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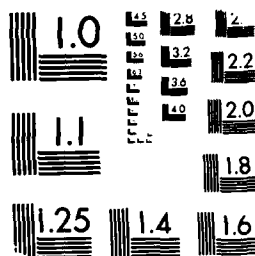
NEW YORK TRACON DEMONSTRATION OF PROGRAM RECODING
REQUIREMENTS ANALYSIS DOCUMENT(U) DATA TRANSFORMATION
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AD-A189 862

New York TRACON Demonstration of Program Recoding Requirements Analysis Document

Data Transformation Corporation
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August 1987

Final Report

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16. Abstract This document is an intermediate deliverable in a project whose objective was to convert portions of the current New York (N.Y.) TRACON software written in ULTRA to a higher order transportable language. A combination of ADA/PDL leading to PASCAL as the higher order language was chosen. The document consists of four main parts: (1) a detailed analysis of the N.Y. TRACON demonstration project software requirements for software version A5.04; (2) a description of the demonstration system architecture, in contrast with the current N.Y. TRACON hardware; (3) a description and rationale for the demonstration system operational software architecture; and (4) a data dictionary of the current system. The output of this document led to the next step which was the actual writing of the new software.					
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Preface

The New York TRACON Demonstration Requirements Analysis is on library TCDRA002.DEV.SCRIPT; the outline is called OUTLINE.

The first revision is January 14, 1987. The following changes are reflected:

- Retrack passes all interfacility messages (both input and output) to the interfacility task. The filtering of messages to process and matching of TCIDs for AM and CX messages will be performed within the interfacility task.
- Retrack will fabricate Start Track messages when processing Tracking Data messages that contain a valid ACID and none is stored for that track. This will allow the demonstration system to display full data blocks for tracks where the interfacility flight plan data was not replayed from the CDR file (because it was on the previous file).
- In CDR conversion, octal digits that will be preserved (message codes and beacon codes) will be translated to EBCDIC. for ease of use by TRACON programs. An octal to real conversion was also added. The CDR conversion rationale and package was added to the architecture section.
- The following keyboard commands are also not being recoded: ATIS, altitude filter limits, and relocating tabular lists.
- The CDR Editor will run under VM.

The second revision is May 29, 1987. The following changes are reflected:

- PSRAP sends the input sector time and target report messages to CDR extraction.
- Retrack initiates processing using either the Data Buffer Header record or the CDR Initialization record is read, whichever occurs first.
- Retrack fabricates a flight data entry keyboard entry based on the information in the Tracking Data message.
- Retrack passes interfacility FP messages to the interfacility task when the matching DA is encountered. Subsequent AM and CX messages for these flights are also sent to interfacility. All other interfacility messages are discarded and are not placed on the CDR File.
- The software architecture has been updated to reflect the system implementation in the following areas:

Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

1

SECURITY
EXCLUDED

- Send and Receive interface
- Monitor Packages
- Load Modules
- Subtask Communication
- Primary Storage Management
- Software Clock Management

Index

1.0 Introduction and Scope	3
2.0 Applicable Documents	4
3.0 Software Requirements	5
3.1 ICD En Route CCC/NY TRACON	9
3.2 System Description and Specification Series	12
3.3 Multiprocessor Executive	23
3.4 Retrack	35
3.5 SRAP Processing	50
3.6 Target Processing (Tracking) and ISL (Inter-sensor Linker)	53
3.7 Keyboard Processing	61
3.8 Display Output Processing	83
3.9 Interfacility Data Transfer	107
3.10 Bulk Store Flight Plans	112
3.11 Non-Executive Error, Status and Input Messages	113
3.12 Site Adaptation	114
3.13 MSAW and Altitude Tracking	120
3.14 Non-Executive Console Teletype Input Processing & On-Call Tasks	121
3.15 Builderz/BUP & CDR Editor	122
3.16 Recovery	126
3.17 Continuous Data Recording Processing	127
3.18 Remote Display Processing	131
3.19 Support Software	132
3.20 Conflict Alert Adaptation Standards & Guidelines, ...	135
3.21 CDR Tape Conversion (from Sperry to IBM Format)	136
4.0 System Architecture	139

5.0	Software Architecture	142
5.1	Operational Software Architecture Description and Rationale	142
5.2	Operational Software Architecture Definitions and Rules	150
A.0	New York TRACON A5.04 Data Dictionary	178

EXECUTIVE SUMMARY

This document is an intermediate deliverable in a project whose objective was to convert portions of the current New York (N.Y.) TRACON software written in ULTRA to a higher order transportable language. A combination of ADA/PDL leading to PASCAL as the higher order language was chosen. The document consists of four main parts: (1) a detailed analysis of the N.Y. TRACON demonstration project software requirements for software version A5.04; (2) a description of the demonstration system architecture, in contrast with the current N.Y. TRACON hardware; (3) a description and rationale for the demonstration system operational software architecture; and (4) a data dictionary of the current system. The output of this document led to the next step which was the actual writing of the new software.

1.0 Introduction and Scope

This document consists of four parts: a detailed analysis of the New York TRACON demonstration software requirements, based on the ARTS IIIA computer program functional specifications (NAS MDs) for version A5.04; a description of the demonstration system architecture, in contrast with the current New York TRACON system architecture; a description and rationale for the demonstration system operational software architecture and the formal definitions and rules for the proposed architecture; and an appendix containing a data dictionary of the current system.

The bulk of the document contains the software requirements. They are organized by NAS MD. Each section contains an introductory paragraph, the analysis by NAS MD subsection, and a discussion of additional capabilities, if there are any. If a subsection contains a functional capability that is being converted from ULTRA to Pascal/VS, it is identified under the heading "Recoded" with a "Yes"; if the function is not a software function, or is being replaced by commercial software, or is not being considered for the demonstration, or contains administrative information only, and so on, it is identified under the "Recoded" heading with a "No." In either case, the rationale is included. Concluding the software requirements section is a section describing our approach to converting the CDR input file from Sperry-UNIVAC format to IBM S/370 format.

2.0 Applicable Documents

The following documents were used during requirements analysis: the NY TRACON Computer Program Functional Specifications (CPFS), contained in a series of nineteen volumes, the Retrack User's Guide, User's Manual for ATC Support Software (NASP-3202-01), and three volumes of the NY TRACON Coding Specifications.

The CPFS documents in the series are the following:

NAS-MD	TITLE
631	NAS En Route Stage A - NY TRACON
634	System Description and Specified Series
635	Executive Control
636	Parallel SRAP Processing
637	Target Processing (Tracking) and ISL
638	Keyboard Input Processing
639	Display Output Processing
640	Interfacility Data Transfer
641	Bulk Store Flight Plan
642	CDT Non-Executive Error and Status Messages
643	Site Adaptation
644	MSAW and Altitude Tracking
645	Non-Executive Console Teletype Processing and On Call Tasks
646	Builder - BUP and CDR Editor
647	Recovery
648	Continuous Data Recording
649	Remote Display Processing
650	Support Software
650A	Support Software Ultra Assembler
650B	Support Software Librarian
650C	Support Software Loader
650D	Support Software Utilities
650E	Support Software COMIOP
651	Conflict Alert

3.0 Software Requirements

This section outlines the major functions that will be developed for the New York TRACON demonstration. A detailed requirements analysis for each NAS-MD is included in the sections that follow.

Major Functions

The following functions are being implemented and will be traceable to the current New York TRACON code:

- Retrack
- Keyboard Operational Functions (for supported messages)
- PSRAP
- Tracking
- Data Base (for supported functions)
- CDR Editor
- Interfacility

The following functions are being implemented but are not traceable to the current New York TRACON code:

- Continuous Data Recording Extractor
- Executive Services Request Module (our implementation uses MVS/RTX and not MPE)
- Display Output (to work with the situation display)
- Test Tools (to support the build plan)
- SDL software (for custom panel support for New York TRACON)
- CDR tape conversion program (to convert the CDR tape to S/370 format and place it on a disk data set)

The following major functions are not being implemented in the New York TRACON demonstration:

- Console Data Terminal Processing

- ETG and ETG scenario generator
- On-call programs
- Keyboard Input Processing (KIP)
- Advanced Tracking (conflict alert, altitude tracking, and MSAW)
- Interfacility (Responses and ARTCC Interface)

In addition, the following functions are not being provided:

- alarm processing
- weather processing
- critical data recording and recovery processing
- bulk store FP processing
- dynamic altering of CDR categories
- consolidation of sectors
- SRAP performance monitoring
- SWABS processing
- the following multifunction keyboard commands
 - C - Configuration
 - D - Display
 - E - Emergency
 - G - BRATS
 - I - Mag Tape/Disc FP
 - K - Reinitialize Display
 - O - Auto Offset
 - Q - MSAW (Display Inhibit)
 - R - Memory Readout
 - V - MSAW (Enable/Disable)

- X - SWAB3
- 1 - CDR Extractor
- 2 - Manual Reconf
- remote tower display processing
- handoff

Detailed Functions and Operational Concepts

The demonstration system will be run under MVS/RTX on an IBM S/370 architecture processor. The system will appear as an MVS/RTX batch job. There will be no inputs allowed during the run. There will be an interactive job (and an interactive terminal attached to that job) ready to be initiated to execute the CDR Editor at the completion of the run.

We will convert the FAA-provided CDR tape from 7-track to 9-track format at the Tech Center. Prior to executing the online system, the FAA-provided CDR tape (in 9-track format) will be converted to S/370 format and stored in a disk data set (see section 3.21 for details on the conversion program) by an offline program.

An executive control program will be implemented, that uses MVS/RTX, to provide application services previously provided by the Multiprocessor Executive (MPE).

Control will pass to Retrack, which will drive the operational system. (See section 3.4 for the requirements analysis for Retrack.) The converted CDR data set will be read by Retrack. The Retrack program will be coded to process tracking data, keyboard data, Radar only Target reports, sector time, CDR termination, interfacility messages, target reports, and data buffer headers. Retrack will pass this input data to PSRAP, keyboard and interfacility for application processing.

The tracking programs will be recoded to provide a traceable functional equivalence with the current New York TRACON algorithms. These programs read the data provided by Retrack and perform tracking for multiple sensors, generating entries in the Central Track Store (CTS) and sending the appropriate data to the display output programs. (The demonstration will display data for only a single controller position.) (See section 3.6 for the requirements analysis for tracking.)

The keyboard operation functions (KOF) programs will be recoded to provide a traceable functional equivalence with the current New York TRACON implementation, for the supported commands. (See section 3.7 for the requirements analysis for keyboard.) These programs read the data provided by Retrack, process the messages, and send the required information to Tracking and Display for further processing.

The display output programs will be coded to support the situation display. The functions performed will be equivalent to the current functions, but, because of the difference in the display hardware interface, functional traceability will not be maintained. (See section 3.8 for the requirements analysis for display output.) The programs that support the remote displays will not be recoded.

The interfacility function will process FP, AM, and CX messages, so that an operational flight plan data base can be maintained. The remaining interfacility messages will not be processed. No interfacility output messages will be generated and the ARTCC interface will not be supported (see Section 3.9). However, the ARTCC Aircraft ID/TRACON Terminal Computer ID relationship will be maintained to process subsequent (AM and CX) messages. The interfacility input programs will pass its data to tracking.

The CDR extractor will be recoded to provide information for the CDR Editor. The points at which the extraction is performed will remain the same as the current NY TRACON system, for the functions recoded. However, the data formats will change to support the following interfaces:

- CDR extractor and PSRAP
- CDR extractor and tracking
- CDR extractor and keyboard
- CDR extractor and display
- CDR extractor and CDR editor

The CDR extractor will produce a data set which resides on an IBM 3380 disk data set. (See section 3.17 for the requirements analysis for CDR extraction.)

CDR Editor will be recoded to produce a listing that will verify the functional equivalence between the GFE system and the demonstration system, for the functions we are recoding in the operational program. The listing produced by the recoded CDR Editor will be identical to that produced by the current editor, for the functions that are supported in the operational recoding. (See section 3.15 for the requirements analysis for the CDR Editor.)

3.1 ICD En Route CCC/NY TRACON

This document (NAS-MD-631) describes the interface between the NAS En Route Stage A Central Computer Complex and the NY TRACON facility. Details of the hardware, software, and operational elements are provided.

Sub-section	Title	Recoded
1.0	INTRODUCTION	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recoded
2.0	TRANSMISSION CHARACTERISTICS	No
	This section describes the ARTCC hardware interface and, as such, contains no demonstrable functions.	

Sub-section	Title	Recoded
3.0	REQUIREMENTS AND FUNCTIONAL CAPABILITIES	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
3.1	Functions	No
	This section provides an overview of the functions performed by the operational interface. Aside from this information, this section contains no demonstrable functions.	

Sub-section	Title	Recorded
3.2	Model A3d2/NY TRACON Interface	No
	This section provides an overview of the Model A3d2/NY TRACON Interface. This section contains no demonstrable functions.	

Sub-section	Title	Recorded
4.0	MESSAGES	Yes
	The following input messages are supported: Flight Plan (FP) Amendment (AM) Cancellation (CX) No other messages are supported. Refer to Section 3.9 of this document for the rationale.	

Sub-section	Title	Recoded
5.0	SUPERVISORY CONTROLS	No
	This function is not required by the FAA and is not required to maintain an integral system. Interfacility will always be enabled. Refer to Section 3.9 of this document for the rationale.	

Sub-section	Title	Recoded
6.0	REFERENCES	No
	This section is administrative and contains no demonstrable functions.	

3.2 System Description and Specification Series

This document (NAS-MD-634) contains the ARTS System Description, Program Organization and presents an overview of the NY TRACON Computer Program Functional Specifications (CPFS) series.

Sub-section	Title	Recoded
1.0	INTRODUCTION	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recoded
2.0	SYSTEM DESCRIPTION	No
	This section is administrative and contains no demonstrable functions.	
	Note also that this section describes hardware components.	

Sub-section	Title	Recoded
2.1	System Organization	No
	This section provides an overview of the following sections and, as such, contains no demonstrable functions.	

Sub-section	Title	Recoded
2.1.1	Data Processing Subsystem	No
	The IBM central processor and software operating systems MVS and RTX comprise the Data Processing system.	

Sub-section	Title	Recoded
2.1.2	Sensor Receiver and Processor	No
	This section describes the hardware components of the SRAP. We are not using the SRAP, since all SRAP inputs have been recorded on the CDR input tape that is read by Retrack.	

Sub-section	Title	Recoded
2.1.3	Data Entry and Display Subsystem	No
	This section describes the input and output devices at the controller workstations.	
	There will be no input capability from the data entry sets, because all inputs have been recorded on the CDR tape after KIP processing.	
	The situation display will function as the output device for controller displays.	

Sub-section	Title	Recorded
2.1.4	Continuous Data Recording Subsystem	No
	Continuous Data Recording will be performed on the IBM processor.	
	There will be no critical data recording. This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recorded
2.1.5	Remote Displays	No
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recorded
3.0	OPERATIONAL PROGRAM	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recoded
3.1	Program Organization	No
	This section provides the major program modules, or subprograms, and the CPFS that describes them. Aside from this information, this section contains no demonstrable functions.	

Sub-section	Title	Recoded
3.1.1	Multiprocessor Executive	No
	Refer to Section 3.3 of this document for the rationale.	

Sub-section	Title	Recoded
3.1.2	SRAP Input Processing	Yes
	Refer to Section 3.5 of this document for the rationale.	

Sub-section	Title	Recorded
3.1.3	Radar/Beacon Tracking Module	Yes
	Refer to Section 3.6 of this document for the rationale.	

Sub-section	Title	Recorded
3.1.4	Keyboard Input Module	Yes
	Refer to Section 3.7 of this document for the rationale.	

Sub-section	Title	Recorded
3.1.5	Interfacility Input/Output	Yes
	Refer to Section 3.9 of this document for the rationale.	

Sub-section	Title	Recorded
3.1.6	Bulk Store Flight Plan Input Module	No
	Refer to Section 3.10 of this document for the rationale.	
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recorded
3.1.7	Display Output Module	Yes
	Refer to Section 3.8 of this document for the rationale.	

Sub-section	Title	Recorded
3.1.8	Automatic Format Offset Module	Yes
	Refer to Section 3.8 of this document for the rationale.	

Sub-section	Title	Recorded
3.1.9	Minimum Safe Altitude Warning (MSAW)	No
	Refer to Section 3.13 of this document for the rationale.	
	This is a priority 2 function and is not required to maintain an integral system.	

Sub-section	Title	Recorded
3.1.10	Continuous Data Recording	Yes
	Refer to Section 3.17 of this document for the rationale.	

Sub-section	Title	Recorded
3.1.11	Recovery Program	No
	Refer to Section 3.16 of this document for the rationale.	
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recoded
3.1.12	On Call Programs	No
	Refer to Section 3.14 of this document for the rationale.	
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recoded
3.1.13	RBTL Operational Functions	No
	Refer to Section 3.16 of this document for the rationale.	
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recoded
3.1.13.1	Full RBTL Operational Function	No
	Refer to Section 3.16 of this document for the rationale.	
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recorded
3.1.13.2	First Level Backup RBTL Operational Function	No
	Refer to Section 3.16 of this document for the rationale.	
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recorded
3.1.13.3	Second Level Backup RBTL Operational Function	No
	Refer to Section 3.16 of this document for the rationale.	
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recorded
3.1.14	Conflict Alert (CA) Module	No
	Refer to Section 3.20 of this document for the rationale.	
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recoded
4.0	ORGANIZATION OF THE CPFS	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recoded
5.0	GLOSSARY OF TERMS	No
	This section provides technical content but contains no demonstrable functions.	

Sub-section	Title	Recoded
6.0	ACRONYMS AND ABBREVIATIONS	No
	This section provides technical content but contains no demonstrable functions.	

Sub-section	Title	Recorded
7.0	ADDITIONAL REFERENCE DOCUMENTS	No
	This section is administrative and contains no demonstrable functions.	

3.3 Multiprocessor Executive

This document (NAS-MD-635) specifies the functional requirements for the Multiprocessor Executive (MPE).

The functions performed by the MPE in the NY TRACON system are performed in the demonstration system by MVS/RTX or are not part of the TRACON Recode project. This section will map categories of MPE work to MVS/RTX services and identify those that will not be re-implemented.

Critical Data Recording and the Recovery Sequence that uses the Critical Data will not be recoded. The equivalent of a scatter interrupt will not exist on the demonstration system.

The initializer module used during preset operation will not be recoded. Offline builds of the load modules to be executed under MVS/RTX will be performed. Task set up will be performed as part of the initialization of the RTX system.

The NY TRACON normal mode MPE services are :

- 1) Interrupt Control
- 2) Scheduler
- 3) Executive Service Request Module
- 4) Debug Module

Interrupt Control processes the following categories of interrupts:

- Interprocessor - Since the recode is on a uniprocessor, interrupts of this type will not occur.
- Executive Controlled I/O interrupts. I/O processing is handled by MVS standard access methods. Included in the Job Control Language that is used to setup the RTX job, will be information about input and output files. MVS will use this information to set up control blocks that describe the characteristics of the files. Pascal/VS will use the control blocks to generate calls to the proper MVS access methods.

The MPE scheduler schedules planned tasks and popup tasks. Planned tasks are scheduled through a lattice which imbeds strict predecessor/successor rules. RTX will schedule a subtask when a Work Request is sent to the subtask from another subtask. Subtask successor rules for each type of work will be imbedded in the logic of the subtask. The execution sequence within a subtask is determined by logic within the subtask.

Popup tasks are aperiodic and are executed on the basis of an associated real time value. RTX time queuing will be used when time related scheduling is required.

The Executive Services Module processes ESRs, critical data requests and executive input messages. It also prints recovery variables and provides device handlers.

The recoded system will use MVS standard I/O routines and will not perform critical data processing or print recovery variables. It will not process EX (Executive) Operator messages. Individual ESRs are covered in the following sub-sections.

Sub-section	Title	Recoded
1.0	INTRODUCTION	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recoded
2.0	EXECUTIVE SERVICES MODULE	No
	This section provides technical content but contains no demonstrable functions.	

Sub-section	Title	Recoded
2.1	Device Handlers	No
	This section is a heading for the 2.1.X sections.	
	I/O to the devices that are on the recoded system will be performed by standard access methods under MVS.	

Sub-section	Title	Recoded
2.1.1	Console Data Terminal Control	No
	This is a priority 1 function, but there are no CDTs in the demonstration system. In the NY TRACON system, CDTs were used to interactively display and enter operator messages. In the recoded system, there is no interactivity.	

Sub-section	Title	Recoded
2.1.2	Disc Control	No
	Equivalent Disk I/O functions will be provided by MVS/RTX.	

Sub-section	Title	Recoded
2.1.3	MSP Control	No
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recoded
2.1.4	MTS Control	No
	Equivalent Tape I/O functions will be provided by MVS/RTX.	

Sub-section	Title	Recorded
2.1.5	CMC Control	No
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recorded
2.2	Executive Input Messages	No
	This function is not required by the FAA and is not required to maintain an integral system.	
	Executive (EX) operator messages will not be processed during the demonstration. These messages include scheduling popups (via the CDT), scatter interrupts (which initiated a recovery sequence), diagnostic loading requests (capability to load diagnostic programs), Print Resources and Print Switches, Peripheral Status Down/Up (redefine status of peripheral devices), Task/Ancillary Message (allows operator to send message to on-call program), Select Designated Backup Level Program, Switch CDT Messages, Select Alternate MSP Channel, Select Alternate DCU Channel, CMC Related EX Messages, CDT Related Input Messages, and Wait for Input Command. The above commands relate to NY IRACON specific hardware, recovery processes or MPE scheduling of tasks. None of these functions will be recorded on the demonstration system.	

Sub-section	Title	Recorded
2.3	Executive Service Request	No
	This section provides technical content but contains no demonstrable functions. Executive Services in NY TRACON allow tasks to request operating system services. In the demonstration system, since it is recorded in Pascal/VS with a modern operating system, the language processor will generate I/O access method calls on behalf of the user. Application code will contain GETs and PUTs rather than an Executive Service request. Scheduling ESRs will be replaced by calls to the SEND/RECEIVE application services. For a description see Additional Capabilities section.	

Sub-section	Title	Recorded
2.3.1	Input/Output ESRs	No
	An equivalent function is being provided by a standard MVS access method.	

Sub-section	Title	Recorded
2.3.2	Indirect ESR Request	No
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recorded
2.3.3	Clear Arithmetic Overflow Designator No	
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recorded
2.3.4	Scheduling BSRs	No
	An equivalent function is being provided by RTX scheduling services invoked by SEND and RECEIVE application services.	

Sub-section	Title	Recorded
2.3.5	Debug - Snap Dump	No
	An equivalent function is being provided by RTX Probe and Debug services.	

Sub-section	Title	Recorded
2.3.6	Request System Resources	No
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recorded
2.3.7	Critical Data ESRs	No
	This function is not required by the FAA and is not required to maintain an integral system. The demonstration system will not include recovery mechanisms.	

Sub-section	Title	Recorded
2.3.8	Device Oriented ESRs	No
	An equivalent function is being provided by standard MVS access methods. Refer to Section 2.3 of this document for the rationale.	

Sub-section	Title	Recorded
2.3.9.1	Request Data (ESDATA)	NO
	This function is not required by the FAA and is not required to maintain an integral system. In the MPE system, this ESR allows a task to read or write the contents of any memory location in the system. It is used to access an area of memory that the task cannot access directly. In the demonstration system, if a task cannot directly access a variable that it requires, it will send a request to the task that owns the data and the owning task will return the requested data.	

Sub-section	Title	Recorded
2.3.9.2	System Scatter Interrupt (ESSCAT)	No
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recorded
2.3.9.3	Call Auxiliary (ESCALL)	No
	This function is not required by the FAA and is not required to maintain an integral system. General programs will not be recorded for the demonstration system.	

Sub-section	Title	Recorded
2.3.9.4	Exit (ESEXIT)	No
	An equivalent function is being provided by MVS/RIX and Pascal/VS.	
	An ESEXIT is used by a task to indicate that it has completed processing. In the demonstration system, the Pascal/VS support system will generate the program exit at the completion of execution.	

Sub-section	Title	Recorded
2.3.9.5	Switch CDT Messages (ESSIM)	No
	This function is not required by the FAA and is not required to maintain an integral system. The recorded system does not contain any CDT's.	

Sub-section	Title	Recorded
2.3.10	CMC Related ESRs	No
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Recorded
3.0	INITIALIZER MODULE	No
	An equivalent function is being provided by MVS/RIX initialization. The MPE Initializer module initialized processor hardware, initialized MPE software, and passed control to task specified program routine. MVS/RIX will perform these services as part of normal job initiation under RIX.	

Sub-section	Title	Recorded
4.0	SCHEDULER MODULE	No
	This section provides technical content but contains no demonstrable functions.	
	Refer to the Overview of the Multiprocessor Executive which appears at the beginning of Section 3.3 for the rationale.	

Sub-section	Title	Recorded
4.1	Popup Scheduler	No
	An equivalent function is being provided by RTX Time Scheduling.	
	Refer to the Overview of the Multiprocessor Executive which appears at the beginning of Section 3.3 for the rationale.	

Sub-section	Title	Recorded
4.2	Planned Scheduler	No
	An equivalent function is being provided by the RTX Scheduler.	
	Refer to the Overview of the Multiprocessor Executive which appears at the beginning of Section 3.3 for the rationale.	

Sub-section	Title	Recorded
4.3	Executive Time Check Routine	No
	An equivalent function is being provided by Timing Control executive service. This routine checks each processor's time to determine if it has been away from the Executive longer than the allotted time or has been in the Executive longer than the allotted time. In the demonstration system, Timing Control will verify that a subtask is not executing an unacceptable length of time. See Additional Capabilities below.	

Sub-section	Title	Recorded
5.0	INTERRUPT CONTROL MODULE	No
	An equivalent function is being provided by MVS/RTX Interrupt Processing. In the MPE system, the Interrupt Control Module processes operational and error interrupts. In the demonstration system, processor and peripheral communication (operational interrupts) will be fielded by MVS; error interrupts of a software nature (program checks) will be fielded by MVS/RTX; hardware interrupts will be fielded by MVS.	

Sub-section	Title	Recorded
6.0	DEBUG MODULE	No
	An equivalent function is being provided by RTX Debugging aids. The MPE Debug module allows setting and releasing of software breakpoints, timing of task execution, snap dumps, history function, automatic restart, etc. In the demonstration, no recovery capabilities will be provided. Program debugging during development will be performed by calls to RTX SNAP and TRACE routines.	

Additional Capabilities	
SEND/RECEIVE will be an application service that provides intertask communication. These services will be used by subtasks to pass data and buffers between subtasks and to request services from other subtasks. Timing Control will be an application service that periodically determines if processing deadlines are being met. It also passes system time for output to the display at a predetermined interval. Initialization/Termination will be an application service that prepares each subtask for execution at system initialization and terminates processing of all subtasks at system termination.	

3.4 Retrack

Retrack is a program that, through use of CDR tape, acts as a load tester and driver for the New York TRACON environment. For the NYTRACON demonstration program, RETRACK will act as a driver only. In the New York IPACON environment RETRACK is an off-line program which uses the backup IOPB to drive the operational system during non-operational periods. The NYTRACON program for the demonstration will be an integral part of the operational program.

The demonstration RETRACK will make use of the same CDR file that the original RETRACK uses; however, not all of the messages will be processed by RETRACK or the operational program. The messages that are not processed will be discarded.

The demonstration RETRACK will be written in PASCAL/VS. The data used will be read from a disk containing CDR data which has been converted to IBM format by an off-line program (see Section 3.21).

Sub-section	Title	Recorded
1.0	INTRODUCTION	NO
	This section contains general information on RETRACK, and contains no demonstrable functions.	

Sub-section	Title	Recorded
1.1	Purpose	NO
	This section contains general information on RETRACK, and contains no demonstrable functions.	

Sub-section	Title	Recorded
1.2	Scope	NO
	This section contains general information on RETRACK, and contains no demonstrable functions.	

Sub-section	Title	Recorded
1.3	Background	NO
	This section contains general information on RETRACK, and contains no demonstrable functions.	

Sub-section	Title	Recorded
1.4	Environment	NO
	Runs as part of the operational system as an MVS/RTX task. Input is from disk.	

Sub-section	Title	Recorded
1.5	Program Description	NO
	This section contains a general description of RETRACK, but contains no demonstrable functions. The demonstration Retrack will be an integral part of the operational system, not an independent program. Enhanced Target Generation will not be incorporated into the demonstration RETRACK. Input data will come from a single source. Refer to section 2.3.1, below. Input data will consist of all information on CDR tapes. Refer to section 3.0, below. The options of the New York TRACON RETRACK will not be incorporated in the demonstration RETRACK. If the data that is sent by RETRACK is not used by the demonstration operational program as it would have been by the New York TRACON program, the receiving task will discard the data.	

Sub-section	Title	Recorded
2.0	PROGRAM OPTIONS	NO
	This section contains general information, and contains no demonstrable functions.	

Sub-section	Title	Recoded
2.1	Assembly Options	NO
	This section contains general information, and contains no demonstrable functions.	

Sub-section	Title	Recoded
2.1.1	Message Processing Inhibits	NO
	This is a New York TRACON assembly option. The demonstration RETRACK will not inhibit CDR message types or subtypes. All messages will be read from the disk. The messages which are ignored by the New York TRACON RETRACK will also be ignored by the demonstration RETRACK. Those messages which are processed by the New York TRACON RETRACK, will also be processed by the demonstration RETRACK. Keyboard messages will not be inhibited by the demonstration RETRACK.	

Sub-section	Title	Recoded
2.1.2	Process Non-Standard Formats	NO
	RETRACK will be coded to accept standard NYTRACON formatted data only.	

Sub-section	Title	Recorded
2.1.3	System/Site Adaptation Parameters	NO
	System parameters used will be unique to the demonstration program. RETRACK Ultra program parameters will not be used.	

Sub-section	Title	Recorded
2.2	Program Startup Options	NO
	These options will not apply to the demonstration program	

Sub-section	Title	Recorded
2.2.1	Force Operational System Into Training Mode	NO
	This option will not apply to the demonstration program	

Sub-section	Title	Recorded
2.2.2	Select Input Sensors	NO
	The four New York TRACON sensors will be processed by the demonstration program. The selection option will not apply.	

Sub-section	Title	Encoded
2.3	Runtime Options	NO
	These options are system specific to UNIVAC hardware. They are not required for the demonstration.	

Sub-section	Title	Encoded
2.3.1	Select Input Media	NO
	Input data will come from an IBM formatted disk containing the CDR data which has been converted to IBM format.	

Sub-section	Title	Encoded
2.3.2	Select Replay Initiation	NO
	This is a UNIVAC hardware specific option. Startup times may be entered in to New York TRACON RETRACK program to invoke the processing of the RETRACK program. The demonstration RETRACK will startup on command from the user not from startup input.	

Sub-section	Title	Recorded
2.3.3	Enable/Disable Interfacility Data Processing	NO
	In the New York TRACON RETRACK, this is a hardware controlled option. For the demonstration RETRACK the option of inhibiting interfacility messages will not apply. RETRACK has the capability to playback interfacility messages when processing non-flight interfacility messages such as AM and CX. The current RETRACK checks to make sure a flight plan has been received and acknowledged first, then it processes the non-flight interfacility messages. The demonstration RETRACK will also have this capability. The demonstration RETRACK will also have the capability to process interfacility flight plan messages.	

Sub-section	Title	Recorded
3.0	INPUTS AND INPUT DATA FORMATS	YES
	Data Buffer Header	
	CDR Initialization	
	CDR Termination	
	Data Delete/Resume *	
	Data Loss *	
	Memory Dump *	
	Sector Time	
	Target Report	
	Tracking Data	
	Keyboard Entry	
	Automatic Function *	
	Interfacility Data	
	MSAW ALARM message *	
	Altitude Tracking message *	
	MSAW DISPLAY message *	
	CTS DATA message *	
	Radar Only Target Report	
	Radar Data Loss *	
	CA Linear message *	
	CA MFMAMS message *	
	CA PROXIMITY message *	
	* are discarded messages	

Sub-section	Title	Recorded
4.0	RETRACK OUTPUTS/OUTPUT DATA FORMATS	YES
	1) Sector Time Messages 2) Beacon/Radar Reinforced Beacon Target Messages 3) Radar only Target Report Messages 4) Display Keyboard Messages 5) Interfacility Input Messages Note: Only the following messages will be fabricated: Keyboard flight data message for CDR input tracking data for which there is no current flight plan.	

Sub-section	Title	Recorded
4.1	SRAP Message Formats	YES
	Only those that are applicable to the NYTRACON program will be included. (parallel SRAP message formats)	

Sub-section	Title	Recorded
4.1.1	Tampa/Sarasota Serial SRAP Message Formats	NO
	These message formats do not apply to the demonstration program.	

Sub-section	Title	Recorded
4.1.2	ARIS IIIA/NEW YORK TRACON Parallel SRAP Message Formats	YES
	These message formats do apply to the demonstration program.	

Sub-section	Title	Recorded
4.1.2.1	Beacon/Radar Reinforced Beacon Message Formats	YES
	These message formats do apply to the demonstration program.	

Sub-section	Title	Recorded
4.1.2.2	Radar Only Message Formats	YES
	These message formats do apply to the demonstration program.	

Sub-section	Title	Recorded
4.1.2.3	Weather Map Formats	NO
	These message formats do not apply to the demonstration program.	

Sub-section	Title	Recorded
4.1.2.4	Sector Mark Formats	YES
	These message formats do apply to the demonstration program.	

Sub-section	Title	Recorded
4.2	Common Digitizer (CD) MSG Formats	NO
	Not applicable to NYTRACON RETRACK.	

Sub-section	Title	Recorded
4.3	Display Keyboard Message Formats	YES
	All keyboard messages with no errors that are read from the CDR data will be processed and sent to keyboard processing. Keyboard messages in error will be logged to a designated log file.	

Sub-section	Title	Recorded
4.4	Interfacility Message Formats	YES
	RETRACK will read all interfacility messages, but will only send FP, CX, and AM messages to the demonstration interfacility module. The FP message must have a matching DA sent to the ARTCC to be sent to interfacility. All other messages will be discarded.	

Sub-section	Title	Recorded
5.0	SYSTEM INITIALIZATION AND CONTROL	NO
	This section contains information describing hardware options, as well as interactive run time options. The assembly and run time options will be incorporated into the core resident RETRACK program.	

Sub-section	Title	Recorded
5.1	RFDU	NO
	This is hardware related to UNIVAC, and is replaced by IBM/370 environment	

Sub-section	Title	Recorded
5.2	Disk Subsystem Initialization	NO
	This is hardware related to UNIVAC, and is replaced by IBM/370 environment.	

Sub-section	Title	Recorded
5.3	VIC Tape Subsystem Initialization	NO
	This is hardware related to UNIVAC, and is replaced by IBM/370 environment.	

Sub-section	Title	Recorded
5.4	IMT Initialization	NO
	This is hardware related to UNIVAC, and is replaced by IBM/370 environment.	

Sub-section	Title	Recorded
5.5	IOPB Initialization	NO
	This is hardware related to UNIVAC, and is replaced by IBM/370 environment.	

Sub-section	Title	Recorded
5.6	System Startup	NO
	This will not be hardware oriented to the extent discussed in this section. the MVS/RTX environment will provide startup.	

Sub-section	Title	Recorded
5.7	Select Runtime Options	NO
	The options specified in the RETRACK USER'S MANUAL are oriented to the New York TRACON RETRACK program only. Run time options for the demonstration RETRACK will be defined by the operating system of which RETRACK will be a subfunction.	

Sub-section	Title	Recorded
APPENDIX A	Message Type Selection Options	YES
	These equates are required to maintain an integral system.	

Sub-section	Title	Recorded
APPENDIX B	CDR System Parameter Options	YES
	Only those equates specific to NYTRACON will be included.	

Sub-section	Title	Recorded
APPENDIX C	OPS Description Parameters	YES
	Only those equates specific to NYTRACON will be included	

Sub-section	Title	Recorded
APPENDIX D	RETRACK Assembly Runstream	NO
	These values will be incorporated into the demonstration RETRACK, but will not be considered as a 'runstream.'	

Additional Capabilities		
There will be no additional capabilities provided for the demonstration.		

3.5 SRAP Processing

This document elaborates on the recoding specifications for Parallel SRAP processing. The sections are derived from NAS-MD-636.

PSRAP receives the radar reports, beacon reports and radar reinforced beacon reports, along with sector time messages, from RETRACK. It then puts them into the formats needed by TRACKING.

PSRAP will not do any hardware related SRAP functions, such as SRAP hardware initialization, performance monitoring, alternate SRAP selection and SRAP Confidence test. It will not process SRAP alarm messages.

Sub-section	Title	Recoded
1.0	INTRODUCTION	No
	This section provides an introduction to the following subsections and, as such, contains no demonstrable functions.	

Sub-section	Title	Recoded
2.0	SRAP INITIALIZATION	Yes
	Only the following SRAP Initialization functions will be implemented: Scan Time Initialization, Sector Mark Table Initialization, and Input Buffer Initialization.	

Sub-section	Title	Recoded
3.0	SRAP MESSAGE PROCESSING	No
	This section provides an introduction to the following subsections and, as such, contains no demonstrable functions.	

Sub-section	Title	Recorded
3.1	BEACON REPORT PROCESSING	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.2	RADAR REPORT PROCESSING	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.3	SECTOR MARK PROCESSING	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.4	ALARM MESSAGE PROCESSING	No
	The alarm processing function is not being provided as stated in Section 3.0: Software Requirements.	

Sub-section	Title	Recorded
4.0	SRAP PERFORMANCE MONITORING	No
	The SRAP performance monitoring function is not being provided.	

Sub-section	Title	Recorded
5.0	ALTERNATE SRAP SELECTION	No
	Since there is no SRAP performance monitoring, there is no need for the Alternate SRAP Selection function.	

Sub-section	Title	Recorded
6.0	SRAP CONFIDENCE TEST	No
	Since there is no SRAP performance monitoring, there is no need for the SRAP Confidence test function.	

Additional Capabilities		
There will be no additional capabilities provided for the demonstration.		

3.6 Target Processing (Tracking) and ISL (Inter-sensor Linker)

This document (NAS-MD-637) describes the specifications for tracking and inter sensor linker.

Tracking gets its inputs of target reports from PSRAP and flight plans from Interfacility. It also receives keyboard messages to update Tracking data base. The primary function of tracking is to correlate proper tracks with the targets and generate data to be displayed and to be extracted on CDR tape. In cases where correlation is not possible, it creates new tracks in CTS using the information in the target reports. Tracking will not store data for Conflict Alert and MSAW, since those functions are not being recoded.

Tracking algorithms will be completely preserved as they are in the current system.

Inter sensor linker links the associated tracks within one sensor to unassociated tracks in a related sensor.

Sub-section	Title	Recoded
1.0	INTRODUCTION	No
	This section provides an overview of the following subsections and contains no demonstrable functions.	

Sub-section	Title	Recoded
1.1	TRACKING SUBFUNCTIONS	No
	This section provides an overview of the tracking subfunctions and contains no demonstrable functions.	

Sub-section	Title	Recorded
1.2	TRACKING FLOW	No
	This section provides an overview of the tracking flow and contains no demonstrable functions.	

Sub-section	Title	Recorded
2.0	TRACKING CONTROL	Yes
	The tracking control function is a required if the tracking function is to be implemented and consequently is a priority 1 function.	

Sub-section	Title	Recorded
3.0	TRACKED TARGET PROCESSING	No
	This section provides an overview of the following subsections and contains no demonstrable functions.	

Sub-section	Title	Recorded
3.1	CORRELATION	Yes
	This is a priority 1 function.	

Sub-section	Title	Recoded
3.1.1	TRACKING FIRMNESS AND TRACK ORIENTED SMOOTHING	Yes
	This is a priority 1 function.	

Sub-section	Title	Recoded
3.1.2	TRACKING BINS	Yes
	This is a priority 1 function.	

Sub-section	Title	Recoded
3.1.3	PRIMARY/SECONDARY BINS	Yes
	This is a priority 1 function.	

Sub-section	Title	Recoded
3.1.4	CROSS REFERENCING	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.1.5	TARGET SELECTION	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.1.6	PRIMARY/SECONDARY CORRELATION	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.1.7	NORMAL, PARENT AND PARENT TRIAL TRACK CORRELATION	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.1.8	SUSPENDED TRACKS	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.1.9	DEVIATION TRACK CREATION	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.1.10	SECOND PASS PROCESSING	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.1.11	INITIAL CORRELATION	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.1.12	DEVIATION TRACK CORRELATION	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.1.13	TRACK CORRECTION	Yes
	This is a priority 1 function	

Sub-section	Title	Recorded
3.1.14	AUTOMATIC ACQUISITION	Yes
	This is a priority 1 function	

Sub-section	Title	Recorded
3.1.15	STORE CONFLICT ALERT DATA	No
	The Advanced Tracking functions are not being implemented in the NY TRACON program for coding.	

Sub-section	Title	Recorded
3.2	PREDICTION	Yes
	This is a priority 1 function	

Sub-section	Title	Recorded
3.2.1	AUTO-DROP AREA PREDICTIONS	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.2.2	AUTO TRANSFER OF FDR	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.2.3	AUTO ACTIVATION OF AIRCRAFT TYPE	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.2.4	AUTO TRANSFER OF AIRCRAFT TYPE TO BRITE TABULAR LIST	No
	The New York TRACON recode demonstration project will not incorporate a Brite display	

Sub-section	Title	Recorded
4.0	PROCESS UNUSED REPORTS (IPUR)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
5.0	INTER-SENSOR LINKER (ISL)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
6.0	EARLY DISCRETE CORRELATION (EDC)	Yes
	This is a priority 1 function.	

Additional Capabilities		
There will be no additional capabilities provided for the demonstration.		

3.7 Keyboard Processing

This document (NAS-MD-638) describes the specifications for the KEYBOARD module. The KEYBOARD module shall process all completed preview messages. The preview messages' characters shall be interpreted, and the required operation processing shall be initiated. The preview messages shall be received from the RETRACK module. RETRACK shall filter out invalid keyboard messages by looking at the error field in each message, and only sending those messages to the KEYBOARD module which are error free. RETRACK will also send to KEYBOARD flight data messages fabricated from the Tracking Data Messages.

The KEYBOARD module shall receive all error free keyboard messages which are on the CDR tape, but shall only process a subset of them. The following sections elaborate on which functions will be implemented, and which functions will not be implemented.

Sub-section	Title	Recorded
1.0	INTRODUCTION	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
1.1	Components of the Keyboard Input Module	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
1.1.1	Alphanumeric Keyboard	No
	This section provides technical content but contains no demonstrable functions.	

Sub-section	Title	Recorded
1.1.2	Slow Entry Device (SED)	No
	This section provides technical content but contains no demonstrable functions.	

Sub-section	Title	Recorded
1.1.3	Quick Lock Selector Switches	No
	This section provides technical content but contains no demonstrable functions.	

Sub-section	Title	Recorded
1.2	Classification and Validation of Messages	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
1.2.1	Message Categories	No
	This section provides technical content but contains no demonstrable functions.	

Sub-section	Title	Recorded
1.2.2	General Message Validation Criteria	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
1.2.3	Message Entry Error Indications	No
	This section provides technical content but contains no demonstrable functions.	

Sub-section	Title	Recorded
1.2.4	Duplicate ACID'S for Track File Identity	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.0	KEYBOARD OPERATIONAL FUNCTION PROCESSING (KOF)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.1	Inputs	Yes
	This is a priority 1 function.	
	The following functions will be recorded.	
	Initiate Control	
	Track Reposition	
	Track Suspend	
	Terminate Control	
	Flight Data Entry	
	The following functions will not be recorded.	
	Handoff Initiate	
	Interfacility Message Print+ INPRINT	
	Interfacility Test Program Operational	
	Training Target Generator Messages	
	Conflict Alert	
	The following Multifunctions will be recorded.	
	deleted	
	BCN (Beacon)	
	deleted	
	HVYJG (Heavy Jet)	
	deleted	
	MODL (Modify)	
	PREK (Preview)	
	SYSK (System Data)	
	TABG (Tabular List Messages)	
	YSCP (Scratch Pad)	
	The following Multifunctions will not be recorded.	
	ATIS	
	CFGD (Configuration)	
	D*SL (Display)	
	EMGL (Emergency)	
	BRATS (Beacon Reports and Tracking Summary)	
	FLTK (Filter)	
	IUP (Mag-Tape/Disc Flight Plan)	
	KINK (Reinitialize Display)	
	LDRL (Logger)	
	OFFK (Auto-Offset)	
	QMSAW (MSAW Display Inhibit)	
	RDTL (Memory Readout)	
	VMSAW (Enable/Disable MSAW Functions)	
	XBCN (Display Sensor Switching)	
	COR Extractor	
	Manual Reconfiguration	

Sub-section	Title	Recorded
2.1	Inputs (continued)	Yes
	The following Implied Functions will be recorded.	
	Beacon Readout	
	Terminate Control	
	Display/Inhibit Associated Track deleted	
	Abbreviated Flight Data Entry	
	Initiate Control	
	Beacon Code Modify	
	The following Implied Functions will not be recorded.	
	Override Interfacility Display Presentation	
	Handoff Accept/Recall	
	Handoff Initiate	
	Remote Tower Display Keyboard Functions	
	Inhibit Blinking DM	
	When keyboard messages that are not being recorded are encountered, they will be recorded on the CDR file and designated as unprocessed keyboard messages. When fabricated messages are processed, they will be recorded and designated as fabricated keyboard messages.	
Sub-section	Title	Recorded
2.2	Subprogram Description	No
	This section provides technical content but contains no demonstrable functions.	
Sub-section	Title	Recorded
2.2.1	Initiate Control Operational Function (STL)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.2.1.1	Initiate a New Track File	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.2.1.2	Activate an Existing Track File in Central Track Store	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.2.1.3	Enable Automatic Acquisition of an Existing Track File	No
	Automatic acquisition is enabled for all tracks.	

Sub-section	Title	Recorded
2.2.2	Track Reposition Operation Function (RPL)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.2.3	Track Suspend Operational Function (SUL)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.2.4	Terminate Control Operational Function (DPL)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.2.4.1	Terminate a Single Track	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.2.4.2	Terminate All Tracks	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.2.5	Handoff Initiate/Recall/Accept (HDL)	No
	This function is not required to maintain an integral system. Only data applicable to one controller is being processed for this demonstration.	

Sub-section	Title	Recorded
2.2.6	Flight Data Entry (FDL)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.2.6.1	Initiate new track file in CTR with Flight Plan or Store Status	Yes
	This is a priority 1 function	

Sub-section	Title	Recorded
2.2.6.2	Display "DM" for Keyboard Entered Flight Plans	Yes
	This is a priority 1 function	

Sub-section	Title	Recorded
2.2.6.3	Display/Delete Display of Aircraft Type in the Full Data Block	Yes
	This is a priority 1 function	

Sub-section	Title	Recorded
3.0	MULTIFUNCTION (KFK)	Yes
	This section provides technical content but contains no demonstrable function	

Sub-section	Title	Recorded
3.1	AIS Multifunction (AIS)	Yes
	This function is not required to maintain an integral system. AIS will be present for entire demonstration.	

Sub-section	Title	Recorded
3.1.1	Select and Display the HOST ALTIMETER setting, ATIS and GI or unique altimeter settings and unique GI.	No
	This function is not required to maintain an integral system. System data will be preset for entire demonstration.	

Sub-section	Title	Recorded
3.1.2	Enable/Disable Arrival Fix Area(s)	No
	This function is not required to maintain an integral system.	

Sub-section	Title	Recorded
3.2	Beacon Multifunction (BCNK)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.2.1	Beacon Code Readout of a Single Track	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.2.2	Enter or Delete Selected Code in System Data Area.	No
	System data area will not display the selected codes.	

Sub-section	Title	Required
3.3	Configuration Multifunction (CONF)	No
	This function is not required to maintain an integral system. The consolidation/deconsolidation of control positions will be a part of this demonstration. System configuration will be preset for entire demonstration.	

Sub-section	Title	Required
3.4	Display Multifunction (DISP)	No
	This function is not required to maintain an integral system.	

Sub-section	Title	Required
3.5	Emergency Multifunction (EMGL)	No
	This function is not required to maintain an integral system. Emergency main failure drive A indicator will be displayed in the full data block.	

Sub-section	Title	Required
3.6	Filter Multifunction (FILF)	No
	Filtering of the data blocks will be based on preset limits.	

Sub-section	Title	Recorded
3.7	Beacon Reports and Tracking Summary	No
	This function is not required to maintain an integral system. Printed output of data collections via keyboard entry is not a part of this demonstration.	

Sub-section	Title	Recorded
3.8	Heavy Jet Flight Plan Status, site Adapted Alpha, Aircraft Type Multifunction (HVVJG)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.9	Mag-Tape/Disc Flight Plan Multifunction (IFP)	No
	This function is not required to maintain an integral system. Flight plan input from tape or disc is not part of this demonstration.	

Sub-section	Title	Recorded
3.10	F7J is currently undefined	No
	This section is administrative and contains no demonstrable functions. This section provides a place holder.	

Subsection	Title	Required
3.11	Reinitialize Display	N
	This function is not required to maintain an integral system. The reinitialization of previously inhibited display functions will not be implemented for this demonstration.	

Subsection	Title	Required
3.12	Leaver Multifunction (LFML)	N
	Automatic offset is implemented for this demonstration.	

Subsection	Title	Required
3.13	Modify Multifunction (MMFL)	Yes
	This is a priority 1 function.	

Subsection	Title	Required
3.14	Modify speed indicator	Yes
	This is a priority 1 function.	

Subsection	Title	Required
3.15	Modify flight plan to display "MM"	N
	on departure	
	This function is not required to maintain an integral system.	

Sub-section	Title	Recorded
3.14	F7N is currently undefined	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
3.15	Auto-Offset Multifunction (OFFK)	No
	This function is not required to maintain an integral system. Automatic offset function the display is enabled for this demonstration.	

Sub-section	Title	Recorded
3.16	Preview Multifunction	Yes
	This is a priority 1 function	

Sub-section	Title	Recorded
3.16.1	Relocate the preview area and brite tabular lists	No
	Preview area will not be displayed and brite functions will not be implemented for this demonstration	

Sub-section	Title	Recorded
3.16.2	Select/inhibit supervisory position	Yes
	This is a priority 1 function	

Subsection	Title	Remarks
3.17	Process MSAW Display Inhibit	
	This function is not required to obtain an integral system.	
	MSAW is a priority 2 function in the Advanced Tracking extension which is not the scope of this effort.	
3.18	Memory Readout Multitasking	
	This function is not required to obtain an integral system. The display of multitasking the memory readout is beyond the scope of this demonstration.	
3.19	System Data Links	
	This is a priority 1 function.	
3.19.1	Relative Motion Data	
	This function is not required to obtain an integral system.	

Sub-section	Title	Recorded
3.19.2	Modify host altimeter or unique altimeter settings	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.19.3	System time settings	Yes
	This message will cause an abnormal termination.	

Sub-section	Title	Recorded
3.19.4	Initiate/modify/delete host ATIS character and general information.	No
	This function is not required to maintain an integral system.	

Sub-section	Title	Recorded
3.19.5	Initiate/modify/delete unique general information.	No
	This function is not required to maintain an integral system.	

Sub-section	Title	Recorded
3.19.6	System date settings	Yes
	This message will cause an abnormal termination.	

Subfunction	Title	Recorded
3.20	Tabular List Messages (TABLM)	Yes
	This is a priority 1 function	

Subfunction	Title	Recorded
3.22.1	Relocate arrival/departure list	No
	This function is not required to exist in an integral system	

Subfunction	Title	Recorded
3.22.2	Relocate unsat/suspend list	No
	This function is not required to exist in an integral system	

Subfunction	Title	Recorded
	Select/insert/delete arrival and departure tabular list	No
	This function is not required to exist in an integral system	

Subfunction	Title	Recorded
3.23	Terminate arrival and departure	Yes
	This is a priority 1 function	

Sub-section	Title	Recorded
3.20.5	Terminate all store tracks with ETA/PTD less time specified.	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.20.6	Relocate MSAW Display Area	No
	This function is not required to maintain an integral system. MSAW is a priority 2 function in the Advanced Tracking category, which is not in the scope of this effort.	

Sub-section	Title	Recorded
3.21	F7U is currently undefined	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
3.22	Enable/Disable MSAW Functions (VMSAW)	No
	This function is not required to maintain an integral system. MSAW is a priority 2 function in the Advanced Tracking category, which is not in the scope of this effort.	

Sub-section	Title	Recorded
3.23	F7W is currently undefined	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
3.24	Display Sensor Switching (X3CH)	No
	This function is not required to maintain an integral system.	
	The scope of this demonstration is limited to one sensor.	

Sub-section	Title	Recorded
3.25	Scratch Pad Multifunction (YSCP)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.26	F7Z is currently undefined	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
3.27	CDR Extractor Control Multifunction (CDKEY)	No
	This function is not required to maintain an integral system.	

Sub-section	Title	Recorded
3.28	Manual Reconfiguration (IORFG)	No
	This function is not required to maintain an integral system. The capability of controlling hardware (e.g. switching SRAPs, TTY or MSP), or controlling software functions (e.g. enable/inhibit printouts, full operational vs. backup programs) will not be part of this demonstration.	

Sub-section	Title	Recorded
3.29	Select/Inhibit Printout of IF Messages (INPR)	No
	This function is not required to maintain an integral system. There will not be any printout of IF messages.	

Sub-section	Title	Recorded
3.30	Interfacility Test Program Operational Function (TKOF14)	No
	This function is not required to maintain an integral system. Only FP, AM and CX inter-facility messages will be processed.	

Sub-section	Title	Recorded
4.0	IMPLIED FUNCTIONS	No
	This section provides technical content but contains no demonstrable functions.	

Sub-section	Title	Recorded
4.1	Beacon Readout	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
4.2	Handoff Accept/Recall	No
	This function is not required to maintain an integral system. Handoff processing will not be implemented for this demonstration.	

Sub-section	Title	Recorded
4.3	Handoff Initiate	No
	This function is not required to maintain an integral system. Handoff processing will not be implemented for this demonstration.	

Sub-section	Title	Recorded
4.4	Terminate Control	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
4.5	Display/Inhibit Associated Track	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
4.6	Inhibit Blinking "DM" from a FDP	No
	This function is not required to maintain an integral system.	

Sub-section	Title	Recorded
4.7	Abbreviated Flight Data Entry	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
4.8	Initiate Control	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
4.9	Implied Beacon Code Modify	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
4.10	Override Interfacility Display Presentation	No
	This function is not required to maintain an integral system.	

Sub-section	Title	Recorded
4.11	Remote Tower Display Keyboard Functions.	No
	This function is not required to maintain an integral system. Tower messages will not be processed for this demonstration.	

Sub-section	Title	Recorded
5.0	TRAINING TARGET GENERATOR MESSAGES	No
	This function is not required by the FAA and is not required to maintain an integral system. Training target generator will not be implemented for this demonstration.	

Sub-section	Title	Recorded
6.0	CONFLICT ALERT MESSAGES	No
	This is a priority 2 function which is beyond the scope of this demonstration.	

Additional Capabilities		
There will be no additional capabilities provided for the demonstration.		

3.8 Display Output Processing

Display Output Processing (NAS-MD-639) primarily will be concerned with the preparation of alphanumeric track data for presentation on the display. There will also be display of selected system data (see below). Interactive keyboard responses (preview area and readout area) will not be processed. Only data originating from the retrack modules that impact tracking/display data will be processed. System parms/data will have to be initialized to some pre-determined values.

Display processing will support the display

Automatic Offset

Full, Limited, Partial Data Blocks and Single Symbols

Coast/Suspend, Arrival/Departure Tabular Lists

System Data display outputs of Current Time, Current Altimeter Setting

Display processing will not display

Preview and Readout Areas

MSAW/CA Data Blocks

IOP/DBM/MDBM Operations and Memory

Brite display Tabular List

System Data display outputs of Memory, Program Level, Test Targets, Overload Sensing and Protection, Emergency/Radio Failure/Hijack & Suspect Aircraft, Host ATIS Character & General Information, Selected Codes

Sub-section	Title	Recoded
1.0	INTRODUCTION	No
	This section provides technical content but contains no demonstrable functions.	
	This is an overview of some of the functions in the current TRACON system.	

Sub-section	Title	Recorded
2.0	ENVIRONMENT	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
2.1	General	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
2.2	Output Data Transfer Function	No
	This is a priority 2 function.	
	This function is not required by the FAA and is not required to maintain an integral system.	
	1. Data transfer from host to situation display will be done using RIX-MVS tools.	
	a. We will not be using sublists to process data information.	
	2. Memory buffer management will not be done using the IOP/MDBM. A method of passing data from the applications (host) to the situation display will be devised.	

Sub-section	Title	Recorded
2.3	MDBM Operation Description	No
2.3.1	General	
2.3.2	DBM Operation	
2.3.2.1	Linked Control Word File	
2.3.2.2	Completion of a Sublist	
	This section provides technical content but contains no demonstrable functions.	
	An overview of the MDBM/DBM functions are discussed in this section of the document.	

Sub-section	Title	Recorded
2.4	Memory Allocation for MDBM	No
	This section provides technical content but contains no demonstrable functions.	
	This is an overview of the MDBM & data support which are sub-divided into sublists.	
	1. We are not using sublist processing or MDBM data storage, but, there is still a need to store & display some data.	

Subsection	Title	Recorded
2.4.1	Tabular Display Data	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	
	The supported data in the system display area are:	
	* Time	
	* Altimeter	
	The non-supported data in the system display area are:	
	* Memory readout area	
	* Emergency/radio failure/hijack/suspect aircraft indication	
	* Program level	
	* Test targets	
	* Overload sensing and protection	
	* ATIS character & general info.	
	Other non-supported display data are:	
	* Aircraft which are in MSAW low altitude warning or in Conflict Alert.	
	Rationale - Please, look at subsection 2.4.	

Sub-section	Title	Recorded
2.4.2	Keyboard Display Data	Yes
	This is a priority 2 function. This function is derived from the FAA requirements and is required to maintain an integral system. Each keyboard connected to the display has its own memory allocation which contains: - Keyboard readout/preview (not-supported) - Keyboard coast/suspend list - Keyboard store track list Rationale - look at sub-section 2.4. Although no interactive keyboard processing will be supported, nevertheless, keyboard data could enter into the system from the retrack tape.	

Sub-section	Title	Recorded
2.4.3	Data Blocks	Yes
	This is a priority 2 function. This function is derived from the FAA requirements and is required to maintain an integral system. Rationale - look at sub-section 2.4.	

Sub-section	Title	Recorded
2.4.4	Single Symbols	Yes
	This is a priority 3 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	
	Rationale - Look at subsection 2.4.	

Sub-section	Title	Recorded
2.4.5	P-Stack Control	No
	Rationale - Look at subsection 2.2.	

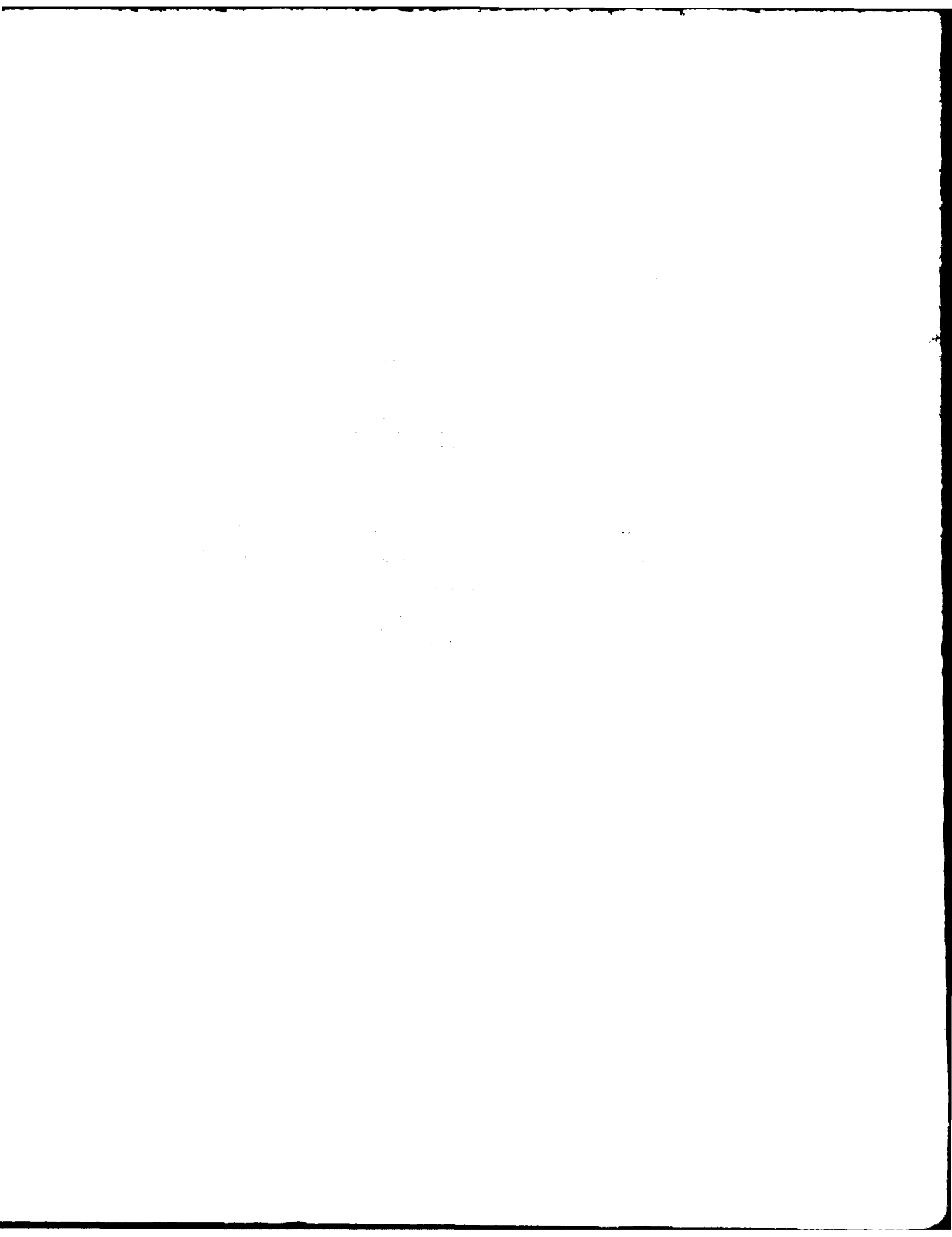
Sub-section	Title	Recorded
2.4.6	Memory Management	No
	This is a priority 2 function.	
	Rationale - Look at subsection 2.2.	

Sub-section	Title	Recorded
3.0	DISPLAY CONSOLE OUTPUT	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recoded
3.1	Introduction	No
	This section provides technical content but contains no demonstrable functions. This overviews the class definition of display console data consisting of: - Single symbols - Limited data blocks - Full data blocks - Partial data blocks	

Sub-section	Title	Recoded
3.2	Associated Tracks	Yes
	This is a priority 2 function. This function is derived from the FAA requirements and is required to maintain an integral system. Associated tracks are processed as full data blocks for all tracks under a controlling console.	

Sub-section	Title	Recoded
3.2.1	Full Data Blocks (FDB)	Yes
	This is a priority 2 function. This function is derived from the FAA requirements and is required to maintain an integral system. Alphanumeric track data is periodically updated to indicate the track position.	



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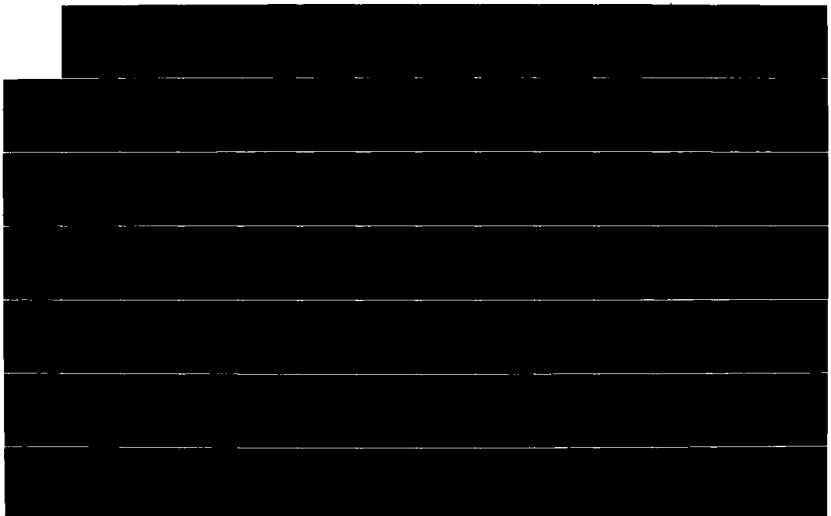
NEW YORK TRACON DEMONSTRATION OF PROGRAM RECODING
REQUIREMENTS ANALYSIS DOCUMENT (U) DATA TRANSFORMATION
CORP SILVER SPRING MD AUG 87 DOI/FAA/CI-87/34
DIFAG3-85-C-0058

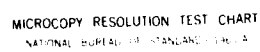
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Sub-section	Title	Recorded
3.2.3	Command Codes	No
	This is a priority 2 function. This function is derived from the FAA requirements and is required to maintain an integral system. Data transfer from host to situation display is handled differently.	

Sub-section	Title	Recorded
3.3	Unassociated Tracks	Yes
	This is a priority 2 function. This function is derived from the FAA requirements and is required to maintain an integral system. Unassoc. tracks are processed and presented as limited data blocks or special single symbols on each display.	

Sub-section	Title	Recorded
3.3.1	Limited Data Block (LDB)	Yes
	This is a priority 2 function. This function is derived from the FAA requirements and is required to maintain an integral system.	

Subsection	Title	Recorded
3.3.1.1	Format of Limited Data Field	Yes
	This is a priority 1 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	
	Formats of data are discussed.	

Subsection	Title	Recorded
3.3.1.1.1	Position Symbol	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	

Subsection	Title	Recorded
3.3.1.1.2	Unassociated Yacht Sailing Leader	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	
	Length of the leader is variable (zero to 1.5 inches) and will be coded as a system parameter.	

Sub-section	Title	Recoded
3.3.1.2	Processing of Limited Data Blocks	Yes
	This is a priority 2 function. This function is derived from the FAA requirements and is required to maintain an integral system. List of conditions are documented.	

Sub-section	Title	Recoded
3.3.2	Single Symbols	Yes
	This is a priority 2 function. This function is derived from the FAA requirements and is required to maintain an integral system. Conditions/limitations of displaying data are discussed.	

Sub-section	Title	Recoded
3.3.3	Command Codes	No
	This is a priority 2 function. This function is derived from the FAA requirements and is required to maintain an integral system. Data transfer from host to situation display is handled differently.	

Sub-section	Title	Recoded
3.9	Partial Data Blocks	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	

Sub-section	Title	Recoded
3.9.1	Format of Partial Data	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	
	Overview of formats.	

Sub-section	Title	Recoded
3.9.2	Position Symbol	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	
	This position symbol is an alphanumeric character which identifies the controlling keyboard or the letter 'E' indicating the track is controlled by ARTCC.	

Sub-section	Title	Recoded
3.4.3	Processing of Partial Data Blocks	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	
	Display the track if it is within selected filter limits. Full data blocks supersede the display of partial data blocks.	

Sub-section	Title	Recoded
3.5	MSAW/CA Data Blocks (MCADB)	No
3.5.1	Format of MSAW/CA Data Blocks	
3.5.2	Position Symbol	
3.5.3	Processing of MSAW/CA Data Blocks	
	This is a priority 2 function.	
	This function is not required by the FAA and is not required to maintain an integral system.	
	1. Assumption - not performing MSAW/CA. The data base and display of data processing are not needed.	

Sub-section	Title	Recoded
4.0	TABULAR LISTS	No
	This section is administrative and contains no demonstrable functions.	

Subsection	Title	Recorded
4	Introduction	Yes
	This is a priority	
	This function is required for the PAA	
	required for the PAA to be an	
	integral system	
	This function is required for the PAA	
	Site adaptation for the PAA and	
	characterized by the PAA	

Subsection	Title	Recorded
5	Abstract	Yes
	This section is required for the PAA	
	abstract is required	

Subsection	Title	Recorded
6	Table 1.1	Yes
	This is a priority	
	This section is required for the PAA	
	required for the PAA to be an	
	integral system	
	Aggregated data is required for the PAA	
	concepts and data are required for the PAA	
	and not in hand for the PAA automatically	
	transferred to the PAA automatically	

Sub-section	Title	Recoded
4.2.2	Format of Coast/Suspend Tabular Lists	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	
	This lists conditions of formatting data.	

Sub-section	Title	Recoded
4.2.3	Command Codes	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	
	Associated command codes with data.	

Sub-section	Title	Recoded
4.3	Flight Plans	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recoded
4.3.1	Flight Plans - Arrivals/Departures	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	

Sub-section	Title	Recoded
4.3.2	Format of Arr./Dep. Tabular List	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	

Sub-section	Title	Recoded
4.3.3	Single Symbol Fix Designators	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	

Sub-section	Title	Recoded
4.3.4	Command Codes	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	

Sub-section	Title	Recorded
4.4	Brite Display Tabular List	No
4.4.1	Landing Aircraft - Brite Display	
4.4.2	Format of Brite Display Tabular List	
4.4.3	Command Codes	
	This is a priority 2 function.	
	This function is not required by the FAA and is not required to maintain an integral system.	
	1. Assumption - not processing Brite displays.	

Sub-section	Title	Recorded
4.5	MSAW Display Area	No
4.5.1	Tracks Flagged for MSAW Warning	
4.5.2	Format of MSAW Display Area	
4.5.3	Command Codes	
	This is a priority 2 function.	
	This function is not required by the FAA and is not required to maintain an integral system.	
	1. Assumption - not performing altitude tracking, conflict alert, MSAW.	

Sub-section	Title	Recorded
5.0	SYSTEM DATA DISPLAY OUTPUTS	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
5.1	Introduction	Yes
	This section contains technical content but contains no design data.	
	Initial location data on the display console is defined in site adaptation. The display can be relocated by a keyboard.	

Sub-section	Title	Recorded
5.2	Current time	Yes
	This is a priority function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	

Sub-section	Title	Recorded
5.3	Current Altitude	Yes
	This is a priority function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	

Sub-section	Title	Recoded
5.4	Host ATIS Character and Gen. Info. or Unique Designator Gen. Info.	No
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is not required to maintain an integral system.	

Sub-section	Title	Recoded
5.5	Selected Codes	No
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is not required to maintain an integral system.	

Sub-section	Title	Recoded
5.6	Emergency/Radio Failure/Hijack & Suspect Aircraft	No
	This is a priority 2 function.	
	This function is not required by the FAA and is not required to maintain an integral system.	
	1. Assumption - not processing multifunctions (emergency).	
	2. Emergency indicator will not be shown in the system data area but will be shown in the full data block area.	

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Sub-section	Title	Recorded
6.0	PREVIEW/READOUT AREA	No
	This is a priority 2 function.	
	This function is not required by the FAA and is not required to be demonstrated in the system.	
	Readout area is also located above the preview area. It is used to display legal keyboard message entries and data as a result of a keyboard request.	
	Preview area is used to display the content of keyboard entries as they are entered into DEDS. Preview data is prepared and maintained by keyboard input processing.	
	1. Assumption - there will be no external processing from the keyboard.	
	2. Petrack will filter out errors and therefore eliminating the need for these areas.	
7.0	SLEW ENTRY DEVICE OUTPUT	No
	This is a priority 2 function.	
	This section provides technical content but contains no demonstrable functions.	
8.0	AUTOMATIC OFFSET	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
8.1	Automatic Offset - Introduction	No
	This section provides technical content but contains no demonstrable functions.	

Sub-section	Title	Recorded
8.2	Active Track Automatic Offset	No
	This section is administrative and contains no demonstrable functions.	

Sub-section	Title	Recorded
8.2.1	Offset Conditions	No
	This section provides technical content but contains no demonstrable functions.	

Sub-section	Title	Recorded
8.2.2	Offset processing	Yes
	This is a priority 2 function.	
	This function is derived from the FAA requirements and is required to maintain an integral system.	
	1. Automatic offset used to prevent overlap of track info.	

Sub-section	Title	Recorded
9.0	DISPLAY REFRESH RATE	No
	This is a priority 2 function.	
	An equivalent function is being provided by:	
	1. Display refresh rate will be controlled by the situation display.	
Additional Capabilities		
1. There will a method of displaying a history trail of a track.		
2. There will be the use of a color flag used to display color on the display. Although the demonstration is performed without color, future anticipated demonstrations will use color.		

3.9 Interfacility Data Transfer

Interfacility Data Transfer as specified in NAS-MD 640 contains the functional requirements between NAS Enroute Stage A and NY TRACON. The data are classified as operational flight data, track data, test data and related responses. This module is used as the primary means of entering flight plan data into the system.

Sub-section	Title	Recorded
1.0	INTRODUCTION	No
	This section provides technical content but contains no demonstrable functions.	

Sub-section	Title	Recorded
2.0	ARTCC-NY TRACON OPERATIONAL FLIGHT DATA TRANSFER	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.1	Flight Plan Message (FP)	Yes
	This is a priority 1 function. It is used as a mechanism to obtain flight plans. This includes departure flight plans, arrival flight plans, overflight plans and duplicate flight plans. No responses will be generated for these messages.	

Sub-section	Title	Recorded
2.2	Amendment Message (AM)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
2.3	Cancellation Message (CX)	Yes
	This is a priority 1 function.	

Sub-section	Title	Recorded
3.0	ARTCC-NY TRACON AND ARTIS TO NY TRACON TRACK DATA TRANSFER	No
	Track data transfers will not be processed for this demonstration.	

Sub-section	Title	Recorded
4.0	ARTCC-NY TRACON TEST DATA TRANSFER	No
	Test data transfers will not be processed for this demonstration.	

Sub-section	Title	Recorded
5.0	NY TRACON-ARTCC AND NY TRACON-ARTS RESPONSE MESSAGE TRANSFER	No
	Response messages will not be implemented for this demonstration. However, the system will maintain the ARTCC ACID/TRACON TCID relationship to process subsequent messages.	

Sub-section	Title	Recorded
6.0	NY TRACON-ARTCC OPERATIONAL FLIGHT DATA TRANSFER	No
	Interfacility outputs will not be implemented for this demonstration.	

Sub-section	Title	Recorded
7.0	NY TRACON-ARTCC AND NY TRACON-ARTS TRACK DATA TRANSFER	No
	Track data transfers will not be implemented for this demonstration.	

Sub-section	Title	Recorded
8.0	NY TRACON-ARTCC TEST DATA TRANSFER (CTR)	No
	Test data transfers will not be implemented for this demonstration.	

Sub-section	Title	Recorded
9.0	ARTCC-NY TRACON AND ARTCC-ARTCC RESPONSE MESSAGE TRANSFER	No
	Response messages will not be processed for this demonstration.	

Sub-section	Title	Recorded
10.0	DISCARDED MESSAGE	Yes
	In addition to messages that do not have a recognizable or legible message field, these messages will be discarded: Initiate Transfer (IT) Track Update (TU) Accept Transfer (TA) Test Data Transfer (TD) Acceptance Message (PA) Retransmit Message (RX) Rejection Message (RJ) Data Test Message (DT)	

Sub-section	Title	Recoded
11.0	RETRANSMISSIONS	No
	No messages will be transmitted for this demonstration.	

Sub-section	Title	Recoded
12.0	MESSAGE PRIORITIES	No
	Output message priorities are not applicable because no messages are transmitted.	

Additional Capabilities		
There will be no additional capabilities provided for the demonstration.		

3.10 Bulk Store Flight Plans

This document (NAS-MO-641) specifies the functional requirements for product and its Store Flight Plans. This function is based on the requirements of this document.

[illegible]

3.11 Non-Executive Error, Status and Input Messages

This document (NAS-MD-642) describes the Non-Executive Error and Status Messages which are printed on the CDTs to alert users of a significant change to the system. This function is beyond the scope of this demonstration.

Sub-section	Title	Recoded
NAS-MD-642	ASR-37 Non-Executive Error, Status and Input Messages	No
	This function is not required by the FAA and is not required to maintain an integral system.	
Additional Capabilities		
There will be no additional capabilities provided for the demonstration.		

2.2.2.2. Adaptation

This document (NASM 1.0) provides a set of parameters used by the NASM operations.

These are the parameters used by the NASM operations to assemble the code into a binary file.

- `16` - The number of bits in the instruction set.
- `32` - The number of bits in the instruction set.
- `64` - The number of bits in the instruction set.
- `128` - The number of bits in the instruction set.
- `256` - The number of bits in the instruction set.
- `512` - The number of bits in the instruction set.
- `1024` - The number of bits in the instruction set.
- `2048` - The number of bits in the instruction set.
- `4096` - The number of bits in the instruction set.
- `8192` - The number of bits in the instruction set.
- `16384` - The number of bits in the instruction set.
- `32768` - The number of bits in the instruction set.
- `65536` - The number of bits in the instruction set.
- `131072` - The number of bits in the instruction set.
- `262144` - The number of bits in the instruction set.
- `524288` - The number of bits in the instruction set.
- `1048576` - The number of bits in the instruction set.
- `2097152` - The number of bits in the instruction set.
- `4194304` - The number of bits in the instruction set.
- `8388608` - The number of bits in the instruction set.
- `16777216` - The number of bits in the instruction set.
- `33554432` - The number of bits in the instruction set.
- `67108864` - The number of bits in the instruction set.
- `134217728` - The number of bits in the instruction set.
- `268435456` - The number of bits in the instruction set.
- `536870912` - The number of bits in the instruction set.
- `1073741824` - The number of bits in the instruction set.
- `2147483648` - The number of bits in the instruction set.
- `4294967296` - The number of bits in the instruction set.
- `8589934592` - The number of bits in the instruction set.
- `17179869184` - The number of bits in the instruction set.
- `34359738368` - The number of bits in the instruction set.
- `68719476736` - The number of bits in the instruction set.
- `137438953472` - The number of bits in the instruction set.
- `274877906944` - The number of bits in the instruction set.
- `549755813888` - The number of bits in the instruction set.
- `1099511627776` - The number of bits in the instruction set.
- `2199023255552` - The number of bits in the instruction set.
- `4398046511104` - The number of bits in the instruction set.
- `8796093022208` - The number of bits in the instruction set.
- `17592186044416` - The number of bits in the instruction set.
- `35184372088832` - The number of bits in the instruction set.
- `70368744177664` - The number of bits in the instruction set.
- `140737488355328` - The number of bits in the instruction set.
- `281474976710656` - The number of bits in the instruction set.
- `562949953421312` - The number of bits in the instruction set.
- `1125899906842624` - The number of bits in the instruction set.
- `2251799813685248` - The number of bits in the instruction set.
- `4503599627370496` - The number of bits in the instruction set.
- `9007199254740992` - The number of bits in the instruction set.
- `18014398509481984` - The number of bits in the instruction set.
- `36028797018963968` - The number of bits in the instruction set.
- `72057594037927936` - The number of bits in the instruction set.
- `144115188075855872` - The number of bits in the instruction set.
- `288230376151711744` - The number of bits in the instruction set.
- `576460752303423488` - The number of bits in the instruction set.
- `1152921504606846976` - The number of bits in the instruction set.
- `2305843009213693952` - The number of bits in the instruction set.
- `4611686018427387904` - The number of bits in the instruction set.
- `9223372036854775808` - The number of bits in the instruction set.
- `18446744073709551616` - The number of bits in the instruction set.
- `36893488147419103232` - The number of bits in the instruction set.
- `73786976294838206464` - The number of bits in the instruction set.
- `147573952589676412928` - The number of bits in the instruction set.
- `295147905179352825856` - The number of bits in the instruction set.
- `590295810358705651712` - The number of bits in the instruction set.
- `1180591620717411303424` - The number of bits in the instruction set.
- `2361183241434822606848` - The number of bits in the instruction set.
- `4722366482869645213696` - The number of bits in the instruction set.
- `9444732965739290427392` - The number of bits in the instruction set.
- `18889465931478580854784` - The number of bits in the instruction set.
- `37778931862957161709568` - The number of bits in the instruction set.
- `75557863725914323419136` - The number of bits in the instruction set.
- `151115727451828646838272` - The number of bits in the instruction set.
- `302231454903657293676544` - The number of bits in the instruction set.
- `604462909807314587353088` - The number of bits in the instruction set.
- `1208925819614629174706176` - The number of bits in the instruction set.
- `2417851639229258349412352` - The number of bits in the instruction set.
- `4835703278458516698824704` - The number of bits in the instruction set.
- `9671406556917033397649408` - The number of bits in the instruction set.
- `19342813113834066795298816` - The number of bits in the instruction set.
- `38685626227668133590597632` - The number of bits in the instruction set.
- `77371252455336267181195264` - The number of bits in the instruction set.
- `154742504910672534362390528` - The number of bits in the instruction set.
- `309485009821345068724781056` - The number of bits in the instruction set.
- `618970019642690137449562112` - The number of bits in the instruction set.
- `1237940039285380274899124224` - The number of bits in the instruction set.
- `2475880078570760549798248448` - The number of bits in the instruction set.
- `4951760157141521099596496896` - The number of bits in the instruction set.
- `9903520314283042199192993792` - The number of bits in the instruction set.
- `19807040628566084398385987584` - The number of bits in the instruction set.
- `39614081257132168796771975168` - The number of bits in the instruction set.
- `79228162514264337593543950336` - The number of bits in the instruction set.
- `158456325028528675187087900672` - The number of bits in the instruction set.
- `316912650057057350374175801344` - The number of bits in the instruction set.
- `633825300114114700748351602688` - The number of bits in the instruction set.
- `1267650600228229401496703205376` - The number of bits in the instruction set.
- `2535301200456458802993406410752` - The number of bits in the instruction set.
- `5070602400912917605986812821504` - The number of bits in the instruction set.
- `10141204801825835211973625643008` - The number of bits in the instruction set.
- `20282409603651670423947251286016` - The number of bits in the instruction set.
- `40564819207303340847894502572032` - The number of bits in the instruction set.
- `81129638414606681695789005144064` - The number of bits in the instruction set.
- `162259276829213363391578010288128` - The number of bits in the instruction set.
- `324518553658426726783156020576256` - The number of bits in the instruction set.
- `649037107316853453566312041152512` - The number of bits in the instruction set.
- `1298074214633706907132624082305024` - The number of bits in the instruction set.
- `2596148429267413814265248164610048` - The number of bits in the instruction set.
- `5192296858534827628530496329220096` - The number of bits in the instruction set.
- `10384593717069655257060992658440192` - The number of bits in the instruction set.
- `20769187434139310514121985316880384` - The number of bits in the instruction set.
- `41538374868278621028243970633760768` - The number of bits in the instruction set.
- `83076749736557242056487941267521536` - The number of bits in the instruction set.
- `166153499473114484112975882535043072` - The number of bits in the instruction set.
- `332306998946228968225951765070086144` - The number of bits in the instruction set.
- `664613997892457936451903530140172288` - The number of bits in the instruction set.
- `1329227995784915872903807060280344576` - The number of bits in the instruction set.
- `2658455991569831745807614120560689152` - The number of bits in the instruction set.
- `5316911983139663491615228241121378304` - The number of bits in the instruction set.
- `10633823966279326983230456482242756608` - The number of bits in the instruction set.
- `21267647932558653966460912964485513216` - The number of bits in the instruction set.
- `42535295865117307932921825928971026432` - The number of bits in the instruction set.
- `85070591730234615865843651857942052864` - The number of bits in the instruction set.
- `170141183460469231731687303715884105728` - The number of bits in the instruction set.
- `340282366920938463463374607431768211456` - The number of bits in the instruction set.
- `680564733841876926926749214863536422912` - The number of bits in the instruction set.
- `1361129467683753853853498429727072845824` - The number of bits in the instruction set.
- `2722258935367507707706996859454145691648` - The number of bits in the instruction set.
- `5444517870735015415413993718908291383296` - The number of bits in the instruction set.
- `10889035741470030830827987437816582766592` - The number of bits in the instruction set.
- `21778071482940061661655974875633165533184` - The number of bits in the instruction set.
- `43556142965880123323311949751266331066368` - The number of bits in the instruction set.
- `87112285931760246646623899502532662132736` - The number of bits in the instruction set.
- `174224571863520493293247799005065324265472` - The number of bits in the instruction set.
- `348449143727040986586495598010130648530944` - The number of bits in the instruction set.
- `696898287454081973172991196020261297061888` - The number of bits in the instruction set.
- `1393796574908163946345982392040522594123776` - The number of bits in the instruction set.
- `2787593149816327892691964784081045188247552` - The number of bits in the instruction set.
- `5575186299632655785383929568162090376495104` - The number of bits in the instruction set.
- `11150372599265311570767859136324180752990208` - The number of bits in the instruction set.
- `22300745198530623141535718272648361505980416` - The number of bits in the instruction set.
- `44601490397061246283071436545296723011960832` - The number of bits in the instruction set.
- `89202980794122492566142873090593446023921664` - The number of bits in the instruction set.
- `178405961588244985132285746181186892047843328` - The number of bits in the instruction set.
- `356811923176489970264571492362373784095686656` - The number of bits in the instruction set.
- `713623846352979940529142984724747568191373312` - The number of bits in the instruction set.
- `1427247692705959881058285969449495136382746624` - The number of bits in the instruction set.
- `2854495385411919762116571938898990272765493248` - The number of bits in the instruction set.
- `5708990770823839524233143877797980545530986496` - The number of bits in the instruction set.
- `11417981541647679048466287755595961091061972992` - The number of bits in the instruction set.
- `22835963083295358096932575511191922182123945984` - The number of bits in the instruction set.
- `45671926166590716193865151022383844364247891968` - The number of bits in the instruction set.
- `91343852333181432387730302044767688728495783936` - The number of bits in the instruction set.
- `182687704666362864775460604089535377456991567872` - The number of bits in the instruction set.
- `365375409332725729550921208179070754913983135744` - The number of bits in the instruction set.
- `730750818665451459101842416358141509827966271488` - The number of bits in the instruction set.
- `1461501637330902918203684832716283019655932542976` - The number of bits in the instruction set.
- `2923003274661805836407369665432566039311865085952` - The number of bits in the instruction set.
- `5846006549323611672814739330865132078623730171904` - The number of bits in the instruction set.
- `11692013098647223345629478661730264157247460343808` - The number of bits in the instruction set.
- `23384026197294446691258957323460528314494920687616` - The number of bits in the instruction set.
- `46768052394588893382517914646921056628989841375232` - The number of bits in the instruction set.
- `93536104789177786765035829293842113257979682750464` - The number of bits in the instruction set.
- `187072209578355573530071658587684226515959365500928` - The number of bits in the instruction set.
- `374144419156711147060143317175368453031918731001856` - The number of bits in the instruction set.
- `748288838313422294120286634350736906063837462003712` - The number of bits in the instruction set.
- `1496577676626844588240573268701473812127674924007424` - The number of bits in the instruction set.
- `2993155353253689176481146537402947624255349848014848` - The number of bits in the instruction set.
- `5986310706507378352962293074805895248510699696029696` - The number of bits in the instruction set.
- `11972621413014756705924586149611790497021399392059392` - The number of bits in the instruction set.
- `23945242826029513411849172299223580994042798784118784` - The number of bits in the instruction set.
- `47890485652059026823698344598447161988085597568237568` - The number of bits in the instruction set.
- `95780971304118053647396689196894323976171195136475136` - The number of bits in the instruction set.
- `191561942608236107294793378393788647952342390272950272` - The number of bits in the instruction set.
- `383123885216472214589586756787577295904684780545900544` - The number of bits in the instruction set.
- `766247770432944429179173513575154591809369561091801088` - The number of bits in the instruction set.
- `1532495540865888858358347027150309183618739122183602176` - The number of bits in the instruction set.
- `3064991081731777716716694054300618367237478244367204352` - The number of bits in the instruction set.
- `6129982163463555433433388108601236734474956488734408704` - The number of bits in the instruction set.
- `12259964326927110866866776217202473468949912977468817408` - The number of bits in the instruction set.
- `24519928653854221733733552434404946937899825954937634816` - The number of bits in the instruction set.
- `49039857307708443467467104868809893875799651909875269632` - The number of bits in the instruction set.
- `98079714615416886934934209737619787751599303819750539264` - The number of bits in the instruction set.
- `196159429230833773869868419475239575503198607639501078528` - The number of bits in the instruction set.
- `392318858461667547739736838950479151006397215279002157056` - The number of bits in the instruction set.
- `784637716923335095479473677900958302012794430558004314112` - The number of bits in the instruction set.
- `1569275433846670190958947355801916604025588861116008628224` - The number of bits in the instruction set.
- `3138550867693340381917894711603833208051177722232017256448` - The number of bits in the instruction set.
- `6277101735386680763835789423207666416102355444464034512896` - The number of bits in the instruction set.
- `12554203470773361527671578846415332832204710888928069025792` - The number of bits in the instruction set.
- `25108406941546723055343157692830665664409421777856138051584` - The number of bits in the instruction set.
- `50216813883093446110686315385661331328818843555712276103168` - The number of bits in the instruction set.
- `100433627766186892221372630771322662657637687111424552206336` - The number of bits in the instruction set.
- `200867255532373784442745261542645325315275374222849104412672` - The number of bits in the instruction set.
- `401734511064747568885490523085290650630550748445698208825344` - The number of bits in the instruction set.
- `803469022129495137770981046170581301261101496891396417650688` - The number of bits in the instruction set.
- `1606938044258990275541962092341162602522202993782792835301376` - The number of bits in the instruction set.
- `3213876088517980551083924184682325205044405987565585670602752` - The number of bits in the instruction set.
- `6427752177035961102167848369364650410088811975131171341205504` - The number of bits in the instruction set.
- `12855504354071922204335696738729300820177623950262342682411008` - The number of bits in the instruction set.
- `25711008708143844408671393477458601640355247900524685364822016` - The number of bits in the instruction set.
- `51422017416287688817342786954917203280710495801049370729644032` - The number of bits in the instruction set.
- `102844034832575377634685573909834406561420991602098741459288064` - The number of bits in the instruction set.
- `205688069665150755269371147819668813122841983204197482918576128` - The number of bits in the instruction set.
- `411376139330301510538742295639337626245683966408394965837152256` - The number of bits in the instruction set.
- `822752278660603021077484591278675252491367932816789931674304512` - The number of bits in the instruction set.
- `1645504557321206042154969182557350504982735865633579863348609024` - The number of bits in the instruction set.
- `3291009114642412084309938365114701009965471731267159726697218048` - The number of bits in the instruction set.
- `6582018229284824168619876730229402019930943462534319453394436096` - The number of bits in the instruction set.
- `13164036458569648337239753460458804039861886925068638906788872192` - The number of bits in the instruction set.
- `26328072917139296674479506920917608079723773850137277813577744384` - The number of bits in the instruction set.
- `52656145834278593348959013841835216159447547700274555627155488768` - The number of bits in the instruction set.
- `105312291668557186697918027683670432318895095400549111254310977536` - The number of bits in the instruction set.
- `210624583337114373395836055367340864637790190801098222508621955072` - The number of bits in the instruction set.
- `421249166674228746791672110734681729275580381602196445017243910144` - The number of bits in the instruction set.
- `842498333348457493583344221469363458551160763204392890034487820288` - The number of bits in the instruction set.
- `1684996666696914987166688442938726917102321526408785780068975640576` - The

Sub-section	Title	Recoded
2.0	SYSTEM PARAMETERS	Yes
	System parameters define data which are variable within the task programs, but are not site dependent. Generally, these are equated values that do not take up storage space in the current system. System parameters corresponding to functions we are recoding will be retained. Examples of this are: - Bin parameters - SRAP parameters - Tracking parameters - CDR filter parameters - CTS word names System parameters corresponding to functions we are recoding but modifying will also be modified. Examples of this are: - DBM parameters - CDR data set parameters System parameters corresponding to functions we are not recoding will not be retained. Examples of this are: - Interfacility retry information - MSAW parameters - FP disk information - KIP parameters - On-call program parameters	

Submission	Title	Reviewed
3.3	SITE PARAMETERS	Yes
	Site parameters are used to control the data used to generate the mission report. Although these site parameters are not used in the operational program, they are used in the site parameter program. Site parameters are used to control the data used to generate the mission report. Examples of this are: - Number of days in the mission - Season code - Auto acquire - Auto drop - Arrival fixed - Aircraft display parameters - Intermittent site - CDR filters Site parameters are used to control the data used to generate the mission report. Examples of this are: - Number of days in the mission - Season code - Auto acquire - Auto drop - Arrival fixed - Aircraft display parameters - Intermittent site - CDR filters Site parameters are used to control the data used to generate the mission report. Examples of this are: - Number of days in the mission - Season code - Auto acquire - Auto drop - Arrival fixed - Aircraft display parameters - Intermittent site - CDR filters	

Sub-section	Title	Recorded
4.0	EXECUTIVE ASSEMBLY PARAMETERS	No
	An equivalent function is being provided by the MVS/RTX operating system. Refer to Section 3.3 of this document for the rationale.	

Sub-section	Title	Recorded
5.0	EXECUTIVE BUILD PARAMETERS	No
	An equivalent function is being provided by the MVS/RTX operating system. Refer to Section 3.3 of this document for the rationale.	

Sub-section	Title	Recorded
6.0	SYSTEM BUILD PARAMETERS	No
	An equivalent function is being provided by the MVS/RTX operating system. Refer to Section 3.3 of this document for the rationale.	

Sub-section	Title	Required
7.0	CONFLICT ALERT	No
	Refer to Section 4.1.1.1 for the rationale.	
	This function is not required by the FAA and is not required to maintain an integral system.	

Sub-section	Title	Required
APPENDIX A	LITE VARIABLE PARAM	Yes
	This function is required by the FAA requirements and is required to maintain an integral system.	
	See the discussion under Section 1.0 of this document for the rationale.	

Sub-section	Title	Required
APPENDIX B	NY T-2000 (11/1/77)	No
	This function is not required by the FAA requirements and is not required to maintain an integral system.	

Additional Capabilities

There will be no additional capabilities provided for the demonstration.

3.13 MSAW and Altitude Tracking

This document (NAS-MD-644) contains the design data for the Minimum Safe Altitude Warning (MSAW) program. This function is not being implemented for the demonstration.

Subsection	Title	Recorded
NAS-MD-644	MSAW and Altitude Tracking	Y
	This is a priority 2 function in the Advanced Tracking category, which is not in the scope of this effort.	
Additional Capabilities		
There will be no additional capabilities provided for the demonstration.		

3.14 Non-Executive Console Teletype Input Processing & On-Call Tasks

This document (NAS-MD-645) describes all appropriate action that is taken once a message is entered from a Console Data Terminal. This function is beyond the scope of this demonstration.

Sub-section	Title	Recorded
NAS-MD-645	Non-Executive Console Teletype Input Processing.	No
	This function is not required by the FAA and is not required to maintain an integral system.	
Additional Capabilities		
There will be no additional capabilities provided for the demonstration.		

3.15 Builder/BUP & CDR Editor

As described in NAS MD-646, the CDR Editor is an offline program which reads the CDR data that is collected online. The data which is recorded on or disk is searched for class type filter information that is specified during initialization of the Editor. The requested data is then read and printed onto a designated device, usually a high or medium speed printer.

The types of messages that CDR Editor processes are listed in Appendix A of this document.

Due to project module limitations, several messages that are extracted during normal execution of the existing operational program, will not be extracted by the newly added CDR. Therefore, some messages will not be received or printed by the Editor. The messages that will not be required are indicated by a "NO" under the receive column in Appendix A.

The printed listing, which will be generated by the new CDR Editor, will contain the same information that is provided by the FAN Editor program. However, we will not produce listings for tracking data, automatic functions, interfacing to keyboard. The demonstration EDITOR will be run under FM.

Sub-section	Title	Recorded
1.0	BUILDER	NO
	An equivalent function is being provided by commercial software, and the MVS/RIX environment.	

Sub-section	Title	Recorded
2.0	BUILDER UTILITY PROGRAM	NO
	An equivalent function is being provided by commercial software, and the MVS/RIX environment.	

Sub-section	Title	Recoded
3.0	INTRODUCTION TO CDR EDITOR	No
	This section provides an overview of the following section and, as such, contains no demonstrable functions.	

Sub-section	Title	Recoded
4.0	CDR EDITOR DESCRIPTION	Yes
	This is a priority 1 function.	
	This function is derived from the FAA requirements, and is required to maintain an integral system.	

Subsection	Title	Recorded
APPENDIX A	EXTRACTION MESSAGES	Yes
	DATA BUFFER HEADER	Yes
	INITIALIZATION MESSAGE	Yes
	TERMINATION MESSAGE	Yes
	DATA DELETE/RESUME MESSAGE	No
	DATA LOSS	No
	MEMORY DUMP	No
	SECTOR TIME MESSAGE	Yes
	TARGET REPORT	No
	TRACKING DATA	Yes
	KEYBOARD ENTRY MESSAGE	No
	AUTOMATIC FUNCTION MESSAGE	No
	INTERFACILITY MESSAGE	Yes
	MSAW ALARM MESSAGE	No
	ALTITUDE TRACKING MESSAGE	No
	MSAW DISPLAY WARNING MESSAGE	No
	RT-3TL CIG DATA MESSAGE	No
	RADAR ONLY TARGET REPORT MESSAGE	No
	LINEAR EXTRACTION MESSAGE	No
	MEMAMS EXTRACTION MESSAGE	No
	PROXIMITY EXTRACTION MESSAGE	No
APPENDIX B	LISTING FORMATS	Yes
	The listing formats provided are identical in format to the printed output from the NYIRADON CDR Filter.	
	Listings for Tracking Data, Automatic Functions, Interfacility and Keyboard will be produced for the demonstration.	

Sub-section	Title	Recoded
APPENDIX C	PARAMETERS	Yes
	These parameters are required to maintain an integral system, and will be included in a stand alone NYTRACON EDITOR program.	
Additional Capabilities		
There will be no additional capabilities provided for the demonstration.		

3.16 Recovery

This document (NAS MD 647) describes the use of software which performs diagnostic sub programs on all I/O of the system and isolates the error. This function is behind the scene of the system.

Sub section	Title	Resided
NAS MD 647	Recovery	
	This function is not required. The FAA and	
	is not required to maintain an integral	
	component	
	Additional Title	
	There will be no additional capabilities provided for the	
	operation	

3.17 Continuous Data Recording Process

This document (NAS-MD-648) specifies the functional requirements for Continuous Data Recording Processing (CDRP).

In the NY TRACON system, Continuous Data Extraction had two major components: CDR Extractor Control and the CDR Extractor. Extractor Control provides manual and automatic switching between disk drives, performs checks of the function (enabled/disabled) and checks to see if CDR can be easily enabled in the event of a system fault recovery sequence. In the demonstration system, CDR will be written to disk using an MMIO access method. When I/O is complete, that I/O has completed successfully. A file directory will not be maintained since the access method will preserve the position within the file. Hence records will be queued for recording; records will not be lost due to an overflow condition. This eliminates the need for overflow checking as is performed in the current NY TRACON CDR Extractor Control.

In the NY TRACON system, the CDR Extractor consists of three parts: Data Extraction, Data Buffer Index Control and Data Buffer Output Control. The function of the Extractor is to extract information from database areas, CIS files and buffers and place the information into output buffers. The CDR data will be obtained in the demonstration system by application programs at specific points during the execution of the tasks. The programs will issue a SEND to the CDR Extractor task; the CDR Extractor will be responsible for recording the data in a file that will be accessible to the offline editor program. In the demonstration system, direct I/O will be performed and the access method will be responsible for I/O buffering.

Sub section	Title	Recorded
1.0	INTRODUCTION	No
	This section is not to be included in content but contains no demerit functions.	

Sub section	Title	Recorded
2.0	THE GENESIS OF THE RTX	No
	An equivalent to the one provided by MVS/RTA file record organization with RTX work queuing mechanism.	
	Refer to the Chapter on Continuous Data Recording which appears at the beginning of Section 3.17 for the rationale.	

Sub section	Title	Recorded
3.0	RTX RECORDING	No
	This section is not to be included in content but contains no demerit functions.	

Sub section	Title	Recorded
3.1	Inputs	No
	This section is not to be included in content but contains no demerit functions.	

Section	Title	Enclosed
1.3.1	1.3.1.1	
	1.3.1.2	
	1.3.1.3	
	1.3.1.4	
	1.3.1.5	
	1.3.1.6	
	1.3.1.7	
	1.3.1.8	
	1.3.1.9	
	1.3.1.10	
	1.3.1.11	
	1.3.1.12	
	1.3.1.13	
	1.3.1.14	
	1.3.1.15	
	1.3.1.16	
	1.3.1.17	
	1.3.1.18	
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	1.3.1.27	
	1.3.1.28	
	1.3.1.29	
	1.3.1.30	
	1.3.1.31	
	1.3.1.32	
	1.3.1.33	
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	1.3.1.35	
	1.3.1.36	
	1.3.1.37	
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	1.3.1.41	
	1.3.1.42	
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	1.3.1.46	
	1.3.1.47	
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	1.3.1.99	
	1.3.1.100	

Sub-section	Title	Recorded
3.2.3	Data Buffer Output Control (DBOC)	No
	An equivalent function is provided by MVS I/O services in combination with RTX work queuing mechanism.	
	Refer to the Chapter of Continuous Data Recording which appears at the beginning of Section 3.1.1 for the rationale.	

Sub-section	Title	Recorded
3.3	Outputs	No
	This section provides technical content but contains no demonstrable functions.	

Additional Capabilities		
There will be no additional capabilities provided for the demonstration.		

3.18 Remote Display Processing

Remote Display Processing (NAS-MD-649) describes the interface between the NY TRACON operational program and the Remote Tower Cab Display (BANS) via a Communications Multiplexer Controller (CMC) and a Remote Display Buffer Memory (RDBM).

Recode of remote processing is beyond the scope of this project and will not be implemented.

Sub-section	Title	Recoded
MD-649	Remote Display Processing	No
	This function had no priority.	
	It is not required to maintain an integral system.	
	1. Assumption - remote processing is not to be done.	
Additional Capabilities		
There will be no additional capabilities provided for the demonstration.		

3.12 Support Software

The NAS-MD 650 series of documents specifies the minimum requirements for ALL Support Software. This series of documents is available at NAS-MD-650 (Support Software). SIR CINCOS The library, NAS-MD-650-1, contains the Ultra 3 compiler, NAS-MD-650B (LIBRARY), NAS-MD-650C (C), NAS-MD-650D (FORTRAN Loader), NAS-MD-650E (Linker) and NAS-MD-650F (Support Software) and

10. If the sequence in the NY SPACON is not subject to a variable
11. program load and link object program, the program in a library
12. can be to perfect data storage operation.

On demonstration system, all developments are done under the IEM VM
control system. VM supports both CMS (Control and Monitoring System) and REXX
Microtask Batch Operating System.

For a library management software package, the user interface and automated analysis tools will be developed through the use of a graphical user interface. The GUI is tailored for the NYU IRACON tool, and is designed that built a graphical user interface. Programmers will use the GUI to interactively create a graph, such as correlation, loads and so on. When the links are created, they are sent to MYIS for compilation. Link is a C++ program under MS-DOS.

1. Text tools and conversion software are available to help you convert documents to digital format.

Sub-section	Title	Recorded
NAS-MD-650A	SUPPORT SOFTWARE ULTRA ASSEMBLER	No
	This function is not required by the FAA and is not required to maintain an integral system. Refer to the Overview of Support Software which appears at the beginning of Section 3.19 for the rationale.	

Sub-section	Title	Recorded
NAS-MD-650B	LIBRARIAN	No
	This function is not required by the FAA and is not required to maintain an integral system. Refer to the Overview of Support Software which appears at the beginning of Section 3.19 for the rationale.	

Sub-section	Title	Recorded
NAS-MD-650C	SUPPORT SOFTWARE LOADER	No
	The equivalent function is being provided by Linkage-Editor in MVS. It will generate executable load modules for execution under MVS/RTX. Refer to the Overview of Support Software which appears at the beginning of Section 3.19 for the rationale.	

3.20 Conflict Alert Adaptation Standards & Guidelines

This document (NAS-MD-651) provides a functional description of Conflict Alert. This function is beyond the scope of this demonstration.

Sub-section	Title	Recorded
NAS-MD-651	Conflict Alert Adaptation Standards and Guidelines	No
	This is a priority 2 function in the Advanced Tracking category, which is not in the scope of this effort.	
Additional Capabilities		
There will be no additional capabilities provided for the demonstration.		

1.21 GPR Label Conversion Step: Integrity

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- The entire GPR will be done here from the MATHS.
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- The operation will be done here from the MATHS.
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- Data Buffer (100)
- Initialization Message (101)
- Termination Message (102)
- Data Delete Message (103)
- Data Load (104)
- Data Load (105)
- Data Load Message (106)
- Data Report (107)
- Tracking Data (108)
- Keyboard Entry (109)
- Automatic Function (110)
- Interfacility Message (111)

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- MSAW Alarm (14)
- Altitude Tracking Data (15)
- MSAW Display Warning (16)
- RB-BTL CTS Data Message (17)
- Radar Only Target Report (20)
- Radar Data Loss (21)
- Linear Extraction (22)
- MFMAMS Extraction (23)
- Proximity Extraction (24)

We will ensure that all records on the CDR tape are converted, even those that are not processed by Retrack. Records not processed by Retrack will have the message type converted and space reserved, but otherwise the contents will not be converted. The following records will be converted in their entirety to a S/370 format:

- Data Buffer Header
- Termination Message (02)
- Sector Time Message (06)
- Target Report (07)
- Tracking Data (10)
- Keyboard Entry (11)
- Interfacility Message (13)
- Radar Only Target Report (20)

The fields in the input CDR tape comprise various types of data:

- Octal bit(s) - flags, data items (such as range, azimuth, time), both signed and unsigned
- Octal digits - message type, beacon codes
- Octal BCD - altitude
- ASCII - aircraft IDs in the tracking data

- II ASCII - characters in keyboard input accepted
- EBCDIC - characters in interface - response

The following conversions have been identified:

- Octal Bit to Hexadecimal Bit (0-7) assigned and assigned
- Octal Bit to Hex
- Octal digit to Hex digit (0-7) assigned and assigned

For example, the hex type will be converted this way:

- Hex to Octal
- ASCII to EBCDIC
- II ASCII to EBCDIC
- EBCDIC to EBCDIC - only if the character is an IOP or a character in a data word

The conversion routine will identify the input type and convert it based on the input type and the desired output type. ASCII characters will be converted using translate tables.

The resultant CDR record on the disk file will be traceable to the record on the input file. Each record on the input tape will be on the disk file. If the record on the input file is not in the system, each record on the input tape will be converted to a data record field on the disk file.

4.0 System Architecture

The current New York TRACON system comprises two subsystems:

- a development and support subsystem (offline) used to build and reduce data from the operational subsystem
- an operational subsystem (online) comprising three subsystems:
 - Data processing
 - IOP architecture
 - System monitor and control
 - Target acquisition
 - Data entry and display (including local and remote interf.)

Current New York TRACON Architecture

The current development subsystem runs on a commercial Sperry 1100 processor (and peripherals) under a commercial off-the-shelf operating system and utilities. It is the (ICP) data processing equipment used by the operational subsystem.

The development subsystem uses special purpose software to build and reduce data generated by the operational subsystem. The operational software is coded in Ultrac; the Ultrac assembler is particular to the IOP architecture. Of special interest in the New York TRACON demonstration is the CDR Editor, which reduces the data information on the CDR file created by the operational software.

Assemblies and operational software builds can be done on both the 1100 and the IOP; the CDR Editor runs only on the IOP.

The current operational system subsystem runs in a multiprocessor, a set of IOPs connected point-to-point and shared memory modules. The IOP is a UNIVAC 8100 processor. The IOPs and memory modules and attached peripherals define the data processing subsystem (DPS).

The DPS interfaces with the en route ARICCs through a Communications Multiplexer Controller (CMC).

The CMC also provides the interface between the DPS and the Console Data Terminals (CDTs). The CDTs provide an interactive means for the operations and system engineering staff to communicate with the system.

Targets are acquired (from the sensors) through the sensor receiver and processor (SRAP). The SRAP interfaces with the IOPs through the processors' (SRAP and IOP) channels.

The DPS interface to the data entry and display subsystem (DEDS) is in two parts: the local interface directs controller data to and from the Texas Instruments keyboard and display (in the TRACON) through multiplexed display memory (MDRM), a buffer memory (BDM) unit; the remote interface (to and from the SRAP) is in the TRACON) comprises (from the IOP outward) a CMC, a modem in the IOP, a modem in the TRACON, and a remote display buffer memory (RDBM) in the TRACON.

The DEDS interface uses a customized monitor, the multiuser monitor executive (MME), and the ARTS real-time control program. There is firmware in the SRAP but no software in the TRACON except for the MME.

The TRACON is designed for the operational subsystem is maintained through the use of modular elements, such as IOPs and memory modules, that can be swapped for failed elements.

New York TRACON Demonstration Architecture

The demonstration system also comprises a development and an operational subsystem. The operational subsystem, however, consists of only a data processing subsystem and a data entry and display subsystem (the local interface only).

Both the development and the operational subsystems will run under a single architecture on IBM S/370. Both subsystems can run on a single 3083-BX processor with 3180 DASD, 3480 tape cartridge units, high speed printers and a set of terminals. The primary characteristic of a 3083 that set it apart from other 3080s are these: the 3083 is a uniprocessor; it executes a simpler and more robust instruction set at roughly four times the cycle speed of an IOP and contains 16 megabytes of storage; the interface to secondary storage devices, the DASD and tapes, run at channel speed (approximately 3 megabytes per second) and the devices hold gigabytes of data.

The development software architecture supports a batch, interactive, and network environment. All software executes under VM. VM supports both CMS, the Conversational Monitoring System, and MVS, IBM's standard batch operating system. Interactive users can run directly under CMS or they can use TSO under VM-MVS. TSO is IBM's standard MVS timesharing system. The New York TRACON demonstration software development tools run under CMS.

Since the operational subsystem is designed to run under MVS, both the development and operational subsystems can run on the same processor under VM. RTX, the real-time control program, allows the ARTS applications to run as batch programs under MVS. (RTX runs under MVS similar to the way that TSO runs under MVS for interactive work.)

In a test environment, the development subsystems can communicate with the operational subsystem through VM: programmers can create and edit the operational software under VM-CMS and send it to MVS to be compiled, built and executed. In a demonstration environment, the operational subsystem will run under MVS-RTX routine (without VM and the development subsystem in the processor).

The demonstration development system, under VM-CMS, will use a set of interactive panel-driven tools, tailored to the New York TRACON demonstration, but based on commercial products. The tools include automated design issues, program trace reports, software accounting and development planning, as well as panels designed to interactively run batch work, such as compilations.

The demonstration data processing subsystem will be connected to the demonstration CEDS through a 2281 BX processor channel. The demonstration CEDS consists of a Device Attachment Control Unit (DACU), driven by an IBM PC, and a graphics display, comprising a display generator with attached data entry device and a monitor.

The demonstration operational software architecture is described in detail in "5.0 Software Architecture". In summary, the ARIS applications, including Entry, the test mode simulated inputs driver, will run under MVS-RTX and will use the services of MVS and RTX through an applications services interface developed for the New York TRACON demonstration. There will be no software recoded or developed for recovery or availability functions. The CDR Editor will execute under MVS-ISO after the operational run is complete.

5.2 Software Architecture

This section is in two parts. The first subsection describes the rationale for the demonstration operational subsystem software architecture and our approach to structural changes in the applications software. The second subsection is a formal list of definitions and rules describing the expected behavior of the operational subsystem software.

The software architecture of the development subsystem is commercial off-the-shelf. Our overview of the products and their capabilities refer to the "New York IRACON Operational Demonstration of Program Recoding Technical Proposal," and "4.0 System Architecture".

Demonstration of Software Architecture Description and Rationale

Running the New York IRACON operational data processing subsystem to execute on an IBM S/370 processor and interface with S/370 peripherals requires that structural changes be made to the current software, which executes on an IOP.

The Differences between the IOP and S/370

Operating supervisors bind applications programs and their data to the data processing resources (processing time, memory, channels, I/O devices, etc.) they require to do system work; e.g., track an aircraft. (This binding of work to programs and hardware is often referred to as a task.) In doing so they provide each application with an interface

- To the processor and its memory and channels
- To external data processing resources, such as I/O devices, communications lines and other systems
- To the application user and the operator
- To the other applications.

The differences between the current operational subsystem and the demonstration operational subsystem with respect to software architecture turn on these four interfaces, the last determined by the rules for concurrency and sequential processing. (Although the 3083 is a uniprocessor, tasks will run concurrently just as in the IOP system.)

The differences caused by different generations and models of equipment, including the processor, its instruction set, etc., are documented in the principles of operation and design data for the IOP hardware and for the S/370 hardware, and will not be elaborated on here. (As described in "3.0 Software Requirements", the demonstration system will process data only in IBM S/370 format.)

The demonstration operational subsystem is much more constrained than the current system in that the demonstration processor will interface only with DASD files and a single DEDS display. The demonstration operational subsystem will not process bulk flight data, and it will not interface with ARICOR. It will not allow operator or applications user inputs (there will be no interface to a SRAP) during its execution. There will be no realtime recovery. It will process simulated inputs from DEDS keyboards and from interfacility (ARICOR) interfaces through Retrack. Retrack will read the inputs from a file resident on a 3380 DASD, and the CIR records generated by the demonstration run will be written to a file also resident on a 3380 DASD.

The demonstration operational subsystem applications will be a subset of the current applications, but the overall data flow and data processing of the system work will be the same. Retrack will read CIR records and pass them to the interactive processors: keyboard and interfacility for input parsing and validation, and to the target acquisition processor (MORPHY) for collection and buffering; the resultant data will be used to track the simulated targets. Retrack will pass the data that are candidates for display to the display processor; they will write it to the situation display.

In the current system the rules for concurrent and sequential execution of applications are encoded in a lattice and carried out and enforced by the IOP. Because the IOP is a multiprocessor, the MPE assigns system work to the applications software in a strict time-sequenced order and then allocates the work software back to an available IOP. The multiprocessor achieves maximum concurrency by executing programs on multiple computers, at the same time. The primary objective of the overall architecture is that the IOP tasks search for work in order to keep the processors busy. (This is not the case in the demonstration system.)

In the demonstration system, the rules (described in the section that follows) will be implemented through a combination of user data, generated by the data generator (see below), and through a data base owned privately by the operating system. In the rules are not as rigid; no lattice is required. The overall flow of control and data through the applications will be the same as both systems. But the performance characteristics of the S/370 3083-BX processor, its speed and memory capacity, simplify the synchronization and binding of work to software and hardware. In place of a lattice, a set of tables will be generated that define the number and priority of each application task and the resources that each task needs that each task will need. After system generation the scheduling and formatting of tasks will be automatically without regard for processor availability as a constraint. Unlike the current system, tasks wait for work and execute without the constraint of maximizing system resources.

Monitors and Operating Systems

The supervisor we have chosen to control the execution of the ARICOR applications is MVS. MVS is a general purpose operating system, unlike the MPE, the NAS Monitor and Host Monitor, which are monitors.

original Houston control program was modified and called RIX. It is now in use supporting several large-scale realtime systems for NASA and the U.S. Air Force.

RIX is a small set of programs that allows realtime applications to use the services of MVS -- not unlike ISJ, which allows MVS to be used in interactive development. Because the processing constraints of realtime tasks are greater than for most systems (data base, etc.), RIX is a markedly simpler operating than the other systems programs listed above. RIX provides another layer of task, storage, time, and interrupt control in order to significantly limit operating system overhead. It uses data supplied at system generation to tailor the system to the application it is running, and by executing user-supplied problem state tables, it can chart course in the message. The tables include the priority of the service by the application, any interrupt overheads and timing overheads for finding and passing of the service request by the interrupt, the execution of the service by the supervisor, any tasking overheads, and the return to the user. In addition, timing after the service request. The timing does not allow the time the application spent waiting to be displaced. The timings are averages, and the real runs then represent trends.

AVERAGE PROCESSOR TIMINGS (micro)

Function	MVS	With RIX
Storage Manager	755	98
Interrupt Manager	1180	47
Task Management	1850	215

The MVS RIX IBM is developed, and it will be used to develop the RIX applications from the implementation of the application and control program. The application driver and control determination message (between the applications task) control the application so that the application programs can be implemented and the control program is independent of the operating environment as possible.

Appendix B: Minimizing the Impact of Structural Changes

A realtime application typically contains these parts:

- An interface to the supervisor to receive work and send it to another application asynchronously
- An interface to the supervisor to acquire internal data processing services, such as time and memory, while performing at a real world pace
- An interface (through a supervisory access method) to request I/O services, including the checkpointing of data for recovery
- An interface with a data base that ensures a deadlock-free and coherent system state
- The algorithms that perform the functional capability.

In transporting the ARFS applications from an IOP architecture to a S/370, our objective is to isolate the algorithmic part of each application as much as possible, thereby maximizing source code traceability from one system to the other. We have achieved this through architecture and design.

The applications software topology is an internal network, much like a system that is functionally distributed across different processors; in this case the processors are internal tasks. Each task owns the data that it needs; global data is minimal. Tasks communicate with each other similar to processors in a network, through well-defined messages. All I/O requests have been localized in three tasks, interfacing with the input CDR file, the output CDR file and the DEDS.

Deleted

Within tasks, an application receives requests for work in a single program called a gateway. (The model for a gateway is provided below in "5.2 Operational Software Architecture Definitions and Rules".) The gateway interfaces with RTX to receive work and call the appropriate application routine to process the work.

Rationale for Application Software Changes

The following chart summarizes the rationale for changing each of the major ARTS application tasks being converted. There are five factors that may change the structure and content of a task:

- (1) Operational constraints: the demonstration will operate in test mode with additional constraints; unlike the field system, we will not support recovery, we will not allow operator inputs during the run, etc. (refer to "3.0 Software Requirements")

- (2) Functional requirements: the demonstration system will not develop all the functions (as described in a particular NAS MD) specified for a functional area (refer to "3.0 Software Requirements")
- (3) Architecture: as described at 1.0 there will be changes due to the impact of a new system and software architecture
- (4) Ada design: Ada enforces design properties that may or may not be congruent with the design properties resulting from the original hardware TRACON software design
- (5) HOL (Pascal/VS): the effects caused by the recoding of ULTRA source code into a high order language

Each change is assigned a value of high, medium or low. If the change is assigned a value of low, it means that the rationale for change, such as a different architecture, is not much of a factor in conducting that application. If the value is high, that particular rationale for change is a significant factor. The value, high, medium or low is not related to how well the resulting design protects against future changes in each of the areas; on the contrary, because of the steps which have been taken to host the applications in an environment that makes them easy to modify and portable, the value with respect to future changes would be low.

Task	Factors	Value	Rationale
CDR Editor	(1)	Low	Operational concepts: similar
	(2)	Medium	Fewer report types
	(3)	Medium	In S/370 environment: no KIP
	(4)	Low	Minimal data decomposition
	(5)	Medium	Data types & control structures
Retina	(1)	High	No keyboard: no backup
	(2)	High	Similar functions
	(3)	High	S/370: software interfaces
	(4)	Medium	Data hiding concepts
	(5)	Medium	Data types & control structures
CDR Extraction	(1)	Medium	No recovery from data loss: dist
	(2)	High	No filtering: extraction in appl.
	(3)	High	S/370 standard I/O interfaces
	(4)	Low	Minimal data decomposition
	(5)	Low	(2) and (3) requires decode
DEDS Access	(1)	Medium	No keyboard: no backup
	(2)	Low	Similar functions
	(3)	High	New technology display
	(4)	Low	Minimal data decomposition
	(5)	Medium	Will use AL and Pascal/V5
Interfacility	(1)	Medium	No ARTCC interface
	(2)	High	Markedly reduced functions
	(3)	Medium	New software interfaces
	(4)	Low	Minimal data decomposition
	(5)	Medium	Data types & control structures
Keyboard	(1)	Medium	No keyboard
	(2)	High	Reduced functions: no KIP
	(3)	Medium	New software interfaces
	(4)	Low	Minimal data decomposition
	(5)	Medium	Data types & control structures
PSRAP	(1)	High	No SRAP: no recovery
	(2)	Medium	Reduced functions
	(3)	Medium	New software interfaces
	(4)	Low	Minimal data decomposition
	(5)	Medium	Data types & control structures

5.2 Operational Software Architecture Definitions and Rules

Introduction

Software architecture describes the mapping of system application work and system operations work to the software. The architecture should answer the questions: What is the unit of work and the unit of software, including the major data bases? How are the work units allocated to the software units? How is the work synchronized? How do the software units communicate with each other? And how do they carry out their work using available data processing resources such as the processor, its storage, and I/O channels.

Scope

The description that follows defines the structure and behavior of the online system (see definitions). The offline work, identified below, will be performed in a standard, batch environment. We are not developing any software to control the flow of work through the offline system; the software architecture is provided commercial-off-the-shelf, viz., VM/SP and MVS.

There are two types of work required of the New York TRACON software system: applications and operations (the work required to start, monitor and control, and terminate the system, regardless of the application).

The description of the software architecture pertaining to system operations (see definitions below) is limited; the text concentrates on the software architecture of the applications work and the software services required to perform it. The New York TRACON demonstration system's support for system operations is limited to the capabilities provided by the commercial-off-the-shelf operating system, MVS. MVS provides the capabilities to allow the operator to start and terminate the system.

Objective

The objective of a realtime system software architecture is to record as many, as possible the rules for software development, and the developmental design, for sequential design (s), for concurrent design (c), and for system performance (p) while modeling as closely as possible the behavior of the real world. The rules will state the invariant conditions between d, s, c and p; the rules for d, c, for example, should not be defined without regard for their impact on the rule for s, etc. There should be as few rules as possible, while stating all the invariants. (Defining a rule that all modules shall execute sequentially satisfies the condition but avoids entirely the second.)

The New York TRACON demonstration system software architecture -- the rule set for s, c and p -- is defined below in more application and method specific terms. The developmental design is described in terms of levels of Ada packages; the sequential design in terms of what defines a TRACON Ada package -- which requirements are clustered within each package; the concurrent design in terms of subtasks and software messages -- both of which will be described later in more concrete terms; and the performance in terms of S/C70, MVS, and RIX behavior.

Definitions (in alphabetical order):

- Ada package: a software unit that has a specification part and a body that defines an abstract data type and behaves as a state machine
- Applications: the ARTS work exclusive of operations, tracking for example; the software that automates that work
- Application resources: subset of data through which the system and the real world (traffic) would communicate: beacon and radar targets, tracks and flight
- Application rules: a set of rules containing system application messages, that define the processing constraints of the software; a process must complete one system application work unit, such as a track, before starting the next.
- Application work station command: an integral input from the system application work station
- ARTS: system that automates the work of TRACONS and their associated towers, Automated Radar Tracking System.
- Batch mode: execution of an offline program non-interactively.
- Concurrent design: the rules that describe how subtasks (see below) interact as they compete for system resources (processor, channels, data, etc.).
- Controller command: a keyboard action from the DEDS
- Controller sector: an area of real airspace mapped onto display coordinates that composes an application work station.
- Conversation: Two-way communication between processes.
- CDR: continuous data recording (logging by category).
- CTS: central track store (the set of track records).
- DEDS: ARTS data entry and display subsystem.
- Flight: the set of data that defines and characterizes an aircraft controlled within ARTS.
- Gateway: a set of programs and data that provide the concurrent interface control for a package.
- Interactive (I): a process initiated by an external input that may interrupt and modify the flow of data through the system.

- Interactive application work station: The device (the LPPS) (including hardware and software), functions and people that interact with the system to create, observe, modify or delete system application work.
- Level-1 package: the top level software parts that compose the monitor and application software, in sequential design, the Ada packages that define the top level abstract data types; in concurrent design, the subtasks (see below).
- Level-2 package: an implementable module that decomposes from a level-1 package.
- Monitor: a set of programs and data that provide data and control synchronization for the software system without knowledge of the application.
- MVS: IBM's batch operating system.
- Online: a run (or execution) of the New York IRISCH operational system. The online system runs under MVS RTX.
- Offline: a run separate from an online run; a data processing job that runs under MVS (but not under RTX) or VM.
- Operational mode: running the ARTS with live target and live user interaction -- as it would be run in the field.
- Operations: work required to run the system (hardware, software and human interface to them); the software that automates that work, part of the online operating system.
- Operations messages: units of data through which the system and the host or machines running the system communicate.
- Operations work: units of data containing system operations messages.
- Operations work station: The device (including hardware and software), functions and people that interact with the system to create, observe, modify or delete system operations work.
- Pipeline (P): a set of processes that execute in order: process A produces data for process B and so on.
- Process: the execution of a subtask that operates on a unit of application work.
- RTX: IBM control program running under MVS to provide realtime services to applications running under it.

- Second-order messages: application messages that modify the state of a track or a flight.
- Sector: a subset of an antenna scan; there are 32 sectors per scan; a sector's worth of tracks or targets.
- Sensor: a unique radar antenna; a full antenna scan of targets.
- Sequential design: the decomposition of an software system into parts and their serial execution; sequentially executed in a deterministic way without regard to dependencies, data sharing, data contention, and the impact of external events on the system.
- Software measures: units of data through which packages communicate.
- Subtask: a set of application software that operates independently, and is dispatchable under MVS-RTX; the binding of a work unit to a level-1 package.
- Targets: a set of beacon and radar messages.
- Task: the automatic execution of system work under the control of an operating system that allocates and monitors all the system resources (channels, devices, memory, programs etc.) required to perform the work.
- Test mode: running the ARTS system using simulated targets, flights, and controller commands.
- Track: a computer model of an aircraft's position and velocity, -- maintained in real world and display coordinates; a dynamic record of the aircraft's behavior.
- Type: a specification of the operations that can be performed on a set of data.
- Work hierarchy: a tree of categories of work units; categories are numbered from 1 to n, where 1 is at the top of tree.

Packages and their Attributes:

The figure below describes 10 application level packages, 9 online, and 1 offline (the GCR Editor); and 1 monitor (MD) package. The attributes and information of Message Control, 3) Timing Control.

(The Level-1 Ada package name is noted in the column header package identifier below)

Monitor Packages:

The Initialization and Termination package will be used when initialization and termination to synchronize startup and shutdown.

A pair of services, Send and Receive, will provide the means for communications between subtasks. Send and Receive will be processed by the Message Control package that provides communications error checking and assures 80% services for synchronization and buffer management.

Timing Control will ensure that all system work completes on time as it moves through the system, and will provide timer services to the other packages.

Initialization/Termination	ADM-1000
Message Control	ADM-1000
Timing Control	ADM-1000

Application Packages:

The application packages decompose the New York PACER demonstration system at the top level. Each of these will further decompose into 10 to 20 packages.

There are 3 classes of application packages, each with special attributes:

- Interactive
- Pipeline
- Data DB

Offline: the offline package, the CDR Editor, runs under VM, takes the operational software. It runs under VM, under CDR. It converts the data generated by the operational execution as input, and generates a new data set.

The offline package, CDR Converter, converts the input CDR tape from 9-track ULTRA format to Pascal/VIS format readable and processable by the demonstration system.

CDR Editor	(TM04\$5\$5\$)
CDR Converter	(TM14\$5\$5\$)

Control: there are three control packages:

Control	(TM05\$5\$5\$)
CDR Execution	(TM06\$5\$5\$)
DEDS Access	(TM07\$5\$5\$)

Although each package has unique attributes, the overriding attribute that binds them is that they are responsible for controlling the applications work, its synchronization and flow, as it interacts with I/O devices.

The DEDS Access software will be largely commercial off-the-shelf; a small part of it will be developed.

Interactive applications packages that can run as processes and receive their input only from Control packages; they process applications work without knowledge of Control and Data operations and can access Data packages concurrent with Pipeline packages and other interactive packages. They may converse with pipeline packages; they interact with P.

Interfacility
Keyboard

4000
4000

Pipeline applications designed that
Control package or another Pipeline package
package and can access Data packages
Interactive package. Pipeline packages

Target Application (TBSAM)
Tracking
Display

4000
4000
4000

Related

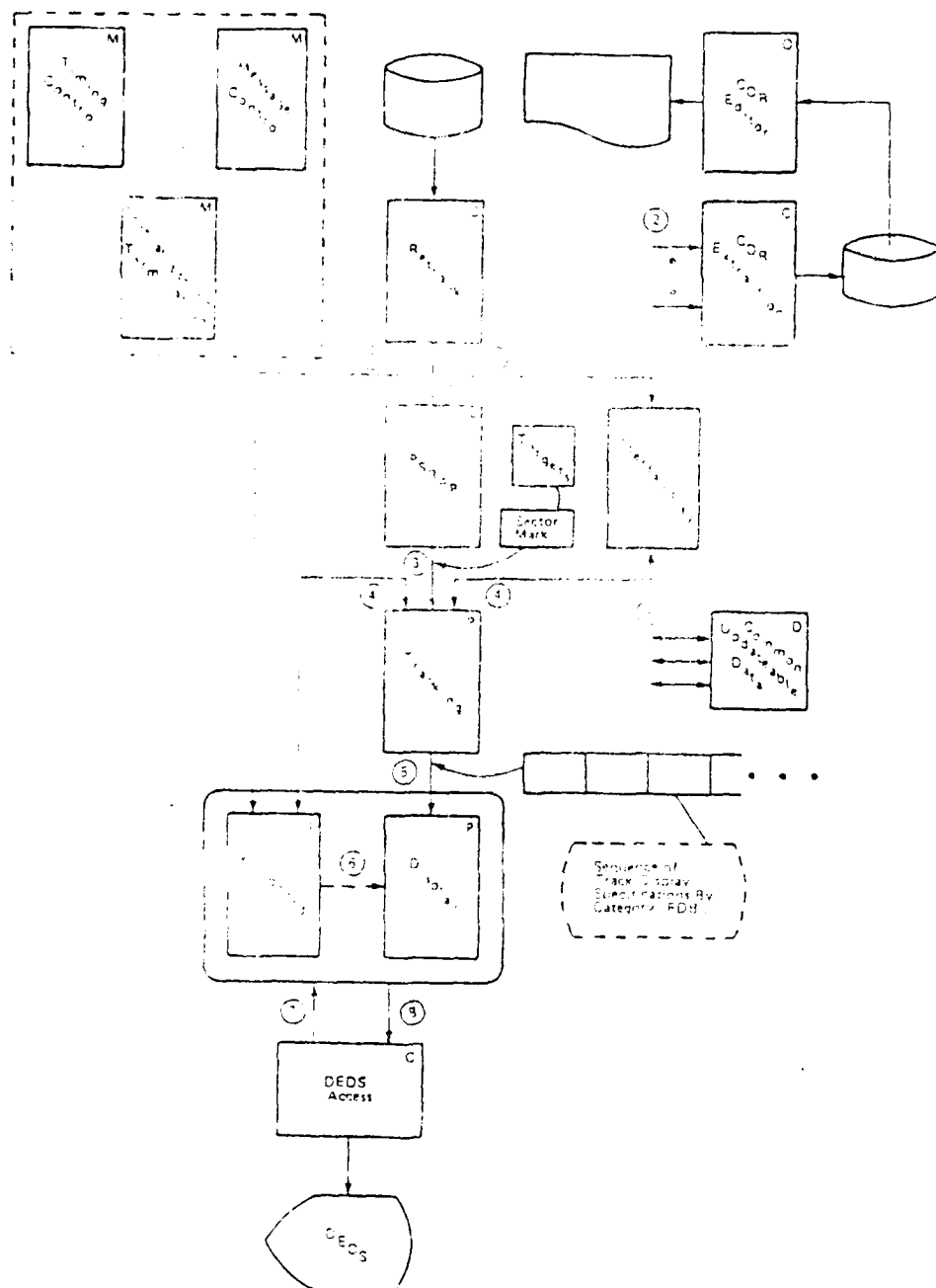


Figure 1 New York TRACON Demonstration Operational Software Architecture

Rules:

I. System Work

- The demonstration system will run in test mode. No work will be permitted into the system except from the CDR input file during execution.
- The indivisible units of system application work are the application messages: 1 - targets (location and other data), 2 - flight
- The work hierarchy for the system application work is:
 - 1 - CDR record
 - 1 - controller sector
 - 1 - application work station command (demand)
 - 1 - TRACON airspace
 - 1 - sensor
 - 2 - sector
 - 3 - target
 - 3 - track
 - 3 - flight
- In test mode, CDR records -- containing the scenario data, the target flights, etc., from an earlier run -- are read from a CDR file and new CDR records are generated by the application program and stored in a file, periodically during system execution, by the CDR extract.
- A controller sector is a subset of a sensor's airspace. It is an application work station. It represents the set of tracks and targets within a sensor that are eligible for display.
- An application work station command is a message from the CDR to the application work station. In test mode the commands will be read from CDR records and passed directly to the Keyboard package; in operational mode commands will be directed to Keyboard from the DIDS Access package.
- A sensor represents the targets (and other messages) that are received through a SRAP from a single antenna. The internal representation of target and track data will be sorted by sensor.

- A sector is 1/32 of an antenna sweep -- all the targets and tracks that lie within that wedge. The internal representation of target and track data will be sorted by sector.
- In operational mode, targets enter the system through a SRAP, as a continuous sequence of messages; in test mode, the messages are read from CDR records.
- Tracks are created automatically by the tracking software -- as a result of the receipt of a discrete bearing stream (called automatic initiation) or as a result of a track handed off from an adjacent ARIS or NAS facility -- or manually by human command. In test mode, tracks will be automatically initiated or will be read from CDR records simulating the interfacility and keyboard inputs.
- In operational mode, flights enter the system from an adjacent facility or through a batch (bulk) sequence of pre-defined flight plans, or manually, by human command. In test mode, flights will be read from CDR records simulating the interfacility and keyboard inputs. (In test mode, bulk flights could be read from a tape as they would be in operational mode; but, for the demonstration, there will be no bulk processing.)
- Sensors, sectors and controller sectors contain integral target and tracks.
- CDR records contain integral targets, tracks, flights and work station commands.

II. System Parts and their Work

- There will be six classes of level-1 packages (see below).
 - Monitor (M)
 - Offline (O)
 - Control (C)
 - Interactive (I)
 - Pipeline (P)
 - Data (D)
- The Initialization and Termination package (M) will synchronize the system startup and shutdown by sending and receiving notification messages to and from the other packages. It will process operator requests to start and stop the job. (In operational mode there would be an interactive interface with the operator; in test mode, the operator will cancel the MVS job and there would be no interaction with the package.) If the run is terminated gracefully for other reasons, a processing timing parameter is exceeded, this package will be retained. Its retained data will include the names of the other packages and information about their processing states.
- Message Control (M) will field the communications primitives issued by the other packages and interface with RTX to provide the appropriate (space) resources.
Deleted
- Timing Control (M) will periodically determine if the pipeline deadlines are being met; if they are not it will record the event. Its retained data will include the critical system events and elapsed times for each. It will terminate processing if a critical event does not occur within the expected time. It will provide timing services to the other packages.
- The offline package, CDR Editor (O), will execute in batch mode under VM. It will read the CDR (output) file (on tape or disk) and generate a listing of the online system's journal. The listing will show that the demonstration system functions are equivalent to those in the current New York TRACON system.
- The offline package, CDR Conversion (O), will execute in batch mode under VM. It will read the CDR (input) file and convert the CDR messages from ULTRA format to PASCAL format. All fields in messages processed by the demonstration system will be converted. Time will be converted from 1/1024ths of a second to 1/1000 of a second (milliseconds).

- The online application packages and their primary work units are:

DEDS Access (C)	== Software messages
Retrack (C)	== CDR records
CDR Extraction (C)	== CDR records
Interfacility (I)	== Flights
Keyboard (I)	== Controller commands
Target Acquisition (I)	== TRACON data and
Tracking (I)	== TRACON data and
Display (I)	== Data for display on
	terminal

Deleted

- The DEDS Access package provides -- through commercial off-the-shelf and developed software -- the link level I/O support between the Display Outputs application and the DEDS. Because controller commands (keyboard inputs) will be input from Retrack only, DEDS Access will support outputs only. DEDS Access will use MVS services to provide channel- and interrupt-level I/O support. It will retain data about the DACU and the display generator pool.
- Retrack will read the CDR tape containing the recorded transactions from a previous execution of the full ARTS system (not our demonstration system). Retrack will read target, controller command and flight records into its internal buffers and pass the target records to the Target Acquisition package, the commands to Keyboard, and the flight data to Interfacility. Retrack will not pass work that has already been identified on the CDR tape as in error. Retrack will send second-order messages, modifications to existing flights and tracks, to Interfacility and Keyboard. If the messages are out of sequence they will be recorded as errors on the CDR output by Keyboard or Interfacility. (Retrack will not interface directly with the CTS as in the current New York TRACON system.)
- CDR Extraction will receive software messages from the other online packages, transform them to CDR records and write the records to the CDR (output) file using a standard MVS access method.
- Interfacility will receive flight data from Retrack. It will check for applications errors (such as out of sequence second-order messages) and send software messages containing track-related fields to Tracking. Tracking will ensure the coherency of the values sent in the message (with respect to the current data retained within Tracking) and either commit the data and return a success indicator or not commit the data and return an error indicator.
- Keyboard will receive flight data from Retrack. It will check for applications errors (such as out of sequence second-order messages) and send software messages containing track-related fields to Tracking. Tracking will ensure the coherency of the values sent in the message (with

respect to the current data retained within Tracking) and either commit the data and return a success indicator or not commit the data and return an error indicator.

- Target Acquisition will determine the sector boundaries and sort the target data by sensor--sector, sending the data (sector data and target data) to Tracking.
- Tracking will perform automatic acquisition, discrete correlation, standard correlation, smoothing, and prediction; track termination; inter-sensor linking. Tracking will receive its inputs from the Keyboard and Interfacility. It will create a sequence of software messages containing the application work station and data blocks eligible (for display) work station. Tracking will maintain the sensor--sector data base, the target data base, the tracking data base (CTS) Beacon Only Table (BOT), the Radar Only Table (ROT) and the Radar Address Table (RAT) -- that defines the mapping of CTS entries to target entries and vice versa -- within its package.
- Display will output to the DEDS full data blocks for associated tracks, limited data blocks for unassociated tracks, partial data blocks, tabular lists and some system data, such as time. It will control the relative offsetting of data blocks if they overlap on the display. Display will receive a sequence of messages from Tracking for each work station eligible for display updating. Timing Control will send the data to Display. Display will access non-tracking data from the Common Updateable Data package. Display will maintain internally the data that describes the model for all outputs at each level of protocol and the data necessary to convert internal information to a display topology and output it to a DEDS monitor. Deleted.

III. The Decomposition of Parts

- Level-2 packages will decompose from Level-1 packages.
- The relationship between a Level-1 package and its Level-2 packages can be one-to-one or one-to-many.
- Level-2 packages will provide type management for the data refined or decomposed from the Level-1 retained data: for example, a Level-2 Tracking package would control the access to RAT.
- Level-2 application packages will work on integral units of system application work.

IV. Tasks and Concurrency

- A subtask will execute independent of and concurrent with other subtasks.
- All Level-1 application packages will map one-to-one onto a subtask.
- Deleted.
- Level-2 application packages will execute sequentially within a subtask.
- Message Control will ensure that all subtasks are synchronized -- via the Send and Receive primitives.
- The synchronization of a Level-1 package (i.e. subtask) with other Level-1 packages will be centralized in a single Level-2 package, if the mapping of a Level-1 to -2 package is one-to-many, or in a single procedure, if the mapping is one-to-one. The single procedure or package is called a gateway. (See Section VII for the mapping to Pascal programs.)
- A subtask will, if possible, request all the data that it does not own (encapsulated by a D package) prior to executing its sequence of algorithms.
- Subtasks need not queue work (work queuing will be provided by PTX -- see below) unless it is required by the Level-1 package, such as Updateable Data queuing requests to update the same data.

V. Communications Between Subtasks

- Monitor (M) packages may communicate and converse with any subtask.
- Control (C) subtasks may communicate and converse with any subtask.
- Data (D) subtasks may communicate and converse with any subtask.
- Pipeline (P) subtasks may converse with Interactive (I) subtasks (P ↔ I).
- Pipeline subtasks may not converse with other Pipeline subtasks (P ↔ P); they may direct work only to the "next P" subtask in the pipeline.
- Interactive subtasks may not communicate with each other (I ↔ I).
- Only Control (C) subtasks may perform requests for I/O.
- All subtasks will communicate through the same means, using Send and Receive commands via Message Control.

Sends:

- There will be 6 categories of Sends:
 - 1) Sends that start a process and do not converse
 - 2) Sends that start a conversation (they start a process and wait for a response)
 - 3) Sends that end a conversation by responding to a waiting subtask, and
 - 4) Sends that schedule an event (to initiate a process) at a delay time from the present
 - 5) Sends that schedule a cyclic event
 - 6) Sends that schedule an event (to initiate a process) at an absolute time in the future
- A Send to a Data package represents a request for data.
- Send will pass data contained in a communication packet.
- The communication packet will consist of a header followed by the user record.

- The header portion of the record will contain the sender, receiver and record identifier (command).
- The command will imply the specification of the user record and the order of the values that follow.
- The user record may be a buffer.
- A buffer is a one-dimensional array containing no metadata, no data about the data in the array; for example, a buffer may contain a sequence of target reports. (A reminder: arrays are fixed-length.)
- A record passed in a Send is transient; permanent records reside in a primary or secondary storage data base (see "Data Base and Data Coherency" below).
- A user record may contain a sequence of records.
- All types in a sequence must be of equal length.
- Transient records can not be recursive; the type field can not be followed by a type field.
- Examples of illegal transient records:

Illegal:

1. A sequence of one record
`<LDB> <LDB> <field_a> <field_b> ...` recursion
2. A sequence of two records
`<TAB> <field_a> <field_b>`
`<TAB> <field_a> <field_b> <field_c>` variable length
3. A sequence of one record
`<field_a>` value-only --
no type name

- Conversational Sends (categories 2 and 3) will be modelled as either a
 - (1) procedure call -- the passed values will be processed by the receiving package and a value indicating the success of the operation will be stored by the "return" Send; or as a
 - (2) function -- the type defines a set of values that will be returned by the "return" Send; (Example: a sending package requests a D package to return a named record; the type field is the name of the transaction -- e.g., read, and the name of the variable, the remaining fields in the record specify the sequence or implied hierarchy of values to be returned by the D package).

Receives:

- When a Package is invoked, it issues a Receive to obtain its communication packet. The communication packet may contain :
 - a Send from Initialization and Termination to startup or shutdown
 - a Send from another package of buffer data or records.

Reliability:

- Message Control will type check the Send command and the
- Each package will type check records; buffers need not be type checked.
- No link-level protocol will be implemented to ensure that receiving packages receive sent data -- the demonstration system is providing minimal realtime recovery.

The Send and Receive commands:

Legend:
<> defines a component
() means it is optional
is an "or" symbol
::= means is replaced by

<Send> <Category> <From_task> <To_task> <CMD> <Record_address>
<Record_length> <Timed attribute>

<Timed attribute> = non-zero if category is 4,5,6

<Receive> <Address of communication packet>

VI. Data Base and Data Coherency

- The data base comprises sets of records
- Data sets can be in primary or secondary storage.
- There will be 5 categories of data:
 - read-only data such as system and site parameters; these data will be directly accessible by each package
 - retained data encapsulated by a P, C, I, or M package that provides synchronous data base services within the subtask (the Level 1 package state data), or within the Level 2 package
 - local variables, required by the various Level-2 package procedures
 - records on secondary storage devices
- Each data set, except local variables, requires a header to identify the data set.

VII. Executing the Online System under MVS and RTX with Pascal

Building the System

The system is built and initialized for execution under RTX using tables created in the execution Job Control language (JCL), which is explained at execution time. The instructions to RTX entered as part of the JCL are:

Before using the datasets must be created pre initialization:

- All load modules for the compiler, the TRACOR application.
- Mappings and tables to be used by RTX in system initialization:

The Master Communications Vector Table (MCVT) is a COPY source member maintained by RTX. The MCVT is used to define Subsystem Communications Vector Tables and Initialization List Tables and is used in the assembly of application programs.

The Subsystem Communication Vector Table (SCVT) is a COPY source member composed of macro and assembly language statements. The SCVTs are used to define Initialization List Tables (ILTs).

Initialization List Tables (ILTs) contain information required to configure the execution. They contain the names of all load modules, work queue definitions, tasks to be initialized, buffer pool definitions, and work area definitions.

- Job Control Language is used to specify the RTX version and to specify the data set names containing the MCVT, SCVTs, ILTs and load modules to the MVS batch initiation system.
- JCL input control commands are part of the input stream to the RTX job and select options to be used during a particular execution.

Tasking

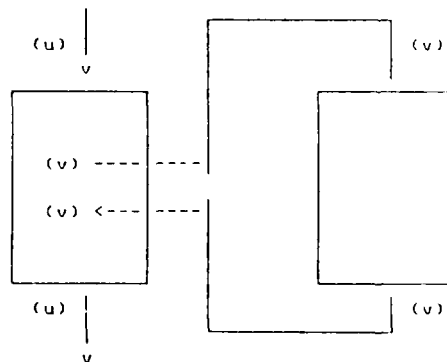
- A copy of Message Control will be linked to each application load module.
- Timing Execution Control will be implemented in the bridge of each task. (Each task contains a bridge that is the entry point for that task. The Pascal Gateway is a reentrant procedure that is invoked from the bridge.)
- A copy of Timing services will be linked to each application load module.
- Initialization and Termination will run as a subtask.

Load Modules

- Each subtask will be an independent load module.
- The entry point for each load module is contained in a bridge for the load module.
- The bridge contains data used by Timing Execution Control.
- The bridge passes a pointer to the task's state data to the gateway.
- The bridge is written in Assembly language and is not reentrant.
- The Gateway is a reentrant Pascal routine.
- RTX will be in an independent MVS address space.
- Each load module will have only a single entry point.
- A copy of the read-only data will be linked to each load module.
- A copy of the Pascal run-time modules will be linked to each load module.

Subtask Communications:

- Subtasks will communicate asynchronously. (In the case of conversational Sends, communications will take place through a combination of synchronous and asynchronous RTX services.)
- Subtasks will communicate (u) and converse (v) in the following manner, with respect to enter and exiting load modules:



- The Send implementation uses the following RTX services:
 - GKENTER, GKEXIT - standard entry and exit linkage
 - GKQWORK - queues a unit of RTX work on an RTX server
 - GKADCK - finds an RTX server to use
 - GKSSUB - requests a buffer from RTX
 - GKST - returns a work buffer
 - GKTRF - transfers time from one reference to another
 - GKTRK - requests a unit of RTX work on a timed basis
 - GKTIME - returns the current time in milliseconds or hours
 - GKLTAB - addresses of flightmode table
- Category 2 Send: queues a unit of RTX work on an RTX server and wait for completion of the work. This is a synchronous work request. Information to satisfy the work request will be placed by the invoked task into a work server buffer acquired by the requesting task at initialization.
- Category 3 Send will respond to a category 2 send by moving the requested information into the requestor's buffer. RTX will inform the requesting task that the work request is complete when the task containing the Category 3 Send terminates. This is a synchronous work request.
- Categories 4, 5 and 6 queue work on a work server to execute at a specified time in the future.
- Receive will be used by an application package after a category Send to locate and access the data placed in the Work Queue buffer by the originator of the Send.

The Relationship of Ada Packages to Pascal Compilations:

- A Pascal load module comprises a single Main program and some number of nested levels of procedures. The Main program controls and manages the interface to other Pascal load modules and the interfaces within its load module. In short, Pascal presumes a hierarchy of programs within a load module. The demonstration architecture presumes that a load module contains a network of Ada packages (or a single node), each comprising a small set of procedures.
- Because a Level-1 Ada package (a load module) may decompose into one (the single node case) or more Level-2 Ada packages, and Pascal/V5 expects the relationship of a load module to a Main program to be one-to-one, the relationship of Level-2 Ada packages to Pascal programs may vary:

Single node case:

- If a Level-1 Ada package decomposes into only one Level-2 package, the Gateway will be the Pascal Main program and its subordinate Pascal procedures will be equivalent to the Level-2 Ada procedures.

Multiple node case:

- If a Level-1 Ada package decomposes into more than one Level-2 package, the Gateway will be the Pascal Main program -- as in the single node -- and its immediately (the first level of nesting) subordinate Pascal procedures will be equivalent to the Level-2 Ada packages. The procedures nested under the first level procedures, then, will be equivalent to the Level-2 Ada procedures.

Primary Storage Management:

- Primary storage (an RTX buffer) will be allocated to each task during the first execution of the task (at initialization time).
- Each time the task is subsequently entered, the bridge for the task will obtain the pointer to the buffer and pass it to the gateway for the task.
- The data that exists across executions of the task is State data.
- Variables created by any procedure within a package will be allocated when the procedure is invoked and released when the procedure exits.
- As part of the Send processing, a task will acquire a work queue buffer to be used by Send and Receive.
- All primary storage will be deallocated at task termination.

Secondary Storage Management:

- A CDR input file, in IBM external and internal format, will be resident on DASD at the start of the online run.
- A CDR output file, in IBM external and internal format, will be resident on DASD at the end of the online run, and it will be accessible to the CDR Editor, running under TSO.
- A LOGREC file will be available at the end of the online run.
- An RTX log file will be available at the end of the online run.
- There will be no system parameters or variables maintained in secondary storage.

- There will be no recovery files maintained in secondary storage.

Recording System States and Recovery:

- There will be no realtime recovery.
- There will be five mechanisms for recording information about the state of the system:
 - the processor and MVS will record equipment errors on the LOGREC file
 - the applications will record data for CDP
 - the applications can log an error with RTX and continue
 - the applications can log an error with RTX and ABEND
 - the applications can log an error to a SYSOUT file (this may be available only in debug mode)
- An ABEND may cause the demonstration to terminate.

Device Access Methods:

- Applications will interface with the disk and tape devices through standard Pascal/VS services.
- Input/Output facilities in Pascal/VS will use the following OS access methods: Queued Sequential Access Method (QSAM) for sequential data sets and Basic Direct Access Method (BDAM) for random record access. An interface to the Graphics Access Method (GAM) will be supplied by assembler programs residing in the DEDS (Data Entry and Display Subsystem) package.
- A data definition entry (//DD in JCL) will be included as part of SYSIN for the RTX job for the CDR input and CDR output files. Both files will be sequential data sets of fixed length records.
- The Retrack gateway program will declare a file variable that will associate the Pascal/VS internal name with the external data control block (DCB).
- Retrack initialization will open the CDR input file using Pascal/VS RESET statement. A RESET statement explicitly opens a file for input.
- Retrack will use Pascal/VS GET statements to read one record at a time from the CDR input file. Whenever an end of file condition is detected, Retrack will notify the Initialization/Termination package using a Send.

- When Retrack is entered at termination, it will explicitly close the file by using a Pascal/VS CLOSE statement.
- The CDR Extractor gateway program will declare a file variable that will associate the Pascal/VS internal name with the external data control block (DCB).
- CDR Extractor Initialization will open the CDR output file using a Pascal/VS REWRITE statement. A REWRITE statement explicitly opens a file for output.
- The CDR Extractor will use Pascal/VS PUT statements to write one record at a time to the CDR output file.
- When the CDR Extractor is entered at termination, it will explicitly close the file by using a Pascal/VS CLOSE statement.

Software Clock Maintenance:

In the current New York TRACON system, the oscillator speed updates the real time clock at intervals of 1/1024ths of a second. This is updated independent of any monitor or software within the system.

In the recoded system, we will use a software clock that is updated every 100 milliseconds. Since a sector mark on an antenna is crossed every 125 milliseconds, our analysis indicates that this is adequate for this demonstration.

The software implications of this are that each time Retrack executes, it will send all CDR input records to the proper tasks that have an earlier time stamp than the current time plus 100 milliseconds. It will then schedule itself for execution in 100 milliseconds.

A further consequence is that CDR records recorded during the demonstration run will be time stamped with the software clock time. That is, data recorded for a single antenna sweep will contain 32 different time stamps. The time stamp will differ from records recorded during a CDR run on the New York TRACON system.

A.0 New York TRACON A5.04 Data Dictionary

The Data Element Dictionary (DED) contains all the global data element names and descriptions. The main purpose of this DED is to define the usage of global elements and provide for configuration management control of these elements. This control of the data elements, along with their conventions, data typing, data base assignment, and description, enhances communication of information throughout the project.

The Data Element Dictionary may map multiple new names to a data element name in the existing NY TRACON system. This occurs when the UNIVAC 30-bit word is subdivided into halfword and bit variables. The new names comprise the old name with an integer appended; this integer indicates the different variables in the word.

The DED is maintained using the PC program dBASE III Plus. The structure of each record is as follows:

- COMPANY - the company responsible for coding the data element (D - DTC, I - IBM, P - PJA)
- DATANAME - data element name (for the existing NY TRACON system)
- data base - data base name (for the existing NY TRACON system)
- PAGENUMBER - page number in NY TRACON Coding Specs (for the data base) that describes the data element
- P1 - procedure name that references the data element

There are up to 10 procedure names; if more than 10 procedures set or use the field, additional lines (with DATANAME, data base, PAGENUMBR, TYPE, VARNAME, DBNAME, NEWPGNUM, and DESCRIPTION duplicated) are used

- S1 - indicator specifying whether the procedure sets and/or uses the data element

There is one S indicator for each valid procedure name

Valid settings of the S field are:

- 0 - Not available
- 1 - set by referencing procedure
- 2 - used by referencing procedure
- 3 - both set and used by referencing procedure
- TYPE - data element type code

Valid settings of the type field are:

- S - character string
- C - character
- L - boolean
- i - integer (short)
- I - integer (long)
- r - real (short)
- R - real (long)
- B - bit
- A - array (table)
- P - pointer (address)
- E - enumerated type
- VARNAME - new data element name
- DBNAME - new data base name: currently used to describe the task that will own the data element

Valid settings of the data base name are:

- NA - Not recoded
- ? - Don't know original data base, don't know new data base, etc.
- PSRAP - PSRAP
- TRACK - Tracking
- KBD - Keyboard
- DISP - Display
- IFY - Interfacility
- SPARM - Global System and Site Parameters
- SYSTEM - Global Parameters that are not System nor Site Parameters

- CDR - Continuous Data Recording
- RETRACK - RETRACK
- MSAW - MSAW
- CA - Conflict Alert
- blank - haven't worked on yet
- NEWFRNUM - page number in new data base document describing the data element
- DESCRIPT - data element description

The data elements are presented sorted by data base on the pages that follow.

Record#	COMPANY	DATABASE	PAGE	NUMBER	P1	S1	P2	SE	P3	S3	P4	S4	P5	S5	P6	S6	P7	S7	P8	S8	P9	S9	P10	S10	P11	S11	P12	S12	P13	S13	P14	S14	P15	S15	P16	S16	P17	S17	P18	S18	P19	S19	P20	S20	P21	S21	P22	S22	P23	S23	P24	S24	P25	S25	P26	S26	P27	S27	P28	S28	P29	S29	P30	S30	P31	S31	P32	S32	P33	S33	P34	S34	P35	S35	P36	S36	P37	S37	P38	S38	P39	S39	P40	S40	P41	S41	P42	S42	P43	S43	P44	S44	P45	S45	P46	S46	P47	S47	P48	S48	P49	S49	P50	S50	P51	S51	P52	S52	P53	S53	P54	S54	P55	S55	P56	S56	P57	S57	P58	S58	P59	S59	P60	S60	P61	S61	P62	S62	P63	S63	P64	S64	P65	S65	P66	S66	P67	S67	P68	S68	P69	S69	P70	S70	P71	S71	P72	S72	P73	S73	P74	S74	P75	S75	P76	S76	P77	S77	P78	S78	P79	S79	P80	S80	P81	S81	P82	S82	P83	S83	P84	S84	P85	S85	P86	S86	P87	S87	P88	S88	P89	S89	P90	S90	P91	S91	P92	S92	P93	S93	P94	S94	P95	S95	P96	S96	P97	S97	P98	S98	P99	S99	P100	S100	P101	S101	P102	S102	P103	S103	P104	S104	P105	S105	P106	S106	P107	S107	P108	S108	P109	S109	P110	S110	P111	S111	P112	S112	P113	S113	P114	S114	P115	S115	P116	S116	P117	S117	P118	S118	P119	S119	P120	S120	P121	S121	P122	S122	P123	S123	P124	S124	P125	S125	P126	S126	P127	S127	P128	S128	P129	S129	P130	S130	P131	S131	P132	S132	P133	S133	P134	S134	P135	S135	P136	S136	P137	S137	P138	S138	P139	S139	P140	S140	P141	S141	P142	S142	P143	S143	P144	S144	P145	S145	P146	S146	P147	S147	P148	S148	P149	S149	P150	S150	P151	S151	P152	S152	P153	S153	P154	S154	P155	S155	P156	S156	P157	S157	P158	S158	P159	S159	P160	S160	P161	S161	P162	S162	P163	S163	P164	S164	P165	S165	P166	S166	P167	S167	P168	S168	P169	S169	P170	S170	P171	S171	P172	S172	P173	S173	P174	S174	P175	S175	P176	S176	P177	S177	P178	S178	P179	S179	P180	S180	P181	S181	P182	S182	P183	S183	P184	S184	P185	S185	P186	S186	P187	S187	P188	S188	P189	S189	P190	S190	P191	S191	P192	S192	P193	S193	P194	S194	P195	S195	P196	S196	P197	S197	P198	S198	P199	S199	P200	S200	P201	S201	P202	S202	P203	S203	P204	S204	P205	S205	P206	S206	P207	S207	P208	S208	P209	S209	P210	S210	P211	S211	P212	S212	P213	S213	P214	S214	P215	S215	P216	S216	P217	S217	P218	S218	P219	S219	P220	S220	P221	S221	P222	S222	P223	S223	P224	S224	P225	S225	P226	S226	P227	S227	P228	S228	P229	S229	P230	S230	P231	S231	P232	S232	P233	S233	P234	S234	P235	S235	P236	S236	P237	S237	P238	S238	P239	S239	P240	S240	P241	S241	P242	S242	P243	S243	P244	S244	P245	S245	P246	S246	P247	S247	P248	S248	P249	S249	P250	S250	P251	S251	P252	S252	P253	S253	P254	S254	P255	S255	P256	S256	P257	S257	P258	S258	P259	S259	P260	S260	P261	S261	P262	S262	P263	S263	P264	S264	P265	S265	P266	S266	P267	S267	P268	S268	P269	S269	P270	S270	P271	S271	P272	S272	P273	S273	P274	S274	P275	S275	P276	S276	P277	S277	P278	S278	P279	S279	P280	S280	P281	S281	P282	S282	P283	S283	P284	S284	P285	S285	P286	S286	P287	S287	P288	S288	P289	S289	P290	S290	P291	S291	P292	S292	P293	S293	P294	S294	P295	S295	P296	S296	P297	S297	P298	S298	P299	S299	P300	S300	P301	S301	P302	S302	P303	S303	P304	S304	P305	S305	P306	S306	P307	S307	P308	S308	P309	S309	P310	S310	P311	S311	P312	S312	P313	S313	P314	S314	P315	S315	P316	S316	P317	S317	P318	S318	P319	S319	P320	S320	P321	S321	P322	S322	P323	S323	P324	S324	P325	S325	P326	S326	P327	S327	P328	S328	P329	S329	P330	S330	P331	S331	P332	S332	P333	S333	P334	S334	P335	S335	P336	S336	P337	S337	P338	S338	P339	S339	P340	S340	P341	S341	P342	S342	P343	S343	P344	S344	P345	S345	P346	S346	P347	S347	P348	S348	P349	S349	P350	S350	P351	S351	P352	S352	P353	S353	P354	S354	P355	S355	P356	S356	P357	S357	P358	S358	P359	S359	P360	S360	P361	S361	P362	S362	P363	S363	P364	S364	P365	S365	P366	S366	P367	S367	P368	S368	P369	S369	P370	S370	P371	S371	P372	S372	P373	S373	P374	S374	P375	S375	P376	S376	P377	S377	P378	S378	P379	S379	P380	S380	P381	S381	P382	S382	P383	S383	P384	S384	P385	S385	P386	S386	P387	S387	P388	S388	P389	S389	P390	S390	P391	S391	P392	S392	P393	S393	P394	S394	P395	S395	P396	S396	P397	S397	P398	S398	P399	S399	P400	S400	P401	S401	P402	S402	P403	S403	P404	S404	P405	S405	P406	S406	P407	S407	P408	S408	P409	S409	P410	S410	P411	S411	P412	S412	P413	S413	P414	S414	P415	S415	P416	S416	P417	S417	P418	S418	P419	S419	P420	S420	P421	S421	P422	S422	P423	S423	P424	S424	P425	S425	P426	S426	P427	S427	P428	S428	P429	S429	P430	S430	P431	S431	P432	S432	P433	S433	P434	S434	P435	S435	P436	S436	P437	S437	P438	S438	P439	S439	P440	S440	P441	S441	P442	S442	P443	S443	P444	S444	P445	S445	P446	S446	P447	S447	P448	S448	P449	S449	P450	S450	P451	S451	P452	S452	P453	S453	P454	S454	P455	S455	P456	S456	P457	S457	P458	S458	P459	S459	P460	S460	P461	S461	P462	S462	P463	S463	P464	S464	P465	S465	P466	S466	P467	S467	P468	S468	P469	S469	P470	S470	P471	S471	P472	S472	P473	S473	P474	S474	P475	S475	P476	S476	P477	S477	P478	S478	P479	S479	P480	S480	P481	S481	P482	S482	P483	S483	P484	S484	P485	S485	P486	S486	P487	S487	P488	S488	P489	S489	P490	S490	P491	S491	P492	S492	P493	S493	P494	S494	P495	S495	P496	S496	P497	S497	P498	S498	P499	S499	P500	S500	P501	S501	P502	S502	P503	S503	P504	S504	P505	S505	P506	S506	P507	S507	P508	S508	P509	S509	P510	S510	P511	S511	P512	S512	P513	S513	P514	S514	P515	S515	P516	S516	P517	S517	P518	S518	P519	S519	P520	S520	P521	S521	P522	S522	P523	S523	P524	S524	P525	S525	P526	S526	P527	S527	P528	S528	P529	S529	P530	S530	P531	S531	P532	S532	P533	S533	P534	S534	P535	S535	P536	S536	P537	S537	P538	S538	P539	S539	P540	S540	P541	S541	P542	S542	P543	S543	P544	S544	P545	S545	P546	S546	P547	S547	P548	S548	P549	S549	P550	S550	P551	S551	P552	S552	P553	S553	P554	S554	P555	S555	P556	S556	P557	S557	P558	S558	P559	S559	P560	S560	P561	S561	P562	S562	P563	S563	P564	S564	P565	S565	P566	S566	P567	S567	P568	S568	P569	S569	P570	S570	P571	S571	P572	S572	P573	S573	P574	S574	P575	S575	P576	S576	P577	S577	P578	S578	P579	S579	P580	S580	P581	S581	P582	S582	P583	S583	P584	S584	P585	S585	P586	S586	P587	S587	P588	S588	P589	S589	P590	S590	P591	S591	P592	S592	P593	S593	P594	S594	P595	S595	P596	S596	P597	S597	P598	S598	P599	S599	P600	S600	P601	S601	P602	S602	P603	S603	P604	S604	P605	S605	P606	S606	P607	S607	P608	S608	P609	S609	P610	S610	P611	S611	P612	S612	P613	S613	P614	S614	P615	S615	P616	S616	P617	S617	P618	S618	P619	S619	P620	S620	P621	S621	P622	S622	P623	S623	P624	S624	P625	S625	P626	S626	P627	S627	P628	S628	P629	S629	P630	S630	P631	S631	P632	S632	P633	S633	P634	S634	P635	S635	P636	S636	P637	S637	P638	S638	P639	S639	P640	S640	P641	S641	P642	S642	P643	S643	P644	S644	P645	S645	P646	S646	P647	S647	P648	S648	P649	S649	P650	S650	P651	S651	P652	S652	P653	S653	P654	S654	P655	S655	P656	S656	P657	S657	P658	S658	P659	S659	P660	S660	P661	S661	P662	S662	P663	S663	P664	S664	P665	S665	P666	S666	P667	S667	P668	S668	P669	S669	P670	S670	P671	S671	P672	S672	P673	S673	P674	S674	P675	S675	P676	S676	P677	S677	P678	S678	P679	S679	P680	S680	P681	S681	P682	S682	P683	S683	P684	S684	P685	S685	P686	S686	P687	S687	P688	S688	P689	S689	P690	S690	P691	S691	P692	S692	P693	S693	P694	S694	P695	S695	P696	S696	P697	S697	P698	S698	P699	S699	P700	S700	P701	S701	P702	S702	P703	S703	P704	S704	P705	S705	P706	S706	P707	S707	P708	S708	P709	S709	P710	S710	P711	S711	P712	S712	P713	S713	P714	S714	P715	S715	P716	S716	P717	S717	P718	S718	P719	S719	P720	S720	P721	S721	P722	S722	P723	S723	P724	S724	P725	S725	P726	S726	P727	S727	P728	S728	P729	S729	P730	S730	P731	S731	P732	S732	P733	S733	P734	S734	P735	S735	P736	S736	P737	S737	P738	S738	P739	S739	P740	S740	P741	S741	P742	S742	P743	S743	P744	S744	P745	S745	P746	S746	P747	S747	P748	S748	P749	S749	P750	S750	P751	S751	P752	S752	P753	S753	P754	S754	P755	S755	P756	S756	P757	S757	P758	S758	P759	S759	P760	S760	P761	S761	P762	S762	P763	S763	P764	S764	P765	S765	P766	S766	P767	S767	P768	S768	P769	S769	P770	S770	P771	S771	P772	S772	P773	S773	P774	S774	P775	S775	P776	S776	P777	S777	P778	S778	P779	S779	P780	S780	P781	S781</
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Line	Frequency (GHz)	Power (dBm)	Bandwidth (MHz)	Modulation	Symbol Rate (ksps)	Guard Band (MHz)	Frequency Offset (MHz)	Phase Offset (deg)	Carrier Frequency (GHz)	Channel Number	Notes
190	4.850	10.0	10	QPSK	1000	0.5	0.0	0.0	4.850	1	Channel 1, 4.850 GHz
191	4.855	10.0	10	QPSK	1000	0.5	0.0	0.0	4.855	2	Channel 2, 4.855 GHz
192	4.860	10.0	10	QPSK	1000	0.5	0.0	0.0	4.860	3	Channel 3, 4.860 GHz
193	4.865	10.0	10	QPSK	1000	0.5	0.0	0.0	4.865	4	Channel 4, 4.865 GHz
194	4.870	10.0	10	QPSK	1000	0.5	0.0	0.0	4.870	5	Channel 5, 4.870 GHz
195	4.875	10.0	10	QPSK	1000	0.5	0.0	0.0	4.875	6	Channel 6, 4.875 GHz
196	4.880	10.0	10	QPSK	1000	0.5	0.0	0.0	4.880	7	Channel 7, 4.880 GHz
197	4.885	10.0	10	QPSK	1000	0.5	0.0	0.0	4.885	8	Channel 8, 4.885 GHz
198	4.890	10.0	10	QPSK	1000	0.5	0.0	0.0	4.890	9	Channel 9, 4.890 GHz
199	4.895	10.0	10	QPSK	1000	0.5	0.0	0.0	4.895	10	Channel 10, 4.895 GHz
200	4.900	10.0	10	QPSK	1000	0.5	0.0	0.0	4.900	11	Channel 11, 4.900 GHz
201	4.905	10.0	10	QPSK	1000	0.5	0.0	0.0	4.905	12	Channel 12, 4.905 GHz
202	4.910	10.0	10	QPSK	1000	0.5	0.0	0.0	4.910	13	Channel 13, 4.910 GHz
203	4.915	10.0	10	QPSK	1000	0.5	0.0	0.0	4.915	14	Channel 14, 4.915 GHz
204	4.920	10.0	10	QPSK	1000	0.5	0.0	0.0	4.920	15	Channel 15, 4.920 GHz
205	4.925	10.0	10	QPSK	1000	0.5	0.0	0.0	4.925	16	Channel 16, 4.925 GHz
206	4.930	10.0	10	QPSK	1000	0.5	0.0	0.0	4.930	17	Channel 17, 4.930 GHz
207	4.935	10.0	10	QPSK	1000	0.5	0.0	0.0	4.935	18	Channel 18, 4.935 GHz
208	4.940	10.0	10	QPSK	1000	0.5	0.0	0.0	4.940	19	Channel 19, 4.940 GHz
209	4.945	10.0	10	QPSK	1000	0.5	0.0	0.0	4.945	20	Channel 20, 4.945 GHz
210	4.950	10.0	10	QPSK	1000	0.5	0.0	0.0	4.950	21	Channel 21, 4.950 GHz
211	4.955	10.0	10	QPSK	1000	0.5	0.0	0.0	4.955	22	Channel 22, 4.955 GHz
212	4.960	10.0	10	QPSK	1000	0.5	0.0	0.0	4.960	23	Channel 23, 4.960 GHz
213	4.965	10.0	10	QPSK	1000	0.5	0.0	0.0	4.965	24	Channel 24, 4.965 GHz
214	4.970	10.0	10	QPSK	1000	0.5	0.0	0.0	4.970	25	Channel 25, 4.970 GHz
215	4.975	10.0	10	QPSK	1000	0.5	0.0	0.0	4.975	26	Channel 26, 4.975 GHz
216	4.980	10.0	10	QPSK	1000	0.5	0.0	0.0	4.980	27	Channel 27, 4.980 GHz
217	4.985	10.0	10	QPSK	1000	0.5	0.0	0.0	4.985	28	Channel 28, 4.985 GHz
218	4.990	10.0	10	QPSK	1000	0.5	0.0	0.0	4.990	29	Channel 29, 4.990 GHz
219	4.995	10.0	10	QPSK	1000	0.5	0.0	0.0	4.995	30	Channel 30, 4.995 GHz
220	5.000	10.0	10	QPSK	1000	0.5	0.0	0.0	5.000	31	Channel 31, 5.000 GHz
221	5.005	10.0	10	QPSK	1000	0.5	0.0	0.0	5.005	32	Channel 32, 5.005 GHz
222	5.010	10.0	10	QPSK	1000	0.5	0.0	0.0	5.010	33	Channel 33, 5.010 GHz
223	5.015	10.0	10	QPSK	1000	0.5	0.0	0.0	5.015	34	Channel 34, 5.015 GHz
224	5.020	10.0	10	QPSK	1000	0.5	0.0	0.0	5.020	35	Channel 35, 5.020 GHz
225	5.025	10.0	10	QPSK	1000	0.5	0.0	0.0	5.025	36	Channel 36, 5.025 GHz
226	5.030	10.0	10	QPSK	1000	0.5	0.0	0.0	5.030	37	Channel 37, 5.030 GHz
227	5.035	10.0	10	QPSK	1000	0.5	0.0	0.0	5.035	38	Channel 38, 5.035 GHz
228	5.040	10.0	10	QPSK	1000	0.5	0.0	0.0	5.040	39	Channel 39, 5.040 GHz
229	5.045	10.0	10	QPSK	1000	0.5	0.0	0.0	5.045	40	Channel 40, 5.045 GHz
230	5.050	10.0	10	QPSK	1000	0.5	0.0	0.0	5.050	41	Channel 41, 5.050 GHz
231	5.055	10.0	10	QPSK	1000	0.5	0.0	0.0	5.055	42	Channel 42, 5.055 GHz
232	5.060	10.0	10	QPSK	1000	0.5	0.0	0.0	5.060	43	Channel 43, 5.060 GHz
233	5.065	10.0	10	QPSK	1000	0.5	0.0	0.0	5.065	44	Channel 44, 5.065 GHz
234	5.070	10.0	10	QPSK	1000	0.5	0.0	0.0	5.070	45	Channel 45, 5.070 GHz
235	5.075	10.0	10	QPSK	1000	0.5	0.0	0.0	5.075	46	Channel 46, 5.075 GHz
236	5.080	10.0	10	QPSK	1000	0.5	0.0	0.0	5.080	47	Channel 47, 5.080 GHz
237	5.085	10.0	10	QPSK	1000	0.5	0.0	0.0	5.085	48	Channel 48, 5.085 GHz

[illegible]

AD-A189 862

NEW YORK TRACON DEMONSTRATION OF PROGRAM RECODING
REQUIREMENTS ANALYSIS DOCUMENT(U) DATA TRANSFORMATION
CORR SILVER SPRING MD AUG 87 DOT/FAA/CI-87/34
DTPA83-85-C-0058

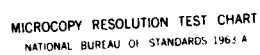
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UNCLASSIFIED

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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963 A

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A.01.28. DEXAMEN (8-50819)

- 1 B-111 Beacon initiation fail
- 2 B-111 Beacon missed report altitude (B-111 words)
- 3 B-111 Beacon missed report Wd (B-111 words)
- 4 B-111 Beacon missed report beacon code (B-111 words)
- 5 B-111 Beacon missed report Wd (B-111 words)
- 6 B-111 Beacon missed report altitude (B-111 words)
- 7 B-111 Beacon missed report range (B-111 words)
- 8 B-111 Beacon missed report r coordinate (B-111 words)
- 9 B-111 Beacon missed report r coordinate (B-111 words)
- 10 B-111 Beacon missed report velocity along r coordinate (B-111 words)
- 11 B-111 Beacon missed report velocity along r coordinate (B-111 words)
- 12 B-111 Beacon missed report sliding window (B-111 words)
- 13 B-111 Beacon missed report firmness value (B-111 words)
- 14 B-111 Beacon missed report time of last correlation (B-111 words)
- 15 B-111 Last correlation flag
- 16 B-111 Last correlation flag
- 17 B-111 Last correlation flag
- 18 B-111 Initial correlation process flag
- 19 B-111 Assigned beacon code
- 20 B-111 Zero
- 21 B-111 Defines status of beacon code
- 22 AC111 Aircraft type
- 23 AC111
- 24 AL11 Reported altitude
- 25 AL11 Reported altitude
- 26 AL12 Console typewriter printout request flag
- 27 AL13 Last scan altitude missing & current scan altitude valid flag
- 28 AL13 A flag indicating that a track's altitude is valid for the current scan
- 29 AL14 Assigned beacon code checked flag
- 30 AL15 Current scan altitude missing
- 31 AL152 Track's last scan altitude was greater than the violation altitude
- 32 AL16 Track's warn count
- 33 AL17 General terrain warning in effect flag
- 34 AL18 Approach warning in effect flag
- 35 AL19 MSW inhibited flag
- 36 AS001 Track no. parent or deviation trial: track number
- 37 AS001 Track no. of parent or deviation trial: track number
- 38 AS001 Track no. parent or deviation trial: track number

- 39 ASOC12 Track no. parent or deviation trial: deviation trial track indicator
- 40 ASOC13 Track no. parent or deviation trial: SPI indicator (squaring ID)
- 41 ASOC14 Track no. parent or deviation trial: emergency/radio failure indicator
- 42 ASOC15 Track no. parent or deviation trial: firmness value
- 43 ASOC16 Track no. parent or deviation trial: interfacility handoff indicator, no handoffs?
- 44 ASOC17 Track no. parent or deviation trial: straightline track class code
- 45 ASOC18 Track no. parent or deviation trial: flag to inhibit deviation trial tracks turn control processing
- 46 ASOC19 Track no. parent or deviation trial: track predict indicator
- 47 CAIB CURRENT POSITIONAL AND SINGLE SYMBOL DATA IN 8 WORD FORMAT
- 48 CAIB Current positional and single symbol data in 8 word format
- 49 CAIB Current positional and single symbol data in 8 word format
- 50 CAIB r r y positional data in 8 word format in old sys
- 51 CAIC11 For limited data blocks: four digits of reported beacon code or pad characters
- 52 CAIC11 For limited data blocks: four digits of reported beacon code or pad characters
- 53 CAIC12 For full data blocks: four M.S. characters of the ACID or pad characters or spaces, for all in pos. l
- 54 CAIC12 For full data blocks: four M.S. characters of the ACID or pad characters or spaces, all in pos. l
- 55 CAIC21 For limited data blocks: contains "ID" or pad characters
- 56 CAIC21 For limited data blocks: contains "ID" or pad characters
- 57 CAIC22 For full data blocks: three L.S. ACID characters, ALL IN CAIC21 IN NEW SYS
- 58 CAIC31 For limited data blocks: three altitude characters, "CSI", "gdr", or 3 spaces
- 59 CAIC32 For full data blocks: handoff receiver position symbol, "x", second L.S. digit of rep. loc. code
- 60 CAIC41 For limited data blocks: two speed characters or pad characters
- 61 CAIC42 For full data blocks: second L.S. character of aircraft type
- 62 CLE11 Radar subsystem with which the track is currently associated
- 63 CLE11 Radar subsystem with which the track is currently associated
- 64 CLE11 Radar subsystem with which the track is currently associated
- 65 CLE11 Radar subsystem with which the track is currently associated
- 66 CLE110 Consecutive times coasted counter
- 67 CLE111 Arrival/departure status indicator
- 68 CLE112 Consecutive successful scans of code match counter (for store/coast track with discrete AC)
- 69 CLE113 Second pass flag
- 70 CLE114 Flight plan received flag
- 71 CLE115 Auto acquisition disallowed flag
- 72 CLE116 Outside of max range of radar flag
- 73 CLE12 Current CIS thread disposition flag
- 74 JLE13 No. of non-space characters in ACID
- 75 CLE14 Disposition of this files EP indicator
- 76 CLE15 Auto-acquisition inhibit flag
- 77 CLE16 Heavy jet flag
- 78 CLE17 Mode C status during track initiation flag

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

79	015108	Applicable code detection display flag
80	015109	Radio flight plan, see RDR UNIT TRACK
81	015111	CR Flightplan, contains track information for each track in CR system and 1 plane after scratch and data for track
82	015112	These character scratch and data for track
83	015113	Plane reset indicator flag
84	015114	Physc. based counter or line identifier for track or plotting display (column)
85	015115	Interact reset indicator flag
86	015116	Flaring report beacon code flag
87	015117	Track displaying a blinking RDR flag
88	015118	Interfacility handoff action flag
89	015119	Track auto acquired previously flag
90	015120	Assigned altitude flag
91	015121	For associated track: track controlling position, position number
92	015121	For associated track: track controlling position, position number
93	015121	For associated track: track controlling position, position number
94	015121	For associated track: track controlling position, position number
95	015121	For associated track: track controlling position, position number
96	015122	For associated track: handoff status
97	015123	For associated track: type & status of track file (UT)
98	015123	For associated track: type & status of track file (UT)
99	015124	For associated track: type & status of track file (A)
100	015124	For associated track: type & status of track file (A)
101	015125	For associated track: type & status of track file (FP)
102	015125	For associated track: type & status of track file (FP)
103	015126	For associated track: radar subsystem with which the track is associated
104	015127	For associated track: minute time field

119	LOC111	Unassociated tabular tracks: output display status indicator
120	LOC112	Unassociated tabular tracks: PMS FIDG/PIDB reference error 1 flag
121	LOC112	Unassociated tabular tracks: PMS FIDG/PIDB reference request flag
122	LOC112	Unassociated tabular tracks: PMS FIDG/PIDB reference error 2 flag
123	LOC113	Active tracks: length of time aircraft type is displayed counter
124	LOC113	Active tracks: length of time aircraft type is displayed counter
125	LOC113	Active tracks: length of time aircraft type is displayed counter
126	LOC114	Active tracks: aircraft type display inhibited flag
127	LOC114	Active tracks: aircraft type display inhibited flag
128	LOC114	Active tracks: aircraft type display inhibited flag
129	LOC115	Active tracks: eligible to have blinking if displayed flag
130	LOC115	Active tracks: eligible to have blinking if displayed flag
131	LOC115	Active tracks: eligible to have blinking if displayed flag
132	LOC116	Active tracks: forced control change flag
133	LOC116	Active tracks: forced control change flag
134	LOC116	Active tracks: forced control change flag
135	LOC117	Suspend active status flag
136	LOC117	Suspend active status flag
137	LOC117	Suspend active status flag
138	LOC118	Active tracks: speed
139	LOC118	Active tracks: speed
140	LOC118	Active tracks: speed
141	LOC119	Active tracks: tabular coast countdown
142	LOC119	Active tracks: tabular coast countdown
143	LOC119	Active tracks: tabular coast countdown
144	LOC12	Unassociated tabular tracks: DUP ID check by MAT flag
145	LOC12	Unassociated tabular tracks: DUP ID check by MAT flag
146	LOC12	Unassociated tabular tracks: DUP ID check by MAT flag
147	LOC120	Flight plans: flight plan EIA/PID
148	LOC120	Flight plans: flight plan EIA/PID
149	LOC120	Flight plans: flight plan EIA/PID
150	LOC13	Unassociated tabular tracks: special symbology for tabular suspend track flag
151	LOC13	Unassociated tabular tracks: special symbology for tabular suspend track flag
152	LOC13	Unassociated tabular tracks: special symbology for tabular suspend track flag
153	LOC14	Unassociated tabular tracks: track position changed flag
154	LOC14	Unassociated tabular tracks: track position changed flag
155	LOC14	Unassociated tabular tracks: track position changed flag
156	LOC15	Unassociated tabular tracks: implied track drop inhibited flag
157	LOC15	Unassociated tabular tracks: implied track drop inhibited flag
158	LOC15	Unassociated tabular tracks: implied track drop inhibited flag

159 L6L6 Unassociated tabular tracks: HEC correlation indicated flag
 160 L6L6 Unassociated tabular tracks: HEC correlation indicated flag
 161 L6L6 Unassociated tabular tracks: HEC correlation indicated flag
 162 L6L7 Unassociated tabular tracks: HEC correlation flag
 163 L6L7 Unassociated tabular tracks: HEC correlation flag
 164 L6L7 Unassociated tabular tracks: HEC correlation flag
 165 L6L6 Unassociated tabular tracks: ACD change flag
 166 L6L6 Unassociated tabular tracks: ACD change flag
 167 L6L7 Unassociated tabular tracks: ACD change flag
 168 L6L9 Unassociated tabular tracks: HEC process this scan flag
 169 L6L9 Unassociated tabular tracks: HEC process this scan flag
 170 L6L9 Unassociated tabular tracks: HEC process this scan flag
 171 L6L11 Track number of link in sensor 1
 172 L6L12 Line to monitor link in sensor 1 flag
 173 L6L13 Pseudo link in sensor 1 flag
 174 L6L14 No link exists in sensor 1 flag
 175 L6L15 Track number of link in sensor 2
 176 L6L16 Line to monitor link in sensor 2 flag
 177 L6L17 Pseudo link exists in sensor 2 flag
 178 L6L18 No link exists in sensor 2 flag
 179 L6L21 Track number of link in sensor 3
 180 L6L22 Line to monitor link in sensor 3 flag
 181 L6L23 Pseudo link in sensor 3 flag
 182 L6L24 No link exists in sensor 3 flag
 183 L6L25 Track number of link in sensor 4
 184 L6L26 Line to monitor link in sensor 4 flag
 185 L6L27 Pseudo link in sensor 4 flag
 186 L6L28 Flag indicating no link exists in sensor 4
 187 L6L11 Sensor 1 link fail count
 188 L6L12 Sensor 2 link fail count
 189 L6L13 Sensor 3 link fail count
 190 L6L14 Sensor 4 link fail count
 191 L6L15 DDM address of data for tabular tracks
 192 L6L16 Tabular data repacked since last output to DDM flag
 193 PAL1 Predicted altitude
 194 PAL2 Altitude tracking firmness value
 195 PAL3 Altitude history sliding window
 196 PAL4 Valid altitude flag
 197 PDB11 For associated tracks: least significant digit of flashing HEC
 198 PDB12 For associated tracks: three altitude characters

199 PIR211 For associated tracks: suspended track controller symbol
200 PIR212 For unassociated tracks: pid characters
201 PIR213 Altitude of latest report with which this track correlated
202 PIR214 Altitude of latest report with which this track correlated
203 PIR215 Altitude of latest report with which this track correlated
204 PIR216 Altitude validity code
205 PIR217 Altitude validity code
206 PIR218 Altitude validity code
207 PIR219 Altitude this scan flag
208 PIR220 Altitude this scan flag
209 PIR221 Altitude this scan flag
210 PIR222 Altitude this scan flag
211 PIR223 Altitude this scan flag
212 PIR224 Reported beacon code for this scan for this track
213 PIR225 Reported beacon code for this scan for this track
214 PIR226 Reported beacon code for this scan for this track
215 PIR227 Reported beacon code validity for this scan for this track
216 PIR228 Reported beacon code validity code for this scan for this track
217 PIR229 Reported beacon code validity code for this scan for this track
218 PIR230 Reported beacon code this scan flag
219 PIR231 Reported beacon code this scan flag
220 PIR232 Reported beacon code this scan flag
221 PIR233 Track file just initiated into system flag
222 PIR234 Track file just initiated into system flag
223 PIR235 Track file just initiated into system flag
224 PIR236 Controller number (prime, handoff receiver, former), split into 2 variables.
225 PIR237 Controller number (prime, handoff receiver, former), split into 2 variables.
226 PIR238 Controller number (prime, handoff receiver, former), split into 2 variables.
227 PIR239
228 PIR240 Split one 2 valued parameter into 2 separate variables
229 PIR241 prime controller number based on flight plan data if no cty keyboard entry had been made
230 PIR242 Index to ICID1 table
231 PIR243
232 PIR244
233 PIR245
234 PIR246 Counter for number of successive successful correlations for this track
235 PIR247 counter for number of successive successful correlations for this track
236 PIR248
237 PIR249 Not needed since the same counter may be used for parent trial and initial track correlation counts
238 PIR250

239 RECPT5 Auto acquisition allowed in a sector hold area flag
 240 RECPT6
 241 RECPT7
 242 RECPT8 Select mode C altitude in FDB inhibited flag
 243 RECPT9
 244 RECPT0
 245 RECPT1 Speed changed flag
 246 RECPT2 Speed change flag
 247 RECPT3 Speed changed flag
 248 RECPT4 altitude changed flag
 249 RECPT5 altitude changed flag
 250 RECPT6 altitude changed flag
 251 RECPT7
 252 RECPT8 ARIS track flag
 253 RECPT9
 254 RECPT0
 255 RECPT1 Predicted track: range
 256 RECPT2
 257 RECPT3
 258 RECPT4 Predicted track: azimuth
 259 RECPT5 smoothed alt
 260 RECPT6 Smoothed altitude
 261 RECPT7 Aural alarm selected flag
 262 RECPT8
 263 RECPT9
 264 RECPT0 Flashing LA/LA indicator
 265 RECPT1 In-solar inhibited flag
 266 RECPT2
 267 RECPT3 Leader direction change request flag
 268 RECPT4 Requested leader direction
 269 RECPT5 DIS thread change request flag
 270 RECPT6
 271 RECPT7 No. of consecutive beacon reports correlated to a radar only track
 272 RECPT8 Delayed auto-terminate flag
 273 RECPT9 Delete from sector thread flag
 274 RECPT0 Live/training flag (live mode = true)
 275 RECPT1 Beacon target correlation flag
 276 RECPT2 Radar target correlation flag
 277 RECPT3 For tabular tracks: three M.S. ASCII characters
 278 RECPT4 For suspend tracks: three characters of altitude

279 IAB312 For tabular coast tracks: xxxxxxxx
280 IAB313 For store tracks: beacon code
281 IAB412 For store tracks: exit fit symbol
282 IHRE11 Track number of previous track file in thread
283 IHRE11
284 IHRE12 Track number of next track file in thread
285 TIME11 Successful correlation time
286 TIME12 Successful correlation Sensor track Number (SIN)
287 TIME13 Successful correlation: SIN presence flag
288 IMP11 Previous track number (sector thread)
289 IMP12 Next track number (sector thread)
290 IMP13 Sector number
291 IMP14 No next track this sector thread flag
292 INT1 Index to INT table
293 INT10 Primary/secondary correlation processing for this scan flag
294 INT2 Suspend track is actively tracking flag
295 INT3 Report in the secondary bin on the scan flag
296 INT4 NM is to be displayed flag
297 INT5 Aircraft flight plan status
298 INT6 Sector thread change request flag
299 INT7 Correlation flag
300 INT8 Inhibit PIR correlation attempt flag
301 INT9 Count of number of reports found in track's bin
302 ICOR1 Predicted track: x coordinate
303 YP0011 Active tracks: x component of velocity
304 YP0012 Active tracks: y component of velocity
305 YP0013 Flight plan or store tracks: index to APT cable (exit)
306 YP0014 Flight plan or store tracks: index to APT cable (entry), alternate primary controller
307 YP0014
308 YP0015 Tracking table coast line of auto tab coast track
309 TCOR1 Predicted track: y coordinate
310 TCOR1
311 ECID1
312 ICID1
313 R1C0 real time clock value
314 SECT00 Pscrp sector mark 0 maximum delta wait time
315 SINSN10
316 S1PRL0 128
317 S1PSC00 minimum sector marks for pscrp to be declared in synch; 3
318 S1P0R0 1

319	SYNTH	Scrap synth consecutive 3 after parity, 2	
320	SYNTH	Scrap errs without parity input failure, 4	
321	SYNTH	8 (10, in 0x6)	
322	SYNTH	7000	
323	SYNTH	Scrap time delay between failure, 4	
324	SYNTH	Post-up start-up time, 1	
325	MSCL	New sector referencing table 12 + 19 and 5, where 19 means 19 sectors, 5 means 5 sectors	
326	MSCL	The sector number for the MSCL table slots 119 and 5 in table 19 and 5	
327	MSCL	The "pre-writing to be done" flag for the sector in table 19 slot 5	
328	MSCL	Number of hits to initiate track from beacon only initiation file	
329	RM510	Number of misses to purge beacon only initiation file	
330	RM510	Beacon only window length (number of scans over which hits and misses are counted)	
331	RM510	Allowable distance, in T and T, between target and tracks for discrete correlation.	
332	RM10010	Velocity vector delta above which radar only initiation files are forbidden	
333	RM10020	Special firmness used for track correlated by TPR	
334	LS0010	Lower speed limit for auto initiation	
335	RM100	Maximum TPR execution time	
336	RM110		
337	RM510	Number of misses to purge radar reinforced initiation file	
338	RM510	Radar-reinforced window length (number of scans over which hits and misses are counted)	
339	RM110	Number of hits to initiate track from radar only initiation file	
340	RM510	Number of misses to purge radar only initiation file	
341	RM10010	Speed below which radar only files are flagged as clutter files.	
342	RM510	Radar only window length (number of scans over which hits and misses are counted)	
343	SCM10	Scan length	
344	TM10	Lower time limit for correlation of initiation file	
345	TM100	Upper time limit for correlation of initiation file.	
346	IPSECO	Working sector n 12	
347	DSB10	Upper speed limit for auto initiation	
348	SF1001	(233) length - 1 in upper id in lower	
349	MA111	Reports score table (parallel to RM111)	
350	MA111	Report address table 12 * RM1010	
351	MA111	A flag indicating whether the report for a BA1 entry is in the secondary bin of the track	
352	MA112	A flag indicating whether the report for a BA1 entry is radar only	
353	MA113	The track number with which the report for a BA1 entry is associated	
354	MA114	A flag indicating whether the report for a BA1 entry is beacon only	
355	MA115	An index for the report for a BA1 entry, that points to the associated entry in the RM5 table	
356	MA116	The number of tracks that have been correlated to this report	
357	MA117	An index for the report for a BA1 entry, that points to the associated entry in the BA01	
358	MA118	The qualifying score for the report (track combination represented by the BA1 entry)	

359	BOI11	Radar only track table (5 x BOI10)
360	BOI111	Radar only table (BOI1) : azimuth
361	BOI112	Radar only table (BOI1) : range
362	BOI113	Radar only table (BOI1) : y coordinate
363	BOI114	Radar only table (BOI1) : x coordinate
364	BOI115	Radar only table (BOI1) : y coordinate component of velocity
365	BOI116	Radar only table (BOI1) : x coordinate component of velocity
366	BOI117	Radar only table (BOI1) : sliding window
367	BOI118	Radar only Report (BOI1) : firmness value
368	BOI119	Radar only table (BOI1) : time of last correlation
369	BOI120	Table containing display parameter data
370	RTBART	Linking execute remote table: RTBART -> A register
371	AD0001	Address of Beacon only Track Table
372	AD0011E	BOI11E1 & BOI11E2 table address
373	AD0101	FIRST table address (INSNSQ words)
374	AD0001	INSECIT table address (INSNSQ words)
375	AD0001	RAI table address (INSNSQ words)
376	AD0001	BOI11 table address (INSNSQ words)
377	AD0001	INSIT table address (INSNSQ words)
378	AD0001	Address of the SASIT1 table
379	AD0001	Address of the STIME1 table
380	AD0001	Address of the STIME1 table
381	AD0001	Lockout flag for Common Subroutine A121
382	AD0001	Address of test target storage buffer (5 words)
383	AD0001	
384	AD0001	Address of UNCOM1 table (INSNSQ words)
385	AD0001	Address of UNCOM1 table (1 word)
386	AD0001	Address in ADP table for each subsystem (INSNSQ words)
387	AD0001	Number of arrival fix areas inhibited for auto acquisition (INSNSQ words)
388	AD0001	RAI table use flag
389	AD0001	A flag indicating which sensor ALTRR should process
390	AD0001	Altitude threshold for altitude correction, altitude correction factor
391	AD0001	Altitude in 100s of feet
392	AD0001	Address of MPEB
393	AD0001	First range/azimuth values for auto drop areas
394	AD0001	Second range/azimuth values for auto drop areas
395	AD0001	Third range/azimuth values for auto drop areas
396	AD0001	Table of azimuths for radar only report geographic clutter areas (inner)
397	AD0001	Table of outer azimuths for radar only report geographic clutter areas
398	AD0001	The beacon and radar table (referenced twice: RAI, page 3.4.9-3; S01, page 55, data elem BMS01)

330 BSM001 Number of scan hits required to initiate a track in BSM011. (1 word)

340 BSM002 Number of scan misses allowed before purging a track in BSM011. (1 word)

350 BSM003 The number of scans that defines the window length of BSM001. (1 word)

360 BSM004 Flag indicating a BSM table overflow

370 BSM005 BSM001 enable/disable flag

380 BSM006 The tracking base sector (sect 1) table

390 BSM007 The tracking base sector (sect 1) table (continued)

400 BSM008 Beacon segments used for auto CAM inhibit

410 CAM000 original time of conflict alert alarm

420 CAS005 A flag indicating which sensor CMT should process

430 CAS006 Amount of core needed

440 CAS007 Length of conflict table

450 CAS008 Negative value of CAS007

460 CAS009 Length of DUPAIR table minus one

470 CAS010 Length of conflict table minus 2

480 CAS011 No scans the following way coast: Unassociated Beacon

490 CAS012 No of scans an associated beacon track may coast

500 CAS013 No scans an associated radar track may coast

510 CAS014 No scans an associated radar track may coast

520 CAS015 A flag indicating which sensor ICRSS should process

530 CAS016 Current real time clock value

540 CAS017 Save word for BS (1 word)

550 CAS018 Current working sector table

560 CAS019 Current working sector (5 words)

570 CAS020 Address of subroutines & tables BSM015 uses

580 CAS021 On call execution flags & TI code task ID (7 x 2 words)

590 CAS022 CTS overflow flag

600 CAS023 Maximum legal delta coordinate X

610 CAS024 Maximum legal delta of Y coordinate

620 CAS025 Radar overflow message buffer, in use in new sys?

630 CAS026 Buffer containing test target display data

640 CAS027 DUPAIR table locked out flag

650 CAS028 Table cleared for DUPAIR

660 CAS029 Buffer containing duplicate IDs (DUPID(11) words)

670 CAS030 Duplicate ID push/pop table

680 CAS031 Length of DUPAIR table minus one

690 CAS032 Length of DUPAIR table (1 word)

700 CAS033 A flag indicating which sensor ICRSS should process

710 CAS034 Address of end of BSM011 table (INSENS0 words), replaced w/pointer

720 CAS035 Address of end of BSM011 table

437	INDENT	Address of end of B0111 table	no out table usage
440	INDENT	Address of end of target Report Store table	
441	ESPP	Contains an ESPP used to schedule P/SAP as a periodic popup	
442	ELIGIBLE	Used to distinguish target generator status	
443	EL	A set of 26 execute remote instructions to perform miscellaneous register loading and storing built	
444	FINOPS	Subroutine FINOPS01B locked out flag	
445	FIRMS	Firmness table	
446	FIRST	First controlled track file table [44] ie 1 per sensor	
447	FIRST	First track file pointer	
448	FIRST	First CONTROLLED track file pointer	
449	FIRST	Number of controlled track files	
450	FREZ	Target generator system freeze flag: freeze flag, init flag	
451	FREZ	Target generator system freeze flag: freeze flag, init flag	
452	GATE	inhibits or clears NSM in approach areas when 7, V1, or 17 Wt respectively	
453	GMS	Used by subroutine GMSR to save B1	
454	GMS	Used by subroutine GMSR to save B5	
455	IAI	Table contains first inner range/altitude values for airport areas	
456	IAI	Table contains second inner range/altitude values for airport areas	
457	INSE	A flag specifying which sensor limit should process	
458	INCL	24 length of pairwise inhibit table minus 1	
459	INSL	length of pairwise inhibit table minus 1	
460	INSL	length of pairwise inhibit table minus 2	
461	IR	Table containing third inner range/altitude values for airport areas	
462	IR	Contains EPDATA used by ROP	
463	LAID	Set to lattice execution time	
464	LOP	Contains addresses and instructions of system data for use by LOD	
465	LSR1	Execute remote table for loading S1 register	
466	LSR1	Execute remote table for loading S1 register	
467	LSR2	Execute remote table for loading S2 register	
468	LSR2	Execute remote table for loading S2 register	
469	MAIR	Temporary storage used by MALN0FF	
470	MAIR	NSM alarm table	
471	MAIR	Timing variable used by MAI	
472	MSM	NSM alert indicator	
473	MSM	Alarm off word	
474	MSM	Difference between actual & rounded altimeter correction in feet	
475	MSM	A flag specifying which sensor NSM must process	
476	MIOP	System parameter table: no. of TOPs	
477	MIOP	Device number table	
478	MIOP	Device number table	

477	WUFL	Weapon number table
480	WUHMW1	Parameter table no. of HWM.
481	WUHMW2	Parameter table no. of HWM.
482	WUSW1	Parameter table no. of swimmers
483	WUSW2	Parameter table no. of swimmers
484	WUSW3	Parameter table no. of swimmers
485	WUE	Canon subline lockout flag when firing flag
486	WUW01	Parameter table no. of displays
487	WUW02	Parameter table no. of displays
488	WUW03	Parameter table no. of tracks
489	WUW04	Index determining which copy of RAD to run next
490	WUW05	Table containing first outer range/altitude values for airport areas
491	WUW06	Table containing second outer range/altitude values for airport areas
492	WUW08	Table containing third outer range/altitude values for airport areas
493	WUESVAR	original real time clock reading
494	WUACX	WFB packet used by PDP
495	WUACX1	
496	WUACX2	
497	WUACX3	
498	WUW07	Table used by PADS: current track being processed, no. tracks no. of eyes this left, no. of processing
499	WUWC11	Untracked target count
500	WUWC12	Display buffer length
501	WUW	Untracked target display buffer
502	WUSERS	A flag indicating which sensor IPMD must process
503	WUSERS	A flag indicating which sensor IPSC must process
504	WUSERS	A flag indicating which sensor IPW must process
505	WADT	Remote aerial alarm display table
506	WAP11	RAI pointer table (5 word revolving table containing indices, to val for section 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11)
507	WAP111	SEE R-AP11
508	WAP11	SEE R-AP11
509	WAP111	rad index table
510	WAP1111	RAI index - next available slot in RAI (WUSW0 words)
511	WAP1112	the next available address in RAI (WUSW0 words.)
512	WAP1113	Final address of RAI (WUSW0 words)
513	WUSW11	Number of scan hits required to initiate a track in the CIS from the RAI (WUSW0)
514	WUSW12	Number of scan misses allowed before a beacon and radar track is purged from the CIS (WUSW0)
515	WUSW1	the no. scans that defines the window length of the hits & misses from beam & radar table
516	WUSW13	Radar only report geographic clutter areas range table: inner
517	WUSW132	Table of ranges for radar only report geographic clutter areas: outer range
518	WUSW111	Number of scan hits required to initiate a track in the CIS from the radar only table (WUSW0 words)

- 517 B5M1 Tracking table: no scans that defines the window length of the hits and misses from radar only table
- 520 B5M2 Number of scan misses allowed before a radar only track is purged from the (1, 1) region
- 521 B5M3 160 Table overflow flag
- 522 B5M4 Tracking table: max speed for declaring radar only track as clutter
- 523 B5M5 No. of MIT reports in sector n 1.
- 524 B5M6 160 Table index
- 525 B5M7 PSAMP/MIG: In-hat flag (B5M4 words)
- 526 B5M8 Tracking table: mask for unused portion of B1
- 527 S2TIME Scan needs swapping flag
- 528 SALAMPS1 Alarm threshold count
- 529 SALAMPS2 Alarm count
- 530 SALB01 Temporary storage for conversion of binary beacon only & radar rest beam to B10
- 531 SALB02 converts: beacon only and radar rest/unused beam altitudes from binary to Binary (1, 1) Domain
- 532 SALB03
- 533 SALB04
- 534 SALB05
- 535 SALB06
- 536 SAS111 Target report sector access store (32 sectors by 4 sensors)
- 537 SAS1111 The start index into the B5 table for the first target associated with the sector (12 by 4 words)
- 538 SAS112 The number of targets associated with the sector (32 words by 4 sensors)
- 539 SB01 Alarm label: B0AS alarm out of tolerance
- 540 SB02 Alarm label: B0AS alarm alarm
- 541 SB03 Alarm label: B0AS B12 FIFO data timeout
- 542 SB04 Alarm label: B0AS B12 FIFO overflow
- 543 SB05 Alarm label: B0AS B12 mode alarm
- 544 SB06 Alarm label: B0AS B12 range alarm
- 545 SB07 Alarm label: B0AS B12 restart performed
- 546 SB08 B0AS alarm index table (13 words)
- 547 SB09 Alarm label: B0AS detector FIFO overflow
- 548 SB10 Alarm label: B0AS illogical condition
- 549 SB11 Alarm label: B0AS interface error
- 550 SB12 Alarm label: B0AS ring/code words out of order
- 551 SB13 A flag indicating which sensor SBAS is to process
- 552 SB14 Alarm label: B0AS B12 table overflow
- 553 SB15 Alarm label: B0AS test target not detected
- 554 SC01 Execute remote table for clearing unused alarm bits from SBAP alarm messages
- 555 SC02 Scan time (B5M4(57) words)
- 556 SC03 Calculated delta scan time
- 557 SC04 Actual scan time
- 558 SC05 Table used by SC02: test & set flag

523 SIRM1 Current track number
524 SIRM13 Number of revolutions this target
525 SIRM14 Number of revolutions
526 SIRM15 Time of last revolution
527 SIRM16 No. sectors in which reports were made
528 SIRM17 Working subsector for alarm
529 SIRM18
530 SIRM19 Sectors what subsystem tracking is currently done in
531 SIRM20 Sectors calculated by an unhealthy radar revolution for target in SIRM19
532 SIRM21 Minimum bit count threshold
533 SIRM22 Sector no. that is 180 degrees behind current sector
534 SIRM23 PSAP alarm address table (bits)
535 SIRM24 PSAP alarm address table (bits)
536 SIRM25 PSAP alarm address table (bits)
537 SIRM26 PSAP alarm address table (bits)
538 SIRM27 PSAP alarm address table (bits)
539 SIRM28 PSAP alarm address table (bits)
540 SIRM29 PSAP alarm address table (bits)
541 SIRM30 PSAP alarm address table (bits)
542 SIRM31 PSAP alarm address table (bits)
543 SIRM32 PSAP alarm address table (bits)
544 SIRM33 PSAP alarm address table (bits)
545 SIRM34 PSAP alarm address table (bits)
546 SIRM35 PSAP alarm address table (bits)
547 SIRM36 PSAP alarm address table (bits)
548 SIRM37 PSAP alarm address table (bits)
549 SIRM38 PSAP alarm address table (bits)
550 SIRM39 PSAP alarm address table (bits)
551 SIRM40 PSAP alarm address table (bits)
552 SIRM41 PSAP alarm address table (bits)
553 SIRM42 PSAP alarm address table (bits)
554 SIRM43 PSAP alarm address table (bits)
555 SIRM44 PSAP alarm address table (bits)
556 SIRM45 PSAP alarm address table (bits)
557 SIRM46 PSAP alarm address table (bits)
558 SIRM47 PSAP alarm address table (bits)
559 SIRM48 PSAP alarm address table (bits)
560 SIRM49 PSAP alarm address table (bits)
561 SIRM50 PSAP alarm address table (bits)
562 SIRM51 PSAP alarm address table (bits)
563 SIRM52 PSAP alarm address table (bits)
564 SIRM53 PSAP alarm address table (bits)
565 SIRM54 PSAP alarm address table (bits)
566 SIRM55 PSAP alarm address table (bits)
567 SIRM56 PSAP alarm address table (bits)
568 SIRM57 PSAP alarm address table (bits)
569 SIRM58 PSAP alarm address table (bits)
570 SIRM59 PSAP alarm address table (bits)
571 SIRM60 PSAP alarm address table (bits)
572 SIRM61 PSAP alarm address table (bits)
573 SIRM62 PSAP alarm address table (bits)
574 SIRM63 PSAP alarm address table (bits)
575 SIRM64 PSAP alarm address table (bits)
576 SIRM65 PSAP alarm address table (bits)
577 SIRM66 PSAP alarm address table (bits)
578 SIRM67 PSAP alarm address table (bits)
579 SIRM68 PSAP alarm address table (bits)
580 SIRM69 PSAP alarm address table (bits)
581 SIRM70 PSAP alarm address table (bits)
582 SIRM71 PSAP alarm address table (bits)
583 SIRM72 PSAP alarm address table (bits)
584 SIRM73 PSAP alarm address table (bits)
585 SIRM74 PSAP alarm address table (bits)
586 SIRM75 PSAP alarm address table (bits)
587 SIRM76 PSAP alarm address table (bits)
588 SIRM77 PSAP alarm address table (bits)
589 SIRM78 PSAP alarm address table (bits)
590 SIRM79 PSAP alarm address table (bits)
591 SIRM80 PSAP alarm address table (bits)
592 SIRM81 PSAP alarm address table (bits)
593 SIRM82 PSAP alarm address table (bits)
594 SIRM83 PSAP alarm address table (bits)
595 SIRM84 PSAP alarm address table (bits)
596 SIRM85 PSAP alarm address table (bits)
597 SIRM86 PSAP alarm address table (bits)
598 SIRM87 PSAP alarm address table (bits)
599 SIRM88 PSAP alarm address table (bits)
600 SIRM89 PSAP alarm address table (bits)
601 SIRM90 PSAP alarm address table (bits)
602 SIRM91 PSAP alarm address table (bits)
603 SIRM92 PSAP alarm address table (bits)
604 SIRM93 PSAP alarm address table (bits)
605 SIRM94 PSAP alarm address table (bits)
606 SIRM95 PSAP alarm address table (bits)
607 SIRM96 PSAP alarm address table (bits)
608 SIRM97 PSAP alarm address table (bits)
609 SIRM98 PSAP alarm address table (bits)
610 SIRM99 PSAP alarm address table (bits)
611 SIRM100 PSAP alarm address table (bits)

579 SIPM01C RIC of last declared SNAP failure
600 SIPM01C
601 SIPM01C SNAP initiate chain input (SIPM01C)
602 SIPM01C
603 SIPM01C Count of number of consecutive words where message ID was not found (S words)
604 SIPM01C PSAP sector mark counter
605 SIPM01C2 SNAP initiation flag to indicate readiness for PSAP processing
606 SIPM01C PSAP input chain address (S words)
607 SIPM01C Total no. of words to process this lattice
608 SIPM01C2 Total number of words processed in this lattice
609 SIPM01C Counts: input parity words per lattice
610 SIPM01C2 Counts: input parity words per SNAP
611 SIPM01C Sector mark initialization: index to start input parity processing (S words)
612 SIPM01C2 Sector mark initialization: sector mark init flag
613 SIPM01C Input table overflow index
614 SIPM01C2 Interrupt status table overflow index
615 SIPM01C PSAP execute remote table: SNAP input buffer -> A register
616 SIPM01C PSAP execute remote table: load logical product on upper half of word in SNAP input buffer
617 SIPM01C Length of parallel SNAP error messages to go out to SNAP output buffer (S words)
618 SIPM01C CBI message store
619 SIPM01C2
620 SIPM01C3
621 SIPM01C4
622 SIPM01C5
623 SIPM01C6
624 SIPM01C7 flag to check message buffer
625 SIPM01C2 number of words in msg buffer
626 SIPM01C8 Buffer for formatted SNAP error messages (temp store minus 1 words by S words)
627 SIPM01C9 Temporary storage for formatted SNAP message to be pulled from error message queue
628 SIPM01C10 Temporary storage word for the formatted error msg in the error msg queue
629 SIPM01C11 SNAP execute remote table: no. of cluster bins -> A register
630 SIPM01C12 No. of sectors which had radar only overload per quad (4 quad by S words)
631 SIPM01C13 On where n is the quadrant number
632 SIPM01C14 Used to override synthetic sector update
633 SIPM01C15
634 SIPM01C16 Execute remote table: for polling bottom on interrupt status word table
635 SIPM01C17 number of parallel traps
636 SIPM01C18
637 SIPM01C19 SNAP request alternate peripheral (S words)
638 SIPM01C20

639 SPSRBL SNAP execute remote table: lower AND(10) 14 register
640 SPSRBL SNAP execute remote table: upper AND(10) 14 register
641 SPSRBL SNAP request interrupt (customer request)
642 SPSRBL1 Defines interrupt status word table: length of interrupt status word table
643 SPSRBL12 Interrupt status word table: address of interrupt status word table
644 SPSRBL13 RIC value of last SNAP print
645 SPSRBL14 Delta RIC value for printout
646 SPSRBL15 Temporary storage of RIC value
647 SPSRBL16 Buffer input pointer (5 words)
648 SPSRBL17
649 SPSRBL18 Address of SPSRBL19
650 SPSRBL19 SNAP timeout error count (5 words)
651 SPSRBL20 SNAP input buffer pointer last lattice (5 words)
652 SPSRBL21 SNAP store buffer input pointer
653 SPSRBL22 Number of dual parallel SNAPs configured minus 1 (5 words)
654 SPSRBL23 Target generator init flag (5 words)
655 SPSRBL24 Sector mark zero found flag
656 SPSRBL25 Sector mark still expected flag (5 words)
657 SPSRBL26
658 SPSRBL27 RIC value of last sector failure printout (5 words)
659 SPSRBL28 Delta RIC value for printout
660 SPSRBL29 Delta sector time (5 words)
661 SPSRBL30 Count of sector numbers out of sequence (5 words)
662 SPSRBL31 Next expected sector mark (5 words)
663 SPSRBL32 SNAP startup flag
664 SPSRBL33 Sector mark zero late flag (5 words)
665 SPSRBL34 RIC value at SNAP startup (5 words)
666 SPSRBL35 SNAP buffer for interrupt storage (5 words)
667 SPSRBL36
668 SPSRBL37 Number sector marks not equal to ESCT (5 words)
669 SPSRBL38 fail count threshold (5 words)
670 SPSRBL39 PSRAP execute remote table: 0 -> SNAP input buffer
671 SPSRBL40 RIC value when next sector should be declared (5 words)
672 SPSRBL41 The SNAP message to be processed (5 words)
673 SPSRBL42
674 SPSRBL43
675 SPSRBL44
676 SPSRBL45
677 SPSRBL46
678 SPSRBL47 Terminate input/output (E8110)

679 SIP103
680 SIP101 RIC value of last change in ABIN by SNAP (5 words)
681 SIP102
682 SIP102
683 SIP103
684 SIP104
685 SIP105 Temporary storage for target report input messages (5 words)
686 SIP106 Temporary storage for target reports
687 SIP107
688 SIP108
689 SIP109 PSRAP temporary target store, fifth word
690 SIP110
691 SIP111 Number of test targets that failed the range/azimuth check (5 words)
692 SIP112 Fail count threshold (5 words)
693 SIP113 PSRAP execute remote table: pull bottom instruction
694 SIP114 PSRAP execute remote table: push top instruction
695 SIP115 Number of scans waiting for sector mark zero (5 words)
696 SIP116 Threshold for declining failure (5 words)
697 SIC18 Linking execute remote table: RLP on LMI1
698 SIC18 Linking execute remote table: RLP on LMI1
699 SIC18 Linking execute remote table: RLP on LMI1
700 SIC18 Linking execute remote table: LMI1 -> A register
701 SIC18 RIC value at SIC18 entry (RIC is in units of time)
702 SIC18 Linking execute remote table: LMI1 -> A register
703 SIC18 Linking execute remote table: LMI1 -> A register
704 SIC18 Track found flag
705 SHP00F Alarm label: NP output FIFO full
706 SHP00S Alarm label: NP RMS/RMS sectors not equal
707 SHP00F Alarm label: NP RMS data error
708 SHP01 Alarm label: NP RMS timeout
709 SHP02 Alarm label: NP startup failure
710 SHP10 Alarm label: NP table overflow
711 SHP00F Number of radar only reports per sector (5 words)
712 SHP00F2 Threshold at which radar only reports per sector are discarded (5 words)
713 SHP00F2 Overload sensing and protection flag (5 words)
714 SHP01 Alarm label: RMS out of tolerance
715 SHP00F1 Relative peripheral numbers of the dual SNAP (5 words)
716 SHP00F2 Alternate relative peripheral numbers of the dual SNAP (5 words)
717 SHP00F SNAP disabled flag (5 words)
718 SHP01 Alarm label: RMS illogical condition

714 SRD146 Keyboard initiated SRAP switch flag
715 SRP1C1 Current target report store index (5 words)
721 SRP1C2 Number of reports in the current sector (5 words)
722 SRD144 Alarm label: RDAS REX detected azimuth alarm
723 SRP1B6 Alarm label: RDAS RMC detected error
724 SRD144 Alarm label: RDAS REX detected range alarm
725 SRD144 Alarm label: REX/RMC data timeout
726 SRD144 Alarm label: RDAS REX/RMC R1/R0 overload
727 SRD144 Alarm label: RDAS RMC overload
728 SRD144 Alarm label: RDAS RMC restart performed
729 SRD144 Alarm label: RDAS restart data timeout
730 SRD144 Alarm label: RDAS RMC table overflow
731 SRD144 Next available open IRISF index (5 words)
732 SRD144 RDAS test target not detected
733 SRD144 Processor save (pws) and restore (pwt) table control words
734 SRD144 Radar only overload function enabled flag
735 SRD144 Target report sector time store (12 sectors by 4 sensors)
736 SRD144 Sensor overflow flag (MSKMS0 words)
737 SRD144 Test target azimuth upper limit (5 words)
738 SRD144 Test target azimuth lower limit (5 words)
739 SRD144 Test target range upper limit (5 words)
740 SRD144 Test target range lower limit (5 words)
741 SRD144 Buffer containing target report store formatted test targets (6 by 3), where 1-3 km, 4-6 Bu
742 SRD144 Partial auto-acquire, auto-drop tables: first range/azimuth for auto drop
743 SRD144 Partial auto-acquire, auto-drop tables: second range/azimuth for auto drop
744 SRD144 SRAP keyboard processing function request flag
745 SRD144 Partial auto-acquire, auto-drop tables: first range/azimuth for auto acquire
746 SRD144 Partial auto-acquire, auto-drop tables: second range/azimuth for auto acquire
747 SRD144 Indicator for subsystem used by keyboard configuration
748 SRD144 Partial auto-acquire, auto-drop table: unknown arrivals for auto drop
749 SRD144 System load indicator (set by IEXEC)
750 SRD144 Radar only processing disable table
751 SRD144 Execute remote word for incrementing 86 by MSKMS0
752 SRD144 Training altimeter correction: altitude where correction necessary
753 SRD144 Training altimeter correction: correction factor
754 SRD144 Execution flag table
755 SRD144 Tracking overloaded and sensors lost flag (set in IEXEC) (MSKMS0 words)
756 SRD144 Test target enable/disable flag; display no. that requested display of test target
757 SRD144 Target generator active/not-active (test mode) flag
758 SRD144 Target generator is active flag

754 TRAT Training track considered for deletion cod.

760 UNCDRT Difference between actual and rounded after correction (164, 164, 164)

761 TCS1 Track numbers: minimum trial

762 TCS2 Track numbers: maximum trial

765 TRATH Conflict alert training interface flag

764 TRAT1 Tracking table: length of RAT

765 TRAT2 Length of RAT minus 1

766 TRATP Addition constant for translating a word from one subsystem to another (164, 164, 164)

767 TRATP Addition constant for translating a word from one subsystem to another (164, 164, 164)

768 TRAT1 Central track store index table: track number (16 words)

769 TRAT2 Central track store (CTS) index table: track file address

770 TRATP A flag specifying which sensor (TRAT) is to process

771 TRATP Maximum number of radar only reports allowed per sector when overload sensing & protection is enable

772 TRATP Contents of TRATP minus 1

773 TRATP Common subroutine lockout flag: subroutine DUPAC

774 TRATP Track Sector Summary Table (TSSS)

775 TRATP (TSSS): a flag specifying whether or not there are any tracks in this sector

776 TRATP Track Sector Summary Table (TSSS): the number of tracks in this sector thread

777 TRATP Track Sector Summary Table (TSSS): starting track number of the first threaded track in this sector

778 TRATP Thread change flag: CTS

779 TRATP Thread change flag: THP

780 UNCDRT1 The file number of the first file in the related uncontrolled track thread

781 UNCDRT2 The count of the number of files in uncontrolled track thread

782 UNCDRT3 uncontrolled track pointer table, not unused

783 UNCD Range/azimuth values for auto drop table: unknown arrival range

784 UNCDRT1 The file number of the first file in the unused track thread

785 UNCDRT2 The count of the number of files in the unused track thread

786 XTRAT Linking execute remote table: TRATP -> A register

787 SIPAB1 SNAP execute remote table: for loading A-register from ALPHABET (lower)

788 SIPABU SNAP execute remote table: for loading A-register from ALPHABET (upper)

789 SIPABUAD SNAP input buffer address (5 words)

790 SIPCH1 PSNAP chain command table (5 words where S is equal to the number of SNAPS)

791 SIPCHS Length of SIPCH table (5 words)

792 SIPCHRS Maximum no. of reports for SIPCH

793 SIPCHRS2

794 SIPCHRS3 Execute remote table: SNAP input buffer -> A register

795 SIPCHRS4 Execute remote table: SNAP interrupt status word buffer -> A register

796 SLSC1 Linking execute remote table: SLQ -> Q register

797 SLSC2 Linking execute remote table: SLQ -> Q register

798 SLSC3 Linking execute remote table: 808 on LMR1

799 SLSILE Linking execute remote table: A register -> LNK11
800 SLSY21 Linking execute remote table: A register -> LNK11
801 SLLC Linking execute remote table: LNK17 -> A register
802 SPMALH Merge processing alarm index table
803 SPSPEP1 Tracking table: upper speed limit for auto initiation (NCEWNU words)
804 SPSPEP2 Tracking table: lower speed limit for auto initiation (NCEWNU words)
805 SSBALH IBAS alarm index table
806 SYN Keyboard input table: miscellaneous data
807 TIME1 Tracking table: successive correlation maximum time interval
808 TIME2 Tracking table: successive correlation minimum time interval
809 TOL Number of track files
810 TTRXT Central track store index table (2 by 10, where 10 is max track data files)
811 VELQT Tracking table: max velocity in which a track may auto drop
812 ADPPE Display packet store
813 ADSTCT Address of the first entry in the SINETS table (1 word per sensor)
814 ADTHM1 Address of the THMT table
815 ADTHM2 Address of the THMT table
816 ADTHM3 Address of the THMT table
817 ADTHM4 Address of the THMT table
818 AMCT Tables for Amplify function
819 ANEBMT Onchip buffer for Amplify function
820 APACZ Display packet store
821 APT Airport table (airports & fixes in TI code)
822 AQR2T Bit encoded keyboards (31 - 60) for adapted displays quick look
823 AQR3T Bit encoded keyboards (61-90) for adapted displays quick look
824 AQR4CT Bit encoded keyboards (1 - 30) for adapted displays quick look
825 AQR4MCT Range inside which tracks will be quick looked, no quick look
826 APLEJD Source identifier for AT TACOM (1 word)
827 ATRNG2 Bit encoded training displays (2 words)
828 AMOT A word table (22 words)
829 BOWMLE A flag indicating priority/alternate sensor for displays
830 BOWCAM BOW command table
831 BCNT Tables containing buffer control words for system data
832 BLACAM NSAW/CA inhibited flag
833 BR11E11 Buffer for first BR11E tabular list (11 words)
834 BR11E21 Buffer for second BR11E tabular list (11 words)
835 BSSEFT Legal sensor indicator in TI code
836 BSUCHT Flags: which sensors need changing; which sensors are currently realigning; we are aligning
837 BSHL6 Flags: No. sensors processed; whether first pass
838 CAC1011 11 character tables

839 CACID24 11 character tables
840 CACID31 11 character tables
841 CAIME Display tables
842 CAIME1 System display chain
843 CAIM Subroutine swap table
844 CAITS Temporary storage
845 CEG27 Temporary storage
846 CFWABC Address of non-standard configuration tables (2 words)
847 COUNT Keyboard counters (21 bit fields)
848 COUNT Keyboard counters (21 bit fields)
849 CPSELAG1 CA displays disable flag
850 CPT111 Product of current range & offcenter of coordinate, complimented, scaled $\times 4$, X coordinate
851 CPT112 Product of current range & offcenter Y coord., complimented, scaled $\times 4$
852 CSB1 X, Y base coordinate
853 DCOM11 Altitude data block counter
854 DCOM12 Single Symbol counter
855 DCOM13 Full data block counter
856 DPMAD2 Next available DPM address for MSAM and full data blocks (2 words)
857 DPMAD3 Next available DM address for single symbols and altitude data blocks
858 DPM01 Temporary storage table
859 DPM01 Table containing display parameter data
860 DPM01 Table containing display parameter data
861 DPM01 Table used for DPM display output
862 DPLAG1 Table containing display parameter data
863 DPLAG1 Table containing display parameter data
864 DPLAG1 Table containing display parameter data
865 DPM A PPM instruction
866 DPM11 Contains DPM parameter data
867 DPM11 Temporary storage
868 DPM11 DM address for keyboard on display (5 words, 1 for each display)
869 DPM11 DM address where data types sublist begins; no. of sublist entries possible
870 DPM Shift instruction
871 DPM Display print inhibit flag
872 DPM No. words of data type 1 that can be processed in dead time: Small
873 DPM No. words of data type 2 that can be processed in dead time: Small
874 DPM No. words of data type 3 that can be processed in dead time: Small
875 DPM Dead time: Small
876 DPM Constant: 000000.0
877 DPM Time interval between data loss messages
878 DPM EN & R counter table for subsystems 1,2,3,4.

879 EBNAT Output buffer for the tab display of non readout requests
880 ETCYF Lit designator symbols table
881 EPELG MPTT variable: input ready flag, flight plan inhibit flag
882 FAEZEF System freeze flag
883 F8IC IIC related data: freeze time IIC correction value
884 FUDOM Miscellaneous flag
885 FUMCF Address of function processing routines, function characters
886 G0LOE Normal exit jump table
887 HJ1 Table contains HJ & SA counters for subsystems 1,2,3,4
888 HPTCH Heavy jet table containing aircraft category/flight plan status codes
889 ICHW1 Contains pointer to the input chain
890 IOW1F Terboard track information
891 IMUSE Misc. variables: test & set for IMI available
892 IMISC1 Interfacility data word
893 IMISC2 Interfacility inhibit flag
894 ICE Exit jump table: capacity error exit
895 ECM1 Terboard parameter data
896 EDUPAE Exit jump table: DUP ID error exit
897 EDUPBE Exit jump table: DUP BOM error exit
898 EFOBME Exit jump table: Format error exit
899 EICE Exit jump table: ILL CHAR error exit
900 EIFIME Exit jump table: IF JMB1 error exit
901 EIFE Exit jump table: IF MMT error exit
902 EILFE Exit jump table: ILL FMT error exit
903 EILIME Exit jump table: ILL LIME error exit
904 EILPSE Exit jump table: ILL POS error exit
905 EILTRA Exit jump table: ILL TR error exit
906 EIPPT Switch table: EIP print inhibit
907 EIRAGE Exit jump table: RUI RAGE error exit
908 EPIET EOP switch table
909 EOTIME Time IUF was entered
910 EOTIME Miscellaneous variable: training flag
911 ESLEME Exit jump table: NO SLEW error exit
912 EYBRT Table containing BRTE data
913 EYBRT Miscellaneous variable: Terboard index
914 EYBRT Miscellaneous variable: temporary storage
915 LAMORD Miscellaneous variable: LA/CA store
916 LSIRIC Saved value of IIC to detect if the IIC has rolled over
917 MAADE1 Last bad status interrupt with input parity received (1 per MORN)
918 MAADE Count of received: bad status interrupts; external interrupt parity errors (1 per MORN)

919 MHDMM Last bad status interrupt received

920 MHDMP Last bad status interrupt with output parity received

921 MHSI MDM display output processing table: next starting address for output chain

922 MHD0 MDM display output processing table: next available address for insertion into output chain

923 MUMI MDM parameter table

924 MHRT Memory readout request table

925 MFTM Next time (in RIC time units) that interrupts are to be enabled for MDM (1 per MDM)

926 MHD MDM display output processing table: first address in chain area

927 MHAF MDM display output processing table: failure count

928 MUMET Keyboard multifunction table

929 MHEV Miscellaneous variable: MSM approach monitor entry flag

930 MHCIR MDM display output processing table: interrupt count

931 MFDIG MDM display output processing table: digits for teletype output

932 MICHN Input chain table

933 MHMBI MDM display output processing table: status queue BOM

934 MHMTI MDM display output processing table: interrupt entrance address

935 MHPAB Input processing table: temporary storage for input parity error status

936 MHP Input processing table: count of number of input buffer parity errors received

937 MHPPI Push/pull control tables: input buffer parity storage table for MDMs

938 MIPSI DM output variables: BOM for P stack output

939 MISAHA MDM display output processing table: temporary storage for A register

940 MISEL MDM display output processing table: SIL instruction

941 MISTG DM output variables: BOM for stagger sublist output

942 MLCAB MDM display output processing table: last avail addr in chain area before overwrite occurs

943 MLD MDM display output processing table: last addr in chain area

944 MLE MDM display output processing table: last MSSI word used

945 MCL Display output processing table: last addr where an I/OCL instr was stored in chain

946 MHMI MDM display output processing table: interrupt routine

947 MPTACE DM output variable: PSPACE for DM refreshed displays

948 MPTEN DM selection bits

949 MPUT Push/pull control tables: used to retrieve data from the MDM input buffer

950 MHRT Switch table: memory readout enable

951 MHRT MDM display output processing table: retry counter for restarting a stopped chain

952 MSWIE MSM inhibit flag

953 MSCAD Miscellaneous variable: temporary store

954 MSCND Miscellaneous variable: temporary store

955 MSLPX MDM display output processing table: status loop indexes

956 MSLTAG Output variable: A-word, B-word, & gross carriage returns

957 MSLAF MDM display output processing table: interrupt status word storage

958 MSNET Switch table: MSM print inhibit flag

959 NUTL61 Variable: NUTP null flag; map face busy flag
 960 NUTSW Variable: no time check on flight plans flag
 961 NUTPSC Variable: flight plan disk drive no.; flight plan source flag (disk or tape)
 962 NUTST71 Variable: external interrupt status word storage
 963 NUTSTP Variable: current time for flight plan time check, no returns if error detected
 964 NUTSTP Variable: external interrupt status word storage
 965 NUTSTL6 Output variable: no display buffers in system
 966 NUTSG1 Current configuration numeric
 967 NUTSPDE Table of site variables: number of JOPs
 968 NUTSPDE Table of site variables: no. of NODs
 969 NUTSPDE Table of site variables: no. of NODs
 970 NUTSPDE Table of site variables: no. of sensors
 971 NUTSPDE Output variable: no. of EDs needed to flood DDM chain
 972 NUTSPDE Table of site variables: no. of displays
 973 NUTSPDE Table of site variables: no. of displays
 974 NUTSPDE Table of site variables: no. of keyboards
 975 NUTSPDE Number of tracks
 976 NUTSPDE NODM display output processing table: previous output chain pointer
 977 NUTSPDE Miscellaneous variable: CGE print flag
 978 NUTSPDE Miscellaneous variable: MFB packet
 979 NUTSPDE Miscellaneous variable: MFB packet
 980 NUTSPDE Keyboard table: keyboard data miscellaneous
 981 NUTSPDE Keyboard table: keyboard data miscellaneous
 982 NUTSPDE Keyboard table: miscellaneous previous data
 983 NUTSPDE Miscellaneous variable: program level
 984 NUTSPDE NODM table: relative peripheral number
 985 NUTSPDE Keyboard table: horit & vert changes of trackball in radar coord
 986 NUTSPDE Display table: keyboards for which quick look switches have been selected (1) 40)
 987 NUTSPDE Display table: keyboards for which quick look switches have been selected (2) 40)
 988 NUTSPDE Display table: keyboards for which quick look switches have been selected (3) 40)
 989 NUTSPDE Display table: keyboards for which quick look switches have been selected (4) 40)
 990 NUTSPDE Keyboard table: miscellaneous quick look data
 991 NUTSPDE Keyboard table: miscellaneous quick look data
 992 NUTSPDE Variable: no. of flight plan files to pass over
 993 NUTSPDE NODM table: miscellaneous message acknowledge data
 994 NUTSPDE Variable: flags used while recovering from detected error
 995 NUTSPDE NODM table: range filter table
 996 NUTSPDE NODM table: re-transmit counter for NODM
 997 NUTSPDE Variable: next data flag
 998 NUTSPDE Brand flag

999 R1001 R000 Table: system time of last message received
 1000 R1001 R000 Table: re transmit request message no. input/output
 1001 N001 Variable: no flight plans to pass over, 24 hour clock round flag
 1002 S01 Table contains nothing
 1003 SAV01 Variable: temporary storage
 1004 SAV02 Variable: temporary storage
 1005 SAV03 Variable: temporary storage
 1006 SAV04 Variable: temporary storage
 1007 SAV05 Miscellaneous variable: temporary storage
 1008 SC001 Display table
 1009 SC1 Selected code display table
 1010 SC11 Selected code display table
 1011 SD001 Display table: system data 8 word
 1012 SEL01 Variable: flight plan input day code; MIFP selected time for inputs
 1013 SE01 Miscellaneous variable: temporary storage
 1014 SP001 Switch table: SNAP print inhibit flag
 1015 S004 Miscellaneous variable: shift instruction
 1016 S000X Sensor track number control table: sensor track number index table (MSKMS word)
 1017 S000 Sensor track number control table: sensor track number index lockout table
 1018 SUP01 Switch table: supervisor position key
 1019 SV0002 Miscellaneous variable: save B2
 1020 SY0015 Miscellaneous variable: temporary storage
 1021 SY00 Miscellaneous variable: temporary storage
 1022 SY00 Related tables: system level display data table
 1023 SY001 Related tables: if coded name of system operational program currently being serviced
 1024 TAB01 Keyboard table: miscellaneous X, Y base coordinate data
 1025 TAB1 Output buffer: system time
 1026 TAB11 Output buffer: satellite 1 -> 3 unique altimeter, ATIS & CST
 1027 TAB10 Output buffer: most altimeter, ATIS, & ESI
 1028 TAB11 Keyboard table: miscellaneous first entered trackball data
 1029 TAB12 Keyboard table: miscellaneous second entered trackball data
 1030 TAB1 System data R00 table for (for training)
 1031 TAB1001 R000 Table: no. count/suppress tracks, no. of store tracks processed by R00P
 1032 TAB1001 Keyboard table: trackball A & B word buffer . . . etc;
 1033 TAB1 Tab line ID indicator: keyboards 0 -> 30
 1034 TAB1 Tab line ID indicator: keyboards 31 -> 60
 1035 TAB1 Tab line ID indicator: keyboards 61 -> 90
 1036 TAB1 Tab line indicator: keyboards 91 -> 120
 1037 TAB1 Display counter
 1038 TAB1 Miscellaneous variable: temporary storage

237

1117 180100 Temporary Storage
1120 180106 Temporary Storage
1121 180102 Temporary Storage
1122 180103 Temporary Storage
1123 180105 Temporary Storage
1124 180107 Temporary Storage
1125 180105 Temporary Storage
1126 180105 Temporary Storage
1127 180106 Temporary Storage
1128 180106 Temporary Storage
1129 180107 Temporary Storage
1130 180108 Temporary Storage
1131 180109 Temporary Storage
1132 18010A Temporary Storage
1133 18010B Temporary Storage
1134 18010E Temporary Storage
1135 180112 Temporary variable, total time elapsed in x direction
1136 180117 Temporary variable, total time elapsed in y direction
1137 180110 Target Report Store (RPS) table
1138 180111 Target report altitude (one entry per sensor)
1139 180110 Target report 3/4 code validity code (NORMA word)
1140 180111 Target report beacon code (one per sensor)
1141 180112 Target report 5/8 code (one per sensor) Values: true, false, weak
1142 180113 Target report Mode C validity code (one per sensor)
1143 180114 Target report Mode C altitude (NORMA word)
1144 180115 Target report range (one per sensor)
1145 180117 Target report radar reinforced flag (one per sensor)
1146 180117 Target report radar report quality (one per sensor)
1147 180114 Target report 1808 use inhibited flag (one per sensor)
1148 180115 Target report emergency flag (one per sensor)
1149 180116 Target report training target generator flag (one per sensor)
1150 180117 Target report in 188 mode flag
1151 180116 Target report used flag (one per sensor)
1152 180119 Target report special position flag (one per sensor)

FILE: 020	09/27/85 D	VM/SP CONVERSATIONAL MONITOR SYSTEM	PAGE 00012
N/A-MCAQ	8.3-3	8.0-10	DISP
N/A-MCAQ	8.3-4	8.0-10	DISP
N/A-MCAQ	8.4-6	8.0-17	DISP
N/A-MCAQ	8.4-7	8.0-15	DISP
N/A-MCAQ	8.6-1	8.0-27	DISP
N/A-MCAQ	8.6-2	8.0-30	DISP
N/A-MCAQ	8.6-3	8.0-38	DISP
N/A-MCAQ	8.6-4	8.0-38	DISP
N/A-MCAQ	8.6-5	8.0-38	DISP
N/A-MCAQ	8.6-6	8.0-38	DISP
N/A-MCAQ	8.6-7	8.0-38	DISP
N/A-MCAQ	8.6-8	8.0-38	DISP
N/A-MCAQ	8.6-9	8.0-38	DISP
N/A-MCAQ	8.6-10	8.0-38	DISP
N/A-MCAQ	8.6-11	8.0-38	DISP
N/A-MCAQ	8.6-12	8.0-38	DISP
N/A-MCAQ	8.6-13	8.0-38	DISP
N/A-MCAQ	8.6-14	8.0-38	DISP
N/A-MCAQ	8.6-15	8.0-38	DISP
N/A-MCAQ	8.6-16	8.0-38	DISP
N/A-MCAQ	8.6-17	8.0-38	DISP
N/A-MCAQ	8.6-18	8.0-38	DISP
N/A-MCAQ	8.6-19	8.0-38	DISP
N/A-MCAQ	8.6-20	8.0-38	DISP
N/A-MCAQ	8.6-21	8.0-38	DISP
N/A-MCAQ	8.6-22	8.0-38	DISP
N/A-MCAQ	8.6-23	8.0-38	DISP
N/A-MCAQ	8.6-24	8.0-38	DISP
N/A-MCAQ	8.6-25	8.0-38	DISP
N/A-MCAQ	8.6-26	8.0-38	DISP
N/A-MCAQ	8.6-27	8.0-38	DISP
N/A-MCAQ	8.6-28	8.0-38	DISP
N/A-MCAQ	8.6-29	8.0-38	DISP
N/A-MCAQ	8.6-30	8.0-38	DISP
N/A-MCAQ	8.6-31	8.0-38	DISP
N/A-MCAQ	8.6-32	8.0-38	DISP
N/A-MCAQ	8.6-33	8.0-38	DISP
N/A-MCAQ	8.6-34	8.0-38	DISP
N/A-MCAQ	8.6-35	8.0-38	DISP
N/A-MCAQ	8.6-36	8.0-38	DISP
N/A-MCAQ	8.6-37	8.0-38	DISP
N/A-MCAQ	8.6-38	8.0-38	DISP
N/A-MCAQ	8.6-39	8.0-38	DISP
N/A-MCAQ	8.6-40	8.0-38	DISP
N/A-MCAQ	8.6-41	8.0-38	DISP
N/A-MCAQ	8.6-42	8.0-38	DISP
N/A-MCAQ	8.6-43	8.0-38	DISP
N/A-MCAQ	8.6-44	8.0-38	DISP
N/A-MCAQ	8.6-45	8.0-38	DISP
N/A-MCAQ	8.6-46	8.0-38	DISP
N/A-MCAQ	8.6-47	8.0-38	DISP
N/A-MCAQ	8.6-48	8.0-38	DISP
N/A-MCAQ	8.6-49	8.0-38	DISP
N/A-MCAQ	8.6-50	8.0-38	DISP
N/A-MCAQ	8.6-51	8.0-38	DISP
N/A-MCAQ	8.6-52	8.0-38	DISP
N/A-MCAQ	8.6-53	8.0-38	DISP
N/A-MCAQ	8.6-54	8.0-38	DISP
N/A-MCAQ	8.6-55	8.0-38	DISP
N/A-MCAQ	8.6-56	8.0-38	DISP
N/A-MCAQ	8.6-57	8.0-38	DISP
N/A-MCAQ	8.6-58	8.0-38	DISP
N/A-MCAQ	8.6-59	8.0-38	DISP
N/A-MCAQ	8.6-60	8.0-38	DISP
N/A-MCAQ	8.6-61	8.0-38	DISP
N/A-MCAQ	8.6-62	8.0-38	DISP
N/A-MCAQ	8.6-63	8.0-38	DISP
N/A-MCAQ	8.6-64	8.0-38	DISP
N/A-MCAQ	8.6-65	8.0-38	DISP
N/A-MCAQ	8.6-66	8.0-38	DISP
N/A-MCAQ	8.6-67	8.0-38	DISP
N/A-MCAQ	8.6-68	8.0-38	DISP
N/A-MCAQ	8.6-69	8.0-38	DISP
N/A-MCAQ	8.6-70	8.0-38	DISP
N/A-MCAQ	8.6-71	8.0-38	DISP
N/A-MCAQ	8.6-72	8.0-38	DISP
N/A-MCAQ	8.6-73	8.0-38	DISP
N/A-MCAQ	8.6-74	8.0-38	DISP
N/A-MCAQ	8.6-75	8.0-38	DISP
N/A-MCAQ	8.6-76	8.0-38	DISP
N/A-MCAQ	8.6-77	8.0-38	DISP
N/A-MCAQ	8.6-78	8.0-38	DISP
N/A-MCAQ	8.6-79	8.0-38	DISP
N/A-MCAQ	8.6-80	8.0-38	DISP
N/A-MCAQ	8.6-81	8.0-38	DISP
N/A-MCAQ	8.6-82	8.0-38	DISP
N/A-MCAQ	8.6-83	8.0-38	DISP
N/A-MCAQ	8.6-84	8.0-38	DISP
N/A-MCAQ	8.6-85	8.0-38	DISP
N/A-MCAQ	8.6-86	8.0-38	DISP
N/A-MCAQ	8.6-87	8.0-38	DISP
N/A-MCAQ	8.6-88	8.0-38	DISP
N/A-MCAQ	8.6-89	8.0-38	DISP
N/A-MCAQ	8.6-90	8.0-38	DISP
N/A-MCAQ	8.6-91	8.0-38	DISP
N/A-MCAQ	8.6-92	8.0-38	DISP
N/A-MCAQ	8.6-93	8.0-38	DISP
N/A-MCAQ	8.6-94	8.0-38	DISP
N/A-MCAQ	8.6-95	8.0-38	DISP
N/A-MCAQ	8.6-96	8.0-38	DISP
N/A-MCAQ	8.6-97	8.0-38	DISP
N/A-MCAQ	8.6-98	8.0-38	DISP
N/A-MCAQ	8.6-99	8.0-38	DISP
N/A-MCAQ	8.6-100	8.0-38	DISP

TKHISC

NOTES

TKTKP

ТКТЕКР

TKMILC

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THE ADULT

INTRAP

257

VM/SP CONVERSATIONAL MONITOR SYSTEM

FILE: UED SP27515 D

FILE: UED	SP27515 D	TIME	DESCRIPTION	STATUS	LOCATION	OPERATOR	REMARKS
N/A-TSPQ			CATU COMB COMB	DOP	IFP		TI_CDE_SPP
N/A-TSPQ			IFO KIP KIP	KOPB			TI_CDE_SPACE
N/A-TSPQ			KOPC RAI MPB	MTP	POOP		
N/A-TSPQ			RDRMD RKP SCTRE	30B1	50B2		
N/A-TSPQ			TPRED TRAD				
N/A-TSPQ			COMA COMB IFO	KIP	KIP		TI_CHAR_CODE_SMALL_PLUS
N/A-TSPQ			KOPC KOPB KOPC	MSAWQ	MSAWQ		TI_CODE_S
N/A-TSPQ			MSAWQ MSAWQ MSITEQ	POOP	POOP		
N/A-TSPQ			30B1 50B2				
N/A-TSPQ			COMB LIND POOP	50B1			TI_CODE_SQUARE
N/A-TSPQ			TSTAY				
N/A-TSPQ			ALPLT				SCT_TRK_SWABS
N/A-TSPQ			COMA				DISPLAY_CONFIG_TYPE_TTDQ
N/A-TSPQ			KOPB KOPC POOP	PSHAP	50B1		NO_TRK_LEFT_BEFORE_PURG
N/A-TSPQ			SYSEQ1 SYSEQ2 TTYD				MTK_TTCN
N/A-TSPQ			TINIT				TEST_TARGET_DISP
N/A-TSPQ			CORD COMA COMB	DOP	IFP		SCTR_TRK_INITIAL
N/A-TSPQ			IFO KIP KIP	KOPB	KOPB		TI_CODE_T
N/A-TSPQ			KOPC MSAWQ MSAWQ MSITEQ	POOP	POOP		
N/A-TSPQ			BOUND RKP 50B1 50B2				TI_CODE_U
N/A-TSPQ			TRAD				TI_CODE_UP_ARROW
N/A-TSPQ			IFO KIP KIP	KOPB	KOPB		TRK_TI_CODE_UNDERBAR
N/A-TSPQ			MSITEQ BOUND 50B2				BOX_TI_CODE_UNDERBAR
N/A-TSPQ			COMB DOP IFO	KOPB	KOPB		TI_CODE_UNDERBAR
N/A-TSPQ			KOPC BOUND 50B2	TRAD			TI_CODE_V
N/A-TSPQ			COMA COMB IFO	KOPB	MSAWQ		
N/A-TSPQ			MSAWQ MSAWQ MSAWQ MSITEQ	50B1	50B2		TI_CODE_V
N/A-TSPQ			KOPC KOPB KOPC	MPB	ATGA		MEM_TBRDOUT_BUFF_WORDS
N/A-TSPQ			TRAD				MEM_TBRDOUT_BUFF_WORDS
N/A-TSPQ			IFO KIP KIP	MSAWQ	MSAWQ		TI_CODE_V
N/A-TSPQ			MSAWQ MSITEQ 50B2				
N/A-TSPQ			CATU COMA KOPB	MSITEQ	50B2		SENSOR_DIPP_DELTA_X
N/A-TSPQ			TRAYIP TINIT	BOUND 50B2			TI_CODE_X
N/A-TSPQ			TYF 50B2				SENSOR_DIPP_DELTA_Y
N/A-TSPQ			MSAWQ MSAWQ MSITEQ 50B2				TI_FORCE_TYPE_DISP
N/A-TSPQ			IFO KIP KOPB	MSAWQ	MSAWQ		TI_SENSOR_TYPE_DISP..
N/A-TSPQ			KOPC				TI_CODE_Y
N/A-TSPQ			CATU COMA IFO	KOPB	KOPB		TI_CODE_Z
N/A-TSPQ			KOPC MSAW MSITEQ	50B2			
N/A-TSPQ			KOPC KOPB KOPC	MSAW	MSAWQ		TI_CODE_0
N/A-TSPQ			MSAWQ MSAWQ MSAWQ MSITEQ	50B2			

FILE: DED		SPR7515 D		VH/SP CONVERSATIONAL MONITOR SYSTEM		PAGE 00022		TTDISP
C	TIADAOIQ	3.01	3.0-30	DSITEQ	AQLR2T	TI	DISPLAY CONFIG TYPE TADAQDQ	
N/A-T1PQ	N/A-T1PQ			MSITEQ	KOPB MSITEQ MSCT	A	NO TRACK FILE CTS_1	DISP
N/A-T1L8	N/A-T1L8		3.5.2-1	SYSEQ	SYSEQ1 SYSEQ2 TI	A	TRA_LVL1_BKUP	TRACK
N/A-T1Q	N/A-T1Q		3.5.2-1	SYSEQ	SYSEQ1 SYSEQ2 TI	A	CTS_1 CURRENT_NO_TRACK_FILE	SPARM
N/A-T1Q	N/A-T1Q		2.0-17	TI	KOPB KOPC MSAMQ	A	TI_CODE_1	TRACK
N/A-T1PQ	N/A-T1PQ		2.0-17	TI	MSAMQ MSITEQ PDOP SDB2	A	CTS_10 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_11 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_12 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_13 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_14 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_15 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_16 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_17 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_18 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_19 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	DISPLAY CONFIG TYPE TADAQDQ	DISP
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_2 CURRENT_NO_TRACK_FILE	SPARM
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	TRA_LVL2_BKUP	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	TI_CODE_2	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_20 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_21 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_22 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_23 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_24 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	DISPLAY CONFIG TYPE TADAQDQ	DISP
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_3 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	TI_CODE_3	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_4 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_5 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_6 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_7 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_8 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_9 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	CTS_10 CURRENT_NO_TRACK_FILE	TRACK
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	ARTCC UPB TIME DIP DEP ABIV THNIFT	TTTTRPRA
N/A-T1PQ	N/A-T1PQ			MSITEQ		A	NOABT UPB TIME DIP DEP ABIV THNIFT	TTTTRPRA

FILE: 020

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4 88