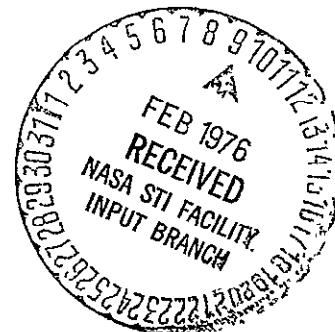


FINAL REPORT

GENERAL PURPOSE SIMULATION SYSTEM OF THE DATA MANAGEMENT SYSTEM FOR SPACE SHUTTLE MISSION 18

CONTRACT NAS8-31458

JANUARY 16, 1976



PREPARED FOR:

DATA SYSTEMS LABORATORY

National Aeronautics and Space Administration

George C. Marshall Space Flight Center, Alabama 35812

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FINAL REPORT OF THE
SPACE SHUTTLE DATA MANAGEMENT SYSTEM
GPSS PROGRAM

January 16, 1976

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FOREWORD

This document presents results of work performed by D P Associates, Inc., Huntsville, Alabama, under Contract No. NAS8-31458 (SB420-8(a)75C-122) for the George C. Marshall Space Flight Center, Data Systems Laboratory. Technical coordination was through Mr. Frank Crumbley, Mr. Douglas Thomas and Mr. James Mabry.



ABSTRACT

This report presents a simulation program for the flow of data through the Data Management System for Spacelab and Shuttle. Included are the science, engineering, command and guidance, navigation and control data. The programming language used was General Purpose Simulation System V (OS). The science and engineering data flow was modeled from its origin at the experiments and subsystems to transmission from Space Shuttle. Command data flow was modeled from the point of reception onboard and from the CDMS Control Panel to the experiments and subsystems. The GN&C data flow model handled data between the General Purpose Computer and the experiments and subsystems. Mission 18 was the particular flight chosen for simulation. First, the general structure of the program is presented, followed by a user's manual. Inputs required to make runs are discussed followed by identification of the output statistics. The appendices contain a detailed model configuration, program listing and results.



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SECTION I
INTRODUCTION

One of the many facets of the developmental phase of Space Shuttle involves design of the Shuttle/Spacelab Data Management System. This design effort must necessarily include two separate but interdependent foci. Of initial interest is the design of the total data management system and the capability of the specified system to service data management functions over a broad spectrum of mission profiles. As the system design emerges, the emphasis turns to the problem of individual component or hardware design. The Space Shuttle Data System Simulator (SSDSS) described in this report has been designed to provide analytical capability both from the system design and hardware design standpoint.

The task facing the data management system designer is a considerable one. There is, for example, the problem of the tremendous volume of data that must be managed during a typical mission. This problem of volume is complicated by the diverse types of data that must be managed -- scientific measurements and recordings, control, command and various other kinds of data. Furthermore there are complex interrelationships among the several types of data that must be considered. This complex volume of data must be input to an intricate system of data processing equipment and the whole affair linked to ground stations through available communication networks. Thus, the designer must be aided in the design effort by methodologies sufficiently suited to this difficult analytical task.



The SSDSS was developed to provide the data system designer with analytical capability for assessing the ability of a specified system configuration to efficiently manage the data generated by a given mission profile. Several simulator characteristics were considered essential in developing SSDSS. Since many shuttle missions are anticipated, it was determined that the simulator should not be mission specific, that is, that it be capable of handling a variety of mission profiles. It was also decided that the simulator should provide the system designer with a ready tool for conducting trade studies -- for analyzing the impact of altering selected design variables. Finally, it was felt that the simulator should be as user oriented as possible -- that individuals might use the program without having an intimate understanding of the programming language or the program itself.



SECTION II

SPACE SHUTTLE MISSION 18

The SSDSS was initially developed using the data profile of Shuttle Mission 18 [1] as input. Mission 18 is a multi-discipline, 168 hour Spacelab mission tentatively scheduled for November 1, 1980. The broad objective of this mission is to provide an environment for development and evaluation of instrumentation, equipment, and techniques which will subsequently be incorporated in operational systems of the Spacelab.

2.1 MISSION PAYLOAD

The operational phase of Mission 18 will include performance of one Earth observation experiment, nine Earth and Ocean Physics experiments, and deployment of two Mini-Laser Ranging Satellites (Mini-LAGEOS). These experiments together with Shuttle flight maneuvers create the bulk of data that must be accommodated by the Shuttle data management system.

2.2 DATA MANAGEMENT SYSTEM

Figure 1 is a schematic diagram of the data management system of the Spacelab and Shuttle. Experiments are depicted by Block 1. Block 2 represents experiment remote acquisition units (RAU's) which interface the experiments with the data system. There is a similar configuration between Spacelab subsystems, Block 13, and the data system with Block 14 depicting the subsystem RAU's. The system includes three computers and associated input/output devices: Blocks 3 and 4 represent the experiment computer system; Blocks 15 and 16 represent



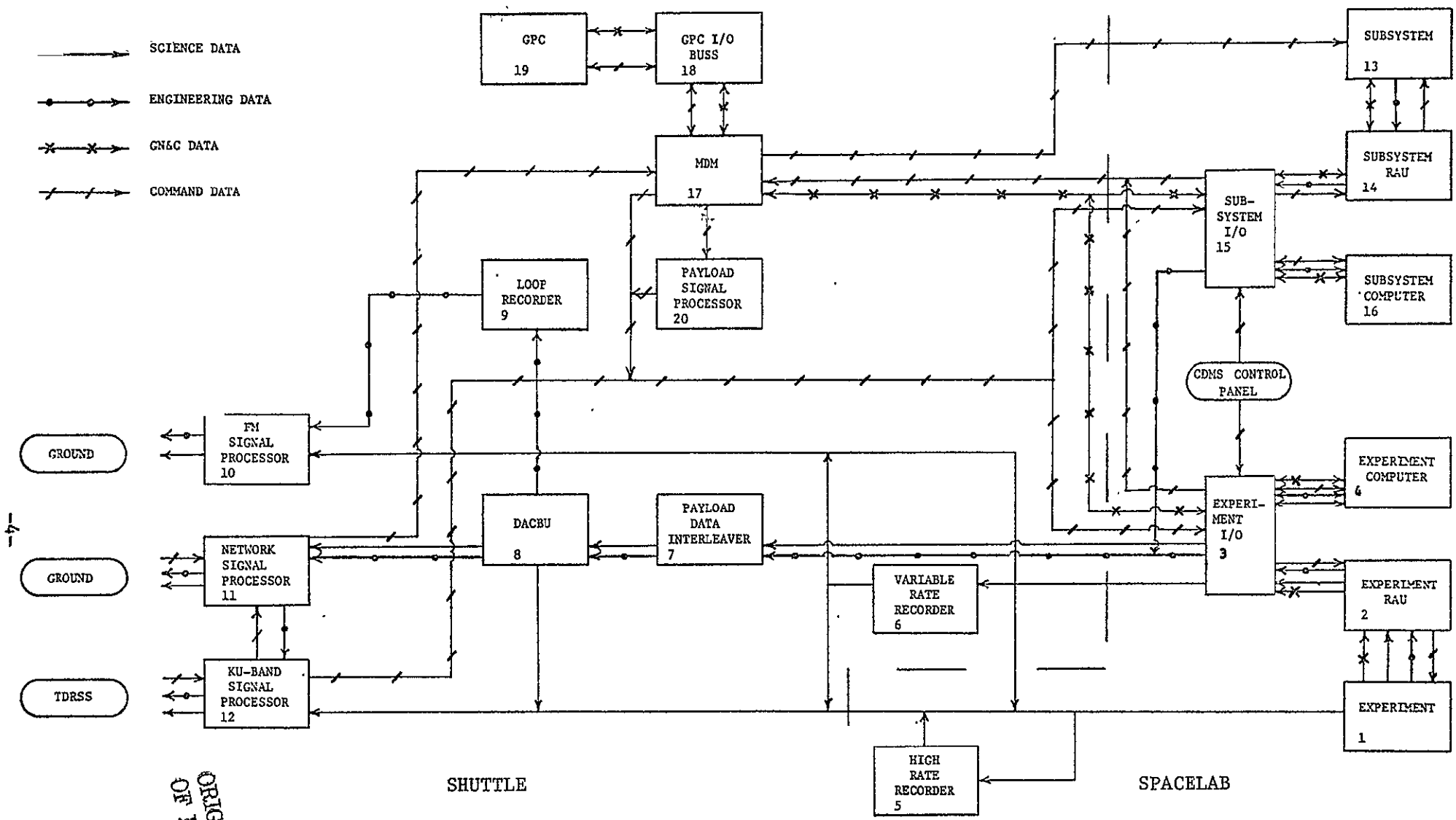


Figure 1. Schematic Diagram of Space Shuttle Data Management System

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the subsystem computer system; and Blocks 18 and 19 depict the general purpose computer (GPC). The system includes three recording devices: high rate recorder, Block 5; variable rate recorder, Block 6; and a loop maintenance recorder, Block 9. Also included are three signal processors; the F.M. signal processor, Block 10; the network signal processor, Block 11; and the K.U. band signal processor, Block 12. As the diagram indicates, the F.M. and network signal processors are linked through ground tracking stations while the K.U. band signal processor is linked through the Tracking and Data Relay Satellite System (TDRSS). Finally, the system includes certain miscellaneous items of equipment: the payload data interleaver, Block 7; the data acquisition control and buffer unit (DACBU), Block 8; the multiplexer/demultiplexer (MDM), Block 17; and the payload signal processor, Block 20 [2,3].

Four different types of data are processed by the system: science, engineering, command and guidance, navigation and control. Science data generated by the experiments is input to the system at Block 1 and is processed thru some prescribed combination of equipment prior to transmission. Engineering data, from monitoring of experiments and subsystems, enters the system at either Block 1 or Block 12 and is processed through the appropriate computer system, Blocks 3 and 4 or Blocks 15 and 16; the payload data interleaver, Block 7; and the DACBU, Block 8, prior to transmission. Command data is transmitted to the Shuttle either through groundlinks or TDRSS and is received by the appropriate signal processor, Blocks 11 or 12. Command data originating onboard enters the system through the CDMS control panel. Guidance, Navigation and Control data (GN&C) enters the system either at the experiments or the GPC and generally proceeds through one or more of the three computer systems.



SECTION III

THE DATA MANAGEMENT SYSTEM SIMULATOR

3.1 GENERAL INFORMATION

The SSDSS was developed in IBM's General Purpose Simulation System V (GPSS), a special purpose simulation language. The major advantage of using a special purpose language for a project of this nature rather than a general purpose language such as FORTRAN is programming efficiency. Also, GPSS is quite widely used, thus anyone who is at all familiar with simulation would probably have at least limited exposure to GPSS.

Some general characteristics about the program are reflected in Figure 2. The core requirement and CPU time required for simulating the entire 168 hour Mission 18 data profile was 228 K bytes and 41 minutes respectively on an IBM 360-65.

The SSDSS simulation uses a unit of time of one hundredth of an hour or 36 seconds. This time period was chosen to give the greatest possible resolution of data flow details, yet still be able to complete an entire mission simulation in a reasonable period of computer run time.

3.2 SIMULATOR DESIGN

Because of the complexity of the data management system, the GPSS software program has been structured into a modular format consisting of 9 divisions, called modules. Certain modules are logically subdivided into parts, i.e. Part 1, Part 2.... Figure 3 shows the nine programs modules presently included in the simulator. Figure 1 contains 20 blocks. Each



- PROGRAM DECK
 - INPUT TAPE FOR EXPERIMENT SCHEDULES
 - GPSS INSTRUCTIONS
 - DEFINITIONS, INITIALIZATION: 700
 - GPSS STATEMENTS: 1600
 - REPORT MODULE: 200
 - INPUT DECK: 2000 CARDS

- COMPUTATIONAL TIME
 - CORE REQUIREMENT: 228K
 - CPU TIME: 41 MINUTES
 - EXECUTION TIME: 45 MINUTES

- OUTPUT LISTING
 - PAGES: 150
 - PROGRAM LISTING: 110 PAGES
 - SIMULATION OUTPUT: 40 PAGES
 - LINES: 8300

Figure 2. Program Characteristics



<u>MODULES</u>	<u>DESCRIPTION</u>
1	EXPERIMENT DATA INPUT (EXPERIMENT SCIENCE DATA AND SUBSYSTEM ENGINEERING DATA).
2	EXPERIMENT SCIENCE DATA PART 1. EXPERIMENT TO I/O PART 2. I/O TO COMPUTER. COMPUTER TO I/O TO PAYLOAD DATA INTERLEAVER TO TRANSMIT. PART 3. I/O TO KU-BAND OR V. R. REC. PART 4. EXPERIMENT TO KU-BAND OR H. R. REC.
3	EXPERIMENT ENGINEERING DATA PART 1. EXPERIMENT TO I/O PART 2. I/O TO COMPUTER. COMPUTER TO I/O TO PAYLOAD DATA INTERLEAVER. PART 3. PAYLOAD DATA INTERLEAVER TO TRANSMIT.
4	SUBSYSTEM ENGINEERING DATA PART 1. SUBSYSTEM TO I/O PART 2. I/O TO COMPUTER. COMPUTER TO I/O TO PAYLOAD DATA INTERLEAVER. PART 3. PAYLOAD DATA INTERLEAVER TO TRANSMIT.
5	DOWNLINK SCHEDULE
6	GROUNDLINK SCHEDULE
7	COMMAND DATA PART 1. GROUND COMMAND THRU NETWORK SIGNAL PROCESSOR. PART 2. GROUND COMMAND THRU KU-BAND. PART 3. CDMS CONTROL PANEL.
8	GUIDANCE, NAVIGATION AND CONTROL DATA PART 1. GPC TO EXPERIMENT COMPUTER AND SUBSYSTEM. PART 2. EXPERIMENT/SUBSYSTEM TO GPC.
9	OUTPUT REPORT GENERATOR

Figure 3. Program Modules



block represents data management hardware modelled by this program. Each module simulates a specific type of data; science, engineering, etc., flowing between blocks. The relationships between modules, blocks and data flow are defined as follows:

- Module 1 utilizes the experiment schedule for the mission to input experiment science data at Block 1 and subsystem engineering data at Block 13.
- Module 2 includes processing of all science data; it is subdivided into four parts.
 - Part 1 treats data from experiments to I/O, Blocks 1-3.
 - Part 2 includes data flow from I/O to Computer, Block 4; back through I/O to payload data interleaver, Block 7; to transmission via network signal processor, Block 11.
 - Part 3 replicates data flow from the I/O to the K.U. band signal processor, Block 12, or the variable rate recorder, Block 6.
 - Part 4 handles data flow direct from experiments, Block 1, to the K.U. band processor, Block 12, or the high rate recorder, Block 6.
- Module 3 treats experiment engineering data; it is subdivided into 3 parts.
 - Part 1 includes data from experiments to I/O, Blocks 1-3.
 - Part 2 replicates data flow from the I/O thru the computer, Block 4, to the payload data interleaver, Block 7.
 - Part 3 handles data movement from the payload data interleaver thru the DACBU, Block 8, to transmission thru either the F.M. or network signal processor, Blocks 10 or 11.
- Module 4 replicates subsystem engineering data; it is subdivided into three parts which parallel those in Module 3.
 - Part 1 includes data from subsystems to I/O, Blocks 13-15.
 - Part 2 replicates data flow from the I/O thru the subsystem computer, Block 16, to the payload data interleaver, Block 7.
 - Part 3 handles data movement from the payload data interleaver thru the DACBU, Block 8, to transmission thru either the F.M. or network signal processor, Blocks 10 or 11.



- Module 5 reproduces the TDRSS schedule. It was found that this schedule was approximately cyclic over a twenty-four hour cycle, thus Module 5 simply replicates a one day cycle continuously over the duration of the mission.
- Module 6 simulates the ground tracking station signal schedule. Since the ground station network actually consists of several individual stations, the simulator must develop a composite schedule from individual station schedules input.
- Module 7 treats the different command data flows found in the system; it is subdivided into three parts.
 - Part 1 accommodates flows received thru the network signal processor, Block 11.
 - Part 2 includes flows received thru the K.U. band signal processor, Block 12.
 - Part 3 handles flows received thru the CDMS control panel on-board.
- Module 8 replicates GN&C data flows; it is divided into two parts.
 - Part 1 accommodates data flows from the GPC, Block 19, to the experiment computer, Block 4, or subsystem, Block 13.
 - Part 2 reproduces data flows from the experiment, Block 1, or subsystem, Block 13, to the GPC, Block 19.
- Module 9 is the output report generator which is used to create the equipment utilization profiles shown in Figures 7-20.

3.3 TRADE STUDY CAPABILITY

A summary of the kinds of changes that might be analyzed in trade studies is given in Figure 4. While the list is not intended to be exhaustive, it does illustrate the kinds of changes which could be assessed with a minimum of alteration to the SSDSS.

Under the category of mission configuration, would be changes in the experiment profile either in the actual experiment schedule or the number of



- MISSION CONFIGURATION
 - DURATION OF MISSION
 - EXPERIMENT CONFIGURATION
 - SCHEDULES
 - NUMBER OF EXPERIMENTS
 - GN&C ACTIVITY
 - COMMAND ACTIVITY

- EQUIPMENT CONFIGURATION
 - CAPACITIES
 - AVAILABILITY
 - RELIABILITY
 - CHARACTERISTICS
 - RECORDER PROCESSING MODES
 - FIXED RATE
 - VARIABLE RATE
 - TRANSMITTERS
 - ONE WAY
 - TWO WAY

- DATA FLOW
 - ROUTING
 - FLOW RATES
 - PRIORITIES

- COMMUNICATION LINKS
 - ALTERNATIVE SYSTEMS
 - AVAILABILITY
 - SCHEDULES
 - RELIABILITY
 - INTERFERENCE

Figure 4. Trade Study Capability



experiments. Also included in this category would be changes in the level of GN&C and/or command data flow rate.

Trade studies in the area of equipment configuration might include changing the capacity of different equipment items or changing the availability of a particular item, where availability is defined as percent of the total mission duration that the equipment is available. Further, reliability studies might be incorporated by specifying a failure probability for a particular item. The SSDSS also has the capability of treating any one of the three recorders as fixed or variable rate recorders and any of the three transmitters as one or two-way processors.

Under the category of data flow alterations, trade studies might be conducted to assess the impact of different routing sequences, different flow rates for the different types of data, or different priorities for the data types.

The priorities used in the basic study are shown in Figure 5. The assignment of these priorities to various types of data at various stages in the model insures that if there is a conflict for a particular piece of hardware the proper type of data i.e., that with the highest priority, will have preference.

Finally, changes in the communication links might be assessed. For example, the impact of incorporating alternate systems might be of importance. Changes in the availability or reliability of communication links can be analyzed as well as alterations in the schedules of available links. It is also possible to assess the impact of competition for the links from, say, another mission.



<u>Type of Data</u>	<u>GPSS Priorities</u>
• Science	0-20
• Engineering	10-20
• Command	25
• GN&C	
Input to GPC	20
Output from GPC	30

Figure 5. Priority Classification of Data Types



SECTION IV
USER'S MANUAL

4.1 INPUT

In order for a user to implement the SSDSS various mission characteristics should be specified. These characteristics include the experiment schedule and the acquisition and loss of signal schedules to both the TDRSS and the ground tracking network. Also defined should be the data flow rates generated at different points as well as routing information. Figure 6a summarizes the necessary user inputs.

4.1.1 Experiment Schedules

The schedules of experiments for a mission are created on an input tape using the GPSS SAVEVALUE MATRIX 1 (MX1). The program to accomplish this is listed in appendix E. Each initial card represents one experiment and is specified by the column number of the matrix. The rows are: 1, the start time in hundredths of hours; 2, the experiment identification and; 3, the length of time, in hundredths of hours, the experiment remains active.

The rate of flow of science data generated by each experiment is defined in the FUNCTION statement FLOW (statement numbers 502 and 503 in the program listing, appendix C). The first number in each pair is the experiment ID and the second number is the corresponding data flow rate generated by that experiment. This flow rate is in thousands of bits per time unit. Since the time unit is one hundredth of an hour, or 36 seconds, 8640 would correspond to 8640/36 or 240 K bits per second.



- EXPERIMENT SCHEDULES
 - EXPERIMENT NUMBER
 - START TIME
 - DURATION OF EXPERIMENT
 - FLOW RATE

- DOWNLINK SCHEDULE (TDRSS)
 - ACQUISITION TIMES
 - LOSS TIMES

- GROUNDLINK SCHEDULE
 - ACQUISITION TIME
 - GROUND STATION ID
 - DURATION OF ACQUISITION

- FLOW MODIFICATION AND ROUTING DATA
 - PERCENTAGE OF DATA FLOW ASSIGNED TO ALTERNATE ROUTES
 - FLOW RATES FOR COMMAND, GN&C, AND ENGINEERING DATA
 - FLOW RATE FOR SUBSYSTEM DATA

Figure 6a. User Supplied Inputs



This method of assigning data flow rates assumes a constant rate coming from each experiment throughout the mission. If the rate is not constant a fourth row should be added to the input tape matrix to correspond to the rate of data flow for a particular use of the experiment. For example, the first experiment might have a flow rate assigned in MX1 as MX1 (4,1), 8640 on the input tape. If this method for assigning flow rates is used than statement number 523 of the program should be changed from

```
BLITZ ASSIGN 3, FN$FLOW, PF
```

to

```
BLITZ ASSIGN 3, MX1(4,1), PF.
```

4.1.2 Data Link Schedules

The SSDSS uses GPSS facilities to check the availability of a link between the orbiter and the TDRSS or the ground. If facility 50 is "seized" there is a down link through the TDRSS and data may be sent. For the data sent directly to the ground facility 49 is used. SAVEVALUE MATRIX 2 (MX2) is used to specify the TDRSS schedule and SAVEVALUE MATRIX 3 (MX3) is used to specify the ground tracking station schedule.

4.1.2.1 Downlink Schedule

The schedule of acquisition and loss of signal between the Shuttle Orbiter and the TDRSS was checked and found to be nearly cyclic every 24 hours. Therefore, only one day's schedule is explicitly defined in the program. The remaining days of the mission follow the same schedule by just repeating the sequence of seizing and releasing facility 50.



The entries in MX2 are simply a sequence of the alternating acquisition and loss of signal times. The time of the first acquisition is assigned to MX2 (1,1). The amount by which this value exceeds the activation of this module, 400 (4th hour of the mission), is placed in variable 18. The first loss of signal is assigned to MX2(1,2), the second acquisition to MX2(1,3) and the second loss to MX2(1,4). After the last loss of signal of the cycle an increment should be used to bring the time to 2800. This increment is 3 in the present program (statement number 955 in appendix C). The signal schedule started at 4 hours and ended at 28 hour. Therefore, the 24 hour cycles has a 4 hour offset from the beginning of the mission.

If the schedule is not cyclic the user may continue to define acquisition and loss times for the rest of the mission by expanding the matrix. However many columns the matrix expands to, that number should replace the number 60 in the MATRIX definition card at the beginning of the INITIAL cards and in the TEST card, statement number 950.

4.1.2.2 Groundlink Schedule

The data link schedule to the ground tracking stations is not cyclic, therefore, it was necessary to include the entire schedule in the program. The actual groundlink schedule is a composite of each acquisition of each tracking station. Because there are many tracking stations around the world and because more than one station often has acquisition it was necessary to use a different form for the groundlink SAVEVALUE matrix than for the downlink matrix.



The format of the initial cards is similar to that of the input tape. The column numbers represent each acquisition. The row numbers are defined as follows: 1, is the start of acquisition; 2, is the ground station identification and; 3, is the duration of acquisition. Should this schedule be changed the new number of acquisitions must be specified in the MATRIX definition card located before the initial cards.

4.1.3 Data Rates and Routing

At the beginning of the program deck the user specifies the flow rates for data which originate at various places in the model. Also specified are various percentages which are used to control data routing. If data comes to a decision point a certain percentage, say 95 percent, might take one branch while the remaining part, 5 percent, would go to another branch.

As with previous user inputs, values are put in MATRIX (MX4) by way of initial cards. The meaning of each matrix value is given in the program listing under "User Set Variables" and in appendix B.

Examples

- MX4(1,1),95. This value, 95%, is the percentage of data generated by the experiments which is routed to the KU-Band Signal Processor or the High Rate Recorder.
- MX4(1,16),72. This is the data flow rate of command data coming from the onboard CDMS Control Panel. It is 72 K bits/time period = 2KBPS.

4.1.4 Block Capacities

The STORAGE DEFINITIONS (statement numbers 416 thru 431) define the maximum capacity of a block to process data in one time unit. For



example, the Experiment RAU's, STORAGE 2, have a capacity defined as 36000. This means that 36000 K bits may enter the experiment RAU's in one time period i.e., 1 million bits per second. The storage numbers are the same as the block numbers in Figure 1. In order to change these capacities the user would multiply the block's new maximum allowable rate (in K bits/sec) by the number of seconds per time period, in this case 36, and enter this number on the storage definition card.

4.2 OUTPUT

There are two types of output from a GPSS program. One type is the standard GPSS output statistics. The other output is programmer defined, in this case graphs. Figure 6b summarizes the output statistics.

4.2.1 Route Flow Statistics

The first section of output is the "block counts." For each block number there is a corresponding program statement. The "total" column gives the number of times data has entered a particular block. This section of output is useful in programming and debugging because it indicates which statements were used and which were not, as well as showing any unusually large or small quantities. The block counts, however, do not explicitly tell how much data went into a block; therefore their use for analysis is rather limited.

4.2.2 Equipment Utilization Statistics

Information on usage for the items of equipment is given on the page marked "storages." In the "storage" column are the acronyms for the items used in the simulation of mission 18. The hardware item number, block



- ROUTE FLOW STATISTICS

- EQUIPMENT UTILIZATION STATISTICS
 - UTILIZATION
 - MAXIMUM DATA FLOW PROCESSED IN A TIME UNIT
 - AVERAGE DELAY IN RECORDERS, COMPUTERS
 - TOTAL DATA PROCESSED, K BITS

- GROUNDLINK AVAILABILITY

- DOWNLINK AVAILABILITY

- DATA LOST STATISTICS
 - LOSS LOCATIONS
 - LOSS QUANTITIES

- EQUIPMENT UTILIZATION PROFILES
 - FLOW RATES
 - vs
 - TIME

Figure 6b. Program Output



numbers, to which they refer are indicated in the equate statement (statements 395 thru 412). Items of equipment which were not used are left off the storage statistics page.

The actual utilization of an item of hardware is not given, but may be computed as follows:

$$U = \frac{\text{Entries X Avg Time/Unit}}{\text{Capacity X Length of Simulation}}$$

for example, the utilization for the experiment computer, block 4, is:

$$\begin{aligned} U_{\text{CPU EX}} &= \frac{9648 \times 495.159}{288 \times 16,800} \\ &= 99\% \end{aligned}$$

The maximum amount of data an item ever had to handle is given in the "maximum contents" column. Again, these quantities are in thousands of bits. The total amount of data which passed through a block is shown under "entries." The experiment RAU's processed a total of 9,381,450 K bits.

The GPSS definitions of all column headings may be found in appendix F and in the GPSS-V User's Manual beginning on page 290.

4.2.3 Signal Availability

As described in paragraph 4.1.2 facilities 49 and 50 indicate the availability of signal links between the orbiter and the ground and TDRSS respectively. The "Facilities" page shows what portion of the total time of the mission each data link was available. Under "Average Utilization During Total Time" downlink (facility 49) was available 17.8% of the time and ground-link (facility 50) was available 84.2% of the time.



4.2.4 Data Loss Statistics

Some of the "Fullword Savevalues" show how much data was terminated or lost at each block in the model. SAVEVALUE numbers 1 thru 20 correspond to the model item numbers. At block 4, the experiment computer, 861,945 K bits were lost. This loss was because although data was going into the computer no data is called to leave the computer, therefore after the computer is filled any additional data added causes a like amount of data to be lost. SAVEVALUE's between 20 and 100 are used for programming purposes only and can usually be ignored. SAVEVALUE numbers from 100 up are used for saving graphical values and can be disregarded.

4.2.5 Equipment Utilization Profiles ,

The non-standard portion of the output is a series of graphs, one for each item of hardware used. These graphs show contents of the item versus time. Because of the limits of the GPSS report generator only a limited number of time periods can be represented on a page of output. These graphs give a "snapshot" value at each time period, that is, the contents of the block is the instantaneous value at the time given below the line. For example, it may be seen from Figure 7 that the contents of the experiment RAU's is about 900 K at the end of the 12th hour.



SECTION V

CONCLUSIONS AND RECOMMENDATIONS

The SSDSS has been thoroughly tested using Shuttle Mission 18 data profile as input. The model appears to replicate quite accurately the interactions which will occur in the data management system of the actual mission. From limited trade study analysis it is apparent that this model can provide valuable information for Space Shuttle Data Management System designers.

It is recommended that developmental work on the SSDSS be continued on three major fronts. First, that the program be examined thoroughly for user oriented improvements which could be incorporated without changing the basic program. Second, that efforts be made to achieve additional program efficiency resulting in either improved core or run time requirements. Third, that further effort be expended in developing improved output with the ultimate objective of obtaining an instantaneous utilization profile of each item of equipment for the duration of the mission.



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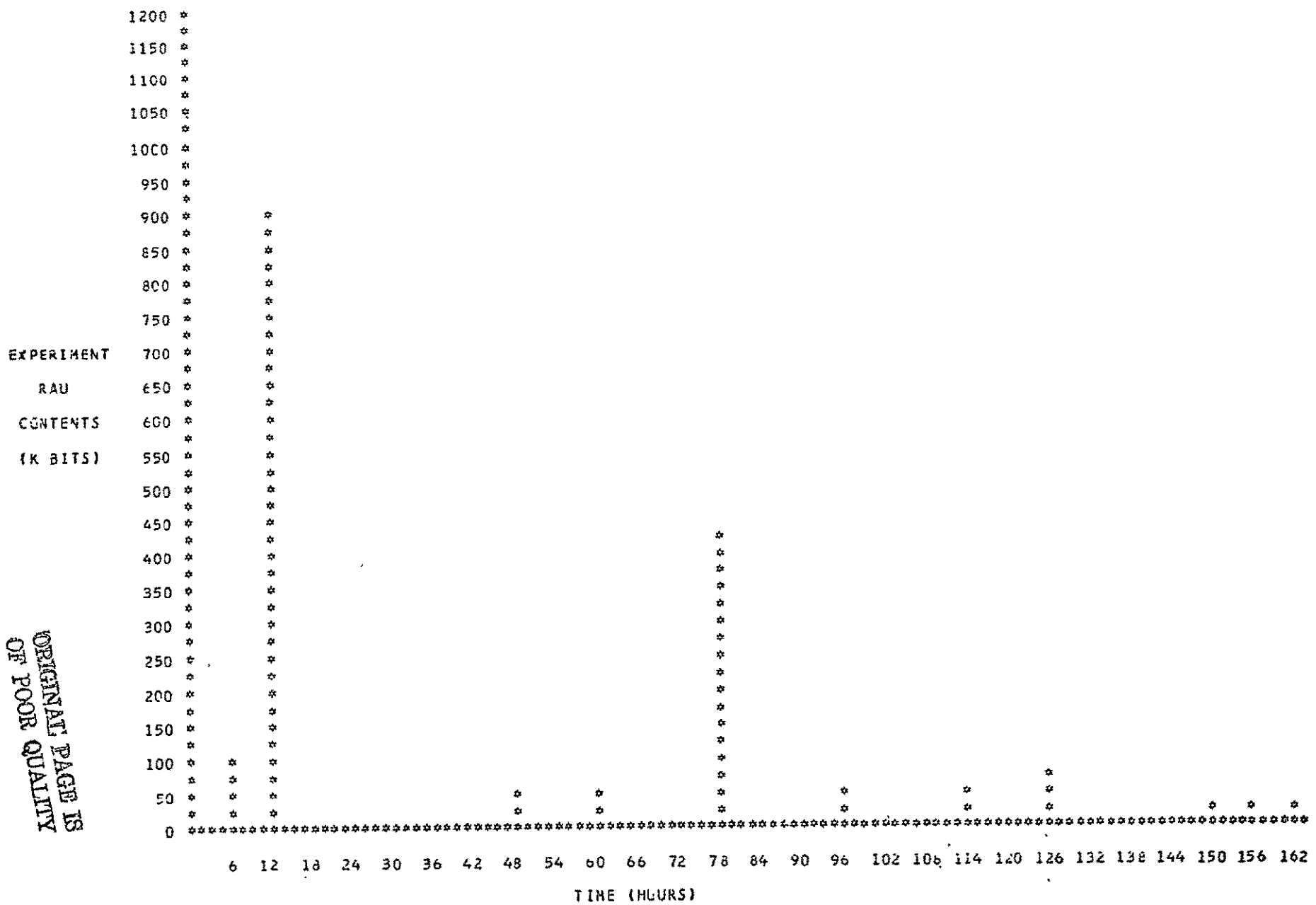


FIGURE 7: CONTENTS OF EXPERIMENT RAU AS A FUNCTION OF TIME.

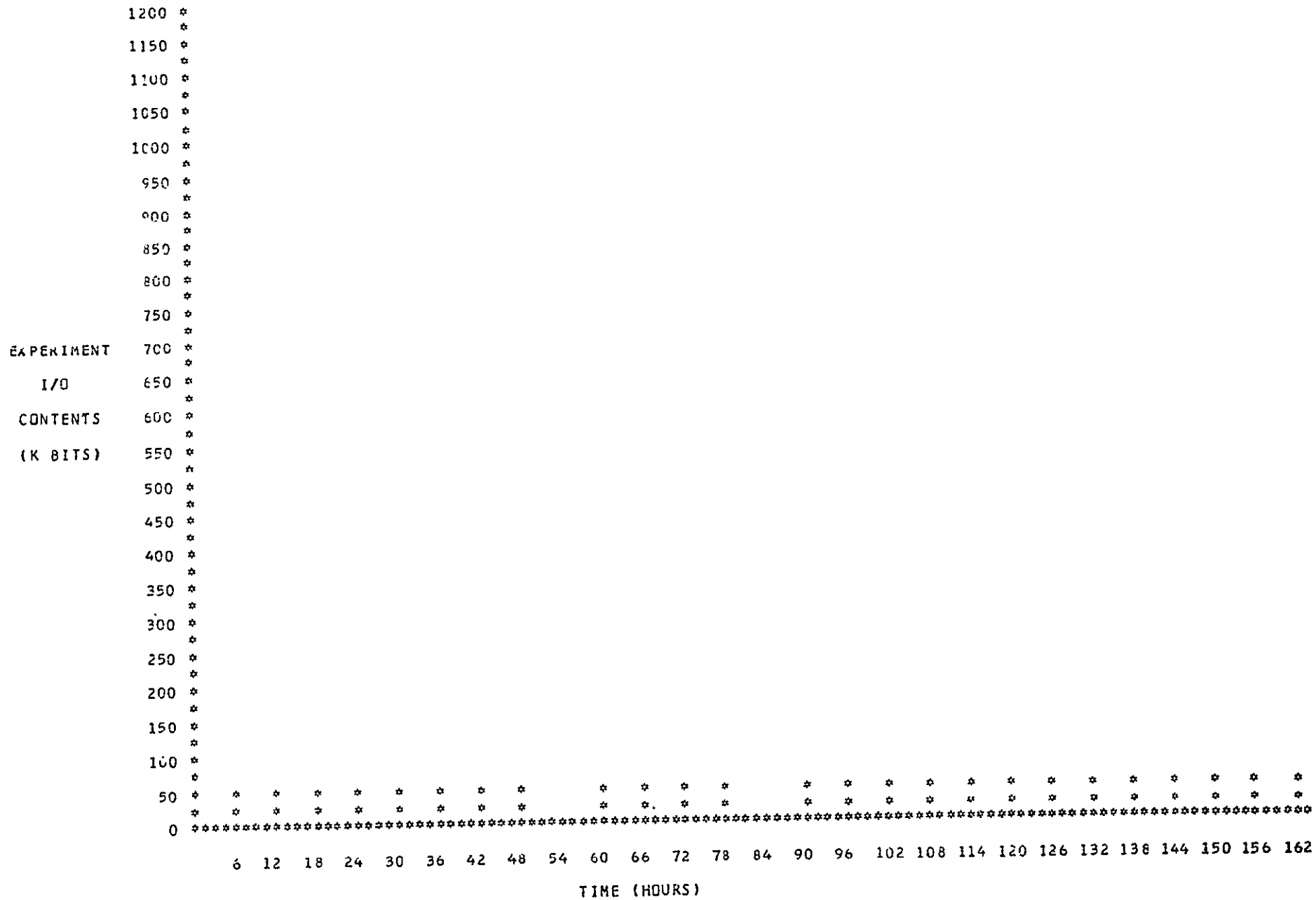


FIGURE 8: CONTENTS OF EXPERIMENT I/O AS A FUNCTION OF TIME.

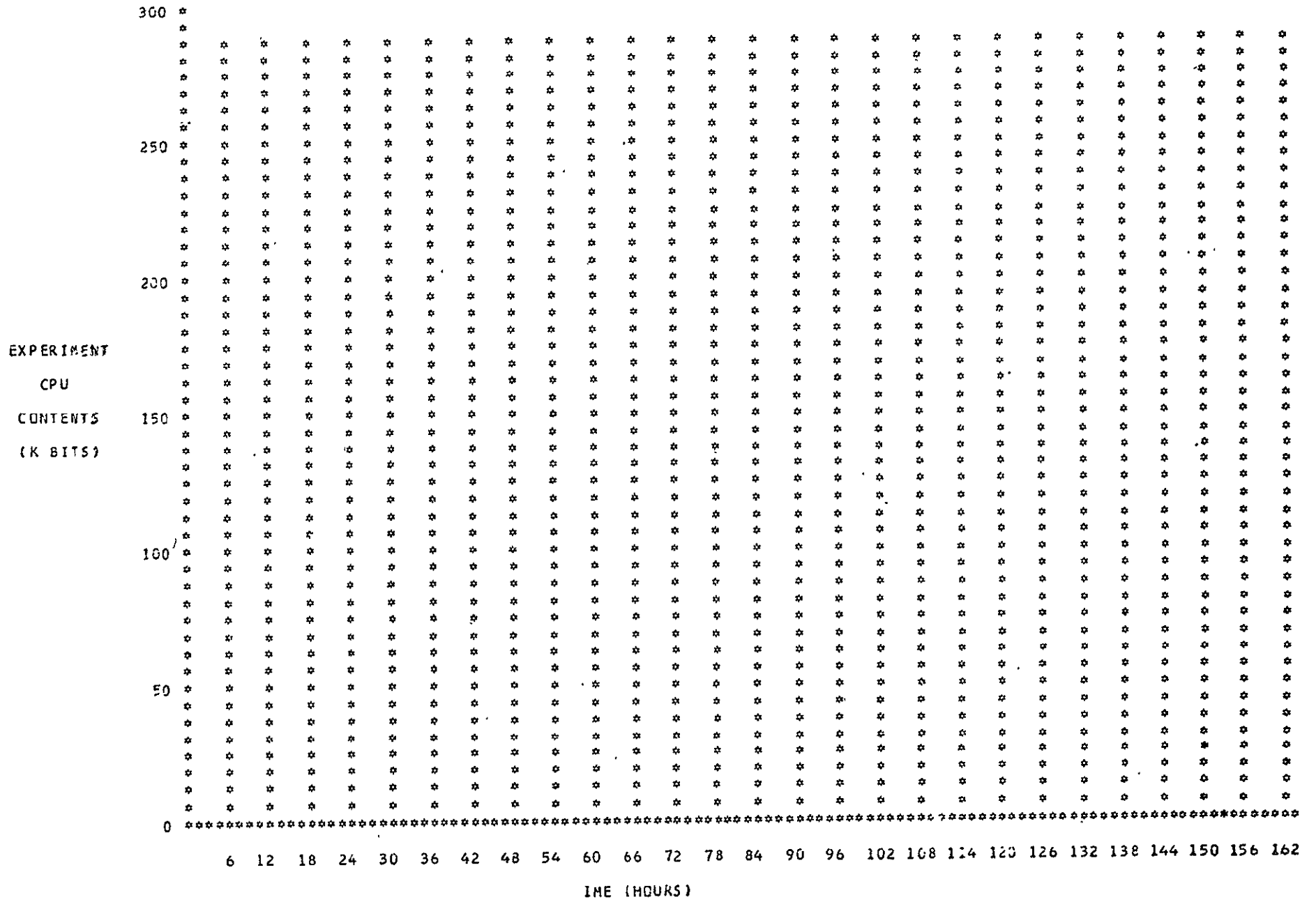


FIGURE 9: CONTENTS OF EXPERIMENT CPU AS A FUNCTION OF TIME.

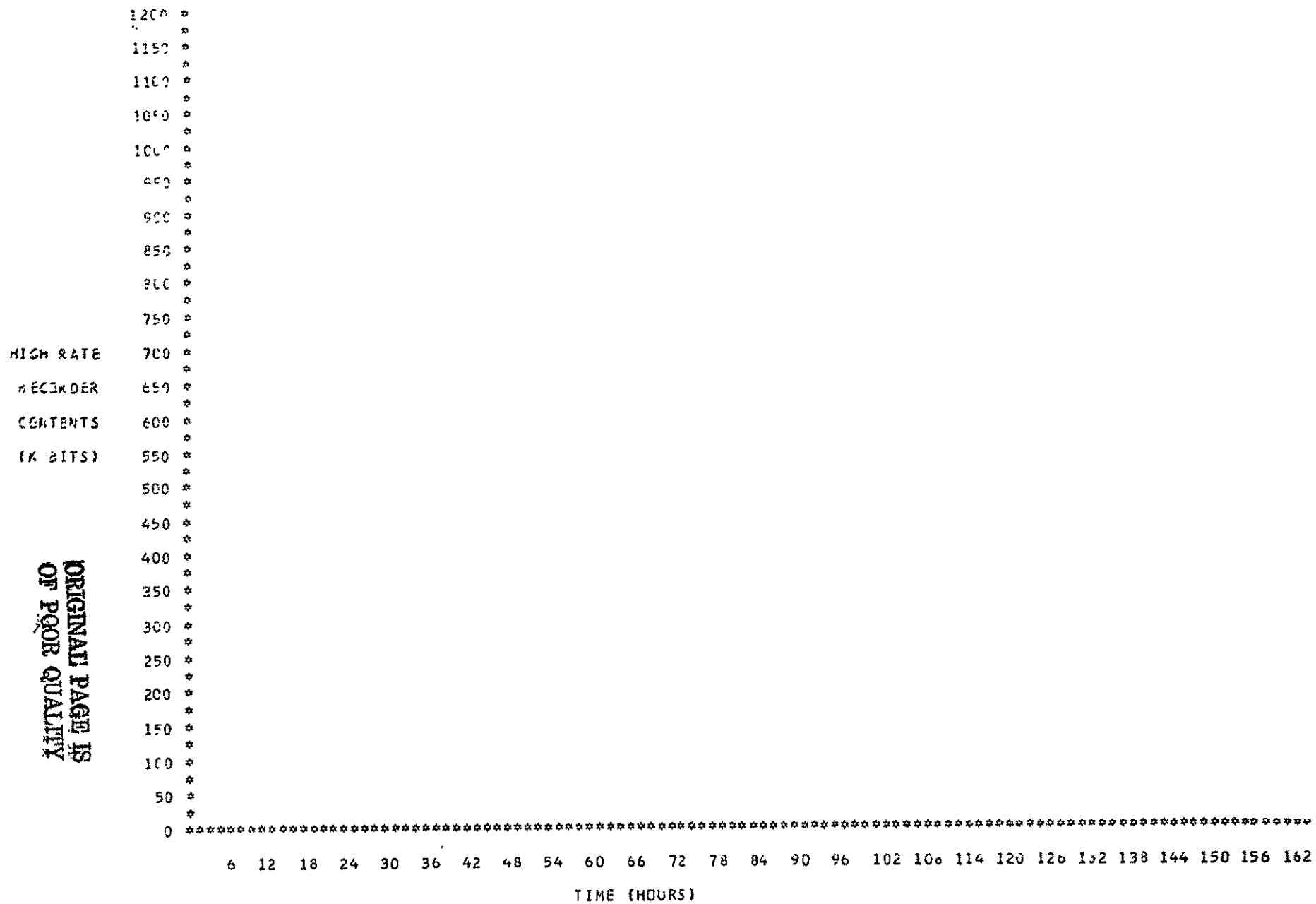


FIGURE 10: CONTENTS OF HIGH RATE RECORDER AS A FUNCTION OF TIME.

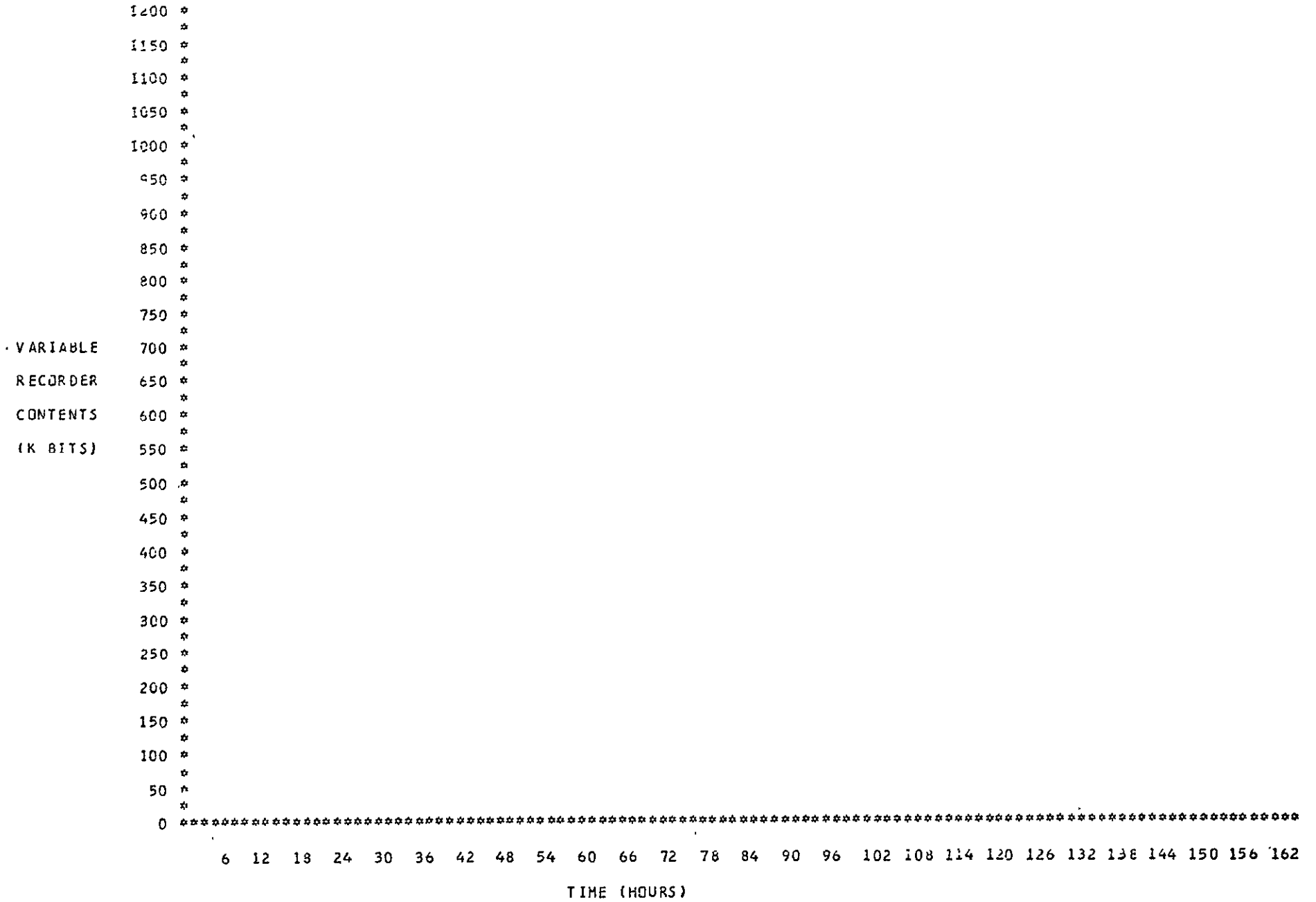


FIGURE 11: CONTENTS OF VARIABLE RATE RECORDER AS A FUNCTION OF TIME.

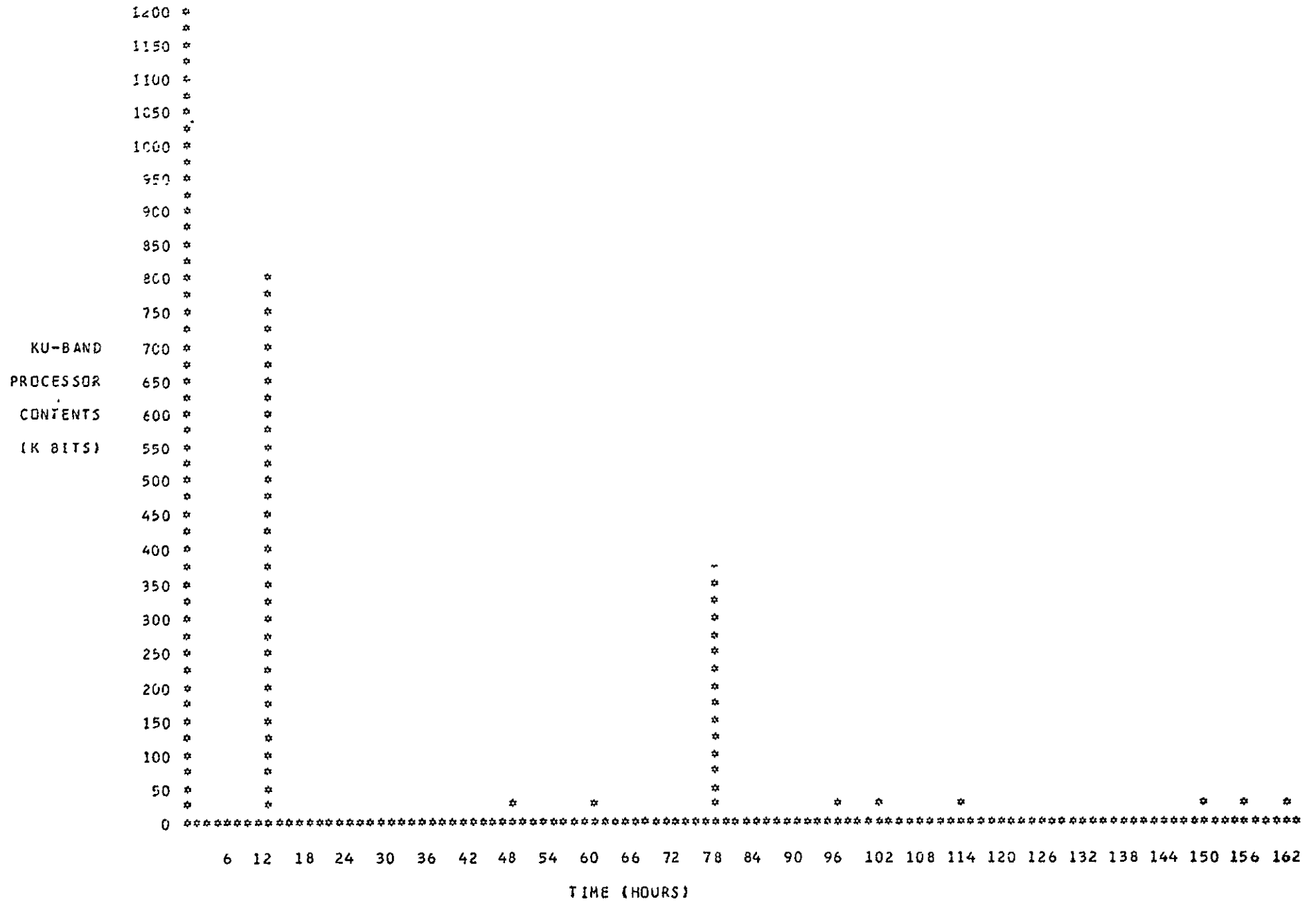


FIGURE 12: CONTENTS OF KU-BAND PROCESSOR AS A FUNCTION OF TIME.

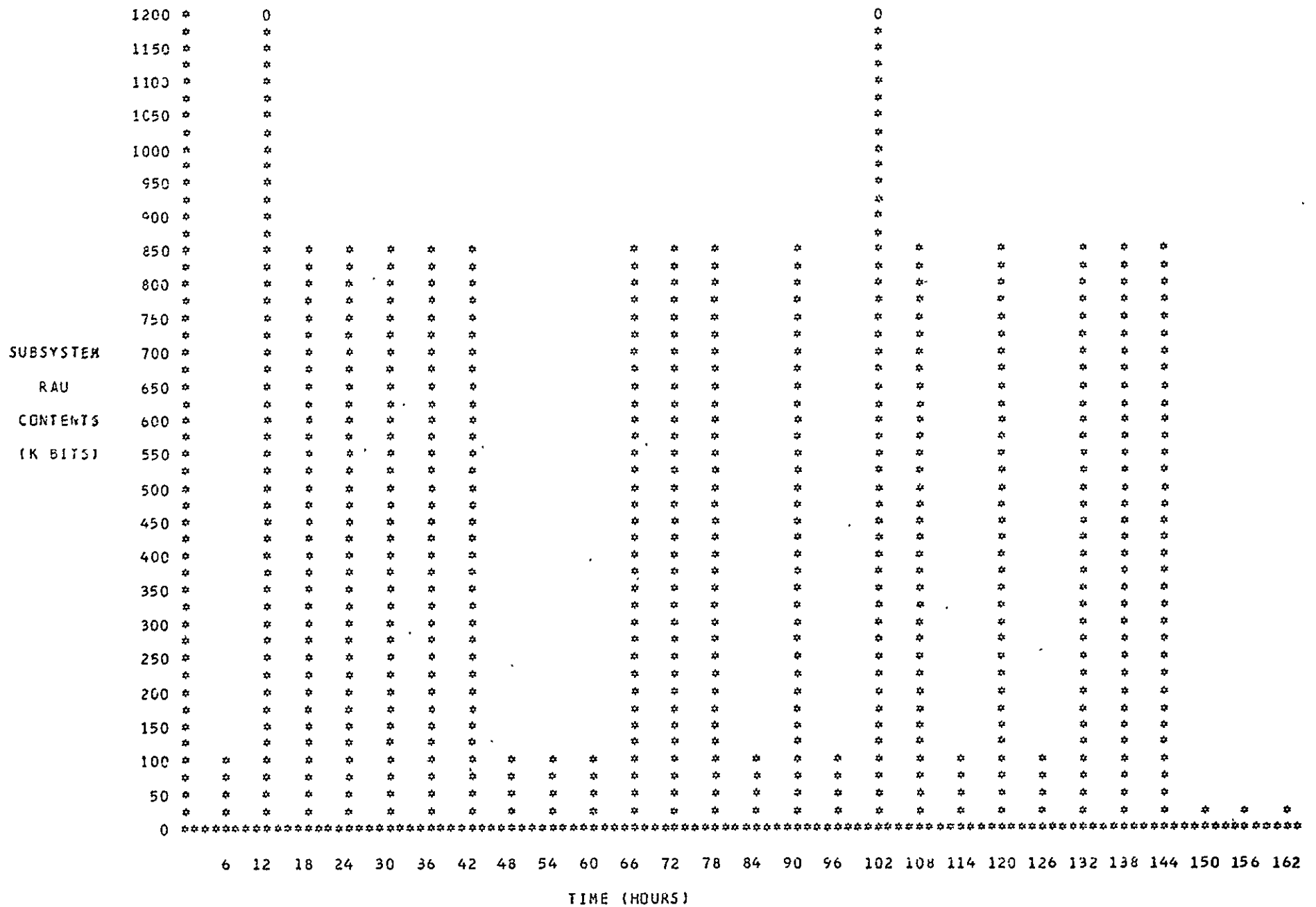


FIGURE 13: CONTENTS OF SUBSYSTEM RAU AS A FUNCTION OF TIME.

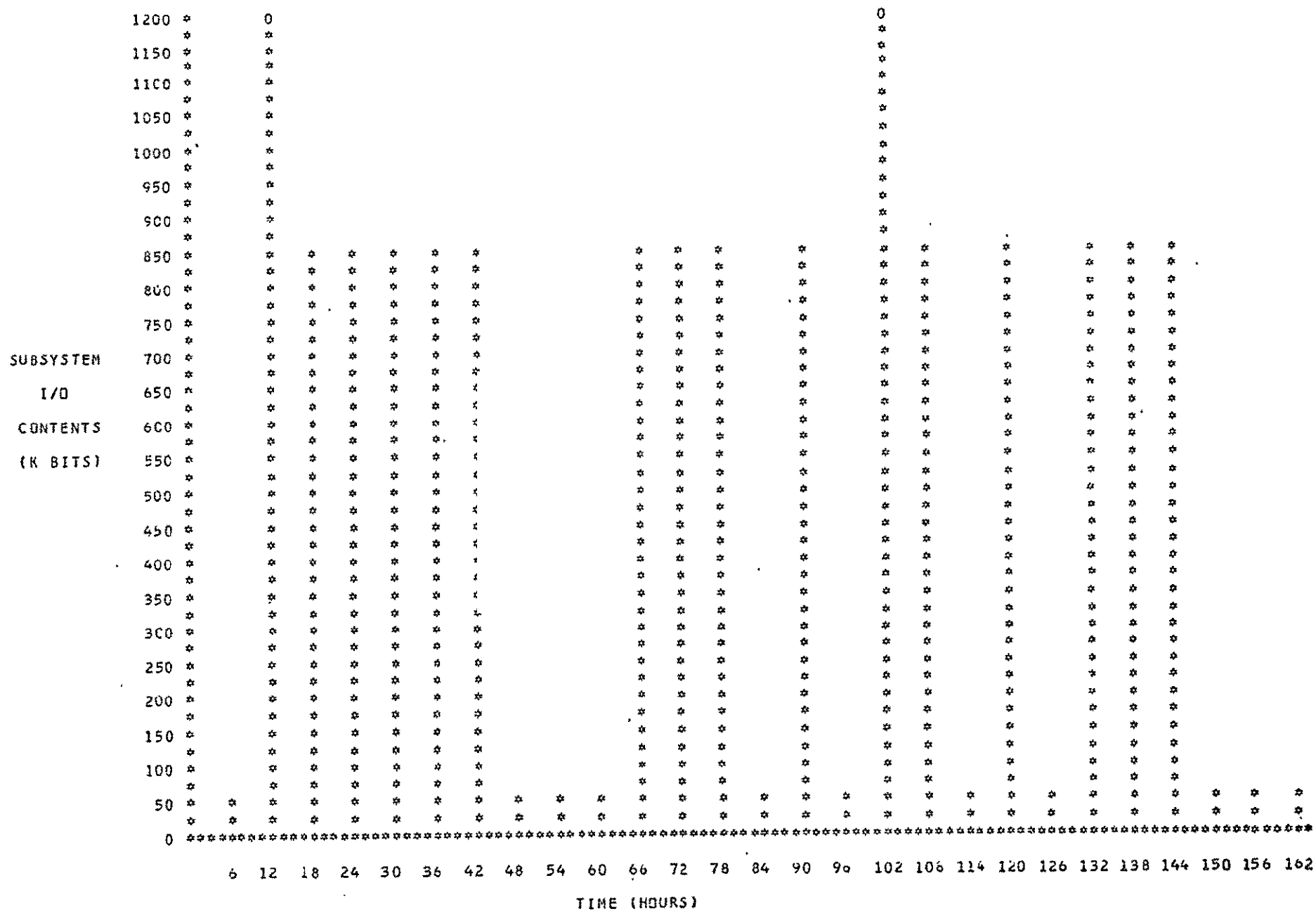


FIGURE 14:CONTENTS OF SUBSYSTEM I/O AS A FUNCTION OF TIME.

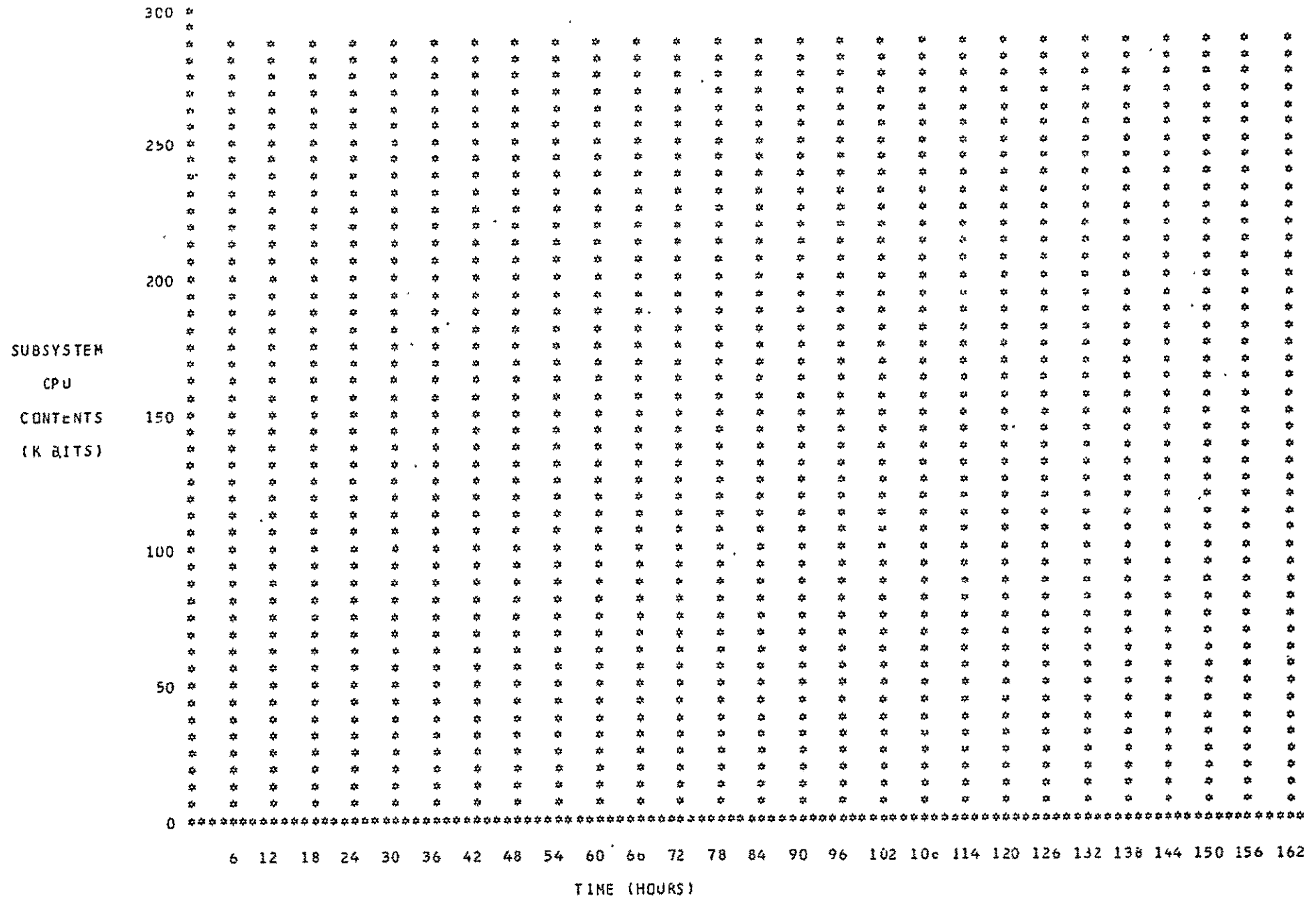


FIGURE 15: CONTENTS OF SUBSYSTEM CPU AS A FUNCTION OF TIME.

1331

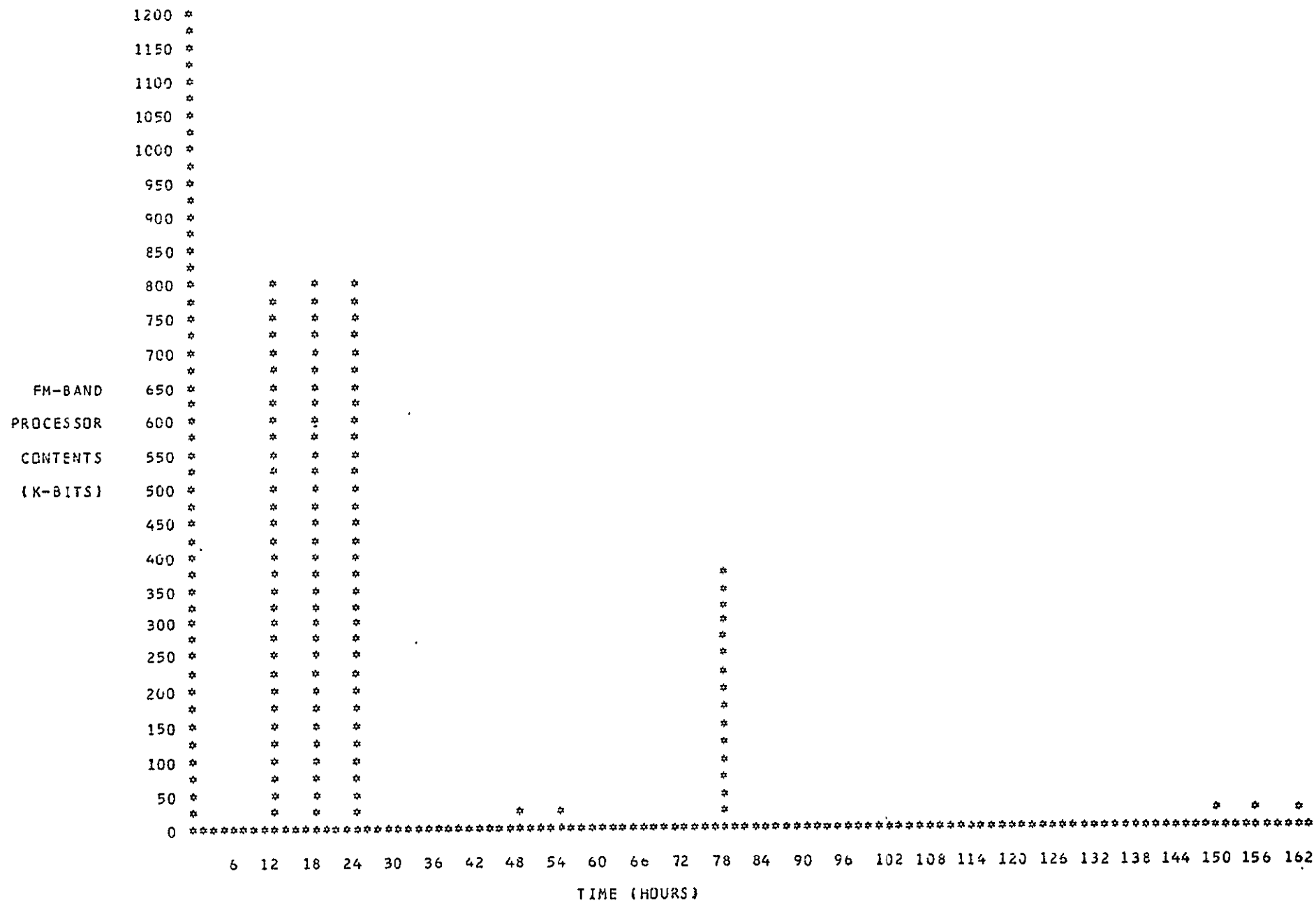


FIGURE 16: CONTENTS OF FM PRUESSOR AS A FUNCTION OF TIME.

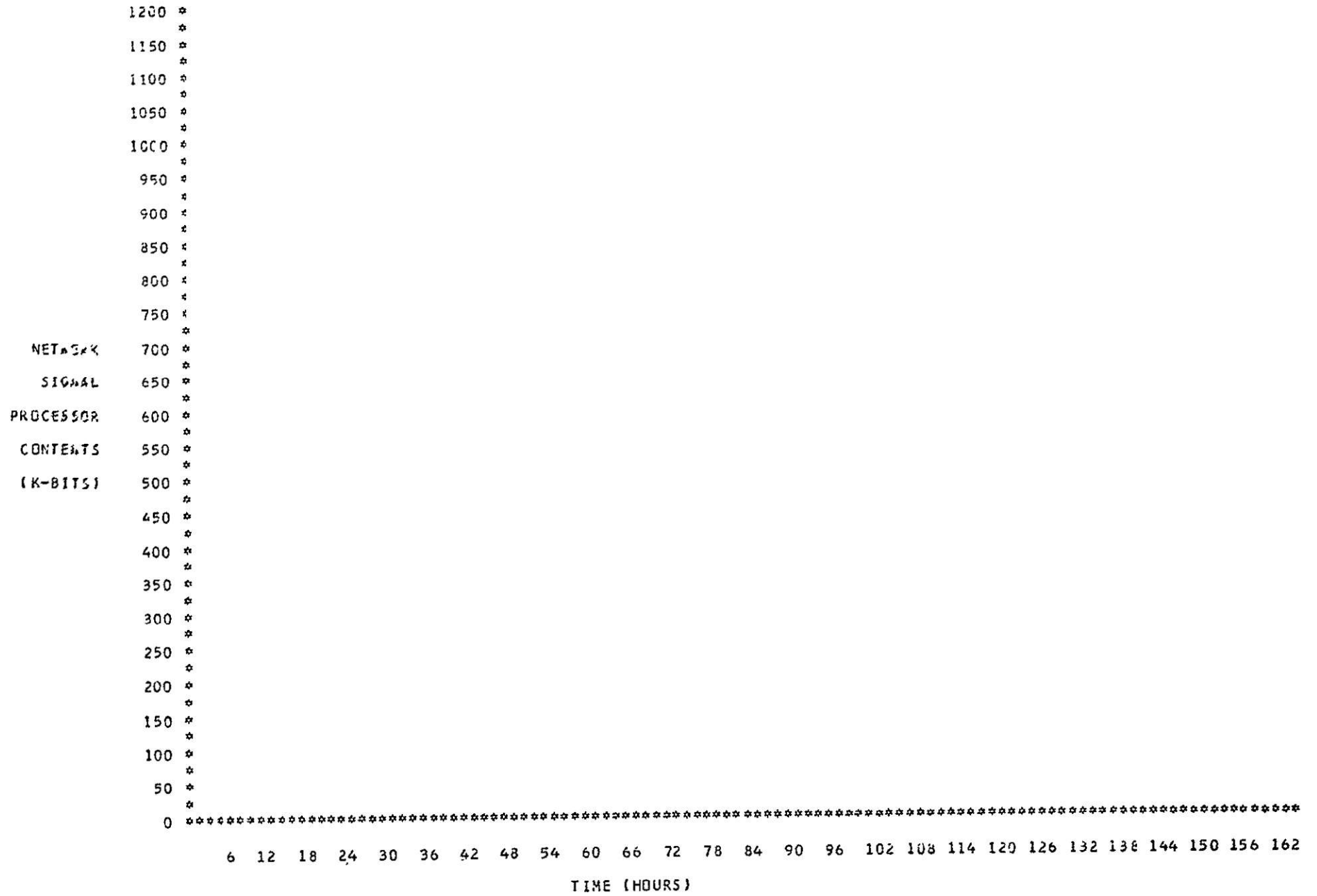


FIGURE 17: CONTENTS OF NETWORK SIGNAL PROCESSOR AS A FUNCTION OF TIME.

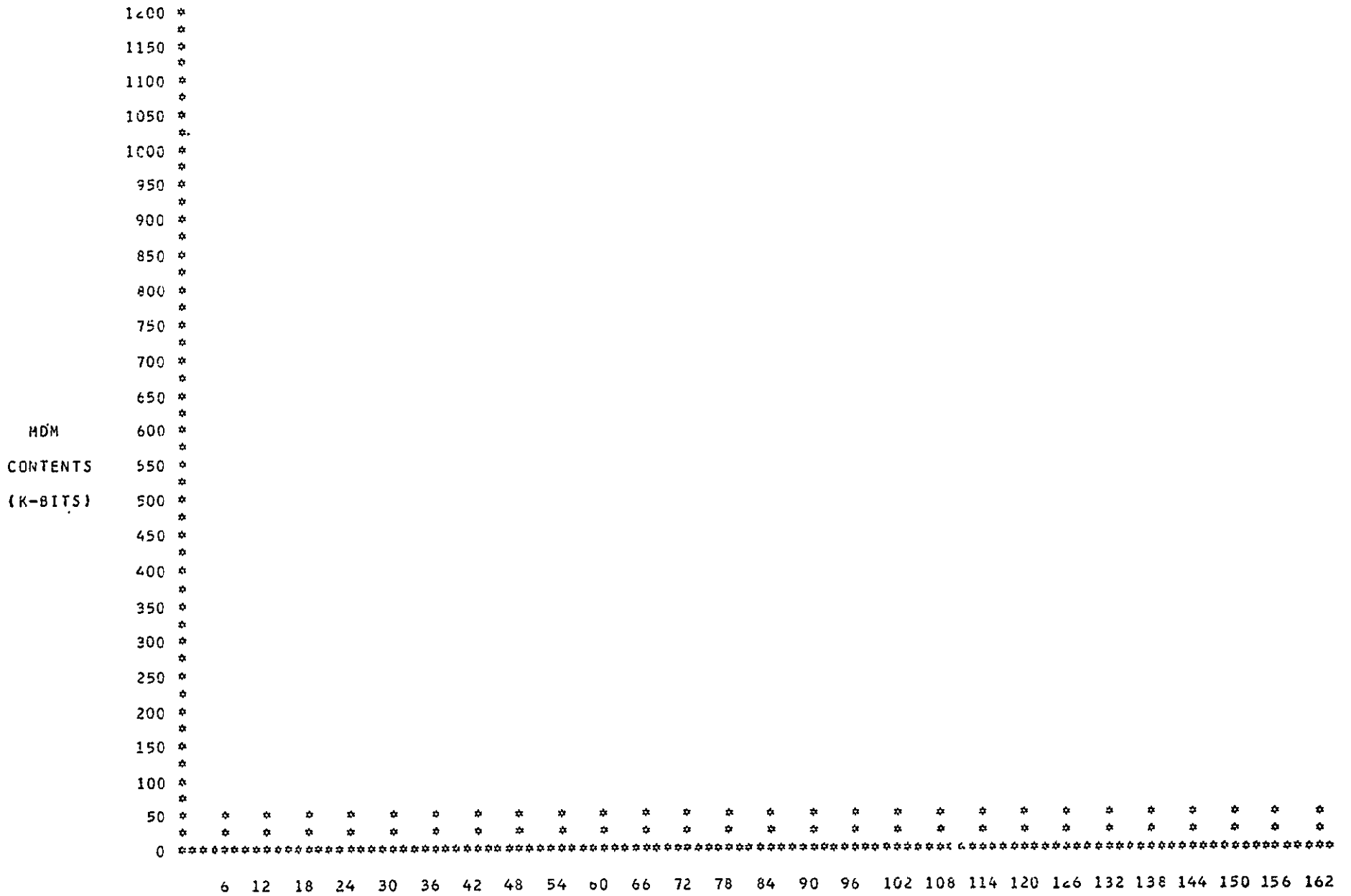


FIGURE 18: CONTENTS OF MDM AS A FUNCTION OF TIME.

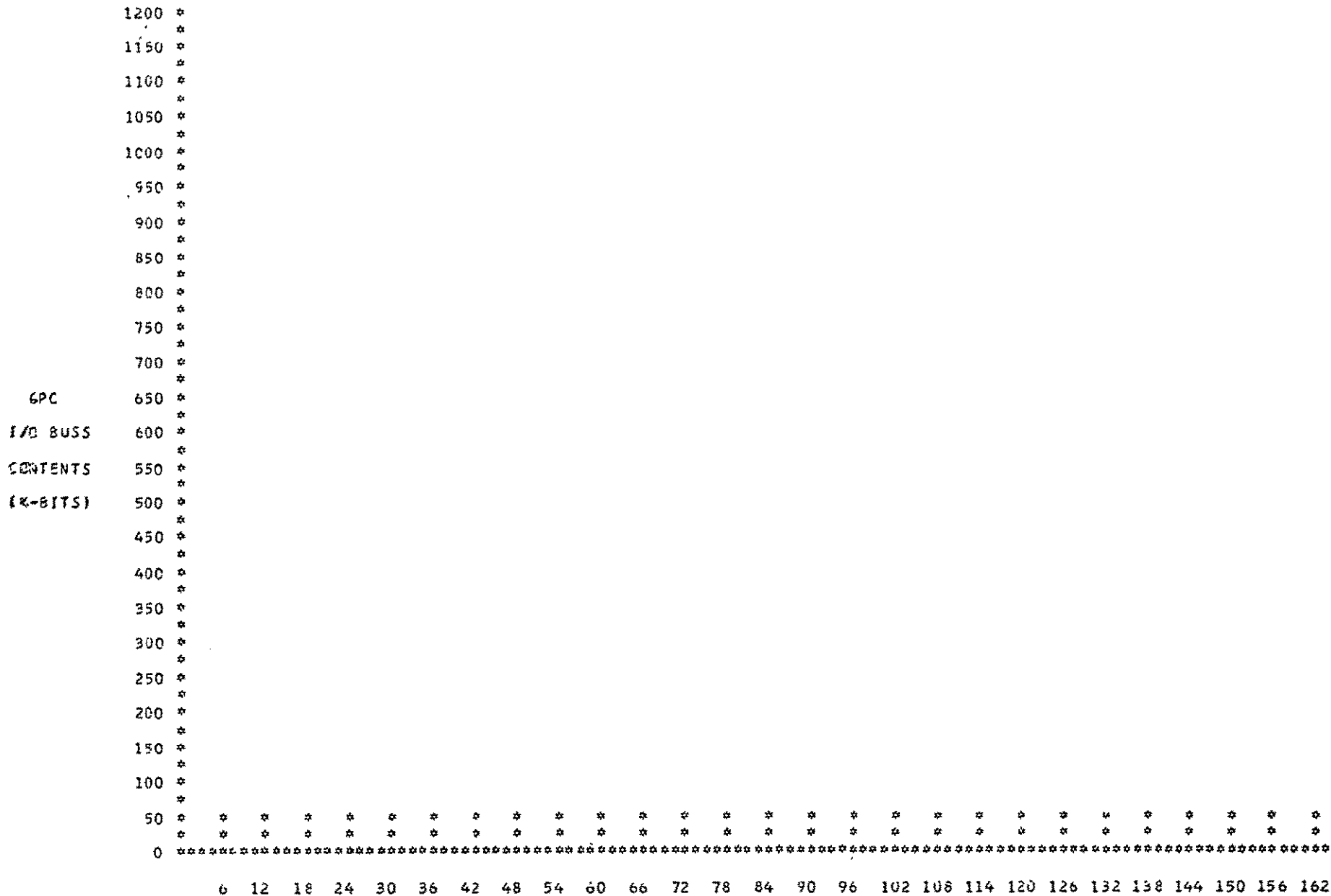


FIGURE 19: CONTENTS OF GENERAL PURPOSE COMPUTER I/O BUSS AS A FUNCTION OF TIME.

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-37-

GPC
CONTENTS
(K-BITS)

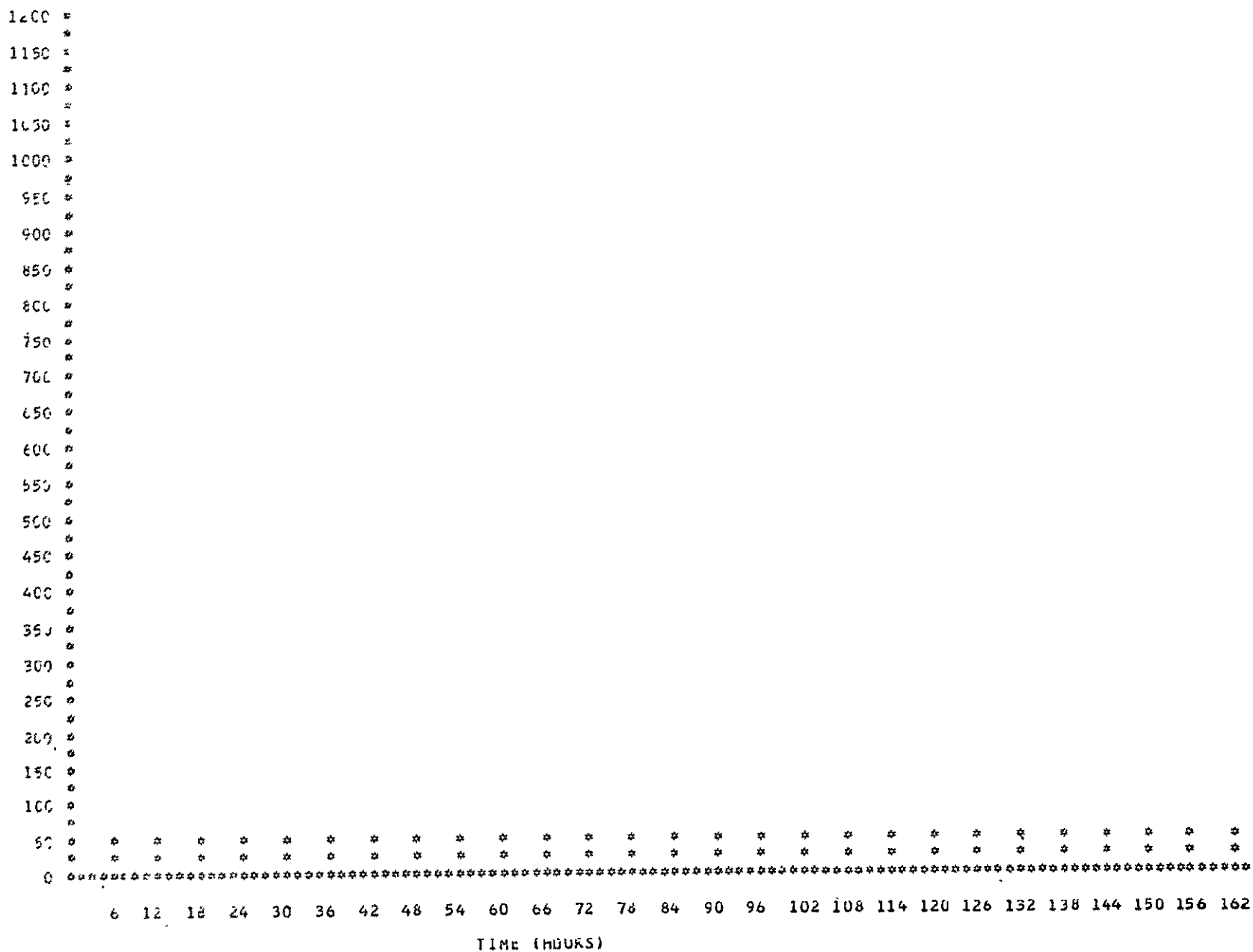


FIGURE 20: CONTENTS OF GENERAL PURPOSE COMPUTER AS A FUNCTION OF TIME.

SECTION VI

REFERENCES

1. Book 18 - Mission 18, Volume III, "Integrated Mission Planning, First Two Years of Shuttle Missions," George C. Marshall Space Flight Center, NASA, August 15, 1974. .
2. "CAMS Subsystem Specifications," Document No. SS-ER-0004, ERNO, May 1975.
3. "Space Shuttle System Payload Accommodations," Document No. JSC-07700, Volume XIV, Revision C, with change 10, Johnson Space Center, July 1974.
4. "General Purpose Simulation System-V User's Manual," Document No. SH20-0851-1, IBM, August 1971.



APPENDIX A
SYSTEM MODULE I/O CONFIGURATIONS



APPENDIX A

SYSTEM MODULE I/O CONFIGURATIONS

Module

Configuration

Experiments

- Science Data
 - Inputs: None
 - Outputs: Compiled from mission schedule
 - 95 percent direct to transmission.
 - 5 percent transmitted to RAU.

- Engineering Data
 - Inputs: N/A
 - Outputs: Transmitted to RAU's. Rate of 3 KBPS.

- Command Data
 - Inputs: Experiment RAU's at 2 KBPS.
 - Outputs: N/A

- GN&C Data
 - Inputs: N/A
 - Outputs: Transmission to experiment RAU's. Rate of 1 KBPS.

2

Experiment RAU's

- Science Data
 - Inputs: From experiments at rate compiled from mission schedule.
 - Outputs: Transmitted to experiment I/O at 1 MBPS.

- Engineering Data
 - Inputs: From experiments at 3 KBPS.
 - Outputs: Transmitted to experiment I/O at 1 MBPS.

- Command Data
 - Inputs: From experiment I/O at 2 KBPS.
 - Outputs: To experiments at 2 KBPS.

- GN&C Data
 - Inputs: From experiments at 1 KBPS.
 - Outputs: Experiment I/O at 1 KBPS.



Module

Configuration

3

Experiment I/O

• Science Data

• Inputs:

- Experiment RAU at 1 MBPS.
- Experiment Computer at 8 KBPS.

• Outputs:

- Experiment Computer at 8 KBPS; thru Experiment I/O to Payload Data Interleaver at 8 KBPS.
- To Variable Rate Recorders (Downlink not available) or to FM Signal Processor (Downlink available, KU Band Signal Processor not available) or KU Band Signal Processor (Downlink available) at 1 MBPS.

• Engineering Data

• Inputs:

- Experiment RAU at 1 MBPS.
- Experiment Computer at 1 MBPS.

• Outputs:

- Payload Data Interleaver or Experiment Computer at 1 MBPS.

• Command Data

• Inputs:

- Experiment Computer at 2 KBPS.
- Payload Signal Processor at 2 KBPS (Without both Detached Payload and Subsystem Commands).
- MDM-(When there is no Safety and Arming Command and 90% of data has by-passed the PSP and there is no Subsystem Command.); at 2 KBPS.
- CDMS Control Panel at 2 KBPS. (When there is no Subsystem Command).
- KU-Band Signal Processor at 2 KBPS. (When there is a Direct Payload Command and no Subsystem Command).

• Outputs:

- Experiment Computer at 2 KBPS.
- Addressed Experiment RAU at 2 KBPS.
- MDM-at 2 KBPS; (When GPC interaction is required).

GN&C Data

• Inputs:

- MDM-at 2 KBPS. (When there is no Subsystem Data).
- Experiment RAU at 1 KBPS.
- Experiment Computer at 1 KBPS.

• Outputs:



Module

Configuration

- Experiment Computer at 2 KBPS.
- Experiment Computer at 1 KBPS.
- MDM-at 1 KBPS.

4

Experiment Computer

- Science Data
 - Inputs:
 - Experiment I/O at 8 KBPS.
 - Outputs:
 - Experiment I/O at KBPS.

- Engineering Data
 - Inputs: Experiment I/O at 8 KBPS.
 - Outputs: Experiment I/O at 8 KBPS.

- Command Data
 - Inputs:
 - Experiment I/O at 2 KBPS.
 - Outputs:
 - Experiment I/O at 2 KBPS.

- GN&C Data
 - Inputs:
 - Experiment I/O at 2 KBPS.
 - Experiment I/O at 1 KBPS.
 - Outputs:
 - Experiment I/O at 1 KBPS.

5

High Rate Recorders

- Science Data
 - Inputs: Experiment at rate compiled from mission schedule. Capacity: 30 MBPS input; 36,000 M bits total.
 - Outputs: KU-Band Signal Processor at 30 MBPS.

- Engineering Data
 - N/A

- Command Data
 - N/A



<u>Module</u>	<u>Configuration</u>
	<ul style="list-style-type: none"> • GN&C Data <ul style="list-style-type: none"> • N/A
6	<p>Variable Rate Recorders</p> <ul style="list-style-type: none"> • Science Data <ul style="list-style-type: none"> • Inputs: Experiment I/O. • Capacity: 30 MBPS input; 36,000 M bits total. • Outputs: KU-Band Signal Processor at 30 MBPS or FM Signal Processor at 1 MBPS. • Engineering Data <ul style="list-style-type: none"> • N/A • Command Data <ul style="list-style-type: none"> • N/A • GN&C Data <ul style="list-style-type: none"> • N/A
7	<p>Payload Data Interleaver</p> <ul style="list-style-type: none"> • Science Data <ul style="list-style-type: none"> • Inputs: Experiment I/O at 8 KBPS. Payload Signal Processor (omit). • Outputs: DACBU at 16 KBPS. • Engineering Data <ul style="list-style-type: none"> • Inputs: <ul style="list-style-type: none"> • Experiment I/O, Subsystem I/O at 64 KBPS. • Payload Signal Processor (Omit). • Outputs: DACBU at 64 KBPS. • Command Data <ul style="list-style-type: none"> • N/A • GN&C Data <ul style="list-style-type: none"> • N/A
8	<p>DACBU</p> <ul style="list-style-type: none"> • Science Data <ul style="list-style-type: none"> • Inputs: Payload Data Interleaver at 16 KBPS. • Outputs: Network Signal Processor at 64 KBPS.



Module

Configuration

- Engineering Data
 - Inputs: Payload Data Interleaver at 64 KBPS.
 - Outputs: Loop Recorder at 128 KBPS. Network Signal Processor at 128 KBPS.

- Command Data
 - N/A

- GN&C Data
 - N/A

- 9 Loop Recorder
 - Science Data
 - N/A

 - Engineering Data
 - Inputs: DACBU at 128 KBPS.
 - Outputs: FM Signal Processor at 128 KBPS.

 - Command Data
 - N/A

 - GN&C Data
 - N/A

- 10 FM Signal Processor
 - Science Data
 - Inputs: Variable Rate Recorder at 1 MBPS.
 - Outputs: Ground at 1 MBPS.

 - Engineering Data
 - Inputs: Loop Recorder at 128 KBPS.
 - Outputs: Ground at 1 MBPS.

 - Command Data
 - N/A

 - GN&C Data
 - N/A



Module

Configuration

11

Network Signal Processor

- Science Data
 - Inputs: DACBU at 64 KBPS.
 - Outputs: Ground at 96 or 192 KBPS or KU-Band Signal Processor at 192 KBPS.

- Engineering Data
 - Inputs: DACBU at 128 KBPS.
 - Outputs: Ground at 192 KBPS or KU-Band Signal Processor at 192 KBPS.

- Command Data
 - Inputs: Ground command at 2 KBPS or KU-Band Signal Processor at 2 KBPS (When there is no Direct Payload command).
 - Outputs: MDM at 2 KBE

- GN&C Data
 - N/A

12

KU-Band Signal Processor

- Science Data
 - Inputs:
 - Experiment at rate determined by mission schedule and signal acquisition schedule.
 - High Rate Recorders at 30 MBPS.
 - Variable Rate Recorders at 30 MBPS.
 - Network Signal Processor at 192 KBPS.

 - Outputs: Ground at 30 MBPS.

- Engineering Data
 - Inputs: Network Signal Processor at 192 KBPS.
 - Outputs: Ground at 30 MBPS.

- Command Data
 - Inputs: Ground command at 2 KBPS.
 - Outputs: All three at 2 KBPS---
 - Network Signal Processor (with no Direct Payload Command); or Experiment I/O (With a Direct Payload Command and no Subsystem Command); or Subsystem I/O (with both Direct Payload and Subsystem Commands).

- GN&C Data
 - N/A



Module

Configuration

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Subsystem

- Science Data
 - N/A

- Engineering Data
 - Inputs: Non_
 - Outputs: RAU at 3 KBPS plus 10% of experiment data rate compiled from mission schedule.

- Command Data
 - Inputs: MDM - at 2 KBPS; (When there is a Payload, Safety and Arming Command).
Subsystem RAU at 2 KBPS.
 - Outputs: None

- GN&C Data
 - Inputs: Subsystem RAU at 2 KBPS.
 - Outputs: Subsystem RAU at 1 KBPS.

14

Subsystem RAU

- Science Data
 - N/A

- Engineering Data
 - Inputs: Subsystem at 3 KBPS plus 10% of experiment data rate compiled from mission schedule.
 - Outputs: Subsystem I/O at 1 MBPS.

- Command Data
 - Inputs:
 - Subsystem I/O at 2 KBPS, (with no GPC Interaction required)
 - Subsystem I/O at 2 KBPS.
 - Subsystem I/O at 2 KBPS (with no Process Monitor required)
 - Outputs: Subsystem at 2 KBPS.

- GN&C Data
 - Inputs:
 - Subsystem I/O at 2 KBPS.
 - Subsystem at 1 KBPS.
 - Outputs:
 - Subsystem at 1 KBPS.
 - Subsystem I/O at 1 KBPS.



ModuleConfiguration

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Subsystem I/O

- Science Data
 - N/A

- Engineering Data
 - Inputs:
 - Subsystem RAU at 1 MBPS.
 - Subsystem Computer at 8 KBPS.
 - Outputs:
 - Subsystem Computer at 8 KBPS.
 - Payload Data Interleaver at 1 MBPS.

- Command Data
 - Inputs:
 - CDMS Control Panel at 2 KBPS (with a Subsystem Command).
 - Subsystem Computer at 2 KBPS.
 - Payload Signal Processor at 2 KBPS (with no Detached Payload Command, but with a Subsystem Command)
 - MDM--(When there is no Safety and Arming Command and 90% of data has by-passed the PSP and there is a Subsystem Command); at 2 KBPS.
 - KU-Band Signal Processor at 2 KBPS; (When there is both a Direct Payload Command and a Subsystem Command)

 - Outputs:
 - Subsystem Computer at 2 KBPS.
 - Subsystem RAU at 2 KBPS.
 - MDM at 2 KBPS; (When GPC interaction is required).

- GN&C Data
 - Inputs:
 - Subsystem Computer at 2 KBPS and 1 KBPS.
 - MDM at 2 KBPS. (When there is Subsystem data)
 - Subsystem RAU at 1 KBPS.
 - Outputs:
 - Subsystem Computer at 2 KBPS and 1 KBPS.
 - Subsystem RAU at 2 KBPS.
 - MDM at 1 KBPS.

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Subsystem Computer

- Science Data
 - N/A



Module

Configuration

- Engineering Data
 - Inputs: Subsystem I/O at 8 KBPS.
 - Outputs: Subsystem I/O at 8 KBPS.
- Command Data
 - Inputs: Subsystem I/O at 2 KBPS.
 - Outputs: Subsystem I/O at 2 KBPS.
- GN&C Data
 - Inputs: Subsystem I/O at both 2 KBPS and 1 KBPS.
 - Outputs: Subsystem I/O at both 2 KBPS and 1 KBPS.

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MDM

- Science Data
 - N/A
- Engineering Data
 - N/A
- Command Data
 - Inputs:
 - Network Signal Processor at 2 KBPS.
 - Subsystem I/O at 2 KBPS; (When GPC interaction is required).
 - Experiment I/O at 2 KBPS; (When GPC interaction is required).
 - GPC I/O Buss at 2 KBPS.
 - Outputs:
 - GPC I/O Buss at 2 KBPS.
 - Subsystem at 2 KBPS; (When there is Payload, Safety and Arming Command).
 - Payload Signal Processor at 2 KBPS. (When there is Payload, Safety and Arming Command and 10% of the data is routed to the PSP).
 - Subsystem I/O at 2 KBPS. (When there is no Att. Payload, Safety and Arming Command and 90% of the data has by-passed the PSP and there is a Sub-system command).
 - Experiment I/O at 2 KBPS. (When there is no Payload, Safety and Arming Command and 90% of the data has by-passed the PSP and there is no Subsystem Command).
- GN&C Data
 - Inputs:



Module

Configuration

- GPC I/O Buss at 2 KBPS.
- Subsystem I/O at 1 KBPS
- Experiment I/O at 1 KBPS.

- Outputs:
 - Experiment I/O at 2 KBPS; (When there is no Sub-system data).
 - Subsystem I/O at 2 KBPS; (When there is Subsystem data).
 - GPC I/O Buss at 1 KBPS.

- 18 GPC Input/Output Buss.
 - Science Data
 - N/A

 - Engineering Data
 - N/A

 - Command Data
 - Inputs:
 - MDM at 2 KBPS.
 - GPC at 2 KBPS.
 - Outputs:
 - GPC at 2 KBPS
 - MDM at 2 KBPS.

 - GN&C Data
 - Inputs:
 - GPC at 2 KBPS.
 - MDM at 1 KBPS.
 - Outputs:
 - MDM at 2 KBPS.
 - GPC at 1 KBPS.

- 19 GP Computer
 - Science Data
 - N/A

 - Engineering Data
 - N/A



Module

Configuration

- Command Data
 - Inputs:
 - GPC I/O Buss at 2 KBPS.
 - Outputs:
 - GPC I/O Buss at 2 KBPS.

- GN&C Data
 - Inputs:
 - GPC I/O Buss at 1 KBPS.
 - Outputs:
 - GPC I/O Buss at 2 KBPS.

- 20 Payload Signal Processor
 - Science Data
 - N/A

 - Engineering Data
 - N/A

 - Command Data
 - Inputs:
 - MDM at 2 KBPS. (With no Payload, Safety and Arming Command and 10% data enters the PSP).
 - Outputs:
 - Subsystem I/O at 2 KBPS. (When there is no Detached Payload Command and a Subsystem Command).
 - Experiment I/O at 2 KBPS. (When there is no Detached Payload Command and no Subsystem Command).

 - GN&C Data
 - N/A



APPENDIX B
USER SET VARIABLES
DEFINITIONS OF MATRIX 4



APPENDIX B
USER SET VARIABLES
DEFINITIONS OF MATRIX 4

I. Data flow rate assignments as a percentage of the incoming data rate.

Science and Engineering data:

- MX4(1,1) = Percent of data from experiments to KU Band Signal Processor or High Rate Recorder.
- MX4(1,2) = Percent of data from experiments to experiment RAU's.
= 100 percent - MX4(1,1).
- MX4(1,3) = Percent of data lost by compression from I/O to computer.
- MX4(1,4) = Percent of data from I/O to computer.
= 100 percent - MX4(1,3).

Command data:

- MX4(1,5) = Percent of data from MDM to I/O or Payload Signal Processor, remainder is safety and arming signal to subsystems.
- MX4(1,6) = Percent of data from I/O or PSP branch of MX4(1,5) to PSP, remainder to I/O.
- MX4(1,7) = Percent of data from KU Band Signal Processor to Network Signal Processor, remainder to I/O's.
- MX4(1,8) = Percent of data from I/O branch of MX4(1,7) to subsystem I/O, remainder to experiment I/O.
- MX4(1,9) = Percent of data from subsystem I/O to subsystem RAU's, remainder to subsystem computer.
- MX4(1,10) = Percent of data from experiment I/O to experiment RAU's, remainder to experiment computer.
- MX4(1,11) = Percent of data from CDMS Control Panel to the experiment I/O, remainder to subsystem I/O.
- MX4(1,12) = Percent of control panel data from subsystem I/O to MDM for GPC interaction, remainder to experiment RAU's.
- MX4(1,13) = Percent of control panel data from experiment I/O to MDM for GPC interaction, remainder to experiment RAU's.



II. Data flow rate assignments at origination points.

Command data:

- MX4(1,14) = Data rate from command input to Network Signal Processor.
MX4(1,15) = Data rate from command input to KU Band Signal Processor.
MX4(1,16) = Data rate from the CDMS Control Panel.

GN&C data:

- MX4(1,17) = Data rate generated by the GPC to the GPC I/O Buss.
MX4(1,18) = Data rate from subsystems to subsystem RAU's.
MX4(1,19) = Data rate from experiments to experiment RAU's.

Engineering data:

- MX4(1,20) = Data rate from experiments to experiment RAU's.
MX4(1,21) = Data rate from subsystems to subsystem RAU's.



APPENDIX C
PROGRAM LISTING



*** J P S S V - G S V E R S I O N ***
*** I B M P R O G R A M P R O D U C T 5 7 3 4 - X 5 2 (V 1 M 3) ***

STATEMENT
NUMBER
1
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REALLOCATE CUM,67CCJ
REALLOCATE BLO,17CG,VAK,65,FUN,5,HSV,1
REALLOCATE GSV,1,LSV,1,GKP,1,HAS,1,BMS,1,LMS,1
REALLOCATE FAC,5G,STD,25,LUG,1,FSV,700,BVR,1,CHA,20,TAB,1

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BLOCK NUMBER	*LUC	OPERATION	A,B,C,D,E,F,G,H,I	COMMENTS	STATEMENT NUMBER
		SIMULATE	55		5
				*****	6
				*****	7
				*****	8
				*****	9
				*****	10
				D. P. ASSOCIATES, INC.	11
				*****	12
				SPACE SHUTTLE DATA SYSTEM SIMULATION	13
				*****	14
				*****	15
				*****	16
				*****	17
				*****	18
				*****	19
				USEP SET VARIABLES	20
				*****	21
	4	MATRIX	X,1,2,3		22
				*****	23
				MX4(1,1) =PERCENT OF DATA FROM EXPERIMENTS TO KU BAND OR RECORDER	24
				MX4(1,2) =100-MX4(1,1).	25
				MX4(1,3) =PERCENT OF DATA LOST BY COMPRESSION FROM I/O TO COMPUTER	26
				MX4(1,4) =100-MX4(1,3), DATA FROM I/O TO COMPUTER.	27
				*****	28
				COMMAND DATA ADJULE	29
				*****	30
				MX4(1,5) =PERCENT OF DATA FROM MDM TO I/O OR PAYLOAD SIGNAL PROCESSOR.	31
				MX4(1,6) =PERCENT OF DATA FROM MDM TO PALOAD SIGNAL PROCESSOR.	32
				MX4(1,7) =PERCENT OF DATA FROM KU-BAND TO NETWORK SIGNAL PROCESSOR.	33
				MX4(1,8) =PERCENT OF DATA FROM KU-BAND TO SUBSYSTEM I/O.	34
				MX4(1,9) =PERCENT OF DATA FROM SUBSYSTEM I/O TO SUBSYSTEM RAU.	35
				MX4(1,10) =PERCENT OF DATA FROM EXPERIMENT I/O TO EXPERIMENT RAU.	36
				MX4(1,11) =PERCENT OF DATA FROM CONTROL PANEL TO EXPERIMENT I/O.	37
				MX4(1,12) =PERCENT OF DATA FROM SUBSYSTEM I/O TO MDM.	38
				MX4(1,13) =PERCENT OF DATA FROM EXPERIMENT I/O TO MDM.	39
				*****	40
				DATA FLOW RATES	41
				*****	42
				MX4(1,14) =COMMAND RATE FROM COMMAND INPUT TO NETWORK SIGNAL PROCESSOR	43
				MX4(1,15) =COMMAND RATE FROM COMMAND INPUT TO KU BAND SIGNAL PROCESSOR	44
				MX4(1,16) =COMMAND RATE FROM CONTROL PANEL.	45
				MX4(1,17) =G+C RATE FROM GPC TO GPC I/O BUSS.	46
				MX4(1,18) =G+C RATE FROM SUBSYSTEM TO SUBSYSTEM RAU.	47
				MX4(1,19) =G+C RATE FROM EXPERIMENT TO EXPERIMENT RAU.	48
				MX4(1,20) =ENGINEERING DATA RATE FROM EXPERIMENT TO EXPERIMENT RAU.	49
				MX4(1,21) =ENGINEERING DATA RATE FROM SUBSYSTEM TO SUBSYSTEM RAU.	50
				*****	51
		INITIAL		MX4(1,1),95/MX4(1,2),5/,MX4(1,3),90/MX4(1,4),10	52
		INITIAL		MX4(1,5),98/MX4(1,6),10/MX4(1,7),95/,MX4(1,8),50	53
		INITIAL		MX4(1,9),90/MX4(1,10),90/MX4(1,11),50/MX4(1,12),75	54
		INITIAL		MX4(1,13),50	55
		INITIAL		MX4(1,14),72/MX4(1,15),72/MX4(1,16),72	56
		INITIAL		MX4(1,17),72/MX4(1,18),36/MX4(1,19),36	57
		INITIAL		MX4(1,20),108/MX4(1,21),108	58
		INITIAL		MX4(1,22),10/MX4(1,23),50	59

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**
*****
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*
* MACRO DEFINITION FOR TRANSMISSION OF ALL DATA TO NEXT UNIT
*
TRNSA STARTMACRO
#A GATE SNF #B, #C
TEST GE #L, PF3, #E
#F ENTER #D, PF3
BUFER MACRO
ASSIGN 8, #B, PF
ASSIGN 9, #F, PF
SAVEVALUE V53, PF9
LEAVE #E, PF3
TRANSFER , #D
ENDMACRO

*
* MACRO DEFINITION FOR TRANSMISSION OF PART DATA TO NEXT UNIT
* #A (TRNSP MACRO) = #E (TRNSA MACRO)
* #F (TRNSP MACRO) = #A (TRNSA MACRO)
* #H (TRNSP MACRO) = #F (TRNSA MACRO)
TRNSP STARTMACRO
#A ASSIGN #B, #C, PF
SPLIT 1, #D
PRIORITY #E
ASSIGN 3, #I, PF
ADVANCE 1
TRANSFER , #F
#D ASSIGN 3, #G, PF
TRANSFER , #H
ENDMACRO

*
*
* MACRO DEFINITION FOR DELAY TRANSMISSION TO NEXT UNIT
* #A (WAITA MACRO) = #C (TRNSA MACRO)
* #D (WAITA MACRO) = #A (TRNSA MACRO)
*
WAITA STARTMACRO
#A PRIORITY #B
QUEUE #L, PF3
ADVANCE 1
DEPART #C, PF3
TRANSFER , #D
ENDMACRO

*
* MACRO DEFINITION FOR TRANSMISSION OF ALL DATA TO SIGNAL PROCESSOR
*
TMITA STARTMACRO
#A GATE SNF #B, #C
TEST GE #L, PF3, #E
ENTER #D, PF3
BUFER MACRO
ASSIGN 8, #B, PF
ASSIGN 9, #F, PF
SAVEVALUE V53, PF9
LEAVE #B, PF3

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TERMINATE
ENDMACRO
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119
* MACRO DEFINITION FOR TRANSMISSION OF PART DATA TO SOURCE PROCESSOR
120
* #A (TMITP MACRO) = #E (TMITA-MACRO)
121
*
122
TMITP STARTMACRO
123
#A ASSIGN 10,4C,PF
124
SPLIT 1,4D
125
ASSIGN 3,4F,PF
126
TRANSFER ,4D
127
#G ASSIGN 3,PF10,PF
128
TRANSFER ,4E
129
ENDMACRO
130
*
131
* CONSTANT RATE RECORDER
132
*
133
* COLLECT ENTRY CANDIDATES
134
COU STARTMACRO
135
#A.. (QUEUE #B
136
" (TEST L #C,108000,4D
137
" (SAVEVALUE #E,PF3 11
138
" (SAVEVALUE #F,1
139
#G ADVANC 0
140
BUFER MACRO
141
ENDMACRO
142
* CHECK REMAINING SPACE
143
CHE STARTMACRO
144
TEST L #A,#B,#C
145
TEST GE PF3,4D,#E
146
SPLIT 1,4F
147
ASSIGN 3,4D,PF
148
ENDMACRO
149
* LOSE SOME DATA
150
LDS.. STARTMACRO
151
#H.. (SAVEVALUE #A,PF3 11
152
" (TEST GE #B,#C,#D)
153
" (SAVEVALUE #E,0
154
" (SAVEVALUE #F,1
155
#G DEPART #E
156
SAVEVALUE #H,PF3
157
TERMINATE
158
#D SAVEVALUE #F,1
159
TRANSFER ,#G
160
ENDMACRO
161
* SAVE PART DATA
162
SAV.. STARTMACRO
163
#A ASSIGN 3,4B,PF
164
#B PRICKITY #C
165
" (QUEUE #D
166
TRANSFER ,4E
167
ENDMACRO
168
* LOAD MAX RATE AND DUMP
169
LOA STARTMACRO
170
#A SAVEVALUE #B,1
171
BUFER MACRO
172
TEST E #C,4D,#E
173

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        ASSIGN      5,108C000,PF
#F      ENTER      #J,PF5
        SAVEVALUE  #G,0
        SAVEVALUE  #F,0
#E      DEPART     #G
        TRANSFER   ,#I
        ENDMACRO
* LOAD REMAINING TAPE SPACE
REM    STARTMACRO
#A     TEST E      #B,#C,#D
        ASSIGN     5,#E,PF
        TRANSFER   ,#F
        ENDMACRO
*
* MACRO DEFINITION FOR TRANSMISSION OF ALL DATA TO V. R. RECORDER
*
RECDA  STARTMACRO
#A     PRIORITY    #H
        GATE SNF   #B,#C
        TEST GE    #D,#E,#F
        ENTER      #B,#E
        TRANSFER   ,#G
        ENDMACRO
*
* MACRO DEFINITION FOR TRANSMISSION OF PART DATA TO RECORDER
*
RECDP  STARTMACRO
#A     ASSIGN      #B,#C,PF
        ENTER      #D,#C
        ASSIGN     #E,#J,PF
        SAVEVALUE  #I,#G
        ASSIGN     3,#F,PF
        TRANSFER   ,#H
        ENDMACRO
*
* MACRO DEFINITION OF RECORDER DUMP, ALL DATA
*
DUMPA  STARTMACRO
#A     GATE U      #I,#B
        GATE SNF   #C,#D
        TEST GE    #E,PF3,#F
        LEAVE      #G,PF3
        TRANSFER   ,#H
        ENDMACRO
*
* MACRO DEFINITION OF RECORDER DUMP, PART DAT.
*
DUMPP  STARTMACRO
#A     ASSIGN      #B,#C,PF
        SPLIT      1,#I
        PRIORITY   #D
        ADVANCE    #E
        ASSIGN     3,#H,PF
        TRANSFER   ,#F
#I     ADVANCE     0
        ASSIGN     3,40,PF
        LEAVE      #J,PF3

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ENDMACRO	231
JUMP1 STARTMACRO	232
TRANSFER ,#A	233
ENDMACRO	234
*	235
* MACRO DEFINITION FOR DELAY TO NEXT TORSS' LINK	236
*	237
DLAY1 STARTMACRO	238
#A PRIORITY #B	239
ADVANCE VS	240
TRANSFER ,#C	241
ENDMACRO	242
*	243
* MACRO DEFINITION FOR DELAY ONE TIME UNIT IN REORDER DUMP	244
*	245
DLAY2 STARTMACRO	246
#A PRIORITY #B	247
ADVANCE 1	248
TRANSFER ,#C	249
ENDMACRO	250
*	251
* MACRO DEFINITION FOR DELAY TO NEXT DOWNLINK	252
*	253
DLAY3 STARTMACRO	254
#A PRIORITY #B	255
TEST GE #C,#D,#E -	256
ADVANCE #D	257
TRANSFER ,#F	258
#E ADVANCE #C	259
TRANSFER ,#F	260
ENDMACRO	261
*	262
* MACRO DEFINITION FOR RECORDING DATA LOST AT RECORDERS	263
*	264
LOSED STARTMACRO	265
#A SAVEVALUE #B+,PF3	266
TERMINATE	267
ENDMACRO	268
*	269
* MACRO DEFINITION FOR COMPUTER LOAD ROUTINE, PART 1	270
*	271
COMPA STARTMACRO	272
#A TEST GE #b,PF3,#C	273
ENTER #D,PF3	274
#E LINK #D,FIFO	275
ENDMACRO	276
*	277
* MACRO DEFINITION FOR COMPUTER LOAD ROUTINE, PART 2	278
*	279
COMPB STARTMACRO	280
#A TEST G #B,0,#C	281
ASSIGN 4,#B,PF	282
SPLIT 1,#D	283
ENTER #E,#3	284
TRANSFER ,#F	285
#D ASSIGN 3,#G,PF	286
ENDMACRO	287

* MACRO DEFINITION FOR COMPUTER LOAD ROUTINE, PART 3

COMPC STARTMACRO
#A SPLIT 1,#D
QUEUE #C
SEIZE #C
DEPART #C
#D UNLINK #C,#E,1
SPLIT 1,#F
RELEASE #C
TERMINATE
ENDMACRO

* MACRO DEFINITION FOR COMPUTER LOAD ROUTINE, PART 4

COMPD STARTMACRO
#A SEIZE #B
TEST E PF3,#C,#D
RELEASE #B
TERMINATE
#D TEST L #C,PF3,#E
ASSIGN 3,#F,PF
TRANSFER ,#G
#E ASSIGN 3,#H,PF
ASSIGN 2,#I,PF
RELEASE #B
SAVEVALUE #J,PF3
LINK #B,LIFO
ENDMACRO

* MACRO DEFINITION FOR COMPUTER LOAD ROUTINE, PART 5

COMPE STARTMACRO
#A SAVEVALUE #B,PF3
SAVEVALUE #C,PF2
SAVEVALUE #D,PF3
TERMINATE
ENDMACRO

* MACRO DEFINITION FOR COMPUTER, COMMAND DATA, PART 2

COMPY STARTMACRO
#A TEST G #B,#C,#C
ASSIGN 4,#B,PF
SPLIT 1,#D
ENTER #E,#B
LEAVE #E,#D
TRANSFER ,#F
#D ASSIGN 3,#B,PF
ENDMACRO

* MACRO DEFINITION FOR RECEIVING DATA

RECEV STARTMACRO
#A GATE SNF #B,#C
ENTER #E,PF3

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BUFFER			345
LEAVE	4B,PF3		346
ENDMACRO			347
MACRO DEFINITION FOR TRANSMISSION OF DATA			348
			349
THIT	STARTMACRO		350
#A	GATE SNF	#E,#C	351
	TEST GE	#D,PF3,#E	352
	ENTER	#B,PF3	353
	BUFFER		354
	ASSIGN	8,#B,PF	355
	ASSIGN	9,#F,PF	356
	SAVEVALUE	V5B,PF9	357
	LEAVE	#D,PF3	358
	ENDMACRO		359
* MACRO DEFINITION FOR COMPUTER, COMMAND DATA, PART 1			360
*			361
COMPZ	STARTMACRO		362
#A	TEST GE	#B,PF3,#C	363
#E	ENTER	#D,PF3	364
	LEAVE	#D,PF3	365
	TRANSFER	,#F	366
	ENDMACRO		367
* MACRO DEFINITION FOR COMPUTER, COMMAND DATA, PART 3			368
*			369
CUMPX	STARTMACRO		370
#A	QUEUE	#C	371
	SEIZE	#C	372
	DEPART	#C	373
#D	TEST NE	#G,O,#B	374
	UNLINK	#L,#E,I	375
	SPLIT	1,#F	376
#B	RELEASE	#C	377
	TERMINATE		378
	ENDMACRO		379
* MACRO DEFINITION FOR BUFFER			380
*			381
BUFER	STARTMACRO		382
	ASSIGN	6,PR,PF	383
	PRIORITY	0,BUFFER	384
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	ENDMACRO		386
* EQUATE STATEMENTS			387
*			388
RAUEX	EQU	2,S	389
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GPCOM EQU	19,S	411
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* STORAGE DEFINITIONS

2	STORAGE	36000	413
3	STORAGE	36000	414
4	STORAGE	288	415
5	STORAGE	36000000	416
6	STORAGE	36000000	417
7	STORAGE	2304	418
8	STORAGE	4608	419
9	STORAGE	4608	420
10	STORAGE	36000	421
11	STORAGE	6912	422
12	STORAGE	108000	423
14	STORAGE	36000	424
15	STORAGE	36000	425
16	STORAGE	288	426
17	STORAGE	36000	427
18	STORAGE	36000	428
19	STORAGE	1152	429
20	STORAGE	1440	430

* VARIABLE STATEMENTS

1	VARIABLE	PF4-1	431
2	FVARIABLE	PF3*(MX4(1,1)/100.)+.5	432
3	VARIABLE	X23+PF3	433
4	VARIABLE	PF3-X23	434
5	VARIABLE	X50-C1	435
6	VARIABLE	(2400*PF3)+MX2(1,PF4)	436
7	VARIABLE	X21-PF3	437
8	VARIABLE	PF3-X21	438
9	VARIABLE	PF3-PF4	439
10	VARIABLE	MX3(1,PF1)+MX3(3,PF1)	440
11	VARIABLE	X25-PF3	441
12	VARIABLE	PF3-X25	442
13	FVARIABLE	PF3*(MX4(1,2)/100.)+.5	443
14	FVARIABLE	PF3*(MX4(1,3)/100.)+.5	444
15	FVARIABLE	PF3*(MX4(1,4)/100.)+.5	445
16	VARIABLE	PF1-1	446
17	VARIABLE	PF1+1	447
18	VARIABLE	C1+17	448
19	VARIABLE	MX2(1,1)-400	449
20	VARIABLE	MX2(1,PF1)-MX2(1,V16)	450
21	VARIABLE	X45-R5	451
22	VARIABLE	PF3-R2	452

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23	VARIABLE	PF3-R3	459
24	VARIABLE	PF3-R4	460
25	VARIABLE	PF3-R5	461
26	VARIABLE	PF3-R6	462
27	VARIABLE	PF3-R7	463
28	VARIABLE	PF3-R8	464
29	VARIABLE	PF3-R9	465
30	VARIABLE	PF3-R10	466
31	VARIABLE	PF3-R11	467
32	VARIABLE	PF3-R12	468
33	VARIABLE	PK+1	469
34	VARIABLE	PF3-R14	470
35	VARIABLE	PF3-R15	471
38	VARIABLE	MX3(1,PF1)-C1	472
39	VARIABLE	MX3(1,PF1)+MX3(3,PF1)-C1	473
40	VARIABLE	MX3(1,PF2)+MX3(3,PF2)	474
41	VARIABLE	PF3-PF10	475
42	VARIABLE	100+N\$PLOTA	476
43	VARIABLE	150+N\$PLOTA	477
44	VARIABLE	160+N\$PLOTA	478
45	VARIABLE	190+N\$PLOTA	479
46	VARIABLE	220+N\$PLOTA	480
47	VARIABLE	250+N\$PLOTA	481
48	VARIABLE	280+N\$PLOTA	482
49	VARIABLE	310+N\$PLOTA	483
50	VARIABLE	340+N\$PLOTA	484
51	VARIABLE	PF3-PF5	485
52	VARIABLE	PF3-R17	486
53	VARIABLE	PF3-R18	487
54	VARIABLE	PF3-VZ1	488
55	VARIABLE	PF3-R19	489
56	VARIABLE	MX3(1,PF1)-C1	490
57	VARIABLE	X49-C1	491
58	VARIABLE	400+PF8	492
59	VARIABLE	370+N\$PLOTA	493
60	VARIABLE	430+N\$PLOTA	494
61	VARIABLE	460+N\$PLOTA	495
62	VARIABLE	490+N\$PLOTA	496
63	VARIABLE	520+N\$PLOTA	497
*			498
* FUNCTION DEFINITIONS			499
*			500
* DATA FLOW RATES FOR EXPERIMENTS			501
FLOW FUNCTION PF2,D9			502
1,3640/4,1080/5,1080/6,8640/7,8640/8,360/12,309/44,36000/107,18000			503
* DATA FLOW RATES FOR SUBSYSTEMS			504
FLOW1 FUNCTION PF2,D9			505
1,0/4,1080/5,C/6,C/7,8640/8,0/12,0/44,36000/107,18000			506
*			507
*****			508
**		**	509
** MODULE 2. EXPERIMENT SCIENCE DATA		**	510
**		**	511
**		**	512
*****			513
*			514
* PART 1. EXPERIMENT TO I/O			515

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	*		516
	*	INPUT EXPERIMENT DATA FROM JOBTAPE	517
	*		518
		JOBTAPE JOBTA1,SEQ1,730	519
1	SEQ1	ASSIGN 4,PF3,PF	520
2		TEST LE PF4,0,BLITZ	521
3		TERMINATE	522
4	BLITZ	ASSIGN 3,FN5FLOD,PF	523
5		TRANSFER ,LOOP1	524
6	UNITS	ADVANCE 1	525
7	LOOP1	SPLIT 1,BLK1	526
8		LOOP 4PF,UNITS	527
9		TERMINATE	528
	*	INPUT FOR EXPERIMENT SCIENCE DATA, PART 4	529
10	BLK1	SPLIT 1,SECT4	530
	*	INPUT FOR SUBSYSTEM ENGINEERING DATA	531
11		SPLIT 1,MODL4	532
	*		533
	*	EXPERIMENT KAU	534
	*		535
12	KAU	ASSIGN 3,V13,PF	536
	*	TRANSMIT ALL DATA TO EXPERIMENT KAU	537
	TRNSA	MACRO RAJSG,2,WAIT2,R2,PART2,RAUEN,IOSEG,---	538
13	RAJSG	GATE SNF 2,WAIT2	538
14		TEST GE R2,PF3,PART2	538
15	RAUEN	ENTER 2,PF3	538
	BUFER	MACRO	538
16		ASSIGN 8,PR,PF	538
17		PRIORITY 0,BUFFER	538
18		PRIORITY PF3	538
19		ASSIGN 8,2,PF	538
20		ASSIGN 9,S2,PF	538
21		SAVEVALUE V58,PF9	538
22		LEAVE 2,PF3	538
23		TRANSFER ,IOSEG	538
	*	TRANSMIT PART DATA TO EXPERIMENT KAU	539
	TRNSP	MACRO PART2,10,R2,MOV2,12,RAJSG,PF10,RAUEN,V22	540
24	PART2	ASSIGN 10,R2,PF	540
25		SPLIT 1,MOV2	540
26		PRIORITY 12	540
27		ASSIGN 3,V22,PF	540
28		ADVANCE 1	540
29		TRANSFER ,RAJSG	540
30	MOV2	ASSIGN 3,PF10,PF	540
31		TRANSFER ,RAUEN	540
	*	DELAY TRANSMISSION ONE TIME UNIT	541
	WAITA	MACRO WAIT2,11,2,RAJSG	542
32	WAIT2	PRIORITY 11	542
33		QUEUE 2,PF3	542
34		ADVANCE 1	542
35		DEPART 2,PF3	542
36		TRANSFER ,RAJSG	542
	*		543
	*	EXPERIMENT I/O	544
	*		545
	*	TRANSMIT ALL DATA TO EXPERIMENT I/O	546
	TRNSA	MACRO IOSEG,3,WAIT3,R3,PART3,IOENT,SPLT3,S3	547

37	IDSEG	GATE SNF	3,VAIT3	547
38		TEST GE	<3,PF3,PART3	547
39	IDENT	ENTER	3,PF3	547
	BUFFER	MACRO		547
40		ASSIGN	8,PA,PF	547
41		PRIORITY	0,BUFFER	547
42		PRIORITY	PF3	547
43		ASSIGN	8,3,PF	547
44		ASSIGN	9,53,PF	547
45		SAVEVALUE	V53,PF9	547
46		LEAVE	3,PF3	547
47		TRANSFER	,SPLT3	547
	*	TRANSMIT	PART DATA TO EXPERIMENT I/O	548
	TRANSP	MACRO	PART3,10,R3,MOV3,16,IOSEG,PF10,IDENT,V23	549
48	PART3	ASSIGN	10,R3,PF	549
49		SPLIT	1,MOV3	549
50		PRIORITY	16	549
51		ASSIGN	3,V23,PF	549
52		ADVANCE	1	549
53		TRANSFER	,IOSEG	549
54	MOV3	ASSIGN	3,PF10,PF	549
55		TRANSFER	,IDENT	549
	*	DELAY	TRANSMISSION ONE TIME UNIT	550
	WAITA	MACRO	WAIT3,15,3,IOSEG	551
56	WAIT3	PRIORITY	15	551
57		QUEUE	3,PF3	551
58		ADVANCE	1	551
59		DEPART	3,PF3	551
60		TRANSFER	,IOSEG	551
61	SPLT3	SPLIT	1,EXCPU	552
	*	PERCENT	OF DATA TRANSMITTED VIA KU OR FM PROCESSOR	553
62		ASSIGN	3,V14,PF	554
63		TRANSFER	,DWN4	555
	*			556
	*	PART 2.	I/O TO COMPUTER. COMPUTER TO PAYLOAD DATA INTERLEAVER TO	557
	*	TRANSMIT		558
	*			559
	*	EXPERIMENT	COMPUTER	560
	*			561
	*	PERCENT	OF DATA TRANSMITTED THRU COMPUTER	562
64	EXCPU	ASSIGN	3,V15,PF	563
65		TEST L	PF3,1,SCCPU	564
66		ASSIGN	3,1,PF	565
	*			566
	*	TRANSMIT	DATA TO EXPERIMENT COMPUTER	567
	COMPA	MACRO	SCCPU,R4,FOURB,4,FOURA	568
67	SCCPU	TEST GE	R4,PF3,FOURB	568
68		ENTER	4,PF3	568
69	FOURA	LINK	4,FIFU	568
	COMPB	MACRO	FOURB,R4,FOURC,FOURD,4,FOURA,V9	569
70	FOURB	TEST G	R4,0,FOURC	569
71		ASSIGN	4,R4,PF	569
72		SPLIT	1,FOURD	569
73		ENTER	4,R4	569
74		TRANSFER	,FOURA	569
75	FOURD	ASSIGN	3,V9,PF	569
	COMPC	MACRO	FOURC,FOURA,4,FOURE,FOURF,BUFF4	570

75	FOURC	SPLIT	1,FOURK	570
77		QUEUE	4	570
78		SEIZE	4	570
79		DEPART	4	570
80	FOURK	UNLINK	4,FOURF,1	570
81		SPLIT	1,BUFF4	570
82		RELEASE	4	571
83		TERMINATE		571
	COMPD	MACRO	3UFF4,4,X21,FOURG,FOURK,V8,FOURK,V7,X20,4-	571
84	BUFF4	SEIZE	4	571
85		TEST E	PF3,X21,FOURG	571
86		RELEASE	4	571
87		TERMINATE		571
88	FOURG	TEST L	X21,PF3,FOURH	571
89		ASSIGN	3,V8,PF	571
90		TRANSFER	,FJURE	571
91	FOURH	ASSIGN	3,V7,PF	571
92		ASSIGN	2,X20,PF	571
93		RELEASE	4	571
94		SAVEVALUE	4-,PF3	572
95		LINK	4,LIFO	572
	CUMPE	MACRO	FOURF,21,20,4+	572
96	FOURF	SAVEVALUE	21,PF3	572
97		SAVEVALUE	20,PF2	572
98		SAVEVALUE	4+,PF3	573
99		TERMINATE		574
	*			575
	*	PAYLOAD DATA INTERLEAVER		576
	*			577
	*	TRANSMIT ALL DATA TO PAYLOAD DATA INTERLEAVER		577
	TRNSA	MACRO	,PDPRT,7,WATE7,K7,PIEC7,PAYEN,DACSG,S7	577
100	PDPRT	GATE SNF	7,WATE7	577
101		TEST GE	K7,PF3,PIEC7	577
102	PAYEN	ENTER	7,PF3	577
	BUFFER	MACRO		577
103		ASSIGN	8,PK,PF	577
104		PRIORITY	0,BUFFER	577
105		PRIORITY	PF8	577
106		ASSIGN	8,7,PF	577
107		ASSIGN	9,S7,PF	577
108		SAVEVALUE	V58,PF9	577
109		LEAVE	7,PF3	578
110		TRANSFER	,DACSG	579
	*	TRANSMIT PART DATA TO PAYLOAD DATA INTERLEAVER		579
	TRNSP	MACRO	PIEC7,10,R7,TRVL7,16,PDPRT,PF10,PAYEN,V27	579
111	PIEC7	ASSIGN	10,K7,PF	579
112		SPLIT	1,TRVL7	579
113		PRIORITY	16	579
114		ASSIGN	3,V27,PF	579
115		ADVANCE	1	579
116		TRANSFER	,PDPRT	579
117	TRVL7	ASSIGN	3,PF10,PF	580
118		TRANSFER	,PAYEN	581
	*	DELAY TRANSMISSION ONE TIME UNIT		581
119	WATE7	MACRO	WATE7,15,7,PDPRT	581
120		PRIORITY	15	581
		QUEUE	7,PF3	581

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121	ADVANCE	1	501
122	DEPART	7,PF3	501
123	TRANSFER	,PUPR	501
* DATA ACQUISITION CONTROL AND BUFFER UNIT			
* TRANSMIT ALL DATA TO DACBU			
124	TRNSA MACRO	DACSG,8,WATE8,R8,PIEC8,DACEN,KUSND,S8	504
125	DACSG GATE SNF	8,WATE8	505
126	TEST GE	R8,PF3,PIEC8	506
127	DACEN ENTER	8,PF3	506
128	BUFEK MACRO		506
129	ASSIGN	8,PR,PF	506
130	PRIORITY	0,BUFFER	506
131	PRIORITY	PF8	506
132	ASSIGN	8,3,PF	506
133	ASSIGN	9,S8,PF	506
134	SAVEVALUE	V58,PF9	506
135	LEAVE	8,PF3	506
136	TRANSFER	,KUSND	506
* TRANSMIT PART DATA TO DACBU			
137	TRNSP MACRO	PIEC9,10,R6,TRVL8,16,DACSG,PF10,DACEN,V28	508
138	PIEC8 ASSIGN	10,R6,PF	508
139	SPLIT	1,TRVL8	508
140	PRIORITY	16	508
141	ASSIGN	3,V28,PF	508
142	ADVANCE	1	508
143	TRANSFER	,DACSG	508
144	TRVL8 ASSIGN	3,PF10,PF	508
145	TRANSFER	,DACEN	508
* DELAY TRANSMISSION ONE TIME UNIT			
146	WAITA MACRO	WATE8,15,8,DACSG	590
147	WATEB PRIORITY	15	590
148	QUEUE	8,PF3	590
149	ADVANCE	1	590
150	DEPART	8,PF3	590
151	TRANSFER	,DACSG	591
* DOWNLINK AVAILABLE?			
152	KUSND GATE U	50,NETWK	592
* KU-BAND			
* TRANSMIT ALL DATA TO KU-BAND			
153	TMITA MACRO	KUSID,12,NETWK,R12,SUM12,S12	599
154	KUSID GATE SNF	12,NETWK	599
155	TEST GE	R12,PF3,SUM12	599
156	ENTER	12,PF3	599
157	BUFEK MACRO		599
158	ASSIGN	8,PR,PF	599
159	PRIORITY	0,BUFFER	599
160	PRIORITY	PF3	599
161	ASSIGN	8,12,PF	599
162	ASSIGN	9,S12,PF	599
163	SAVEVALUE	V58,PF9	599
164	LEAVE	12,PF3	599

157	TERMINATE		599
	TRANSMIT PART DATA TO KU-BAND		600
	TMITP MACRO	SUM12,10,R12,NETWK,KUSID,V32,DTA	601
160	SUM12 ASSIGN	10,R12,PF	601
161	SPLIT	1,DTA	601
162	ASSIGN	3,V32,PF	601
163	TRANSFER	,NETWK	601
164	DTA ASSIGN	3,PF10,PF	601
165	TRANSFER	,KUSID	601
166	NETWK GATE U	49,SPIL8	602
	*		603
	* NETWORK SIGNAL PROCESSOR		604
	*		605
	* TRANSMIT ALL DATA TO NETWORK SIGNAL PROCESSOR		606
	TMITA MACRO	NSSND,11,SPIL8,R11,SUM11,S11	607
167	NSSND GATE SNF	11,SPIL8	607
168	TEST GE	R11,PF3,SUM11	607
169	ENTER	11,PF3	607
	BUFER MACRO		607
170	ASSIGN	8,PR,PF	607
171	PRIORITY	0,BUFFER	607
172	PRIORITY	PF8	607
173	ASSIGN	8,11,PF	607
174	ASSIGN	9,S11,PF	607
175	SAVEVALUE	V58,PF9	607
176	LEAVE	11,PF3	607
177	TERMINATE		607
	TRANSMIT PART DATA TO NETWORK SIGNAL PROCESSOR		608
	TMITP MACRO	SUM11,10,R11,SPIL8,NSSND,V31,DTB	609
178	SUM11 ASSIGN	10,R11,PF	609
179	SPLIT	1,DTB	609
180	ASSIGN	3,V31,PF	609
181	TRANSFER	,SPIL8	609
182	DTB ASSIGN	3,PF10,PF	609
183	TRANSFER	,NSSND	609
184	SPIL8 SAVEVALUE	8+,PF3	610
185	TERMINATE		611
	*		612
	* PART 3. I/O TO KU-BAND OR V.R. RECORDER		613
	*		614
	* DOWNLINK AVAILABLE?		615
	*		616
186	DOWN4 GATE U	50,GLAVL	617
	*		618
	* KU-BAND		619
	*		620
	* TRANSMIT ALL DATA TO KU-BAND		621
	TMITA MACRO	KUSEG,12,GLAVL,R12,PRT12,S12	622
187	KUSEG GATE SNF	12,GLAVL	622
188	TEST GE	R12,PF3,PRT12	622
189	ENTER	12,PF3	622
	BUFER MACRO		622
190	ASSIGN	8,PR,PF	622
191	PRIORITY	0,BUFFER	622
192	PRIORITY	PF8	622
193	ASSIGN	8,12,PF	622
194	ASSIGN	9,S12,PF	622

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195	SAVEVALUE	V55,PF9	622
196	LEAVE	12,PF3	622
197	TERMINATE		622
*	TRANSMIT PART DATA TO KU-BAND		623
	THITP	MACRO PFT12,10,R12,GLAVL;KUSEG,V32,DUTC	624
198	PRT12	ASSIGN 10,R12,PF	624
199	SPLIT	1,DUTC	624
200	ASSIGN	3,V32,PF	624
201	TRANSFER	,GLAVL	624
202	DUTC	ASSIGN 3,PF10,PF	624
203	TRANSFER	,KUSEG	624
*			625
*	GROUNDLINK AVAILABLE?		626
*			627
204	GLAVL	GATE U 49,VKREC	628
*			629
*	F.M. SIGNAL PROCESSOR		630
*			631
*	TRANSMIT ALL DATA TO F.M. SIGNAL PROCESSOR		632
	TMITA	MACRO FMSIT,10,VRREC,R10,BIT10,S10	633
205	FMBIT	GATE SNF 10,VKREC	633
206	TEST GE	R10,PF3,BIT10	633
207	ENTER	10,PF3	633
	BUFER	MACRO	633
208	ASSIGN	8,PK,PF	633
209	PRIORITY	0,BUFFER	633
210	PRIORITY	PF3	633
211	ASSIGN	8,10,PF	633
212	ASSIGN	9,S10,PF	633
213	SAVEVALUE	V55,PF9	633
214	LEAVE	10,PF3	633
215	TERMINATE		634
*	TRANSMIT PART DATA TO F.M. SIGNAL PROCESSOR		635
	THITP	MACRO BIT10,10,R10,VKREC,FMBIT,V30,BIT06	635
216	BIT10	ASSIGN 10,R10,PF	635
217	SPLIT	1,BIT06	635
218	ASSIGN	3,V30,PF	635
219	TRANSFER	,VKREC	635
220	BIT06	ASSIGN 3,PF10,PF	635
221	TRANSFER	,FMBIT	635
*			636
*	V.R. RECORDER		637
*			638
*	TRANSMIT ALL DATA TO V.R. RECORDER		639
	RECDA	MACRO VKREC,6,LJSC0,R6,PF3,PART6,DUMP6,5	640
222	VKREC	PRIORITY 5	640
223	GATE SNF	6,LOSE6	640
224	TEST GE	R6,PF3,PART6	640
225	ENTER	6,PF3	640
226	TRANSFER	,DUMP6	640
*	TRANSMIT PART DATA TO V.R. RECORDER, LOSE PART DATA		641
	RECDP	MACRO PART6,10,R6,6,11,PF10,PF11,DUMP6,6+,V26	642
227	PART6	ASSIGN 10,R6,PF	642
228	ENTER	6,R6	642
229	ASSIGN	11,V26,PF	642
230	SAVEVALUE	6+,PF11	642
231	ASSIGN	3,PF10,PF	642

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232	TRANSFER	,DJMP6	642
*			643
*	DUMP V.K. RECEIVER TO (1) KU-BAND, (2) FM SIGNAL PROCESSOR		644
*			645
*	DUMP ALL DATA TO KU-BAND		646
	DUMPA MACRO	DUMPO,DMP6A,12,DMP6A,R12,PTA12,6,KUSEG,50	647
233	DUMP6 GATE U	50,DMP6A	647
234	GATE SNF	12,DMP6A	647
235	TEST GE	R12,PF3,PTA12	647
236	LEAVE	6,PF3	647
237	TRANSFER	,KUSEG	647
*	DUMP PART DATA TO KU-BAND		648
	DUMPP MACRO	PTA12,10,R12,9,0,DMP6A,PF10,V32,MUV12,6	649
238	PTA12 ASSIGN	10,R12,PF	649
239	SPLIT	1,MUV12	649
240	PRIORITY	9	649
241	ADVANCE	0	649
242	ASSIGN	3,V32,PF	649
243	TRANSFER	,DMP6A	649
244	MUV12 ADVANCE	0	649
245	ASSIGN	3,PF10,PF	649
246	LEAVE	6,PF3	649
	JUMP1 MACRO	KUSEG	650
247	TRANSFER	,KUSEG	650
*	JUMP ALL DATA TO FM-BAND		651
	DUMPA MACRO	DMP6A,DLAY6,10,DLA6A,R10,PTA10,6,FMSEG,49	652
248	DMP6A GATE U	49,DLAY6	652
249	GATE SNF	10,DLA6A	652
250	TEST GE	R10,PF3,PTA10	652
251	LEAVE	6,PF3	652
252	TRANSFER	,FMSEG	652
*	DUMP PART DATA TO FM BAND		653
	DUMPP MACRO	PTA10,10,R10,9,1,DUMP6,PF10,V41,MJV06,6	654
253	PTA10 ASSIGN	10,R10,PF	654
254	SPLIT	1,MJV06	654
255	PRIORITY	9	654
256	ADVANCE	1	654
257	ASSIGN	3,V41,PF	654
258	TRANSFER	,DUMP6	654
259	MJV06 ADVANCE	0	654
260	ASSIGN	3,PF10,PF	654
261	LEAVE	6,PF3	654
	JUMP1 MACRO	FMSEG	655
262	TRANSFER	,FMSEG	655
*	DELAY UNTIL CHANNEL AVAILABLE		656
	DLAY3 MACRO	DLAY6,8,V57,V5,FBAND,DUMP6	657
263	DLAY6 PRIORITY	6	657
264	TEST GE	V57,V5,FBAND	657
265	ADVANCE	V5	657
266	TRANSFER	,DUMP6	657
267	FBAND ADVANCE	V57	657
268	TRANSFER	,DUMP6	657
*	DELAY ONE TIME UNIT		658
	DLAY2 MACRO	DLA6A,0,DUMP6	659
269	DLA6A PRIORITY	0	659
270	ADVANCE	1	659
271	TRANSFER	,DUMP6	659

	*		660
	*	F.M. SIGNAL PROCESSOR	661
	*		662
	*	TRANSMIT ALL DATA TO F.M. SIGNAL PROCESSOR	663
	*		664
		THITA MACRO FMSEG,10,DUMP6,K10,PRT10,S10	665
272		FMSEG GATE SNF 10,DUMP6	665
273		TEST GE K10,PF3,PRT10	665
274		ENTER 10,PF3	665
		BUFER MACRO	665
275		ASSIGN 8,PK,PF	665
276		PRIORITY 0,BUFFER	665
277		PRIORITY PF3	665
278		ASSIGN 8,10,PF	665
279		ASSIGN 9,S10,PF	665
280		SAVEVALUE V58,PF9	665
281		LEAVE 10,PF3	665
282		TERMINATE	665
	*	TRANSMIT PART DATA TO F.M. SIGNAL PROCESSOR	666
	*	THITP MACRO PRT10,10,R10,DUMP6,FMSEG,V30,DGT6	667
283		PRT10 ASSIGN 10,R10,PF	667
284		SPLIT 1,JUT6	667
285		ASSIGN 3,V30,PF	667
286		TRANSFER ,DUMP6	667
287		DGT6 ASSIGN 3,PF10,PF	667
288		TRANSFER ,FMSEG	667
	*	REORDER FILLED. DATA LOST (IN SAVEVALUE 6)	668
289		LOSE6 SAVEVALUE 6,PF3	669
290		TERMINATE	670
	*		671
	*	PART 4. EXPERIMENT TO KU-BAND OR H.R. RECORDER	672
	*		673
	*		674
	*	DOWNLINK AVAILABLE?	675
	*		676
291		SECT4 ASSIGN 3,V2,PF	677
292		GATE U 50,HRREC	678
	*		679
	*	KU-BAND SIGNAL PROCESSOR	680
	*		681
	*	TRANSMIT ALL DATA TO KU-BAND	682
	*	THITA MACRO KUSIG,12,HRREC,R12,SEC12,S12	683
293		KUSIG GATE SNF 12,HRREC	683
294		TEST GE R12,PF3,SEC12	683
295		ENTER 12,PF3	683
		BUFER MACRO	683
296		ASSIGN 8,PK,PF	683
297		PRIORITY 0,BUFFER	683
298		PRIORITY PF3	683
299		ASSIGN 8,12,PF	683
300		ASSIGN 9,S12,PF	683
301		SAVEVALUE V59,PF9	683
302		LEAVE 12,PF3	683
303		TERMINATE	683
	*	TRANSMIT PART DATA TO KU-BAND	684
	*	THITP MACRO SEC12,10,R12,HRREC,KUSIG,V32,DGT12	685
304		SEC12 ASSIGN 10,R12,PF	685

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305	SPLIT	1,DT12	685
306	ASSIGN	3,V32,PF	685
307	TRANSFER	,HAREC	685
308	DT12 ASSIGN	3,PF10,PF	685
309	TRANSFER	,KUSIG	685
*			686
*	H.R. RECORDER		687
*			688
*	TRANSMIT DATA TO H.R. RECORDER		689
	RECDA MACRO	HAREC,5,LOSE5,R5,PF3,PART5,DUMP5,0	690
310	HAREC PRIORITY	0	690
311	GATE SNF	5,LOSE5	690
312	TEST GE	R5,PF3,PART5	690
313	ENTER	5,PF3	690
314	TRANSFER	,DUMP5	691
*	TRANSMIT PART DATA TO HIGH RATE RECORDER		692
	REC DP MACRO	PART5,10,R5,5,11,PF10,PF11,DUMP5,5+,V41	692
315	PART5 ASSIGN	10,R5,PF	692
316	ENTER	5,R5	692
317	ASSIGN	11,V41,PF	692
318	SAVEVALUE	5+,PF11	692
319	ASSIGN	3,PF10,PF	692
320	TRANSFER	,DUMP5	693
*			694
*	RECORD DATA LOST		695
*			696
321	LOSES SAVEVALUE	5+,PF3	697
322	TERMINATE		698
*			699
*	DUMP H.R. RECORDER TO KU-BAND		700
*			701
*	DUMP ALL DATA TO KU-BAND		702
	DUMPA MACRO	DUMP5,DLAY5,12,DLA5A,R12,SEA12,5,KUSIG,50	702
323	DUMP5 GATE U	50,DLAY5	702
324	GATE SNF	12,DLA5A	702
325	TEST GE	R12,PF3,SEA12	702
326	LEAVE	5,PF3	702
327	TRANSFER	,KUSIG	703
*	DUMP PART DATA TO KU-BAND		704
	DUMPP MACRO	SEA12,10,R12,4,0,DLA5A,PF10,V32,MOVE5,5	704
328	SEA12 ASSIGN	10,R12,PF	704
329	SPLIT	1,MOVE5	704
330	PRIORITY	4	704
331	ADVANCE	0	704
332	ASSIGN	3,V32,PF	704
333	TRANSFER	,DLA5A	704
334	MOVE5 ADVANCE	0	704
335	ASSIGN	3,PF10,PF	704
336	LEAVE	5,PF3	705
	JUMP1 MACRO	KUSIG	705
337	TRANSFER	,KUSIG	706
*	DELAY UNTIL DOWNLINK AVAILABLE		707
	DLAY1 MACRO	DLAY5,3,DUMP5	707
338	DLAY5 PRIORITY	3	707
339	ADVANCE	5	707
340	TRANSFER	,DUMP5	708
*	DELAY LINE TIME UNIT		708

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	DLAY2 MACRO	DLA5A,1,DUMP5	709
341	DLA5A PRIORITY	1	709
342	ADVANCE	1	709
343	TRANSFER	,DUMP5	709
	*****		710
	**		711
	** MODULE 3. EXPERIMENT ENGINEERING DATA		712
	**		713
	*****		714
	*		715
	*		716
	* INPUT EXPERIMENT DATA		717
	*		718
	* GENERATE 1,,200,14775,10,25PF		719
344	ASSIGN	3,4X4(1,20),PF	720
345	*		721
	* PART 1. EXPERIMENT TO I/O		722
	*		723
	* EXPERIMENT KAU		724
	*		725
	* TRANSMIT ALL DATA TO EXPERIMENT KAU		725
	TRNSA MACRO	RAUPT,2,HOLD2,R2,SOME2,RAUGO,IOPKT,S2	727
346	RAUPT GATE SNF	2,HOLD2	727
347	TEST GE	R2,PF3,SOME2	727
348	RAUGO ENTER	2,PF3	727
	BUFER MACRO	.	727
349	ASSIGN	8,PK,PF	727
350	PRIORITY	0,BUFFER	727
351	PRIORITY	PF3	727
352	ASSIGN	8,2,PF	727
353	ASSIGN	9,S2,PF	727
354	SAVEVALUE	V58,PF9	727
355	LEAVE	2,PF3	727
356	TRANSFER	,IOPKT	728
	* TRANSMIT PART DATA TO EXPERIMENT KAU		729
	TRNSP MACRO	SOME2,10,R2,TRVL2,12,RAUPT,PF10,RAUGO,V22	729
357	SOME2 ASSIGN	10,R2,PF	729
358	SPLIT	1,TRVL2	729
359	PRIORITY	12	729
360	ASSIGN	3,V22,PF	729
361	ADVANCE	1	729
362	TRANSFER	,RAUPT	729
363	TRVL2 ASSIGN	3,PF10,PF	729
364	TRANSFER	,RAUGO	730
	* DELAY TRANSMISSION ONE TIME UNIT		731
	WAITA MACRO	HOLD2,11,2,RAUGO	731
365	HOLD2 PRIORITY	11	731
366	QUEUE	2,PF3	731
367	ADVANCE	1	731
368	DEPART	2,PF3	731
369	TRANSFER	,RAUGO	732
	*		733
	* EXPERIMENT I/O		734
	*		735
	* TRANSMIT ALL DATA TO EXPERIMENT I/O		736
	TRNSA MACRO	IOPRT,3,HOLD3,R3,SOME3,IOPRT,S3	736
370	IOPRT GATE SNF	3,HOLD3	736

371	TEST GE	R3,PF3,SGME3	736
372	IGGDS ENTER	3,PF3	736
	MACRO		736
373	ASSIGN	8,PK,PF	736
374	PRIORITY	0,BUFFER	736
375	PRIORITY	PF3	736
376	ASSIGN	8,3,PF	736
377	ASSIGN	9,5,PF	736
378	SAVEVALUE	V53,PF9	736
379	LEAVE	3,PF3	736
380	TRANSFER	,SPLZ3	736
	* TRANSMIT PAYT DATA TO EXPERIMENT I/O		737
	TRNSP MACRO	JCLC3,10,R3,TRVL3,16,IOPRT,PF10,IUGGS,V30	738
381	SGME3 ASSIGN	10,R3,PF	738
382	SPLIT	1,TRVL3	738
383	PRIORITY	16	738
384	ASSIGN	3,V30,PF	738
385	ADVANCE	1	738
386	TRANSFER	,IOPRT	738
387	TRVL3 ASSIGN	3,PF10,PF	738
388	TRANSFER	,IUGGS	738
	* DELAY TRANSMISSION ONE TIME UNIT		739
	WAITA MACRO	HOLD3,15,3,IOPRT	740
389	HOLD3 PRIORITY	15	740
390	QUEUE	3,PF3	740
391	ADVANCE	1	740
392	DEPART	3,PF3	740
393	TRANSFER	,IOPRT	740
	* EXTRM COULD BE CHANGED TO AN ASSIGN BEFORE PDSeg IF SOME DATA		741
	* BYPASSES THE COMPUTER.		742
394	SPLZ3 SPLIT	1,EXTRM	743
395	ASSIGN	3,V15,PF	744
396	TEST L	PF3,1,EDCPU	745
397	ASSIGN	3,1,PF	746
	* PART 2. I/O TO COMPUTER TO I/O TO PAYLOAD DATA INTERLEAVER		747
	* EXPERIMENT COMPUTER		748
	* TRANSMIT DATA TO EXPERIMENT COMPUTER		749
	COMPA MACRO	EDCPU,R4,FOREB,4,FOREA	750
398	EDCPU TEST GE	R4,PF3,FOREB	751
399	ENTER	4,PF3	751
400	FOREA LINK	4,FIFC	753
	COMPB MACRO	FGREC,R4,FOREC,FORED,4,FOREA,V9	754
401	FOREB TEST G	R4,0,FOREC	754
402	ASSIGN	4,R4,PF	754
403	SPLIT	1,FOREB	754
404	ENTER	4,R4	754
405	TRANSFER	,FOREA	754
406	FORED ASSIGN	3,V9,PF	754
	COMPC MACRO	FGREC,FOREA,4,FOREE,FOREF,BUFE4	755
407	FUREC SPLIT	1,FOREA	755
408	QUEUE	4	755
409	SEIZE	4	755
410	DEPART	4	755
411	FUREE UNLINK	4,FOREF,1	755

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412	SPLIT	1,DUFE4	
413	RELEASE	4	755
414	TERMINATE		755
	COMPD MACRO	DUFE4,4,X23,FOREG,FOREH,V4,FOREE,V3,X22,4-	755
415	BUFE4 SEIZE	4	756
416	TEST E	PF3,X23,FCREG	756
417	RELEASE	4	756
418	TERMINATE		756
419	FOREG TEST L	X23,PF3,FOREH	756
420	ASSIGN	3,V4,PF	756
421	TRANSFER	,FOREE	756
422	FOREH ASSIGN	3,V3,PF	756
423	ASSIGN	2,X22,PF	756
424	RELEASE	4	756
425	SAVEVALUE	4-,PF3	756
426	LINK	4,LIFC	756
	COMPB MACRO	FOREH,23,22,4+	756
427	FOREF SAVEVALUE	23,PF3	757
428	SAVEVALUE	22,PF2	757
429	SAVEVALUE	4+,PF3	757
430	TERMINATE		757
	*****		757
	* EXPERIMENT ENGINEERING DATA STOPS HERE SINCE IT IS NOT CALLED		758
	* FROM THE COMPUTER		759
	*****		760
	* TRANSMIT ALL DATA BACK THRU EXPERIMENT I/O		761
431	TRNSA MACRO	IDEXP,3,STP3,R3,HAF3,IOETR,SEGPD,53	762
432	IJEXP GATE SWF	3,STP3	763
433	TEST GE	R3,PF5,HAF3	763
	IOETR ENTER	3,PF3	763
	BUFFER MACRO		763
434	ASSIGN	8,PR,PF	763
435	PRIORITY	0,BUFFER	763
436	PRIORITY	PF3	763
437	ASSIGN	8,3,PF	763
438	ASSIGN	9,53,PF	763
439	SAVEVALUE	V53,PF9	763
440	LEAVE	3,PF3	763
441	TRANSFER	,SEGPD	763
	* TRANSMIT PART DATA BACK THRU EXPERIMENT I/O		764
442	TRNSP MACRO	HAF3,10,R3,ZIP3,16,IDEXP,PF10,IOETR,V23	765
443	HAF3 ASSIGN	10,R3,PF	765
444	SPLIT	1,ZIP3	765
445	PRIORITY	16	765
446	ASSIGN	3,V23,PF	765
447	ADVANCE	1	765
448	TRANSFER	,IDEXP	765
449	ZIP3 ASSIGN	3,PF10,PF	765
	TRANSFER	,IOETR	765
	* WAITA DELAY TRANSMISSION ONE TIME UNIT		765
450	STP3 PRIORITY	15	766
451	QUEUE	3,PF3	767
452	ADVANCE	1	767
453	DEPART	3,PF3	767
454	TRANSFER	,IJEXP	767
			767
			768


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* SUBSYSTEM I/O
*
* TRANSMIT ALL DATA TO SUBSYSTEM I/O
TRNSA MACRO EIJS6,15,WAT15,R15,PRT15,EIDEN,SPL15,S15
488 EIJS6 GATE SNF 15,WAT15 804
489 TEST GE K15,PF3,PRT15 804
490 EIDEN ENTER 15,PF3 804
    DUFR MACRO
491 ASSIGN 8,PK,PF 804
492 PRICKITY 0,SUFFER 804
493 PRICKITY PF3 804
494 ASSIGN 8,15,PF 804
495 ASSIGN 9,S15,PF 804
496 SAVEVALUE V58,PF9 804
497 LEAVE 15,PF3 804
498 TRANSFER ,SPL15 804
* TRANSMIT PACKET DATA TO SUBSYSTEM I/O
TRNSP MACRO PKT15,10,R15,MVP15,16,EIJS6,PF10,EIDEN,V35
499 PRT15 ASSIGN 10,K15,PF 806
500 SPLIT 1,MVP15 806
501 PRICKITY 16 806
502 ASSIGN 3,V35,PF 806
503 ADVANCE 1 806
504 TRANSFER ,EIJS6 806
505 MVP15 ASSIGN 3,PF10,PF 806
506 TRANSFER ,EIDEN 806
* DELAY TRANSMISSION ONE TIME UNIT
WATA MACRO WAT15,15,15,EIJS6
507 WAT15 PRIGRITY 15 808
508 QUEUE 15,PF3 808
509 ADVANCE 1 808
510 DEPART 15,PF3 808
511 TRANSFER ,EIJS6 808
*
* ENGINEERING SUBSYSTEM DATA IN I/O; 90 PERCENT TERMINATED 10
* PERCENT TO SUBSYSTEM COMPUTER.
*
* SBTRM COULD BE CHANGED TO AN ASSIGN BEFORE POSEG IF SOME DATA
* BYPASSES THE COMPUTER.
512 SPL15 SPLIT 1,SBTRM 815
513 ASSIGN 3,V15,PF 816
514 TEST L PF3,1,SBCPU 817
515 ASSIGN 3,1,PF 818
*
* PART 2. I/O TO COMPUTER TO I/J TO PAYLOAD DATA INTERLEAVER
*
* SUBSYSTEM COMPUTER
*
* TRANSMIT DATA TO SUBSYSTEM COMPUTER
COMPA MACRO SBCPU,R16,TEENB,16,TEENA
516 SBCPU TEST GE K16,PF3,TEENB 825
517 ENTER 16,PF3 825
518 TEENA LINK 16,FIFO 825
COMPB MACRO TEENB,K16,TEENC,TEEND,16,TEENA,V9
519 TEENB TEST G R16,0,TEENC 826
520 ASSIGN 4,R16,PF 826
521 SPLIT 1,TEENB 826

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522          ENTER          16,R16
523          TRANSFER      ,TEENA
524  TEEND  ASSIGN          3,V9,PF
      COMPC  MACKC        TEENC,TEENA,16,TEENL,TEENF;BUF16
525  TEENC  SPLIT          1,TEENA
526          QUEUE          16
527          SEIZE          16
528          DISPATCH       16
529  TEENE  LINK           16,TEENF,1
530          SPLIT          1,BUF16
531          RELEASE       16
532          TERMINATE
      COMPD  MACKC        BUF16,16,X25,TEENG,TEENH,V12,TEENE,V11,X24,16-
533  BUF16  SIZE           16
534          TEST E        PF3,X25,TEENG
535          RELEASE       16
536          TERMINATE
537  TEENG  TEST L        X25,PF3,TEENH
538          ASSIGN        3,V12,PF
539          TRANSFER      ,TEENE
540  TEENH  ASSIGN          3,V11,PF
541          ASSIGN        2,X24,PF
542          RELEASE       16
543          SAVEVALUE     16-,PF3
544          LINK           16,LIFU
      COMPE  MACKC        TEENF,25,24,16+
545  TEENF  SAVEVALUE     25,PF3
546          SAVEVALUE     24,PF2
547          SAVEVALUE     16+,PF3
548          TERMINATE

*****
*      SUBSYSTEM ENGINEERING DATA STOPS HERE SINCE IT IS NOT CALLED
*      FROM THE COMPUTER
*****
*      TRANSMIT ALL DATA BACK THRU SUBSYSTEM I/O
      TRNSA  MACKC        ILSUB,15,STP15,R15,HAF15,IOSTR,PDSEG,S15
549  ILSUB  GATE SNF       15,STP15
550          TEST GE       R15,PF3,HAF15
551  IOSTR  ENTER          15,PF3
      BUFFER  MACKC
552          ASSIGN        8,PH,PF
553          PRIORITY       0,BUFFER
554          PRIORITY       PF3
555          ASSIGN        8,15,PF
556          ASSIGN        9,S15,PF
557          SAVEVALUE     V58,PF9
558          LEAVE         15,PF3
559          TRANSFER      ,PJSEG

      TRANSMIT PAKT DATA BACK THRU SUBSYSTEM I/O
      TRNSP  MACKC        HAF15,10,R15,ZIP15,16,IJSUB,PF10,IOSTR,V35
560  HAF15  ASSIGN          10,R15,PF
561          SPLIT          1,ZIP15
562          PRIORITY       16
563          ASSIGN        3,V35,PF
564          ADVANCE        1
565          TRANSFER      ,IJSUB
566  ZIP15  ASSIGN          3,PF10,PF

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567	TRANSFER ,IJSTR	827
*	DELAY TRANSMISSION ONE TIME UNIT	828
	WAITA MACRO STP15,15,15,IUSUB	839
568	STP15 PRIORITY 15	839
569	QUEUE 15,PF3	839
570	ADVANCE 1	839
571	DEPART 15,PF3	839
572	TRANSFER ,IJSUB	840
*	TRANSMIT TO PAYLOAD DATA INTERLEAVER	840
573	TRANSFER ,PJSEG	841
*		842
*	PART 3. PAYLOAD DATA INTERLEAVER TO TRANSMIT	843
*		844
*	PAYLOAD DATA INTERLEAVER	845
*		846
*	TRANSMIT ALL DATA TO PAYLOAD DATA INTERLEAVER	847
	TRNSA MACRO PLSEG,7,WAIT7,K7,PART7,PDENT,DCSEG,S7	848
574	PDSEG GATE SNF 7,WAIT7	848
575	TEST GE K7,PF3,PART7	848
576	PDENT ENTER 7,PF3	848
	BUFFER MACRO	848
577	ASSIGN 8,PR,PF	848
578	PRIORITY 0,BUFFER	848
579	PRIORITY PF3	848
580	ASSIGN 8,7,PF	848
581	ASSIGN 9,S7,PF	848
582	SAVEVALUE V58,PF9	848
583	LEAVE 7,PF3	848
584	TRANSFER ,DCSEG	849
*	TRANSMIT PART DATA TO PAYLOAD DATA INTERLEAVER	850
	TRNSP MACRO PART7,10,K7,MOV7,16,PDSEG,PF10,PDENT,V27	850
585	PART7 ASSIGN 10,R7,PF	850
586	SPLIT 1,MOV7	850
587	PRIORITY 16	850
588	ASSIGN 3,V27,PF	850
589	ADVANCE 1	850
590	TRANSFER ,PDSEG	850
591	MOV7 ASSIGN 3,PF10,PF	850
592	TRANSFER ,PDENT	850
*	DELAY TRANSMISSION ONE TIME UNIT	851
	WAITA MACRO WAIT7,15,7,PDSEG	852
593	WAIT7 PRIORITY 15	852
594	QUEUE 7,PF3	852
595	ADVANCE 1	852
596	DEPART 7,PF3	852
597	TRANSFER ,PDSEG	853
*		854
*	DATA ACQUISITION CONTROL AND BUFFER UNIT	855
*		856
*	TRANSMIT ALL DATA TO DACBU	857
	TRNSA MACRO DCSEG,8,WAIT8,R8,PART8,DCENT,DLSEG,S8	857
598	DCSEG GATE SNF 8,WAIT8	857
599	TEST GE K8,PF3,PART8	857
600	DCENT ENTER 8,PF3	857
	BUFFER MACRO	857
601	ASSIGN 8,PR,PF	857
602	PRIORITY 0,BUFFER	857

603	PRICRITY	PF8	857
604	ASSIGN	8,5,PF	857
605	ASSIGN	9,S8,PF	857
606	SAVEVALUE	V53,PF9	857
607	LEAVE	8,PF3	857
608	TRANSFER	,LLSEG	858
	* TRANSMIT PART DATA TO DACBU		859
	TFNSP MACRO	PAKTB,10,K8,MOVP8,16,DCSEG,PF10,DCENT,V21	859
609	PART8 ASSIGN	10,R8,PF	859
610	SPLIT	1,MOVP8	859
611	PRICRITY	16	859
612	ASSIGN	3,V28,PF	859
613	ADVANCE	1	859
614	TRANSFER	,DCSEG	859
615	MOVP8 ASSIGN	3,PF10,PF	859
616	TRANSFER	,DCENT	860
	* DELAY TRANSMISSION ONE TIME UNIT		861
	WAITA MACRO	WAIT8,15,8,DCSEG	861
617	WAIT8 PRIORITY	15	861
618	QUEUE	8,PF3	861
619	ADVANCE	1	861
620	DEPART	8,PF3	861
621	TRANSFER	,DCSEG	862
	* * * * *		863
	DOWNLINK AVAILABLE?		864
	* * * * *		865
622	DLSEG GATE U	50,NETWD	866
	* * * * *		867
	KU-BAND		868
	* * * * *		869
	TRANSMIT ALL DATA TO KU-BAND		870
	TMITA MACRO	KUPRT,12,NETWD,R12,PTL12,S12	870
623	KUPRT GATE SNF	12,NETWD	870
624	TEST GE	R12,PF5,PTL12	870
625	ENTER	12,PF3	870
	BUFER MACRO		870
626	ASSIGN	8,PK,PF	870
627	PRIORITY	0,BUFFER	870
628	PRIORITY	PF3	870
629	ASSIGN	8,12,PF	870
630	ASSIGN	9,S12,PF	870
631	SAVEVALUE	V53,PF9	870
632	LEAVE	12,PF3	870
633	TERMINATE		871
	* TRANSMIT PART DATA TO KU-BAND		872
	TMITP MACRO	PTL12,10,R12,NETWD,KUPRT,V32,DDTD	872
634	PTL12 ASSIGN	10,R12,PF	872
635	SPLIT	1,DDTD	872
636	ASSIGN	3,V32,PF	872
637	TRANSFER	,NETWC	872
638	DDTD ASSIGN	3,PF10,PF	872
639	TRANSFER	,KUPRT	873
640	NETWC GATE U	49,LNKEC	874
	* * * * *		875
	NETWORK SIGNAL PROCESSOR		876
	* * * * *		877
	TRANSMIT ALL DATA TO NETWORK SIGNAL PROCESSOR		

	FMITA	MACRO	NSPRT,11,LMREC,R11,PRT11,S11	378
641	ASRT	GATE SNF	11,LMREC	378
642		TEST GE	K11,PF3,PRT11	378
643		ENTER	11,PF3	373
	BUFFER	MACRO		378
644		ASSIGN	8,PR,PF	373
645		PRIORITY	0,BUFFER	378
646		PRIORITY	PF8	378
647		ASSIGN	8,11,PF	378
648		ASSIGN	9,S11,PF	378
649		SAVEVALUE	V53,PF9	378
650		LEAVE	11,PF3	378
651		TERMINATE		378
	= TRANSMIT PART DATA TO NETWORK SIGNAL PROCESSOR			379
	IMITP	MACRO	PRT11,10,R11,LMREC,NSPRT,V31,DUT11	380
652	PRT11	ASSIGN	10,K11,PF	380
653		SPLIT	1,DUT11	380
654		ASSIGN	3,V31,PF	380
655		TRANSFER	,LMREC	380
656	DUT11	ASSIGN	3,PF10,PF	380
657		TRANSFER	,NSPRT	380
	= LOOP MAINTENANCE RECORDER			381
	= TRANSMIT ALL DATA TO L.M. RECORDER			382
	L-CDR	MACRO	LMREC,9,LUSE9,R9,PF3,PART9,DUMP9,10	383
658	LMREC	PRIORITY	10	385
659		GATE SNF	9,LUSE9	385
660		TEST GE	R9,PF3,PART9	385
661		ENTER	9,PF3	385
662		TRANSFER	,DUMP9	385
	= TRANSMIT PART DATA TO L.M. RECORDER			386
	RECDP	MACRO	PART9,10,R9,9,11,PF10,PF11,DUMP9,9+,V29	387
663	PART9	ASSIGN	10,K9,PF	387
664		ENTER	9,R9	387
665		ASSIGN	11,V29,PF	387
666		SAVEVALUE	9+,PF11	387
667		ASSIGN	3,PF10,PF	387
668		TRANSFER	,DUMP9	387
	= DUMP L.M. RECORDER TO F.M. SIGNAL PROCESSOR			388
	= DUMP ALL DATA TO F.M. SIGNAL PROCESSOR			389
	DUMPA	MACRO	DUMP9,DLAY9,10,DLA9A,R10,PR10,9,FMPRT,49	390
669	DUMP9	GATE U	49,DLAY9	392
670		GATE SNF	10,DLA9A	392
671		TEST GE	R10,PF3,PR10	392
672		LEAVE	9,PF3	392
673		TRANSFER	,FMPRT	392
	= DUMP PART DATA TO F.M. SIGNAL PROCESSOR			393
	DUMPP	MACRO	PR10,10,R10,14,1,DUMP9,PF10,V30,MVA10,9	394
674	PR10	ASSIGN	10,K10,PF	394
675		SPLIT	1,MVA10	394
676		PRIORITY	14	394
677		ADVANCE	1	394
678		ASSIGN	3,V30,PF	394
679		TRANSFER	,DUMP9	394

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680	PF10 ADVANCE	0	894
681	ASSIGN	3,PF10,PF	894
682	LEAVE	9,PF3	894
	JUMP1 MACRO	FMPKT	895
683	TRANSFER	,FMPKT	895
	* DELAY UNTIL DOWNLINK AVAILABLE		896
	DELAY3 MACRO	DELAY4,13,V57,V5,FMBAD,DUMP9	897
684	DELAY9 PRIORITY	13	897
685	TEST GE	V57,V5,FMBAD	897
686	ADVANCE	V5	897
687	TRANSFER	,DUMP9	897
688	FMBAD ADVANCE	V57	897
689	TRANSFER	,DUMP9	897
	* DELAY LINE TIME UNIT		898
	DELAY2 MACRO	DELAY4,11,DUMP9	899
690	DELAY9A PRIORITY	11	899
691	ADVANCE	1	899
692	TRANSFER	,DUMP9	899
	* F.M. SIGNAL PROCESSOR		900
	* TRANSMIT ALL DATA TO F.M. SIGNAL PROCESSOR		901
	TMITP MACRO	FMPKT,10,DUMP9,R10,SEG10,S10	902
693	FMPKT GATE SNF	10,DUMP9	904
694	TEST GE	R10,PF3,SEG10	904
695	ENTER	10,PF3	904
	BUFER MACRO		904
696	ASSIGN	8,PR,PF	904
697	PRIORITY	0,BUFFER	904
698	PRIORITY	PF8	904
699	ASSIGN	8,10,PF	904
700	ASSIGN	9,S10,PF	904
701	SAVEVALUE	V58,PF9	904
702	LEAVE	10,PF3	904
703	TERMINATE		904
	* TRANSMIT PART DATA TO F.M. SIGNAL PROCESSOR		905
	TMITP MACRO	SEG10,10,R10,DUMP9,FMPKT,V30,DUT10	906
704	SEG10 ASSIGN	10,R10,PF	906
705	SPLIT	1,DUT10	906
706	ASSIGN	3,V30,PF	906
707	TRANSFER	,DUMP9	906
708	DOT10 ASSIGN	3,PF10,PF	906
709	TRANSFER	,FMPKT	906
710	EXTRM TERMINATE		907
711	SBTRM TERMINATE		908
712	LOSE9 SAVEVALUE	9+,PF3	909
713	TERMINATE		910
	*****		911
	**		912
	** MODULE 5. DOWNLINK SCHEDULE		913
	**		914
	*****		915
2	MATRIX	X,1,OC	916
	INITIAL	MX2(1,1),417/MX2(1,2),422/MX2(1,3),425/MX2(1,4),500	917
	INITIAL	MX2(1,5),503/MX2(1,6),561/MX2(1,7),583/MX2(1,8),594	918
	INITIAL	MX2(1,9),600/MX2(1,10),726/MX2(1,11),742	919
	INITIAL	MX2(1,12),761/MX2(1,13),772/MX2(1,14),900	920

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	INITIAL	MX2(1,15),906/MX2(1,16),928/MX2(1,17),950	921
	INITIAL	MX2(1,18),1106/MX2(1,19),1117/MX2(1,20),1283	922
	INITIAL	MX2(1,21),1286/MX2(1,22),1339/MX2(1,23),1344	923
	INITIAL	MX2(1,24),1411/MX2(1,25),1425/MX2(1,26),1439	924
	INITIAL	MX2(1,27),1444/MX2(1,28),1500/MX2(1,29),1511	925
	INITIAL	MX2(1,30),1572/MX2(1,31),1592/MX2(1,32),1606	926
	INITIAL	MX2(1,33),1608/MX2(1,34),1672/MX2(1,35),1675	927
	INITIAL	MX2(1,36),1731/MX2(1,37),1755/MX2(1,38),1897	928
	INITIAL	MX2(1,39),1914/MX2(1,40),1928/MX2(1,41),1939	929
	INITIAL	MX2(1,42),2069/MX2(1,43),2072/MX2(1,44),2094	930
	INITIAL	MX2(1,45),2117/MX2(1,46),2272/MX2(1,47),2289	931
	INITIAL	MX2(1,48),2447/MX2(1,49),2453/MX2(1,50),2511	932
	INITIAL	MX2(1,51),2517/MX2(1,52),2586/MX2(1,53),2594	933
	INITIAL	MX2(1,54),2611/MX2(1,55),2617/MX2(1,56),2672	934
	INITIAL	MX2(1,57),2633/MX2(1,58),2726/MX2(1,59),2739	935
	INITIAL	MX2(1,60),2797	936
714	GENERATE	,,400,1,50,25PF	937
715	LOOP2	ASSIGN 1+,1,PF	938
716	TEST E	PF1,1,MOVE1	939
717	SAVEVALUE	50,V19	940
718	ASSIGN	2,V19,PF	941
719	TRANSFER	,DLINK	942
720	MOVE1	ASSIGN 2,V20,PF	943
721	DLINK	ADVANCE PF2	944
722	ASSIGN	1+,1,PF	945
723	ASSIGN	2,V20,PF	946
724	SEIZE	50	947
725	ADVANCE	PF2	948
726	RELEASE	50	949
727	TEST E	PF1,60,GUHEd	950
728	ASSIGN	1,0,PF	951
729	ASSIGN	3+,1,PF	952
730	ASSIGN	4,1,PF	953
731	SAVEVALUE	50,V6	954
732	ADVANCE	3	955
733	TRANSFER	,LOOP2	956
734	GUHEd	ASSIGN 4,V17,PF	957
735	CKDLK	SAVEVALUE 50,V6	958
736	TRANSFER	,LOOP2	959
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**

** MODULE 6. GROUND LINK SCHEDULE

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MATRIX	X,3,353	
INITIAL	MX3(1,1),292/MX3(2,1),330/MX3(3,1),13	966
INITIAL	MX3(1,2),299/MX3(2,2),230/MX3(3,2),12	967
INITIAL	MX3(1,3),301/MX3(2,3),340/MX3(3,3),12	968
INITIAL	MX3(1,4),326/MX3(2,4),280/MX3(3,4),13	969
INITIAL	MX3(1,5),362/MX3(2,5),360/MX3(3,5),12	970
INITIAL	MX3(1,6),452/MX3(2,6),330/MX3(3,6),13	971
INITIAL	MX3(1,7),487/MX3(2,7),280/MX3(3,7),12	972
INITIAL	MX3(1,8),522/MX3(2,8),360/MX3(3,8),13	973
INITIAL	MX3(1,9),561/MX3(2,9),300/MX3(3,9),13	974
INITIAL	MX3(1,10),626/MX3(2,10),300/MX3(3,10),13	975
INITIAL	MX3(1,11),678/MX3(2,11),330/MX3(3,11),13	976
INITIAL	MX3(1,12),731/MX3(2,12),7/MX3(3,12),12	977

INITIAL	MX3(1,13),769/MX3(2,13),320/MX3(3,13),13	978
INITIAL	MX3(1,14),709/MX3(2,14),7/MX3(3,14),13	979
INITIAL	MX3(1,15),794/MX3(2,15),7/MX3(3,15),13	980
INITIAL	MX3(1,16),794/MX3(2,16),350/MX3(3,16),13	981
INITIAL	MX3(1,17),301/MX3(2,17),7/MX3(3,17),16	982
INITIAL	MX3(1,18),351/MX3(2,18),350/MX3(3,18),13	983
INITIAL	MX3(1,19),304/MX3(2,19),320/MX3(3,19),13	984
INITIAL	MX3(1,20),305/MX3(2,20),480/MX3(3,20),3	985
INITIAL	MX3(1,21),349/MX3(2,21),7/MX3(3,21),13	986
INITIAL	MX3(1,22),249/MX3(2,22),7/MX3(3,22),15	987
INITIAL	MX3(1,23),949/MX3(2,23),340/MX3(3,23),12	988
INITIAL	MX3(1,24),952/MX3(2,24),230/MX3(3,24),12	989
INITIAL	MX3(1,25),907/MX3(2,25),7/MX3(3,25),9	990
INITIAL	MX3(1,26),1015/MX3(2,26),340/MX3(3,26),12	991
INITIAL	MX3(1,27),1019/MX3(2,27),230/MX3(3,27),13	992
INITIAL	MX3(1,28),1086/MX3(2,28),320/MX3(3,28),13	993
INITIAL	MX3(1,29),1086/MX3(2,29),7/MX3(3,29),13	994
INITIAL	MX3(1,30),1100/MX3(2,30),330/MX3(3,30),13	995
INITIAL	MX3(1,31),1100/MX3(2,31),7/MX3(3,31),13	996
INITIAL	MX3(1,32),1123/MX3(2,32),7/MX3(3,32),13	997
INITIAL	MX3(1,33),1160/MX3(2,33),330/MX3(3,33),13	998
INITIAL	MX3(1,34),1181/MX3(2,34),320/MX3(3,34),13	999
INITIAL	MX3(1,35),1342/MX3(2,35),360/MX3(3,35),13	1000
INITIAL	MX3(1,36),1502/MX3(2,36),360/MX3(3,36),13	1001
INITIAL	MX3(1,37),1992/MX3(2,37),280/MX3(3,37),13	1002
INITIAL	MX3(1,38),2153/MX3(2,38),280/MX3(3,38),13	1003
INITIAL	MX3(1,39),2224/MX3(2,39),300/MX3(3,39),13	1004
INITIAL	MX3(1,40),2294/MX3(2,40),350/MX3(3,40),13	1005
INITIAL	MX3(1,41),2385/MX3(2,41),300/MX3(3,41),12	1006
INITIAL	MX3(1,42),2449/MX3(2,42),230/MX3(3,42),12	1007
INITIAL	MX3(1,43),2451/MX3(2,43),340/MX3(3,43),12	1008
INITIAL	MX3(1,44),2454/MX3(2,44),350/MX3(3,44),13	1009
INITIAL	MX3(1,45),2474/MX3(2,45),280/MX3(3,45),13	1010
INITIAL	MX3(1,46),2475/MX3(2,46),7/MX3(3,46),12	1011
INITIAL	MX3(1,47),2602/MX3(2,47),340/MX3(3,47),22	1012
INITIAL	MX3(1,48),2609/MX3(2,48),230/MX3(3,48),13	1013
INITIAL	MX3(1,49),2630/MX3(2,49),280/MX3(3,49),13	1014
INITIAL	MX3(1,50),2672/MX3(2,50),360/MX3(3,50),13	1015
INITIAL	MX3(1,51),2762/MX3(2,51),330/MX3(3,51),13	1016
INITIAL	MX3(1,52),2797/MX3(2,52),280/MX3(3,52),13	1017
INITIAL	MX3(1,53),2871/MX3(2,53),300/MX3(3,53),13	1018
INITIAL	MX3(1,54),2871/MX3(2,54),7/MX3(3,54),13	1019
INITIAL	MX3(1,55),2907/MX3(2,55),7/MX3(3,55),12	1020
INITIAL	MX3(1,56),2923/MX3(2,56),7/MX3(3,56),21	1021
INITIAL	MX3(1,57),2923/MX3(2,57),350/MX3(3,57),12	1022
INITIAL	MX3(1,58),2932/MX3(2,58),340/MX3(3,58),12	1023
INITIAL	MX3(1,59),2959/MX3(2,59),7/MX3(3,59),12	1024
INITIAL	MX3(1,60),3032/MX3(2,60),300/MX3(3,60),12	1025
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923	ASSIGN	8,3,PF	1471
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935		ASSIGN	4, R4, PF	1479
936		SPLIT	1, EXPD	1479
937		ENTER	4, R4	1479
938		LEAVE	4, R4	1479
939		TRANSFER	, EICJP	1479
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944	EXPE	TEST WE	CH4, 0, EXPZ	1480
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946		SPLIT	1, EBUF	1480
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951		RELEASE		1481
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956	EXPH	ASSIGN	3, V3, PF	1481
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966		TEST GE	R3, PF3, EXLUZ	1487
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969		ASSIGN	8, 3, PF	1487
970		ASSIGN	9, S3, PF	1487
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977		PRIORITY	0,BUFFER	1491
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979		ASSIGN	8,Z,PF	1491
980		ASSIGN	9,S2,PF	1491
981		SAVEVALUE	V50,PF9	1491
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986		GENERATE	1,,200,,25,25PF	1501
987		ASSIGN	3,MX4(1,16),PF	1502
988		TRANSFER	.MX4(1,11),SUBIO,EXPIO	1503
	"			1504
	"	SUBSYSTEM I/O		1505
	"			1506
	"	TRANSMIT ALL DATA TO SUBSYSTEM I/O		1507
	TRNSA	MACRO	SUBIO,15,TRM15,R15,TRM15,GUESU,CPUSU,S15	1508
989	SUBIO	GATE SNF	15,TRM15	1508
990		TEST GE	R15,PF3,TRM15	1508
991	GUESU	ENTER	15,PF3	1508
	BUFER	MACRO		1508
992		ASSIGN	8,PR,PF	1508
993		PRIORITY	0,BUFFER	1508
994		PRIORITY	PF3	1508
995		ASSIGN	8,15,PF	1508
996		ASSIGN	9,S15,PF	1508
997		SAVEVALUE	V58,PF9	1508
998		LEAVE	15,PF3	1508
999		TRANSFER	,CPUSU	1508
1000	TRM15	TERMINATE		1509
	"			1510
	"	SUBSYSTEM COMPUTER		1511
	"			1512
	"	TRANSMIT ALL DATA TO SUBSYSTEM COMPUTER		1513
	COMPZ	MACRO	CPUSU,K16,SIXTB,16,SIXTA,SUBOI	1514
1001	CPUSU	TEST GE	K16,PF3,SIXTB	1514
1002	SIXTA	ENTER	16,PF3	1514
1003		LEAVE	16,PF3	1514
1004		TRANSFER	,SUBOI	1514
	COMPY	MACRO	SIXTB,R16,SIXTC,SIXTD,16,SUBOI,V9	1515
1005	SIXTB	TEST G	K16,C,SIXTC	1515
1006		ASSIGN	4,K16,PF	1515
1007		SPLIT	1,SIXTD	1515
1008		ENTER	16,R16	1515
1009		LEAVE	16,R16	1515

1052	ASSIGN	8,PR,PF	1530
1053	PRIORITY	0,3UFFER	1530
1054	PRIORITY	PF3	1530
1055	ASSIGN	8,3,PF	1530
1056	ASSIGN	9,53,PF	1530
1057	SAVEVALUE	V53,PF9	1530
1058	LEAVE	3,PF3	1530
1059	TRANSFER	,LPUEX	1530
1060	TERM3	TERMINATE	1531
*			1532
*	EXPERIMENT	COMPUTER	1533
*			1534
*	TRANSMIT	DATA TO EXPERIMENT COMPUTER	1535
	CUMPZ	MACRO CPJEX,4,FUARB,4,FUARA,EXPOI	1536
1061	CPUEX	TEST GE R4,PF3,FLARB	1536
1062	FUAKA	ENTER 4,PF3	1536
1063	LEAVE	4,PF3	1536
1064	TRANSFER	,EXPOI	1536
	COMPY	MACRO FQAKB,R4,FUARC,FOARD,4,EXPOI,V9	1537
1065	FQAKB	TEST G R4,0,FQAKC	1537
1066	ASSIGN	4,R4,PF	1537
1067	SPLIT	1,FQARD	1537
1068	ENTER	4,R4	1537
1069	LEAVE	4,R4	1537
1070	TRANSFER	,EXPOI	1537
1071	FQAKD	ASSIGN 3,V4,PF	1537
	COMPX	MACRO FLAKC,FQARZ,4,FQARE,FQARF,BUUF4,CH4	1538
1072	FQARC	QUEUE 4	1538
1073	SEIZE	4	1538
1074	DEPART	4	1538
1075	FQARE	TEST NE CF4,0,FQARZ	1538
1076	UNLINK	4,FQAKF,1	1538
1077	SPLIT	1,BUUF4	1538
1078	FQARZ	RELEASE 4	1538
1079	TERMINATE		1538
	COMPD	MACRO BUJF4,4,X23,FUARG,FQARH,V4,FOAKE,V3,X22,4-	1539
1080	BUUF4	SEIZE 4	1539
1081	TEST E	PF3,X23,FQARG	1539
1082	RELEASE	4	1539
1083	TERMINATE		1539
1084	FQARG	TEST L X23,PF3,FQARH	1539
1085	ASSIGN	3,V4,PF	1539
1086	TRANSFER	,FOARE	1539
1087	FQARH	ASSIGN 3,V3,PF	1539
1088	ASSIGN	2,X22,PF	1539
1089	RELEASE	4	1539
1090	SAVEVALUE	4-,PF3	1539
1091	LINK	4,LIFC	1539
	COMPE	MACRO FLAKF,23,22,4+	1540
1092	FQARF	SAVEVALUE 23,PF3	1540
1093	SAVEVALUE	22,PF2	1540
1094	SAVEVALUE	4+,PF3	1540
1095	TERMINATE		1540
*			1541
*	EXPERIMENT	I/O	1542
*			1543
*	TRANSMIT	ALL DATA BACK THRU EXPERIMENT I/O	1544

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TRNSA MACRO      EXPDI,3,TER,M3,R3,TER,M3,GDDIO,COMND,S3          1545
1096  EXPDI GATE SNF 3,TER,M3          1545
1097  TEST GE      R3,PF3,TER,M3      1545
1098  GDDIO ENTER  3,PF3              1545
      BUFEK MACRO
1099  ASSIGN      8,PR,PF              1545
1100  PRIORITY    0,BUFEK              1545
1101  PRIORITY    PF8                  1545
1102  ASSIGN      8,3,PF              1545
1103  ASSIGN      9,S3,PF             1545
1104  SAVEVALUE   V58,PF9            1545
1105  LEAVE       3,PF3               1545
1106  TRANSFER    ,COMND              1545
1107  COMND ASSIGN 7,1,PF              1546
1108  TRANSFER    ,MX4(1,15),RAUC,MDISG 1547
*****
**
** MODULE 8: GUIDANCE, NAVIGATION AND CONTROL DATA          1549
**
*****
*
* PART 1. GPC TO EXPERIMENT COMPUTER AND SUBSYSTEM          1553
*
* INPUT GNEC DATA                                          1556
*
* GENERATE . 1,,20C,,20,25PF          1559
1109  ASSIGN      3,MX4(1,17),PF      1560
1110
*
* GPC I/O BUSS                                             1561
*
* TRANSMIT GNEC DATA TO GPC I/O BUSS                       1564
TRNSA MACRO      GPCPT,18,GPLOZ,R18,GPLOP,GPCR,MDMPT,S18        1565
1111  GPCPT GATE SNF 18,GPLU2          1565
1112  TEST GE      R18,PF3,GPLOP      1565
1113  GPCR ENTER   18,PF3              1565
      BUFEK MACRO
1114  ASSIGN      8,PR,PF              1565
1115  PRIORITY    0,BUFEK              1565
1116  PRIORITY    PF9                  1565
1117  ASSIGN      8,18,PF             1565
1118  ASSIGN      9,S18,PF            1565
1119  SAVEVALUE   V58,PF9            1565
1120  LEAVE       18,PF3              1565
1121  TRANSFER    ,MDMPT              1565
TRNSP MACRO      GPLQP,10,R18,GPCA,12,GPCPT,PF10,GPCR,V53        1566
1122  GPLQP ASSIGN 10,R18,PF          1566
1123  SPLIT       1,GPCA               1566
1124  PRIORITY    12                   1566
1125  ASSIGN      3,V53,PF            1566
1126  ADVANCE     1                     1566
1127  TRANSFER    ,GPCPT              1566
1128  GPCA ASSIGN  3,PF10,PF          1566
1129  TRANSFER    ,GPCR               1566
*
* MD4
*

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	*	TRANSMIT GNEC DATA TO MDM	1570
	TRNSA	MACRO MDMP,17,MDLQZ,R17,MDLQP,MDMK,SUIDS,S17	1571
1130	MDMPT	GATE SWF 17,MDLCZ	1571
1131		TEST GE R17,PF3,MDLCP	1571
1132	MDMK	ENTER 17,PF3	1571
	BUFER	MACRO	1571
1133		ASSIGN 8,PR,PF	1571
1134		PRIORITY 0,BUFFER	1571
1135		PRIORITY PF3	1571
1136		ASSIGN 8,17,PF	1571
1137		ASSIGN 9,S17,PF	1571
1138		SAVEVALUE V53,PF9	1571
1139		LEAVE 17,PF3	1571
1140		TRANSFER ,SUIDS	1571
	TRNSP	MACRO MDLQP,10,R17,MDM17,12,MDMPT,PF10,MDMK,V52	1572
1141	MDLQP	ASSIGN 10,R17,PF	1572
1142		SPLIT 1,MDM17	1572
1143		PRIORITY 12	1572
1144		ASSIGN 3,V52,PF	1572
1145		ADVANCE 1	1572
1146		TRANSFER ,MDMPT	1572
1147	MDM17	ASSIGN 3,PF10,PF	1572
1148		TRANSFER ,MDMK	1572
	*		1573
	*	GNEC DATA SPLITS; PART TO EXPERIMENT I/O, PART TO SUBSYSTEM I/O	1574
	*	SPLIT 1,EXDIS	1575
	*		1576
	*	SUBSYSTEM I/O	1577
	*		1578
	*	TRANSMIT GNEC DATA TO SUBSYSTEM I/O	1579
	TRNSA	MACRO SUIDS,15,SULOZ,R15,SULQP,SIGR,SUCPU,S15	1580
1149	SUIDS	GATE SWF 15,SULOZ	1580
1150		TEST GE R15,PF3,SULQP	1580
1151	SIGR	ENTER 15,PF3	1580
	BUFER	MACRO	1580
1152		ASSIGN 8,PR,PF	1580
1153		PRIORITY 0,BUFFER	1580
1154		PRIORITY PF3	1580
1155		ASSIGN 8,15,PF	1580
1156		ASSIGN 9,S15,PF	1580
1157		SAVEVALUE V53,PF9	1580
1158		LEAVE 15,PF3	1580
1159		TRANSFER ,SUCPU	1580
	TRNSP	MACRO SULQP,10,R15,SUB15,12,SUIDS,PF10,SIGR,V35	1581
1160	SULQP	ASSIGN 10,R15,PF	1581
1161		SPLIT 1,SUB15	1581
1162		PRIORITY 12	1581
1163		ASSIGN 3,V35,PF	1581
1164		ADVANCE 1	1581
1165		TRANSFER ,SUIDS	1581
1166	SUB15	ASSIGN 3,PF10,PF	1581
1167		TRANSFER ,SIGR	1581
	*		1582
	*	SUBSYSTEM COMPUTER	1583
	*		1584
	COMPZ	MACRO SUCPU,R16,SAXTB,16,SAXTA,SUBUI	1585
1168	SUCPU	TEST GE R16,PF3,SAXTB	1585

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1169	SAXTA	ENTER	16,PF3	1585
1170		LEAVE	16,PF3	1585
1171		TRANSFER	,SUBDI	1585
	COMPY	MACRO	SAXTB,R16,SAXTC,SAXTD,16,SUBDI,V9	1586
1172	SAXTB	TEST G	R16,,SAXTC	1586
1173		ASSIGN	4,X16,PF	1586
1174		SPLIT	1,SAXTD	1586
1175		ENTER	16,R16	1586
1176		LEAVE	16,R16	1586
1177		TRANSFER	,SUBDI	1586
1178	SAXTD	ASSIGN	3,V9,PF	1586
	COMPX	MACRO	SAXTC,SAXTZ,16,SAXTE,SAXTF,8AF16,CH16	1587
1179	SAXTC	QUEUE	16	1587
1180		SEIZE	16	1587
1181		DEPART	16	1587
1182	SAXTE	TEST ME	CH16,C,SAXTZ	1587
1183		UNLINK	16,SAXTF,1	1587
1184		SPLIT	1,8AF16	1587
1185	SAXTZ	RELEASE	16	1587
1186		TERMINATE		1587
	COMPD	MACRO	8AF16;16,X25,SAXTG,SAXTH,V12,SAXTE,V11,X24,16-	1588
1187	8AF16	SEIZE	16	1588
1188		TEST E	PF3,X25,SAXTG	1588
1189		RELEASE	16	1588
1190		TERMINATE		1588
1191	SAXTG	TEST L	X25,PF3,SAXTH	1588
1192		ASSIGN	3,V12,PF	1588
1193		TRANSFER	,SAXTE	1588
1194	SAXTH	ASSIGN	3,V11,PF	1588
1195		ASSIGN	2,X24,PF	1588
1196		RELEASE	16	1588
1197		SAVEVALUE	16-,PF3	1588
1198		LINK	16,LIFO	1588
	COMPE	MACRO	SAXTF,25,24,16+	1589
1199	SAXTF	SAVEVALUE	25,PF3	1589
1200		SAVEVALUE	24,PF2	1589
1201		SAVEVALUE	16+,PF3	1589
1202		TERMINATE		1589
	*			1590
	*	SUBSYSTEM I/O		1591
	*			1592
	*	TRANSMIT GNEC DATA TO SUBSYSTEM I/O		1593
	TRNSA	MACRO	ICSUS,15,LUZSU,R15,LUZSP,SUIR,SSRAU,S15	1594
1203	ICSUS	GATE SHF	15,LUZSU	1594
1204		TEST GE	K15,PF3,LUZSP	1594
1205	SUIR	ENTER	15,PF3	1594
	BUFEK	MACRO		1594
1206		ASSIGN	8,PK,PF	1594
1207		PRIORITY	0,BUFFER	1594
1208		PRIORITY	PF3	1594
1209		ASSIGN	8,15,PF	1594
1210		ASSIGN	9,S15,PF	1594
1211		SAVEVALUE	VF3,PF9	1594
1212		LEAVE	15,PF3	1594
1213		TRANSFER	,SSRAU	1594
	TRNSP	MACRO	LUZSP,10,R15,IOS15,12,IOSUS,PF10,SUIR,V35	1595
1214	LUZSP	ASSIGN	10,R15,PF	1595

1215	SPLIT	1,IGS15	1595
1216	PRIORITY	12	1595
1217	ASSIGN	3,V35,PF	1595
1218	ADVANCE	1	1595
1219	TRANSFER	,IJSUS	1595
1220	IGS15 ASSIGN	3,PF10,PF	1595
1221	TRANSFER	,SUK	1595
#			1596
#	SUBSYSTEM RAU		1597
#			1598
#	TRANSMIT GNC DATA TO SUBSYSTEM RAU		1599
TRNSA MACRO	SSRAU,14,SSL02,R14,SSLUP,SRUR,SUBTR,S14		1600
1222	SSRAU GATE SWF	14,SSL02	1600
1223	TEST GE	R14,PF3,SSLUP	1600
1224	SRUR ENTER	14,PF3	1600
BUFFER MACRO			1600
1225	ASSIGN	8,PR,PF	1600
1226	PRIORITY	0,BUFFER	1600
1227	PRIORITY	PF3	1600
1228	ASSIGN	8,14,PF	1600
1229	ASSIGN	9,S14,PF	1600
1230	SAVEVALUE	V53,PF9	1600
1231	LEAVE	14,PF3	1600
1232	TRANSFER	,SUBTR	1600
TRNSP MACRO	SSLUP,10,R14,SSR14,12,SSRAU,PF10,SRUR,V34		1601
1233	SSLUP ASSIGN	10,R14,PF	1601
1234	SPLIT	1,SSR14	1601
1235	PRIORITY	12	1601
1236	ASSIGN	3,V34,PF	1601
1237	ADVANCE	1	1601
1238	TRANSFER	,SSRAU	1601
1239	SSR14 ASSIGN	3,PF10,PF	1601
1240	TRANSFER	,SRUR	1601
1241	SUBTR TERMINATE		1602
#			1603
#	EXPERIMENT I/O		1604
#			1605
#	TRANSMIT GNC DATA TO EXPERIMENT I/O		1606
TRNSA MACRO	EXJIS,3,EELJZ,K3,EELDP,EIOR,EPCPU,S3		1607
1242	EXJIS GATE SWF	3,EELCZ	1607
1243	TEST GE	R3,PF3,EELUP	1607
1244	EIOR ENTER	3,PF3	1607
BUFFER MACRO			1607
1245	ASSIGN	8,PR,PF	1607
1246	PRIORITY	0,BUFFER	1607
1247	PRIORITY	PF3	1607
1248	ASSIGN	8,3,PF	1607
1249	ASSIGN	9,S3,PF	1607
1250	SAVEVALUE	V53,PF9	1607
1251	LEAVE	3,PF3	1607
1252	TRANSFER	,EPCPU	1607
TRNSP MACRO	EELJP,10,K3,EXD3,12,EXG15,PF10,EIOR,V23		1608
1253	EELJP ASSIGN	10,K3,PF	1608
1254	SPLIT	1,EXD3	1608
1255	PRIORITY	12	1608
1256	ASSIGN	3,V23,PF	1608
1257	ADVANCE	1	1608

1258	TRANSFER	,EKOIS	1e08
1259	EXOB ASSIGN	3,PF10,PF	1e08
1260	TRANSFER	,EILK	1e08
*			1e09
*	EXPERIMENT CPU		1e10
*			1e11
*	TRANSFER GNEC DATA TO EXPERIMENT COMPUTER		1e12
	COMPZ MACRO	EP CPU, A4, FORTD, 4, FORTA, EPPID	1e13
1261	EPCPU TEST GE	K4, PF3, FORTB	1e13
1262	FORTA ENTER	4, PF3	1e13
1263	LEAVE	4, PF3	1e13
1264	TRANSFER	,EPPIC	1e13
	COMPY MACRO	FLKTD, K4, FUKTC, FORTD, 4, EPPID, V9	1e14
1265	FORTD TEST G	K4, 0, FORTC	1e14
1266	ASSIGN	4, K4, PF	1e14
1267	SPLIT	1, FORTD	1e14
1268	ENTER	4, K4	1e14
1269	LEAVE	4, R4	1e14
1270	TRANSFER	,EPPIC	1e14
1271	FORTD ASSIGN	3, V9, PF	1e14
	COMPX MACRO	FLKTC, FCRTZ, 4, FORTE, FORTF, BAFF4, CH4	1e15
1272	FURTC QUEUE	4	1e15
1273	SEIZE	4	1e15
1274	DEPART	4	1e15
1275	FURTE TEST NE	CH4, 0, FORTZ	1e15
1276	UNLINK	4, FORTF, 1	1e15
1277	SPLIT	1, BAFF4	1e15
1278	FURTZ RELEASE	4	1e15
1279	TERMINATE		1e15
	COMPD MACRO	BAFF4, 4, X23, FORTG, FORTH, V4, FURTE, V3, X22, 4-	1e16
1280	BAFF4 SEIZE	4	1e16
1281	TEST E	PF3, X23, FORTG	1e16
1282	RELEASE	4	1e16
1283	TERMINATE		1e16
1284	FORTG TEST L	X23, PF3, FORTH	1e16
1285	ASSIGN	3, V4, PF	1e16
1286	TRANSFER	,FUKTE	1e16
1287	FORTH ASSIGN	3, V3, PF	1e16
1288	ASSIGN	2, X22, PF	1e16
1289	RELEASE	4	1e16
1290	SAVEVALUE	4-, PF3	1e16
1291	LINK	4, LIFC	1e16
	COMPE MACRO	FLKTF, 23, 22, 4+	1e17
1292	FORTF SAVEVALUE	23, PF3	1e17
1293	SAVEVALUE	22, PF2	1e17
1294	SAVEVALUE	4+, PF3	1e17
1295	TERMINATE		1e17
1296	EPPID TERMINATE		1e18
*			1e19
*	PART 2. EXPERIMENT/SUBSYSTEM TO GPC		1e20
*			1e21
*			1e22
*	INPUT SUBSYSTEM GNEC DATA		1e23
1297	GENERATE	1, , , 30, 25PF	1e24
1298	ASSIGN	3, MX4(1, 18), PF	1e25
*			1e26
*	SUBSYSTEM RAU		1e27

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			1628
		TRANSMIT GNEC DATA TO SUBSYSTEM KAU	1629
	TRANSA	MACRC SYKAU,14,SYLUZ,R14,SYLUP,SKAR,SYIND,S14	1630
1299	SYKAU	GATE SNF 14,SYLJZ	1630
1300		TEST GE R14,PF3,SYLUP	1630
1301	SKAR	ENTER 14,PF3	1630
	BUFER	MACRC	1630
1302		ASSIGN 8,PR,PF	1630
1303		PRIORITY 0,BUFFER	1630
1304		PRIORITY PF3	1630
1305		ASSIGN 8,14,PF	1630
1306		ASSIGN 9,S14,PF	1630
1307		SAVEVALUE V58,PF9	1630
1308		LEAVE 14,PF3	1630
1309		TRANSFER ,SYIND	1630
	TRNSP	MACRC SYLUP,10,R14,SYR14,12,SYKAU,PF10,SKAR,V34	1631
1310	SYLUP	ASSIGN 10,R14,PF	1631
1311		SPLIT 1,SYR14	1631
1312		PRIORITY 12	1631
1313		ASSIGN 3,V34,PF	1631
1314		ADVANCE 1	1631
1315		TRANSFER ,SYKAU	1631
1316	SYR14	ASSIGN 3,PF10,PF	1631
1317		TRANSFER ,SKAR	1631
	*		1632
	*	SUBSYSTEM I/O	1633
	*		1634
	*	TRANSMIT GNEC DATA TO SUBSYSTEM I/O	1635
	TRANSA	MACRC SYIND,15,SYLOZ,R14,SYLUP,SUER,SYCPU,S15	1636
1318	SYIND	GATE SNF 15,SYLOZ	1636
1319		TEST GE R14,PF3,SYLUP	1636
1320	SUER	ENTER 15,PF3	1636
	BUFER	MACRC	1636
1321		ASSIGN 8,PR,PF	1636
1322		PRIORITY 0,BUFFER	1636
1323		PRIORITY PF3	1636
1324		ASSIGN 8,15,PF	1636
1325		ASSIGN 9,S15,PF	1636
1326		SAVEVALUE V58,PF9	1636
1327		LEAVE 15,PF3	1636
1328		TRANSFER ,SYCPU	1636
	TRNSP	MACRC SYLUP,10,R14,SYI14,12,SYIND,PF10,SUER,V33	1637
1329	SYLUP	ASSIGN 10,R14,PF	1637
1330		SPLIT 1,SYI14	1637
1331		PRIORITY 12	1637
1332		ASSIGN 3,V35,PF	1637
1333		ADVANCE 1	1637
1334		TRANSFER ,SYIND	1637
1335	SYI14	ASSIGN 3,PF10,PF	1637
1336		TRANSFER ,SUER	1637
	*		1638
	*	SUBSYSTEM COMPUTER	1639
	*		1640
	*	TRANSMIT GNEC DATA TO SUBSYSTEM COMPUTER	1641
	CMPZ	MACRC SYCPU,R16,SYXTB,16,SYXTA,SYSUB	1642
1337	SYCPU	TEST GE R16,PF3,SYXTB	1642
1338	SYXTA	ENTER 16,PF3	1642

1339	LEAVE	16,PF3	16+2
1340	TRANSFER	,SYSUB	1642
	COMPY MACRO	SYXTO,R16,SYXTC,SYXTO,16,SYSUB,V9	16+3
1341	SYXTB TEST G	R16,0,SYXTC	1643
1342	ASSIGN	4,R16,PF	1643
1343	SPLIT	1,SYXTO	16+3
1344	ENTER	16,R16	16+3
1345	LEAVE	16,R16	1643
1346	TRANSFER	,SYSUB	1643
1347	SYXTD ASSIGN	3,V9,PF	1643
	CUMPX MACRO	SYXTC,SYXTZ,16,SYXTE,SYXTF,8YF16,LH16	1644
1348	SYXTC QUEUE	16	1644
1349	SEIZE	16	1644
1350	DEPART	16	1644
1351	SYXTE TEST ME	CH16,C,SYXTZ	1644
1352	UNLINK	16,SYXTF,1	1644
1353	SPLIT	1,8YF16	1644
1354	SYXTZ RELEASE	16	1644
1355	TERMINATE		1644
	CUMPD MACRO	8YF16,16,X25,SYXTG,SYXTH,V12,SYXTE,V11,X24,16-	1645
1356	BYF16 SFIZE	16	1645
1357	TEST E	PF3,X25,SYXTG	1645
1358		16	1645
1359	TERMINATE		1645
1360	SYXTG TEST L	X25,PF3,SYXTH	1645
1361	ASSIGN	3,V12,PF	1645
1362	TRANSFER	,SYXTE	1645
1363	SYXTH ASSIGN	3,V11,PF	1645
1364	ASSIGN	2,X24,PF	1645
1365	RELEASE	16	1645
1366	SAVEVALUE	16-,PF3	1645
1367	LINK	16,LIFO	1645
	COMPE MACRO	SYXTF,25,24,16+	1646
1368	SYXTF SAVEVALUE	25,PF3	1646
1369	SAVEVALUE	24,PF2	1646
1370	SAVEVALUE	16+,PF3	1646
1371	TERMINATE		1646
	* GNC DATA SPLITS; PART TO SUBSYSTEM 'RAU, PART TO MDM		1647
	* * * * *		1648
1372	SYSUB SPLIT	1,IOSUS	1649
	* * * * *		1650
	* SUBSYSTEM I/O		1651
	* * * * *		1652
	* TRANSMIT DATA TO SUBSYSTEM I/O		1653
	* * * * *		1654
	TRNSA MACRO	SYIOU,15,SYLAZ,R15,SYLAP,SINR,MOPRT,S15	1655
1373	SYIOU GATE SNF	15,SYLAZ	1655
1374	TEST G	R15,PF3,SYLAP	1655
1375	SINR ENTER	15,PF3	1655
	BUFFER MACRO		1655
1376	ASSIGN	8,PR,PF	1655
1377	PRIORITY	0,BUFFER	1655
1378	PRIORITY	PF3	1655
1379	ASSIGN	8,15,PF	1655
1380	ASSIGN	9,S15,PF	1655
1381	SAVEVALUE	V5B,PF9	1655
1382	LEAVE	15,PF3	1655

1383	TRANSFER	,PJPKT	1055
	TRANSP MACRO	SYLAP,10,R15,SYI15,12,SYIGU,PF10,SINR,V35	1056
1384	SYLAP ASSIGN	10,R15,PF	1056
1385	SPLIT	1,SYI15	1056
1386	PRIORITY	12	1056
1387	ASSIGN	3,V35,PF	1056
1388	ADVANCE	1	1056
1389	TRANSFER	,SYIGU	1056
1390	SYI15 ASSIGN	3,PF10,PF	1056
1391	TRANSFER	,SINR	1056
	*		1057
	* MDM		1058
	*		1059
	* TRANSMIT DATA TO MDM		1060
	TRNSA MACRO	MDPRT,17,MDLST,R17,MDLSP,MDER,GPPKT,S17	1061
1392	MDPRT GATE SNF	17,MDLST	1061
1393	TEST GE	R17,PF3,MDLSP	1061
1394	MDER ENTER	17,PF3	1061
	BUFER MACRO		1061
1395	ASSIGN	8,PF,PF	1061
1396	PRIORITY	0,3UFFER	1061
1397	PRIORITY	PF3	1061
1398	ASSIGN	8,17,PF	1061
1399	ASSIGN	9,S17,PF	1061
1400	SAVEVALUE	V58,PF9	1061
1401	LEAVE	17,PF3	1061
1402	TRANSFER	,GPPRT	1061
	TRNSP MACRO	MDLSP,10,R17,MDP17,12,MDPRT,PF10,MDER,V52	1062
1403	MDLSP ASSIGN	10,R17,PF	1062
1404	SPLIT	1,MDP17	1062
1405	PRIORITY	12	1062
1406	ASSIGN	3,V52,PF	1062
1407	ADVANCE	1	1062
1408	TRANSFER	,MDPRT	1062
1409	MDP17 ASSIGN	3,PF10,PF	1062
1410	TRANSFER	,MDER	1062
	*		1063
	* GPC I/O BUS		1064
	*		1065
	*		1066
	TRNSA MACRO	GPPRT,18,GPLST,R18,GPLSP,GIDR,GPCAT,S18	1067
1411	GPPRT GATE SNF	18,GPLST	1067
1412	TEST GE	R18,PF3,GPLSP	1067
1413	GIDR ENTER	18,PF3	1067
	BUFER MACRO		1067
1414	ASSIGN	3,PK,PF	1067
1415	PRIORITY	0,3UFFER	1067
1416	PRIORITY	PF3	1067
1417	ASSIGN	8,18,PF	1067
1418	ASSIGN	9,S18,PF	1067
1419	SAVEVALUE	V53,PF9	1067
1420	LEAVE	18,PF3	1067
1421	TRANSFER	,GPCAT	1067
	TRNSP MACRO	GPLSP,10,R18,GPP18,12,GPPKT,PF10,GIDR,V53	1068
1422	GPLSP ASSIGN	10,R18,PF	1068
1423	SPLIT	1,GPP18	1068
1424	PRIORITY	12	1068

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1425	ASSIGN	3,V55,PF	1008
1426	ADVANCE	1	1008
1427	TRANSFER	,GPKT	1008
1428	GPP18 ASSIGN	3,PF10,PF	1008
1429	TRANSFER	,GICR	1008
*			1009
*	GPC		1070
*			1071
*			1072
	TRANSA MACRO	GPCAT,19,GPCLT,R19,GPCLP,GPER,GPCTR,S19	1073
1430	GPCAT GATE SNF	19,GPCLT	1073
1431	TEST GE	R19,PF3,GPCLP	1073
1432	GPER ENTER	19,PF3	1073
	BUFER MACRO		1073
1433	ASSIGN	8,PR,PF	1073
1434	PRIORITY	0,BUFFER	1073
1435	PRIORITY	PF3	1073
1436	ASSIGN	8,19,PF	1073
1437	ASSIGN	9,S19,PF	1073
1438	SAVEVALUE	V55,PF9	1073
1439	LEAVE	19,PF3	1073
1440	TRANSFER	,GPCTR	1073
	TRANSP MACRO	GPCLP,10,R19,GPC19,12,GPCAT,PF10,GPEK,V55	1074
1441	GPCLP ASSIGN	10,R19,PF	1074
1442	SPLIT	1,GPC19	1074
1443	PRIORITY	12	1074
1444	ASSIGN	3,V55,P	1074
1445	ADVANCE	1	1074
1446	TRANSFER	,GPCAT	1074
1447	GPL19 ASSIGN	3,PF10,PF	1074
1448	TRANSFER	,GPEK	1074
1449	GPCTR TERMINATE		1075
*			1076
*	INPUT ENGINEERING GNEC DATA		1077
*			1078
1450	GENERATE	1,, , ,0,25PF	1079
1451	ASSIGN	3,XX4(1,19),PF	1080
*			1081
*	EXPERIMENT KAU		1082
*			1083
*	TRANSMIT GNEC DATA TO EXPERIMENT KAU		1084
	TRANSA MACRO	XPKAU,2,XPLUZ,K2,XPLUP,XRAU,XPIND,S2	1085
1452	XPKAU GATE SNF	2,XPLUZ	1085
1453	TEST GE	R2,PF3,XPLUP	1085
1454	XRAU ENTER	2,PF3	1085
	BUFER MACRO		1085
1455	ASSIGN	8,PR,PF	1085
1456	PRIORITY	0,BUFFER	1085
1457	PRIORITY	PF3	1085
1458	ASSIGN	8,2,PF	1085
1459	ASSIGN	9,2,PF	1085
1460	SAVEVALUE	V55,PF9	1085
1461	LEAVE	2,PF3	1085
1462	TRANSFER	,XPIND	1085
	TRANSP MACRO	XPLUP,10,R2,XPR2,12,XPRAU,PF10,XRAU,V22	1086
1463	XPLUP ASSIGN	10,R2,PF	1086
1464	SPLIT	1,XPK2	1086

1465	PRIORITY	12	1586
1466	ASSIGN	3,V22,PF	1586
1467	ADVANCE	1	1586
1468	TRANSFER	,XPRAL	1586
1469	XPR2 ASSIGN	3,PF10,PF	1586
1470	TRANSFER	,XRAU	1586
*			1587
*	EXPERIMENT I/O		1588
*			1589
*	TRANSMIT GNEC DATA TO EXPERIMENT I/O		1590
TKNSA	MACRO	XFINO,3,XPLDZ,R3,XPLOP,EXIR,XPCPU,S3	1591
1471	XPINO	GATE SNF 3,XPLCZ	1591
1472		TEST GE R3,PF3,XPLD	1591
1473	EXIR	ENTER 3,PF3	1591
	BUFER	MACRO	1591
1474		ASSIGN 8,PR,PF	1591
1475		PRIORITY 0,BUFFER	1591
1476		PRIDKIT PF3	1591
1477		ASSIGN 8,3,PF	1591
1478		ASSIGN 9,S3,PF	1591
1479		SAVEVALUE V53,PF9	1591
1480		LEAVE 3,PF3	1591
1481		TRANSFER ,XPCPL	1592
	TRNSP	MACRO XPLDZ,10,R3,XPI3,12,XPINO,PF10,EXIR,V23	1592
1482	XPLOP	ASSIGN 10,R3,PF	1592
1483		SPLIT 1,XPI3	1592
1484		PRIORITY 12	1592
1485		ASSIGN 3,V23,PF	1592
1486		ADVANCE 1	1592
1487		TRANSFER ,XPINC	1592
1488	XP I3	ASSIGN 3,PF10,PF	1592
1489		TRANSFER ,EXIR	1593
*	EXPERIMENT COMPUTER		1594
*			1595
*	TRANSMIT GNEC DATA TO EXPERIMENT COMPUTER		1596
CUMPX	MACRO	XPCPU,R4,FOXTB,4,FOXTA,XPCOM	1596
1490	XPCPU	TEST GE R4,PF3,FOXTB	1596
1491	FOXTA	ENTER 4,PF3	1596
1492		LEAVE 4,PF3	1596
1493		TRANSFER ,XPCOM	1597
	COMPY	MACRO FCXTB,R4,FOXTC,FOXTD,4,XPCOM,V9	1597
1494	FOXTB	TEST G R4,C,FOXTC	1597
1495		ASSIGN 4,R4,PF	1597
1496		SPLIT 1,FOXTD	1597
1497		ENTER 4,R4	1597
1498		LEAVE 4,R4	1597
1499		TRANSFER ,XPCOM	1597
1500	FOXTD	ASSIGN 3,V9,PF	1598
	CUMPX	MACRO FCXTC,FOXTZ,4,FOXTE,FOXTF,FXBUF,CH4	1598
1501	FOXTC	QUEUE 4	1598
1502		SEIZE 4	1598
1503		DEPART 4	1598
1504	FOXTE	TEST ME CH4,C,FOXTZ	1598
1505		UNLINK 4,FOXTF,1	1598
1506		SPLIT 1,FXBUF	1598
1507	FOXTZ	RELEASE 4	1598
1508		TERMINATE	1598

	CONPD	MACRO	FXBUF,4,X23,FXXT6,FXXT8,V4,FXTE,V3,X22,4-	1699
1509	FXBUF	SEIZE	4	1699
1510		TEST E	PF3,X23,FXXTG	1699
1511		RELEASE	4	1699
1512		TERMINATE		1699
1513	FXXTG	TEST L	X23,PF3,FXXT8	1699
1514		ASSIGN	3,V4,PF	1699
1515		TRANSFER	,FXXTG	1699
1516	FXXT8	ASSIGN	3,V3,PF	1699
1517		ASSIGN	2,X22,PF	1699
1518		RELEASE	4	1699
1519		SAVEVALUE	4-,PF3	1699
1520		LINK	4,LIFC	1699
	CONPE	MACRO	FXXTF,23,22,4+	1700
1521	FXXTF	SAVEVALUE	23,PF3	1700
1522		SAVEVALUE	22,PF2	1700
1523		SAVEVALUE	4+,PF3	1700
1524		TERMINATE		1700
	*			1701
	*	EXPERIMENT I/O		1702
	*			1703
	*	TRANSMIT GN&C DATA TO EXPERIMENT I/O		1704
	TRANSA	MACRO	XPCOM,3,XPLST,R3,XPLSP,EXOK,TRAFR,S3	1705
1525	XPCOM	GATE SNF	3,XPLST	1705
1526		TEST GE	R3,PF3,XPLSP	1705
1527	EXOK	ENTFK	3,PF3	1705
	BUFER	MACRO		1705
1528		ASSIGN	8,PR,PF	1705
1529		PRIORITY	0,BUFFER	1705
1530		PRIORITY	PF0	1705
1531		ASSIGN	8,3,PF	1705
1532		ASSIGN	9,S3,PF	1705
1533		SAVEVALUE	V53,PF9	1705
1534		LEAVE	3,PF3	1705
1535		TRANSFER	,TRAFR	1705
	TRNSP	MACRO	XPLSP,10,R3,XPC3,12,XPCOM,PF10,EXOK,V23	1706
1536	XPLSP	ASSIGN	10,R3,PF	1706
1537		SPLIT	1,XPC3	1706
1538		PRIORITY	12	1706
1539		ASSIGN	3,V23,PF	1706
1540		ADVANCE	1	1706
1541		TRANSFER	,XPCJM	1706
1542	XPC3	ASSIGN	3,PF10,PF	1706
1543		TRANSFER	,EXOK	1706
1544	TRAFR	TRANSFER	,MDPKT	1707
1545	MDLOZ	SAVEVALUE	17+,PF3	1708
1546		TERMINATE		1709
1547	SULOZ	SAVEVALUE	15+,PF3	1710
1548		TERMINATE		1711
1549	LUZSU	SAVEVALUE	15+,PF3	1712
1550		TERMINATE		1713
1551	SSLOZ	SAVEVALUE	14+,PF3	1714
1552		TERMINATE		1715
1553	EELOZ	SAVEVALUE	3+,PF3	1716
1554		TERMINATE		1717
1555	SYLUZ	SAVEVALUE	14+,PF3	1718
1556		TERMINATE		1719

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1557      TERMINATE
1558 SYLDZ SAVEVALUE 15+,PF3
1559      TERMINATE
1560 SYLAZ SAVEVALUE 15+,PF3
1561      TERMINATE
1562 MDLST SAVEVALUE 17+,PF3
1563      TERMINATE
1564 GPLST SAVEVALUE 18+,PF3
1565      TERMINATE
1566 GPCLT SAVEVALUE 19+,PF3
1567      TERMINATE
1568 XPLUZ SAVEVALUE 2+,PF3
1569      TERMINATE
1570 XPLOZ SAVEVALUE 3+,PF3
1571      TERMINATE
1572 XPLST SAVEVALUE 3+,PF3
1573      TERMINATE

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**
** MODULE 9: OUTPUT REPORT GENERATOR
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1574 PLJTA GENERATE 000,0,25PF
1575      SAVEVALUE V42,X402
1576      SAVEVALUE V43,X403
1577      SAVEVALUE V44,S4
1578      SAVEVALUE V45,S5
1579      SAVEVALUE V40,S6
1580      SAVEVALUE V47,X412
1581      SAVEVALUE V48,X414
1582      SAVEVALUE V49,X415
1583      SAVEVALUE V50,S16
1584      SAVEVALUE V59,X411
1585      SAVEVALUE V60,X411
1586      SAVEVALUE V61,X411
1587      SAVEVALUE V62,X411
1588      SAVEVALUE V63,X411
1589      TERMINATE
1590      GENERATE 10800
1591      TERMINATE 1
      START 1
      REPORT
      OUTPUT
      GRAPH X,101,127
      ORIGIN 50,22
      X 1,3,0,0
      Y 0,50,24,2
5 STATEMENT 22,10,EXPERIMENT
8 STATEMENT 24,3,RAU
6 STATEMENT 26,8,CONTENTS
6 STATEMENT 28,8,(CONTENTS)
26 STATEMENT 52,106,5 12 18 24 30 36 42 48 54 60 66 72 1
78 84 90 96 102 108 114 120 126 132 138 144 150 156 162
60 STATEMENT 54,12,TIME (HOURS)
3 STATEMENT 58,59,FIGURE 7: CONTENTS OF EXPERIMENT RAU AS A FUNCTI
ION OF TIME.
      ENDDGRAPH

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5	STATEMENT	58,68,FIGURE 11: CONTENTS OF VARIABLE RATE RECORDER AS	1854
	S A FUNCTION OF TIME.		1855
	ENDGRAPH		1856
	EJECT		1857
	GRAPH	X,251,277	1858
	ORIGIN	50,22	1859
	X	,1,3,.,.,ND	1860
	Y	0,50,24,2	1861
7	STATEMENT	22,7,KU-BAND	1862
5	STATEMENT	24,9,PROCESSOR	1863
6	STATEMENT	26,8,CONTENTS	1864
6	STATEMENT	28,8,(K BITS)	1865
26	STATEMENT	52,100,0 12 18 24 30 36 42 48 54 60 66 72 1	1866
78	84 90 96	102 108 114 120 126 132 138 144 150 156 162	1867
60	STATEMENT	54,12,TIME (HOURS)	1868
8	STATEMENT	58,63,FIGURE 12: CONTENTS OF KU-BAND PROCESSOR AS A F1	1869
	UNCTION OF TIME.		1870
	ENDGRAPH		1871
	EJECT		1872
	GRAPH	X,281,307	1873
	ORIGIN	50,22	1874
	X	,1,3,.,.,ND	1875
	Y	0,50,24,2	1876
5	STATEMENT	22,9,SUBSYSTEM	1877
8	STATEMENT	24,3,RAU	1878
6	STATEMENT	26,8,CONTENTS	1879
6	STATEMENT	28,8,(K BITS)	1880
26	STATEMENT	52,100,6 12 18 24 30 36 42 48 54 60 66 72 1	1881
78	84 90 96	102 108 114 120 126 132 138 144 150 156 162	1882
60	STATEMENT	54,12,TIME (HOURS)	1883
8	STATEMENT	58,58,FIGURE 13: CONTENTS OF SUBSYSTEM RAU AS A FUNCTI	1884
	ON OF TIME.		1885
	ENDGRAPH		1886
	EJECT		1887
	GRAPH	X,311,337	1888
	ORIGIN	50,22	1889
	X	,1,3,.,.,ND	1890
	Y	0,50,24,2	1891
5	STATEMENT	22,9,SUBSYSTEM	1892
8	STATEMENT	24,3,I/O	1893
6	STATEMENT	26,8,CONTENTS	1894
6	STATEMENT	28,8,(K BITS)	1895
26	STATEMENT	52,106,6 12 18 24 30 36 42 48 54 60 66 72 1	1896
78	84 90 96	102 108 114 120 126 132 138 144 150 156 162	1897
60	STATEMENT	54,12,TIME (HOURS)	1898
8	STATEMENT	58,50,FIGURE 14: CONTENTS OF SUBSYSTEM I/O AS A FUNCTI	1899
	ON OF TIME.		1900
	ENDGRAPH		1901
	EJECT		1902
	GRAPH	X,341,367	1903
	ORIGIN	50,22	1904
	X	,1,3,.,.,ND	1905
	Y	0,50,6,8	1906
5	STATEMENT	22,9,SUBSYSTEM	1907
8	STATEMENT	24,3,CPU	1908
6	STATEMENT	26,8,CONTENTS	1909
6	STATEMENT	28,8,(K BITS)	1910

26	STATEMENT	52,106,6	12	18	24	30	36	42	48	54	60	66	72	1	1891
78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	1892
60	STATEMENT	54,12,TIME	(HOURS)												1893
8	STATEMENT	58,58,FIGURE 15:CONTENTS OF SUBSYSTEM CPU AS A FUNCTION OF TIME.													1894
	ENDGRAPH														1895
	EJECT														1896
	GRAPH	X,371,397													1897
	ORIGIN	50,22													1898
	X	,1,3,.,.,,NO													1899
	Y	0,50,24,2													1900
7	STATEMENT	24,7,FM-BAND													1901
5	STATEMENT	26,9,PROCESSOR													1902
6	STATEMENT	28,8,CONTENTS													1903
6	STATEMENT	30,8,(K-BITS)													1904
26	STATEMENT	52,106,6	12	18	24	30	36	42	48	54	60	66	72	1	1905
78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	1906
60	STATEMENT	54,12,TIME	(HOURS)												1907
8	STATEMENT	58,57,FIGURE 16: CONTENTS OF FM PROCESSOR AS A FUNCTION OF TIME.													1908
	ENDGRAPH														1909
	EJECT														1910
	GRAPH	X,451,457													1911
	ORIGIN	50,22													1912
	X	,1,3,.,.,,NO													1913
	Y	0,50,24,2													1914
7	STATEMENT	22,7,NETWORK													1915
8	STATEMENT	24,6,SIGNAL.													1916
5	STATEMENT	26,9,PROCESSOR													1917
6	STATEMENT	28,8,CONTENTS													1918
6	STATEMENT	30,8,(K-BITS)													1919
26	STATEMENT	52,106,5	12	18	24	30	36	42	48	54	60	66	72	1	1920
78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	1921
60	STATEMENT	54,12,TIME	(HOURS)												1922
8	STATEMENT	58,70,FIGURE 17: CONTENTS OF NETWORK SIGNAL PROCESSOR AS A FUNCTION OF TIME.													1923
	ENDGRAPH														1924
	EJECT														1925
	GRAPH	X,461,487													1926
	ORIGIN	50,22													1927
	X	,1,3,.,.,,NO													1928
	Y	0,50,24,2													1929
8	STATEMENT	24,3,MDM													1930
6	STATEMENT	28,8,CONTENTS													1931
6	STATEMENT	30,8,(K-BITS)													1932
26	STATEMENT	52,106,6	12	18	24	30	36	42	48	54	60	66	72	1	1933
78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	1934
60	STATEMENT	54,12,TIME	(HOURS)												1935
8	STATEMENT	58,50,FIGURE 18: CONTENTS OF MDM AS A FUNCTION OF TIME.													1936
	ENDGRAPH														1937
	EJECT														1938
	GRAPH	X,441,517													1939
	ORIGIN	50,22													1940
	X	,1,3,.,.,,NO													1941
	Y	0,50,24,2													1942
8	STATEMENT	24,5,GPC													1943
6	STATEMENT	26,8,1/0 BUSS													1944

APPENDIX D
PROGRAM OUTPUT



RELATIVE CLOCK	16300		ABSOLUTE CLOCK		16800									
BLOCK COUNTS	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT		
1	0	429	11	0	51476	21	0	25738	31	0	0	41	0	25738
2	0	929	12	0	25738	22	0	25738	32	0	0	42	0	25738
3	0	3	13	0	25738	23	0	25738	33	0	0	43	0	25738
4	0	929	14	0	25738	24	0	0	34	0	0	44	0	25738
5	0	929	15	0	25738	25	0	0	35	0	0	45	0	25738
6	0	24812	16	0	25738	26	0	0	36	0	0	46	0	25738
7	0	51476	17	0	25738	27	0	0	37	0	25738	47	0	25738
8	0	25738	18	0	25738	28	0	0	38	0	25738	48	0	0
9	0	726	19	0	25738	29	0	0	39	0	25738	49	0	0
10	0	51476	20	0	25738	30	0	0	40	0	25738	50	0	0

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
51	0	61	0	51476	71	0	0	81	0	84652	91	0	17190
52	0	62	0	25738	72	0	0	82	0	42326	92	0	17190
53	0	63	0	25738	73	0	0	83	0	42326	93	0	17190
54	0	64	0	25738	74	0	0	84	0	42326	94	0	17190
55	0	65	0	25738	75	0	0	85	0	42326	95	0	17190
56	0	66	0	0	76	0	51476	86	0	8548	96	0	29195
57	0	67	0	25738	77	0	25738	87	0	8548	97	0	29195
58	0	68	0	0	78	0	25738	88	0	33778	98	0	29195
59	0	69	0	25738	79	0	25738	89	0	10568	99	0	29195
60	0	70	0	25738	80	0	42326	90	0	6588	100	0	0

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
101	0	111	0	0	121	0	0	131	0	0	141	0	0
102	0	112	0	0	122	0	0	132	0	0	142	0	0
103	0	113	0	0	123	0	0	133	0	0	143	0	0
104	0	114	0	0	124	0	0	134	0	0	144	0	0
105	0	115	0	0	125	0	0	135	0	0	145	0	0
106	0	116	0	0	126	0	0	136	0	0	146	0	0
107	0	117	0	0	127	0	0	137	0	0	147	0	0
108	0	118	0	0	128	0	0	138	0	0	148	0	0
109	0	119	0	0	129	0	0	139	0	0	149	0	0
110	0	120	0	0	130	0	0	140	0	0	150	0	0

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
151	0	161	0	0	171	0	0	181	0	0	191	0	24304
152	0	162	0	0	172	0	0	182	0	0	192	0	24304
153	0	163	0	0	173	0	0	183	0	0	193	0	24304
154	0	164	0	0	174	0	0	184	0	0	194	0	24304
155	0	165	0	0	175	0	0	185	0	0	195	0	24304
156	0	166	0	0	176	0	0	186	0	25738	196	0	24304
157	0	167	0	0	177	0	0	187	0	24304	197	0	24304
158	0	168	0	0	178	0	0	188	0	24304	198	0	0
159	0	169	0	0	179	0	0	189	0	24304	199	0	0
160	0	170	0	0	180	0	0	190	0	24304	200	0	0

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
201	0	211	0	1093	221	0	0	231	0	0	241	0	0
202	0	212	0	1093	222	0	2401	232	0	0	242	0	0
203	0	213	0	1093	223	0	2401	233	0	4802	243	0	0
204	0	214	0	1093	224	0	2401	234	0	2060	244	0	0
205	0	215	0	1093	225	0	2401	235	0	2060	245	0	0
206	0	216	0	0	226	0	2401	236	0	2060	246	0	0
207	0	217	0	0	227	0	0	237	0	2060	247	0	0
208	0	218	0	0	228	0	0	238	0	0	248	0	2742
209	0	219	0	0	229	0	0	239	0	0	249	0	341

210	0	1033	220	0	0	230	0	0	240	0	0	250	0	341
BLCK	CURRENT	TOTAL	BLCK	CURRENT	TOTAL	BLCK	CURRENT	TOTAL	BLCK	CURRENT	TOTAL	BLCK	CURRENT	TOTAL
251	0	341	261	0	0	271	0	0	281	0	341	291	0	25738
252	0	341	262	0	0	272	0	341	282	0	341	292	0	25738
253	0	0	263	0	2401	273	0	341	283	0	0	293	0	25738
254	0	0	264	0	2401	274	0	341	284	0	0	294	0	25738
255	0	0	265	0	2060	275	0	341	285	0	0	295	0	25738
256	0	0	266	0	2060	276	0	341	286	0	0	296	0	25738
257	0	0	267	0	341	277	0	341	287	0	0	297	0	25738
258	0	0	268	0	341	278	0	341	288	0	0	298	0	25738
259	0	0	269	0	0	279	0	341	289	0	0	299	0	25738
260	0	0	270	0	0	280	0	341	290	0	0	300	0	25738

BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL
301	0	25738	311	0	3494	321	0	0	331	0	0	341	0	0
302	0	25738	312	0	3494	322	0	0	332	0	0	342	0	0
303	0	25738	313	0	3494	323	0	6988	333	0	0	343	0	0
304	0	0	314	0	3494	324	0	3494	334	0	0	344	0	14775
305	0	0	315	0	0	325	0	3494	335	0	0	345	0	14775
306	0	0	316	0	0	326	0	3494	336	0	0	346	0	14775
307	0	0	317	0	0	327	0	3494	337	0	0	347	0	14775
308	0	0	318	0	0	328	0	0	338	0	3494	348	0	14775
309	0	0	319	0	0	329	0	0	339	0	3494	349	0	14775
310	0	3494	320	0	0	330	0	0	340	0	3494	350	0	14775

BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL
351	0	14775	361	0	0	371	0	14775	381	0	0	391	0	0
352	0	14775	362	0	0	372	0	14775	382	0	0	392	0	0
353	0	14775	363	0	0	373	0	14775	383	0	0	393	0	0
354	0	14775	364	0	0	374	0	14775	384	0	0	394	0	29550
355	0	14775	365	0	0	375	0	14775	385	0	0	395	0	14775
356	0	14775	366	0	0	376	0	14775	386	0	0	396	0	14775
357	0	0	367	0	0	377	0	14775	387	0	0	397	0	0
358	0	0	368	0	0	378	0	14775	388	0	0	398	0	14775
359	0	0	369	0	0	379	0	14775	389	0	0	399	0	21
360	0	0	370	0	14775	380	0	14775	390	0	0	400	0	14775

BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL
401	0	14754	411	0	25057	421	0	10303	431	0	0	441	0	0
402	0	0	412	0	50114	422	0	11039	432	0	0	442	0	0
403	0	0	413	0	25057	423	0	11039	433	0	0	443	0	0
404	0	0	414	0	25057	424	0	11039	434	0	0	444	0	0
405	0	0	415	0	25057	425	0	11039	435	0	0	445	0	0
406	0	0	416	0	25057	426	0	11039	436	0	0	446	0	0
407	0	29502	417	0	3715	427	0	10507	437	0	0	447	0	0
408	0	14754	418	0	3715	428	0	10507	438	0	0	448	0	0
409	0	14754	419	0	21342	429	0	10507	439	0	0	449	0	0
410	0	14754	420	0	10303	430	0	10507	440	0	0	450	0	0

BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL
451	0	0	461	0	40513	471	0	26365	481	0	0	491	0	26365
452	0	0	462	0	40513	472	0	26365	482	0	0	492	0	26365
453	0	0	463	0	14148	473	0	26365	483	0	0	493	0	26365
454	0	0	464	0	26365	474	0	26365	484	0	0	494	0	26365
455	0	0	465	0	26365	475	0	0	485	0	0	495	0	26365
456	0	14775	466	0	26365	476	0	0	486	0	0	496	0	26365
457	0	14775	467	0	26365	477	0	0	487	0	0	497	0	26365
458	0	14775	468	0	26365	478	0	0	488	0	26365	498	0	26365
459	0	25738	469	0	26365	479	0	0	489	0	26365	499	0	0
460	0	25738	470	0	26365	480	0	0	490	0	26365	500	0	0

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BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
501	0	511	0	521	0	531	0	541	0
502	0	512	0	522	0	532	0	542	0
503	0	513	0	523	0	533	0	543	0
504	0	514	0	524	0	534	0	544	0
505	0	515	0	525	0	535	0	545	0
506	0	516	0	526	0	536	0	546	0
507	0	517	20	527	0	537	0	547	0
508	0	518	26365	528	0	538	0	548	0
509	0	519	26345	529	0	539	0	549	0
510	0	520	0	530	0	540	0	550	0

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
551	0	561	0	571	0	581	0	591	0
552	0	562	0	572	0	582	0	592	0
553	0	563	0	573	0	583	0	593	0
554	0	564	0	574	0	584	0	594	0
555	0	565	0	575	0	585	0	595	0
556	0	566	0	576	0	586	0	596	0
557	0	567	0	577	0	587	0	597	0
558	0	568	0	578	0	588	0	598	0
559	0	569	0	579	0	589	0	599	0
560	0	570	0	580	0	590	0	600	0

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
601	0	611	0	621	0	631	0	641	0
602	0	612	0	622	0	632	0	642	0
603	0	613	0	623	0	633	0	643	0
604	0	614	0	624	0	634	0	644	0
605	0	615	0	625	0	635	0	645	0
606	0	616	0	626	0	636	0	646	0
607	0	617	0	627	0	637	0	647	0
608	0	618	0	628	0	638	0	648	0
609	0	619	0	629	0	639	0	649	0
610	0	620	0	630	0	640	0	650	0

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
651	0	661	0	671	0	681	0	691	0
652	0	662	0	672	0	682	0	692	0
653	0	663	0	673	0	683	0	693	0
654	0	664	0	674	0	684	0	694	0
655	0	665	0	675	0	685	0	695	0
656	0	666	0	676	0	686	0	696	0
657	0	667	0	677	0	687	0	697	0
658	0	668	0	678	0	688	0	698	0
659	0	669	0	679	0	689	0	699	0
660	0	670	0	690	0	690	0	700	0

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
701	0	711	26365	721	0	731	6	741	1
702	0	712	0	722	0	732	6	742	213
703	0	713	0	723	0	733	6	743	213
704	0	714	1	724	0	734	197	744	332
705	0	715	204	725	1	735	197	745	119
706	0	716	204	726	0	736	197	746	29
707	0	717	7	727	0	737	1	747	29
708	0	718	7	728	0	738	1	748	29
709	0	719	7	729	0	739	1	749	90
710	14775	720	197	730	6	740	1	750	90

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BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
751	90	761	0	771	0	781	0	791	0
752	90	762	0	772	0	782	0	792	0
753	213	763	0	773	0	783	0	793	0
754	213	764	0	774	0	784	0	794	0
755	212	765	0	775	0	785	0	795	0
756	212	766	0	776	0	786	0	796	0
757	212	767	16601	777	0	787	0	797	0
758	212	768	16601	778	0	788	0	798	0
759	212	769	18228	779	0	789	0	799	0
760	0	770	18228	780	0	790	0	800	0
801	18231	811	0	821	0	831	0	841	0
802	18231	812	0	822	0	832	0	842	0
803	18231	813	0	823	0	833	0	843	0
804	18231	814	0	824	0	834	0	844	0
805	18231	815	0	825	0	835	0	845	0
806	18231	816	0	826	0	836	0	846	0
807	0	817	0	827	0	837	0	847	0
808	0	818	0	828	0	838	0	848	0
809	18231	819	0	829	0	839	0	849	0
810	18231	820	0	830	0	840	0	850	0
851	18231	861	0	871	0	881	0	891	0
852	370	862	0	872	0	882	0	892	0
853	670	863	0	873	0	883	0	893	0
854	370	864	0	874	0	884	0	894	0
855	870	865	0	875	0	885	0	895	0
856	870	866	0	876	0	886	0	896	0
857	670	867	0	877	0	887	0	897	0
858	870	868	0	878	0	888	0	898	0
859	870	869	0	879	0	889	0	899	0
860	870	870	0	880	0	890	0	900	0
901	0	911	0	921	0	931	0	941	0
902	0	912	0	922	0	932	0	942	0
903	0	913	0	923	0	933	0	943	0
904	0	914	0	924	0	934	0	944	0
905	0	915	0	925	0	935	0	945	0
906	36	916	0	926	0	936	0	946	0
907	36	917	0	927	0	937	0	947	0
908	36	918	0	928	0	938	0	948	0
909	36	919	0	929	0	939	0	949	0
910	36	920	0	930	0	940	0	950	0
951	1	961	0	971	0	981	0	991	0
952	1	962	0	972	0	982	0	992	0
953	23457	963	0	973	0	983	0	993	1
954	23376	964	0	974	0	984	0	994	0
955	23376	965	0	975	0	985	0	995	0
956	79	966	0	976	0	986	0	996	0
957	79	967	0	977	0	987	0	997	0
958	79	968	0	978	0	988	0	998	0
959	79	969	0	979	0	989	0	999	0
960	79	970	0	980	0	990	0	1000	0

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1001	0	15312	1011	0	0	1021	0	9443	1031	0	8958	1041	0	39
1002	0	19	1012	0	15793	1022	0	1	1032	0	9443	1042	0	39
1003	1	19	1013	0	15793	1023	0	1	1033	0	9443	1043	0	39
1004	1	19	1014	0	15793	1024	0	9442	1034	0	9443	1044	0	39
1005	1	15793	1015	0	16277	1025	0	484	1035	0	9443	1045	0	39
1006	1	0	1016	0	9443	1026	0	484	1036	0	39	1046	0	39
1007	1	0	1017	0	18886	1027	0	8958	1037	0	39	1047	0	39
1008	0	0	1018	0	16277	1028	0	8958	1038	0	39	1048	0	39
1009	0	0	1019	0	16277	1029	0	8958	1039	0	39	1049	0	788
1010	0	0	1020	0	9443	1030	0	8958	1040	0	39	1050	0	788

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL		
1051	0	788	1061	0	788	1071	0	271	1081	0	271
1052	0	788	1062	0	1	1072	0	787	1082	0	0
1053	0	788	1063	0	1	1073	0	787	1083	0	0
1054	0	788	1064	0	1	1074	0	787	1084	0	271
1055	0	788	1065	0	787	1075	0	1058	1085	0	271
1056	0	788	1066	0	0	1076	0	271	1086	0	271
1057	0	788	1067	0	0	1077	0	542	1087	0	0
1058	0	788	1068	0	0	1078	0	1058	1088	0	0
1059	0	788	1069	0	0	1079	0	1058	1089	0	0
1060	0	0	1070	0	0	1080	0	271	1090	0	0

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL		
1101	0	1	1111	0	16601	1121	0	16600	1131	0	16600
1102	0	1	1112	0	16601	1122	0	0	1132	0	16600
1103	0	1	1113	0	16601	1123	0	0	1133	0	16600
1104	0	1	1114	0	16601	1124	0	0	1134	0	16600
1105	0	1	1115	1	16601	1125	0	0	1135	0	16600
1106	0	1	1116	0	16600	1126	0	0	1136	0	16600
1107	0	1	1117	0	16600	1127	0	0	1137	0	16600
1108	0	1	1118	0	16600	1128	0	0	1138	0	16600
1109	0	16601	1119	0	16600	1129	0	0	1139	0	16600
1110	0	16601	1120	0	16600	1130	0	16600	1140	0	16600

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL		
1151	0	16600	1161	0	0	1171	0	16581	1181	0	16581
1152	0	16600	1162	0	0	1172	0	16581	1182	0	38346
1153	0	16600	1163	0	0	1173	0	1	1183	0	23172
1154	0	16600	1164	0	0	1174	0	2	1184	0	46344
1155	0	16600	1165	0	0	1175	0	1	1185	0	38346
1156	0	16600	1166	0	0	1176	0	1	1186	0	38346
1157	0	16600	1167	0	0	1177	0	1	1187	0	23172
1158	0	16600	1168	0	16600	1178	0	1	1188	0	23172
1159	0	16600	1169	0	19	1179	0	16581	1189	0	50
1160	0	0	1170	0	19	1180	0	16581	1190	0	50

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL		
1201	0	23172	1211	0	219	1221	0	219	1231	0	219
1202	0	23172	1212	0	219	1222	0	219	1232	0	219
1203	0	219	1213	0	219	1223	0	219	1233	0	0
1204	0	219	1214	0	0	1224	0	219	1234	0	0
1205	0	219	1215	0	0	1225	0	219	1235	0	0
1206	0	219	1216	0	0	1226	0	219	1236	0	0
1207	0	219	1217	0	0	1227	0	219	1237	0	0
1208	0	219	1218	0	0	1228	0	219	1238	0	0
1209	0	219	1219	0	0	1229	0	219	1239	0	0
1210	0	219	1220	0	0	1230	0	219	1240	0	0

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
1271	0	1281	0	1291	0	1301	0	1311	0

1252	0	0	1262	0	0	1272	0	0	1282	0	0	1292	0	0
1253	0	0	1263	0	0	1273	0	0	1283	0	0	1293	0	0
1254	0	0	1264	0	0	1274	0	0	1284	0	0	1294	0	0
1255	0	0	1265	0	0	1275	0	0	1285	0	0	1295	0	0
1256	0	0	1266	0	0	1276	0	0	1286	0	0	1296	0	0
1257	0	C	1267	0	0	1277	0	0	1287	0	0	1297	0	16800
1258	0	0	1268	0	0	1278	0	0	1288	0	0	1298	0	16800
1259	0	0	1269	0	0	1279	0	0	1289	0	0	1299	0	16800
1260	0	0	1270	0	0	1280	0	0	1290	0	0	1300	0	16800

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
1301	16900	1311	0	1321	0	1331	0	1341	0	1351	0
1302	16800	1312	0	1322	0	1332	0	1342	0	1352	0
1303	16800	1313	0	1323	0	1333	0	1343	0	1353	0
1304	16799	1314	0	1324	0	1334	0	1344	0	1354	0
1305	16799	1315	0	1325	0	1335	0	1345	0	1355	0
1306	16799	1316	0	1326	0	1336	0	1346	0	1356	0
1307	16799	1317	0	1327	0	1337	0	1347	0	1357	0
1308	16799	1318	16799	1328	0	1338	219	1348	0	1358	16800
1309	16799	1319	16799	1329	0	1339	219	1349	0	1359	16800
1310	0	1320	16799	1330	0	1340	219	1350	0	1360	16800

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
1351	24737	1361	0	1371	9453	1381	0	1391	0	1401	0
1352	9453	1362	0	1372	438	1382	0	1392	0	1402	439
1353	18906	1363	0	1373	219	1383	0	1393	0	1403	439
1354	24737	1364	0	1374	219	1384	0	1394	0	1404	439
1355	24737	1365	0	1375	219	1385	0	1395	0	1405	439
1356	9453	1366	0	1376	219	1386	0	1396	0	1406	439
1357	9453	1367	0	1377	219	1387	0	1397	0	1407	439
1358	26	1368	0	1378	219	1388	0	1398	0	1408	439
1359	26	1369	0	1379	219	1389	0	1399	0	1409	439
1360	9427	1370	0	1380	219	1390	0	1400	0	1410	439

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
1401	439	1411	0	1421	439	1431	0	1441	0	1451	0
1402	439	1412	0	1422	0	1432	0	1442	0	1452	0
1403	0	1413	0	1423	0	1433	0	1443	0	1453	0
1404	0	1414	0	1424	0	1434	0	1444	0	1454	0
1405	0	1415	0	1425	0	1435	0	1445	0	1455	0
1406	0	1416	0	1426	0	1436	0	1446	0	1456	0
1407	0	1417	0	1427	0	1437	0	1447	0	1457	0
1408	0	1418	0	1428	0	1438	0	1448	0	1458	0
1409	0	1419	0	1429	0	1439	0	1449	0	1459	439
1410	0	1420	439	1430	439	1440	439	1450	0	1460	16800

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
1451	16800	1461	0	1471	16799	1481	0	1491	0	1501	220
1452	16800	1462	0	1472	16799	1482	0	1492	0	1502	220
1453	16800	1463	0	1473	0	1483	0	1493	0	1503	220
1454	16800	1464	0	1474	16799	1484	0	1494	0	1504	16579
1455	16800	1465	0	1475	16799	1485	0	1495	0	1505	0
1456	16800	1466	0	1476	16799	1486	0	1496	0	1506	0
1457	16799	1467	0	1477	16799	1487	0	1497	0	1507	0
1458	16799	1468	0	1478	16799	1488	0	1498	0	1508	0
1459	16799	1469	0	1479	16799	1489	0	1499	0	1509	0
1460	16799	1470	0	1480	16799	1490	16799	1500	0	1510	0

BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL	BLOCK CURRENT	TOTAL
1501	16579	1511	1	1521	5593	1531	220	1541	0	1551	0
1502	16579	1512	1	1522	5593	1532	220	1542	0	1552	0

1503	0	15579	1513	0	5592	1523	0	5593	1533	0	220	1543	0	0
1504	0	21967	1514	0	5388	1524	0	5593	1534	0	220	1544	0	220
1505	0	5593	1515	0	5388	1525	0	220	1535	0	220	1545	0	0
1506	0	11166	1516	0	204	1526	0	220	1536	0	0	1546	0	0
1507	0	21967	1517	0	204	1527	0	220	1537	0	0	1547	0	0
1508	0	21967	1518	0	204	1528	0	220	1538	0	0	1548	0	0
1509	0	5593	1519	0	204	1529	0	220	1539	0	0	1549	0	0
1510	0	5593	1520	0	204	1530	0	220	1540	0	0	1550	0	0

BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL	BLOCK	CURRENT	TOTAL
1551	0	0	1561	0	0	1571	0	0	1581	0	27	1591	0	0
1552	0	0	1562	0	0	1572	0	0	1582	0	27			
1553	0	0	1563	0	0	1573	0	0	1583	0	27			
1554	0	0	1564	0	0	1574	0	27	1584	0	27			
1555	0	0	1565	0	0	1575	0	27	1585	0	27			
1556	0	0	1566	0	0	1576	0	27	1586	0	27			
1557	0	0	1567	0	0	1577	0	27	1587	0	27			
1558	0	0	1568	0	0	1578	0	27	1588	0	27			
1559	0	0	1569	0	0	1579	0	27	1589	0	27			
1560	0	0	1570	0	0	1580	0	27	1590	0	1			

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*                                     *
*                               FACILITIES                               *
*                                     *
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FACILITY	NUMBER ENTRIES	AVERAGE TIME/TRAN	-AVERAGE UTILIZATION DURING-		CURRENT STATUS	PERCENT AVAILABILITY	TRANSACTION NUMBER	
			TOTAL TIME	AVAIL. UNAVAIL. TIME TIME			SEIZING	PREEMPTING
4	108957	.000	.000			100.0		
16	157336	.000	.000			100.0		
49	213	14.103	.178			100.0		7
50	204	69.422	.842			100.0		6

 * STORAGES *
 *

STORAGE	CAPACITY	AVERAGE CONTENTS	ENTRIES	AVERAGE TIME/UNIT	-AVERAGE TOTAL TIME	UTILIZATION AVAIL. TIME	DURING UNAVAIL. TIME	CURRENT STATUS	PERCENT AVAILABILITY	CURRENT CONTENTS	MAXIMUM CONTENTS
RAUEX	36000	.000	9381450	.000	.000				100.0	36	4986
IDEXP	36000	.000	10483806	.000	.000				100.0		4986
CPUEX	288	284.363	9648	495.159	.987				100.0	288	288
INREC	3600000	5877.769	20347390	3.136	.000				100.0		772206
VARREC	3600000	203.396	520578	6.753	.000				100.0		18811
FMSIG	36000	.000	501345	.000	.000				100.0		72
NASIG	6912	.000	1312416	.000	.000				100.0		772905
KUSIG	1080000	.000	141594499	.000	.000				100.0	36	9864
RAUSU	36000	.000	15602400	.000	.000				100.0	72	9864
ICSUB	36000	.000	12006340	.000	.000				100.0	288	288
CPJSU	288	284.370	10908	497.974	.987				100.0		144
MDMUL	36000	.000	3836772	.000	.000				100.0	72	144
GPCI7	36000	.000	3836340	.000	.000				100.0		72
WPCUM	1152	.000	1328436	.000	.000						

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*
*           QUEUES
*
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QUEUE	MAXIMUM CONTENTS	AVERAGE CONTENTS	TOTAL ENTRIES	ZERO ENTRIES	PERCENT ZEROS	AVERAGE TIME/TRANS	AVERAGE TIME/TRANS	TABLE NUMBER	CURRENT CONTENTS
4	1	.000	72252	72252	100.0	.000	.000		
16	1	.000	76394	76094	100.0	.000	.000		

AVERAGE TIME/TRANS = AVERAGE TIME/TRANS EXCLUDING ZERO ENTRIES

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*****
*                                     *
*                               USER CHAINS                               *
*                                     *
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USER CHAIN	TOTAL ENTRIES	AVERAGE TIME/TRANS	CURRENT CONTENTS	AVERAGE CONTENTS	MAXIMUM CONTENTS
4	69025	.428		1.758	21
1b	59269	.172		.606	20

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 *
 * FULLWORD SAVEVALUES *
 *

NUMBER	CONTENTS	NUMBER	CONTENTS	NUMBER	CONTENTS	NUMBER	CONTENTS	NUMBER	CONTENTS	NUMBER	CONTENTS
1	161952	4	861945	13	1197936	16	1498159	20	44	21	11
22	.5	23	5	25	11	49	16819	50	16689	101	108
102	900	103	15	104	15	105	15	106	15	107	15
108	54	109	15	110	54	111	15	112	15	113	432
114	15	115	15	116	54	117	15	118	15	119	54
120	15	121	108	122	15	123	15	124	15	125	36
126	36	127	36	131	72	132	72	133	72	134	72
135	72	136	72	137	72	138	72	139	15	140	72
141	72	142	72	143	72	144	15	145	72	146	54
147	72	148	72	149	72	150	72	151	72	152	72
153	72	154	72	155	72	156	72	157	72	161	288
162	288	163	288	164	288	165	288	166	288	167	288
168	288	169	288	170	288	171	288	172	288	173	288
174	288	175	288	176	288	177	288	178	288	179	288
180	288	181	288	182	288	183	288	184	288	185	288
186	288	187	288	252	810	253	15	254	15	255	13
256	13	257	13	258	49	259	15	260	49	261	13
262	13	263	389	264	13	265	13	266	49	267	49
268	13	269	49	270	13	271	13	272	13	273	13
274	13	275	49	276	49	277	49	281	108	282	1800
283	864	284	864	285	864	286	864	287	864	288	108
289	108	290	108	291	864	292	864	293	864	294	108
295	864	296	108	297	1800	298	864	299	108	300	864
301	108	302	864	303	864	304	864	305	56	306	36
307	36	311	72	312	1800	313	864	314	864	315	864
316	864	317	864	318	72	319	72	320	72	321	864
322	864	323	864	324	72	325	864	326	72	327	1800
328	864	329	72	330	864	331	72	332	864	333	864
334	864	335	72	336	72	337	72	341	288	342	288
343	288	344	288	345	288	346	288	347	288	348	288
349	288	350	288	351	288	352	288	353	288	354	288
355	288	356	288	357	288	358	288	359	288	360	288
361	288	362	288	363	288	364	288	365	288	366	288
367	288	372	810	373	810	374	810	375	13	376	13
377	13	378	49	379	49	380	13	381	13	382	13
383	389	384	13	385	13	386	13	387	13	388	13
389	13	390	13	391	13	392	13	393	13	394	13
395	49	396	49	397	49	402	36	403	72	410	49
412	49	414	36	415	72	417	72	418	72	419	72
461	72	462	72	463	72	464	72	465	72	466	72
467	72	468	72	469	72	470	72	471	72	472	72
473	72	474	72	475	72	476	72	477	72	478	72
479	72	480	72	481	72	482	72	483	72	484	72
485	72	486	72	487	72	491	72	492	72	493	72
494	72	495	72	496	72	497	72	498	72	499	72
500	72	501	72	502	72	503	72	504	72	505	72
506	72	507	72	508	72	509	72	510	72	511	72
512	72	513	72	514	72	515	72	516	72	517	72
521	72	522	72	523	72	524	72	525	72	526	72
527	72	528	72	529	72	530	72	531	72	532	72

533	72	534	72	535	72	536	72	537	72	538	72
539	72	540	72	541	72	542	72	543	72	544	72
545	72	546	72	547	72						

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 * FULLWORD MATRICES *
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FULLWORD MATRIX	2										
ROW/COLUMN	1	2	3	4	5	6	7	8	9	10	
i	417	422	425	500	503	561	583	594	600	728	
ROW/COLUMN	11	12	13	14	15	16	17	18	19	20	
i	742	761	772	900	906	928	950	1106	1117	1283	
ROW/COLUMN	21	22	23	24	25	26	27	28	29	30	
i	1206	1339	1344	1411	1425	1439	1444	1500	1911	1572	
ROW/COLUMN	31	32	33	34	35	36	37	38	39	40	
i	1592	1606	1608	1672	1675	1731	1756	1897	1914	1928	
ROW/COLUMN	41	42	43	44	45	46	47	48	49	50	
i	1939	2009	2072	2094	2117	2272	2289	2447	2453	2511	
ROW/COLUMN	51	52	53	54	55	56	57	58	59	60	
i	2517	2586	2594	2611	2617	2672	2683	2728	2739	2797	

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FULLWORK MATRIX

	1	2	3	4	5	6	7	8	9	10
ROW/COLUMN										
1	292	290	301	326	362	452	487	522	561	626
2	330	230	340	230	360	330	280	360	300	300
3	13	12	12	13	12	13	12	13	13	13
ROW/COLUMN	11	12	13	14	15	16	17	18	19	20
1	678	731	769	769	794	794	861	861	864	865
2	330	7	320	7	7	350	7	350	320	480
3	13	12	13	13	13	13	16	13	13	3
ROW/COLUMN	21	22	23	24	25	26	27	28	29	30
1	890	949	949	952	967	1015	1019	1080	1086	1100
2	7	7	340	230	7	340	230	320	7	330
3	13	15	12	12	9	12	13	13	13	13
ROW/COLUMN	31	32	33	34	35	36	37	38	39	40
1	1100	1123	1166	1181	1342	1502	1942	2150	2224	2294
2	7	7	330	320	360	360	280	280	300	350
3	13	13	13	13	13	13	13	13	13	13
ROW/COLUMN	41	42	43	44	45	46	47	48	49	50
1	2385	2449	2451	2454	2474	2475	2602	2609	2636	2672
2	300	230	340	350	280	7	340	230	280	360
3	12	12	12	13	13	12	22	13	13	13
ROW/COLUMN	51	52	53	54	55	56	57	58	59	60
1	2762	2797	2871	2871	2907	2923	2923	2932	2959	3032
2	330	230	300	7	7	7	330	340	7	300
3	13	13	13	13	12	21	12	12	12	12
ROW/COLUMN	61	62	63	64	65	66	67	68	69	70
1	3032	3057	3104	3104	3118	3118	3133	3209	3239	3239
2	7	7	7	350	7	280	7	7	320	7
3	12	13	13	13	14	13	12	13	13	12
ROW/COLUMN	71	72	73	74	75	76	77	78	79	80
1	3257	3257	3259	3262	3265	3278	3325	3325	3329	3334
2	300	7	340	230	350	7	340	7	230	320
3	13	20	13	13	13	15	13	21	13	12
ROW/COLUMN	81	82	83	84	85	86	87	88	89	90

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1	3397	3401	3571	3813	4303	4463	4535	4695	4759	4765
2	320	330	330	360	280	280	300	300	230	350
3	13	22	12	13	12	13	12	13	13	12
ROW/COLUMN	91	92	93	94	95	96	97	98	99	100
1	4919	4919	4921	4925	4928	4946	4947	5073	5082	5107
2	7	230	340	350	480	7	280	330	340	280
3	19	13	13	13	3	13	12	13	12	13
ROW/COLUMN	101	102	103	104	105	106	107	108	109	110
1	5143	5192	5233	5269	5303	5303	5342	5342	5377	5428
2	360	300	330	7	7	360	7	300	7	7
3	12	12	13	13	13	13	13	13	13	14
ROW/COLUMN	111	112	113	114	115	116	117	118	119	120
1	5428	5443	5512	5550	5550	5569	5569	5575	5588	5642
2	280	7	7	320	7	7	340	350	7	7
3	12	13	12	13	13	19	13	13	16	15
ROW/COLUMN	121	122	123	124	125	126	127	128	129	130
1	5642	5645	5730	5730	5733	5800	5866	5881	5947	5956
2	350	320	7	340	230	230	320	330	330	340
3	13	12	15	12	12	13	13	13	13	13
ROW/COLUMN	131	132	133	134	135	136	137	138	139	140
1	5961	6125	6283	6774	6845	6934	7005	7075	7230	7232
2	320	360	360	280	300	280	300	350	230	340
3	13	13	13	12	13	13	13	13	12	12
ROW/COLUMN	141	142	143	144	145	146	147	148	149	150
1	7235	7255	7257	7326	7326	7383	7390	7392	7417	7453
2	350	280	280	7	300	330	230	340	280	360
3	13	13	13	13	13	13	13	13	13	13
ROW/COLUMN	151	152	153	154	155	156	157	158	159	160
1	7543	7613	7652	7652	7688	7718	7718	7740	7755	7770
2	330	360	300	7	7	300	7	7	7	330
3	13	13	13	13	12	13	12	12	13	12
ROW/COLUMN	161	162	163	164	165	166	167	168	169	170
1	7770	7822	7861	7861	7885	7885	7952	7952	7956	7956
2	7	7	7	320	350	7	350	7	320	480
3	12	13	13	13	13	13	13	16	12	3

ROW/COLUMN	171	172	173	174	175	176	177	178	179	180
1	7990	8040	8040	8043	8059	8106	8106	8110	8177	8191
2	7	340	7	230	7	340	7	230	220	330
3	13	13	16	13	17	13	17	13	13	13
ROW/COLUMN	181	182	183	184	185	186	187	188	189	190
1	8257	8434	8594	9084	9244	9316	9385	9476	9540	9542
2	330	360	360	280	280	300	350	300	230	340
3	13	12	13	13	13	12	13	13	13	13
ROW/COLUMN	191	192	193	194	195	196	197	198	199	200
1	9546	9565	9700	9700	9702	9728	9728	9765	9854	9888
2	350	280	230	7	340	7	280	360	330	280
3	12	13	13	15	13	22	12	13	13	13
ROW/COLUMN	201	202	203	204	205	206	207	208	209	210
1	9963	10014	10023	10048	10123	10123	10158	10196	10196	10209
2	300	330	340	7	7	300	7	7	350	280
3	12	13	13	15	13	13	13	13	13	13
ROW/COLUMN	211	212	213	214	215	216	217	218	219	220
1	10209	10224	10301	10330	10330	10349	10349	10350	10353	10356
2	7	7	7	7	320	7	300	340	230	350
3	14	13	12	13	13	20	13	13	13	13
ROW/COLUMN	221	222	223	224	225	226	227	228	229	230
1	10369	10416	10416	10421	10425	10489	10488	10502	10502	10525
2	7	7	340	230	320	7	320	330	7	7
3	16	22	13	12	13	13	13	12	16	13
ROW/COLUMN	231	232	233	234	235	236	237	238	239	240
1	10662	10904	11394	11555	11626	11780	11850	11856	12011	12011
2	330	360	280	280	300	300	230	350	230	340
3	13	13	13	12	13	13	13	13	12	12
ROW/COLUMN	241	242	243	244	245	246	247	248	249	250
1	12016	12019	12038	12104	12173	12198	12234	12273	12324	12394
2	350	480	280	330	340	280	360	300	330	360
3	13	3	13	13	13	13	13	13	13	13
ROW/COLUMN	251	252	253	254	255	256	257	258	259	260
1	12453	12463	12520	12520	12534	12603	12641	12641	12661	12661
2	300	7	280	7	7	7	320	7	340	7
3	12	12	12	13	8	13	13	13	12	13

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ROW/COLUMN	261	262	263	264	265	266	267	268	269	270
1	12666	12679	12733	12733	12736	12821	12821	12824	12891	12891
2	350	7	350	7	340	340	7	230	7	230
3	13	16	13	16	13	13	16	13	13	13
ROW/COLUMN	271	272	273	274	275	276	277	278	279	280
1	12907	12958	12972	13038	13047	13053	13215	13375	13865	13936
2	7	320	330	330	340	320	360	360	280	300
3	13	13	13	13	13	12	14	12	13	13
ROW/COLUMN	281	282	283	284	285	286	287	288	289	290
1	14025	14097	14166	14321	14323	14327	14347	14348	14417	14474
2	280	300	350	230	340	350	280	280	300	330
3	13	12	13	13	13	12	12	13	13	13
ROW/COLUMN	291	292	293	294	295	296	297	298	299	300
1	14475	14481	14483	14509	14509	14544	14544	14635	14705	14744
2	7	230	340	7	280	360	7	330	360	7
3	21	13	13	22	12	13	13	13	12	12
ROW/COLUMN	301	302	303	304	305	306	307	308	309	310
1	14744	14779	14809	14809	14831	14847	14861	14861	14952	14977
2	300	7	7	300	7	7	7	330	320	350
3	12	13	13	13	13	13	13	13	13	13
ROW/COLUMN	311	312	313	314	315	316	317	318	319	320
1	15044	15047	15048	15134	15197	15202	15269	15283	15349	15364
2	350	320	480	230	340	230	320	330	330	320
3	12	13	2	13	13	12	13	12	12	12
ROW/COLUMN	321	322	323	324	325	326	327	328	329	330
1	15525	15635	16175	16336	16407	16477	16567	16633	16637	16657
2	360	360	280	280	300	350	300	340	350	280
3	13	13	13	12	13	13	13	13	13	13
ROW/COLUMN	331	332	333	334	335	336	337	338	339	340
1	16792	16794	16819	16855	16945	16980	17105	17114	17249	17287
2	230	340	280	360	330	280	330	340	310	350
3	12	12	13	13	13	12	13	13	13	13
ROW/COLUMN	341	342	343	344	345	346	347	348	349	350
1	17201	17221	17222	17445	17447	17508	17512	17515	17516	17580

2	280	320	340	230	350	340	230	450	320	320
3	12	13	12	12	13	12	13	4	13	13
ROW/COLUMN	351	352	353							
1	17595	7753	16068							
2	330	330	310							
3	13	13	12							

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FULL WORD MATRIX

	4									
ROW/COLUMN	1	2	3	4	5	6	7	8	9	10
1	95	5	90	10	98	10	95	50	90	90
ROW/COLUMN	11	12	13	14	15	16	17	18	19	20
1	50	75	50	72	72	72	72	30	36	108
ROW/COLUMN	21	22	23							
1	108	10	50							

APPENDIX E
INPUT TAPE CREATION PROGRAM LISTING



BLOCK NUMBER	LOC	OPERATION	A, B, C, D, E, F, G, H, I	COMMENTS	STATEMENT NUMBER
				*****	1
**				**	2
**		D. P. ASSOCIATES, INC.		**	3
**				**	4
**		SHUTTLE MISSION 18 DATA SYSTEM		**	5
**				**	6
**		MODULE 1: CREATION OF DATA ENTRIES		**	7
**				**	8
				*****	9
				*	10
		SIMULATE			11
		AN INITIAL CARD IS REQUIRED FOR EACH DATA ENTRY. MATRIX MX1 WILL			12
*		CONTAIN THE FOLLOWING DATA ELEMENTS:			13
*		MX1(1,J) THE TIME FROM LAUNCH OF DATA ENTRY J.			14
*		MX1(2,J) EXPERIMENT NUMBER I.D. OF DATA ENTRY J.			15
I		MATRIX X, 3, 929			16
*		MX1(3,J) DURATION OF DATA ENTRY J.			17
INITIAL		MX1(1,1), 731/MX1(2,1), 107/MX1(3,1), 12			18
INITIAL		MX1(1,2), 769/MX1(2,2), 107/MX1(3,2), 14			19
INITIAL		MX1(1,3), 786/MX1(2,3), 44/MX1(3,3), 14			20
INITIAL		MX1(1,4), 800/MX1(2,4), 107/MX1(3,4), 7			21
INITIAL		MX1(1,5), 861/MX1(2,5), 107/MX1(3,5), 10			22
INITIAL		MX1(1,6), 899/MX1(2,6), 107/MX1(3,6), 13			23
INITIAL		MX1(1,7), 940/MX1(2,7), 44/MX1(3,7), 20			24
INITIAL		MX1(1,8), 960/MX1(2,8), 107/MX1(3,8), 4			25
INITIAL		MX1(1,9), 967/MX1(2,9), 107/MX1(3,9), 13			26
INITIAL		MX1(1,10), 1015/MX1(2,10), 107/MX1(3,10), 17			27
INITIAL		MX1(1,11), 1100/MX1(2,11), 107/MX1(3,11), 12			28
INITIAL		MX1(1,12), 1101/MX1(2,12), 44/MX1(3,12), 11			29
INITIAL		MX1(1,13), 1166/MX1(2,13), 107/MX1(3,13), 13			30
INITIAL		MX1(1,14), 1181/MX1(2,14), 107/MX1(3,14), 13			31
INITIAL		MX1(1,15), 1195/MX1(2,15), 107/MX1(3,15), 13			32
INITIAL		MX1(1,16), 1298/MX1(2,16), 107/MX1(3,16), 13			33
INITIAL		MX1(1,17), 1342/MX1(2,17), 107/MX1(3,17), 8			34
INITIAL		MX1(1,18), 1800/MX1(2,18), 7/MX1(3,18), 22			35
INITIAL		MX1(1,19), 1800/MX1(2,19), 12/MX1(3,19), 27			36
INITIAL		MX1(1,20), 1873/MX1(2,20), 5/MX1(3,20), 13			37
INITIAL		MX1(1,21), 1877/MX1(2,21), 12/MX1(3,21), 88			38
INITIAL		MX1(1,22), 1879/MX1(2,22), 7/MX1(3,22), 84			39
INITIAL		MX1(1,23), 1956/MX1(2,23), 5/MX1(3,23), 12			40
INITIAL		MX1(1,24), 1970/MX1(2,24), 12/MX1(3,24), 30			41
INITIAL		MX1(1,25), 1972/MX1(2,25), 7/MX1(3,25), 16			42
INITIAL		MX1(1,26), 1990/MX1(2,26), 7/MX1(3,26), 7			43
INITIAL		MX1(1,27), 1993/MX1(2,27), 5/MX1(3,27), 20			44
INITIAL		MX1(1,28), 2034/MX1(2,28), 5/MX1(3,28), 12			45
INITIAL		MX1(1,29), 2039/MX1(2,29), 4/MX1(3,29), 3			46
INITIAL		MX1(1,30), 2047/MX1(2,30), 12/MX1(3,30), 7			47
INITIAL		MX1(1,31), 2056/MX1(2,31), 12/MX1(3,31), 105			48
INITIAL		MX1(1,32), 2056/MX1(2,32), 5/MX1(3,32), 13			49
INITIAL		MX1(1,33), 2059/MX1(2,33), 7/MX1(3,33), 57			50
INITIAL		MX1(1,34), 2116/MX1(2,34), 5/MX1(3,34), 13			51
INITIAL		MX1(1,35), 2120/MX1(2,35), 7/MX1(3,35), 9			52
INITIAL		MX1(1,36), 2134/MX1(2,36), 7/MX1(3,36), 9			53
INITIAL		MX1(1,37), 2145/MX1(2,37), 7/MX1(3,37), 14			54
INITIAL		MX1(1,38), 2153/MX1(2,38), 5/MX1(3,38), 19			55

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INITIAL	MX1(1,894),14667/MX1(2,894),5/MX1(3,894),13	911
INITIAL	MX1(1,895),14671/MX1(2,895),107/MX1(3,895),12	912
INITIAL	MX1(1,896),14675/MX1(2,896),4/MX1(3,896),2	913
INITIAL	MX1(1,897),14677/MX1(2,897),7/MX1(3,897),2	914
INITIAL	MX1(1,898),14690/MX1(2,898),7/MX1(3,898),11	915
INITIAL	MX1(1,899),14702/MX1(2,899),7/MX1(3,899),1	916
INITIAL	MX1(1,900),14705/MX1(2,900),107/MX1(3,900),12	917
INITIAL	MX1(1,901),14711/MX1(2,901),7/MX1(3,901),39	918
INITIAL	MX1(1,902),14744/MX1(2,902),107/MX1(3,902),12	919
INITIAL	MX1(1,903),14744/MX1(2,903),5/MX1(3,903),13	920
INITIAL	MX1(1,904),14756/MX1(2,904),7/MX1(3,904),45	921
INITIAL	MX1(1,905),14779/MX1(2,905),107/MX1(3,905),13	922
INITIAL	MX1(1,906),14779/MX1(2,906),5/MX1(3,906),13	923
INITIAL	MX1(1,907),14800/MX1(2,907),5/MX1(3,907),23	924
INITIAL	MX1(1,908),14809/MX1(2,908),107/MX1(3,908),13	925
INITIAL	MX1(1,909),14816/MX1(2,909),44/MX1(3,909),5	926
INITIAL	MX1(1,910),14830/MX1(2,910),5/MX1(3,910),13	927
INITIAL	MX1(1,911),14831/MX1(2,911),107/MX1(3,911),13	928
INITIAL	MX1(1,912),14847/MX1(2,912),107/MX1(3,912),13	929
INITIAL	MX1(1,913),14847/MX1(2,913),5/MX1(3,913),13	930
INITIAL	MX1(1,914),14861/MX1(2,914),107/MX1(3,914),13	931
INITIAL	MX1(1,915),14890/MX1(2,915),5/MX1(3,915),13	932
INITIAL	MX1(1,916),14911/MX1(2,916),5/MX1(3,916),13	933
INITIAL	MX1(1,917),14911/MX1(2,917),107/MX1(3,917),15	934
INITIAL	MX1(1,918),14952/MX1(2,918),107/MX1(3,918),13	935
INITIAL	MX1(1,919),14952/MX1(2,919),5/MX1(3,919),13	936
INITIAL	MX1(1,920),14968/MX1(2,920),44/MX1(3,920),7	937
INITIAL	MX1(1,921),14971/MX1(2,921),5/MX1(3,921),21	938
INITIAL	MX1(1,922),15047/MX1(2,922),5/MX1(3,922),13	939
INITIAL	MX1(1,923),15117/MX1(2,923),5/MX1(3,923),13	940
INITIAL	MX1(1,924),15132/MX1(2,924),5/MX1(3,924),12	941
INITIAL	MX1(1,925),15194/MX1(2,925),5/MX1(3,925),13	942
INITIAL	MX1(1,926),15207/MX1(2,926),5/MX1(3,926),16	943
INITIAL	MX1(1,927),15229/MX1(2,927),5/MX1(3,927),12	944
INITIAL	MX1(1,928),15245/MX1(2,928),5/MX1(3,928),13	945
INITIAL	MX1(1,929),15269/MX1(2,929),5/MX1(3,929),13	946
		947

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1	GENERATE	0,,1,,25PF	CREATE WORKER TRANSACTION	948
2	ASSIGN	12,1,PF	NUMBER FIRST DATA ENTRY	949
3	TRANSFER	,EXP1		950
4	EXP	ASSIGN 12+,1,PF	NUMBER DATA ENTRIES	951
5	ADVANCE	V1	DELAY INTERARRIVAL TIME	952
6	EXP1	ASSIGN 1,MX1(1,P12),PF	RECORD TIME FROM LAUNCH	953
7	ASSIGN	2,MX1(2,P12),PF	RECORD EXPERIMENT NUMBER	954
8	ASSIGN	3,MX1(3,P12),PF	RECORD DATA ENTRY DURATION	955
9	WRITE	JOBTAP1	CREATE JOBTAPE RECORD	956
10	TEST E	P12,929,EXP		957
11	TERMINATE	1		958
	CLEAR	MX1		959
1	VARIABLE	MX1(1,P12)-MX1(1,V2)	COMPUTE INTERARRIVAL TIME	960
2	VARIABLE	P12-1		961
	START	1		962
	END			963

APPENDIX F
DEFINITIONS OF OUTPUT FOR STORAGES



APPENDIX F

Definitions of Output for STORAGES

STORAGE: Storage block name or number.

CAPACITY: Original capacity of STORAGE block; this value is found in the STORAGE definition statement.

AVERAGE CONTENTS: Computed by accumulating the number of time units spent in the storage for each entry made into it and dividing by the length of the simulation.

ENTRIES: Total number of units which was placed into the storage during the simulation.

AVERAGE TIME/UNIT: Calculated by accumulating the number of time units spent in the storage for all entries made into it and dividing by the total entries.

TOTAL TIME: Computed by accumulating the number of time units spent in the storage for all entries made into it and dividing by (length of the simulation X CAPACITY).

PERCENT AVAILABILITY:

$$\frac{(\text{Length of the simulation}) - (\text{Total time storage was unavailable during simulation})}{(\text{Length of the simulation})}$$

CURRENT CONTENTS: Number of units in the storage when the printout occurred.

MAXIMUM CONTENTS: Maximum number of units which were in the storage at any point during the simulation.

