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COMPUTER-BASED SHIPBOARD TRAINING ADMINISTRATION SYSTEM: DEVELOPMENT PHASE

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COMPUTER-BASED SHIPBOARD TRAINING ADMINISTRATION SYSTEM: DEVELOPMENT PHASE[1]

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Prepared for

Navy Personnel Research and Development Center
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Computer systems have been used aboard combatant ships to perform functions in support of tactical operations. An additional goal has been the use of computer systems to support nontactical functions, e.g., training administration. A minicomputer system (NOVA 1200) aboard the USS DAHLGREN for other nontactical data management functions was the impetus for the development of a Shipboard Training Administration System (STAS).

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Report covers the shore-based development and shipboard checkout phases of the STAS project. The subsequent shipboard test and evaluation will be covered in future reports.

* STAS provides automated capabilities for: (1) centralized repository for individual training information, (2) more rapid availability of training and qualification records, (3) better use of available information for career counseling and development, (4) more effective training scheduling, and (5) more timely training status information.

FOREWORD

This effort was performed under Technical Development Plan 43-03 (Education and Training Development) and Work Unit Number 43-03.P14X1 (Design/Development of Shipboard Computer-based Instruction and Training Administration). It was initiated in response to a request from the Chief of Naval Operations (OP-99) to determine the feasibility of utilizing shipboard computer systems for training applications aboard combatant ships. The computer systems considered included those already installed for tactical purposes, and those which could be added to shipboard inventory, e.g., minicomputers. This report describes the shore-based development and shipboard checkout of a minicomputer-based Shipboard Training Administration System (STAS), developed in conjunction with a shipboard Computer-Integrated Instruction (CII) prototype in General Damage Control. The CII effort is described in a separate report, Shipboard Computer-Integrated Instruction in General Damage Control: Development Phase (in press). Both of these efforts were accomplished by the System Development Corporation, Santa Monica, California under Contract No. N00600-74-C-0399. Dr. David J. Chesler was the technical contract monitor for the Navy Personnel Research and Development Center (NAVPERSRANDCEN). The subsequent shipboard test and evaluation will be conducted by the Navy.

A project concerned with the feasibility of using minicomputers aboard a combatant ship necessarily depends upon the cooperation and assistance of several Navy organizations. In this instance, support has been most generous. The Information Systems Division, CNO (OP-91) procured, installed, and maintained the shipboard minicomputer system. The Commander, Naval Surface Force, U. S. Atlantic Fleet (COMNAVSURFLANT) provided a demonstration ship, the USS DAHLGREN (DLG 12) for shipboard checkout of STAS. Priority commitments have precluded use of DAHLGREN for a subsequent systematic test and evaluation--which, however, is planned to be conducted with another ship and the same minicomputer system. Personnel from OP-91, COMNAVSURFLANT, and DAHLGREN provided invaluable expertise enhanced by practical experience in the shipboard environment. NAVPERSRANDCEN expresses its appreciation, as well as that of the System Development Corporation, for the contributions of:

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SUMMARY

Problem

This report describes the development of a prototype for a computerized Shipboard Training Administration System (STAS). The training administration function aboard combatant ships is currently accomplished by manual procedures. Various types of records pertaining to training are maintained by the Personnel Office, Division Offices, and the Training Officer. As a result, management of training information is very time consuming. For example, records of all crew members must be manually searched and updated to determine ship compliance with formal school requirements and with Personnel Qualification Standards (PQS) requirements. The STAS project was therefore initiated to determine the feasibility of using a shipboard minicomputer system for planning and managing the training of shipboard personnel and related personnel functions.

Background

In August 1972, the Chief of Naval Operations (OP-91) initiated a study to determine the feasibility of a minicomputer system capability for command management purposes. The USS DAHLGREN (DLG12) was selected for operational evaluation of this capability. A NOVA 1200 system was installed aboard the ship in January 1973.

The Navy Personnel Research and Development Center (NAVPERSRANDCEN) had independently initiated a project to determine the feasibility of using a shipboard minicomputer system for instructional and training administration purposes. NAVPERSRANDCEN was invited by OP-91 to share the NOVA 1200 system on the DAHLGREN for these applications.

Requirements

The two basic requirements were the development of: (1) STAS, to facilitate the recording, processing, and reporting of training information; and (2) Computer Integrated Instruction (CII), in which instruction is conducted off-line and is integrated with on-line testing, diagnostics, and prescriptives. General Damage Control was selected as the prototype CII subject matter area.

The present document reports the development and shipboard installation of STAS. The CII development effort is described in a separate report. The development phase of both STAS and CII was accomplished ashore with contractual support. The subsequent shipboard test and evaluation will be conducted by the Navy.

The data element specifications for STAS reflect the needs of the DAHLGREN, and the Commander, Naval Surface Force, U. S. Atlantic Fleet (COMNAVSURFLANT). STAS was accordingly designed to provide: (1) a centralized shipboard repository for individual training information; (2) more rapid availability of training and qualification records; (3) better use of available information--e.g., for career counseling; (4) more consistent and effective training scheduling; (5) more timely and effective training status information; and (6) a programmed data management system capable of a variety of uses.

Approach

The development of STAS was accomplished with a NOVA 1200 system compatible with the DAHLGREN configuration. For program development, the operating system RDOS, Version 3.2 and Extended BASIC Version 3.6 were used. The programs were designed as a series of overlays to be operated in a multi-user environment and in the swapping mode of BASIC.

STAS contains a General Data Base and a PQS Data Base. The General Data Base contains training information for each person aboard ship--e.g., rate, division, schools completed, GMT status, and the like. The PQS Data Base contains specific information pertaining to PQS requirements and accomplishments. System users may add, delete, or change records in both data bases. They may query the data bases in predetermined format, or generate additional reports by requesting specific data fields. Data are entered into STAS from a teletype or any of four CRT's and are output via line printer or the CRT. A shore-based demonstration/checkout was conducted to test all STAS commands and functions. No failures or major problems were encountered. The shore-based demonstration was followed by shipboard installation and checkout.

Conclusions

A minicomputer-based system for use aboard combatant ships has been successfully developed to facilitate the management of data pertinent to individual training status and Personnel Qualification Standards. These data are integrated with other personnel data for a combined query and update capability.

The operation feasibility, cost effectiveness, and further technical feasibility of the system in the dockside environment and underway will be determined in a follow-on test and evaluation phase.

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FIGURES

INTRODUCTION

Problem

Training administration aboard ship is currently accomplished by manual procedures in accordance with standard Navy regulations and Fleet and Type Commander directives. There is no central repository of individual or shipboard training information. Rather, various types of records are maintained by the Personnel Officer, the Training Officer, and Division Officers. As a result, the proper management of training information by responsible personnel is very time consuming. Figure 1 illustrates the manual procedures used to retrieve training data; the type of information requested determines which records aboard ship must be searched. For example, the COMCRUDESLANT Training Manual (1974) lists recommended formal school training requirements for personnel aboard each ship type. To determine whether this requirement is being complied with, each crew member's service record must be manually searched and updated. This is difficult to accomplish by manual methods. Personnel Qualification Standards (PQS) progress charts are cumbersome to maintain and liable to error. At present, there is no way to determine the overall PQS status of a ship except through a laborious record search.

Purpose

The Shipboard Training Administration System (STAS) project was established to determine the feasibility of using shipboard computer systems for training management purposes. Its primary objective was to increase shipboard operational readiness by upgrading and improving the onboard training capability. STAS will have no effect on a ship's organization since personnel now responsible for maintaining certain records will continue to be responsible for their original accuracy and entry into the data bases.

Background

Computer systems and technology have been used for many years aboard Navy combatant ships to perform functions in support of tactical operations. An additional goal has been to use computer systems to support nontactical activities, such as instruction and training administration. Computer systems that have been considered for these purposes include those already installed aboard ship and those that can reasonably be added to shipboard inventory.

In August 1972 the Chief of Naval Operations, Information Systems Division (OP-91) began a requirements study to determine the feasibility of an automated data processing (ADP) capability aboard combatant ships for (1) Maintenance and Material Management (3M), (2) personnel administration, and (3) supply. The ship selected for operational evaluation of the ADP capability was USS DAHLGREN (DLG12). The system Development Corporation (SDC) was tasked to recommend and install a minicomputer hardware/software system aboard the ship. The NOVA 1200 system was selected and installed in January 1973.

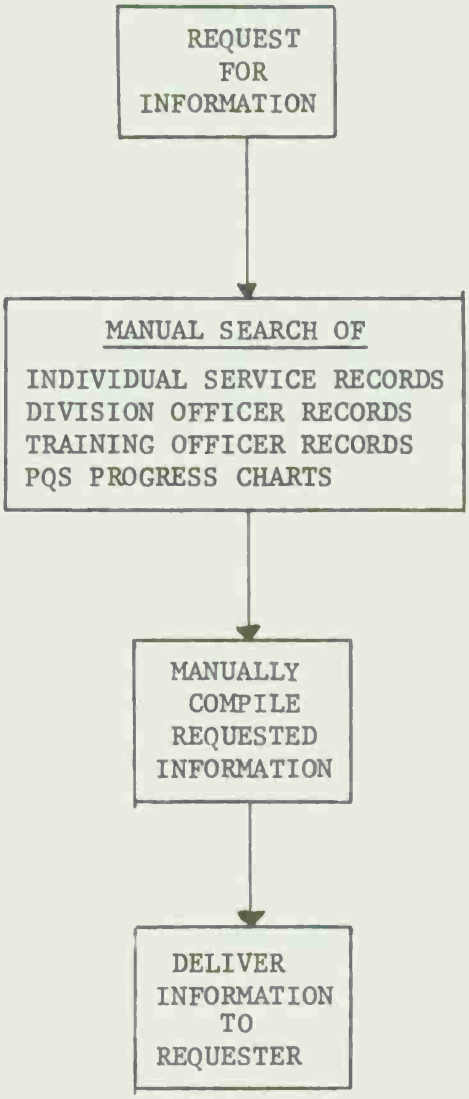

Figure 1. Manual data collection flow.

In July 1973 the Navy Personnel Research and Development Center (NAVPERS-RANDCEN) independently initiated a project to determine the feasibility of using a minicomputer system aboard a combatant ship for instruction and training administration. Subsequently, the Center was invited by OP-91 to use the NOVA 1200 system on DAHLGREN for operational evaluation. The result was a joint endeavor by the Center, OP-91 and Commander, Naval Surface Force, U. S. Atlantic Fleet (COMNAVSURFLANT) to explore the feasibility of using a shipboard minicomputer system for training applications.

A Shipboard Training Administration System (STAS) was to be developed to facilitate the recording, processing, and reporting of training information for planning, scheduling, and other administrative purposes. Computer Integrated Instruction (CII), in which instruction is conducted off-line and is integrated with on-line testing, diagnostics, and prescriptives, was also to be developed. The prototype CII subject matter area selected was General Damage Control. SDC was tasked to develop STAS and CII in November 1973.

Scope

This report covers the development and shipboard installation of STAS only. The installation completed SDC's participation in the project. The subsequent shipboard test and evaluation will be conducted and reported by the Navy and will utilize the DAHLGREN minicomputer system after installation on another ship. The CII project is described in Hoyt, Butler, and Hayward (1975).

SYSTEM DESCRIPTION

Development

STAS development was accomplished with a NOVA 1200 system located at a facility in Fairfax, Virginia that was compatible with the system on board the DAHLGREN. System hardware components consisted of the following:

- NOVA 1200 (32K core memory)
- Disk Drive (1 fixed head, 256K words)[1]
- Disk Drive (1 moving head, 1.2 million bytes)
- ASR 33 Teletype
- Cassette Drives (6 units)
- Line Printer (132 Column)
- CRT Terminals (4)
- Card Reader (225 CPM)

[1]It was anticipated that two fixed head disks would be available on the DAHLGREN, thus providing a minimum of 512K words of storage (possible 786K if the Model 6003 disk were installed. However, only one unit was available, thus limiting the STAS storage capacity. Expanded hardware capabilities would allow a more comprehensive system.

The system was designed for operating in a mulit-user environment. The Real-time Disk Operating System (RDOS), Version 3.2 and the extended interpretive programming language (BASIC), Version 3.6 were used for program development. The programs were designed as a series of overlays to be operated in the BASIC swapping mode. All program routines interact with the main data base.

Structure

The basic STAS design is structured for a main data base and two data subsets. As developed, the main data base can be either all the data elements contained in: (1) the General Data Base or (2) the PQS Data Base. In operation, the user selects the desired data base and loads it on the system disk.

General Data Base

The General Data Base contains individual training information. This includes such data as rate, division, schools completed, and general military training status. It is a variable length file composed of logical records (one per person up to 400). A logical record is composed of six physical records of 128 characters each, for a total logical record size of 768 characters. The General Data Base structure is shown in Figure 2 and its contents are listed in the appendix.

PQS Data Base

The PQS Data Base contains specific information pertaining to personnel qualification standards. It is a complete record of the PQS program and the status of each individual aboard ship. It is also a variable length file composed of logical records (one per person up to 400), and its structure is similar to that of the General Data Base (see Figure 2). Its contents are listed in the appendix.

Data Subsets

The data subsets contain selected personnel and training information normally maintained by the Division Officers. Because of system limitations, it was not possible to include all such material. The subsets provide the user with a three-leval query select option by use of a series of selective reductions.

Dictionary Files

Both the General and PQS Data Bases have dictionary files that contain specific descriptions (title, identification, characteristics, size, and location) of the data base elements. They are variable length files composed of a maximum of 86 physical records (one for each data element) of 128 characters each for a total files size of 11,008 characters. The file structure is shown in Figure 3.

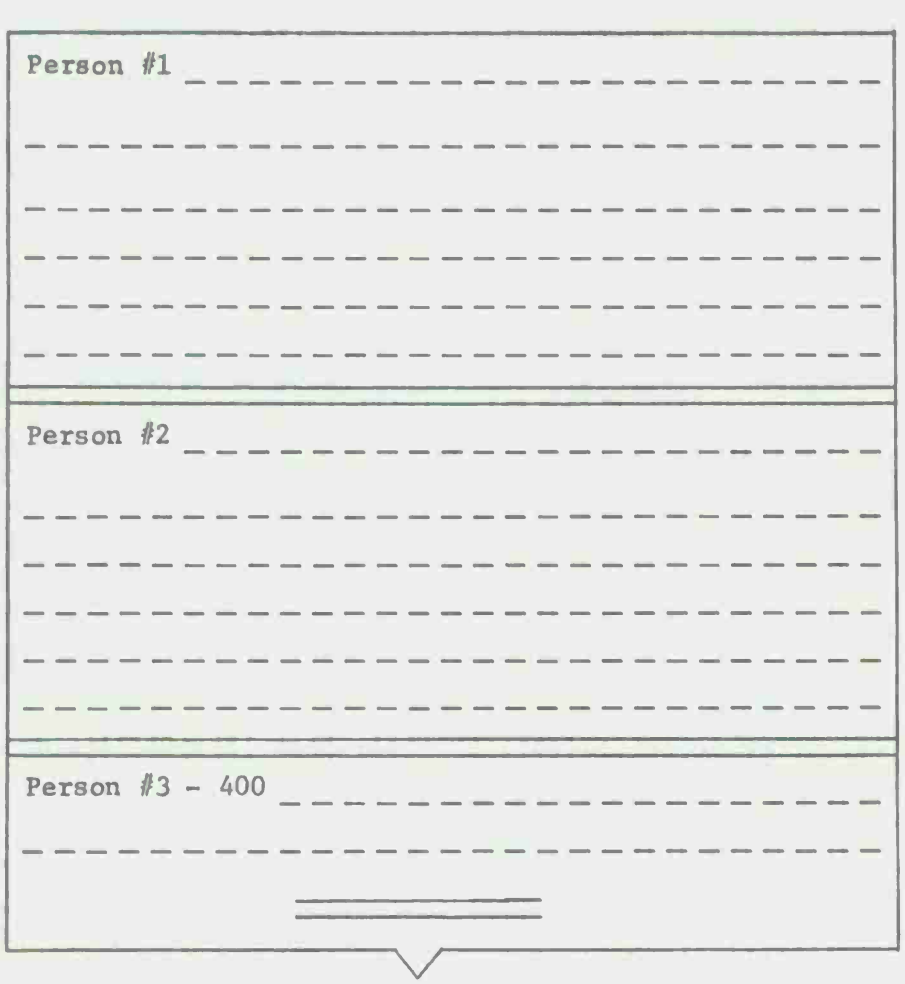

Figure 2. General and PQS File structure.

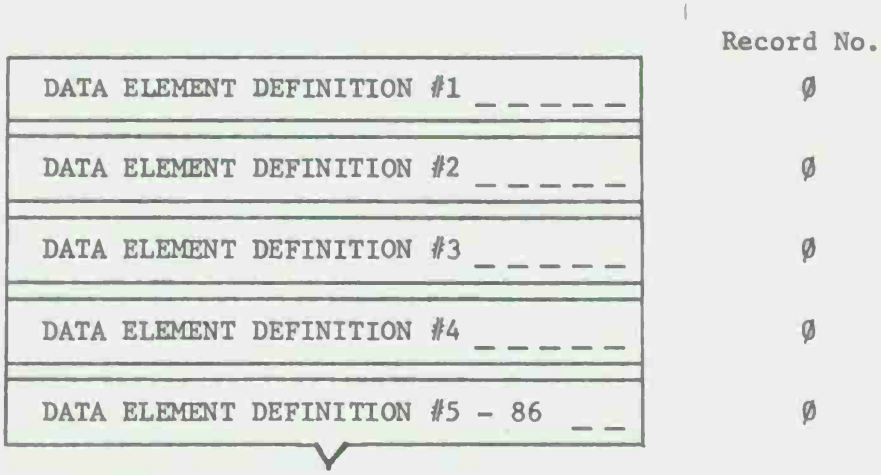

Figure 3. Dictionary File structure.

The dictionary files are maintained by the Dictionary Manager (DCTMGR) computer program, which allows the user to add new data elements to the data bases, to make changes and deletions to the existing data element definitions, and to print the dictionary contents (see Figure 4). It is accessed by all STAS input and output functions, thus providing a simplified method for data base modifications. Also, it controls the maximum size of a field to be input to the system.

The data element definitions maintained by DCTMGR are used by the File Manager (FILMGR) computer program to maintain the data bases and generate reports. Both FILMGR and DCTMGR have a core-resident control function and a series of structured program overlays that are read in and operated as required, thus allowing efficient use of the available core memory storage.

Data Base Generation

The dynamic data required for the General and PQS Data Bases were gathered on forms provided to COMNAVSURFLANT by SDC, and completed by NAVPERSRANDCEN and DAHLGREN personnel. As indicated previously, the data for the subsets were obtained from Division Officers' records. The static data elements needed for the dictionary computer program were extracted by SDC personnel from cassette tapes available aboard the ship.

Information in the data bases will be updated as required. Records will be retained for each person aboard ship, and normally deleted from the data files when he is reassigned. Figure 5 shows the data elements included in the data bases and the dictionary files.

Capabilities

Within the limits of the NOVA 1200, STAS provides the following capabilities:

- A centralized repository for individual training information
- More rapid availability of training and qualification records
- Better use of available information, e.g., for career counseling
- More consistent and effective training scheduling
- More timely and effective training status information

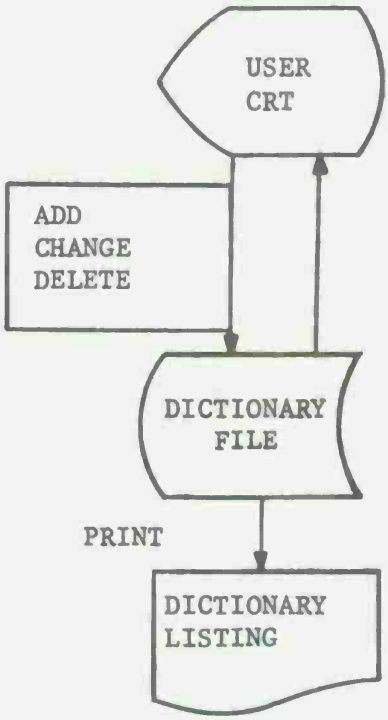

Figure 4. Dictionary Manager (DCTMGR) operations.

DICTIONARY DATA ELEMENTS--STATIC DATA	GENERAL DATA BASE ELEMENTS--DYNAMIC DATA
Expanded Element ID Element ID Element Length Is This a String Element Number of Elements in String Which Record Contains Element Element Starting Byte in Record	Social Security Number Name Last Update Present Rate Primary NEC EAOS Projected Rotation Date Secondary NEC GCT ARI Mech Cler Third NEC Division Pay Grade Navy Service Schools Successfully Completed (occurs 6 times) School Code Navy Correspondence Courses Completed (occurs 10 times) Course Code General Military Training (occurs 24 times) GMT code Completion Date Work Center Completed QUAL Cards (occurs 10 times) QUAL Number Completion Date CII Course Completed
PQS DATA BASE ELEMENTS--DYNAMIC DATA	
Social Security Number Name Work Center Completed QUAL cards (occurs 10 times) QUALS in Progress (occurs 8 times) QUAL Number Start Date Total Possible Score Cumulative Score Completion Date Required to Qualify	

Figure 5. STAS data base content

. A programmed data management system capable of expansion for a variety of uses[2]

STAS permits the user (1) to add, delete, or change records in both data bases, (2) to query the data bases in predetermined format, and (3) to generate additional reports by requesting specific data fields. These functions will normally be performed by the Training Officer or his designee, the Executive Officer, or Division Officers. Response time for all functions is minimal, although a reasonable amount of time is required for printing a long report or sorting a large data base. Data are entered into STAS from a teletype or any of four CRTs and are output via line printer or the CRTs. The line printer provides hard copy. The CRTs are used to query, update, and edit the data bases. Tape cassettes provide off-line storage, and serve as input and output devices for system and data base loading and backup. The disk is the primary mass storage device while STAS is in operation.

Eleven commands are available to the user: ADD, CHANGE, DELETE, SORT, DISPLAY, SEARCH, PRINT, EXPLAIN, SELECT, FORMAT, and FINI. These commands are described in detail in the STAS Users Manual, UM-01 (SDC, 1974). After the user loads the desired base from the tape library to the system disk, he may use any of the primary commands (ADD, CHANGE, DELETE, SORT, DISPLAY) to access data stored in the data base. For example, if he wishes to view a person's record, he operates the DISPLAY command using the desired parameters (e.g., SSN or NAME). If he wishes to generate a preformatted report header for use on the line printer, he operates the FORMAT command to access the data base. The system can store up to 50 of these preformatted report headers. Examples of the four preformatted reports delivered to the ship are shown in Figures 6-9. If his actions change the data base, a new permanent file is created on tape cassette.

Figure 10 presents an overview of STAS operations.

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[2]During system design, consideration was given to including data bases on ship exercise and status and department/division training. The former was not included because of the small number of external reports required. The latter included data on up to 25 training exercises per division, for which progress and status information would be helpful. However, the limited capacity of the system precluded inclusion of this capability.

01/31/74

USS DAHLGREN (DLG 12)
PQS OVERALL REPORT

QUAL CARD NR AND WATCH STATION	TOTAL NR PERS REQD TO QUAL	NR PERS IN QUAL PROCESS	TOTAL NR PERS FULLY QUAL
43119-2Q22400	152	87	65
43117-2Q12401	48	16	20
43119-2Q12410	85	14	70
43119-2Q12420	40	10	27
43119-2Q12430	120	62	58

Figure 6. PQS overal report

03/20/74

USS DAHLGREN (DLG 12)
COMPLETED PQS

NAME	SSN	QCNO	COMPDT
JONES MARK J	170060215	43172-Q4 412	7402
		43119-2Q12401	7404
LARSON JOHN K	146360215	43117-Q1 7410	7305
		43172-Q1 7420	7310
		43172-Q1 7430	7312
		43172-Q1 7440	7403

Figure 7. Completed PQS report

03/02/74

USS DAHLGREN (DLG 12)
PQS DETAIL REPORT

NAME	SSN	QCNO	START	TOTPOS	CUM	COMPDT
JONES MARK J	170020215	43117-Q242410	7312	200	185	
		43172-Q4 412	7312	150	150	7402
		43172-Q4 413	7402	250	45	
SMITH BARRY K	172022115	43119-2Q12401	7305	450	450	7310
		43119-2Q12410	7309	225	225	7312
		43172-Q1 7410	7311	175	175	7401
		43172-Q1 7420	7401	225	220	
		43172-Q1 7430	7402	675	120	

Figure 8. PQS detail report

03/20/74

USS DAHLGREN (DLG 12)
MAN REPORT

SSN	126403217	LNME	JONES	FNME	JOHN	UPDATE	7402
PRATE	HT3	PNEC	3210	EAOS	740120	PRD	7410
SNEC	3211	GCT	02	ARI	03	MECH	04
CLER	05	TNEC	0621	DIV	1	PYGRD	2
SC1	8321-9847	SC2		SC3		SC4	
SC5		SC6		CC1		CC2	
CC3		CC4		CC5		CC6	
CC7		CC8		CC9		CC10	
GMT01	217310	GMT02		GMT03		GMT04	
GMT05		GMT06		GMT07		GMT08	
GMT09		GMT10		GMT11		GMT12	
GMT13		GMT14		GMT15		GMT16	
GMT17		GMT18		GMT19		GMT20	
GMT21		GMT22		GMT23		GMT24	
WRKCTR	4321	QC01	43172-Q4 412	QDTE01	7310	QC02	43172-Q4 413
QDTE02	7312	QC03	43119-2Q12401	QDTE05		QC06	
QDTE06		QC07		QDTE07		QC08	
QDTE08		QC09		QDTE09		QC10	
QDTE10		CIIGDC	Y				

Figure 9. Man report

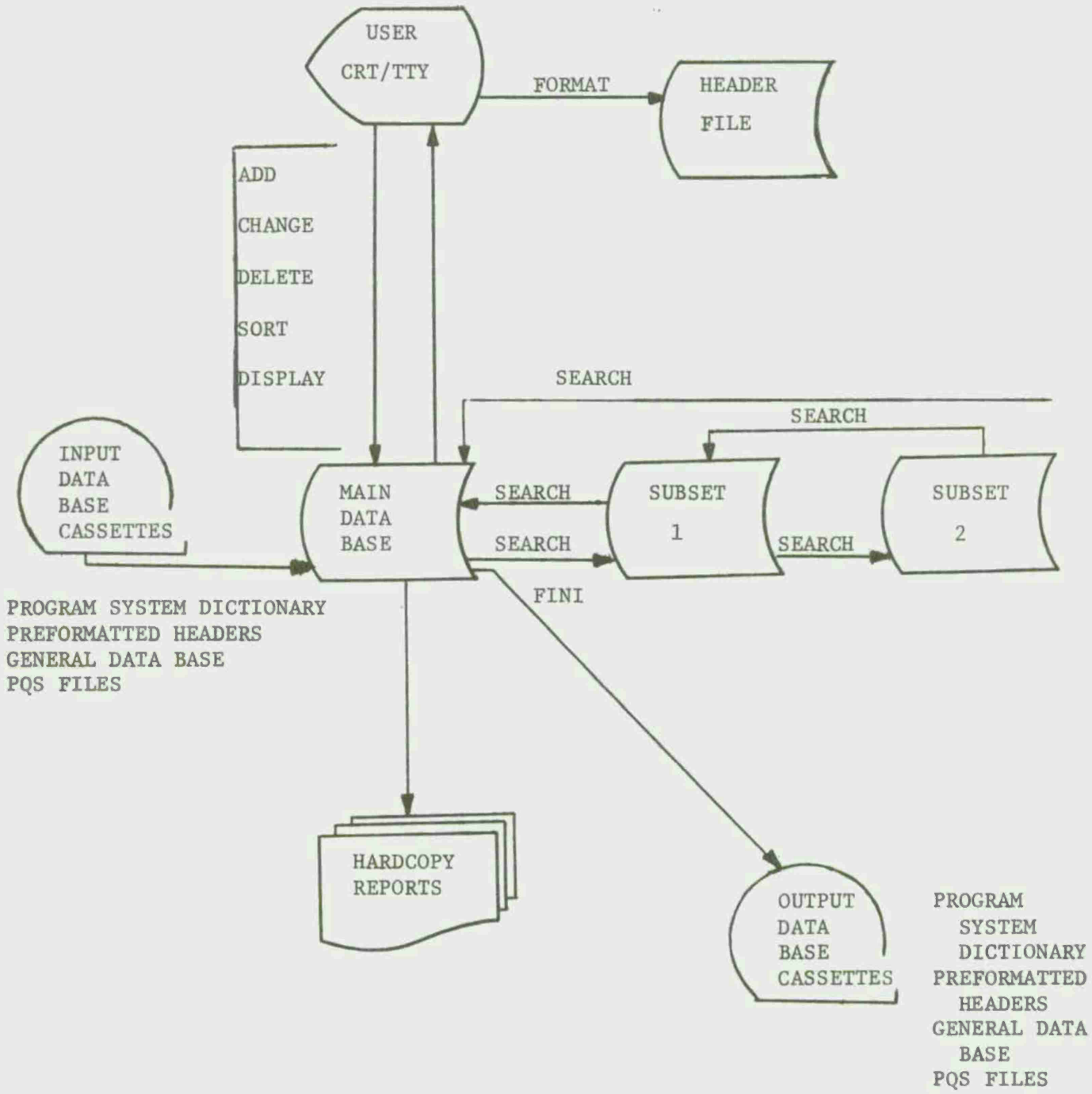

Figure 10. STAS operational flow

ADP Documentation

The STAS ADP documentation consists of the following (see references):

- Functional Description, FD-01B
- Data Requirements, RD-01A
- Users Manual, UM-01
- Computer Operation Manual, OM-01
- Maintenance Manual, MM-01
- Test and Implementation Plan, PT-01

SHORE-BASED DEMONSTRATION AND SHIPBOARD INSTALLATION

The shore-based demonstration/checkout of STAS was conducted 11-22 November 1974 at the SDC Computer facility in Fairfax, Virginia. STAS tests were designed to verify the proper operation of all system commands and functions. STAS was demonstrated to and exercised by NAVPERSRANDCEN representatives throughout the 2-week period. No failures or major problems were encountered. A detailed description of the plan for this system test is presented in the Test and Implementation Plan (PT-01 (SDC, 1974)).

The following STAS capabilities were tested:

- Add records to data base
- Delete records from data base
- Change records already in data base
- Change record format and update data base in accordance with new record format
- Display data to CRT
- Print data on line printer
- Generate and store report headers.

Test/Function Relationships

Five tests were supplied as part of the system test (see figure 11). Each system function was exercised in at least one test. The first test executed loaded the data base from cassettes, and the last test dumped the data base from the disk back to cassettes. A description of these tests follows.

TEST NUMBER AND TITLE / COMMAND/ FUNCTION NAME	ADD	DELETE	CHANGE	DISPLAY	PRINT	FORMAT	SELECT	SORT	SEARCH	EXPLAIN	REPORTS	FINI
1. EXPLAIN, SELECT, and DELETE		X					X			X		
2. ADD, SELECT, DISPLAY, and CHANGE	X		X	X			X					
3. SELECT, SORT, PRINT, DISPLAY, and SEARCH				X	X		X	X	X			
4. FORMAT, SELECT, PRINT, and DISPLAY				X	X	X	X				X	X
5. Dictionary Maintenance	X	X	X		X							X

Figure 11. STAS test/function matrix

1. EXPLAIN, SELECT, and DELETE Commands. The EXPLAIN command was executed to get an explanation of the use of the SELECT command. A record was then selected from the data base and deleted. This record was again requested to ensure that it no longer existed in the data base.

2. ADD, SELECT, DISPLAY, and CHANGE Commands. A record was added to the data base and then selected from the data base into a subset. The DISPLAY command was used to display on the CRT the SSN, NAME, etc., of the record in the subset. The middle initial (MI) and primary rate (PRATE) were changed, and the record was again selected from the data base into a subset and displayed to show that the changes had been executed.

3. SELECT, SORT, PRINT, DISPLAY, and SEARCH Commands. A selection into a subset was made of all personnel whose projected rotational date (PROJ) was 5/1/75. The records in the subset were sorted by PROJ. After sorting, the PRINT command was used to print the SSN, NAME, PROJ. etc. of the sorted records on the line printer. From the subset created by the previous selection, an additional selection isolated the personnel who attended school A2210015.

The DISPLAY command was used to display on the CRT the SSN, NAME, PROJ, and SCHOOLS of the records selected. At this point, the subset contained only those personnel whose projected rotation date was 1 May 1975 and who attended school A2210015. The SEARCH command was then used to instruct the system to go back to the first created subset and use it as the basic data source. The SSN, PRATE, and PROJ were displayed on the CRT to verify the existence of the first subset.

4. FORMAT, SELECT, PRINT, and DISPLAY Commands. The FORMAT command was used to create a preformatted header to print the completed PQS codes along with SSN, NAME, and PRATE. The SELECT command was used to select all personnel who had completed a PQS after 1/1/74. The selected records were printed on the line printer using the PRINT command created by the preformatted header at the beginning of the test.

After display of the data on the CRT, the preformatted header was deleted using the FORMAT command. The PRINT command was used to print the four preformatted reports supplied with the system (see Figures 6 through 9).

5. Dictionary Maintenance. The commands associated with the dictionary program are ADD, CHANGE, DELETE, and PRINT. A record was added to the dictionary using the ADD command. The record contained the dictionary description of a new data element name needed to allow modifications to the data base contents, e.g., if an addition to Social Security Number (SSN), a new data element name is desired for the last digit of the SSN, and could be defined as SSNL. After creation of the new dictionary element, SSNL, program control was switched to FILMGR and data values were input for SSNL. The data base was then queried to display the contents of SSNL to verify existence in the data base. This data value was then deleted from the data base. After addition of a record, the PRINT command was executed to print the original elements in the dictionary plus the new record just added.

The dictionary record was changed (CHANGE command) and again the complete dictionary was printed to show the change that took place. After printing, the record was deleted using the DELETE command. At this point, the dictionary printed (PRINT) once more to show it in its original form.

Test Constraints

The only testing limitation encountered was computer size. Because the disk capacity of the computer at the SDC test site is approximately one-half that of the DAHLGREN computer system, the on-line data base was limited to approximately 200 records. The data base was therefore segmented on storage cassettes so that at any one time only half the data base was available on line (see Figure 12). Of the total data base A through Z, only the segments A through H or I through Z were available for on-line access at any one time. However, it was possible to demonstrate any of the segments at separate times.

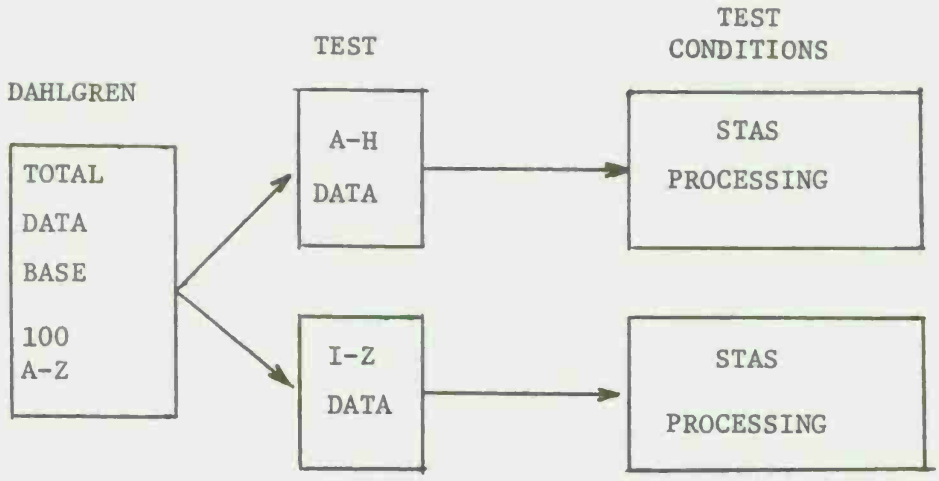

Figure 12. SDC test site data handling procedure

SDC did not test conditions which result from overload, saturation, and other "worst case" effects as detected by functions of the operating system (RDOS) and the extended BASIC interpreter. These system errors are presented to the user as a display on the CRT or teletype. These error conditions vary from critical to slight impact and the user must determine his particular situation. Recovery is possible since STAS returns him to the COMMAND point.

Shipboard Installation

In December, 1974 STAS was installed on the DAHLGREN. The following items were delivered aboard; computer program printouts, data bases, dictionaries, computer programs, and magnetic tape cassettes of the data bases. This completed SDC's participation in the project. As already indicated earlier in this report, it is planned to install the DAHLGREN minicomputer system on another ship for systematic test and evaluation of STAS and other applications.

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GLOSSARY OF TERMS

ADP	Automatic Data Processing
ARI	Arithmetic
Audit Trail	Recording of significant activities
BASIC	Interpretive programming language
Byte	Storage for one character
CII	Computer Integrated Instruction
CII Programs	Computer programs for CII functions
Card Reader	Computer input device for punched cards
Cassette Tape	Small magnetic recording tape for computer
CLER	Clerical
COMMAND?	Request for user input
CPU	Central Processing Unit
CR	Carriage Return
CRT	Cathode Ray Tube
DGC	Data General Corporation
Data Base	Total amount of data for system use
Disk	Temporary data storage device
Display	To produce an image on the CRT screen
DOR	Date of Rank
EAM	Electric Accounting Machine
EAOS	Expiration Active Obligated Service
EDP	Electronic Data Processing
EQ	Equal
ESC	Escape key
File	Storage procedure for computer data, usually consists of several records
File identification	File name maintained by RDOS
Flag	Training Official Indicator
FNME	First name
GCT	General Classification Test
GDC	General Damage Control
GMT	General Military Training
GR	Greater than
Hard Copy	Printed material

ID	Identification
I/O	Input/Output computer procedures
Initiation	To start a new function by setting the proper conditions at the computer
Interactive	Conversation-like use of computer
Line Printer	Printing device connected to computer
LNME	Last name
Log In	To identify yourself to the system to start system use
Log Out	To quit system use
Logical Record	Storage for related information usually consisting of more than one physical record
LS	Less than
MARST	Marital status
MECH	Mechanical
MI	Middle initial
Moudle	Independent course of study
Multiuser	More than one user simultaneously
NE	Not equal
NEC	Naval Enlisted Classification Code
Physical Record	A unit of hardware storage (128 bytes for the Nova 1200)
PNEC	Primary Naval Enlisted Classification Code
Posttest	Test taken after study of training materia
PQS	Personnel Qualification Standard
PRATE	Present rate
Practical Exercise	Physical demonstration of procedure
Pretest	Test taken before study of training materials
PROJ	Projected Rotation date
QUAL	Qualification
RDOS	Real-time Disk Operating System
Record	Storage procedure for computer data

RG	Range
SDC	System Development Corporation
SSN	Social Security Number
STAS	Shipboard Training Administration System
String	Units of related data
Tape label	Tape name written on tape container
Tape Library	Repository for system tape cassettes
Training Official	Personnel officially designated by Commanding Officer to manage or operate CII
WIFENM	Wife's Name

APPENDIX - DATA BASES

General Data Base

EXPANDED ELEMENT ID	REC #	START	LEN	ELEMENT ID
SOCIAL SECURITY NUMBER	1	001	09	SSN
LAST NAME	1	010	16	LNME
FIRST NAME	1	026	10	FNME
MIDDLE INITIAL	1	036	01	MI
PRESENT RATE	1	037	05	PRATE
LAST UPDATE	1	042	06	UPDATE
PRIMARY NEC	1	048	04	PNEC
EXP. ACTIVE OBL. SERVICE	1	052	06	EAOS
PROS. ROTATION DATE	1	058	04	PRD
SECONDARY NEC	1	062	04	SNEC
GCT	1	066	02	GCT
ARI	1	068	02	ARI
MECH	1	070	02	MECH
CLER	1	072	02	CLER
THIRD NEC	1	074	04	TNEC
DIVISION	1	078	01	DIV
PAY GRADE	1	079	01	PGRADE
WORK CENTER	1	080	04	WRKCTR
CII MODULE COMPLETED	1	084	01	CIIGDC
SCHOOLS COMPLETED 1	2	001	08	SC1
SCHOOLS COMPLETED 2	2	009	08	SC2
SCHOOLS COMPLETED 3	2	017	08	SC3
SCHOOLS COMPLETED 4	2	025	08	SC4
SCHOOLS COMPLETED 5	2	033	08	SC5
SCHOOLS COMPLETED 6	2	041	08	SC6
COURSES COMPLETED 1	3	001	08	CC1
COURSES COMPLETED 2	3	009	08	CC2
COURSES COMPLETED 3	3	017	08	CC3
COURSES COMPLETED 4	3	025	08	CC4
COURSES COMPLETED 5	3	033	08	CC5
COURSES COMPLETED 6	3	041	08	CC6
COURSES COMPLETED 7	3	049	08	CC7
COURSES COMPLETED 8	3	057	08	CC8
COURSES COMPLETED 9	3	065	08	CC9
COURSES COMPLETED 10	3	073	08	CC10
COMP QUAL CODE 1	4	001	13	QC01
COMP QUAL DATE 1	4	014	04	QDTE01
COMP QUAL CODE 2	4	018	13	QC02
COMP QUAL DATE 2	4	031	04	QDTE02
COMP QUAL CODE 3	4	035	13	QC03
COMP QUAL DATE 3	4	048	04	QDTE03
COMP QUAL CODE 4	4	052	13	QC04
COMP QUAL CODE 4	4	065	04	QDTE04
COMP QUAL CODE 5	4	069	13	QC05

General Data Base (Cont.)

EXPANDED ELEMENT ID	REC #	START	LEN	ELEMENT ID
COMP QUAL DATE 5	4	082	04	QDTE05
COMP QUAL CODE 6	4	086	13	QC06
COMP QUAL DATE 6	4	099	04	QDTE06
COMP QUAL CODE 7	4	103	13	QC07
COMP QUAL DATE 7	4	116	04	QDTE07
COMP QUAL CODE 8	5	001	13	QC08
COMP QUAL DATE 8	5	014	04	QDTE08
COMP QUAL CODE 9	5	018	13	QC09
COMP QUAL DATE 9	5	031	04	QDTE09
COMP QUAL CODE 10	5	035	13	QC10
COMP QUAL DATE 10	5	048	04	QDTE10
GMT 1	5	111	06	GMT01
GMT 2	5	117	06	GMT02
GMT 3	5	123	06	GMT03
GMT 4	6	001	06	GMT04
GMT 5	6	007	06	GMT05
GMT 6	6	013	06	GMT06
GMT 7	6	019	06	GMT07
GMT 8	6	025	06	GMT08
GMT 9	6	031	06	GMT09
GMT 10	6	037	06	GMT10
GMT 11	6	043	06	GMT11
GMT 12	6	049	06	GMT12
GMT 13	6	055	06	GMT13
GMT 14	6	061	06	GMT14
GMT 15	6	067	06	GMT15
GMT 16	6	073	06	GMT16
GMT 17	6	079	06	GMT17
GMT 18	6	085	06	GMT18
GMT 19	6	091	06	GMT19
GMT 20	6	097	06	GMT20
GMT 21	6	103	06	GMT21
GMT 22	6	109	06	GMT22
GMT 23	6	115	06	GMT23
GMT 24	6	121	06	GMT24

PQS Data Base

EXPANDED ELEMENT ID	NEC #	START	LEN	ELEMENT ID
SOCIAL SECURITY NUMBER	1	001	09	SSN
LAST NAME	1	010	16	LNME
FIRST NAME	1	026	10	FNME
MIDDLE INITIAL	1	036	01	MI
WORK CENTER	1	037	04	WRKCTR
COMPLETED QUAL 1	2	001	13	COMQ1
COMPLETED QUAL 2	2	014	13	COMQ2
COMPLETED QUAL 3	2	027	13	COMQ3
COMPLETED QUAL 4	2	040	13	COMQ4
COMPLETED QUAL 5	2	053	13	COMQ5
COMPLETED QUAL 6	2	066	13	COMQ6
COMPLETED QUAL 7	2	079	13	COMQ7
COMPLETED QUAL 8	2	092	13	COMQ8
COMPLETED QUAL 9	2	105	13	COMQ9
COMPLETED QUAL 10	3	001	13	COMQ10
QUAL IN PROG 1	4	001	13	QNUM1
QUAL START DATE 1	4	014	04	QSDT1
QUAL POSS SCORE 1	4	018	04	QPOS1
QUAL CUM SCORE 1	4	022	04	QCUM1
QUAL STOP DATE 1	4	026	04	QSTP1
REQ TO QUAL 1	4	030	01	QREQ1
QUAL IN PROG 2	4	031	13	QNUM2
QUAL START DATE 2	4	044	04	QSDT2
QUAL POSS SCORE 2	4	048	04	QPOS2
QUAL CUM SCORE 2	4	052	04	QCUM2
QUAL STOP DATE 2	4	056	04	QSTP2
REQ TO QUAL 2	4	060	01	QREQ2
QUAL IN PROG 3	4	061	13	QNUM3
QUAL START DATE 3	4	074	04	QSDT3
QUAL POSS SCORE 3	4	078	04	QPOS3
QUAL CUM SCORE 3	4	082	04	QCUM3
QUAL STOP DATE 3	4	086	04	QSTP3
REQ TO QUAL 3	4	090	01	QREQ3
QUAL IN PROG 4	4	091	13	QNUM4
QUAL START DATE 4	4	104	04	QSTD4
QUAL POSS SCORE 4	4	108	04	QPOS4
QUAL CUM SCORE 4	4	112	04	QCUM4
QUAL STOP DATE 4	4	116	04	QSTP4
REQ TO QUAL 4	4	120	01	QREQ4
QUAL IN PROG 5	5	001	13	QNUM5
QUAL START DATE 5	5	014	04	QSDT5
QUAL POSS SCORE 5	5	018	04	QPOS5
QUAL CUM SCORE 5	5	022	04	QCUM5
QUAL STOP DATE 5	5	026	04	QSTP5

PQS Data Base (Cont.)

EXPANDED ELEMENT ID	REC #	START	LEN	ELEMENT ID
REQ TO QUAL 5	5	030	01	QREQ5
QUAL IN PROG 6	5	031	13	QNUM6
QUAL START DATE 6	5	044	04	QSDT6
QUAL POSS SCORE 6	5	048	04	QPOS6
QUAL CUM SCORE 6	5	052	04	QCUM6
QUAL STOP DATE 6	5	056	04	QSTP6
REQ TO QUAL 6	5	060	01	QREQ6
QUAL IN PROG 7	5	061	13	QNUM7
QUAL START DATE 7	5	074	04	QSDT7
QUAL POSS SCORE 7	5	078	04	QPOS7
QUAL CUM SCORE 7	5	082	04	QCUM7
QUAL STOP DATE 7	5	086	04	QSTP7
REQ TO QUAL 7	5	090	01	QREQ7
QUAL IN PROG 8	5	091	13	QNUM8
QUAL START DATE 8	5	104	04	QSDT8
QUAL POSS SCORE 8	5	108	04	QPOS8
QUAL CUM SCORE 8	5	112	04	QCUM8
QUAL STOP DATE 8	5	116	04	QSTP8
REQ TO QUAL 8	5	120	01	QREQ8
COMPLETED QUALS STRING	2	001	13	CQUALS
QUALS IN PROGRESS STRING	4	001	13	QINPRG
START DATE STRING	4	014	04	DATES
TOTAL POSSIBLE STRING	4	018	04	POSS
CUM SCORE STRING	4	022	04	CUMMS
STOP DATES STRING	4	026	04	STOPS

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