

ADVANCED CREW PROCEDURES DEVELOPMENT TECHNIQUES

PROCEDURES GENERATION PROGRAM REQUIREMENTS DOCUMENT

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CONTENTS

	<u>PAGE</u>
Abbreviations and Definitions.	iv
SECTION 1 INTRODUCTION	1-1
SECTION 2 SPS DATA TRANSFER.	2-1
2.1 Procedures Data	2-1
2.2 Performance Data.	2-1
2.3 Transfer Rates.	2-2
2.4 Miscellaneous Transfers	2-3
SECTION 3 DATA MANIPULATION.	3-1
3.1 Checkpoints	3-1
3.2 Reset	3-1
SECTION 4 CDC 211 CAPABILITIES	4-1
4.1 Format Construction	4-1
4.2 Crew Station Configuration Check.	4-1
4.3 Display Reconstruction.	4-2
4.4 Training Data	4-4
SECTION 5 CDC 243 CAPABILITIES	5-1
5.1 Display Capability.	5-1
5.2 Format Construction	5-1
5.3 Display Construction.	5-1
5.4 Display Reconstruction.	5-2
5.5 User Interface.	5-2
SECTION 6 GDP/PGP DATA TRANSFER.	6-1
6.1 Magnetic Tape Transfer.	6-1
6.2 Hazeltine Terminal Transfer	6-1
SECTION 7 PGP OUTPUT	7-1
7.1 General	7-1
7.2 CDC 211 Displays.	7-2
7.3 CDC 243 Displays.	7-2
SECTION 8 MISCELLANEOUS.	8-1
8.1 PGP Data Base	8-1
8.2 Real-time Operations.	8-1
8.3 Batch Operations.	8-1
SECTION 9 REFERENCES	9-1

LIST OF PAGES

Title Page

i thru v

1-1 thru 1-2

2-1 thru 2-3

3-1

4-1 thru 4-5

5-1 thru 5-2

6-1 thru 6-2

7-1 thru 7-2

8-1

9-1

ABBREVIATIONS AND DEFINITIONS

ACPDT	Advanced Crew Procedures Development Techniques
Checkpoint Reset	A collection and recording of SPS parameters at a specific interval or upon user command which provides sufficient information to reinitialize the SPS.
CDC	Control Data Corporation
CPDT	Crew Procedures Development Techniques
CRT	Cathode Ray Tube
CUE	A reference identifier initiated by the PGP user to facilitate data retrieval and review at a specified time during a run.
Default Value	The value assumed by a parameter within the PGP data base at the initialization time assuming the user fails to provide an input value.
Difference Procedure	A combination of the following data: Hold Configuration Difference, Switch Configuration Difference, Sequence Difference, Detailed Difference Summary, and Summary Procedure Difference.
Display Format	The arrangement and general makeup of a display as seen by the PGP user.
Display Page	A single display format. Several display pages may be prepared by the PGP for each display format.
Event Descriptor	Hollerith statement describing event.
FMT	Format
GDP	Generalized Document Processor
MOPAS	Matrix Oriented Production Assembly System
Performance Data	That data which is the "delayed" result of crew action (e.g., vehicle attitude, airspeed, and sink rate). Performance Data shall be available for insertion into Procedures Data Formats.
PGP	Procedures Generation Program
PGP Data Base	The collection of data that is internally accessible by the PGP and on which the PGP operates. Segments of the PGP data base are identified as: (1) Hollerith Statements Data; (2) Numerical and Criterion Data; (3) Format Descriptors, and (4) Reference Procedures Data.

Performance Evaluation Data	Data presented by the PGP to provide a measure of crew performance.
PGP User	The PGP user is identified as a Procedures Developer during a procedures generation type run as an SPS Instructor during a training exercise.
Procedures	Collection of Hollerith statements in a specified format (e.g., detailed procedures, checklists, cue cards, and summary procedures).
Procedures Data	That data which is the "immediate" result of crew action (e.g., switch settings, keyboard entries, and control deflections).
Reference Run Data	Procedures Data from a previous run used as the nominal time history reference for difference comparisons.
Run	Real-Time SPS operation
Run Data	Data which is stored by the PGP and represents procedures data and performance data for the current simulation run. These data are adequate for the construction of all PGP displays formats.
SPS	Shuttle Procedures Simulator
Switch Configuration Difference	A collection of Hollerith statements which describes the instantaneous difference between the current state of the SPS controls and displays and a standard state which is stored as the reference run data in the PGP data base.
TBD	To be determined
Training Script	Instructor aid, generated by the PGP, which contains a description of the SPS reset point and malfunction data, identification of the real-time performance and procedures displays used, and identification of post-run displays and hardcopy data used. A training script documents the scenario of the PGP user operations for a run.

SECTION 1

INTRODUCTION

The Procedures Generation Program (PGP) is an automated crew procedures generation and performance monitoring system. The heart of the system is a digital program which translates SPS data inputs into crew procedures and compares these procedures with a stored reference to provide difference procedures. In addition, the PGP provides performance data and compares this performance data to a set of established criterion to provide an evaluation of performance. Presently, procedures and performance data are available on alphanumeric displays in real-time or post-run via the CDC 211 CRT. Also, the data may be hardcopy output via line printer

This document defines the computer software requirements for the Advanced Crew Procedures Development Techniques (ACPDT), PGP. These requirements define the capabilities which are to be added to those implemented in the Crew Procedures Development Techniques (CPDT), PGP. Implementation of these additional capabilities will provide the desired operational PGP system.

The requirements for the CPDT, PGP were presented in Reference (1). These requirements defined an eventual desired capability for an operational PGP. Under the CPDT contract, only a portion of these requirements were implemented. These were the requirements necessary to demonstrate the feasibility of the PGP. The remainder of the CPDT requirements were to be implemented under the ACPDT contract. Also, subsequent to the definition of the CPDT requirements, new capabilities and better methods of operation were identified. This document presents the requirements still to be implemented from

Reference (1) and defines the requirements for the new capabilities and improved methods of operation.

Various PGP and desirable SPS capabilities are presented in this document. Section 2 presents the requirements for updating the data transfers to conform to the latest SPS crew station configuration. Also it presents some design goals, dependent upon SPS capabilities, which will improve the PGP operational capabilities. Section 3 presents the usage of the design goal SPS checkpoint resets. These checkpoints will be used to reset the SPS and PGP to a point prior to an error in the simulation run thus allowing continuation of a proper run. Additional capabilities for CDC 211 operations are discussed in Section 4. These capabilities include construction of formats not initially implemented for PGP operations, crew station configuration checks prior to simulation runs, reconstruction of previous time PGP displays and training data which provides an instructor with training scripts and the status of each crewmens training. Section 5 presents the graphical capabilities of the new CDC 243 graphics terminal. Included in this section are the CDC 243 display capabilities, format construction, display construction, display reconstruction and the interface commands for user operation. Section 6 presents the two methods of procedures data transfer between the GDP and PGP. The first method is via magnetic tape and the second is via a GDP Hazeltine terminal. Section 7 presents the various output capabilities of the PGP. Finally, section 8 presents some miscellaneous items which cover the PGP data base, fast-time operations in real-time, and control of operations in the batch mode.

SECTION 2

SPS DATA TRANSFER

2.1 PROCEDURES DATA

1. Procedures data transferred to the PGP shall be revised to conform with the November 1974 SPS crew station configuration (includes active systems controls) and include:
 - a. Discretes indicating the position of all active switches, circuit breakers, and keyboards. Approximately 420 discretes are required for the November 1974 SPS crew station configuration.
 - b. Discretes indicating the status of all active talkbacks and indicator lights. Approximately 120 discretes are required with the November 1974 SPS configuration.
 - c. Discretes and analog parameters indicating the status of other controls such as:
 - (1) Rotation hand controllers
 - (2) Translation hand controllers
 - (3) Rudder pedals
 - (4) Speed brake controls
 - (5) System variable controls and potentiometers

2.2 PERFORMANCE DATA

1. Performance data transferred to the PGP shall be revised to conform with the November 1974 SPS crew station configuration (includes active systems controls) and include:
 - a. The transfer of the following parameters is a design goal dependent upon SPS availability.
Parameters relating to environmental conditions such as:
 - (1) Weather
 - Winds
 - Temperature
 - Pressure
 - Cloud Cover
 - (2) Runway Conditions
 - Dry
 - Wet

b. Parameters relating to systems operations such as but not limited to:

(1) EPS

- Main DC Bus A, B, C Voltage (3)
- ESS Bus 1, 2, 3 Voltage (3)
- Main AC Bus 1, 2, 3 (ØA, ØB, ØC) Voltage (9)
- Fuel Cell 1, 2, 3 Voltage (3)
- Fuel Cell 1, 2, 3 Current (3)

(2) Hydraulics

- APU Fuel Tank Quantity*

(3) ECS

- Cabin Pressure
- Cabin CO₂ Partial Pressure
- Cabin O₂ Partial Pressure
- Cabin Humidity
- Pri, Sec H₂O Coolant Flow (2)
- Pri, Sec Avionics Bay Coolant Inlet Temperature (2)
- Freon Loop 1, 2 Flow (2)
- Freon Loop 1, 2 Interchange Inlet Temp (2)

2.3 TRANSFER RATES

1. Data shall be transferred to the PGP according to the following rates:
 - a. Discretes indicating positions of switches, circuit breakers, keyboards, talkbacks, and indicator lights shall be transferred each computation cycle of the SPS.
 - b. Discretes and analog parameters indicating the status of other controls shall be transferred at least every other computation cycle of the SPS.
 - c. Performance parameters shall be transferred a minimum of once a second with the capability to transfer some parameters at least five times a second. The number of parameters is TBD.

2.4 MISCELLANEOUS TRANSFERS

1. It shall be a design goal to obtain from the SPS a transfer identifying the SPS mission phase.
 - a. If a mission phase identifier is available in the SPS, this identifier should be used as a default value in the event the user does not key in the mission phase.
 - b. If the default mission phase and that desired by the user are not in agreement, a message "Mission Phases do not agree" should be displayed to the user.
 - c. If no mission phase identifier has been made available to the PGP before the user tries to operate the program, the user interface device shall display the message "Key in Mission Phase."
2. It shall be a design goal to obtain from the SPS a transfer identifying the SPS reset and/or checkpoint reset. SPS reset and/or checkpoint identification number shall be transferred to the PGP upon SPS selection to enable the PGP to compare the crew station configuration with a reference configuration (in PGP data base) and display difference on the Hold Configuration display.
3. It shall be a design goal to obtain from the SPS transfers identifying the following data for use in generating training scripts:
 - a. SPS reset selection
 - b. Manual dispersion inputs through the CDC-211 (SPS control) or other SPS input devices
 - c. Malfunction insertion data
 - d. Fast time inputs

SECTION 3

DATA MANIPULATION

3.1 CHECKPOINTS

The following requirements are design goals dependent upon SPS availability:

1. SPS checkpoint resets shall be recorded periodically during a run.
 - a. The user shall have the input capability to specify the time interval between checkpoints.
 - b. Actual recording of the checkpoint reset may vary from the specified interval due to CPU activities. A maximum variation of 2 minutes is acceptable.
2. SPS checkpoint resets shall be recorded immediately each time a "CUE" is initiated by the PGP user.
3. The PGP shall store the crew station configuration for each SPS checkpoint generated.

3.2 RESET

The following requirements are design goals dependent upon SPS availability:

1. The user shall have the capability of revising a procedure by resetting the SPS and PGP to a checkpoint reset preceding the error and then continuing the run properly.
2. The user will have the capability of revising performance data by resetting the SPS and PGP to a checkpoint reset preceding the error and then continuing the run properly. This capability is not independent for procedures and performance data (e.g., when the procedures data are revised by resetting the SPS and PGP to a checkpoint and rerunning, the performance data is also revised and vice versa).
3. The user shall have the option to revise or not revise the stored data when selecting a checkpoint reset.

SECTION 4

CDC 211 CAPABILITIES

4.1 FORMAT CONSTRUCTION

1. The PGP user shall have the capability to define and incorporate Procedures and Difference Procedure Formats into the PGP display system which are not included in the initial implementation display requirements.
2. The PGP shall have the capability to define and incorporate Performance Formats in addition to the initial display requirement implemented. This includes Performance Evaluation and Performance Parameter Formats.
3. The PGP shall have the capability to define and incorporate Training Data Formats without modification of the PGP software.

4.2 CREW STATION CONFIGURATION CHECK

1. It shall be a design goal (dependent upon the SPS initial data transfer) to detect and display configuration differences between the SPS crew station and the reference data selected for the mission phase defined. The display shall be presented on the Hold Configuration Difference format prior to the SPS going to RUN.
2. It shall be a design goal (dependent upon SPS checkpoint capabilities) to detect and display differences between the SPS crew station configuration and the reference configuration contained in the PGP data base upon selection of a new reset or checkpoint. The display shall be presented on the Hold Configuration Difference Format prior to the SPS returning to RUN.
3. The PGP shall provide the means of updating the stored reference configuration for a reset or checkpoint using the SPS crew station configuration or via punch card input.

4.3 DISPLAY RECONSTRUCTION

1. On user command and when the SPS is in the hold mode or a post-run condition, the PGP shall assemble the procedures data required to construct all the PGP displays valid at any user selected previous time during the run, i.e., times for which data has been stored.
2. On user command and when the SPS is in the hold mode or a post-run condition, the PGP shall assemble the procedures data required to construct all the PGP displays valid at any user selected time for the reference run that has been stored as part of the PGP data base.
3. On user commands and when the SPS is in a hold mode or a post-run condition, the PGP shall assemble the performance data required to reconstruct all of the Performance Evaluation displays valid at any user selected previous time during the run. Selection of a time not valid for the format or selection of a format not valid for the current time shall result in display of the fixed background format.
4. On user command and when the SPS is in the hold mode or in a post-run condition, the PGP shall assemble the performance data required to reconstruct all of the Performance Parameter displays valid for any user selected time. Selection of a time not valid for the format or selection of a format not valid for the current time shall result in display of the fixed background format.
5. The PGP shall be capable of being stepped forward and backwards in time and be able to reconstruct the selected display.
6. The PGP user interface shall provide a means for returning to a user specified point in the stored data stream.
 - a. This capability shall only exist during the post-run or simulation "HOLD" modes.
 - b. A previously defined event may represent the specified point (e.g., TPI Maneuver, Over Outer Marker, Mach 7).
 - c. The specified point may be defined by a time referenced to a previously defined event (e.g., TPI +10 minutes, TPI +3 minutes).
 - d. The specified point may be identified by a time corresponding to a cue that the user had previously inserted in the data stream.

- e. The capability shall be provided for the user to select several different time references. These options shall include:
 - Ground Elapsed Time (GET), ● Simulation Run Time (SRT),
 - Greenwich Mean Time (GMT), ● Mission Elapsed Time (MET)
 - f. The user shall initiate this capability by keying in "REPEAT = L,M" from the CDC 211 keyboard. In this command, L represents the time reference option or mission event, and M represents the desired time value.
 - g. In response to this command, the PGP shall display to the user the most recent display format that is contained in the display format record.
 - h. While at this requested time, the user shall have the capability to request any display format that he desires.
 - i. Response to this command shall present the display format with the requested time or event located at the bottom of the page.
 - j. The time reference and display data shall return to the current time when the SPS returns to the "RUN" mode, or the user by keying "CONTINUE" shall command the PGP to return to the current time.
7. The PGP user interface shall provide a means for returning to a specified point previously tagged by a CUE. To return to a specified cue time, two options shall be provided. Each option is available during the post-run or simulation "HOLD" modes.
- a. Option 1 - This option allows the user to select and key in a sequence number from the cue list which results in the reconstruction of PGP data at the requested time. Use of this option requires the CUE Record Summary display to be on the user CRT at the time of the request. After selection of the desired cue, the user shall have the capability to request any PGP display.
 - b. Option 2 - This option allows the user to select and key in a discussed GET time using the "REPEAT" command described in item 6 above.
8. Upon returning to the requested cue time, the CUE Record Summary Display will not be modified. This allows the user to have a record of the entire simulation cue record.

4.4 TRAINING DATA

1. Training data shall allow the user to display Training Script and Training Status formats which are accessible during SPS hold or post-run operations.
2. All training formats shall be accessible via PGP display tree selection operations and displayed on the CDC 211 CRT.
3. The PGP shall record all PGP user operations during each PGP/SPS simulation run.
4. It shall be a design goal (dependent upon SPS availability) to record all SPS control operations during each PGP/SPS simulation run.
5. During Hold and during Post-Run operations, the PGP shall construct, on user command, a Training Script which is a time referenced list of hollerith statements relating the following actions:
 - a. PGP initialization data input
 - b. SPS initialization data input (design goal)
 - c. SPS reset selection and dispersions (design goal)
 - d. PGP synchronization inputs
 - e. Malfunction insertions (design goal)
 - f. SPS control inputs (design goal)
 - g. PGP user station keyboard inputs controlling the real-time CDC 211 and Norden CRT displays
 - h. Insertion of PGP "cues"
 - i. PGP user station keyboard inputs for selecting post-run displays for debriefing
 - j. PGP user station inputs for PGP clean up
 - k. PGP user station inputs for hardcopy outputs
6. The PGP shall maintain an up-to-date record of the training status of all crew members participating in SPS training activities.
 - a. The PGP shall record for this training exercise:
 - (1) Start/stop times and provide an indication of total training time
 - (2) Crew member identification number or name by crew station position
 - (3) Exercise number
 - (4) Mission phase
 - (5) Date of exercise

- b. The following data shall be provided by the user during post-run operations of each training exercise.
 - (1) Crew performance evaluation
 - (2) Indication of training requirement completion
7. The user shall have the capability input and maintain a listing of exercise training times and total exercises required for each mission phase or training task.
8. During hold and during post-run operations, the PGP shall construct on user command Training Status formats. Training Status data for individual crewman shall include:
 - a. Total training hours
 - b. Total training hours at each station
 - c. Total training hours by exercise
 - d. Date training was completed by exercise
 - e. Training hours not completed
 - f. Evaluation of performance

SECTION 5

CDC 243 CAPABILITIES

5.1 DISPLAY CAPABILITY

1. The PGP shall provide graphical displays of performance data on the CDC 243 CRT.
2. PGP graphical display capabilities shall be available for all mission phases and during real-time and non-real-time PGP operations.
3. Displaying graphical data on the CDC 243 CRT will not preclude simultaneous display of procedures or performance data on the CDC 211 CRT.

5.2 FORMAT CONSTRUCTION

1. Construction of graphical formats shall be controlled from the CDC 243 keyboard and/or penlight.
2. The PGP user shall have capability to construct new graphical formats which were not initially implemented. This capability shall only exist during non-real-time PGP operations.
3. PGP graphical displays shall include the capability to present nominal and/or max-min criteria, as background format data, in a graphical form.
4. Display construction shall include defining the format title, format number, and ordinate and abscissa location, parameters, scales, and scale graduations. Construction shall be controlled through CDC 243 keyboard and penlight entries.
5. PGP graphical displays shall include, as a design goal, the capability to present multiple parameter axis (max of 3) for both the ordinate and abscissa, thus providing multiple plots per display.

5.3 DISPLAY CONSTRUCTION

1. Display callup of graphical formats shall be controlled from the CDC 243 keyboard and/or penlight.
2. Display callup of graphical formats shall be via a display tree selection method.

3. On user command, during the SPS run mode, the PGP shall assemble the performance data required to construct all currently valid graphical displays.
 - a. The display shall be initialized with data coinciding with the display callup time.
 - b. It shall be a design goal, if sufficient CDC 243 storage is available, to initialize the display with data which coincides with the start of run or the first valid data.
 - c. Selection of a format not valid for the current time shall result in display of the fixed background format.

5.4 DISPLAY RECONSTRUCTION

1. On user command and when the SPS is in the hold mode or during a post-run condition, the PGP shall assemble the performance data required to construct all graphical displays valid for the simulation.
 - a. The display shall be initialized with data coinciding with the start of run or the first valid data.
 - b. Selection of a format not valid for the current time shall result in display of the fixed background format.

5.5 USER INTERFACE

1. CDC 243 operations shall be controlled from the CDC 243 keyboard and penlight. CDC 243 operations shall, in general, be independent of CDC 211 operations except for initialization and termination of PGP operations. These shall be performed through the CDC 211 terminal.
 - a. Commands shall be consistent with established PGP commands.
 - b. Commands shall include a G (indicating graphical operations) prior to the valid PGP command (e.g., GDISPLAY = L, M, N).
2. The valid commands that must be applicable to CDC 243 operations are:
 - a. DISPLAY Presents display of available graphical formats
 - b. DISPLAY = L,M,N Presents specific display format (graphical formats only)
 - c. + Advance one display format
 - d. - Move back one display format
 - e. COPY = CP Copy display to calcomp plotter

SECTION 6

GDP/PGP DATA TRANSFER

6.1 MAGNETIC TAPE TRANSFER

1. The PGP shall provide the capability to accept for processing a magnetic tape containing procedures developed or maintained on the Generalized Document Processor (GDP).
 - a. Data transferred from the GDP on magnetic tape shall be used as a reference data source.
 - b. Reference run data (Procedures) contained in the PGP data base may be replaced by data transferred from the GDP on magnetic tape.
2. The PGP shall provide the capability to transfer procedures post-run via magnetic tape to the GDP.

6.2 HAZELTINE TERMINAL TRANSFER

1. The PGP shall provide the capability to transfer procedures data between the PGP and GDP via a Hazeltine 4000G terminal.
 - a. The Hazeltine terminal interface shall be selectable between either the GDP or PGP systems.
 - b. Switching between systems must not change the data displayed on the Hazeltine CRT.
2. All GDP/Hazeltine operations will conform with established GDP operating procedures.
3. All PGP/Hazeltine operations must be performed during non-real-time PGP activities (building 35 computer complex constraint).
4. The PGP shall display alphanumeric procedures data on the Hazeltine CRT.
 - a. Displaying alphanumeric procedures data on the Hazeltine CRT shall not preclude simultaneous display of alphanumeric procedures and performance data on the CDC 211 CRT, and graphical performance data on the CDC 243 CRT.
 - b. The PGP shall display procedures data on the CDC 211 and Hazeltine CRT's (17 lines and 50 lines per display page respectively) using the same format descriptor.

5. PGP/Hazeltine operations shall be controlled by commands input on the CDC 211 keyboard.
 - a. Commands shall be consistent with established PGP commands.
 - b. Commands shall include a H (indicating Hazeltine operations) prior to the valid PGP command (e.g., HDISPLAY = L,M,N).
6. The PGP valid commands that must be applicable to Hazeltine operations are:
 - a. DISPLAY=L,M,N Requests specific display format (procedures only)
 - b. + Advance one display format
 - c. - Move back one display format
 - d. † Advance one display page
 - e. ‡ Move back one display page
 - f. ^ Advance one display line
 - g. v Move back one display line
 - h. REPEAT=L,M Construct current display at input time (procedures only)
 - i. / Change data source between actual and reference data
7. Command inputs not applicable to Hazeltine operations shall result in an error display indicating invalid Hazeltine operations.
8. The PGP must be able to accommodate an expanded character set which includes lower case letters.
 - a. Display of the expanded character set is applicable to the Hazeltine terminal.
 - b. Data base inputs displayed on the Hazeltine terminal (including lower case letters) shall be stored by the PGP.
9. The PGP shall have the capability to store procedures data displayed on the Hazeltine terminal.

SECTION 7

PGP OUTPUT

7.1 GENERAL

1. The PGP shall provide the capability to output data via line printer and/or magnetic tape during post-run operations.
2. During the pre-run and post-run operations, the PGP user shall have the capability to define the request for hardcopy capability via the CDC 211 keyboard.
3. During a run, the user shall have the capability to request that a particular PGP display page be hardcopied to a specific device via the COPY=L command.
4. Following definition of hardcopy requests, a summary of all user defined hardcopy request shall be displayed to the PGP user:
 - a. First the display format defining the hardcopy requests to the line printer shall be displayed to the user. After review and modification of these requests, the user shall command the PGP to begin processing the output data by keying in on the user control line the command "ACCEPT." If the user decides he does not want any of the hardcopy requests, he must key in the command "DROP."
 - b. After the lineprinter requests are verified, the magnetic tape hardcopy requests shall be displayed to the user. The command "ACCEPT" and "DROP" apply to the magnetic tape requests.
5. Post-run output data processing of the hardcopy and magnetic tape requests shall not prohibit the PGP from continuing with the next simulation run. The PGP shall be able to execute a new simulation run while performing the output data processing from the previous run.

7.2 CDC 211 DISPLAYS

1. The PGP user shall have the capability of directing the PGP to output CDC 211 display data to the line printer for hardcopy or to magnetic tape for GDP data transfer.
 - a. The user shall have the capability of directing the hardcopy of magnetic tape construction of any or all CDC 211 CRT display formats.
 - b. The user shall have the capability to direct the time interval of the output data to include all or a selected portion of the total simulation run time.
 - c. The user shall have the capability to request hardcopy output for either the reference data source or the run data source.
 - (1) Hardcopy outputs shall be provided for the data source that is selected by the user at the time of the hardcopy command. For example, consider that the data source is run data, and the user specifies several hardcopy outputs. He may then change the data source to the reference data and specify an additional set of hardcopy outputs. Each desired hardcopy output must be specified for each data source.

7.3 CDC 243 DISPLAYS

1. The PGP shall have the capability of directing the PGP to output CDC 243 display data to magnetic tape which may be processed post-run to provide CALCOMP plots.
 - a. The user shall have the capability of directing magnetic tape construction of all CDC 243 CRT display formats.
 - b. A batch software program shall be provided which shall read and process the magnetic tape to produce the CALCOMP plots.

SECTION 8
MISCELLANEOUS

8.1 PGP DATA BASE

1. The PGP shall contain logic to detect events at which HS are to be output and logic to select the appropriate HS from the HS tables for the ascent, rendezvous, deorbit phases, systems oriented events, and any additional events required for the existing mission phases.
2. The PGP shall provide the capability to input and update the data base from the Hazeltine terminal.
 - a. The data base input format (FMT 131) shall be the input source for the Hazeltine capability.
 - b. Data base inputs to FMT 131 shall be made via the Hazeltine keyboard (includes lower case letters).
 - c. Input to the PGP shall be controlled via the CDC 211 keyboard.
3. The PGP shall provide a tutorial display during initialization that allows the user to verify the contents of the data base switch groups, switch tests, and sequence tests.
4. The PGP shall provide the user a listing of the changes made to the data base. The list shall provide the data of change and identify the locations which change.

8.2 REAL-TIME OPERATIONS

1. It shall be a design goal (dependent upon SPS capabilities) to respond to a "FASTIME" SPS operating mode.

8.3 BATCH OPERATIONS

1. The user commands that are defined for interactive operations shall be executable in the batch operations.
 - a. Batch operations shall be controlled by punch card inputs which shall be of the same format as the Keystroke Commands from the CDC 211.
 - b. Display commands shall be interpreted as print commands during batch operations.
 - c. The capability shall be provided for the user to specify the entire time period or portions of the entire time period to be printed for the requested display.

SECTION 9

REFERENCES

1. Crew Procedures Development Techniques, Procedures Generation Program Requirements Document, MDC E1006, dated 31 January 1974.