

NO-A182 545

INTEGRATED INFORMATION SUPPORT SYSTEM (IIS) VOLUME 8

1/3

USER INTERFACE SUBS (U) GENERAL ELECTRIC CO

SCHENECTADY NY PRODUCTION RESOURCES CONSU

UNCLASSIFIED

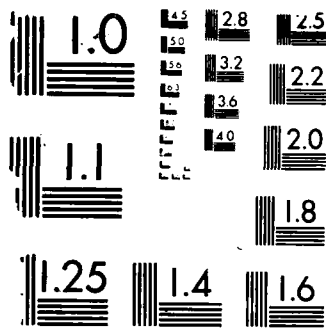
C MORENC ET AL

01 NOV 85

P5-620144300

F/G 12/5

M1



MICROCOPY RESOLUTION TEST CHART
NBS 1963-A

AD-A182 545

AFWAL-TR-86-4006
Volume VIII
Part 10

DTIC FILE COPY



INTEGRATED INFORMATION
SUPPORT SYSTEM (IISS)
Volume VIII - User Interface Subsystem
Part 10 - Virtual Terminal Product Specification

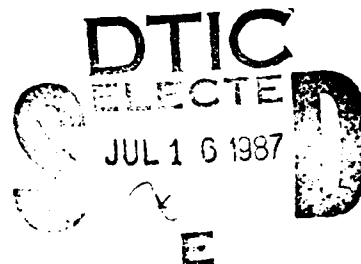
General Electric Company
Production Resources Consulting
One River Road
Schenectady, New York 12345

Final Report for Period 22 September 1980 - 31 July 1985
November 1985

Approved for public release; distribution is unlimited.

PREPARED FOR:

MATERIALS LABORATORY
AIR FORCE WRIGHT AERONAUTICAL LABORATORIES
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AFB, OH 45433-6533

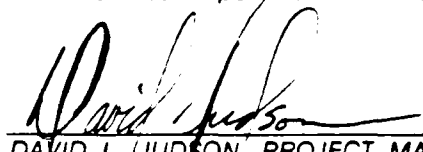


NOTICE

When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

This report has been reviewed by the Office of Public Affairs (ASD/PA) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.



DAVID L. JUDSON, PROJECT MANAGER
AFWAL/MLTC
WRIGHT PATTERSON AFB OH 45433

5 Aug 1986

DATE

FOR THE COMMANDER:



GERALD C. SHUMAKER, BRANCH CHIEF
AFWAL/MLTC
WRIGHT PATTERSON AFB OH 45433

7 Aug 86

DATE

"If your address has changed, if you wish to be removed from our mailing list, or if the addressee is no longer employed by your organization please notify AFWAL/MLTC, W-PAFB, OH 45433 to help us maintain a current mailing list."

Copies of this report should not be returned unless return is required by security considerations, contractual obligations, or notice on a specific document.

Unclassified

1 November 1985

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

H182,545

1a REPORT SECURITY CLASSIFICATION Unclassified		1b RESTRICTIVE MARKINGS			
2a SECURITY CLASSIFICATION AUTHORITY		3 DISTRIBUTION AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.			
2b DECLASSIFICATION/DOWNGRADING SCHEDULE					
4. PERFORMING ORGANIZATION REPORT NUMBER(S)		5. MONITORING ORGANIZATION REPORT NUMBER(S) AFVAL-TR-86-4006 Vol VIII, Part 10			
6a NAME OF PERFORMING ORGANIZATION General Electric Company Production Resources Consulting	6b OFFICE SYMBOL (If applicable) AFVAL/MLTC	7a NAME OF MONITORING ORGANIZATION AFVAL/MLTC			
8a ADDRESS (City, State and ZIP Code) 1 River Road Schenectady, NY 12345		7b ADDRESS (City, State and ZIP Code) WPAFB, OH 45433-6533			
8a NAME OF FUNDING/SPONSORING ORGANIZATION Materials Laboratory Air Force Systems Command, USAF	8b OFFICE SYMBOL (If applicable) AFVAL/MLTC	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER F33615-80-C-5155			
8c ADDRESS (City, State and ZIP Code) Wright-Patterson AFB, Ohio 45433		10 SOURCE OF FUNDING NOS			
		PROGRAM ELEMENT NO. 78011F	PROJECT NO. 7500	TASK NO. 62	WORK UNIT NO. 01
11. TITLE (Include Security Classification) (See Reverse)					
12. PERSONAL AUTHOR(S) Morenc, Carol, Barker, Sandy and Robie, Penny					
13a TYPE OF REPORT Final Technical Report	13b TIME COVERED 22 Sept 1980 - 31 July 1985	14. DATE OF REPORT (Yr., Mo., Day) 1985 November	15. PAGE COUNT 212		
16. SUPPLEMENTARY NOTATION ICAM Project Priority 6201		The computer software contained herein are theoretical and/or references that in no way reflect Air Force-owned or -developed computer software.			
17. COSATI CODES		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)			
FIELD	GROUP	SUB GR			
1308	0905				
19. ABSTRACT (Continue on reverse if necessary and identify by block number) This specification established the detailed design of a computer program identified as the Virtual Terminal (VT). One of the objectives of the IISS test bed is to allow applications to be run from a wide variety of terminals. Instead of the application programmer having to worry about what commands to send to which type of terminal to perform what functions, he just uses commands for the VT. The VT is defined just like a real terminal; it has a set of functions which it can perform, a set of attributes that it supports, a set of commands for invoking the functions and modes of operation.					
20. DISTRIBUTION AVAILABILITY OF ABSTRACT UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT ☐ DTIC USERS ☐		21. ABSTRACT SECURITY CLASSIFICATION Unclassified			
22a NAME OF RESPONSIBLE INDIVIDUAL David L. Judson		22b TELEPHONE NUMBER (Include Area Code) 813-255-8976	22c OFFICE SYMBOL AFVAL/MLTC		

11. Title

Integrated Information Support System (IISS)
Vol VIII - User Interface Subsystem
Part 10 - Virtual Terminal Product Specification

Accession For	
NTIS GRA&I	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	



PREFACE

This product specification covers the work performed under Air Force Contract F33615-80-C-5155 (ICAM Project 6201). This contract is sponsored by the Materials Laboratory, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. It was administered under the technical direction of Mr. Gerald C. Shumaker, ICAM Program Manager, Manufacturing Technology Division, through Project Manager, Mr. David Judson. The Prime Contractor was Production Resources Consulting of the General Electric Company, Schenectady, New York, under the direction of Mr. Alan Rubenstein. The General Electric Project Manager was Mr. Myron Hurlbut of Industrial Automation Systems Department, Albany, New York.

Certain work aimed at improving Test Bed Technology has been performed by other contracts with Project 6201 performing integrating functions. This work consisted of enhancements to Test Bed software and establishment and operation of Test Bed hardware and communications for developers and other users. Documentation relating to the Test Bed from all of these contractors and projects have been integrated under Project 6201 for publication and treatment as an integrated set of documents. The particular contributors to each document are noted on the Report Documentation Page (DD1473). A listing and description of the entire project documentation system and how they are related is contained in document FTR620100001, Project Overview.

The subcontractors and their contributing activities were as follows:

TASK 4.2

<u>Subcontractors</u>	<u>Role</u>
Boeing Military Aircraft Company (BMAC)	Reviewer
D. Appleton Company (DACOM)	Responsible for IDEF support, state-of-the-art literature search
General Dynamics/ Ft. Worth	Responsible for factory view function and information models

Subcontractors

Role

Illinois Institute of
Technology

Responsible for factory view
function research (IITRI)
and information models of
small and medium-size business

North American Rockwell

Reviewer

Northrop Corporation

Responsible for factory view
function and information
models

Pritsker and Associates

Responsible for IDEF2 support

SofTech

Responsible for IDEF0 support

TASKS 4.3 - 4.9 (TEST BED)

Subcontractors

Role

Boeing Military Aircraft
Company (BMAC)

Responsible for consultation on
applications of the technology
and on IBM computer technology.

Computer Technology
Associates (CTA)

Assisted in the areas of
communications systems, system
design and integration
methodology, and design of the
Network Transaction Manager.

Control Data Corporation
(CDC)

Responsible for the Common Data
Model (CDM) implementation and
part of the CDM design (shared
with DACOM).

D. Appleton Company
(DACOM)

Responsible for the overall CDM
Subsystem design integration
and test plan, as well as part
of the design of the CDM
(shared with CDC). DACOM also
developed the Integration
Methodology and did the schema
mappings for the Application
Subsystems.

Subcontractors

Role

Digital Equipment
Corporation (DEC)

Consulting and support of the
performance testing and on DEC
software and computer systems
operation.

McDonnell Douglas
Automation Company
(McAuto)

Responsible for the support and
enhancements to the Network
Transaction Manager Subsystem
during 1984/1985 period.

On-Line Software
International (OSI)

Responsible for programming the
Communications Subsystem on the
IBM and for consulting on the
IBM.

Rath and Strong Systems
Products (RSSP) (In 1985
became McCormack & Dodge)

Responsible for assistance in
the implementation and use of
the MRP II package (PIOS) that
they supplied.

SofTech, Inc.

Responsible for the design and
implementation of the Network
Transaction Manager (NTM) in
1981/1984 period.

Software Performance
Engineering (SPE)

Responsible for directing the
work on performance evaluation
and analysis.

Structural Dynamics
Research Corporation
(SDRC)

Responsible for the User
Interface and Virtual Terminal
Interface Subsystems.

Prime contractors under other projects who have contributed
to Test Bed Technology, their contributing activities and
responsible projects are as follows:

<u>Contractors</u>	<u>ICAM Project</u>	<u>Contributing Activities</u>
Boeing Military Aircraft Company (BMAC)	1701, 2201, 2202	Enhancements for IBM node use. Technology Transfer to Integrated Sheet Metal Center (ISMC)

PS 620144300
1 November 1985

<u>Contractors</u>	<u>ICAM Project</u>	<u>Contributing Activities</u>
Control Data Corporation (CDC)	1502, 1701	IISS enhancements to Common Data Model Processor (CDMP)
D. Appleton Company (DACOM)	1502	IISS enhancements to Integration Methodology
General Electric	1502	Operation of the Test Bed and communications equipment.
Hughes Aircraft Company (HAC)	1701	Test Bed enhancements
Structural Dynamics Research Corporation (SDRC)	1502, 1701, 1703	IISS enhancements to User Interface/Virtual Terminal Interface (UI/VTI)
Systran	1502	Test Bed enhancements. Operation of Test Bed.

TABLE OF CONTENTS

	<u>Page</u>
SECTION 1.0 SCOPE	1-1
1.1 Identification	1-1
1.2 Functional Summary	1-1
SECTION 2.0 DOCUMENTS	2-1
2.1 Reference Documents	2-1
2.2 Terms and Abbreviations	2-2
SECTION 3.0 REQUIREMENTS	3-1
3.1 Structural Description	3-1
3.2 Functional Flow	3-1
3.3 Interfaces	3-2
3.3.1 Physical Terminal	3-2
3.3.2 Application	3-2
3.3.2.1 VT Process as Master	3-3
3.3.2.2 VT Process as Slave	3-3
3.3.3 Terminal User	3-4
3.4 Program Interrupts	3-4
3.5 Timing and Sequencing Description ..	3-4
3.6 Special Control Features	3-5
3.7 Storage Allocation	3-5
3.8 Object Code Creation	3-5
3.9 Adaptation Data	3-5
3.10 Detailed Design Description	3-5
3.10.1 Main Program List	3-5
3.10.2 Module List	3-8
3.10.3 External Routines List	3-12
3.10.4 Include File List	3-15
3.10.5 Where Include File Used List	3-17
3.10.6 Where External Routine Used List ..	3-27
3.10.7 Main Program Parts List	3-39
3.10.8 Module Documentation	3-43
3.10.9 Include File Descriptions	3-139
3.11 Program Listing Comments	3-196
SECTION 4.0 QUALITY ASSURANCE PROVISIONS	4-1
4.1 Introduction and Definitions	4-1
4.2 Computer Programming Test and Evaluation	4-1

PS 620144300
1 November 1985

FIGURES

3-1	Virtual Terminal Structure	3-1
3-2	Virtual Terminal Data Flow	3-2

SECTION 1

SCOPE

1.1 Identification

This specification establishes the detailed design of a computer program identified as the Virtual Terminal, hereinafter referred to as the VT. The VT is one configuration item of the Integrated Information Support System (IISS) User Interface (UI).

1.2 Functional Summary

One of the objectives of the IISS testbed is to allow applications to be run from a wide variety of terminals. Instead of the application programmer having to worry about what commands to send to which type of terminal to perform what functions, he just uses commands for the Virtual Terminal. The Virtual Terminal is defined just like a real terminal; it has a set of functions which it can perform, a set of attributes that it supports, a set of commands for invoking the functions, and modes of operation.

The VT translates between the Virtual Terminal commands and commands for the particular type of terminal a user has. This process is not as simple as it sounds since no single terminal provides all of the functions and attributes that the Virtual Terminal does. Thus, the Virtual Terminal Interface must simulate missing functions with existing ones.

In addition to supporting real terminals, the VT also performs another function -- interfacing existing applications to the testbed. An existing application sends (and expects to receive) commands for a particular type of terminal. In the testbed these commands are intercepted and sent to the Virtual Terminal which then converts the commands into Virtual Terminal commands, just as if they had been entered from a real terminal. Of course, it also converts Virtual Terminal commands to the specific terminal commands the application expects to receive. The Virtual Terminal allows an application to be run from a terminal other than the one it was designed for.

SECTION 2

DOCUMENTS

2.1 Reference Documents

- [1] Structural Dynamics Research Corporation, Application Interface Product Specification, PS 620144700 , 1 November 1985.
- [2] Structural Dynamics Research Corporation, Forms Driven Form Editor Product Specification, PS 620144402 , 1 November 1985.
- [3] Structural Dynamics Research Corporation, Forms Language Compiler Product Specification, PS 620144401 , 1 November 1985.
- [4] Structural Dynamics Research Corporation, Form Processor Product Specification, PS 620144200 , 1 November 1985.
- [5] Structural Dynamics Research Corporation, Rapid Application Generator Product Specification, PS 620144502 , 1 November 1985.
- [6] Structural Dynamics Research Corporation, Report Writer Product Specification, PS 620144501 , 1 November 1985.
- [7] Structural Dynamics Research Corporation, Text Editor Product Specification, PS 620144600 , 1 November 1985.
- [8] Structural Dynamics Research Corporation, User Interface Services Product Specification, PS 620144100 , 1 November 1985.
- [9] Structural Dynamics Research Corporation, Virtual Terminal Development Specification, DS 620144300B, 1 November 1985.
- [10] Structural Dynamics Research Corporation, Virtual Terminal User Manual, UM 620144300B, 1 November 1985.

[11] Structural Dynamics Research Corporation, Virtual
Terminal Unit Test Plan, UTP620144300 , 1 November
1985.

2.2 Terms and Abbreviations

American Standard Code for Information Interchange:
(ASCII), the character set defined by ANSI X3.4 and used by most computer vendors.

Application Interface: (AI), subset of the IISS User Interface that consists of the callable routines that are linked with applications that use the Form Processor or Virtual Terminal. The AI enables applications to be hosted on computers other than the host of the User Interface.

Application Process: (AP), a cohesive unit of software that can be initiated as a unit to perform some function or functions.

Attribute: field characteristic such as blinking, highlighted, black, etc. and various other combinations. Background attributes are defined for forms or windows only. Foreground attributes are defined for items. Attributes may be permanent, i.e., they remain the same unless changed by the application program, or they may be temporary, i.e., they remain in effect until the window is redisplayed.

Communication Services: allows on host interprocess communication and inter-host communication between the various Test Bed subsystems.

Computer Program Configuration Item: (CPCI), an aggregation of computer programs or any of their discrete portions, which satisfies an end-use function.

Device Drivers: (DD), software modules written to handle I/O for a specific kind of terminal. The modules map terminal specific commands and data to a neutral format. Device Drivers are part of the UI Virtual Terminal.

Extended Binary Coded Decimal Interchange Code: (EBCDIC), the character set used by a few computer vendors (notably IBM) instead of ASCII.

Field: two dimensional space on a terminal screen.

Integrated Information Support System: (IISS), a test computing environment used to investigate, demonstrate and test the concepts of information management and information integration in the context of Aerospace Manufacturing. The IISS addresses the problems of integration of data resident on heterogeneous data bases supported by heterogeneous computers interconnected via a Local Area Network.

Logical Device: a conceptual device which to an application is indistinguishable from a physical device and is then mapped to part or all of a physical device.

Network Transaction Manager: (NTM), IISS subsystem that performs the coordination, communication and housekeeping functions required to integrate the Application Processes and System Services resident on the various hosts into a cohesive system.

Operating System: (OS), software supplied with a computer which allows it to supervise its own operations and manage access to hardware facilities such as memory and peripherals.

Physical Device: a hardware terminal.

User Interface: (UI), IISS subsystem that controls the user's terminal and interfaces with the rest of the system. The UI consists of two major subsystems: the User Interface Development System (UIDS) and the User Interface Management System (UIMS).

User Interface Management System: (UIMS), the runtime UI. It consists of the Form Processor, Virtual Terminal, Application Interface, the User Interface Services and the Text Editor.

User Interface Monitor: (UIM), part of the Form Processor that handles messaging between the NTM and the UI. It also provides authorization checks and initiates applications.

User Interface/Virtual Terminal Interface: (UI/VTI), another name for the User Interface.

Virtual Terminal: (VT), subset of the IISS User Interface that performs the interfacing between different terminals and the UI. This is done by defining a specific set of terminal features and protocols which must be supported by the UI software which constitutes the virtual terminal definition. Specific terminals are then mapped against the virtual terminal software by specific software modules written for each type of real terminal supported.

Virtual Terminal Interface: (VTI), the callable interface to the VT.

Window: dynamic area of a terminal screen on which predefined forms may be placed at run time.

Window Manager: a facility which allows the following to be manipulated: size and location of windows, the device on which an application is running, the position of a form within a window. It is part of the Form Processor.

SECTION 3

REQUIREMENTS

3.1 Structural Description

Figure 3-1 describes the structure of the Virtual Terminal. The Virtual Terminal consists of some routines that are linked with the application that uses it (VT Application Monitor) as well as a process that performs monitoring, window management activities and translation of VT commands into commands for a specific device.

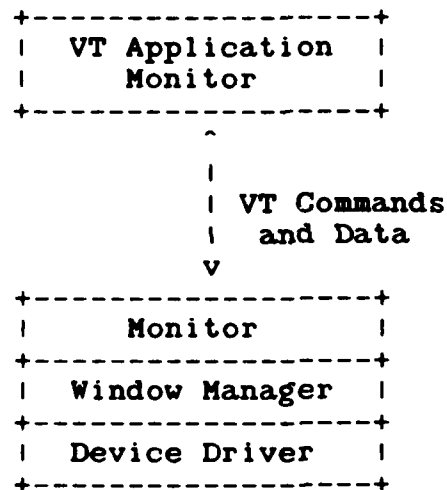


Figure 3-1 Virtual Terminal Structure

3.2 Functional Flow

The Virtual Terminal can be used in two different modes: master and slave. Currently, the master mode is used for interactive devices and the slave mode is used for batch devices such as printers.

Figure 3-2 is a data flow for the Virtual Terminal in master and slave mode.

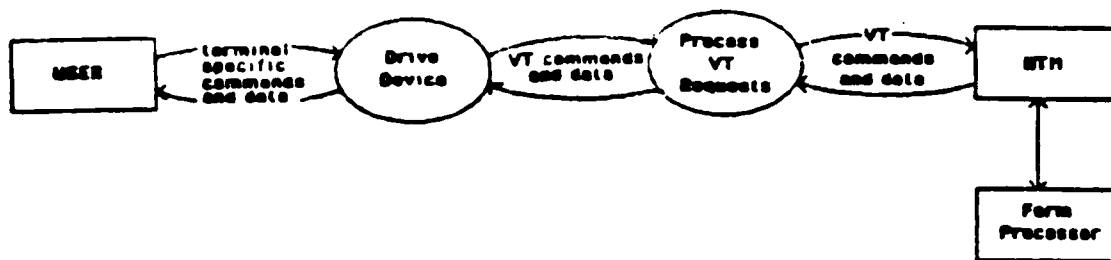


Figure 3-2 Virtual Terminal Data Flow

3.3 Interfaces

3.3.1 Physical Terminal

The interface to a physical terminal is a function of the host Operating System (OS) and is highly system dependent. When somewhat portable functions are recognized, they are isolated into system independent routines thus making as much of the code portable as is possible.

3.3.2 Application

Applications can use the VT Application Monitor to communicate with the VT process. The types of messages that are sent to and from the VT process are dependent upon the mode (master or slave) of the VT process and are described in the next two sections. Device data messages (type DD) contain VT commands and data. The VT commands are described in Appendix A of the Virtual Terminal Development Specification (DS 620144300B).

3.3.2.1 VT Process as Master

RECEIVE MESSAGES

Message Type	Action Taken/Buffer
SD	Terminates Device Driver.
DD	Send Device Data to be output to Virtual Terminal.
DQ	Send Device Data to be output to Virtual Terminal and request for acknowledgement.

SEND MESSAGES

Message Type	Action Taken/Buffer
DE	Informs UIM that Master Device Driver is entering the UIM system control.
DD	Send Device Data which was input to Virtual Terminal.

Section 3.2.2.1.2 of the Virtual Terminal Development Specification contains a detailed description of these messages.

3.3.2.2 VT Process as Slave

RECEIVE MESSAGES

Message Type	Action Taken/Buffer
DE	Starts up Slave Device Driver.
SD	Terminates Device Driver.
DD	Send Device Data to be output to Virtual Terminal.

SEND MESSAGES

Message Type	Action Taken/Buffer
DI	Informs UIM that slave driver is alive and should be initialized with proper size.
DD	Send Device Data which was input to Virtual Terminal.

Section 3.2.2.2.2 of the Virtual Terminal Development Specification contains a detailed description of these messages.

3.3.3 Terminal User

When the VT process is the master it is started by the terminal user. It has a number of parameters that can be used if scripting is required.

-w <scripting file name>	- write script file
-r <scripting file name>	- read script file
-s <save file name>	- saves output from session

These arguments are optional. The user can either create a script file, read a script file, or do neither. The user can also save or not save the output from a session

3.4 Program Interrupts

Attention interrupts received from the terminal (CNTL/C, break) cause the VT process to terminate by calling the NTM routine TRMNAT.

3.5 Timing and Sequencing Description

The Monitor processes two types of input: keyboard characters and NTM messages. First, a check is made for available keyboard characters. As long as characters are available, they are processed. When no characters are available, a check is made for NTM messages. If a message is found, it is processed and the Monitor again checks for keyboard characters. If no message is available, the Monitor waits for approximately .1 seconds before again checking for keyboard characters.

3.6 Special Control Features

The detailed design of the VT does not include any special control features as defined in the ICAM Documentation Standards manual.

3.7 Storage Allocation

The executable sizes for the device driver routines for each supported terminal are:

ADM3A	172 blocks
CI600	165 blocks
IBM3270	not available
PRINTR	153 blocks
PW3270	not available
VIP	174 blocks
VT100	176 blocks
VT100W	176 blocks
VTMIN	175 blocks

3.8 Object Code Creation

The VT routines were compiled using a C compiler developed by Interactive Software under VAX/VMS.

3.9 Adaptation Data

The C source modules for the VT can be compiled using any UNIX version 7 compatible C compiler. All routines beginning with 'TRM' are device dependent, and the routine TERMIO.C is VAX specific.

3.10 Detailed Design Description

3.10.1 Main Program List

The following is a list of all "Main Programs" which are modules that are not called by any other module being documented here. These modules are either program entry points or, if they are hooked into another set of programs via subroutine calls, they are the points the external programs can call and therefore enter through. To differentiate between the two types of entry points, look at the individual Module Documentation (section 3.10.8) and look at Module Type for each of the Main Program modules listed. Note whether the routine

PS 620144300
1 November 1985

is a Program, Subroutine, or Function. If it is a Program, it is truly a main program entry point. If not, then it is merely called by other programs not being documented here.

PS 620144300
1 November 1985

VIRTUAL TERMINAL Main Program List

Module Name -----	Purpose -----
DRIVER/MAIN	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

3.10.2 Module List

The following is a list of all the modules being documented here along with their purpose. Each module has a unique name, no matter what language it was written in.

VIRTUAL TERMINAL Module List

Module Name -----	Purpose -----
ABSPOS	ABSOLUTIZE CURSOR POSITION OF FIELD
BLDMSG	BUILD MESSAGE
BLDMSG/BLDBUF	BUILD BUFFER
BLDMSG/REDOFF	READ FLAG TURNED OFF
BVTIDS	BUILD VTI DATA STRUCTURE
BVTIDS/BVTIFM	BUILD VTI FIELD MAP
BVTIDS/CLRFLG	CLEAR FLAGS
BVTIDS/CVTIFM	CLEAR VTI FIELD MAP
BVTIDS/INSFLD	INSERT FIELD
BVTIDS/RVTIFM	REBUILD VTI FIELD MAP
CLRMOD	CLEAR MODIFY FLAGS
DEFFLD	DEFINE FIELD
DEFWND	DEFINE WINDOW
DOSCR/ERASE	ERASE PART OF SCREEN
DOSCR/HSCR	HORIZONTAL SCROLL
DOSCR/VSCR	VERTICAL SCROLL
DOSCREEN	DO COMMAND TO INTERNAL SCREEN
DRIVER/MAIN	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
ERAWND	ERASE WINDOW
FATAL	REPORT FATAL ERROR

VIRTUAL TERMINAL Module List

Module Name -----	Purpose -----
FNDWND	FIND WINDOW
GETVT	GET DATA FROM VIRTUAL TERMINAL
GVTICMD	GET VIRTUAL TERMINAL INTERFACE COMMAND
INTVT	INITIALIZE VIRTUAL TERMINAL
INVIS	CHECK FOR INVISIBILITY
PCHVTI	PUT SCREEN CHARACTERS TO VTI DATA STRUCTURE
PRCCMDS	PROCESS COMMAND
PUTVT	PUT DATA TO VIRTUAL TERMINAL
PVTICMD	PUT VTI COMMAND
PVTICMD/PUTNUM	PUT NUMBER
REFRESH	REFRESH TERMINAL
REFTERM	REFRESH TERMINAL
RMVWND	REMOVE WINDOW
SLINEND	FIND SCREEN LINE END
STFMTF	SET FORMAT FLAG FOR ALL CHILDREN WINDOWS AND FIELDS
STRDPN	SET READ PENDING FLAGS
STRDPN/STFDRD	SET FIELD READ PENDING
SWNPRC	SET WINDOW PRECEDENCE
TPUTNUM	TERMINAL PUT NUMBER
TPUTS	TERMINAL PUT STRING

PS 620144300
1 November 1985

VIRTUAL TERMINAL Module List

Module Name -----	Purpose -----
TRMCHK	TERMINAL CHECK
TRMEND	TERMINAL END
TRMFLS	TERMINAL FLUSH
TRMGET	TERMINAL GET
TRMINI	TERMINAL INITIALIZE
TRMPUT	TERMINAL PUT
TRMVT	TERMINATE VIRTUAL TERMINAL
TVTPRC	TERMINATE VTI PROCESS
VT100/MOVCUR	MOVE CURSOR (INTERNAL)
VT100/SETATR	SET ATTRIBUTES (INTERNAL)

3.10.3 External Routines List

The following is a list of all routines or functions not documented here that are called by modules that are documented here. The first caller, in alphabetical order, is listed as well. The specification in which any module is documented may be found in the Module Documentation Index (Document Number CM 620100001). See section 3.10 6 for a list of the modules that call each of these external routines.

PS 620144300
1 November 1985

VIRTUAL TERMINAL External Routines List

Module Name	First User
-----	-----
BLDCMD	BVTIDS
CABIT	TRMPUT
CALLOC	DEFWND
CBIT	DOSCR/ERASE
COL	TRMPUT
CSTR	INTVT
DELAY	DRIVER/MAIN
EXIT	TVTPRC
FCLOSE	DRIVER/MAIN
FFBDA	TRMPUT
FFBSA	VT100/SETATR
FFBSB	DOSCREEN
FIX	DOSCREEN
FLOOR	DOSCREEN
FOPEN	DRIVER/MAIN
FPRINTF	DRIVER/MAIN
FREE	BVTIDS/INSFLD
FSEARCH	DRIVER/MAIN
FWRITE	DRIVER/MAIN
GETCHAR	TRMPUT
INITEX	DRIVER/MAIN
ISDIGIT	TRMGET
ISPRINT	GVTICMD
LIMIT	DOSCREEN
MALLOC	BVTIDS/INSFLD
MAX	PCHVTI
MEMCMP	DRIVER/MAIN
MEMCPY	DRIVER/MAIN
MEMSET	DEFFLD
MIN	DOSCR/VSCR
NSEND	DRIVER/MAIN
POS	TRMPUT
PRINTF	FATAL
PRNEND	TRMEND
PRNFLS	TRMPUT
PRNINI	TRMINI
PRNPUT	TRMPUT
PUTC	DRIVER/MAIN
RCV	DRIVER/MAIN
ROW	REFRESH
SBIT	DOSCR/VSCR

PS 620144300
1 November 1985

VIRTUAL TERMINAL External Routines List

Module Name	First User
-----	-----
SIGNAL	DRIVER/MAIN
SPRINTF	DRIVER/MAIN
STRASN	BVTIDS/CVTIFM
STRCAT	DRIVER/MAIN
STRCPY	DRIVER/MAIN
STRLEN	BLDMSG/BLDBUF
TBIT	DOSCR/ERASE
TBOPEN	TRMINI
TCHECK	TRMCHK
TCLOSE	TRMEND
TFLUSH	TRMFLS
TGETC	TRMGET
TOLOWER	DRIVER/MAIN
TPURGE	TRMGET
TPUTC	VT100/SETATR
TRMNAT	DRIVER/MAIN
ZERO	DOSCREEN

3.10.4 Include File List

The following is a list of all include files called in by modules being documented here. Each include file has a unique name regardless of the language being used. The purpose of each include file is listed as well. A more complete description of each include file is given in section 3.10.9. The purpose listed is the one that is in the source code of the include file.

A purpose of "***** PURPOSE NOT FOUND BY STRIPPER *****" indicates that a purpose statement was not written into the include file itself. The most common reason for this is that the include file comes from system libraries that were not developed by the project, such as 'C' libraries that are provided with the 'C' compiler.

See section 3.10.6 for a set of lists which show all the modules which call in each of these include files.

PS 620144300
1 November 1985

VIRTUAL TERMINAL Include File List

File Name -----	Purpose -----
BITS	INCLUDE FILE FOR BIT MANIPULATION ROUTINES
CI600.C"	**** PURPOSE NOT FOUND BY STRIPPER ****
CTLCHR	CONTROL CHARACTERS
CTYPE	**** PURPOSE NOT FOUND BY STRIPPER ****
DEVICE	PHYSICAL DEVICE DATA STRUCTURE
DEVINI	DEVICE INITIALIZATIONS
FUNCTS	FUNCTION DEFINITIONS
NTM	NTM INTERFACE INCLUDE FILE
SCREEN	INTERNAL SCREEN DEFINITIONS
SIGNAL	**** PURPOSE NOT FOUND BY STRIPPER ****
STDIO	**** PURPOSE NOT FOUND BY STRIPPER ****
STDTP	STANDARD TYPE DEFINITIONS
TERMIO	TRANSPARENT TERMINAL I/O DEFINITIONS
TRMRTN	TERMINAL (DEVICE DRIVER) ROUTINES

PS 620144300
1 November 1985

3.10.5 Where Include File Used List

The following lists each include file from 3.10.4 and all the modules documented in this specification which include them. The purpose of each module is listed as well.

VIRTUAL TERMINAL Where-include-file-used List

Include File	Module Name	Module Purpose
BITS		
	BLDMSG	BUILD MESSAGE
	BLDMSG/BL	BUILD BUFFER
	BLDMSG/RE	READ FLAG TURNED OFF
	BVTIDS	BUILD VTI DATA STRUCTURE
	BVTIDS/BV	BUILD VTI FIELD MAP
	BVTIDS/CL	CLEAR FLAGS
	BVTIDS/CV	CLEAR VTI FIELD MAP
	BVTIDS/IN	INSERT FIELD
	BVTIDS/RV	REBUILD VTI FIELD MAP
	CLRMOD	CLEAR MODIFY FLAGS
	DEFFLD	DEFINE FIELD
	DEFWND	DEFINE WINDOW
	DOSCR/ERA	ERASE PART OF SCREEN
	DOSCR/HSC	HORIZONTAL SCROLL
	DOSCR/VSC	VERTICAL SCROLL
	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
	DRIVER/MA	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
	ERAWND	ERASE WINDOW
	GETVT	GET DATA FROM VIRTUAL TERMINAL
	GVTICMD	GET VIRTUAL TERMINAL INTERFACE COMMAND
	INTVT	INITIALIZE VIRTUAL TERMINAL
	INVIS	CHECK FOR INVISIBILITY
	PCHVTI	PUT SCREEN CHARACTERS TO VTI DATA STRUCTURE
	PRCCMDS	PROCESS COMMAND
	PUTVT	PUT DATA TO VIRTUAL TERMINAL
	PVTICMD	PUT VTI COMMAND
	PVTICMD/P	PUT NUMBER
	REFRESH	REFRESH TERMINAL
	REFTERM	REFRESH TERMINAL
	RMVWND	REMOVE WINDOW
	SLINEND	FIND SCREEN LINE END
	STFMTF	SET FORMAT FLAG FOR ALL CHILDREN WINDOWS AND FIELDS
	SWNPRC	SET WINDOW PRECEDENCE
	TRMCHK	TERMINAL CHECK
	TRMEND	TERMINAL END
	TRMFLS	TERMINAL FLUSH

VIRTUAL TERMINAL Where-include-file-used List

Include File	Module Name	Module Purpose
-----	-----	-----
	TRMGET	TERMINAL GET
	TRMINI	TERMINAL INITIALIZE
	TRMPUT	TERMINAL PUT
	TRMVT	TERMINATE VIRTUAL TERMINAL
	VT100/MOV	MOVE CURSOR (INTERNAL)
	VT100/SET	SET ATTRIBUTES (INTERNAL)

CI600.C

TRMCHK	TERMINAL CHECK
TRMEND	TERMINAL END
TRMFLS	TERMINAL FLUSH
TRMGET	TERMINAL GET
TRMINI	TERMINAL INITIALIZE
TRMPUT	TERMINAL PUT
VT100/MOV	MOVE CURSOR (INTERNAL)
VT100/SET	SET ATTRIBUTES (INTERNAL)

CTLCHR

BLDMSG	BUILD MESSAGE
BLDMSG/BL	BUILD BUFFER
BLDMSG/RE	READ FLAG TURNED OFF
DRIVER/MA	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
GVTICMD	GET VIRTUAL TERMINAL INTERFACE COMMAND
INTVT	INITIALIZE VIRTUAL TERMINAL
PVTICMD	PUT VTI COMMAND
PVTICMD/P	PUT NUMBER
TRMVT	TERMINATE VIRTUAL TERMINAL

CTYPE

DEFFLD	DEFINE FIELD
--------	--------------

VIRTUAL TERMINAL Where-include-file-used List

Include File	Module Name	Module Purpose
	GVTICMD	GET VIRTUAL TERMINAL INTERFACE COMMAND
	TRMCHK	TERMINAL CHECK
	TRMEND	TERMINAL END
	TRMFLS	TERMINAL FLUSH
	TRMGET	TERMINAL GET
	TRMINI	TERMINAL INITIALIZE
	TRMPUT	TERMINAL PUT
	VT100/MOV	MOVE CURSOR (INTERNAL)
	VT100/SET	SET ATTRIBUTES (INTERNAL)

DEVICE

ABSPOS	ABSOLUTIZE CURSOR POSITION OF FIELD
BLDMSG	BUILD MESSAGE
BLDMSG/BL	BUILD BUFFER
BLDMSG/RE	READ FLAG TURNED OFF
BVTIDS	BUILD VTI DATA STRUCTURE
BVTIDS/BV	BUILD VTI FIELD MAP
BVTIDS/CL	CLEAR FLAGS
BVTIDS/CV	CLEAR VTI FIELD MAP
BVTIDS/IN	INSERT FIELD
BVTIDS/RV	REBUILD VTI FIELD MAP
DEFFLD	DEFINE FIELD
DEFWND	DEFINE WINDOW
DRIVER/MA	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
ERAWND	ERASE WINDOW
FNDWND	FIND WINDOW
GETVT	GET DATA FROM VIRTUAL TERMINAL
PCHVTI	PUT SCREEN CHARACTERS TO VTI DATA STRUCTURE
PUTVT	PUT DATA TO VIRTUAL TERMINAL
RMVWND	REMOVE WINDOW
STFMTF	SET FORMAT FLAG FOR ALL CHILDREN WINDOWS AND FIELDS
STRDPN	SET READ PENDING FLAGS
STRDPN/ST	SET FIELD READ PENDING
SWNPRC	SET WINDOW PRECEDENCE

VIRTUAL TERMINAL Where-include-file-used List

Include File	Module Name	Module Purpose
-----	-----	-----

DEVINI

DRIVER MA MAIN MODULE FOR WINDOW MANAGER AND DEVICE
DRIVER

FUNCTS

BLDMSG	BUILD MESSAGE
BLDMSG/BL	BUILD BUFFER
BLDMSG/RE	READ FLAG TURNED OFF
BVTIDS	BUILD VTI DATA STRUCTURE
BVTIDS/BV	BUILD VTI FIELD MAP
BVTIDS/CL	CLEAR FLAGS
BVTIDS/CV	CLEAR VTI FIELD MAP
BVTIDS/IN	INSERT FIELD
BVTIDS/RV	REBUILD VTI FIELD MAP
DEFFLD	DEFINE FIELD
DEFWND	DEFINE WINDOW
DOSCR/ERA	ERASE PART OF SCREEN
DOSCR/HSC	HORIZONTAL SCROLL
DOSCR/VSC	VERTICAL SCROLL
DOSCREEN	DO COMMAND TO INTERNAL SCREEN
DRIVER/MA	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
GETVT	GET DATA FROM VIRTUAL TERMINAL
GVTICMD	GET VIRTUAL TERMINAL INTERFACE COMMAND
INTVT	INITIALIZE VIRTUAL TERMINAL
PCHVTI	PUT SCREEN CHARACTERS TO VTI DATA STRUCTURE
PRCCMDS	PROCESS COMMAND
PUTVT	PUT DATA TO VIRTUAL TERMINAL
PVTICMD	PUT VTI COMMAND
PVTICMD/P	PUT NUMBER
REFRESH	REFRESH TERMINAL
REFTERM	REFRESH TERMINAL

VIRTUAL TERMINAL Where-include-file-used List

Include File	Module Name	Module Purpose
	STFMTF	SET FORMAT FLAG FOR ALL CHILDREN WINDOWS AND FIELDS
	SWNPRC	SET WINDOW PRECEDENCE
	TRMCHK	TERMINAL CHECK
	TRMEND	TERMINAL END
	TRMFLS	TERMINAL FLUSH
	TRMGET	TERMINAL GET
	TRMINI	TERMINAL INITIALIZE
	TRMPUT	TERMINAL PUT
	TRMVT	TERMINATE VIRTUAL TERMINAL
	VT100/MOV	MOVE CURSOR (INTERNAL)
	VT100/SET	SET ATTRIBUTES (INTERNAL)

NTM

DRIVER/MA MAIN MODULE FOR WINDOW MANAGER AND DEVICE
DRIVER

SCREEN

BLDMSG BUILD MESSAGE
BLDMSG BL BUILD BUFFER
BLDMSG/RE READ FLAG TURNED OFF
BVTIDS BUILD VTI DATA STRUCTURE
BVTIDS/BV BUILD VTI FIELD MAP
BVTIDS/CL CLEAR FLAGS
BVTIDS/CV CLEAR VTI FIELD MAP
BVTIDS/IN INSERT FIELD
BVTIDS/RV REBUILD VTI FIELD MAP
CLRMOD CLEAR MODIFY FLAGS
DOSCR/ERA ERASE PART OF SCREEN
DOSCR/HSC HORIZONTAL SCROLL
DOSCR/VSC VERTICAL SCROLL
DOSCREEN DO COMMAND TO INTERNAL SCREEN
DRIVER/MA MAIN MODULE FOR WINDOW MANAGER AND DEVICE
DRIVER

VIRTUAL TERMINAL Where-include-file-used List

Include File	Module Name	Module Purpose
-----	-----	-----
	GETVT	GET DATA FROM VIRTUAL TERMINAL
	INTVT	INITIALIZE VIRTUAL TERMINAL
	INVIS	CHECK FOR INVISIBILITY
	PCHVTI	PUT SCREEN CHARACTERS TO VTI DATA STRUCTURE
	PRCCMDS	PROCESS COMMAND
	PUTVT	PUT DATA TO VIRTUAL TERMINAL
	PVTICMD	PUT VTI COMMAND
	PVTICMD/P	PUT NUMBER
	REFRESH	REFRESH TERMINAL
	REFTERM	REFRESH TERMINAL
	SLINEND	FIND SCREEN LINE END
	TRMCHK	TERMINAL CHECK
	TRMEND	TERMINAL END
	TRMFLS	TERMINAL FLUSH
	TRMGET	TERMINAL GET
	TRMINI	TERMINAL INITIALIZE
	TRMPUT	TERMINAL PUT
	TRMVT	TERMINATE VIRTUAL TERMINAL
	VT100/MOV	MOVE CURSOR (INTERNAL)
	VT100/SET	SET ATTRIBUTES (INTERNAL)

SIGNAL

DRIVER/MA MAIN MODULE FOR WINDOW MANAGER AND DEVICE
DRIVER

STDIO

DRIVER/MA MAIN MODULE FOR WINDOW MANAGER AND DEVICE
DRIVER

FATAL REPORT FATAL ERROR

TRMCHK TERMINAL CHECK

TRMEND TERMINAL END

TRMFLS TERMINAL FLUSH

TRMGET TERMINAL GET

VIRTUAL TERMINAL Where-include-file-used List

Include File	Module Name	Module Purpose
	TRMINI	TERMINAL INITIALIZE
	TRMPUT	TERMINAL PUI
	VT100/MOV	MOVE CURSOR (INTERNAL)
	VT100/SET	SET ATTRIBUTES (INTERNAL)

STDTP

ABSPOS	ABSOLUTIZE CURSOR POSITION OF FIELD
BLDMSG	BUILD MESSAGE
BLDMSG/BL	BUILD BUFFER
BLDMSG/RE	READ FLAG TURNED OFF
BVTIDS	BUILD VTI DATA STRUCTURE
BVTIDS/BV	BUILD VTI FIELD MAP
BVTIDS/CL	CLEAR FLAGS
BVTIDS/CV	CLEAR VTI FIELD MAP
BVTIDS/IN	INSERT FIELD
BVTIDS/RV	REBUILD VTI FIELD MAP
CLRMOD	CLEAR MODIFY FLAGS
DEFFLD	DEFINE FIELD
DEFWND	DEFINE WINDOW
DOSCR/ERA	ERASE PART OF SCREEN
DOSCR/HSC	HORIZONTAL SCROLL
DOSCR/VSC	VERTICAL SCROLL
DOSCREEN	DO COMMAND TO INTERNAL SCREEN
DRIVER/MA	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
ERAWND	ERASE WINDOW
FATAL	REPORT FATAL ERROR
FNDWND	FIND WINDOW
GETVT	GET DATA FROM VIRTUAL TERMINAL
GVTICMD	GET VIRTUAL TERMINAL INTERFACE COMMAND
INTVT	INITIALIZE VIRTUAL TERMINAL
INVIS	CHECK FOR INVISIBILITY
PCHVTI	PUT SCREEN CHARACTERS TO VTI DATA STRUCTURE
PRCCMDS	PROCESS COMMAND
PUTVT	PUT DATA TO VIRTUAL TERMINAL
PVTICMD	PUT VTI COMMAND

VIRTUAL TERMINAL Where-include-file-used List

Include File	Module Name	Module Purpose
-----	-----	-----
	PVTICMD/P	PUT NUMBER
	REFRESH	REFRESH TERMINAL
	REFTERM	REFRESH TERMINAL
	RMVWND	REMOVE WINDOW
	SLINEND	FIND SCREEN LINE END
	STFMTF	SET FORMAT FLAG FOR ALL CHILDREN WINDOWS AND FIELDS
	STRDPN	SET READ PENDING FLAGS
	STRDPN/ST	SET FIELD READ PENDING
	SWNPRC	SET WINDOW PRECEDENCE
	TPUTNUM	TERMINAL PUT NUMBER
	TPUTS	TERMINAL PUT STRING
	TRMCHK	TERMINAL CHECK
	TRMEND	TERMINAL END
	TRMFLS	TERMINAL FLUSH
	TRMGET	TERMINAL GET
	TRMINI	TERMINAL INITIALIZE
	TRMPUT	TERMINAL PUT
	TRMVT	TERMINATE VIRTUAL TERMINAL
	TVTPRC	TERMINATE VTI PROCESS
	VT100/MOV	MOVE CURSOR (INTERNAL)
	VT100/SET	SET ATTRIBUTES (INTERNAL)

TERMIO

DRIVER/MA	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
PRCCMDS	PROCESS COMMAND
PUTVT	PUT DATA TO VIRTUAL TERMINAL
TPUTNUM	TERMINAL PUT NUMBER
TPUTS	TERMINAL PUT STRING
TRMCHK	TERMINAL CHECK
TRMEND	TERMINAL END
TRMFLS	TERMINAL FLUSH
TRMGET	TERMINAL GET
TRMINI	TERMINAL INITIALIZE
TRMPUT	TERMINAL PUT
VT100/MOV	MOVE CURSOR (INTERNAL)

PS 620144300
1 November 1985

VIRTUAL TERMINAL Where-include-file-used List

Include File	Module Name	Module Purpose
-----------------	----------------	-------------------

VT100/SET SET ATTRIBUTES (INTERNAL)

TRMRTN

DRIVER/MA	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
GETVT	GET DATA FROM VIRTUAL TERMINAL
INTVT	INITIALIZE VIRTUAL TERMINAL
PRCCMDS	PROCESS COMMAND
PUTVT	PUT DATA TO VIRTUAL TERMINAL
REFRESH	REFRESH TERMINAL
REFTERM	REFRESH TERMINAL
TRMCHK	TERMINAL CHECK
TRMEND	TERMINAL END
TRMFLS	TERMINAL FLUSH
TRMGET	TERMINAL GET
TRMINI	TERMINAL INITIALIZE
TRMPUT	TERMINAL PUT
TRMVT	TERMINATE VIRTUAL TERMINAL
VT100/MOV	MOVE CURSOR (INTERNAL)
VT100/SET	SET ATTRIBUTES (INTERNAL)

PS 620144300
1 November 1985

3.10.6 Where External Routine Used List

The following lists each external function or routine listed in 3.10.3 and all the documented modules which call it. The purpose of each module is listed as well.

VIRTUAL TERMINAL Where-external-routine-used List

System Module -----	Module Name -----	Module Purpose -----
BLDCMD	BVTIDS	BUILD VTI DATA STRUCTURE
	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
	GETVT	GET DATA FROM VIRTUAL TERMINAL
	PRCCMDS	PROCESS COMMAND
	PUTVT	PUT DATA TO VIRTUAL TERMINAL
	REFRESH	REFRESH TERMINAL
	REFTERM	REFRESH TERMINAL
	TRMGET	TERMINAL GET
CABIT	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
	TRMPUT	TERMINAL PUT
CALLOC	DEFFLD	DEFINE FIELD
	DEFWND	DEFINE WINDOW
	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
CBIT	CLRMOD	CLEAR MODIFY FLAGS
	DOSCR/ERASERASE	PART OF SCREEN
	DOSCR/VSCR	VERTICAL SCROLL
	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
	REFRESH	REFRESH TERMINAL
	REFTERM	REFRESH TERMINAL
COL	BLDMSG	BUILD MESSAGE
	BVTIDS	BUILD VTI DATA STRUCTURE

VIRTUAL TERMINAL Where-external-routine-used List

System Module	Module Name	Module Purpose
-----	-----	-----
	DOSCR/ERASERASE	PART OF SCREEN
	DOSCR/HSCRHORIZONTAL	SCROLL
	DOSCR/VSCRVERTICAL	SCROLL
	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
	PRCCMDS	PROCESS COMMAND
	REFRESH	REFRESH TERMINAL
	REFTERM	REFRESH TERMINAL
	SLINEND	FIND SCREEN LINE END
	TRMGET	TERMINAL GET
	TRMPUT	TERMINAL PUT
	VT100/MOVCMOVE	CURSOR (INTERNAL)
CSTR	INTVT	INITIALIZE VIRTUAL TERMINAL
DELAY	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
EXIT	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
	TVTPRC	TERMINATE VTI PROCESS
FCLOSE	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
FFBDA	TRMPUT	TERMINAL PUT

VIRTUAL TERMINAL Where-external-routine-used List

System Module -----	Module Name -----	Module Purpose -----
FFBSA	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
	TRMPUT	TERMINAL PUT
	VT100/SETASET	ATTRIBUTES (INTERNAL)
FFBSB	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
FIX	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
FLOOR	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
FOPEN	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
FPRINTF	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
FREE	BVTIDS/CVTCLEAR	VTI FIELD MAP
	BVTIDS/INSINSERT	FIELD

VIRTUAL TERMINAL Where-external-routine-used List

System Module	Module Name	Module Purpose
-----	-----	-----
	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
	ERAWND	ERASE WINDOW
	INTVT	INITIALIZE VIRTUAL TERMINAL
	RMVWND	REMOVE WINDOW
	TRMVT	TERMINATE VIRTUAL TERMINAL
FSEARCH	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
FWRITE	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
GETCHAR	TRMGET	TERMINAL GET
	TRMPUT	TERMINAL PUT
INITEX	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
ISDIGIT	GVTICMD	GET VIRTUAL TERMINAL INTERFACE COMMAND
	TRMGET	TERMINAL GET
ISPRINT		

PS 620144300
1 November 1985

VIRTUAL TERMINAL Where-external-routine-used List

System Module	Module Name	Module Purpose
	DEFFLD	DEFINE FIELD
	GVTICMD	GET VIRTUAL TERMINAL INTERFACE COMMAND
	TRMGET	TERMINAL GET
LIMIT		
	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
MALLOC		
	BVTIDS/BVTBUILD	VTI FIELD MAP
	BVTIDS/CVTCLEAR	VTI FIELD MAP
	BVTIDS/INSINSERT	FIELD
	DEFFLD	DEFINE FIELD
	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE
		DRIVER
	INTVT	INITIALIZE VIRTUAL TERMINAL
MAX		
	BVTIDS	BUILD VTI DATA STRUCTURE
	BVTIDS/INSINSERT	FIELD
	DEFWND	DEFINE WINDOW
	DOSCR/VSCRVERTICAL	SCROLL
	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
	PCHVTI	PUT SCREEN CHARACTERS TO VTI DATA
		STRUCTURE
	REFTERM	REFRESH TERMINAL
MEMCMP		
	BVTIDS	BUILD VTI DATA STRUCTURE
	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE
		DRIVER

PS 620144300
1 November 1985

VIRTUAL TERMINAL Where-external-routine-used List

System Module -----	Module Name -----	Module Purpose -----
MEMCPY		BLDMSG BUILD MESSAGE BLDMSG/BLDBUILD BUFFER DRIVER/MAIMAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
MEMSET	DEFFLD	DEFINE FIELD
MIN		BVTIDS/INSINSERT FIELD DEFWND DEFINE WINDOW DOSCR/HSCRHORIZONTAL SCROLL DOSCR/VSCRVERTICAL SCROLL DRIVER/MAIMAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER REFTERM REFRESH TERMINAL
NSEND		DRIVER/MAIMAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
POS	DOSCREEN TRMPUT	DO COMMAND TO INTERNAL SCREEN TERMINAL PUT
PRINTF		

PS 620144300
1 November 1985

VIRTUAL TERMINAL Where-external-routine-used List

System Module	Module Name	Module Purpose
	DRIVER/MAI	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
	FATAL	REPORT FATAL ERROR
	TRMGET	TERMINAL GET
	TRMPUT	TERMINAL PUT
PRNEND	TRMEND	TERMINAL END
PRNFLS	TRMPUT	TERMINAL PUT
PRNINI	TRMINI	TERMINAL INITIALIZE
PRNPUT	TRMPUT	TERMINAL PUT
PUTC	DRIVER/MAI	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
RCV	DRIVER/MAI	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Where-external-routine-used List

System Module -----	Module Name -----	Module Purpose -----
ROW	BLDMSG	BUILD MESSAGE
	BVTIDS	BUILD VTI DATA STRUCTURE
	DOSCR VSCRVERTICAL	SCROLL
	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
	PRCCMDS	PROCESS COMMAND
	REFRESH	REFRESH TERMINAL
	REFTERM	REFRESH TERMINAL
	TRMGET	TERMINAL GET
	TRMPUT	TERMINAL PUT
	VT100 MOVCMOVE	CURSOR (INTERNAL)
SBIT	DOSCR/ERASERASE	PART OF SCREEN
	DOSCR/VSCRVERTICAL	SCROLL
	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
	REFRESH	REFRESH TERMINAL
	REFTERM	REFRESH TERMINAL
	TRMPUT	TERMINAL PUT
SIGNAL	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
SPRINTF	BLDMSG	BUILD MESSAGE
	BLDMSG/BLDBUILD	BUFFER
	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
STRASN	BVTIDS	BUILD VTI DATA STRUCTURE

VIRTUAL TERMINAL Where-external-routine-used List

System Module -----	Module Name -----	Module Purpose -----
	BVTIDS/CVTCLEAR	VTI FIELD MAP
	BVTIDS/INSINSERT	FIELD
	DOSCR/ERASERASE	PART OF SCREEN
STRCAT	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
STRCPY	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
STRLEN	BLDMSG	BUILD MESSAGE
	BLDMSG/BLDBUILD	BUFFER
	DRIVER/MAIMAIN	MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
TEIT	DOSCR/ERASERASE	PART OF SCREEN
	DOSCR/HSCRHORIZONTAL	SCROLL
	DOSCR/VSCRVERTICAL	SCROLL
	DOSCREEN	DO COMMAND TO INTERNAL SCREEN
	GETVT	GET DATA FROM VIRTUAL TERMINAL
	INVIS	CHECK FOR INVISIBILITY
	PCHVTI	PUT SCREEN CHARACTERS TO VTI DATA STRUCTURE
	PRCCMDS	PROCESS COMMAND
	PUTVT	PUT DATA TO VIRTUAL TERMINAL
	REFRESH	REFRESH TERMINAL
	REFTERM	REFRESH TERMINAL
	TRMGET	TERMINAL GET

PS 620144300
1 November 1985

VIRTUAL TERMINAL Where-external-routine-used List

System Module -----	Module Name -----	Module Purpose -----
	TRMPUT	TERMINAL PUT
TBOPEN	TRMINI	TERMINAL INITIALIZE
TCHECK	TRMCHK	TERMINAL CHECK
TCLOSE	TRMEND	TERMINAL END
TFLUSH	TRMFLS	TERMINAL FLUSH
TGETC	TRMGET	TERMINAL GET
TOLOWER	DRIVER /MAIMAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER	
TPURGE	TRMGET	TERMINAL GET

PS 620144300
1 November 1985

VIRTUAL TERMINAL Where-external-routine-used List

System Module	Module Name	Module Purpose
-----	-----	-----
TPUTC	TPUTNUM	TERMINAL PUT NUMBER
	TPUTS	TERMINAL PUT STRING
	TRMPUT	TERMINAL PUT
	VT100/MOV	MOVE CURSOR (INTERNAL)
	VT100/SET	SET ATTRIBUTES (INTERNAL)
TRMNAT	DRIVER/MA	MAIN MODULE FOR WINDOW MANAGER AND DEVICE
	DRIVER	
	TVTPRC	TERMINATE VTI PROCESS
ZERO	DOSCREEN	DO COMMAND TO INTERNAL SCREEN

3.10.7 Main Program Parts List

The following lists each Main Program listed in 3.10.1 and all the modules which are called either by that module itself or by any of the documented modules which it calls. It is possible for a non-main module to be listed more than once if it is called by multiple modules. The called modules, in this case known as program parts, are marked as to whether they are documented here. If so, the phrase "well-defined module" appears by the module name, if not it is an "external routine". The Purpose of the Main Program module is listed as well.

VIRTUAL TERMINAL Main Program Parts List

Main Pgm Name	Module Name	Module Type
DRIVER/MAIN	Purpose--	MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
	ABSPOS	Well-defined module
	BLDCMD	External routine
	BLDMSG	Well-defined module
	BLDMSG/BLDBUF	Well-defined module
	BLDMSG/REDOFF	Well-defined module
	BVTIDS	Well-defined module
	BVTIDS/BVTIFM	Well-defined module
	BVTIDS/CLRFLG	Well-defined module
	BVTIDS/CVTIFM	Well-defined module
	BVTIDS/INSFLD	Well-defined module
	BVTIDS/RVTIFM	Well-defined module
	CABIT	External routine
	CALLOC	External routine
	CBIT	External routine
	CLRMOD	Well-defined module
	COL	External routine
	CSTR	External routine
	DEFFLD	Well-defined module
	DEFWND	Well-defined module
	DELAY	External routine
	DOSCR/ERASE	Well-defined module
	DOSCR/HSCR	Well-defined module
	DOSCR/VSCR	Well-defined module
	DOSCREEN	Well-defined module
	ERAWND	Well-defined module
	EXIT	External routine
	FATAL	Well-defined module
	FCLOSE	External routine
	FFBDA	External routine
	FFBSA	External routine
	FFBSB	External routine
	FIX	External routine
	FLOOR	External routine
	FNDWND	Well-defined module
	FOPEN	External routine
	FPRINTF	External routine
	FREE	External routine
	FSEARCH	External routine

VIRTUAL TERMINAL Main Program Parts List

Main Pgm Name -----	Module Name -----	Module Type -----
	FWRITE	External routine
	GETCHAR	External routine
	GETVT	Well-defined module
	GVTICMD	Well-defined module
	INITEX	External routine
	INTVT	Well-defined module
	INVIS	Well-defined module
	ISDIGIT	External routine
	ISPRINT	External routine
	LIMIT	External routine
	MALLOC	External routine
	MAX	External routine
	MEMCMP	External routine
	MEMCPY	External routine
	MEMSET	External routine
	MIN	External routine
	NSEND	External routine
	PCHVTI	Well-defined module
	POS	External routine
	PRCCMDS	Well-defined module
	PRINTF	External routine
	PRNEND	External routine
	PRNFLS	External routine
	PRNINI	External routine
	PRNPUT	External routine
	PUTC	External routine
	PUTVT	Well-defined module
	PVTICMD	Well-defined module
	PVTICMD/PUTNUM	Well-defined module
	RCV	External routine
	REFRESH	Well-defined module
	REFTerm	Well-defined module
	RMVWND	Well-defined module
	ROW	External routine
	SBIT	External routine
	SIGNAL	External routine
	SLINEND	Well-defined module
	SPRINTF	External routine
	STFMTF	Well-defined module
	STRASN	External routine

PS 620144300
1 November 1985

VIRTUAL TERMINAL Main Program Parts List

Main Pgm Name	Module Name	Module Type
	STRCAT	External routine
	STRCPY	External routine
	STRDPN	Well-defined module
	STRDPN/STFDRD	Well-defined module
	STRLEN	External routine
	SWNPRC	Well-defined module
	TBIT	External routine
	TBOPEN	External routine
	TCHECK	External routine
	TCLOSE	External routine
	TFLUSH	External routine
	TGETC	External routine
	TOLOWER	External routine
	TPURGE	External routine
	TPUTC	External routine
	TPUTNUM	Well-defined module
	TPUTS	Well-defined module
	TRMCHK	Well-defined module
	TRMEND	Well-defined module
	TRMFLS	Well-defined module
	TRMGET	Well-defined module
	TRMINI	Well-defined module
	TRMNAT	External routine
	TRMPUT	Well-defined module
	TRMVT	Well-defined module
	TVTPRC	Well-defined module
	VT100/MOVCUR	Well-defined module
	VT100/SETATR	Well-defined module
	ZERO	External routine

3.10.8 Module Documentation

The following documentation describes information which is specific to each individual module being documented in this specification as listed in section 3.10.2. It provides a compact way of getting information that would be otherwise buried within each module's source code.

The specific items in this module documentation have the following meanings:

NAME:	Name of program Module.
PURPOSE:	Purpose of Module as detailed in the source code.
LANGUAGE:	Programming language source code is written in. The choices are: VAX-11 FORTRAN C (I/S-1 Workbench 'C') VAX-11 COBOL
MODULE TYPE:	Whether a Program, Subroutine, or Function.
SOURCE FILE:	Name of Source File from file specification.
SOURCE FILE TYPE:	Source File Extension from file specification.
HOST:	Whether this is a host-dependent routine (VAX or IBM) or blank if host-independent.
SUBSYSTEM:	IISS sub-system this file resides in.
SUBDIRECTORY:	Sub-directory of that subsystem in which this file resides.
DOCUMENTATION GROUP:	Name of documentation group of which this source file is a member.
DESCRIPTION:	A description of the module as obtained

from the source code.

ARGUMENTS: The arguments with which this routine is called if it is a Subroutine or a Function.

INCLUDE FILES: A list of all the files that are included into this module as well as their purposes.

ROUTINES CALLED: Subroutines or Functions, either documented or external, called by this module, if any.

CALLED DIRECTLY BY: The documented routines which call this module, if any.

USED IN MAIN PROGRAM(S): The documented Main Programs which contain this module in their parts list according to the list in section 3.10.7.

The Module Documentation is arranged alphabetically according to Module Name.

VIRTUAL TERMINAL Module Documentation

NAME: ABSPOS
PURPOSE: ABSOLUTIZE CURSOR POSITION OF FIELD
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: ABSPOS
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
VOID ABSPOS(WNDPTR,ACRPOS)
    WND      *WNDPTR;
    POSITION *ACRPOS;
```

INPUTS/OUTPUTS:

INPUTS:

WNDPTR - WINDOW WHOSE ROW AND COL WANT TO ABSOLUTIZED
ADDRESS OF STURCTURE FOR RETURNING VALUES OF:

ROW	ABSOLUTE
COL	ABSOLUTE

OUTPUTS:

STRUCTURE CONTAINING:

ABSOLUTE ROW OF FIELD
ABSOLUTE COL OF FIELD

DESCRIPTION

THIS MODULE ABSOLUTIZES A FIELD'S ROW AND COL BY GOING
BACK UP
CHILD PARENT TREE AND ADDING EACH SUCCESSIVE PARENT'S ROW
AND COL
TO SUM OF CHILDS'.

PS 620144300
1 November 1985

ARGUMENTS:

WNDPTR = WND *
ACRPOS = POSITION *

INCLUDE FILES:

STDTP - STANDARD TYPE DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

CALLED DIRECTLY BY:

BVTIDS - BUILD VTI DATA STRUCTURE
PCHVTI - PUT SCREEN CHARACTERS TO VTI DATA STRUCTURE

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

VIRTUAL TERMINAL Module Documentation

NAME: BLDMSG
PURPOSE: BUILD MESSAGE
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: BLDMSG
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
VOID BLDMSG(BUFF, MAXLEN, LEN)
    CHAR BUFF[];
    INT MAXLEN;
    INT *LEN;
```

INPUTS/OUTPUTS:

INPUTS:

ADDRESS OF BUFF WHERE FORMATED MESSAGE TO BE PUT
MAXLEN - LENGTH OF THIS MEMORY AREA
ADDRESS OF LOCATION WHERE LEN OF THIS FORMATTED MESSAGE
TO BE PUT

OUTPUTS:

BUFF - CONTAINES FORMATED MESSAGE
LEN - CONTAINES LENGTH OF THIS FORMATED MESSAGE

DESCRIPTION

THIS MODULE BUILDS A FORMATED MESSAGE(TO BE SENT ACROSS
NTM TO MONITOR)

ARGUMENTS:

BUFF = CHAR []
MAXLEN = INT
LEN = INT *

PS 620144300
1 November 1985

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
CTLCHR - CONTROL CHARACTERS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

ROW
COL
BLDMSG/BLDBUF - BUILD BUFFER
SPRINTF
STRLEN
MEMCPY
BLDMSG/REDOFF - READ FLAG TURNED OFF
BVTIDS - BUILD VTI DATA STRUCTURE

CALLED DIRECTLY BY:

GETVT - GET DATA FROM VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: BLDMSG/BLDBUF
PURPOSE: BUILD BUFFER
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: BLDMSG
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

----- SYNOPSIS

STATIC VOID BLDBUF(WNDPT, BUFPTR, BUFEND)
REGISTER WND *WNDPT;
REGISTER CHAR **BUFPTR;
CHAR *BUFEND;

INPUTS/OUTPUTS:

INPUTS:

WNDPT - POINTER TO WINDOW FROM WHICH TO GET INFO TO
PUT IN MESSAGE
BUFPTR - ADDRESS OF POINTER WHERE FORMATED MESSAGE TO
BE PUT
BUFEND - END OF THIS MEMORY AREA

OUTPUTS:

BUFPTR - POINTS TO LAST ENTERY OF FORMATED MESSAGE

DESCRIPTION

THIS MODULE BUILDS A FORMATED MESSAGE(TO BE SENT ACROSS
NTM TO MONITOR)
FROM WINDOW POINTED TO BY WNDPT

ARGUMENTS:

WNDPT = WND *
BUFPTR = CHAR **
BUFEND = CHAR *

PS 620144300
1 November 1985

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
CTLCHR - CONTROL CHARACTERS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

BLDMSG/BLDBUF - BUILD BUFFER
MEMCPY
STRLEN
SPRINTF

CALLED DIRECTLY BY:

BLDMSG/BLDBUF - BUILD BUFFER
BLDMSG - BUILD MESSAGE

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: BLDMSG/REDOFF
PURPOSE: READ FLAG TURNED OFF
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: BLDMSG
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

STATIC VOID REDOFF(WNDPT)
REGISTER WND *WNDPT;

INPUTS/OUTPUTS:

INPUTS:

WNDPT - POINTER TO WINDOW FROM WHICH DATA WAS READ

OUTPUTS:

NONE

DESCRIPTION

THIS MODULE TURNS OFF ALL READ FLAGS OF CHILD WINDOWS AND
FIELDS WHOSE
DATA HAS BEEN PUT IN FORMATED MESSAGE(TO BE SENT ACROSS
NTM TO MONITOR)
OF WINDOW POINTED TO BY WNDPT

ARGUMENTS:

WNDPT * WND *

INCLUDE FILES:

STDDEF - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES

PS 620144300
1 November 1985

SCREEN	- INTERNAL SCREEN DEFINITIONS
FUNCTS	- FUNCTION DEFINITIONS
CTLCHR	- CONTROL CHARACTERS
DEVICE	- PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

BLDMSG/REDOFF - READ FLAG TURNED OFF

CALLED DIRECTLY BY:

BLDMSG/REDOFF - READ FLAG TURNED OFF
BLDMSG - BUILD MESSAGE

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: BVTIDS
PURPOSE: BUILD VTI DATA STRUCTURE
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: BOOL ()
SOURCE FILE: BVTIDS
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

BOOL BVTIDS()

INPUTS/OUTPUTS:

INPUTS:
NONE

OUTPUTS:
RETURNS SUCCESS/FAILURE

DESCRIPTION

THIS MODULE (AND STATIC SUBMODULES) BUILDS THE VTI FIELD
MAP USED BY
VIRTUAL TERMINAL TO PAINT SCREEN ON TERMINAL(DEVICE) FROM
THE INTERNAL
DATA STRUCTURE.

INCLUDE FILES:

STDTP - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
SCREEN - INTERNAL SCREEN DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

PS 620144300
1 November 1985

ROUTINES CALLED:

BLDCMD
PRCCMDS - PROCESS COMMAND
BVTIDS/CLRFLG - CLEAR FLAGS
ROW
COL
ABSPOS - ABSOLUTIZE CURSOR POSITION OF FIELD
MAX
STRASN
MEMCMP
BVTIDS/RVTIFM - REBUILD VTI FIELD MAP

CALLED DIRECTLY BY:

BLDMSG - BUILD MESSAGE
PUTVT - PUT DATA TO VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: BVTIDS/BVTIFM
PURPOSE: BUILD VTI FIELD MAP
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: BOOL ()
SOURCE FILE: BVTIDS
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

DESCRIPTION

TRAVERSES THE INTERNAL STRUCTURE ADDING WINDOWS AND
FIELDS TO THE
FIELD MAP

ARGUMENTS:

WNDPT = WND *
BNI = INT []

INCLUDE FILES:

STDTP - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
SCREEN - INTERNAL SCREEN DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

BVTIDS/BVTIFM - BUILD VTI FIELD MAP
BVTIDS/INSFLD - INSERT FIELD
MALLOC

CALLED DIRECTLY BY:

PS 620144300
1 November 1985

BVTIDS/RVTIFM - REBUILD VTI FIELD MAP
BVTIDS/BVTIFM - BUILD VTI FIELD MAP

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: BVTIDS/CLRFLG
PURPOSE: CLEAR FLAGS
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: BVTIDS
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

DESCRIPTION

THIS MODULE CLEARS ALL FORMAT CHANGE AND CHANGE OUTPUT
FLAGS

ARGUMENTS:

WNDPT = WND *

INCLUDE FILES:

STDTP - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
SCREEN - INTERNAL SCREEN DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

BVTIDS/CLRFLG - CLEAR FLAGS

CALLED DIRECTLY BY:

BVTIDS/CLRFLG - CLEAR FLAGS
BVTIDS - BUILD VTI DATA STRUCTURE

PS 620144300
1 November 1985

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: BVTIDS/CVTIFM
PURPOSE: CLEAR VTI FIELD MAP
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: BOOL ()
SOURCE FILE: BVTIDS
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

DESCRIPTION

REMOVES ALL OLD VTI FIELDS FROM THE MAP AND FREES THEM

INCLUDE FILES:

STDYTP - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
SCREEN - INTERNAL SCREEN DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

STRASN
MALLOC
FREE

CALLED DIRECTLY BY:

BVTIDS/RVTIFM - REBUILD VTI FIELD MAP

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

VIRTUAL TERMINAL Module Documentation

NAME: BVTIDS/INSFLD
PURPOSE: INSERT FIELD
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: BOOL ()
SOURCE FILE: BVTIDS
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

----- DESCRIPTION

INSERTS A FIELD (OR WINDOW) INTO THE FIELD MAP TAKING
CARE TO TRUNCATE,
SPLIT, OR REMOVE FIELDS ALREADY IN THE FIELD MAP WHICH ARE
PARTIALLY OR
TOTALLY OBSCURED BY THE NEW FIELD. NOTE THAT THIS
ASSUMES FIELDS ARE
INSERTED IN A BACK-TO-FRONT ORDER.

ARGUMENTS:

IVTIPT = VTIFLD *
WBNDRY = INT []

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
SCREEN - INTERNAL SCREEN DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

STRASN
MALLOC
FREE

PS 620144300
1 November 1985

MIN
MAX

CALLED DIRECTLY BY:

BVTIDS/BVTIFM - BUILD VTI FIELD MAP

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: BVTIDS/RVTIFM
PURPOSE: REBUILD VTI FIELD MAP
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: BOOL ()
SOURCE FILE: BVTIDS
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

DESCRIPTION
REBUILD VTI FIELD MAP

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
SCREEN - INTERNAL SCREEN DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

BVTIDS/BVTIFM - BUILD VTI FIELD MAP
BVTIDS/CVTIFM - CLEAR VTI FIELD MAP

CALLED DIRECTLY BY:

BVTIDS - BUILD VTI DATA STRUCTURE

USED IN MAIN PROGRAM(S):

DRIVER MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: CLRMOD
PURPOSE: CLEAR MODIFY FLAGS
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: CLRMOD
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

VOID CLRMOD()

DESCRIPTION

CLEARs ALL THE MODIFY FLAGS IN THE INTERNAL SCREEN

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS

ROUTINES CALLED:

CBIT

CALLED DIRECTLY BY:

GETVT - GET DATA FROM VIRTUAL TERMINAL
PUTVT - PUT DATA TO VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

VIRTUAL TERMINAL Module Documentation

NAME: DEFFLD
PURPOSE: DEFINE FIELD
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: BOOL ()
SOURCE FILE: DEFFLD
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
BOOL DEFFLD(CMD, PTR)
  STRUCT COMMAND *CMD;
  CHAR          *PTR;
```

INPUTS/OUTPUTS:

INPUTS:

CMD - ADDRESS OF COMMAND STRUCTURE USED TO MODIFY DATA
STRUCTURE
PTR - POINTS TO END OF MESSAGE BUFFER BEING PROCESSED

OUTPUTS

PTR - WILL POINT TO END PROCESSED DATA IN BUFFER
RETURNS SUCCESS / FAILURE

DESCRIPTION

THIS MODULE USING DATA IN COMMAND STRUCTURE AS WELL AS
DATA STILL IN
MESSAGE BUFFER MODIFIES INTERNAL DATA STRUCTURE OF FIELD
SPECIFIED BY
CURRENT WINDOW AND ROW AND COL OF FIELD FIELD BEING DEFINED
IF NO FIELD
IS FOUND TO MODIFY THEN ONE IS CREATED.

ARGUMENTS

PS 620144300
1 November 1985

CMD = STRUCT COMMAND *
PTR = CHAR **

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
CTYPE - **** PURPOSE NOT FOUND BY STRIPPER ****
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

CALLOC
MALLOC
MEMSET
ISPRINT

CALLED DIRECTLY BY:

PUTVT - PUT DATA TO VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME	DEFWND
PURPOSE	DEFINE WINDOW
LANGUAGE	C
MODULE TYPE	FUNCTION
FUNCTION TYPE	BOOL ()
SOURCE FILE	DEFWND
SOURCE FILE TYPE	.C
HOST	
SUBSYSTEM	UI
SUBDIRECTORY	DRIVER
DOCUMENTATION GROUP	VIRTERM

DESCRIPTION

SYNOPSIS

```
BOOL DEFWND(CMD)  
STRUCT COMMAND *CMD;
```

INPUTS OUTPUTS

INPUTS

CMD ADDRESS OF COMMAND STRUCTURE USED TO MODIFY DATA
STRUCTURE

OUTPUTS

RETURN SUCCESS FAILURE

DESCRIPTION

THIS MODULE USING DATA IN COMMAND STRUCTURE MODIFIES
INTERNAL DATA
STRUCTURE OF WINDOW SPECIFIED BY CURENT WNDOW AND WNDID
OF WINDOW
IF NO DEFINED IF NO WINDOW IS FOUND TO MODIFY THEN ONE
IS CREATED

APPLICANTS

CMD STRUCT COMMAND *

PS 620144300
1 November 1985

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

FNDWND - FIND WINDOW
CALLOC
MAX
MIN
STFMTF - SET FORMAT FLAG FOR ALL CHILDREN WINDOWS AND
FIELDS

CALLED DIRECTLY BY:

PUTVT - PUT DATA TO VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

VIRTUAL TERMINAL Module Documentation

NAME: DOSCR/ERASE
PURPOSE: ERASE PART OF SCREEN
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: DOSCR
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

ARGUMENTS:

LO = INT
HI = INT

INCLUDE FILES:

STDYTP - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
SCREEN - INTERNAL SCREEN DEFINITIONS

SOURCES CALLED:

UNIT
CALL
CALL
CALL
CALL
CALL

FUNCTIONS BY:

0 HORIZONTAL SCROLL
1 VERTICAL SCROLL
100 COMMAND TO INTERNAL SCREEN

PS 620144300
1 November 1985

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

VIRTUAL TERMINAL Module Documentation

NAME: DOSCR/HSCR
PURPOSE: HORIZONTAL SCROLL
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: DOSCR
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

ARGUMENTS:

POS = INT
DIR = INT
N = INT*

INCLUDE FILES:

STDTP - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
SCREEN - INTERNAL SCREEN DEFINITIONS

ROUTINES CALLED:

DOSCR ERASE - ERASE PART OF SCREEN
MIN
COL
TEIT

CALLED DIRECTLY BY:

DOSCREEN - DO COMMAND TO INTERNAL SCREEN

PS 620144300
1 November 1985

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: DOSCR/VSCR
PURPOSE: VERTICAL SCROLL
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: DOSCR
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

ARGUMENTS:

POS = INT
N = INT

INCLUDE FILES:

STDYTP - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
SCREEN - INTERNAL SCREEN DEFINITIONS

ROUTINES CALLED:

SBIT
MAX
DOSCR/ERASE - ERASE PART OF SCREEN
ROW
MIN
COL
CBIT
TBIT

CALLED DIRECTLY BY:

PS 620144300
1 November 1985

DOSCREEN - DO COMMAND TO INTERNAL SCREEN

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

VIRTUAL TERMINAL Module Documentation

NAME: DOSCREEN
PURPOSE: DO COMMAND TO INTERNAL SCREEN
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: INT ()
SOURCE FILE: DOSCR
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
INT DOSCREEN(CMD)
STRUCT COMMAND *CMD;
```

DESCRIPTION

EXECUTES CMD ON THE INTERNAL SCREEN AND FIXES UP ITS
PARAMETERS.

RETURNS -1 FOR ERRORS, 0 FOR NO ACTION, 1 FOR NORMAL
COMMAND, AND 2 FOR

MOVE THE CURSOR AND RETRY.

ARGUMENTS:

CMD = STRUCT COMMAND *

INCLUDE FILES:

STDYTP	- STANDARD TYPE DEFINITIONS
BITS	- INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS	- FUNCTION DEFINITIONS
SCREEN	- INTERNAL SCREEN DEFINITIONS

ROUTINES CALLED:

TBIT
CBIT

PS 620144300
1 November 1985

FFBSA
DOSCR/HSCR - HORIZONTAL SCROLL
COL
MAX
FFBSB
ROW
DOSCR/VSCR - VERTICAL SCROLL
DOSCR/ERASE - ERASE PART OF SCREEN
FIX
LIMIT
POS
CABIT
FLOOR
SBIT
ZERO

CALLED DIRECTLY BY:

PRCCMDS - PROCESS COMMAND
TRMGET - TERMINAL GET

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: DRIVER/MAIN
PURPOSE: MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: INT ()
SOURCE FILE: DRIVER
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DEVDRV
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

MAIN()

DESCRIPTION

THIS IS THE MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER. IT SITS IN A POOLING LOOP GETTING MESSAGES FOM NTN AND PROCESSING THEM AND GETTING TERMINAL INPUT AND PROCESSING THAT. WHEN RUN, THREE OPTIONAL ARGUMENTS MAY BE SPECIFIED FOR SCRIPTING: -W<FILE> TO WRITE A SCRIPT FILE, -R<FILE> TO READ A SCRIPT FILE, AND -S<FILE> TO SAVE OUTPUT IN A FILE.

ARGUMENTS:

ARGC = INT
ARGV = CHAR * []

INCLUDE FILES:

STDYTP - STANDARD TYPE DEFINITIONS
STDIO - **** PURPOSE NOT FOUND BY STRIPPER ****
TERMIO - TRANSPARENT TERMINAL I/O DEFINITIONS

PS 620144300
1 November 1985

DEVICE	- PHYSICAL DEVICE DATA STRUCTURE
DEVINI	- DEVICE INITIALIZATIONS
NTM	- NTM INTERFACE INCLUDE FILE
BITS	- INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS	- FUNCTION DEFINITIONS
SCREEN	- INTERNAL SCREEN DEFINITIONS
CTLCHR	- CONTROL CHARACTERS
SIGNAL	- **** PURPOSE NOT FOUND BY STRIPPER ****
TRMRTN	- TERMINAL (DEVICE DRIVER) ROUTINES

ROUTINES CALLED:

BLDCMD	
TVTPRC	- TERMINATE VTI PROCESS
INITEX	
MEMCMP	
PUTVT	- PUT DATA TO VIRTUAL TERMINAL
FPRINTF	
PRINTF	
TRMNAT	
EXIT	
INTVT	- INITIALIZE VIRTUAL TERMINAL
CALLOC	
MALLOC	
FATAL	- REPORT FATAL ERROR
DELAY	
TRMVT	- TERMINATE VIRTUAL TERMINAL
RCV	
TRMCHK	- TERMINAL CHECK
GETVT	- GET DATA FROM VIRTUAL TERMINAL
SIGNAL	
MEMCPY	
STRCPY	
FREE	
STRCAT	
SPRINTF	
STRLEN	
NSEND	
FWRITE	
MIN	
PUTC	
FCLOSE	
FSEARCH	
FOPEN	
PRCCMDS	- PROCESS COMMAND
TOLOWER	

PS 620144300
1 November 1985

VIRTUAL TERMINAL Module Documentation

NAME: ERAWND
PURPOSE: ERASE WINDOW
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: ERAWND
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
VOID ERAWND(WNDPT)  
WND *WNDPT;
```

INPUTS OUTPUTS:

INPUTS:

WNDPT - POINTER TO WINDOW WISH TO FREE

OUTPUTS:

NONE

DESCRIPTION

THIS MODULE FREES ALL WINDOW'S CHILDREN WINDOWS AS WELL
AS ALL

DEPENDENT FIELDS.

ARGUMENTS:

WNDPT = WND *

INCLUDE FILES:

STDTP - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES

PS 620144300
1 November 1985

DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

ERAWND - ERASE WINDOW
FREE

CALLED DIRECTLY BY:

ERAWND - ERASE WINDOW
PUTVT - PUT DATA TO VIRTUAL TERMINAL
RMVWND - REMOVE WINDOW

USED IN MAIN PROGRAM(S):

DRIVER MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

VIRTUAL TERMINAL Module Documentation

NAME	FATAL
PURPOSE	REPORT FATAL ERROR
LANGUAGE	C
MODULE TYPE	SUBROUTINE
FUNCTION TYPE	VOID ()
SOURCE FILE	FATAL
SOURCE FILE TYPE	.C
HOST	
SUBSYSTEM	UI
SUBDIRECTORY	DRIVER
DOCUMENTATION GROUP	VIRTERM

DESCRIPTION

SYNOPSIS

```
VOID FATAL(MSG)
    CHAR MSG[];
```

INPUTS

MSG - ERROR MESSAGE TO BE DISPLAYED (ERROR - %S\N)

DESCRIPTION

DISPLAYS THE SPECIFIED ERROR MESSAGE AND EXITS.

ARGUMENTS

MSG = CHAR []

INCLUDE FILES

```
STDTyp STANDARD TYPE DEFINITIONS
Stdio **** PURPOSE NOT FOUND BY STRIPPER ****
```

ROUTINES CALLED

```
TVTPRC - TERMINATE VTI PROCESS
PRINTF
```

PS 620144300
1 November 1985

CALLED DIRECTLY BY:

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

NO-A102 545

INTEGRATED INFORMATION SUPPORT SYSTEM (IISS) VOLUME 8

2/3

USER INTERFACE SUBS (U) GENERAL ELECTRIC CO

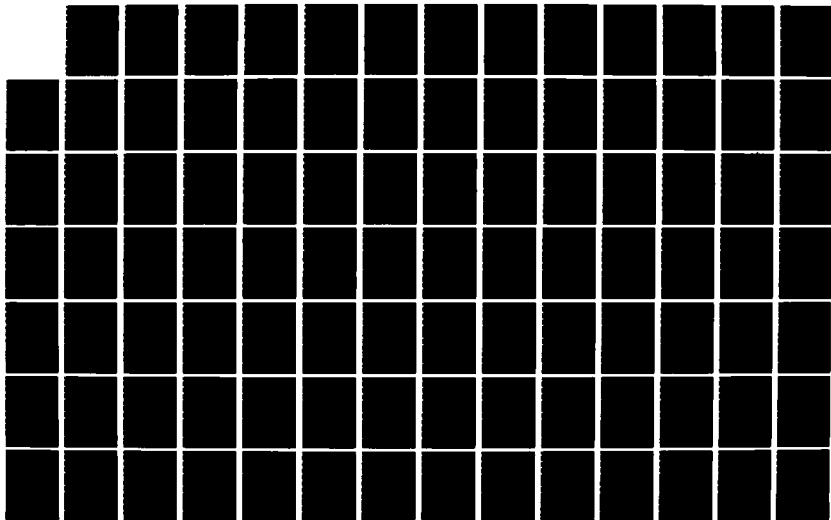
SCHENECTADY NY PRODUCTION RESOURCES CONSU

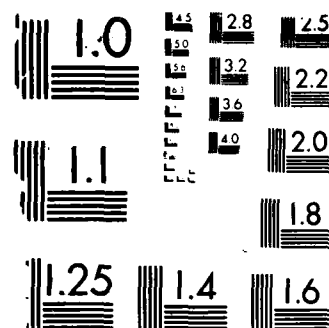
C MORENC ET AL 01 NOV 85 PS-620144300

F/G 12/5

ML

UNCLASSIFIED





MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

VIRTUAL TERMINAL Module Documentation

NAME: FNDWND
PURPOSE: FIND WINDOW
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: WND * (
SOURCE FILE: FNDWND
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

WND *FNDWND(WNDID,FWNDPT)
REGISTER INT WNDID;
REGISTER WND *FWNDPT;

INPUTS/OUTPUTS:

INPUTS:

WNDID - ID OF WINDOW SEARCHING FOR
FWNDPT - POINTER TO FIRST WINDOW IN LIST TO BE SEARCHED

OUTPUTS:

RETURNS A POINTER TO WINDOW FOUND OR A NULL

DESCRIPTION

THIS MODULE SEARCHES FOR A WINDOW WITH THE ID GIVEN AND
EITHER RETURNS
A POINTER TO THE WINDOW FOUND OR A NULL.

ARGUMENTS:

WNDID = INT
FWNDPT = WND *

INCLUDE FILES:

PS 620144300
1 November 1985

STD TYP - STANDARD TYPE DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

FNDWND - FIND WINDOW

CALLED DIRECTLY BY:

DEFWND - DEFINE WINDOW
FNDWND - FIND WINDOW
PUTVT - PUT DATA TO VIRTUAL TERMINAL
RMVWND - REMOVE WINDOW

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: GETVT
PURPOSE: GET DATA FROM VIRTUAL TERMINAL
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: GETVT
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
VOID GETVT(BUFF, MAXLEN, LEN)
    CHAR *BUFF;
    INT *MAXLEN, *LEN;
```

DESCRIPTION

PERFORMS A READ FROM THE VIRTUAL TERMINAL. IF IN FORMS
MODE, BUFF
WILL CONTAIN A FORMATTED SCREEN, OTHERWISE IT WILL
CONSIST OF ALL THE
PRINTABLE CHARACTERS ENTERED PRIOR TO A COMMAND; IF IN
CONTROL TRANSFER
MODE, THE COMMAND WILL ALSO BE STORED. MAXLEN IS THE
LENGTH OF BUFF.
LEN IS THE NUMBER OF CHARACTER READ IN.

ARGUMENTS:

```
BUFF =      CHAR *
MAXLEN =    INT *
LEN =       INT *
```

INCLUDE FILES

```
STDTPY      STANDARD TYPE DEFINITIONS
BITS        INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS      FUNCTION DEFINITIONS
```

PS 620144300
1 November 1985

SCREEN	- INTERNAL SCREEN DEFINITIONS
DEVICE	- PHYSICAL DEVICE DATA STRUCTURE
TRMRTN	- TERMINAL (DEVICE DRIVER) ROUTINES

ROUTINES CALLED:

BLDCMD	
CLRMOD	- CLEAR MODIFY FLAGS
TBIT	
PVTICMD	- PUT VTI COMMAND
TRMGET	- TERMINAL GET
PCHVTI	- PUT SCREEN CHARACTERS TO VTI DATA STRUCTURE
BLDMSG	- BUILD MESSAGE

CALLED DIRECTLY BY:

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: GVTICMD
PURPOSE: GET VIRTUAL TERMINAL INTERFACE COMMAND
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: GVTICMD
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
VOID GVTICMD(CMD, PTR, END)
    STRUCT COMMAND *CMD;
    CHAR **PTR, *END;
```

DESCRIPTION

PARSES THE NEXT VIRTUAL TERMINAL COMMAND INTO CMD AND
UPDATES PTR TO
POINT TO THE CHARACTER FOLLOWING IT. END IS A POINTER TO
THE CHARACTER
FOLLOWING THE END OF THE COMMAND STRING.

ARGUMENTS:

```
CMD =    STRUCT COMMAND *
PTR =    CHAR **
END =    CHAR *
```

INCLUDE FILES

```
STDYTP    STANDARD TYPE DEFINITIONS
CTYPE     **** PURPOSE NOT FOUND BY STRIPPER ****
BITS      INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS     FUNCTION DEFINITIONS
CTLCHR     CONTROL CHARACTERS
```

PS 620144300
1 November 1985

ROUTINES CALLED:

ISPRINT
ISDIGIT

CALLED DIRECTLY BY:

PUTVT - PUT DATA TO VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: INTVT
PURPOSE: INITIALIZE VIRTUAL TERMINAL
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: INTVT
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
VOID INTVT(TNAME, LEN)
    CHAR *TNAME;
    INT *LEN;
```

DESCRIPTION

OPENS THE VTI FOR THE TERMINAL SPECIFIED BY TNAME. LEN
IS THE NUMBER OF
CHARACTERS IN TNAME.

ARGUMENTS:

TNAME = CHAR *
LEN = INT *

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
CTLCHR - CONTROL CHARACTERS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES

ROUTINES CALLED:

PS 620144300
1 November 1985

CSTR
MALLOC
FREE
PUTVT - PUT DATA TO VIRTUAL TERMINAL
TRMINI - TERMINAL INITIALIZE

CALLED DIRECTLY BY:

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: INVIS
PURPOSE: CHECK FOR INVISIBILITY
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: BOOL ()
SOURCE FILE: INVIS
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

BOOL INVIS(POS)
INT POS;

DESCRIPTION

RETURNS TRUE IF THE CHARACTER AT POSITION POS ON THE
INTERNAL SCREEN
IS INVISIBLE, FALSE OTHERWISE.

ARGUMENTS:

POS = INT

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS

ROUTINES CALLED:

TBIT

CALLED DIRECTLY BY:

PS 620144300
1 November 1985

REFRESH - REFRESH TERMINAL
SLINEND - FIND SCREEN LINE END

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: PCHVTI
PURPOSE: PUT SCREEN CHARACTERS TO VTI DATA
STRUCTURE
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: BOOL ()
SOURCE FILE: PCHVTI
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

BOOL PCHVTI()

INPUTS/OUTPUTS:

INPUTS:

NONE

OUTPUTS:

RETURNS FAILURE/SUCCESS

DESCRIPTION

THIS MODULE TAKES VT DATA IN "SCREEN" BUFFER AND PUTS IT
INTO
VTI INTERNAL DATA STRUCTURE

INCLUDE FILES:

STDTP	-	STANDARD TYPE DEFINITIONS
BITS	-	INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN	-	INTERNAL SCREEN DEFINITIONS
FUNCTS	-	FUNCTION DEFINITIONS
DEVICE	-	PHYSICAL DEVICE DATA STRUCTURE

PS 620144300
1 November 1985

ROUTINES CALLED:

TBIT
ABSPOS - ABSOLUTIZE CURSOR POSITION OF FIELD
MAX

CALLED DIRECTLY BY:

GETVT - GET DATA FROM VIRTUAL TERMINAL
PUTVT - PUT DATA TO VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

VIRTUAL TERMINAL Module Documentation

NAME: PRCCMDS
PURPOSE: PROCESS COMMAND
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: PRCCMDS
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
VOID PRCCMDS(CMD)
STRUCT COMMAND *CMD;
```

INPUTS/OUTPUTS:

INPUTS:

CMD - COMMAND TO BE PROCESSED

OUTPUTS:

NONE

DESCRIPTION

PROCESSES INDIVIDUAL VIRTUAL TERMINAL COMMANDS

ARGUMENTS:

CMD = STRUCT COMMAND *

INCLUDE FILES:

STDYTP - STANDARD TYPE DEFINITIONS
TERMIO - TRANSPARENT TERMINAL I/O DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS

PS 620144300
1 November 1985

SCREEN - INTERNAL SCREEN DEFINITIONS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES

ROUTINES CALLED:

BLDCMD
DOSCREEN - DO COMMAND TO INTERNAL SCREEN
TRMPUT - TERMINAL PUT
TBIT
ROW
COL

CALLED DIRECTLY BY:

BVTIDS - BUILD VTI DATA STRUCTURE
DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
PUTVT - PUT DATA TO VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: PUTVT
PURPOSE: PUT DATA TO VIRTUAL TERMINAL
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: PUTVT
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
VOID PUTVT(BUFF, LEN)
    CHAR *BUFF;
    INT *LEN;
```

DESCRIPTION

PERFORMS A WRITE TO THE VIRTUAL TERMINAL. LEN IS THE
NUMBER OF
CHARACTERS IN BUFF TO BE WRITTEN.

ARGUMENTS:

```
BUFF = CHAR *
LEN = INT *
```

INCLUDE FILES:

```
STDTyp - STANDARD TYPE DEFINITIONS
TERMIO - TRANSPARENT TERMINAL I/O DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
SCREEN - INTERNAL SCREEN DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES
```

ROUTINES CALLED:

PS 620144300
1 November 1985

BLDCMD
FNDWND - FIND WINDOW
PRCCMDS - PROCESS COMMAND
TBIT
TRMFLS - TERMINAL FLUSH
RMVWND - REMOVE WINDOW
DEFWND - DEFINE WINDOW
SWNPRC - SET WINDOW PRECEDENCE
DEFFLD - DEFINE FIELD
BVTIDS - BUILD VTI DATA STRUCTURE
ERAWND - ERASE WINDOW
PCHVTI - PUT SCREEN CHARACTERS TO VTI DATA STRUCTURE
CLRMOD - CLEAR MODIFY FLAGS
GVTICMD - GET VIRTUAL TERMINAL INTERFACE COMMAND
STRDPN - SET READ PENDING FLAGS

CALLED DIRECTLY BY:

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
INTVT - INITIALIZE VIRTUAL TERMINAL
TRMVT - TERMINATE VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME	PVTICMD
PURPOSE	PUT VTI COMMAND
LANGUAGE	C
MODULE TYPE	SUBROUTINE
FUNCTION TYPE	VOID ()
SOURCE FILE	PVTICMD
SOURCE FILE TYPE	C
HOST	
SUBSYSTEM	UI
SUBDIRECTORY	DRIVER
DOCUMENTATION GROUP	VIRTERM

DESCRIPTION

SYNOPSIS

```
VOID PVTICMD(CMD, BUFF, END)
    STRUCT COMMAND *CMD;
    CHAR **BUF, *END;
```

DESCRIPTION

CONVERTS CMD TO CHARACTER FORM AND UPDATE BUFF TO POINT
TO THE CHARACTER
FOLLOWING THE CONVERTED STRING. END IS A POINTER TO THE
CHARACTER
FOLLOWING THE BUFFER

ARGUMENTS

CMD	=	STRUCT COMMAND *
BUFF	=	CHAR **
END	=	CHAR *

INCLUDE FILES

STDYTP	-	STANDARD TYPE DEFINITIONS
BITS	-	INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN	-	INTERNAL SCREEN DEFINITIONS
FUNCTS	-	FUNCTION DEFINITIONS
CTLCHK	-	CONTROL CHARACTERS

PS 620144300
1 November 1985

ROUTINES CALLED:

PVTICMD/PUTNUM - PUT NUMBER

CALLED DIRECTLY BY:

GETVT - GET DATA FROM VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: PVTICMD/PUTNUM
PURPOSE: PUT NUMBER
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: PVTICMD
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

ARGUMENTS:

NUM = INT
BUFF = CHAR **
END = CHAR *

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
CTLCHR - CONTROL CHARACTERS

CALLED DIRECTLY BY

PVTICMD PUT VTI COMMAND

USED IN MAIN PROGRAM(S)

DRIVER MAI MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: REFRESH
PURPOSE: REFRESH TERMINAL
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: REFRESH
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS
VOID REFRESH()

DESCRIPTION
CLEARS THE TERMINAL SCREEN AND REWRITES IT FROM THE
INTERNAL SCREEN.

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES

ROUTINES CALLED:

BLDCMD
INVIS - CHECK FOR INVISIBILITY
ROW
COL
TBIT
TRMPUT - TERMINAL PUT
SBIT
TRMFLS - TERMINAL FLUSH
CBIT

PS 620144300
1 November 1985

CALLED DIRECTLY BY:

TRMPUT - TERMINAL PUT

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: REFTERM
PURPOSE: REFRESH TERMINAL
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: REFTERM
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

VOID REFTERM(MIN, MAX)
INT MIN, MAX;

DESCRIPTION

REFRESHES THE SPECIFIED PORTION OF THE TERMINAL SCREEN
FROM THE INTERNAL

SCREEN.

ARGUMENTS:

MIN = INT
MAX = INT

INCLUDE FILES:

STDTP - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES

ROUTINES CALLED:

BLDCMD
TBIT

PS 620144300
1 November 1985

TRMPUT - TERMINAL PUT
SBIT
SLINEND - FIND SCREEN LINE END
CBIT
COL
ROW
MAX
MIN

CALLED DIRECTLY BY:

TRMPUT - TERMINAL PUT

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: RMVWND
PURPOSE: REMOVE WINDOW
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: RMVWND
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

VOID RMVWND(WNDID)
INT WNDID;

INPUTS/OUTPUTS:

INPUTS:
WNDID - ID OF WINDOW WISH TO REMOVE

OUTPUTS:
NONE

DESCRIPTION

THIS MODULE AFTER CALLING FNDWND TO GET POINTER TO WINDOW
INTERESTED IN
REMOVING, UNLINKS IT FROM DATA STRUCTURE AND CALLS FREWND
TO FREE IT
AND ALL ITS CHILDREN WINDOWS AS WELL AS ALL DEPENDENT
FIELDS.

ARGUMENTS:

WNDID = INT

INCLUDE FILES:

PS 620144300
1 November 1985

STDTP - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

FNDWND - FIND WINDOW
ERAWND - ERASE WINDOW
FREE

CALLED DIRECTLY BY:

PUTVT - PUT DATA TO VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: SLINEND
PURPOSE: FIND SCREEN LINE END
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: INT ()
SOURCE FILE: SLINEND
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

INT SLINEND(POS)
INT POS;

DESCRIPTION

RETURNS THE POSITION OF THE LAST VISIBLE CHARACTER ON THE
LINE CONTAINING
THE SPECIFIED POSITION.

ARGUMENTS:

POS = INT

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS

ROUTINES CALLED:

INVIS - CHECK FOR INVISIBILITY
COL

CALLED DIRECTLY BY:

PS 620144300
1 November 1985

REFTERM - REFRESH TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: STFMTF
PURPOSE: SET FORMAT FLAG FOR ALL CHILDREN WINDOWS
AND FIELDS
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: STFMTF
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
VOID STFMTF(WNDPT);  
    WND *WNDPT;
```

INPUTS/OUTPUTS:

INPUTS:

WNDPT - POINTER TO WINDOW SETTING FLAGS FOR

OUTPUTS:

NONE

DESCRIPTION

THIS MODULE SETS ALL FORMAT CHANGE FLAGS FOR WINDOW AND
ITS CHILDREN
WINDOWS AND FIELDS

ARGUMENTS:

WNDPT = WND *

INCLUDE FILES:

STDTP - STANDARD TYPE DEFINITIONS

PS 620144300
1 November 1985

BITS	- INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS	- FUNCTION DEFINITIONS
DEVICE	- PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

STFMTF - SET FORMAT FLAG FOR ALL CHILDREN WINDOWS AND
 FIELDS

CALLED DIRECTLY BY:

DEFWND - DEFINE WINDOW
STFMTF - SET FORMAT FLAG FOR ALL CHILDREN WINDOWS AND
 FIELDS
SWNPRC - SET WINDOW PRECEDENCE

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: STRDPN
PURPOSE: SET READ PENDING FLAGS
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: STRDPN
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

VOID STRDPN(WNDPT)
REGISTER WND *WNDPT;

INPUTS/OUTPUTS:

INPUTS:

WNDPT - POINTER TO WINDOW FROM WHICH DATA IS TO BE READ

OUTPUTS:

NONE

DESCRIPTION

THIS MODULE TURNS ON ALL READ FLAGS OF CHILD WINDOWS AND
FIELDS WHOSE
DATA HAS IS TO BE PUT INTO FORMATED MESSAGE(TO BE SENT
ACROSS NTM TO
MONITOR) OF WINDOW POINTED TO BY WNDPT

ARGUMENTS:

WNDPT = WND *

INCLUDE FILES:

STDTP - STANDARD TYPE DEFINITIONS

PS 620144300
1 November 1985

DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

STRDPN STFDRD - SET FIELD READ PENDING

CALLED DIRECTLY BY:

PUTVT - PUT DATA TO VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME	STRDPN STFDRD
PURPOSE	SET FIELD READ PENDING
LANGUAGE	C
MODULE TYPE	SUBROUTINE
FUNCTION TYPE	VOID ()
SOURCE FILE	STRDPN
SOURCE FILE TYPE	C
HOST	
SUBSYSTEM	UI
SUBDIRECTORY	DRIVER
DOCUMENTATION GROUP	VIRTERM

DESCRIPTION

ARGUMENTS

WNDPT * WND *

INCLUDE FILES:

STDTP - STANDARD TYPE DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

STRDPN/STFDRD - SET FIELD READ PENDING

CALLED DIRECTLY BY:

STRDPN/STFDRD - SET FIELD READ PENDING
STRDPN - SET READ PENDING FLAGS

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME:	SWNPRC
PURPOSE:	SET WINDOW PRECEDENCE
LANGUAGE:	C
MODULE TYPE:	SUBROUTINE
FUNCTION TYPE:	VOID ()
SOURCE FILE:	SWNPRC
SOURCE FILE TYPE:	.C
HOST:	
SUBSYSTEM:	UI
SUBDIRECTORY:	DRIVER
DOCUMENTATION GROUP:	VIRTERM

DESCRIPTION

SYNOPSIS

```
VOID SWNPRC(CMD)
    STRUCT COMMAND *CMD;
```

INPUTS/OUTPUTS:

INPUTS:

CMD - ADDRESS OF COMMAND STRUCTURE USED TO SET
PRECEDENCE OF
WINDOWS

OUTPUTS:

NONE

DESCRIPTION

THIS MODULE REORDERS PRECEDENCE OF WINDOWS, TAKING FIRST
WINDOW OUT OF
LIST AND PUTTING IT AT THE HEAD OF THE LIST, THEN TAKING
THE NEXT WINDOW
AND DOING THE SAME THING AND SO ON UNTIL ALL WINDOW PASSED
IN COMMAND
STRUCTURE HAVE BEEN PROCESSED.

ARGUMENTS:

CMD = STRUCT COMMAND *

PS 620144300
1 November 1985

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
FUNCTS - FUNCTION DEFINITIONS
DEVICE - PHYSICAL DEVICE DATA STRUCTURE

ROUTINES CALLED:

STFMTF - SET FORMAT FLAG FOR ALL CHILDREN WINDOWS AND
FIELDS

CALLED DIRECTLY BY:

PUTVT - PUT DATA TO VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: TPUTNUM
PURPOSE: TERMINAL PUT NUMBER
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: TPUTNUM
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
VOID TPUTNUM(I, CHAN)
    INT I;
    TERM *CHAN;
```

DESCRIPTION

CONVERTS I TO CHARACTER FORM AND WRITES IT TO THE
SPECIFIED TERMINAL.

ARGUMENTS:

I = INT
CHAN = TERM *

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
TERMIO - TRANSPARENT TERMINAL I/O DEFINITIONS

ROUTINES CALLED:

TPUTC

CALLED DIRECTLY BY:

PS 620144300
1 November 1985

VT100/MOVCUR - MOVE CURSOR (INTERNAL)
VT100/SETATR - SET ATTRIBUTES (INTERNAL)
TRMPUT - TERMINAL PUT

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: TPUTS
PURPOSE: TERMINAL PUT STRING
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: TPUTS
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

```
VOID TPUTS(S, CHAN)
    CHAR *S;
    TERM *CHAN;
```

DESCRIPTION

WRITES THE SPECIFIED STRING TO THE SPECIFIED TERMINAL.

ARGUMENTS:

S = CHAR *
CHAN = TERM *

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
TermIO - TRANSPARENT TERMINAL I/O DEFINITIONS

ROUTINES CALLED:

TPUTC

CALLED DIRECTLY BY:

VT100/MOVCUR - MOVE CURSOR (INTERNAL)

PS 620144300
1 November 1985

VT100/SETATR - SET ATTRIBUTES (INTERNAL)
TRMPUT - TERMINAL PUT
TRMEND - TERMINAL END

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

VIRTUAL TERMINAL Module Documentation

NAME: TRMCHK
PURPOSE: TERMINAL CHECK
LANGUAGE: C
MODULE TYPE: FUNCTION
FUNCTION TYPE: INT ()
SOURCE FILE: VT100
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DEVDRV
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

----- SYNOPSIS

INT TRMCHK()

DESCRIPTION

THIS MODULE RETURNS THE NUMBER OF CHARACTERS IN THE
TYPE-AHEAD BUFFER.

INCLUDE FILES:

STDIO - **** PURPOSE NOT FOUND BY STRIPPER ****
STDYTP - STANDARD TYPE DEFINITIONS
CTYPE - **** PURPOSE NOT FOUND BY STRIPPER ****
TERMIO - TRANSPARENT TERMINAL I/O DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES
CI600.C" - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

TCHECK

CALLED DIRECTLY BY:

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: TRMEND
PURPOSE: TERMINAL END
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: VT100
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DEVDRV
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS
VOID TRMEND()

DESCRIPTION
RESETS THE CURRENTLY OPEN TERMINAL AND CLOSSES IT.

INCLUDE FILES:

STDIO - **** PURPOSE NOT FOUND BY STRIPPER ****
STDYTP - STANDARD TYPE DEFINITIONS
CTYPE - **** PURPOSE NOT FOUND BY STRIPPER ****
TERMIO - TRANSPARENT TERMINAL I/O DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES
CI600.C" - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

PRNEND
TPUTS - TERMINAL PUT STRING
TCLOSE

CALLED DIRECTLY BY:

PS 620144300
1 November 1985

TRMVT - TERMINATE VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: TRMFLS
PURPOSE: TERMINAL FLUSH
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: VT100
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DEVDRV
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS
VOID TRMFLS()

DESCRIPTION
FLUSH ANY TERMINAL BUFFERS.

INCLUDE FILES:

STDIO - **** PURPOSE NOT FOUND BY STRIPPER ****
STDYTP - STANDARD TYPE DEFINITIONS
CTYPE - **** PURPOSE NOT FOUND BY STRIPPER ****
TERMIO - TRANSPARENT TERMINAL I/O DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES
CI600.C" - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

VT100/MOVCUR - MOVE CURSOR (INTERNAL)
TFLUSH

CALLED DIRECTLY BY:

PUTVT - PUT DATA TO VIRTUAL TERMINAL

PS 620144300
1 November 1985

REFRESH - REFRESH TERMINAL
TRMGET - TERMINAL GET

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: TRMGET
PURPOSE: TERMINAL GET
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: VT100
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DEVDRV
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

VOID TRMGET(CMD)
STRUCT COMMAND *CMD;

DESCRIPTION

GETS THE NEXT COMMAND FROM THE TERMINAL AND CONVERTS IT
TO INTERNAL FORM.

ARGUMENTS:

CMD = STRUCT COMMAND *

INCLUDE FILES:

STDIO - **** PURPOSE NOT FOUND BY STRIPPER ****
STDYTP - STANDARD TYPE DEFINITIONS
CTYPE - **** PURPOSE NOT FOUND BY STRIPPER ****
TERMIO - TRANSPARENT TERMINAL I/O DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES
CI600.C - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

BLDCMD

PS 620144300
1 November 1985

PRINTF
GETCHAR
TPURGE
ISPRINT
TGETC
DOSCREEN - DO COMMAND TO INTERNAL SCREEN
ROW
COL
TRMPUT - TERMINAL PUT
TRMFLS - TERMINAL FLUSH
TBIT
ISDIGIT

CALLED DIRECTLY BY:

GETVT - GET DATA FROM VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: TRMINI
PURPOSE: TERMINAL INITIALIZE
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: VT100
SOURCE FILE TYPE: C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DEVDRV
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

VOID TRMINI(TNAME)
CHAR *TNAME;

DESCRIPTION

OPENS THE TERMINAL SPECIFIED BY TNAME AND INITIALIZES IT.

ARGUMENTS:

TNAME = CHAR *

INCLUDE FILES:

STDIO - **** PURPOSE NOT FOUND BY STRIPPER ****
STDYFP - STANDARD TYPE DEFINITIONS
CTYPE - **** PURPOSE NOT FOUND BY STRIPPER ****
TERMIO - TRANSPARENT TERMINAL I/O DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES
CI600.C - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

TBOPEN
PRNINI

PS 620144300
1 November 1985

CALLED DIRECTLY BY:

INTVT - INITIALIZE VIRTUAL TERMINAL

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: TRMPUT
PURPOSE: TERMINAL PUT
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: VT100
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DEVDRV
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

VOID TRMPUT(CMD)
STRUCT COMMAND *CMD;

DESCRIPTION

PUTS AN INTERNAL FORMAT COMMAND TO THE TERMINAL.

ARGUMENTS:

CMD = STRUCT COMMAND *

INCLUDE FILES:

STDIO - ***** PURPOSE NOT FOUND BY STRIPPER *****
STDYTP - STANDARD TYPE DEFINITIONS
CTYPE - ***** PURPOSE NOT FOUND BY STRIPPER *****
TERMIO - TRANSPARENT TERMINAL I/O DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES
CI600.C" - ***** PURPOSE NOT FOUND BY STRIPPER *****

ROUTINES CALLED:

GETCHAR
PRINTF

PS 620144300
1 November 1985

PRNFLS
PRNPUT
REFTERM - REFRESH TERMINAL
TPUTNUM - TERMINAL PUT NUMBER
POS
TPUTS - TERMINAL PUT STRING
REFRESH - REFRESH TERMINAL
ROW
COL
TPUTC
VT100/SETATR - SET ATTRIBUTES (INTERNAL)
SBIT
FFBSA
CABIT
FFBDA
VT100/MOVCUR - MOVE CURSOR (INTERNAL)
TBIT

CALLED DIRECTLY BY:

PRCCMDS - PROCESS COMMAND
REFRESH - REFRESH TERMINAL
REFTERM - REFRESH TERMINAL
TRMGET - TERMINAL GET

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: TRMVT
PURPOSE: TERMINATE VIRTUAL TERMINAL
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: TRMVT
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

VOID TRMVT()

DESCRIPTION

CLOSES THE VTI.

INCLUDE FILES:

STDTyp - STANDARD TYPE DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
CTLCHR - CONTROL CHARACTERS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES

ROUTINES CALLED:

TRMEND - TERMINAL END
FREE
PUTVT - PUT DATA TO VIRTUAL TERMINAL

CALLED DIRECTLY BY:

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER
TVTPRC - TERMINATE VTI PROCESS

PS 620144300
1 November 1985

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

VIRTUAL TERMINAL Module Documentation

NAME: TVTPRC
PURPOSE: TERMINATE VTI PROCESS
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: TVTPRC
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DRIVER
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

VOID TVTPRC()

DESCRIPTION

THIS IS AN EXIT HANDLER FOR ABNORMAL TERMINATIONS

INCLUDE FILES:

STDTPY - STANDARD TYPE DEFINITIONS

ROUTINES CALLED:

TRMNAT

TRMVT

EXIT

- TERMINATE VIRTUAL TERMINAL

CALLED DIRECTLY BY:

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

FATAL - REPORT FATAL ERROR

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: VT100/MOVCUR
PURPOSE: MOVE CURSOR (INTERNAL)
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: VT100
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DEVDRV
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

STATIC VOID MOVCUR(NEWPOS)
INT NEWPOS;

DESCRIPTION

MOVES THE TERMINAL CURSOR TO THE SPECIFIED POSITION AND
RESETS ANY
PENDING POSITION.

ARGUMENTS:

NEWPOS = INT

INCLUDE FILES:

STDIO - **** PURPOSE NOT FOUND BY STRIPPER ****
STDYTP - STANDARD TYPE DEFINITIONS
CTYPE - **** PURPOSE NOT FOUND BY STRIPPER ****
TERMIO - TRANSPARENT TERMINAL I/O DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES
CI600.C" - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

PS 620144300
1 November 1985

TPUTC
TPUTNUM - TERMINAL PUT NUMBER
TPUTS - TERMINAL PUT STRING
COL
ROW

CALLED DIRECTLY BY:

TRMPUT - TERMINAL PUT
TRMFLS - TERMINAL FLUSH

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

VIRTUAL TERMINAL Module Documentation

NAME: VT100/SETATR
PURPOSE: SET ATTRIBUTES (INTERNAL)
LANGUAGE: C
MODULE TYPE: SUBROUTINE
FUNCTION TYPE: VOID ()
SOURCE FILE: VT100
SOURCE FILE TYPE: .C
HOST:
SUBSYSTEM: UI
SUBDIRECTORY: DEVDRV
DOCUMENTATION GROUP: VIRTERM

DESCRIPTION:

SYNOPSIS

VOID SETATR(ATR)
INT ATR;

DESCRIPTION

SETS THE SPECIFIED TERMINAL ATTRIBUTES.

ARGUMENTS:

ATR = INT

INCLUDE FILES:

STDIO - **** PURPOSE NOT FOUND BY STRIPPER ****
STDYTP - STANDARD TYPE DEFINITIONS
CTYPE - **** PURPOSE NOT FOUND BY STRIPPER ****
TERMIO - TRANSPARENT TERMINAL I/O DEFINITIONS
BITS - INCLUDE FILE FOR BIT MANIPULATION ROUTINES
SCREEN - INTERNAL SCREEN DEFINITIONS
FUNCTS - FUNCTION DEFINITIONS
TRMRTN - TERMINAL (DEVICE DRIVER) ROUTINES
CI600.C" - **** PURPOSE NOT FOUND BY STRIPPER ****

ROUTINES CALLED:

TPUTNUM - TERMINAL PUT NUMBER
TPUTC

PS 620144300
1 November 1985

FFBSA
TPUTS - TERMINAL PUT STRING

CALLED DIRECTLY BY:

TRMPUT - TERMINAL PUT

USED IN MAIN PROGRAM(S):

DRIVER/MAI - MAIN MODULE FOR WINDOW MANAGER AND DEVICE DRIVER

PS 620144300
1 November 1985

3.10.9 Include File Descriptio

The following list contains a purpose and description of each include file listed in 3.10.4 as specified in the source code. The language it is written in is also given.

PS 620144300
1 November 1985

VIRTUAL TERMINAL Include File Description

FILE NAME: BITS
PURPOSE: INCLUDE FILE FOR BIT MANIPULATION ROUTINES
LANGUAGE: C

DESCRIPTION:

PS 620144300
1 November 1985

VIRTUAL TERMINAL Include File Description

FILE NAME: CTLCHR
PURPOSE: CONTROL CHARACTERS
LANGUAGE: C

DESCRIPTION:

DESCRIPTION
DEFINITIONS OF ALL CONTROL CHARACTERS TO AVOID CHARACTER
SET
DEPENDENCIES.

PS 620144300
1 November 1985

VIRTUAL TERMINAL Include File Description

FILE NAME: DEVICE
PURPOSE: PHYSICAL DEVICE DATA STRUCTURE
LANGUAGE: C

DESCRIPTION:

DESCRIPTION

THIS IS INCLUDE FILE FOR WINDOW MANAGER. IT CONTAINS DATA
STRUCTURE
FOR THE PHYSICAL DEVICE AND ITS LOGICAL DEVICES AND
WINDOWS.

PS 620144300
1 November 1985

VIRTUAL TERMINAL Include File Description

FILE NAME: DEVINI
PURPOSE: DEVICE INITIALIZATIONS
LANGUAGE: C

DESCRIPTION:

DESCRIPTION
EXTERNAL DEFINITION AND INITIALIZING INCLUDE FILE FOR
DEVICE.H

PS 620144300
1 November 1985

VIRTUAL TERMINAL Include File Description

FILE NAME: FUNCTS
PURPOSE: FUNCTION DEFINITIONS
LANGUAGE: C

DESCRIPTION:

DESCRIPTION

DEFINES THE MNEMONIC VIRTUAL TERMINAL COMMAND FUNCTIONS.
AND DEFINES STRUCTURE FOR PARSING VTI MESSAGE BUFFER.

PS 620144300
1 November 1985

VIRTUAL TERMINAL Include File Description

FILE NAME: NTM
PURPOSE: NTM INTERFACE INCLUDE FILE
LANGUAGE: C

DESCRIPTION:

DESCRIPTION
INCLUDE FILE FOR NTM INTERFACE

PS 620144300
1 November 1985

VIRTUAL TERMINAL Include File Description

FILE NAME: SCREEN
PURPOSE: INTERNAL SCREEN DEFINITIONS
LANGUAGE: C

DESCRIPTION:

DESCRIPTION
DEFINES SYMBOLS, EXTERNALS, ETC. FOR THE INTERNAL SCREEN
BUFFER.

VIRTUAL TERMINAL Include File Description

FILE NAME: STDTP
PURPOSE: STANDARD TYPE DEFINITIONS
LANGUAGE: C

DESCRIPTION:

DESCRIPTION

THIS FILE ENSURES THAT THE FOLLOWING STANDARD TYPES ARE
AVAILABLE:

FLOAT	- SINGLE PRECISION FLOAT
DOUBLE	- DOUBLE PRECISION FLOAT
LONG	- 32 BIT (OR LARGER) SIGNED INTEGER
LBITS	- 32 BITS (OR MORE) FOR BIT MANIPULATION
INT	- NATURAL SIZE SIGNED INTEGER
UNSIGNED	- NATURAL SIZE UNSIGNED INTEGER
BOOL	- NATURAL SIZE LOGICAL (ZERO / NON-ZERO ONLY)
SHORT	- 16 BIT (OR LARGER) SIGNED INTEGER
USHORT	- 16 BIT (OR LARGER) UNSIGNED INTEGER
BITS	- 16 BITS (OR MORE) FOR BIT MANIPULATION
CHAR	- SINGLE MACHINE CHARACTER (REAL CHARACTERS ALWAYS POSITIVE)
TINY	- 8 BIT (OR LARGER) SIGNED INTEGER
UTINY	- 8 BIT (OR LARGER) UNSIGNED INTEGER
TBITS	- 8 BITS (OR MORE) FOR BIT MANIPULATION
TBOOL	- 8 BIT (OR LARGER) LOGICAL (ZERO / NON-ZERO ONLY)
METACHAR	- 16 BIT (OR LARGER) AUGMENTED CHARACTER (SIGNED)
VOID	- FUNCTION THAT RETURNS NO VALUE
FORTAN	- STORAGE CLASS FOR FOREIGN (NON-C) ROUTINES OR C ROUTINES WHICH ARE CALLABLE FROM FOREIGN ROUTINES

SINCE NOT ALL COMPILERS SUPPORT USHORT, TINY, AND UTINY,
THE FUNCTIONS

PS 620144300
1 November 1985

USHORT(), TINY(), AND UTINY() SHOULD BE USED WHENEVER
REFERENCING THEM.

IN ADDITION, THE FOLLOWING UTILITY MACROS ARE DEFINED:
LURSHIFT(N, B) - UNSIGNED LONG RIGHT SHIFT
MAX(A, B) - MAXIMUM OF A AND B
MIN(A, B) - MINIMUM OF A AND B

VIRTUAL TERMINAL Include File Description

ABS(A)	- ABSOLUTE VALUE OF A
STRASN(A, B)	- TRANSPORTABLE A = B FOR STRUCTURES
NULL	- NULL POINTER VALUE (0)
TRUE	- 1
FALSE	- 0
SUCCESS	- EXIT(SUCCESS) INDICATES SUCCESSFUL COMPLETION
FAILURE	- EXIT(FAILURE) INDICATES ERRORS

THE FOLLOWING SYMBOLS SHOULD BE DEFINED BASED ON THE
COMPILER BEING USED:

USHORT	- COMPILER SUPPORTS UNSIGNED SHORT
TINY	- COMPILER TREATS CHAR AS SIGNED
UTINY	- CHAR IS SIGNED AND COMPILER SUPPORTS UNSIGNED CHAR
VOID	- COMPILER SUPPORTS VOID
FORTRAN	- COMPILER SUPPORTS FORTRAN
STRASN	- DEFINE APPROPRIATE MACRO
SUCCESS	- DEFINE APPROPRIATE VALUE IF NOT 0
FAILURE	- DEFINE APPROPRIATE VALUE IF NOT 1

PS 620144300
1 November 1985

VIRTUAL TERMINAL Include File Description

FILE NAME: TERMIO
PURPOSE: TRANSPARENT TERMINAL I/O DEFINITIONS
LANGUAGE: C

DESCRIPTION:

PS 620144300
1 November 1985

VIRTUAL TERMINAL Include File Description

FILE NAME: TRMRTN
PURPOSE: TERMINAL (DEVICE DRIVER) ROUTINES
LANGUAGE: C

DESCRIPTION:

DESCRIPTION
DECLARATIONS FOR ALL TRM* DEVICE SPECIFIC DEVICE DRIVER
ROUTINES.

3.10.10 Hierarchy Chart

The following hierarchy charts show the relationships between all of the modules mentioned in the above documentation. A module may call a subroutine several times within its code, but the call will only be shown once as a single relationship on this hierarchy chart. All modules shown at the top of the first page are considered Main Programs as described in section 3.10.1 above.

There is an internal paging scheme as marked by the numbers in the upper right corner of each page. An index after the last page of the chart shows where a routine and its calls are first defined. If a routine has no page reference, it either makes no calls or is an external routine. A continuation box on the end of a tree limb shows where that the tree continues on the page numbered mentioned. A number in a box with a routine name points to the page where the routine is further defined within the hierarchy tree. If there is no number in a box, the routine either makes no calls or is an external routine.

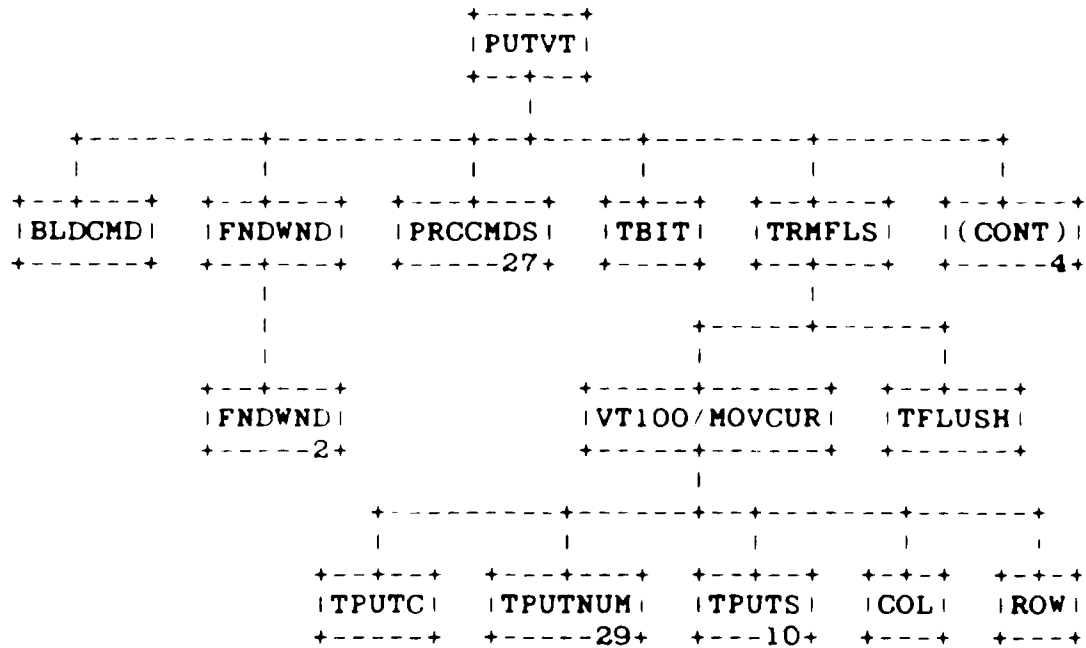
PS 620144300
1 November 1985

1

```
+-----+  
| DRIVER/MAIN |  
+-----+  
|  
+-----+  
| | | | | |  
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+  
| BLD CMD | | TVT PRC | | INITEX | | MEMCMP | | PUTVT | | (CONT) |  
+-----+ +-----+ +-----+ +-----+ +-----2+ +-----3+  
|  
+-----+  
| | |  
+-----+ +-----+ +-----+  
| TRMNAT | | TRMVT | | EXIT |  
+-----+ +-----10+ +-----+
```

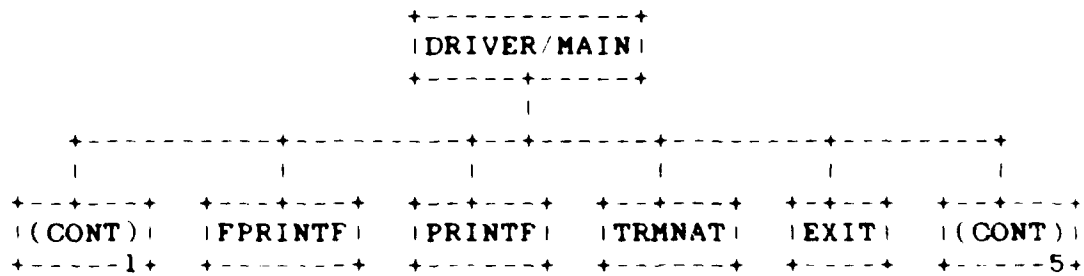
PS 620144300
1 November 1985

2



PS 620144300
1 November 1985

3



PS 620144300
1 November 1985

4

```

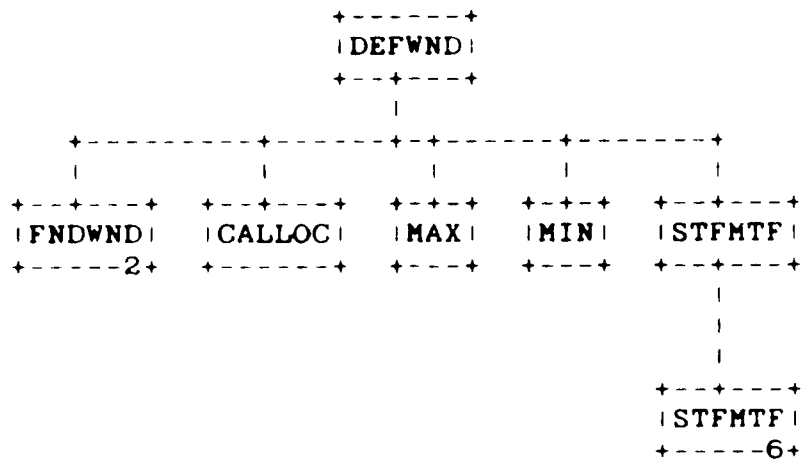
+-----+
| PUTVT |
+-----+
|
+-----+-----+-----+-----+-----+
| | | | | |
+-----+-----+-----+-----+-----+
| (CONT) | RMVWND | DEFWND | SWNPRC | DEFFLD | (CONT) |
+-----2+ +-----+ +-----6+ +-----+ +-----7+ +-----8+
| | | | |
+-----+-----+-----+-----+
| FNDWND | ERAWND | FREE | STFMTF |
+-----2+ +-----8+ +-----+ +-----6+

```

```

+-----+
| DRIVER/MAIN |
+-----+
|
+-----+
| | | | | |
+-----+
| (CONT) | | INTVT | | CALLOC | | MALLOC | | FATAL | | (CONT) |
+-----3+ +-----9+ +-----+ +-----+ +-----+ +-----10+
|
+-----+
| | |
+-----+
| TVTPRC | | PRINTF |
+-----1+ +-----+

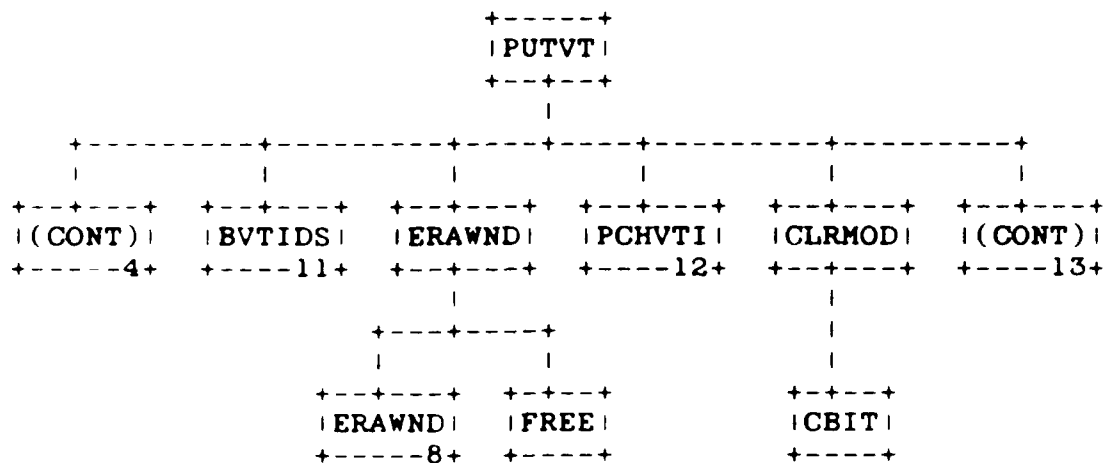
```

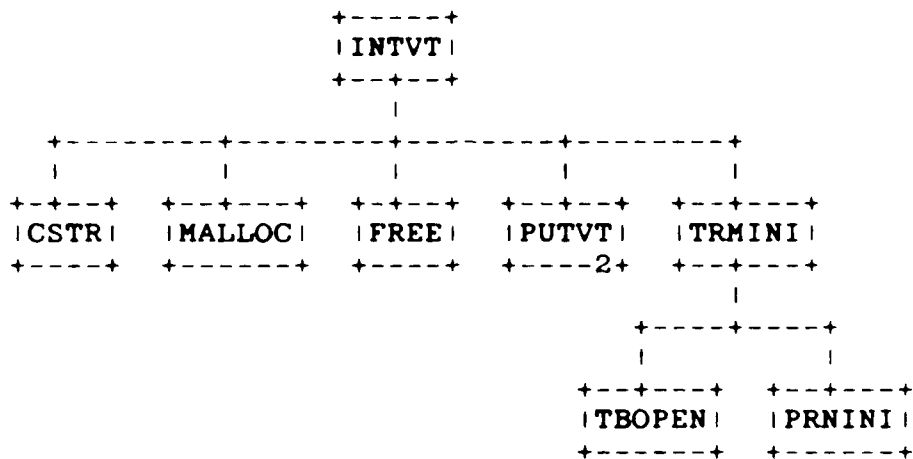


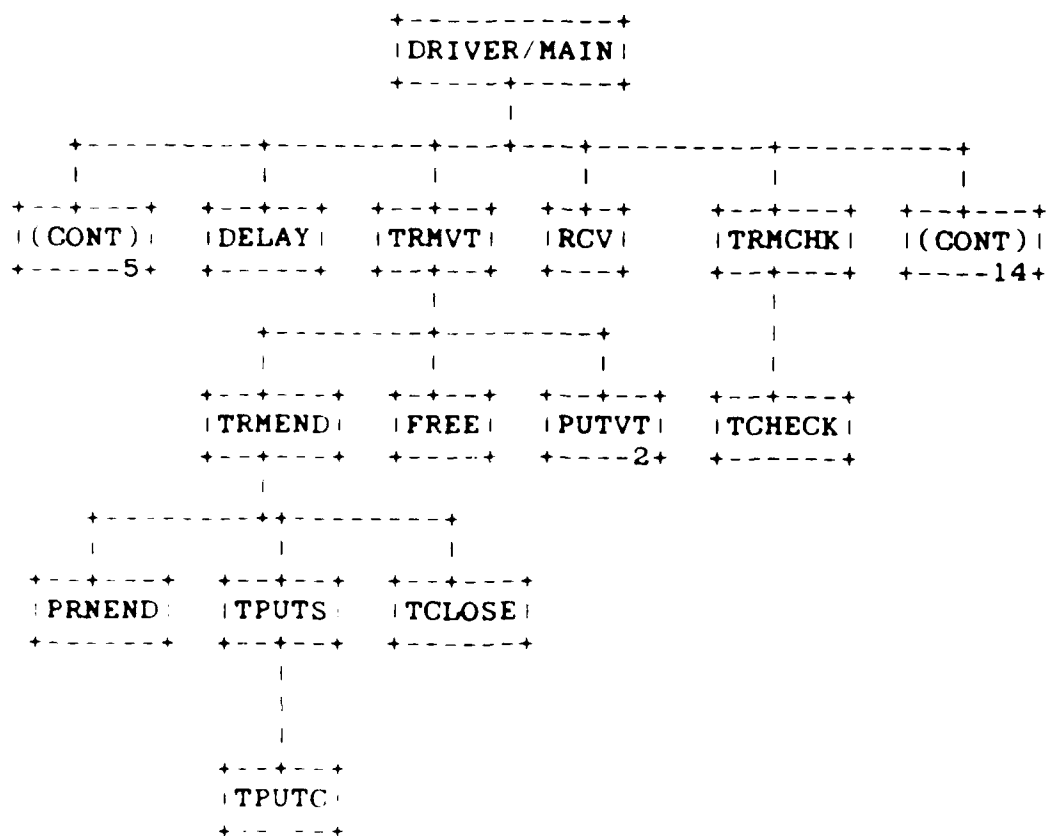
PS 620144300
1 November 1985

7

```
      +-----+  
      |DEFFLD|  
      +-----+  
      |  
+-----+  
|         |         |         |  
+-----+ +-----+ +-----+ +-----+  
|CALLOC| |MALLOC| |MEMSET| |ISPRINT|  
+-----+ +-----+ +-----+ +-----+
```







PS 620144300
1 November 1985

11

```

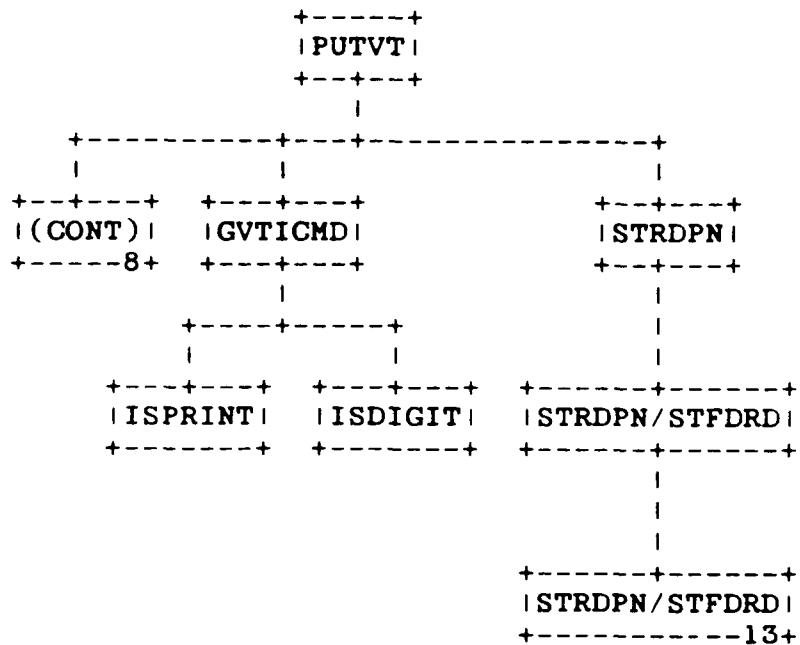
+-----+
| BVTIDS |
+-----+
|
+-----+-----+-----+-----+-----+
| | | | |
+-----+ +-----+ +-----+ +-----+ +-----+
| BLDCMD | | PRCCMDS | | BVTIDS / CLRFLG | | ROW | | (CONT) |
+-----+ +-----27+ +-----+ +-----+ +-----15+
|
|
|
+-----+
| BVTIDS / CLRFLG |
+-----11+

```

PS 620144300
1 November 1985

12

```
      +-----+
      | PCHVTI |
      +-----+
        |
+-----+-----+
|         |         |
+-----+ +-----+ +-----+
| TBIT | | ABSPOS | | MAX |
+-----+ +-----+ +-----+
```



PS 620144300
1 November 1985

14

```

+-----+
| DRIVER/MAIN |
+-----+
|
+-----+
|         |         |         |         |         |
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+
| (CONT) | | GETVT | | SIGNAL | | MEMCPY | | STRCPY | | (CONT) |
+-----10+ +-----16+ +-----+ +-----+ +-----+ +-----17+

```

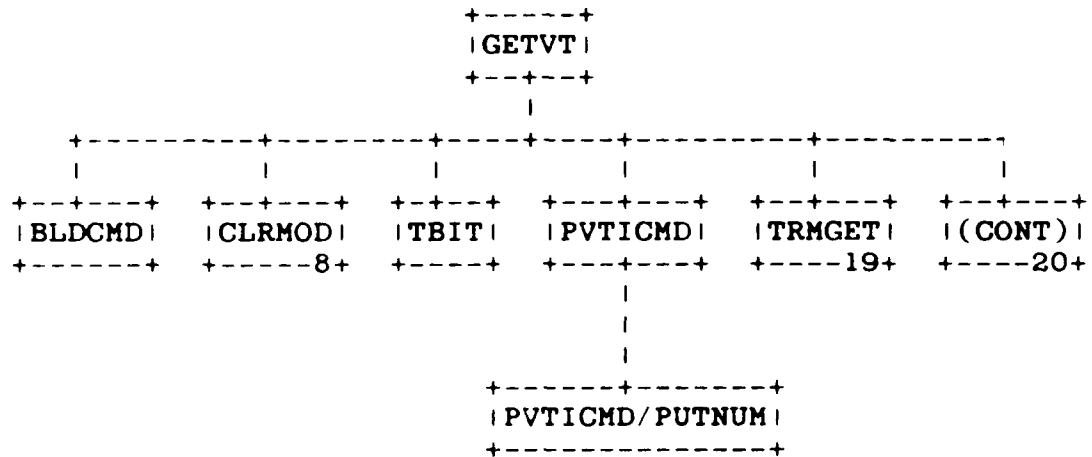
PS 620144300
1 November 1985

15

```

+-----+
|BVTIDS|
+-----+
|
+-----+
|          |          |          |          |          |
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+
| (CONT) | |COL| |ABSPOS| |MAX| |STRASN| | (CONT) |
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+
|      11 | |      | |      | |      | |      | |      18 |
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+

```



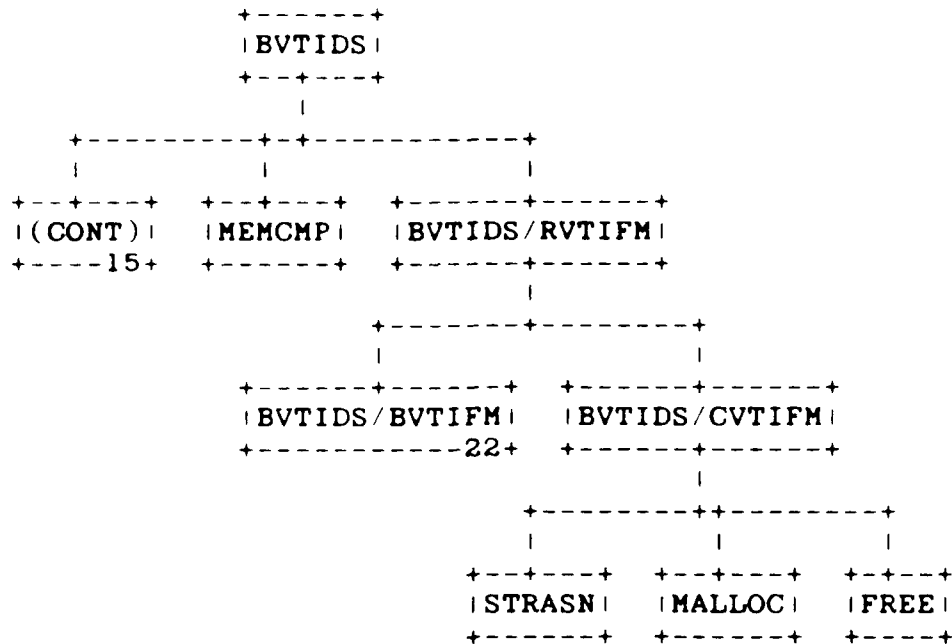
PS 620144300
1 November 1985

17

```

+-----+
| DRIVER/MAIN |
+-----+
|
+-----+
| (CONT) | | FREE | | STRCAT | | SPRINTF | | STRLEN | | (CONT) |
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+
| -14 | | | | | | | | | -21 |

```



PS 620144300
1 November 1985

19

```

+-----+
| TRMGET |
+-----+
|
+-----+-----+-----+-----+
|   |   |   |   |   |
+-----+-----+-----+-----+
| BLD CMD | PRINTF | GETCHAR | TPURGE | (CONT) |
+-----+-----+-----+-----+
|                                     | -23 |
+-----+-----+-----+-----+

```

```

+-----+
|GETVT|
+-----+
|
+-----+
|         |         |
+-----+ +-----+ +-----+
|(CONT)| |PCHVTI| |BLDMSG|
+-----16+ +-----12+ +-----+
|
+-----+
|         |         |         |         |
+-----+ +-----+ +-----+ +-----+ +-----+
|ROW| |COL| |BLDMSG/BLDBUF| |SPRINTF| |(CONT)|
+-----+ +-----+ +-----+ +-----+ +-----24+
|
+-----+
|         |         |         |
+-----+ +-----+ +-----+ +-----+
|BLDMSG/BLDBUF| |MEMCPY| |STRLEN| |SPRINTF|
+-----20+ +-----+ +-----+ +-----+

```

PS 620144300
1 November 1985

21

```

+-----+
| DRIVER/MAIN |
+-----+
|
+-----+-----+-----+-----+-----+
| | | | | |
+-----+-----+-----+-----+-----+
| (CONT) | | NSEND | | FWRITE | | MIN | | PUTC | | (CONT) |
+-----17+ +-----+ +-----+ +-----+ +-----+ +-----25+

```

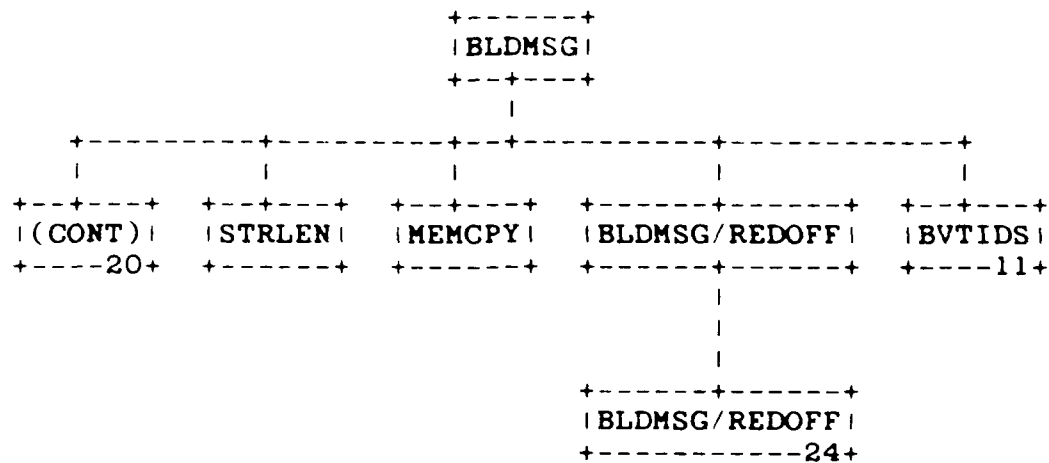
```
+-----+
|BVTIDS/BVTIFM|
+-----+
|
+-----+
|
+-----+
|BVTIDS/BVTIFM| |BVTIDS/INSFLD| |MALLOC|
+-----+
|
+-----+
|STRASN| |MALLOC| |FREE| |MIN| |MAX|
+-----+
```

PS 620144300
1 November 1985

23

```

+-----+
| TRMGET |
+-----+
|
+-----+-----+-----+-----+-----+
| | | | | |
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+
| (CONT) | | ISPRINT | | TGETC | | DOSCREEN | | ROW | | (CONT) |
+-----19+ +-----+ +-----+ +-----28+ +-----+ +-----26+
```



PS 620144300
1 November 1985

25

+-----+
| DRIVER/MAIN |
+-----+

|

+-----+	+-----+	+-----+	+-----+	+-----+	+-----+
(CONT)	FCLOSE	FSEARCH	FOPEN	PRCCMDS	TOLOWER
+-----21+	+-----+	+-----+	+-----+	+-----27+	+-----+

AD-A182 545

INTEGRATED INFORMATION SUPPORT SYSTEM (IIS) VOLUME 8

3/3

USER INTERFACE SUBS (U) GENERAL ELECTRIC CO

SCHENECTADY NY PRODUCTION RESOURCES CONSU

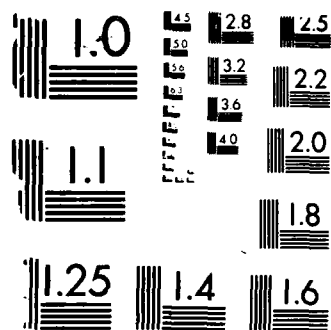
UNCLASSIFIED

C MORENC ET AL 01 NOV 85 PS-620144300

F/G 12/5

NL

END
8-87
DTIC



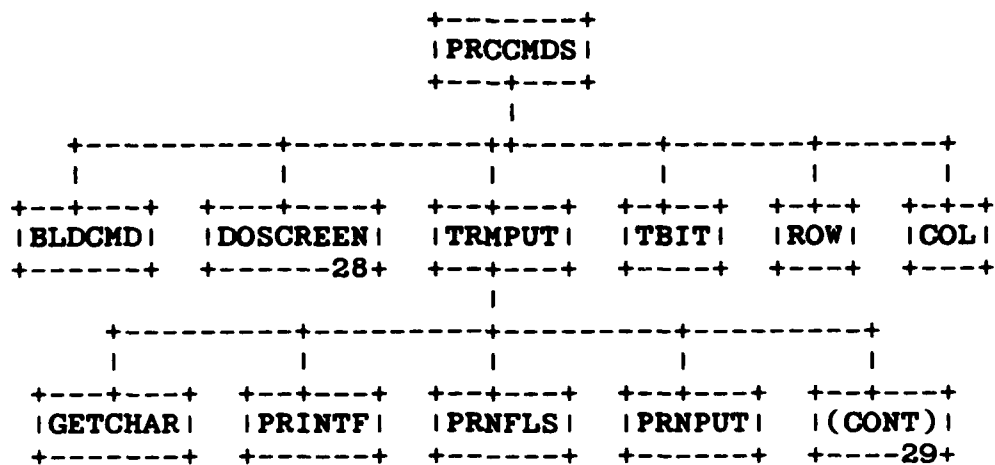
MICROCOPY RESOLUTION TEST CHART

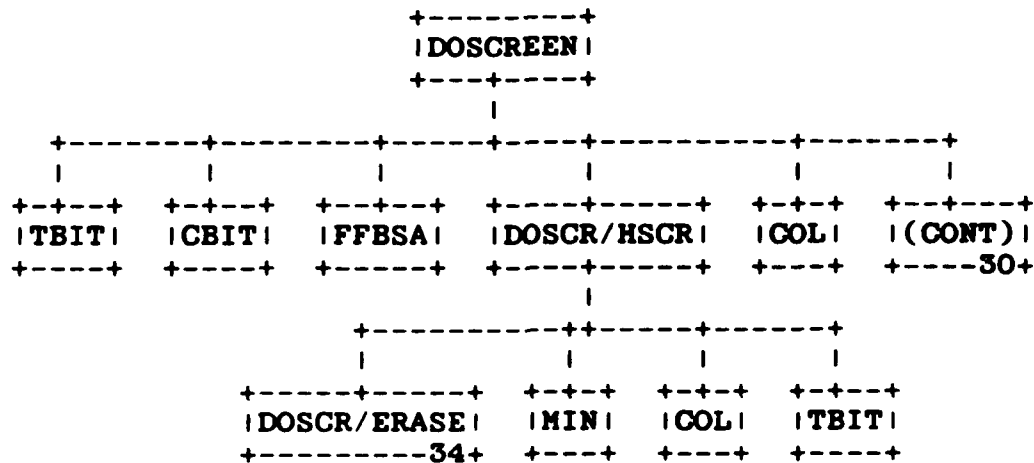
U.S. GOVERNMENT PRINTING OFFICE: 1963 O - 348-094

PS 620144300
1 November 1985

26

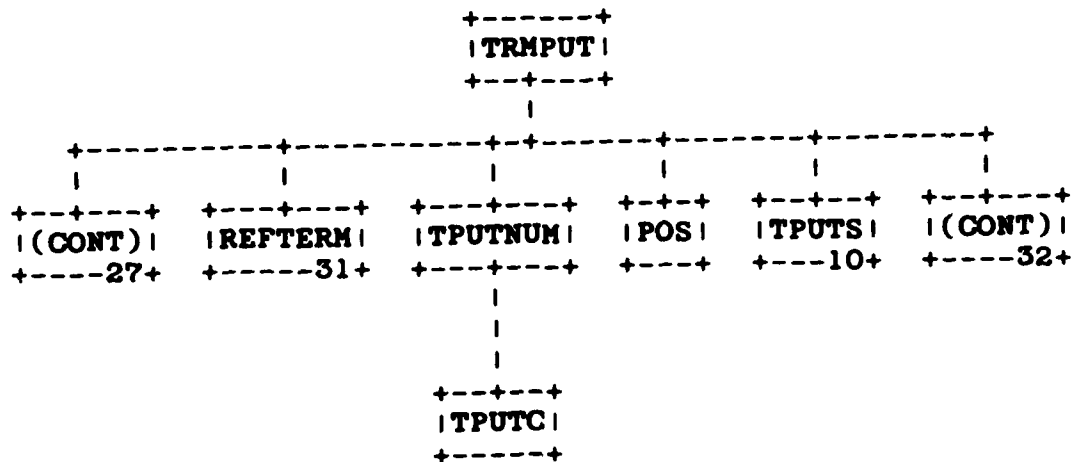
```
      +-----+  
      |TRMGET|  
      +-----+  
      |  
+-----+-----+-----+-----+-----+-----+  
|         |         |         |         |         |         |  
+---+---+ +---+ +---+---+ +---+---+ +---+---+ +---+---+  
| (CONT) | |COL| |TRMPUT| |TRMFLS| |TBIT| |ISDIGIT|  
+---23+ +---+ +---27+ +---2+ +---+ +---+---+  
|         |         |         |         |         |         |
```





PS 620144300
1 November 1985

29

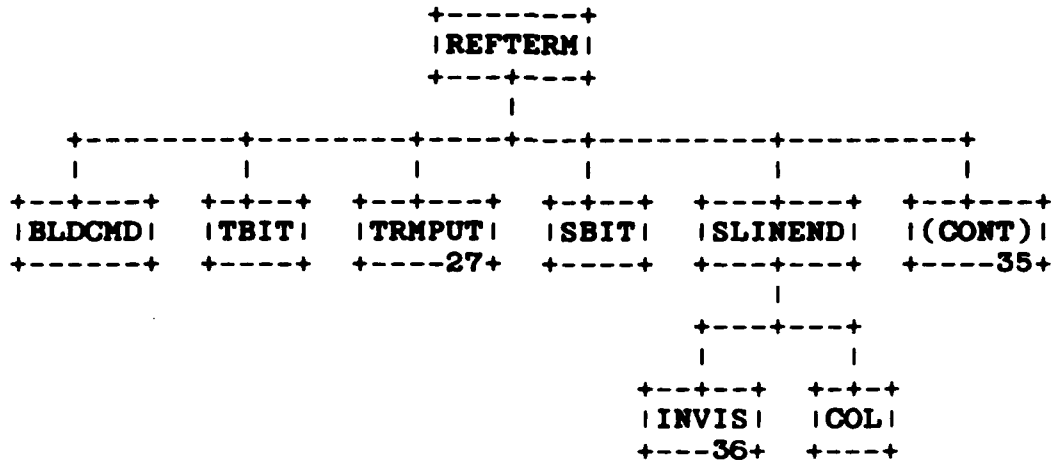


PS 620144300
1 November 1985

30

```

+-----+
| DOSCREEN |
+-----+
|
+-----+-----+-----+-----+-----+
| | | | | | |
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+
| (CONT) | | MAX | | FFBSB | | ROW | | DOSCR/VSCR | | (CONT) |
+-----28+ +-----+ +-----+ +-----+ +-----33+ +-----34+
```



```
      +-----+
      | TRMPUT |
      +-----+
      |
+-----+-----+-----+-----+-----+
|         |         |         |         |         |
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+
| (CONT) | | REFRESH | | ROW | | COL | | TPUTC | | (CONT) |
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+
| 29 | | 36 | |  | |  | |  | | | 37 |
```

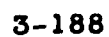
PS 620144300
1 November 1985

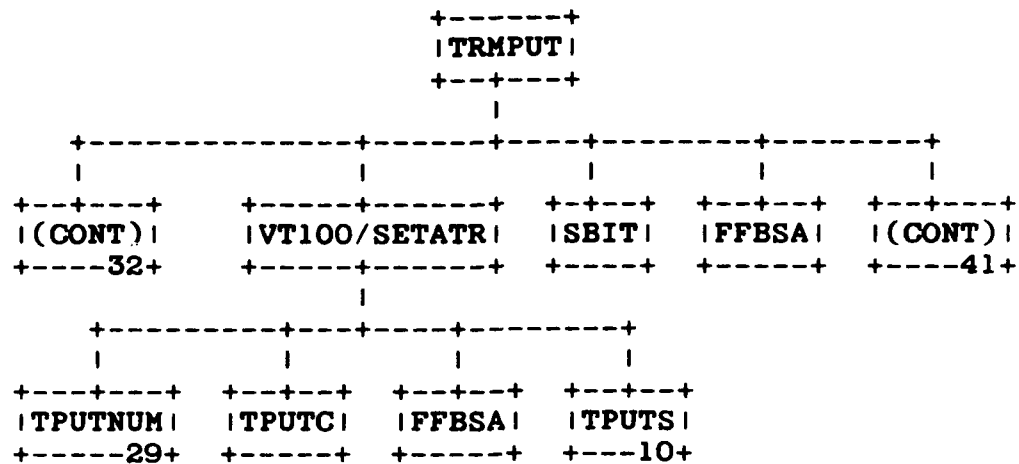
33

```
      +-----+
      |DOSCR/VSCR|
      +-----+
      |
+-----+-----+-----+-----+-----+-----+
|      |      |      |      |      |      |      |
+-----+-----+-----+-----+-----+-----+
|SBIT| |MAX| |DOSCR/ERASE| |ROW| |MIN| |COL| |(CONT)|
+-----+-----+-----+-----+-----+-----+
|      |      |      34+ |      |      |      |      38+
+-----+-----+-----+-----+-----+-----+
```

+-----+					
DOSCREEN					
+-----+					
+-----+					
+-----+	+-----+	+-----+	+-----+	+-----+	+-----+
(CONT)	DOSCR/ERASE	FIX	LIMIT	POS	(CONT)
+-----30+	+-----+	+-----+	+-----+	+-----+	+-----39+
+-----+					
+-----+	+-----+	+-----+	+-----+	+-----+	+-----+
SBIT	COL	TBIT	CBIT	STRASN	
+-----+	+-----+	+-----+	+-----+	+-----+	

+-----+					
REFTERM					
+-----+					
+-----+					
+-----+	+-----+	+-----+	+-----+	+-----+	+-----+
(CONT)	CBIT	COL	ROW	MAX	MIN
+-----+	+-----+	+-----+	+-----+	+-----+	+-----+
+---31+					





PS 620144300
1 November 1985

38

```

+-----+
|DOSCR/VSCR|
+-----+
|
+-----+
|         |         |
+-----+ +-----+ +-----+
| (CONT) | |CBIT| |TBIT|
+-----+ +-----+ +-----+
| 33 |

```

PS 620144300
1 November 1985

39

```
      +-----+
      |DOSCREEN|
      +-----+
        |
+-----+-----+-----+-----+
|         |         |         |         |
+-----+ +-----+ +-----+ +-----+ +-----+
| (CONT) | |CABIT| |FLOOR| |SBIT| |ZERO|
+-----+ +-----+ +-----+ +-----+ +-----+
| 34     | |         | |         | |         | |         |
```

PS 620144300
1 November 1985

40

```
      +-----+
      | REFRESH |
      +-----+
        |
+-----+-----+-----+-----+
|         |         |         |         |
+-----+ +-----+ +-----+ +-----+
| (CONT) | | SBIT | | TRMFLS | | CBIT |
+-----+ +-----+ +-----+ +-----+
| 36 |    |    |    | 2 |    |    |
```

PS 620144300
1 November 1985

41

```

      +-----+
      |TRMPUT|
      +-----+
      |
+-----+-----+-----+-----+
|         |         |         |         |
+-----+ +-----+ +-----+ +-----+ +-----+
| (CONT) | |CABIT| |FFBDA| |VT100/MOVCUR| |TBIT|
+-----+ +-----+ +-----+ +-----+ +-----+
|   37   | |       | |       | |       2 | |       |

```

ABSPOS	ISPRINT
BLDCMD	LIMIT
BLDMSG.....20	MALLOC
BLDMSG/BLDBUF....20	MAX
BLDMSG/REDOFF....24	MEMCMP
BVTIDS.....11	MEMCPY
BVTIDS/BVTIFM....22	MEMSET
BVTIDS/CLRFLG....11	MIN
BVTIDS/CVTIFM....18	NSEND
BVTIDS/INSFLD....22	PCHVTI.....12
BVTIDS/RVTIFM....18	POS
CABIT	PRCCMDS.....27
CALLOC	PRINTF
CBIT	PRNEND
CLRMOD.....8	PRNFLS
COL	PRNINI
CSTR	PRNPUT
DEFFLD.....7	PUTC
DEFWND.....6	PUTVT.....2
DELAY	PVTICMD.....16
DOSCR/ERASE.....34	PVTICMD/PUTNUM
DOSCR/HSCR.....28	RCV
DOSCR/VSCR.....33	REFRESH.....36
DOSCREEN.....28	REFTERM.....31
DRIVER/MAIN.....1	RMVWND.....4
ERAWND.....8	ROW
EXIT	SBIT
FATAL.....5	SIGNAL
FCLOSE	SLINEND.....31
FFBDA	SPRINTF
FFBSA	STFMTF.....6
FFBSB	STRASN
FIX	STRCAT
FLOOR	STRCPY
FNDWND.....2	STRDPN.....13
FOPEN	STRDPN/STFDRD....13
FPRINTF	STRLEN
FREE	SWNPRC.....4
FSEARCH	TBIT
FWRITE	TBOPEN
GETCHAR	TCHECK
GETVT.....16	TCLOSE
GVTICMD.....13	TFLUSH
INITEX	TGETC
INTVT.....9	TOLOWER
INVIS.....36	TPURGE
ISDIGIT	TPUTC

PS 620144300
1 November 1985

TPUTNUM.....29
TPUTS.....10
TRMCHK.....10
TRMEND.....10
TRMFLS.....2
TRMGET.....19
TRMINI.....9
TRMNAT
TRMPUT.....27
TRMVT.....10
TVTPRC.....1
VT100/MOVCUR.....2
VT100/SETATR.....37
ZERO

PS 620144300
1 November 1985

3.11 Program Listings Comments

This information is contained in the Module Descriptions in section 3.10.

SECTION 4

QUALITY ASSURANCE PROVISIONS

4.1 Introduction and Definitions

"Testing" is a systematic process that may be preplanned and explicitly stated. Test techniques and procedures may be defined in advance, and a sequence of test steps may be specified. "Debugging" is the process of isolation and correction of the cause of an error.

"Antibugging" is defined as the philosophy of writing programs in such a way as to make bugs less likely to occur and when they do occur, to make them more noticeable to the programmer and the user. In other words, as much error checking as is practical and possible in each routine should be performed.

4.2 Computer Programming Test and Evaluation

The quality assurance provisions for test consists of the normal testing techniques that are accomplished during the construction process. They consist of design and code walk-throughs, unit testing, and integration testing. These tests are performed by the design team. Structured design, design walk-through and the incorporation of "antibugging" facilitate this testing by exposing and addressing problem areas before they become coded "bugs."

END

8-87

DTIC