURS	42 MINUTES	16.310	SECONDS	
113	100-5	2.80	5.73	-.3456-06	8 HOURS	42 MINUTES	16.454	SECONDS	
114	101-5	2.70	5.82	-.3624-06	8 HOURS	42 MINUTES	16.598	SECONDS	
115	100-5	2.38	5.91	-.4161-06	8 HOURS	42 MINUTES	16.742	SECONDS	
116	101-5	2.24	5.99	-.4396-06	8 HOURS	42 MINUTES	16.886	SECONDS	
117	100-5	2.54	6.08	-.3893-06	8 HOURS	42 MINUTES	17.030	SECONDS	
118	101-5	3.04	6.17	-.3054-06	8 HOURS	42 MINUTES	17.174	SECONDS	
119	100-5	2.54	6.25	-.3893-06	8 HOURS	42 MINUTES	17.318	SECONDS	
120	101-5	2.38	6.34	-.4161-06	8 HOURS	42 MINUTES	17.462	SECONDS	
121	100-5	2.26	6.42	-.4362-06	8 HOURS	42 MINUTES	17.606	SECONDS	
122	101-5	2.54	6.51	-.3893-06	8 HOURS	42 MINUTES	17.750	SECONDS	
123	100-5	2.88	6.60	-.3322-06	8 HOURS	42 MINUTES	17.894	SECONDS	
124	101-5	2.46	6.68	-.4027-06	8 HOURS	42 MINUTES	18.038	SECONDS	
125	100-5	2.26	6.77	-.4362-06	8 HOURS	42 MINUTES	18.182	SECONDS	
126	101-5	2.36	6.85	-.4195-06	8 HOURS	42 MINUTES	18.326	SECONDS	
127	100-5	2.74	6.94	-.3557-06	8 HOURS	42 MINUTES	18.470	SECONDS	

DATE 20 APR 67 TIME OF RUN 09¥23¥20

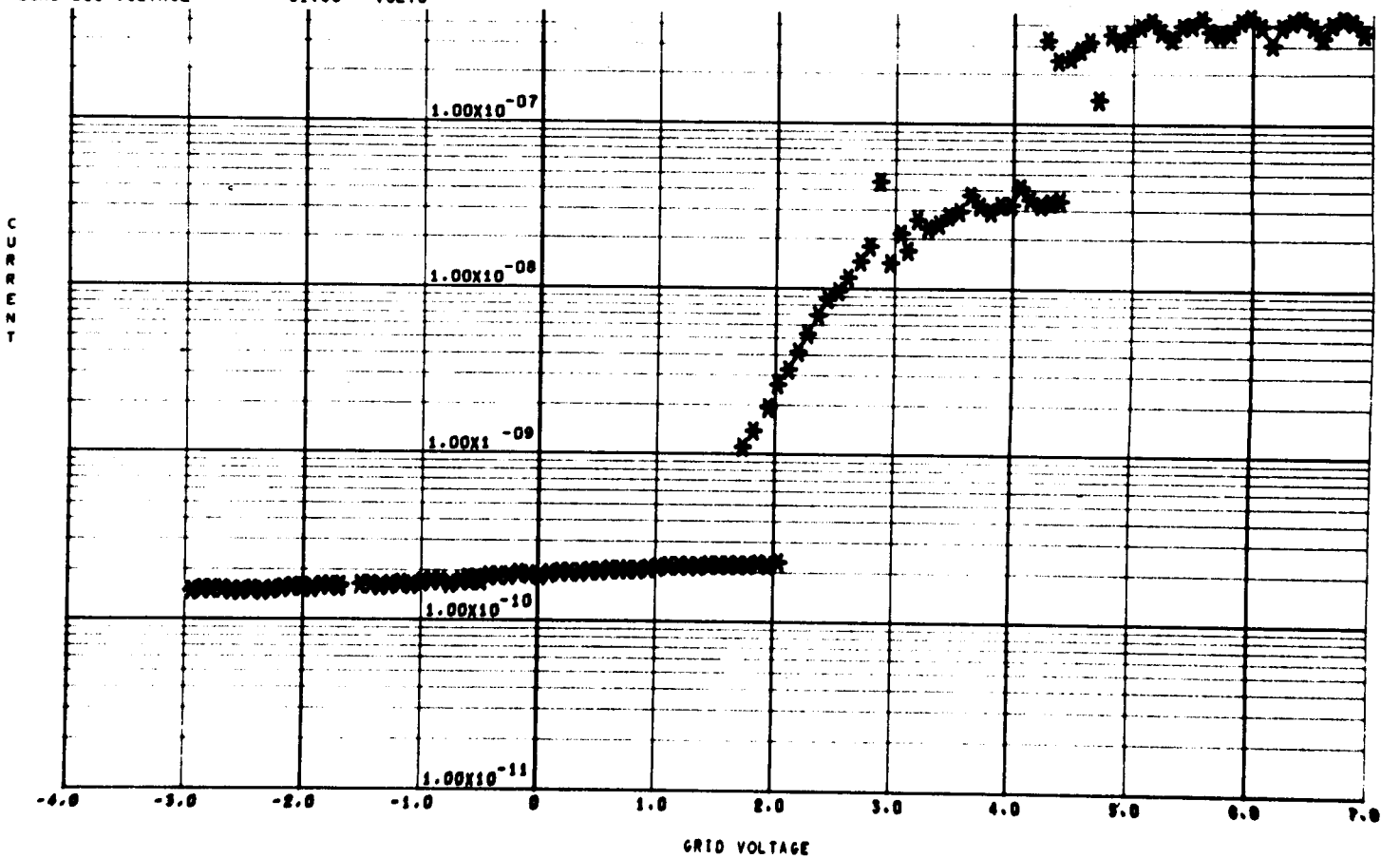
OGO-C (POGO) DATA

DATA DATE	22 OCT 65	
DATA TIME	8 HOURS	42 MINUTES
ALTITUDE	1259.04	KILOMETERS
LATITUDE	23.70	DEGREES
LONGITUDE	121.03	DEGREES
L	1.22	
G LATITUDE	12.39	DEGREES
VELOCITY	7.08	KM/SEC.
RECORD NUMBER	2	
OPEP TEMPERATURE	23.36	DEGREES
PANL TEMPERATURE	18.41	DEGREES
SOEP TEMPERATURE	29.63	DEGREES
LOAD BUS VOLTAGE	31.88	VOLTS

ATTITUDE - ACTUAL
PASS 108

ANGLES	DEGREES
OPEP-VELOCITY -	7.81
OPEP-SUN	115.50
OPEP-MAG.	32.86
OPEP-BODY	21.96
SOEP-SUN	3.28

DATA MODE ELECTRON



DATE 20 APR 67 TIME OF RUN 09¥23¥22

OGO-C (POGO) DATA

DATA DATE	22 OCT 65	
DATA TIME	8 HOURS	42 MINUTES
ALTITUDE	1259.04	KILOMETERS
LATITUDE	23.70	DEGREES
LONGITUDE	121.03	DEGREES
L	1.22	
G LATITUDE	12.39	DEGREES
VELOCITY	7.08	KM/SEC.
RECORD NUMBER	2	
OPEP TEMPERATURE	23.36	DEGREES
PANL TEMPERATURE	18.41	DEGREES
SOEP TEMPERATURE	29.63	DEGREES
LOAD BUS VOLTAGE	31.88	VOLTS

ATTITUDE - ACTUAL
PASS 108

ANGLES	DEGREES
OPEP-VELOCITY -	7.81
OPEP-SUN	115.50
OPEP-MAG.	32.86
OPEP-BODY	63.80
SOEP-SUN	3.28

DATA MODE ELECTRON

SOEP TABULATIONS

*=ERROR

STEP NUMBER	SOEP ANALOG	STEP VOLTAGE	CAL. CURRENT	TIME		
0	4.54	-10.50	-.4086-09	8 HOURS	42 MINUTES	.18 SECONDS
1	4.54	-10.10	-.4086-09	8 HOURS	42 MINUTES	.33 SECONDS
2	4.54	-9.70	-.4086-09	8 HOURS	42 MINUTES	.47 SECONDS
3	4.54	-9.30	-.4086-09	8 HOURS	42 MINUTES	.61 SECONDS
4	4.52	-8.90	-.3513-09	8 HOURS	42 MINUTES	.76 SECONDS
5	4.54	-8.50	-.4086-09	8 HOURS	42 MINUTES	.90 SECONDS
6	4.52	-8.10	-.3513-09	8 HOURS	42 MINUTES	1.05 SECONDS
7	4.52	-7.70	-.3513-09	8 HOURS	42 MINUTES	1.19 SECONDS
8	4.50	-7.30	-.2940-09	8 HOURS	42 MINUTES	1.33 SECONDS
9	4.48	-6.90	-.2367-09	8 HOURS	42 MINUTES	1.48 SECONDS
10	4.46	-6.50	-.1794-09	8 HOURS	42 MINUTES	1.62 SECONDS
11	4.46	-6.10	-.1794-09	8 HOURS	42 MINUTES	1.77 SECONDS
12	4.42	-5.70	-.6476-10	8 HOURS	42 MINUTES	1.91 SECONDS
13	4.40	-5.30	-.7450-11	8 HOURS	42 MINUTES	2.05 SECONDS
14	4.36	-4.90	.1072-09	8 HOURS	42 MINUTES	2.20 SECONDS
15	4.30	-4.50	.2791-09	8 HOURS	42 MINUTES	2.34 SECONDS
16	4.24	-4.10	.4510-09	8 HOURS	42 MINUTES	2.49 SECONDS
17	4.16	-3.70	.6802-09	8 HOURS	42 MINUTES	2.63 SECONDS
18	4.04	-3.30	.1024-08	8 HOURS	42 MINUTES	2.77 SECONDS
19	3.84	-2.90	.1597-08	8 HOURS	42 MINUTES	2.92 SECONDS
20	3.56	-2.50	.2399-08	8 HOURS	42 MINUTES	3.06 SECONDS
21	3.08	-2.10	.3775-08	8 HOURS	42 MINUTES	3.21 SECONDS
22	2.32	-1.70	.5952-08	8 HOURS	42 MINUTES	3.35 SECONDS
23	1.72	-1.30	.1062-07	8 HOURS	42 MINUTES	3.49 SECONDS
24	.48	-.90	.2113-07	8 HOURS	42 MINUTES	3.64 SECONDS
25	.10	-.50	.2435-07	8 HOURS	42 MINUTES	3.78 SECONDS
26	.08	-.10	.2452-07	8 HOURS	42 MINUTES	3.93 SECONDS
27	.06	.36	.2469-07	8 HOURS	42 MINUTES	4.07 SECONDS
28	.06	.76	.2469-07	8 HOURS	42 MINUTES	4.21 SECONDS
29	.06	1.17	.2469-07	8 HOURS	42 MINUTES	4.36 SECONDS
30	.06	1.57	.2469-07	8 HOURS	42 MINUTES	4.50 SECONDS
31	.06	1.97	.2469-07	8 HOURS	42 MINUTES	4.65 SECONDS

Sample output from the IBM 7094 output file is shown below.

```
OPEP                ION
22OCT 65  8 42  108ACTUAL
   .00      .00      .00      .00      .00      .00    23.36    18.41    29.63    31.88
 90.00    90.00    90.00    90.00    90.00
    0 000-5     4.68     11.65   -.0000     8 41   41.750    1 001-5     4.68    11.55   -.0000     8 41   41.894
    2 000-1     4.62     11.45   -.7947-11  8 41   42.038    3 001-1     4.64    11.35   -.5298-11  8 41   42.182
    4 000-1     4.64     11.25   -.5298-11  8 41   42.326    5 001-1     4.66    11.15   -.2649-11  8 41   42.470
    6 000-1     4.64     11.05   -.5298-11  8 41   42.614    7 001-1     4.66    10.95   -.2649-11  8 41   42.758
    8 000-1     4.68     10.80   -.0000     8 41   42.902    9 001-1     4.70    10.70    .2649-11  8 41   43.046
   10 000-1     4.70     10.60    .2649-11  8 41   43.190   11 001-1     4.72    10.50    .5298-11  8 41   43.334
   12 000-1     4.70     10.45    .2649-11  8 41   43.478   13 001-1     4.74    10.30    .7947-11  8 41   43.622
   14 000-1     4.74     10.20    .7947-11  8 41   43.766   15 001-1     4.78    10.15    .1325-10  8 41   43.910
   16 010-1     4.80     10.05    .1589-10  8 41   44.054   17 011-1     4.82     9.93    .1854-10  8 41   44.198
   18 010-1     4.86      9.83    .2384-10  8 41   44.342   19 011-1     4.88     9.72    .2649-10  8 41   44.486
   20 010-1     4.90      9.63    .2914-10  8 41   44.630   21 011-1     4.92     9.52    .3179-10  8 41   44.774
   22 010-1     4.96      9.42    .3709-10  8 41   44.918   23 011-1     4.98     9.32    .3974-10  8 41   45.062
   24 010-1     5.04      9.21    .4768-10  8 41   45.206   25 011-1     5.02     9.10    .4503-10  8 41   45.350
   26 010-1     5.08      9.00    .5298-10  8 41   45.494   27 011-1     5.08     8.90    .5298-10  8 41   45.638
   28 010-1     5.10      8.80    .5563-10  8 41   45.782   29 011-1     5.10     8.70    .5563-10  8 41   45.926
   30 010-1     5.10      8.60    .5563-10  8 41   46.070   31 011-1     5.10     8.49    .5563-10  8 41   46.214
   32 020+1      .38      8.61    .9272-10  8 41   46.358   33 021+1      .46     8.50    .1033-09  8 41   46.502
   34 020+1      .48      8.40    .1060-09  8 41   46.646   35 021+1      .52     8.30    .1113-09  8 41   46.790
   36 020+1      .56      8.20    .1166-09  8 41   46.934   37 021+1      .58     8.09    .1192-09  8 41   47.078
   38 020+1      .62      8.00    .1245-09  8 41   47.222   39 021+1      .70     7.89    .1351-09  8 41   47.366
   40 020+1      .74      7.78    .1404-09  8 41   47.510   41 021+1      .82     7.68    .1510-09  8 41   47.654
   42 020+1      .88      7.58    .1589-09  8 41   47.798   43 021+1      .96     7.47    .1695-09  8 41   47.942
   44 020+1     1.10      7.38    .1881-09  8 41   48.086   45 021+1     1.18     7.27    .1987-09  8 41   48.230
   46 020+1     1.30      7.17    .2146-09  8 41   48.374   47 021+1     1.42     7.06    .2305-09  8 41   48.518
   48 030+1     1.52      6.98    .2437-09  8 41   48.662   49 031+1     1.68     6.87    .2649-09  8 41   48.806
   50 030+1     2.02      6.77    .3099-09  8 41   48.950   51 031+1     2.22     6.66    .3364-09  8 41   49.094
   52 030+1     2.54      6.56    .3788-09  8 41   49.238   53 031+1     2.92     6.46    .4291-09  8 41   49.382
   54 030+1     3.40      6.36    .4927-09  8 41   49.526   55 031+1     3.88     6.26    .5563-09  8 41   49.670
   56 030+1     4.48      6.15    .6358-09  8 41   49.814   57 031+2      .86     6.04    .9440-09  8 41   49.958
   58 030+2      .96      5.94    .1024-08  8 41   50.102   59 031+2     1.06     5.84    .1104-08  8 41   50.246
   60 030+2     1.08      5.74    .1120-08  8 41   50.390   61 031+2     1.24     5.64    .1248-08  8 41   50.534
   62 030+2     1.26      5.53    .1264-08  8 41   50.678   63 031+2     1.32     5.42    .1312-08  8 41   50.822
   64 040+2     2.06      5.75    .1904-08  8 41   50.966   65 041+2     2.44     5.65    .2208-08  8 41   51.110
   66 040+2     2.90      5.55    .2576-08  8 41   51.254   67 041+2     3.30     5.45    .2896-08  8 41   51.398
   68 040+2     3.76      5.35    .3264-08  8 41   51.542   69 041+2     4.24     5.24    .3648-08  8 41   51.686
   70 040+2     4.84      5.14    .4128-08  8 41   51.830   71 041+2      .78     5.04    .8800-09  8 41   51.974
   72 040+3      .86      4.93    .5592-08  8 41   52.118   73 041+3     1.00     4.82    .6256-08  8 41   52.262
   74 040+3     1.10      4.72    .6730-08  8 41   52.406   75 041+3     1.14     4.62    .6919-08  8 41   52.550
   76 040+3     1.20      4.52    .7204-08  8 41   52.694   77 041+3     1.26     4.42    .7488-08  8 41   52.838
   78 040+3     1.36      4.32    .7962-08  8 41   52.982   79 041+3     1.38     4.21    .8057-08  8 41   53.126
   80 050+3     1.42      4.12    .8246-08  8 41   53.270   81 051+3     1.48     4.02    .8531-08  8 41   53.414
   82 050+3     1.56      3.92    .8910-08  8 41   53.558   83 051+3     1.60     3.82    .9100-08  8 41   53.702
   84 050+3     1.60      3.72    .9100-08  8 41   53.846   85 051+3     1.64     3.61    .9289-08  8 41   53.990
   86 050+3     1.68      3.51    .9479-08  8 41   54.134   87 051+3     1.70     3.41    .9573-08  8 41   54.278
   88 050+3     1.72      3.30    .9668-08  8 41   54.422   89 051+3     1.74     3.20    .9763-08  8 41   54.566
   90 050+3     1.76      3.10    .9858-08  8 41   54.710   91 051+3     1.78     2.99    .9953-08  8 41   54.854
   92 050+3     1.76      2.90    .9858-08  8 41   54.998   93 051+3     1.80     2.79    .1005-07  8 41   55.142
   94 050+3     1.76      2.69    .9858-08  8 41   55.286   95 051+3     1.80     2.58    .1005-07  8 41   55.430
   96 060+3     2.98      2.70    .1564-07  8 41   55.574   97 061+3     3.00     2.60    .1573-07  8 41   55.718
   98 060+3     3.02      2.50    .1583-07  8 41   55.862   99 061+3     3.04     2.39    .1592-07  8 41   56.006
  100 060+3     3.06      2.29    .1602-07  8 41   56.150  101 061+3     3.08     2.19    .1611-07  8 41   56.294
  102 060+3     3.08      2.09    .1611-07  8 41   56.438  103 061+3     3.10     1.98    .1621-07  8 41   56.582
  104 060+3     3.12      1.88    .1630-07  8 41   56.726  105 061+3     3.12     1.77    .1630-07  8 41   56.870
  106 060+3     3.12      1.67    .1630-07  8 41   57.014  107 061+3     3.12     1.57    .1630-07  8 41   57.158
  108 060+3     3.14      1.47    .1640-07  8 41   57.302  109 061+3     3.16     1.36    .1649-07  8 41   57.446
  110 060+3     3.16      1.27    .1649-07  8 41   57.590  111 061+3     3.16     1.16    .1649-07  8 41   57.734
  112 070+3     3.16      1.07    .1649-07  8 41   57.878  113 071+3     3.16      .97    .1649-07  8 41   58.022
  114 070+3     3.16       .87    .1649-07  8 41   58.166  115 071+3     3.18      .76    .1659-07  8 41   58.310
  116 070+3     3.18       .66    .1659-07  8 41   58.454  117 071+3     3.18      .56    .1659-07  8 41   58.598
  118 070+3     3.18       .46    .1659-07  8 41   58.742  119 071+3     3.20      .36    .1668-07  8 41   58.886
  120 070+3     3.20       .25    .1668-07  8 41   59.030  121 071+3     3.20      .14    .1668-07  8 41   59.174
  122 070+3     3.20       .04    .1668-07  8 41   59.318  123 071+3     3.20     -.06    .1668-07  8 41   59.462
  124 070+3     3.22      -.16    .1678-07  8 41   59.606  125 071+3     3.22     -.26    .1678-07  8 41   59.750
  126 070+3     3.22      -.36    .1678-07  8 41   59.894  127 071+3     3.22     -.47    .1678-07  8 42     .038
```

SOEP ION
22OCT 65 8 42 108ACTUAL

.00	.00	.00	.00	.00	.00	23.36	18.41	29.63	31.88						
90.00	90.00	90.00	90.00	90.00											
0	.04	1.97	.2486-07	8	41	41.750	1	.04	1.57	.2486-07	8	41	41.894
2	.04	1.17	.2486-07	8	41	42.038	3	.06	.76	.2469-07	8	41	42.182
4	.06	.36	.2469-07	8	41	42.326	5	.08	-.10	.2452-07	8	41	42.470
6	.10	-.50	.2435-07	8	41	42.614	7	.48	-.90	.2113-07	8	41	42.758
8	1.74	-1.30	.1045-07	8	41	42.902	9	2.34	-1.70	.5895-08	8	41	43.046
10	3.08	-2.10	.3775-08	8	41	43.190	11	3.56	-2.50	.2399-08	8	41	43.334
12	3.84	-2.90	.1597-08	8	41	43.478	13	4.02	-3.30	.1081-08	8	41	43.622
14	4.16	-3.70	.6802-09	8	41	43.766	15	4.24	-4.10	.4510-09	8	41	43.910
16	4.32	-4.50	.2218-09	8	41	44.054	17	4.36	-4.90	.1072-09	8	41	44.198
18	4.40	-5.30	-.7450-11	8	41	44.342	19	4.42	-5.70	-.6476-10	8	41	44.486
20	4.44	-6.10	-.1221-09	8	41	44.630	21	4.46	-6.50	-.1794-09	8	41	44.774
22	4.48	-6.90	-.2367-09	8	41	44.918	23	4.48	-7.30	-.2367-09	8	41	45.062
24	4.50	-7.70	-.2940-09	8	41	45.206	25	4.52	-8.10	-.3513-09	8	41	45.350
26	4.52	-8.50	-.3513-09	8	41	45.494	27	4.52	-8.90	-.3513-09	8	41	45.638
28	4.52	-9.30	-.3513-09	8	41	45.782	29	4.54	-9.70	-.4086-09	8	41	45.926
30	4.54	-10.10	-.4086-09	8	41	46.070	31	4.56	-10.50	-.4659-09	8	41	46.214

OPEP ELECTRON
22OCT 65 8 42 108ACTUAL
1259.04 23.70 121.03 12.39 7.08 1.22 23.36 18.41 29.63 31.88
7.81 115.50 32.86 21.96 3.28

0	171+5	.00	-3.11	.2349-07	8	42	.182	1	170+5	.00	-3.02	.2349-07	8	42	.326
2	171-1	3.76	-2.94	-.1457-09	8	42	.470	3	170-1	3.74	-2.85	-.1483-09	8	42	.614
4	171-1	3.74	-2.77	-.1483-09	8	42	.758	5	170-1	3.74	-2.68	-.1483-09	8	42	.902
6	171-1	3.76	-2.60	-.1457-09	8	42	1.046	7	170-1	3.76	-2.52	-.1457-09	8	42	1.190
8	171-1	3.72	-2.43	-.1510-09	8	42	1.334	9	170-1	3.76	-2.34	-.1457-09	8	42	1.478
10	171-1	3.72	-2.26	-.1510-09	8	42	1.622	11	170-1	3.70	-2.17	-.1536-09	8	42	1.766
12	171-1	3.68	-2.09	-.1563-09	8	42	1.910	13	170-1	3.68	-2.00	-.1563-09	8	42	2.054
14	171-1	3.70	-1.92	-.1536-09	8	42	2.198	15	170-1	3.66	-1.84	-.1589-09	8	42	2.342
16	161-1	3.66	-1.77	-.1589-09	8	42	2.486	17	160-1	3.66	-1.68	-.1589-09	8	42	2.630
18	161-1	3.68	-1.69	-.1563-09	8	42	2.774	19	160-1	3.64	-1.51	-.1616-09	8	42	2.918
20	161-1	3.64	-1.42	-.1616-09	8	42	3.062	21	160-1	3.66	-1.34	-.1589-09	8	42	3.206
22	161-1	3.64	-1.26	-.1616-09	8	42	3.350	23	160-1	3.62	-1.17	-.1642-09	8	42	3.494
24	161-1	3.64	-1.08	-.1616-09	8	42	3.638	25	160-1	3.60	-.99	-.1669-09	8	42	3.782
26	161-1	3.58	-.91	-.1695-09	8	42	3.926	27	160-1	3.58	-.82	-.1695-09	8	42	4.070
28	161-1	3.62	-.74	-.1642-09	8	42	4.214	29	160-1	3.58	-.65	-.1695-09	8	42	4.358
30	161-1	3.58	-.57	-.1695-09	8	42	4.502	31	160-1	3.58	-.48	-.1695-09	8	42	4.646
32	151-1	3.52	-.60	-.1775-09	8	42	4.790	33	150-1	3.52	-.52	-.1775-09	8	42	4.934
34	151-1	3.48	-.41	-.1828-09	8	42	5.078	35	150-1	3.48	-.33	-.1828-09	8	42	5.222
36	151-1	3.48	-.24	-.1828-09	8	42	5.366	37	150-1	3.42	-.16	-.1907-09	8	42	5.510
38	151-1	3.44	-.07	-.1881-09	8	42	5.654	39	150-1	3.46	.02	-.1854-09	8	42	5.798
40	151-1	3.42	.10	-.1907-09	8	42	5.942	41	150-1	3.40	.19	-.1934-09	8	42	6.086
42	151-1	3.38	.27	-.1960-09	8	42	6.230	43	150-1	3.38	.36	-.1960-09	8	42	6.374
44	151-1	3.36	.44	-.1987-09	8	42	6.518	45	150-1	3.36	.53	-.1987-09	8	42	6.662
46	151-1	3.32	.61	-.2040-09	8	42	6.806	47	150-1	3.32	.70	-.2040-09	8	42	6.950
48	141-1	3.32	.76	-.2040-09	8	42	7.094	49	140-1	3.32	.85	-.2040-09	8	42	7.238
50	141-1	3.30	.94	-.2066-09	8	42	7.382	51	140-1	3.28	1.02	-.2093-09	8	42	7.526
52	141-1	3.24	1.11	-.2146-09	8	42	7.670	53	140-1	3.24	1.20	-.2146-09	8	42	7.814
54	141-1	3.24	1.28	-.2146-09	8	42	7.958	55	140-1	3.24	1.36	-.2146-09	8	42	8.102
56	141-1	3.20	1.45	-.2199-09	8	42	8.246	57	140-1	3.20	1.54	-.2199-09	8	42	8.390
58	141-1	3.20	1.62	-.2199-09	8	42	8.534	59	140-1	3.22	1.71	-.2172-09	8	42	8.678
60	141-1	3.22	1.79	-.2172-09	8	42	8.822	61	140-1	3.18	1.88	-.2225-09	8	42	8.966
62	141-1	3.20	1.96	-.2199-09	8	42	9.110	63	140-1	3.16	2.05	-.2252-09	8	42	9.254
64	131-2	3.48	1.73	-.1104-08	8	42	9.398	65	130-2	3.14	1.82	-.1376-08	8	42	9.542
66	131-2	2.46	1.94	-.1920-08	8	42	9.686	67	130-2	1.56	2.02	-.2640-08	8	42	9.830
68	131-2	.78	2.11	-.3264-08	8	42	9.974	69	130-3	3.98	2.20	-.4171-08	8	42	10.118
70	131-3	3.74	2.28	-.5308-08	8	42	10.262	71	130-3	3.40	2.37	-.6919-08	8	42	10.406
72	131-3	3.04	2.45	-.8626-08	8	42	10.550	73	130-3	2.82	2.54	-.9668-08	8	42	10.694
74	131-3	2.38	2.62	-.1175-07	8	42	10.838	75	130-3	1.78	2.72	-.1460-07	8	42	10.982
76	131-3	1.04	2.80	-.1810-07	8	42	11.126	77	130-4	3.34	2.88	-.4419-07	8	42	11.270
78	131-3	1.82	2.97	-.1441-07	8	42	11.414	79	130-3	.30	3.06	-.2161-07	8	42	11.558
80	121-4	4.28	3.12	-.1686-07	8	42	11.702	81	120-4	3.96	3.20	-.2616-07	8	42	11.846
82	121-4	4.06	3.29	-.2326-07	8	42	11.990	83	120-4	4.00	3.38	-.2500-07	8	42	12.134
84	121-4	3.90	3.46	-.2791-07	8	42	12.278	85	120-4	3.84	3.55	-.2965-07	8	42	12.422
86	121-4	3.60	3.64	-.3663-07	8	42	12.566	87	120-4	3.78	3.72	-.3140-07	8	42	12.710
88	121-4	3.84	3.81	-.2965-07	8	42	12.854	89	120-4	3.74	3.89	-.3256-07	8	42	12.998
90	121-4	3.76	3.98	-.3198-07	8	42	13.142	91	120-4	3.44	4.06	-.4128-07	8	42	13.286
92	121-4	3.66	4.15	-.3488-07	8	42	13.430	93	120-4	3.76	4.24	-.3198-07	8	42	13.574
94	121-4	3.70	4.32	-.3372-07	8	42	13.718	95	120-4	3.68	4.40	-.3430-07	8	42	13.862
96	111-5	2.94	4.28	-.3221-06	8	42	14.006	97	110-5	3.40	4.37	-.2450-06	8	42	14.150
98	111-5	3.36	4.47	-.2517-06	8	42	14.294	99	110-5	3.18	4.56	-.2819-06	8	42	14.438
100	111-5	2.96	4.64	-.3188-06	8	42	14.582	101	110-4	.00	4.72	-.1413-06	8	42	14.726
102	111-5	2.78	4.82	-.3490-06	8	42	14.870	103	110-5	2.96	4.90	-.3188-06	8	42	15.014
104	111-5	2.74	4.98	-.3557-06	8	42	15.158	105	110-5	2.56	5.07	-.3859-06	8	42	15.302
106	111-5	2.38	5.16	-.4161-06	8	42	15.446	107	110-5	2.70	5.24	-.3624-06	8	42	15.590
108	111-5	2.92	5.33	-.3255-06	8	42	15.734	109	110-5	2.54	5.42	-.3893-06	8	42	15.878
110	111-5	2.48	5.50	-.3993-06	8	42	16.022	111	110-5	2.28	5.58	-.4329-06	8	42	16.166
112	101-5	2.70	5.65	-.3624-06	8	42	16.310	113	100-5	2.80	5.73	-.3456-06	8	42	16.454
114	101-5	2.70	5.82	-.3624-06	8	42	16.598	115	100-5	2.38	5.91	-.4161-06	8	42	16.742
116	101-5	2.24	5.99	-.4396-06	8	42	16.886	117	100-5	2.54	6.08	-.3893-06	8	42	17.030
118	101-5	3.04	6.17	-.3054-06	8	42	17.174	119	100-5	2.54	6.25	-.3893-06	8	42	17.318
120	101-5	2.38	6.34	-.4161-06	8	42	17.462	121	100-5	2.26	6.42	-.4362-06	8	42	17.606
122	101-5	2.54	6.51	-.3893-06	8	42	17.750	123	100-5	2.88	6.60	-.3322-06	8	42	17.894
124	101-5	2.46	6.68	-.4027-06	8	42	18.038	125	100-5	2.26	6.77	-.4362-06	8	42	18.182
126	101-5	2.36	6.85	-.4195-06	8	42	18.326	127	100-5	2.74	6.94	-.3557-06	8	42	18.470

SOEP ELECTRON
22OCT 65 8 42 108ACTUAL
1259.04 23.70 121.03 12.39 7.08 1.22 23.36 18.41 29.63 31.88
7.81 115.50 32.86 63.80 3.28

0	4.54	-10.50	-.4086-09	8	42	.182	1	4.54	-10.10	-.4086-09	8	42	.326
2	4.54	-9.70	-.4086-09	8	42	.470	3	4.54	-9.30	-.4086-09	8	42	.614
4	4.52	-8.90	-.3513-09	8	42	.758	5	4.54	-8.50	-.4086-09	8	42	.902
6	4.52	-8.10	-.3513-09	8	42	1.046	7	4.52	-7.70	-.3513-09	8	42	1.190
8	4.50	-7.30	-.2940-09	8	42	1.334	9	4.48	-6.90	-.2367-09	8	42	1.478
10	4.46	-6.50	-.1794-09	8	42	1.622	11	4.46	-6.10	-.1794-09	8	42	1.766
12	4.42	-5.70	-.6476-10	8	42	1.910	13	4.40	-5.30	-.7450-11	8	42	2.054
14	4.36	-4.90	.1072-09	8	42	2.198	15	4.30	-4.50	.2791-09	8	42	2.342
16	4.24	-4.10	.4510-09	8	42	2.486	17	4.16	-3.70	.6802-09	8	42	2.630
18	4.04	-3.30	.1024-08	8	42	2.774	19	3.84	-2.90	.1597-08	8	42	2.918
20	3.56	-2.50	.2399-08	8	42	3.062	21	3.08	-2.10	.3775-08	8	42	3.206
22	2.32	-1.70	.5952-08	8	42	3.350	23	1.72	-1.30	.1062-07	8	42	3.494
24	.48	-.90	.2113-07	8	42	3.638	25	.10	-.50	.2435-07	8	42	3.782
26	.08	-.10	.2452-07	8	42	3.926	27	.06	.36	.2469-07	8	42	4.070
28	.06	.76	.2469-07	8	42	4.214	29	.06	1.17	.2469-07	8	42	4.358
30	.06	1.57	.2469-07	8	42	4.502	31	.06	1.97	.2469-07	8	42	4.646

History/Error Output File

Sample output from the History/Error output file is shown below.

DAY	MILSECDAY	STEP	STATUS	CYCLE	OPEPAV	SOEPAV	VOLTAGE	CURRENT	TYPE
225	31781270	0	000-5	ION	5.10	.00	11.65	.00	OPEP
225	31781414	1	001-5	ION	5.10	.00	11.55	.00	OPEP
225	31781558	2	000-1	ION	.32	.00	11.45	-.00	OPEP
225	31781702	3	001-1	ION	.42	.00	11.35	-.00	OPEP
225	31781846	4	000-1	ION	.48	.00	11.25	-.00	OPEP
225	31781990	5	001-1	ION	.56	.00	11.15	-.00	OPEP
225	31782134	6	000-1	ION	.62	.00	11.05	-.00	OPEP
225	31782278	7	001-1	ION	.72	.00	10.95	-.00	OPEP
225	31782422	8	000-1	ION	.72	.00	10.80	-.00	OPEP
225	31782566	9	001-1	ION	.98	.00	10.70	-.00	OPEP
225	31782710	10	000-1	ION	1.04	.00	10.60	-.00	OPEP
225	31782854	11	001-1	ION	1.16	.00	10.50	-.00	OPEP
225	31782998	12	000+1	ION	1.28	.00	10.45	.00	OPEP
225	31783142	13	001+1	ION	1.42	.00	10.30	.00	OPEP
225	31783286	14	000+1	ION	1.52	.00	10.20	.00	OPEP
225	31783430	15	001+1	ION	1.64	.00	10.15	.00	OPEP
225	31783574	16	010+1	ION	1.92	.00	10.05	.00	OPEP
225	31783718	17	011+1	ION	1.88	.00	9.93	.00	OPEP
225	31783862	18	010+1	ION	2.22	.00	9.83	.00	OPEP
225	31784006	19	011+1	ION	2.32	.00	9.72	.00	OPEP
225	31784150	20	010+1	ION	2.52	.00	9.63	.00	OPEP
225	31784294	21	011+1	ION	2.64	.00	9.52	.00	OPEP
225	31784438	22	010+1	ION	2.76	.00	9.42	.00	OPEP
225	31784582	23	011+1	ION	2.84	.00	9.32	.00	OPEP
225	31784726	24	010+1	ION	3.02	.00	9.21	.00	OPEP
225	31784870	25	011+1	ION	3.06	.00	9.10	.00	OPEP
225	31785014	26	010+1	ION	3.32	.00	9.00	.00	OPEP
225	31785158	27	011+1	ION	3.46	.00	8.90	.00	OPEP
225	31785302	28	010+1	ION	3.64	.00	8.80	.00	OPEP
225	31785446	29	011+1	ION	3.78	.00	8.70	.00	OPEP
225	31785590	30	010+1	ION	4.72	.00	8.60	.00	OPEP
225	31785734	31	011+1	ION	4.90	.00	8.49	.00	OPEP

DAY	MILSECDAY	STEP	STATUS	CYCLE	OPEPAV	SOEPAV	VOLTAGE	CURRENT	TYPE
295	31578230	0		ELTRN	.00	4.56	-10.50	-.00	SOEP
295	31578374	1		ELTRN	.00	4.54	-10.10	-.00	SOEP
295	31578518	2		ELTRN	.00	4.54	-9.70	-.00	SOEP
295	31578662	3		ELTRN	.00	4.54	-9.30	-.00	SOEP
295	31578806	4		ELTRN	.00	4.54	-8.90	-.00	SOEP
295	31578950	5		ELTRN	.00	4.52	-8.50	-.00	SOEP
295	31579094	6		ELTRN	.00	4.50	-8.10	-.00	SOEP
295	31579238	7		ELTRN	.00	4.52	-7.70	-.00	SOEP
295	31579382	8		ELTRN	.00	4.50	-7.30	-.00	SOEP
295	31579526	9		ELTRN	.00	4.48	-6.90	-.00	SOEP
295	31579670	10		ELTRN	.00	4.46	-6.50	-.00	SOEP
295	31579814	11		ELTRN	.00	4.44	-6.10	-.00	SOEP
295	31579958	12		ELTRN	.00	4.42	-5.70	-.00	SOEP
295	31580102	13		ELTRN	.00	4.40	-5.30	-.00	SOEP
295	31580246	14		ELTRN	.00	4.36	-4.90	.00	SOEP
295	31580390	15		ELTRN	.00	4.32	-4.50	.00	SOEP
295	31580534	16		ELTRN	.00	4.24	-4.10	.00	SOEP
295	31580678	17		ELTRN	.00	4.16	-3.70	.00	SOEP
295	31580822	18		ELTRN	.00	4.04	-3.30	.00	SOEP
295	31580966	19		ELTRN	.00	3.84	-2.90	.00	SOEP
295	31581110	20		ELTRN	.00	3.56	-2.50	.00	SOEP
295	31581254	21		ELTRN	.00	3.08	-2.10	.00	SOEP
295	31581398	22		ELTRN	.00	2.32	-1.70	.00	SOEP
295	31581542	23		ELTRN	.00	1.72	-1.30	.00	SOEP
295	31581686	24		ELTRN	.00	.48	-.90	.00	SOEP
295	31581830	25		ELTRN	.00	.10	-.50	.00	SOEP
295	31581974	26		ELTRN	.00	.08	-.10	.00	SOEP
295	31582118	27		ELTRN	.00	.06	.36	.00	SOEP
295	31582262	28		ELTRN	.00	.06	.76	.00	SOEP
295	31582406	29		ELTRN	.00	.06	1.17	.00	SOEP
295	31582550	30		ELTRN	.00	.06	1.57	.00	SOEP
295	31582694	31		ELTRN	.00	.04	1.97	.00	SOEP

III. PROGRAM DESCRIPTION

A. CALCULATION PROCEDURE

The main routine (START) maintains control of all transmission rate processing, performs all input functions except the reading of the Attitude/Orbit file, and directs all output functions.

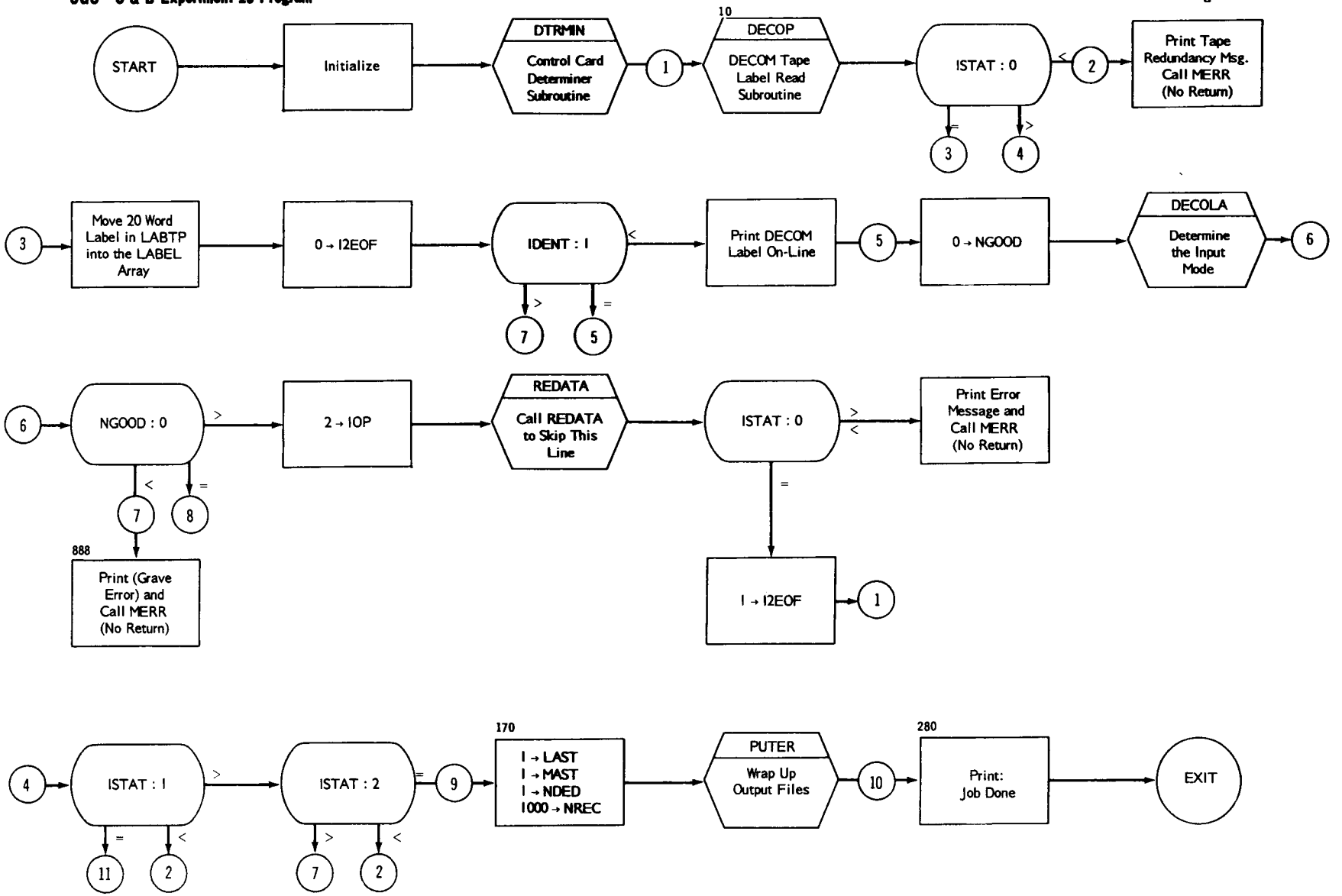
The execution of the program begins with the main routine which reads the Run Deck containing specified English mnemonics which designate the options desired. The first header of the DECOM file on tape is then read. From this header the kilobit rate and mode type is determined. If the header indicates flexible format mode, the file is backspaced and a different set of vectors are turned on; but if the header indicates normal data mode, no backspacing takes place and no vectors are set since all sub-programs are initially set for this type of file. Following this basic initialization, the main program reads ten records, determines which processor subroutine is necessary for this data, and relinquishes control to it.

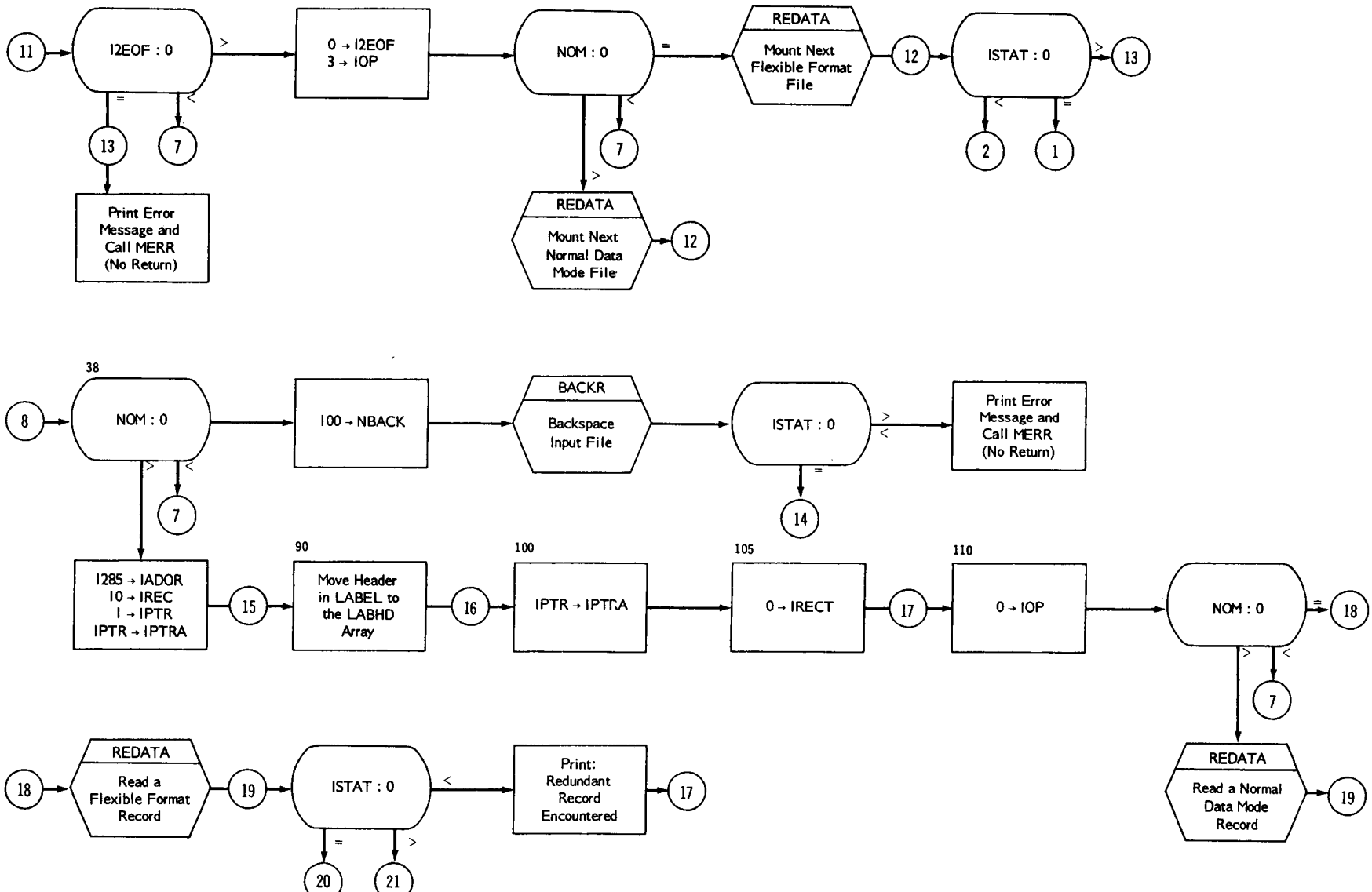
The processor subroutine makes a pass over the data searching for an ION or an ELECTRON cycle and upon locating a cycle a call is made to the correct computation routine. In the computation routine, a calculated current is computed from the telemetry analog value and a step voltage. This result, and its related time and step voltage, is stored in a working matrix which is subsequently used by the output subroutine. The computation subroutine then returns to the processor subroutine. If the processor subroutine observes 128 consecutive steps of either cycle, it calls the output routine at which time the cycle is either tabulated and/or plotted depending on the option switches. Return again is made to the processor subroutine. Upon exhausting the available data, the processor designates to the main program the number of records to read and the location in which to store them and returns to the main program.

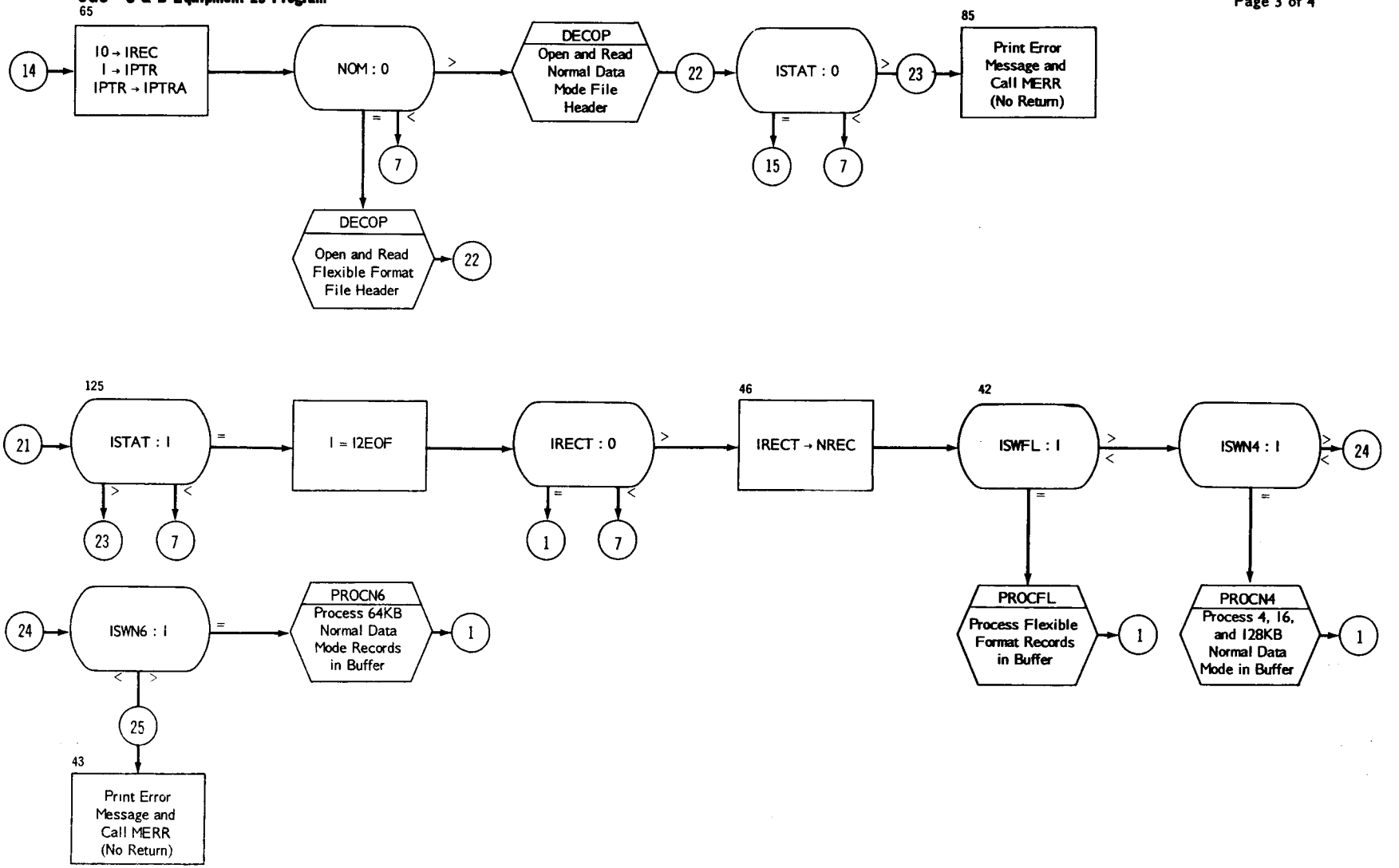
This procedure is repeated until all the input data has been read. At this time, the main program directly calls the output routine indicating an end of job action. The output routine now determines what outputs were generated, then empties all buffers and rewinds all tapes.

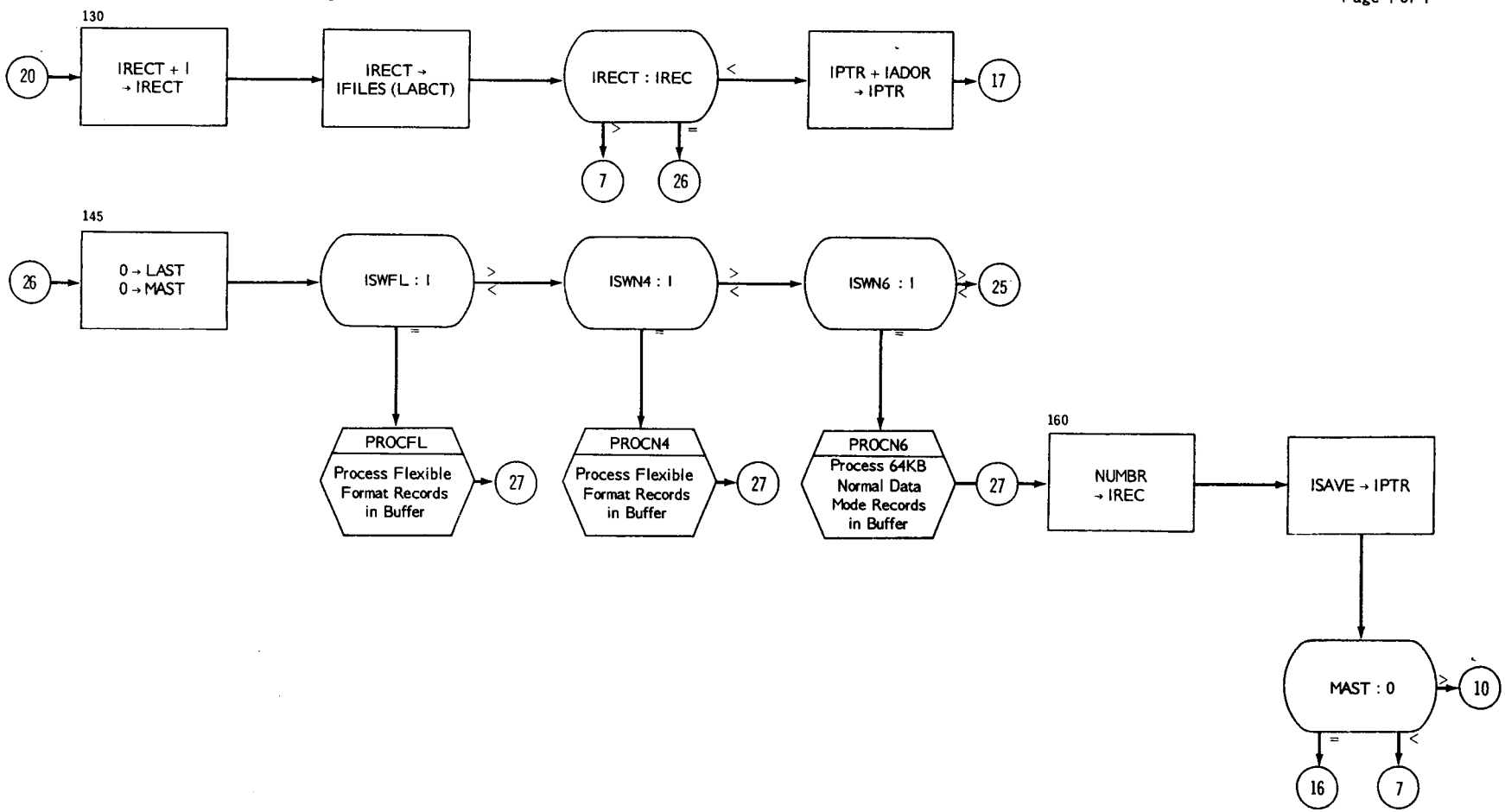
B. FLOWCHARTS

The main routine flowcharts for the OGO-C&D Experiment 19 Program are shown on the following pages.


START
Initialize
DTRMIN
Control Card Determiner Subroutine
1
10
DECOP
DECOM Tape Label Read Subroutine
ISTAT : 0
<
2
Print Tape Redundancy Msg. Call MERR (No Return)
=
>
3
4
3
Move 20 Word Label in LABTP into the LABEL Array
0 → I2EOF
IDENT : 1
<
Print DECOM Label On-Line
5
0 → NGOOD
DECOLA
Determine the Input Mode
6
>
=
7
5
6
NGOOD : 0
>
2 → IOP
REDATA
Call REDATA to Skip This Line
ISTAT : 0
>
<
Print Error Message and Call MERR (No Return)
<
=
7
8
888
Print (Grave Error) and Call MERR (No Return)
=
I → I2EOF
1
4
ISTAT : 1
>
ISTAT : 2
=
9
170
I → LAST
I → MAST
I → NDED
1000 → NREC
PUTER
Wrap Up Output Files
10
280
Print: Job Done
EXIT
=
<
>
<
11
2
7
2


11
I2EOF : 0
>
=
<
13
7
Print Error Message and Call MERR (No Return)
0 → I2EOF
3 → IOP
NOM : 0
=
<
7
>
REDATA
Mount Next Normal Data Mode File
12
REDATA
Mount Next Flexible Format File
12
ISTAT : 0
>
13
<
=
2
1
8
38
NOM : 0
>
<
7
100 → NBACK
BACKR
Backspace Input File
ISTAT : 0
>
<
=
Print Error Message and Call MERR (No Return)
14
1285 → IADOR
10 → IREC
1 → IPTR
IPTR → IPTRA
15
90
Move Header in LABEL to the LABHD Array
16
100
IPTR → IPTRA
105
0 → IRECT
17
110
0 → IOP
NOM : 0
=
18
>
<
7
18
REDATA
Read a Flexible Format Record
19
ISTAT : 0
<
=
>
20
21
Print: Redundant Record Encountered
17
REDATA
Read a Normal Data Mode Record
19


65
14
10 → IREC
1 → IPTR
IPTR → IPTRA
NOM : 0
>
=
<
7
DECOP
Open and Read Normal Data Mode File Header
22
DECOP
Open and Read Flexible Format File Header
22
ISTAT : 0
>
=
<
15
7
23
85
Print Error Message and Call MERR (No Return)
125
21
ISTAT : I
=
>
<
23
7
I = I2EOF
IRECT : 0
>
=
<
1
7
46
IRECT → NREC
42
ISWFL : I
>
<
=
PROCFL
Process Flexible Format Records in Buffer
1
ISWN4 : I
>
<
=
24
PROCN4
Process 4, 16, and 128KB Normal Data Mode in Buffer
1
24
ISWN6 : I
=
<
>
PROCN6
Process 64KB Normal Data Mode Records in Buffer
1
25
43
Print Error Message and Call MERR (No Return)


130
20
IRECT + 1 → IRECT
IRECT → IFILES (LABCT)
IRECT : IREC
<
>
=
7
26
IPTR + IADOR → IPTR
17
145
26
0 → LAST
0 → MAST
ISWFL : 1
ISWN4 : 1
ISWN6 : 1
25
PROCFL
Process Flexible Format Records in Buffer
27
PROCN4
Process Flexible Format Records in Buffer
27
PROCN6
Process 64KB Normal Data Mode Records in Buffer
27
160
NUMBR → IREC
ISAVE → IPTR
MAST : 0
10
16
7