KERNEL

TECHNICAL MANUAL

Version 8.0

July 1995

Revised February 2005

Department of Veterans Affairs
VistA Health Systems Design & Development (HSD&D)
Infrastructure and Security Services (ISS)

Revision History

Documentation Revisions

The following table displays the revision history for this document. Revisions to the documentation are based on patches and new versions released to the field.

Date	Revision	Description	Author
07/95	1.0	Initial Kernel V. 8.0 software and documentation release	Kyle Clarke and Kernel Development Team, San Francisco, CA OIFO
02/03/05	2.0	Reformatted document to follow the latest ISS styles and guidelines. No other content updates have been made in regards to released patches at this time. Reviewed document and edited for the "Data Scrubbing" and the "PDF 508 Compliance" projects. **Data Scrubbing—**Changed all patient/user TEST data to conform to HSD&D standards and conventions as indicated below: • The first three digits (prefix) of any Social Security Numbers (SSN) start with "000" or "666." • Patient or user names are formatted as follows: KRNPATIENT,[N] or KRNUSER,[N] respectively, where the N is a number written out and incremented with each new entry (e.g., KRNPATIENT, ONE, KRNPATIENT, TWO, etc.). • Other personal demographic-related data (e.g., addresses, phones, IP addresses, etc.) were also changed to be generic. **PDF 508 Compliance—**The final PDF document was recreated and now supports the minimum requirements to be 508 compliant (i.e., accessibility tags, language selection, alternate text for all images/icons, fully functional Web links, successfully passed Adobe Acrobat Quick Check).	Thom Blom, Oakland, CA OIFO

Table i: Documentation revision history

Patch Revisions

For the current patch history related to this software, please refer to the Patch Module on FORUM.

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Orientation

This manual is intended for use in conjunction with the Kernel software. Items included in the release of Kernel (e.g., routines and files) are only briefly described for quick reference. To gain a comprehensive understanding of the internal mechanisms of Kernel, the reader needs to begin with VA FileMan, MailMan, and other Kernel manuals and follow with a query of the system software itself.

How to Use this Manual

Throughout this manual, advice and instruction are offered about Application Programming Interfaces (APIs), Direct Mode Utilities, and other programmer-related information that Kernel V. 8.0 provides for overall Veterans Health Information Systems and Technology Architecture (VistA) application developers.

To protect the security of VistA systems, distribution of this software for use on any other computer system by VistA sites is prohibited. All requests for copies of Kernel for non-VistA use should be referred to the VistA site's local Office of Information Field Office (OIFO).

Otherwise, there are no special legal requirements involved in the use of Kernel.

This manual uses several methods to highlight different aspects of the material:

- Various symbols are used throughout the documentation to alert the reader to special information. The following table gives a description of each of these symbols:

Symbol	Description
	Used to inform the reader of general information including references to additional reading material.
	Used to caution the reader to take special notice of critical information.

Table ii: Documentation symbol descriptions

- Descriptive text is presented in a proportional font (as represented by this font).
- Conventions for displaying TEST data in this document are as follows:
  - The first three digits (prefix) of any Social Security Numbers (SSN) will begin with either "000" or "666".
  - Patient and user names will be formatted as follows: [Application Name]PATIENT,[N] and [Application Name]USER,[N] respectively, where "Application Name" is defined in the Approved Application Abbreviations document and "N" represents the first name as a number spelled out and incremented with each new entry. For example, in Kernel (KRN) test patient and user names would be documented as follows: KRNPATIENT,ONE; KRNPATIENT,TWO; KRNPATIENT,THREE; etc.

- Sample HL7 messages, "snapshots" of computer online displays (i.e., character-based screen captures/dialogues) and computer source code are shown in a *non*-proportional font and enclosed within a box. Also included are Graphical User Interface (GUI) Microsoft Windows images (i.e., dialogues or forms).
  - User's responses to online prompts will be boldface.
  - The "**<Enter>**" found within these snapshots indicate that the user should press the Enter or Return key on their keyboard. Other special keys are represented within angle brackets (**< >**). For example, pressing the PF1 key can be represented as pressing **<PF1>**.
  - Author's comments are displayed in italics or as "callout" boxes.

    Callout boxes refer to labels or descriptions usually enclosed within a box, which point to specific areas of a displayed image.

- This manual refers in many places to the M programming language. Under the 1995 American National Standards Institute (ANSI) standard, M is the primary name of the MUMPS programming language, and MUMPS will be considered an alternate name. This manual uses the name M.
- Descriptions of direct mode utilities are prefaced with the standard M ">" prompt to emphasize that the call is to be used *only in direct mode*. They also include the M command used to invoke the utility. The following is an example:

  ```
  >D ^XUP
  ```

- The following conventions will be used with regards to APIs:
  - Headings for programmer API descriptions (e.g., supported for use in applications and on the Database Integration Committee [DBIC] list) include the routine tag (if any), the caret ("^") used when calling the routine, and the routine name. The following is an example:

    ```
    EN1^XQH
    ```

  - For APIs that take input parameter, the input parameter will be labeled "required" when it is a required input parameter and labeled "optional" when it is an optional input parameter.
  - For APIs that take parameters, parameters are listed in lowercase. This is to convey that the listed parameter name is merely a placeholder; M allows you to pass a variable of any name as the parameter or even a string literal (if the parameter is not being passed by reference). The following is an example of the formatting for input parameters:

    ```
    XGLMSG^XGLMSG(msg_type,[.]var[,timeout])
    ```

  - Rectangular brackets **[ ]** around a parameter are used to indicate that passing the parameter is optional. Rectangular brackets around a leading period **[.]** in front of a parameter indicate that you can optionally pass that parameter by reference.
- All uppercase is reserved for the representation of M code, variable names, or the formal name of options, field/file names, and security keys (e.g., the XUPROGMODE key).

  Other software code (e.g., Delphi/Pascal and Java) variable names and file/folder names can be written in lower or mixed case.

How to Obtain Technical Information Online

Exported file, routine, and global documentation can be generated through the use of Kernel, MailMan, and VA FileMan utilities.

Methods of obtaining specific technical information online will be indicated where applicable under the appropriate topic.

Please refer to the *Kernel Technical Manual* for further information.

Help at Prompts

Kernel has online help and commonly used system default prompts. Users are encouraged to enter question marks at any response prompt. At the end of the help display, you are immediately returned to the point from which you started. This is an easy way to learn about any aspect of Kernel.

To retrieve online documentation in the form of Help in any VistA character-based product:

- Enter a single question mark ("**?**") at a field/prompt to obtain a brief description. If a field is a pointer, entering one question mark ("**?**") displays the HELP PROMPT field contents and a list of choices, if the list is short. If the list is long, the user will be asked if the entire list should be displayed. A YES response will invoke the display. The display can be given a starting point by prefacing the starting point with a caret ("^") as a response. For example, **^M** would start an alphabetic listing at the letter M instead of the letter A while **^127** would start any listing at the 127th entry.
- Enter two question marks ("**??**") at a field/prompt for a more detailed description. Also, if a field is a pointer, entering two question marks displays the HELP PROMPT field contents and the list of choices.
- Enter three question marks ("**???**") at a field/prompt to invoke any additional Help text stored in Help Frames.

  The Help Frames themselves are grouped according to function. The lead frame for a function contains the "keywords" or reference words, highlighted in reverse video, for linking to related frames. For example, while in a Help Frame, enter the desired keyword at the "Select HELP SYSTEM action or <return>:" prompt. The user can return to the previous Help frame simply by pressing the **<Enter>** key at the message prompt.

Obtaining Data Dictionary Listings

Technical information about files and the fields in files is stored in data dictionaries. You can use the List File Attributes option on the Data Dictionary Utilities submenu in VA FileMan to print formatted data dictionaries.

For details about obtaining data dictionaries and about the formats available, please refer to the "List File Attributes" chapter in the "File Management" topic of the *VA FileMan Advanced User Manual*.

Assumptions About the Reader

This manual is written with the assumption that the reader is familiar with the following:

- VistA computing environment
- VA FileMan data structures and terminology
- Microsoft Windows
- M programming language

It provides an overall explanation of configuring the Kernel interface and the functionality contained in Kernel Version 8.0. However, no attempt is made to explain how the overall VistA programming system is integrated and maintained. Such methods and procedures are documented elsewhere. We suggest you look at the various VA home pages on the World Wide Web (WWW) for a general orientation to VistA. For example, go to the Veterans Health Administration (VHA) Office of Information (OI) Health Systems Design & Development (HSD&D) Home Page at the following web address:

http://vista.med.va.gov/

Reference Materials

Readers who wish to learn more about Kernel should consult the following:

- *Kernel Release Notes*
- *Kernel Installation Guide*
- *Kernel Systems Manual*
- *Kernel Programmer Manual*
- *Kernel Technical Manual* (this manual)
- *Kernel Security Tools Manual*
- Kernel Home Page at the following web address:

  http://vista.med.va.gov/kernel/index.asp

  This site contains other information and provides links to additional documentation.

If the reader is not already familiar with VA FileMan or MailMan, the respective user, programmer, and technical manuals for each should be obtained and reviewed. Other source documents describing overall VistA policy are:

- "VA Programming Standards and Conventions (SAC)"
- "MIRMO/OIFO Operations Document"

VistA documentation is made available online in Microsoft Word format and in Adobe Acrobat Portable Document Format (PDF). The PDF documents *must* be read using the Adobe Acrobat Reader (i.e., ACROREAD.EXE), which is freely distributed by Adobe Systems Incorporated at the following web address:

http://www.adobe.com/

For more information on the use of the Adobe Acrobat Reader, please refer to the "Adobe Acrobat Quick Guide" at the following web address:

http://vista.med.va.gov/iss/acrobat/index.asp

VistA documentation can be downloaded from the Health Systems Design and Development (HSD&D) VistA Documentation Library (VDL) Web site:

http://www.va.gov/vdl/

VistA documentation and software can also be downloaded from the Enterprise VistA Support (EVS) anonymous directories:

- Albany OIFO ftp.fo-albany.med.va.gov
- Hines OIFO ftp.fo-hines.med.va.gov
- Salt Lake City OIFO ftp.fo-slc.med.va.gov
- Preferred Method download.vista.med.va.gov

  This method transmits the files from the first available FTP server.

DISCLAIMER: The appearance of external hyperlink references in this manual does *not* constitute endorsement by the Department of Veterans Affairs (VA) of this Web site or the information, products, or services contained therein. The VA does *not* exercise any editorial control over the information you may find at these locations. Such links are provided and are consistent with the stated purpose of this VA Intranet Service.

1. Introduction

Kernel provides VistA's computing environment. Users of VistA software work in a computing environment structured by Kernel. Managers of VistA computer systems track the users of their systems and resolve problems by using Kernel options. Developers of VistA application software rely on tools provided by Kernel to perform routine programming tasks.

By offering a computing environment that hides the non-standard features of M, Kernel frees VistA users, programmers, and system managers from dependence on any one vendor's implementation of M. This allows VistA to shift easily to new hardware and software platforms as computer science advances into the twenty-first century.

The purpose of this manual is to provide information about the structure of the set of software utilities known as Kernel. Two major affiliated software applications, VA FileMan and MailMan, are excluded since they are documented elsewhere. This material is presented for reference by VistA system managers and application programmers and by others who are using Kernel.

2. Implementation and Maintenance

The *Kernel Installation Guide* has detailed information regarding the installation of Kernel. Installing Kernel both on a system having a previous version of Kernel present and on a system without Kernel (a "virgin" install) is explained in the *Kernel Installation Guide*. It also contains many requirements and recommendations regarding how Kernel should be configured. Be sure to read it before attempting to install Kernel.

Other topics in this manual contain recommendations for global mapping, journaling, translation, and replication. There is also a topic containing recommendations for purging in Kernel.

Site Parameters

This topic lists the site parameters that can be set to customize the operation of the various components of Kernel.

File Changes for Site Parameters with Kernel V. 8.0

Kernel V. 8.0 exports three central site parameter files, where before it only exported one. The three files are:

File	Description
MAILMAN SITE PARAMETERS (#4.3)	Stored in ^XMB, this file formerly contained Kernel's site parameters along with Mailman's. Due to software separation and namespace considerations, Mailman's site parameters continue to be stored in this file, but Kernel's site parameters have been moved to the KERNEL SYSTEM PARAMETERS file (#8989.3).
KERNEL SYSTEM PARAMETERS (#8989.3)	Kernel's main site parameters that were formerly stored in the MAILMAN SITE PARAMETERS file (#4.3) are now stored in this file.
KERNEL PARAMETERS (#8989.2)	This new file holds parameters that Kernel uses which the site is allowed to change. It is not restricted solely to site parameters. It is still in the development stage. The file makes use of a DEFAULT value field and a REPLACEMENT value field for each parameter.

Table 2-1: Kernel site parameter files

Kernel System Parameters

The Kernel system parameters are stored in the KERNEL SYSTEM PARAMETERS file (#8989.3).

```
 Operations Management ...                                          [XUSITEMGR]
   Kernel Management Menu...                                         [XUKERNEL]
      Enter/Edit Kernel Site Parameters                             [XUSITEPARM]
```

Table 2-2: Enter/Edit Kernel Site Parameters menu option

Parameters (Fields)	Description
AGENCY CODE	This field defines what agency uses this computer. It sets a flag which can be accessed by applications programs which need to know this information.
ASK DEVICE TYPE AT SIGN-ON	This is the default for whether a user/terminal should be asked for their terminal type at signon. This is overridden by a similar field in the DEVICE (#3.5) and NEW PERSON (#200) files. If set to YES, then an ANSI DA is sent to the terminal to collect the terminal's DEVICE ATTRIBUTES message. If it is a known one, then the terminal type is set to this. Otherwise the user is prompted. If set to NO, then the one from the LAST SIGN-ON field or device subtype is used.
AUTO-GENERATE ACCESS CODES	If this field is set to YES, the person assigning access codes must choose one of the automatically generated codes that are presented. Other codes are only accepted if this field is set to NO.
BYPASS DEVICE LOCK-OUT	Setting this field to YES causes all device lockout checking to be bypassed. This means that during signon the checks against the DEVICE file (#3.5) for OUT OF SERVICE?, SECURITY and PROHIBITED TIMES FOR SIGN-ON will be skipped. Can be overridden by the PERFORM DEVICE CHECKING field in the DEVICE file (#3.5).
DEFAULT # OF ATTEMPTS	This is the default number of attempts that a user is allowed when trying to sign on before the device is locked. This field is overridden by a similar field in the DEVICE file (#3.5). ALL checking for device lockout can be bypassed by setting the BYPASS DEVICE LOCK-OUT field.
DEFAULT AUTO-MENU	This is the default for whether auto-menu is turned ON or OFF. It is overridden by similar fields in the DEVICE (#3.5) and USER (#3) files.
DEFAULT INSTITUTION	This field is used to define a default institution that will be assigned to the user's institution (DUZ(2)) for any user that does not have one.
DEFAULT LANGUAGE	This is the default language used to set the DUZ("LANG") flag for each user. VA FileMan uses this setting to enable the display of language-specific dates and times, numeric formats, and dialogs.

Parameters (Fields)	Description
DEFAULT LOCK-OUT TIME	This is the default time in seconds that a locked device must be idle before another signon attempt is allowed. This time is overridden by a similar field in the DEVICE file (#3.5). ALL checking for device lockout is ignored if the BYPASS DEVICE LOCK-OUT field is set to YES.
DEFAULT MULTIPLE SIGN-ON	This is the default value for whether users may sign on at more than one terminal at a time. It is overridden by similar fields in the DEVICE (#3.5) and NEW PERSON (#200) files.
DEFAULT TIMED-READ (SECONDS)))	This is the default time-out for all READs and is overridden by similar fields in the DEVICE (#3.5) and (Obsolete) USER (#3) files.
DEFAULT TYPE-AHEAD	This is the default as to whether or not Type-Ahead is allowed. It is overridden by similar fields in the DEVICE (#3.5) and (Obsolete) USER (#3) files.
DEVICE TO AUDIT	For information on this parameter, please refer to the "Audit-related Site Parameters" topic in this chapter.
FAILED ACCESS ATTEMPTS	For information on this parameter, please refer to the "Audit-related Site Parameters" topic in this chapter.
INITIATE AUDIT	For information on this parameter, please refer to the "Audit-related Site Parameters" topic in this chapter.
INTERACTIVE USER'S PRIORITY	This field changes the priority of interactive users on the system at signon time. There is a danger that using this field will cause the users to have poor response time from the computer.
LIFETIME OF VERIFY CODE	This is the number of days that a Verify code remains valid. After this time the user must choose a new Verify code.
LOG RESOURCE USAGE?	This YES/NO field is used to indicate whether resource usage data such as CPU seconds, DIO, BIO, etc. will be collected in ^XUCP(. For more information on this field, please refer to the documentation for Kernel Toolkit.
LOG SYSTEM RT?	A subfield in the VOLUME SET multiple. Setting this field to YES enables system response time logging, which only takes place if the necessary code exists in the application software. For more information on this field, please refer to the documentation for Kernel Toolkit.

Parameters (Fields)	Description
MAX SIGNON ALLOWED	A subfield in the VOLUME SET multiple. This field defines the maximum number of jobs that XUS allows to sign on to this VOLUME SET or CPU. It is the number of processes (interactive, background, and system) that can be active on the machine at any one time. When reached, Kernel will prohibit logons.
MAX SPOOL DOCUMENTS PER USER	For information on this parameter, please refer to the Spooler Site Parameters topic later in this chapter.
MAX SPOOL DOCUMENT LIFE-SPAN	For information on this parameter, please refer to the Spooler Site Parameters topic later in this chapter.
MAX SPOOL LINES PER USER	For information on this parameter, please refer to the Spooler Site Parameters topic later in this chapter.
NAMESPACE TO AUDIT	For information on this parameter, please refer to the Audit-related Site Parameters topic later in this chapter.
NEW PERSON IDENTIFIERS	Holds M code to Set the DR variable to the string of fields (not a template) to be used as identifiers when adding entries to the NEW PERSON file (#200).
OPTION AUDIT	For information on this parameter, please refer to the Audit-related Site Parameters topic later in this chapter.
OPTION TO AUDIT (Multiple)	For information on this parameter, please refer to the Audit-related Site Parameters topic later in this chapter.
ROUTINE MONITORING, ROUTINE N-SPACE TO MONITOR	These fields support routine auditing. For more information, please refer to the *Kernel Security Tools Manual*.
TERMINATE AUDIT	For information on this parameter, please refer to the Audit-related Site Parameters topic later in this chapter.
USER TO AUDIT	For information on this parameter, please refer to the Audit-related Site Parameters topic later in this chapter.
VOLUME SET (Multiple)	This is the name of each CPU or Volume Set in the domain. Within each Volume Set, you can set: MAX SIGN-ON ALLOWED and LOG SYSTEM RT?.

Table 2-3: Kernel system parameters—KERNEL SYSTEM PARAMETERS file (#8989.3)

Kernel Parameters (Stored in File #8989.2)

Kernel does *not* export an option to edit these parameters. The KERNEL PARAMETERS file (#8989.2) holds parameters that Kernel uses which the site is allowed to change. It is not restricted solely to site parameters. It is still in the development stage. The file makes use of a DEFAULT value field and a REPLACEMENT value field for each parameter. Rather than having a specific field for each parameter, one multiple holds all parameters.

Kernel currently stores the following active parameters in this file:

Parameters (Fields)	Description
XUEDIT CHARACTERISTICS	You can enter the name of a replacement for the standard Edit User Characteristics template in the REPLACEMENT field. Kernel will then use the replacement for the Edit User Characteristics option.
XUNEW USER	You can enter the name of a template to use in the Add a New User to the System option in the REPLACEMENT field. Kernel will then use the replacement template for the Add a New User to the System option.
XUREACT USER	You can enter the name of a template to use in the Reactivate a User option in the REPLACEMENT field. Kernel will then use the replacement template for the Reactivate a User option.
XUSER COMPUTER ACCOUNT	You can enter the name of a help frame in the REPLACEMENT field. Kernel will then use the replacement help frame instead of the standard one when printing the computer access letter from the Add a New User to the System option.

Table 2-4: Kernel system parameters—KERNEL PARAMETERS file (#8989.2)

Audit-related Site Parameters

```
System Security...                                                    [XUSPY]
  Audit Features ...                                              [XUAUDIT MENU]
    Maintain System Audit Options...                              [XUAUDIT MAINT]
      Establish System Audit Parameters                                [XUAUDIT]
```

Table 2-5: Audit-related menu options

You can edit audit-related site parameters using the Establish System Audit Parameters option (the fields are also reachable from the Enter/Edit Kernel Site Parameters option).

For more information on auditing, please refer to the *Kernel Security Tools Manual*.

Parameters (Fields)	Description
INITIATE AUDIT	This field indicates the date when an audit begins. The OPTION AUDIT field defines the nature of the audit that will be performed. Auditing is only done if there is both INITIATE AUDIT and TERMINATE AUDIT data.
TERMINATE AUDIT	This field indicates when audits will end. The start date is set in the INITIATE AUDIT field.
OPTION AUDIT	This field indicates what should be audited between the INITIATE AUDIT date and TERMINATE AUDIT date fields. The OPTION TO AUDIT subfile)) along with the NAMESPACE TO AUDIT subfile hold the lists of specific options that would be audited (choosing "s"). The USER TO AUDIT subfile holds the list of users that would be audited (choosing "**u**"). The choices are: • n NO AUDIT • a ALL OPTIONS AUDITED • s SPECIFIC OPTIONS AUDITED • u USERS AUDITED
DEVICE TO AUDIT (Multiple)	This field is referenced when the FAILED ACCESS ATTEMPT AUDIT field is set to "**D**" or "**DR**." It is used to specify the logical names of the devices on which to audit failed attempts.
NAMESPACE TO AUDIT (Multiple)	This field holds a software namespace. All options within that namespace will be audited if the OPTION AUDIT Field)) is set to "**s**" (specific options).
OPTION TO AUDIT (Multiple)))	This field holds the name of an option that will be audited if the OPTION AUDIT field)) is set to "**s**" (specific options).
USER TO AUDIT (Multiple)	This field identifies a user whose use of options will be audited if the OPTION AUDIT)) field is set to "**u**" (users audited).

Parameters (Fields)	Description
FAILED ACCESS ATTEMPT AUDIT	This field indicates whether an audit log is to be generated for failed access attempts. Audits can be done for all devices or specified devices only. Recording of what is entered is optional: • A ALL DEVICES/NO TEXT RECORDED • D SPECIFIED DEVICES/NO TEXT RECORDED • AR ALL DEVICES/TEXT RECORDED • DR SPECIFIED DEVICES/TEXT RECORDED • N NO AUDIT

Table 2-6: Audit-related parameters

Spooler Site Parameters

```
Spool Management...                                              [XU-SPL-MGR]
  Spooler Site Parameters Edit                                   [XU-SPL-SITE]
```

Table 2-7: Spooler Site Parameters Edit menu option

You can edit spooler-related site parameters with the Spooler Site Parameters Edit option (the fields are also reachable from the Enter/Edit Kernel Site Parameters option).

For more information on the Spooler, please refer to the "Spooling" chapter in the *Kernel Security Tools Manual*.

Parameters (Fields)	Description
MAX SPOOL LINES PER USER	This field holds the maximum number of lines of spooled output a user is allowed. If the user has more than this number then they will not be allowed to spool any more until some of their spool documents are deleted. This only controls the granting of new spool documents and does *not* terminate a job that is running that has gone over the limit. Recommended value 9999.
MAX SPOOL DOCUMENTS PER USER	This field limits the number of spool documents that any user can have on the system. Recommended value 10-100.
MAX SPOOL DOCUMENT LIFE-SPAN	This field controls the number of days that a spooled document will be allowed to remain in the spooler before deletion by the XU-SPL-PURGE option that needs to be setup to run in the background.

Table 2-8: Spooler-related parameters

TaskMan Site Parameters

There are three separate groups of site parameters for TaskMan. They are stored in the following files:

- TASKMAN SITE PARAMETERS (#14.7)
- UCI ASSOCIATION (#14.6)
- VOLUME SET (#14.5)

For information about configuring TaskMan's site parameters, please refer to the TaskMan System Management: Configuration chapter of the *Kernel Systems Manual*.

3. Routines

This chapter lists the routines exported with Kernel.

Manager's Account Routines

%ZIS
%ZIS1
%ZIS2
%ZIS3
%ZIS5
%ZIS6
%ZIS7
%ZISC
%ZISP
%ZISS
%ZISS1
%ZISS2
%ZISUTL
%ZTER
%ZTER1
%ZTLOAD
%ZTLOAD1
%ZTLOAD2
%ZTLOAD3
%ZTLOAD4
%ZTLOAD5
%ZTLOAD6
%ZTLOAD7
%ZTM
%ZTM0
%ZTM1
%ZTM2
%ZTM3
%ZTM4
%ZTM5
%ZTM6
%ZTMOVE
%ZTMS
%ZTMS0
%ZTMS1
%ZTMS2
%ZTMS3
%ZTMS4
%ZTMS7
%ZTMSH
XUCIDTM
XUCIMSM
XUCIMSQ
XUCIVXD
ZINTEG
ZIS4DTM
ZIS4MSM
ZIS4MSQ
ZIS4VXD
ZISETDTM
ZISETMSM
ZISETMSQ
ZISETVXD
ZISFDTM
ZISFMSM
ZISFMSQ
ZISFVXD
ZISHDTM
ZISHMSM
ZISHMSQ
ZISHMSU
ZISHUNT
ZISHVXD
ZISX
ZOSFDTM
ZOSFMSM
ZOSFMSQ
ZOSFVXD
ZOSV1DTM
ZOSV1VXD
ZOSV2MSM
ZOSV2VXD
ZOSVDTM
ZOSVMSM
ZOSVMSQ
ZOSVVXD
ZTBKCDTM
ZTBKCMSM
ZTBKCMSQ
ZTBKCVXD
ZTMB
ZTMCHK
ZTMCHK1
ZTMDCL
ZTMGRSET
ZTMKU
ZTMON
ZTMON1
ZUA

Production Account Routines

ORBSTAT
ORBUTL
ORF2
XGF
XGFDEMO
XGFDEMO1
XGKB
XGKB1
XGS
XGSA
XGSBOX
XGSETUP
XGSW
XLFDT
XLFDT1
XLFDT2
XLFDT3
XLFDT4
XLFHYPER
XLFLTR
XLFLTR1
XLFMSMT
XLFMSMT2
XLFMTH
XLFMTH1
XLFSTR
XLFUTL
XMGAPI4
XPDCOM
XPDCOMG
XPDCPU
XPDDCS
XPDDI
XPDDP
XPDE
XPDET
XPDGCDEL
XPDH
XPDI
XPDIA
XPDIA1
XPDIA2
XPDID
XPDIGP
XPDIJ
XPDIK
XPDIL
XPDIL1
XPDIN001
XPDIN002
XPDIN003
XPDIN004
XPDIN005
XPDIN006
XPDIN007
XPDIN008
XPDIN009
XPDIN00A
XPDIN00B
XPDIN00C
XPDIN00D
XPDIN00E
XPDIN00F
XPDIN00G
XPDIN00H
XPDIN00I
XPDIN00J
XPDIN00K
XPDIN00L
XPDIN00M
XPDIN00N
XPDIN00O
XPDIN00P
XPDIN00Q
XPDIN00R
XPDIN00S
XPDIN00T
XPDINIT
XPDINIT1
XPDINIT2
XPDINIT3
XPDINIT4
XPDINIT5
XPDIP
XPDIPM
XPDIQ
XPDIR
XPDIST
XPDIU
XPDKEY
XPDKRN
XPDMENU
XPDNTEG
XPDPINIT
XPDR
XPDRSUM
XPDT
XPDTA
XPDTA1
XPDTC
XPDTP
XPDUTL
XPDV
XQ
XQ1
XQ11
XQ12
XQ2
XQ21
XQ3
XQ31
XQ32
XQ33
XQ4
XQ41
XQ5
XQ55
XQ6
XQ61
XQ62
XQ6A
XQ7
XQ71
XQ72
XQ72A
XQ73
XQ74
XQ75
XQ8
XQ81
XQ82
XQ83
XQ83A
XQ83D
XQ83R
XQ8A
XQ9
XQ91
XQ92
XQ93
XQABELOG
XQABERR
XQABLIST
XQABLOAD
XQALBUTL
XQALDATA
XQALDEL
XQALDOIT
XQALERT
XQALERT1
XQALFWD
XQALMAKE
XQALSET
XQCHK
XQDATE
XQH
XQH0
XQH1
XQH2
XQH3
XQH4
XQH5
XQHLP
XQKEY
XQLOCK
XQLOCK1
XQOO
XQOO1
XQOO2
XQOO3
XQOR
XQOR1
XQOR2
XQOR3
XQOR4
XQORD
XQORD1
XQORM
XQORM1
XQORM2
XQORM3
XQORM4
XQORM5
XQORMX
XQORO
XQSET
XQSMD
XQSMD1
XQSMD2
XQSMD21
XQSMD3
XQSMD31

XQSMD4
XQSMD5
XQSMDCPY
XQSMDFM
XQSMDP
XQSRV
XQSRV1
XQSRV2
XQSRV3
XQSRV4
XQSRV5
XQSTCK
XQSUITE
XQSUITE1
XQT
XQT1
XQT2
XQT3
XQT4
XQT5
XQTOC
XQUSR
XTER
XTER1
XTER1A
XTER1A1
XTER1B
XTER2
XTERPUR
XTRMON
XUA4A7
XUA4A71
XUAPURGE
XUCIDTM
XUCIMSM
XUCIMSQ
XUCIVXD
XUFILE
XUFILE1
XUFILE3
XUGET
XUINCON
XUINEACH
XUINEND
XUINOK
XUINPRE
XUINTSK
XUINTSK1
XUINTSK2
XUP
XUPARAM
XUS
XUS1
XUS11
XUS1A
XUS2
XUS3
XUS3A
XUS4
XUS5
XUS6
XUS9
XUS91
XUSCLEAN
XUSER
XUSERBLK
XUSERNEW
XUSESIG
XUSG
XUSG1
XUSHSH
XUSHSHP
XUSMGR
XUSPURGE
XUSRA
XUSTAT
XUSTAT1
XUSTAT2
XUSTERM
XUSTERM1
XUSTERM2
XUSTZ
XUTMD
XUTMD1
XUTMDEVQ
XUTMDQ
XUTMDQ1
XUTMG145
XUTMG146
XUTMG14P
XUTMG19
XUTMG43
XUTMK
XUTMKE
XUTMKE1
XUTMKE2
XUTMONH
XUTMONH1
XUTMONH2
XUTMOPT
XUTMQ
XUTMQ0
XUTMQ1
XUTMQ2
XUTMQ3
XUTMQH
XUTMR
XUTMR1
XUTMRJD
XUTMRJD1
XUTMSYNC
XUTMT
XUTMTA
XUTMTAL
XUTMTD
XUTMTDL
XUTMTED
XUTMTEIO
XUTMTEP
XUTMTES
XUTMTL
XUTMTLD
XUTMTLU
XUTMTP
XUTMTP0
XUTMTP1
XUTMTPD
XUTMTPU
XUTMTR1
XUTMTR2
XUTMTR3
XUTMTR4
XUTMTS
XUTMTU
XUTMTUL
XUTMTZ
XUTMTZ1
XUTMTZ2
XUTMTZ3
XUTMUSE
XUTMUSE1
XUTMUSE2
XUTMUSE3
XUTMUTL
XUVERIFY
XUWORKDY
ZISEDIT
ZISHUNT
ZISPL
ZISPL1
ZISPL2
ZISX
ZTMB
ZTMCHK
ZTMCHK1
ZTMKU
ZTMON
ZTMON1
ZUA
ZUDTM
ZUMSM
ZUMSQ
ZUVXD

Additional Routines Installed by Virgin Install

Additional routines are brought in by the virgin install for the production account. They are as follows:

XVIRENV
XVIRPOST

Mapping Routines

Routine mapping is at the discretion of the systems manager. The RTHIST routines provide a method for each site to determine the extent to which certain routines are utilized.

For a list of recommended routine mapping, please refer to the "Installing Kernel V. 8.0 in a V. 7.1 Environment" topic in the *Kernel Installation Guide*. Under the "Installation Instructions" topic, see the "Implement Routine Mapping (DSM for OpenVMS only)" topic. Recommended routines to map are listed there.

4. File List

This chapter lists all Kernel files with their file numbers, names, global location, description, whether or not data comes with the file and the data setting if data comes with a file.

At the end of this chapter, an additional listing is made of other files which are brought in during a virgin installation (see Table 5-3).

Kernel's file numbers range as follows:

3.05 - 3.54	49.00 - 49.00
4.00 - 4.11	101.00 - 101.00
5.00 - 5.00	200.00 - 200.00
5.12 - 7.10	8932.10 - 8935.91
9.20 - 9.80	8980.20 - 8980.22
14.40 - 14.80	8989.20 - 8989.30
19.00 - 20.00	8991.5 - 8992.00
40.50 - 40.50	

File #	File Name	Global Location	Description	Data w/ File	Data Setting
3	USER	^DIC(3,	(Obsolete) In the past, the degree and scope of each user's access was determined by information in this file. That information is now stored in the NEW PERSON file (#200). A set of cross-references keeps the data in this file coordinated with the data in the NEW PERSON file (#200). The USER file (#3) is now obsolete. This file is cross-referenced by Name, Initial, Nickname, Access and Verify codes, primary and secondary menu options and synonyms, accessible files, and HINQ employee number.	NO	NA

File #	File Name	Global Location	Description	Data w/ File	Data Setting
3.05	FAILED ACCESS ATTEMPTS LOG	^%ZUA(3.05,	Once the maximum signon attempts limit has been exceeded, an entry is made in this file to record all available information about the failed signon attempt. Information includes the date/time, CPU, UCI, device, and, if known, user. The text entered for each attempt is recorded when it does not match existing codes. This file is not cross-referenced.	NO	NA
3.07	PROGRAMMER MODE LOG	^%ZUA(3.07,	Entrance into programmer mode via the menu system is automatically logged in this file. It points to the NEW PERSON file (#200) to identify the user. It is not cross-referenced.	NO	NA
3.075	ERROR LOG	^%ZTER(1,	This file is used to maintain a log of the errors occurring during use of the system. Errors are entered into this log by the error trap established for the user by ZU or application programs calling %ZTER when an error occurs. The entries are all entered by the routine %ZTER. There is no need for a user to make a manual entry into this file.	NO	NA
3.076	ERROR MESSAGES	^%ZTER(2,	This file contains a number of the abbreviations used to indicate the type of error encountered. The most important ones are those which are indicated as fatal errors warranting termination of the job after logging of the error.	YES	Merge
3.081	SIGN-ON LOG	^XUSEC(0,	This file records signon/signoff times by user, device, job, UCI, and CPU. It is cross-referenced by user, device, and signoff time.	NO	NA
3.1	TITLE	^DIC(3.1,	This file can be used to indicate a user's title. It is pointed to by the NEW PERSON file (#200). It is only cross-referenced by name.	NO	NA

File #	File Name	Global Location	Description	Data w/ File	Data Setting
3.2	TERMINAL TYPE	^%ZIS(2,	This file is pointed to by the Subtype field of the Device File (#3.5). This file can hold vendor-specific code to characterize a terminal type. For example, escape sequences can be entered in the Open and Close Execute fields to set pitch or font. This file is also pointed to by the NEW PERSON file (#200) to record signon subtype characteristics by user. Data is distributed with this file to support screen-handling capabilities. This data overwrites existing data for those terminal types of the same name. However, terminal types for printers are not affected, since the data that is distributed is for a subset of known CRTs. The Kernel Virgin Install distribution will seed a more complete set of terminal types including those for printers as well as CRTs. However, the Kernel Virgin Install should only be performed once and only on a system where there is no pre-existing Kernel. The data in this file is cross-referenced by name and synonym.	YES	Overwrite
3.22	DA RETURN CODES	^%ZIS(22,	This file holds the translation between the ANSI DA return code and the name in the TERMINAL TYPE file (#3.2) that should be associated with the return code.	YES	Merge

File #	File Name	Global Location	Description	Data w/ File	Data Setting
3.23	LINE/PORT ADDRESS	^%ZIS(3.23,	This file is used to associate device(s)/subtype(s) with line/port addresses. The line/port address should be entered when editing the name field of this file. This address can be obtained by using the OS-specific function $ZIO on VAX DSM or $ZDEV($I) on MSM. To establish an association with a Device and Terminal Type, the DEVICE and SUBTYPE fields of this file must store the appropriate values that correspond to entries in the DEVICE (#3.5) and TERMINAL TYPE (#3.2) files. This file is cross-referenced by name and device.	NO	NA
3.5	DEVICE	^%ZIS(1,	This file defines all input/output devices that can be accessed from this CPU (definitions are not account-specific). Each device is identified with a unique name. Each is associated with a $I value which may correspond with a hardware port or, on layered systems, a host file or directory. If there are several devices for the same volume set and $I, one may be given signon system status. Devices can also be assigned to hunt groups to share work. This file is cross-referenced by name, $I, volume set (CPU), and signon/system device. It is also cross-referenced by hunt group, local synonym, mnemonic, subtype, and form currently mounted.	NO	NA

File #	File Name	Global Location	Description	Data w/ File	Data Setting
3.51	SPOOL DOCUMENT	^XMB(3.51,	This file holds the name of spool documents created by the Kernel spooler (%ZIS4) for all operating systems. It does not hold the text of the documents themselves. The text is first spooled to spool space, then moved into the ^XMB global as a mail message. This file does, however, provide the mechanism for securing spool space for and during spooling. It is cross-referenced by name, spool number, user, and mail message.	NO	NA
3.519	SPOOL DATA	^XMBS(3.519	This is the holding file for spool documents until they are moved into a mail message or deleted.	NO	NA
3.54	RESOURCE	^%ZISL(3.54	This file is for internal use by TaskMan and the Device Handler in the sequential processing of tasks. Jobs that have been sent to a resource-type device are monitored according to fields in this file. To accommodate the Device Handler's need to write to but rarely read from this file, the translated ^%ZISL global is used. This file is cross-referenced by name and job number.	NO	NA
3.6	BULLETIN	^XMB(3.6,	Bulletins are "Super" messages. Each bulletin has a text and a subject just like a normal message. But embedded within either the subject or the text can be variable fields that can be filled in with parameters. A standard set of recipients in the form of a mail group is associated with the bulletin.	NO	NA
4	INSTITUTION	^DIC(4,	This file contains a listing of VA institutions. It is cross-referenced by name and station number. The Number field is no longer meaningful (it previously referenced the station number).	NO	NA

File #	File Name	Global Location	Description	Data w/ File	Data Setting
4.1	FACILITY TYPE	^DIC(4.1,	This file is pointed to by the Institution file. It contains a list of facility codes that were previously stored in the VA Type Code field of the Institution file. This file is distributed with data, and the new data should overwrite the old. It is cross-referenced by name and full name.	YES	Merge
4.11	AGENCY	^DIC(4.11,	This file replaces the Set of Codes field AGENCY that had been used in the INSTITUTION file (#4).	YES	Overwrite
4.3	MAILMAN SITE PARAMETERS	^XMB(1,	This file holds the site parameters for MailMan. It has only one entry, the domain name of the installation site. Some parameters are defined by the systems manager during the installation process. These include time zone, and specification of the account where XMAD, the MailMan background filer, should run. Others can be edited subsequent to installation. The parent domain, set to FORUM during initialization, can be changed.	NO	NA
6	PROVIDER	^DIC(6,	(Obsolete) The PROVIDER file (#6) was used to store a variety of information about the person providing patient care. The PROVIDER file (#6) pointed to the PERSON file (#16, Obsolete).	NO	NA
9.2	HELP FRAME	^DIC(9.2,	This file contains the text of help frames created via the Help Processor (XQH). Help frames can be associated with options or with data dictionary fields to provide online instruction. The file is cross-referenced by name, header, date entered, author, and editor.	NO	NA

File #	File Name	Global Location	Description	Data w/ File	Data Setting
9.4	PACKAGE	^DIC(9.4,	The top level of a PACKAGE file (#9.4) entry for software now stores static software information. The PACKAGE file (#9.4) stores mainly static software information that is not version-specific, as well as the patch history of the software. KIDS updates the VERSION (Multiple) field. Patch installations update the PATCH APPLICATION HISTORY (Multiple) field, which is within the VERSION (Multiple) field. Most other fields have been designated for removal at the top level of the PACKAGE file (#9.4).	NO	NA
9.6	BUILD	^XPD(9.6,	This file identifies the elements of a software application that will be transported by the Kernel Installation & Distribution System (KIDS). All components of the software (i.e., templates, options, Security Keys, etc.) must be listed in this file.	NO	NA
9.7	INSTALL	^XPD(9.7,	This file contains the installation information for a site from the Kernel Installation & Distribution System (KIDS). This file should not be edited. All information is updated when new software is installed at a site.	NO	NA
9.8	ROUTINE	^DIC(9.8,	This file is used to document system routines. Parameters and entry points can be described. When running %INDEX, some fields will be given values as the %INDEX verification tool locates variables, globals, and routine references. When using the %Z editor, the EDIT HISTORY (Multiple) field will be filled in with date, device, user, and UCI. The %ZOSF("TEST") node can be executed, checking $T, to determine whether a routine listed in this file exists in the current account. This file is cross-referenced by name.	NO	NA

File #	File Name	Global Location	Description	Data w/ File	Data Setting
14.4	TASKS	^%ZTSK(	This file describes TaskMan's main file of jobs to start. Because TaskMan works on this file from many UCIs, it does *not* use VA FileMan to manipulate it. There are no cross-references on this file and there are no fields that can be edited; use TaskMan options for that. The file can be searched, sorted and printed. The third piece of the zero node is only updated when the XUTM QCLEAN option runs. Some applications still do their own setting into this global and wipe out the zero node. The storage of the symbol table is not in a VA FileMan-compatible format.	NO	NA
14.5	VOLUME SET	^%ZIS(14.5	This file describes the volume sets available in the current multiprocessor network. The information pertaining to each volume set is used primarily by Kernel, especially TaskMan. The UCIs that make up each volume set can be determined by using the cross-reference in the UCI Association Table file.	NO	NA
14.6	UCI ASSOCIATION	^%ZIS(14.6,	This file contains information that indicates which UCIs on different volume sets are equivalent. This information allows the running of tasks that need a device only available on a different volume set, even if the UCI on the other volume set has another name.	NO	NA
14.7	TASKMAN SITE PARAMETERS	^%ZIS(14.7,	This file should be used by the system manager to tune TaskMan to the site's specific needs. Entries are identified by the CPU and volume set, so that parameters can be set differently for different nodes that share a single volume set, etc. Changes to any of the fields automatically causes all accessible Task Managers on the system to update their local copies of the parameters.	NO	NA

File #	File Name	Global Location	Description	Data w/ File	Data Setting
14.8	TASK SYNC FLAG	^%ZISL(14.8,	This file holds the task synchronization flags that control if a task can run or must wait.	NO	NA
16	PERSON	^DIC(16,	(Obsolete) In the past, the scope of each person's access was determined by information in this file. Now, that information is contained in the NEW PERSON file (#200). A set of cross-references keeps the data in this file coordinated with the data in the NEW PERSON file (#200). The PERSON file (#16) is obsolete. The PERSON file (#16)was used to store the names of users on the computer system, providers of patient care, and associated information.	NO	NA
19	OPTION	^DIC(19,	Information in this file is used to drive the menu system. Options are created, associated with others on menus, locked, set out-of-order, assigned prohibited times or devices, or given entry/exit actions. The Edit Options of Menu Management should be used (instead of VA FileMan) so that the global root (DIC) and other such fields are given the correct values. Options can be tailored by setting VA FileMan variables via this file. The Order Enter/Results Reporting (OE/RR) software is accessed by using the appropriate option type. It is cross-referenced by name, menu text, uppercase menu text, type, item, synonym, help frame, out-of-order message, lock, prohibited times, restricted devices, and priority.	NO	NA

File #	File Name	Global Location	Description	Data w/ File	Data Setting
19.081	AUDIT LOG FOR OPTIONS	^XUSEC(19,	The KERNEL SYSTEM PARAMETERS file (#8989.3) establishes when and how a log of option usage will be recorded in this file. For the indicated time period, all specified options, namespaces, and users will be audited. It is recommended that when audits are run, the number of audited entities be minimized so that disk space is not inadvertently wasted. This file is cross-referenced by option.	NO	NA
19.1	SECURITY KEY	^DIC(19.1,	This file holds the names of security keys that are used to lock options. To lock an option, the name of the key is entered in the Lock field of the OPTION file. To permit a user to unlock the option, the user's name is entered in the Holder field of this file. It is cross-referenced by name and holder.	NO	NA
19.2	OPTION SCHEDULING	^DIC(19.2,	This file holds records that relate to the scheduling of options to run on a schedule or occasionally on a one-time basis. There is one record for each time that an option is scheduled. This allows one option to be scheduled to run on more that one CPU or at more that one time without having to duplicate the option in the OPTION file.	NO	NA
40.5	HOLIDAY	^HOLIDAY(	This file is used to record institutional holidays. It is referenced by the XUWORKDY routine and is not distributed with data. It is cross-referenced by date.	NO	NA

File #	File Name	Global Location	Description	Data w/ File	Data Setting
49	SERVICE/ SECTION	^DIC(49,	This file is a list of the services and sections within the services. Some of the entries may be "MIS COSTING SECTIONS" for use with the cost accounting part of the Management Information System software. A section is an MIS section if there is a code entered in the field called MIS COSTING CODE. In the cost accounting system all medical center costs are tied to a particular section. When MIS sections change, do not delete the old section. Instead, change the fields under the multiple field called "DATE CLOSED" to identify which sections are no longer in use.	NO	NA
200	NEW PERSON	^VA(200,	This file contains data on employees, users, practitioners, etc., that was previously stored in the User, Person, Provider, and other files. VistA software developers must check with the Kernel developers to see that a given number/namespace is available for use.	NO	NA
8989.2	KERNEL PARAMETERS	^XTV(8989.2,	This file holds parameters that Kernel uses that the site is allowed to change. It is still in the development stage. An example is the computer account letter. Kernel loads its standard name into the file and if the site builds a new letter, then they can enter a replacement name that will be used in place of the standard one.	NO	NA

File #	File Name	Global Location	Description	Data w/ File	Data Setting
8989.3	KERNEL SYSTEM PARAMETERS	^XTV(8989.3,	This file holds the site parameters for this installation of Kernel. It has only one entry, the domain name of the installation site. Some parameters are defined by the systems manager during the installation process. These include Agency, volume set multiple, Default parameters. Others can be edited subsequent to installation. Spooling, response time, and audit parameters can be established. Priorities can be set for interactive users and for TaskMan. Defaults for fields such as timed read, auto-menu, and ask device are defined for use when not otherwise specified for a user or device.	NO	NA
8991.5	XQAB ERRORS LOGGED	^XTV(8991.5,	This file is used to maintain a log of errors occurring at alpha/beta test sites.	NO	NA
8992	ALERT	^XTV(8992,	This file is used to keep track of alerts pending processing for each user. The main entry for each record is a pointer to the NEW PERSON file (#200). A multiple under each user is used to record the date and time an alert was generated, the unique ID associated with the alert, the text for display, an optional routine entry point or option for use in processing the alert, and an optional data string associated with the alert.	NO	NA

File #	File Name	Global Location	Description	Data w/ File	Data Setting
8992.1	ALERT TRACKING	^XTV(8992.1,	This file is used to track the content and interactions with an alert. Every alert that is generated is initially filed within this file. Each entry has the date and time the alert was generated, which user generated the alert, whether the alert was generated in a background task, what action was to be taken, if any (the entry point or option name to be used), and the data string, if any, for use with the alert. There is a multiple field which also identifies each user that the alert was sent to, when the user initially saw the displayed text, when the alert was selected for processing, when the processing was completed, and when the alert was deleted after processing or associated with another user's processing, or when the alert was deleted by a cleanup operation. Unless a longer lifetime is specified for the specific alert, it is deleted from the file after 30 days. If a longer lifetime is specified, it will not be deleted until after that period passes.	NO	NA

Table 4-1: Kernel file list

Additional Files Installed During Virgin Installation

The Virgin Installation brings in the following additional files:

File #	File Name	Global Location	Description	Data w/ File	Data Setting
3.8	MAIL GROUP	^XMB(3.8,	This file holds the names of all groups and their members known to MailMan.	No	NA
4.2	DOMAIN	^DIC(4.2,	This file is used to name all of the nodes to which MailMan messages can be routed. Each name in this file corresponds to the right side of a MailMan address, the part following the "@".	No	NA
5	STATE	^DIC(5,	This file contains a list of state names and abbreviations.	Yes	Overwrite
7	PROVIDER CLASS	^DIC(7,	This file is used to identify various classifications or types of providers.	No	NA
7.1	SPECIALITY	^DIC(7.1,	This file identifies locally added specialties and their associated services.	No	NA
10	RACE	^DIC(10,	This file currently consists of seven entries. The allowable entries are established by VACO MAS. Entries in this file should not be altered or added to. To do so may have a negative impact on the performance of the MAS module as well as other modules.	Yes	Overwrite
11	MARITAL STATUS	^DIC(11,	This file currently consists of six entries which are distributed by the MAS development team. Alteration of any of the six entries or addition of entries to this file which are not distributed by the MAS developers may have a negative impact on the performance of the MAS module as well as other modules.	Yes	Overwrite

File #	File Name	Global Location	Description	Data w/ File	Data Setting
13	RELIGION	^DIC(13,	This file currently contains 30 entries. These entries are determined by VACO MAS. This file should not be added to nor should entries in it be altered or deleted by the facility. Entry, edit or deletion of these entries could have severe negative affects on the performance of the MAS module.	Yes	Overwrite

Table 4-2: Kernel file list—Virgin Installations

5. Global Storage

Files are listed in order of the global in which they are stored:

Global Name	File Number	File Name
DIC	3	USER (Obsolete)
	3.1	TITLE
	4	INSTITUTION
	4.1	FACILITY TYPE
	4.11	AGENCY
	6	PROVIDER (Obsolete)
	9.2	HELP FRAME
	9.4	PACKAGE
	9.8	ROUTINE
	16	PERSON (Obsolete)
	19	OPTION
	19.1	SECURITY KEY
	19.2	OPTION SCHEDULING
	49	SERVICE/SECTION
HOLIDAY	40.5	HOLIDAY
XMB	3.51	SPOOL DOCUMENT
	3.6	BULLETIN
	4.3	MAILMAN SITE PARAMETERS
XMBS	3.519	SPOOL DATA
XPD	9.6	BUILD
	9.7	INSTALL
XTV	8989.2	KERNEL PARAMETERS
	8989.3	KERNEL SYSTEM PARAMETERS
	8991.5	XQAB ERRORS LOGGED
	8992	ALERT
	8992.1	ALERT TRACKING
	8995.9	BINARY OBJECT
XUSEC	3.081	SIGN-ON LOG
	19.081	AUDIT LOG FOR OPTIONS
VA	200	NEW PERSON

Global Name	File Number	File Name
%ZIS	3.2	TERMINAL TYPE
	3.22	DA RETURN CODES
	3.23	LINE/PORT ADDRESS
	3.5	DEVICE
	14.5	VOLUME SET
	14.6	UCI ASSOCIATION
	14.7	TASKMAN SITE PARAMETERS
%ZISL	3.54	RESOURCE
	14.8	TASK SYNC FLAG
%ZTER	3.075	ERROR LOG
	3.076	ERROR MESSAGES
%ZTSK	14.4	TASKS
%ZUA	3.05	FAILED ACCESS ATTEMPTS LOG
	3.07	PROGRAMMER MODE LOG

Table 5-1: Kernel globals associated with VA FileMan

There are other files for VA FileMan stored in DI* globals, and many files for MailMan that are stored in the XMB* globals. You should review the *VA FileMan Technical Manual* and *MailMan Technical Manual* for a complete list.

Kernel Globals for Non-VA-FileMan-compatible Storage

There are several additional Kernel globals that are *not* associated with VA FileMan files. These include the following:

Global	Description
XTMP	Storage location for inter-process temporary data
XUTL	Compiled menu system
%ZOSF	Operating system-specific information
%ZTSCH	TaskMan schedule of tasks

Table 5-2: Kernel globals *not* associated with VA FileMan

In addition, many Kernel routines make use of the ^TMP global for temporary storage space.

Global Storage Used for Additional Files During Virgin Install

The following additional global storage is used by files brought in by Kernel V. 8.0 Virgin Install:

Global Name	File Number	File Name
DIC	4.2	DOMAIN
	5	STATE
	7	PROVIDER CLASS
	7.1	SPECIALITY
	10	RACE
	11	MARITAL STATUS
	13	RELIGION
XMB	3.8	MAIL GROUP

Table 5-3: Kernel global storage during virgin installations

6. Exported Options (Menu Structure)

This chapter lists Kernel's exported options.

Kernel Menu Tree Roots

Kernel exports three separate menu trees. They are:

- Systems Manager Menu [EVE]. Eve is used by the systems manager to get to other menus. Eve contains the following sub-menus:
  - Core Applications [XUCORE]
  - Device Management [XUTIO]
  - Menu Management [XUMAINT]
  - Operations Management [XUSITEMGR]
  - Programmer Options [XUPROG]
  - Spool Management [XU-SPL-MGR]
  - System Security [XUSPY]
  - Taskman Management [XUTM MGR]
  - User Management [XUSER]
- SYSTEM COMMAND OPTIONS [XUCOMMAND]. This holds the common menu options executable from anywhere in the menu processor.
- Parent of Queuable Options [ZTMQUEUABLE OPTIONS]. This menu has no parent; it collects together all parentless Kernel options that are intended to be scheduled through the TaskMan ZTMSCHEDULE option.

The menu trees for these three menus are presented on the following pages.

The menu tree for EVE is broken into the individual menu trees for each EVE option. The menu trees for ZTMQUEUABLE OPTIONS and XUCOMMAND are presented intact.

Systems Manager Menu [EVE]

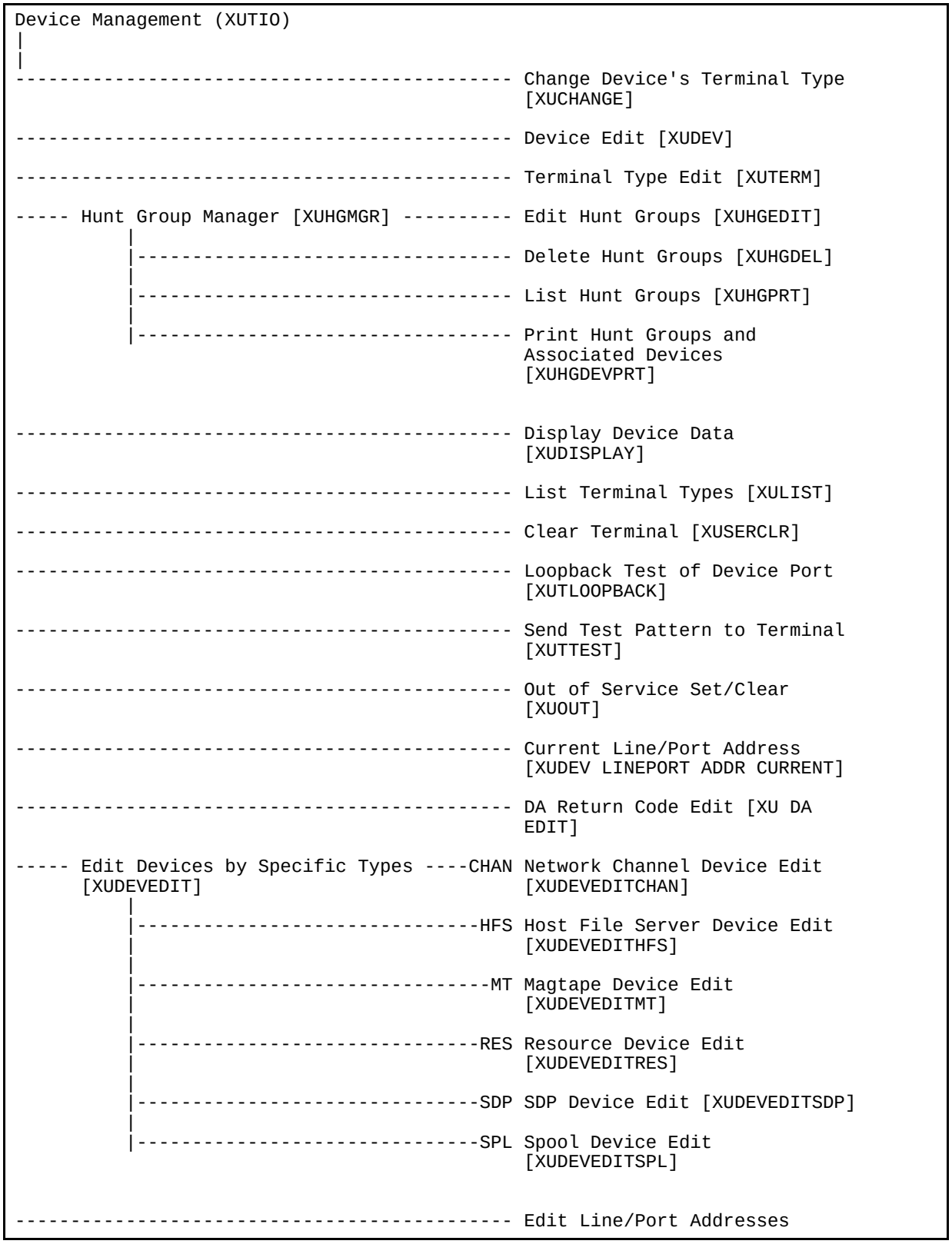
EVE contains the following menu trees: XUCORE, XUTIO, XUMAINT, XUSITEMGR, XUPROG, XU-SPL-MGR, XUSPY, XUTM MGR, and XUSER. Each of these menu trees is listed individually below.

XUCORE

```
Core Applications (XUCORE)
|
|
```

Table 6-1: XUCORE—Menu tree

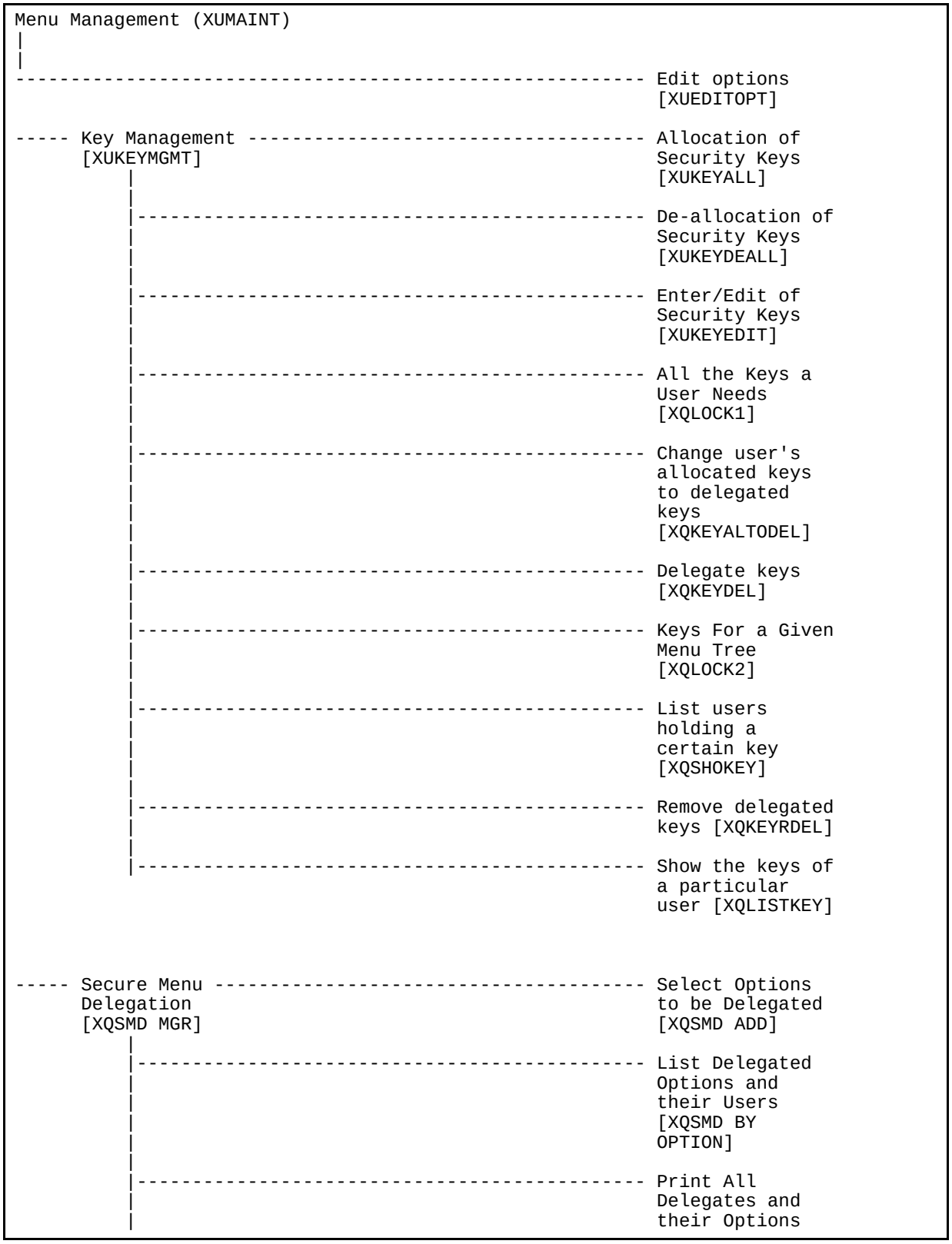
XUTIO

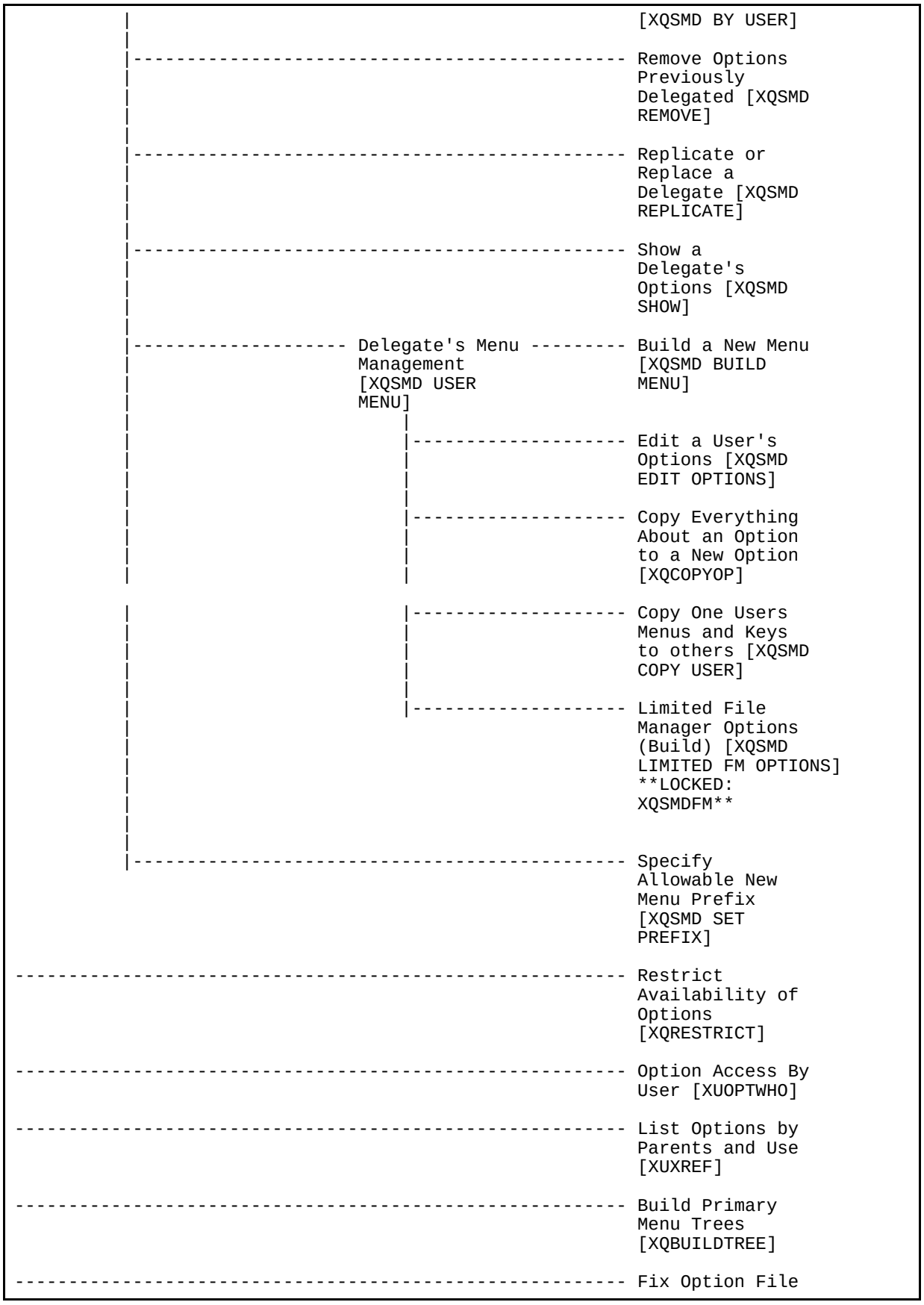

Device Management (XUTIO)
Change Device's Terminal Type [XUCHANGE]
Device Edit [XUDEV]
Terminal Type Edit [XUTERM]
Hunt Group Manager [XUHGMGR]
Edit Hunt Groups [XUHGEDIT]
Delete Hunt Groups [XUHGDEL]
List Hunt Groups [XUHGPRT]
Print Hunt Groups and Associated Devices [XUHGDEVPRT]
Display Device Data [XUDISPLAY]
List Terminal Types [XULIST]
Clear Terminal [XUSERCLR]
Loopback Test of Device Port [XUTLOOPBACK]
Send Test Pattern to Terminal [XUTTEST]
Out of Service Set/Clear [XUOUT]
Current Line/Port Address [XUDEV LINEPORT ADDR CURRENT]
DA Return Code Edit [XU DA EDIT]
Edit Devices by Specific Types [XUDEVEDIT]
CHAN Network Channel Device Edit [XUDEVEDITCHAN]
HFS Host File Server Device Edit [XUDEVEDITHFS]
MT Magtape Device Edit [XUDEVEDITMT]
RES Resource Device Edit [XUDEVEDITRES]
SDP SDP Device Edit [XUDEVEDITSDP]
SPL Spool Device Edit [XUDEVEDITSPL]
Edit Line/Port Addresses

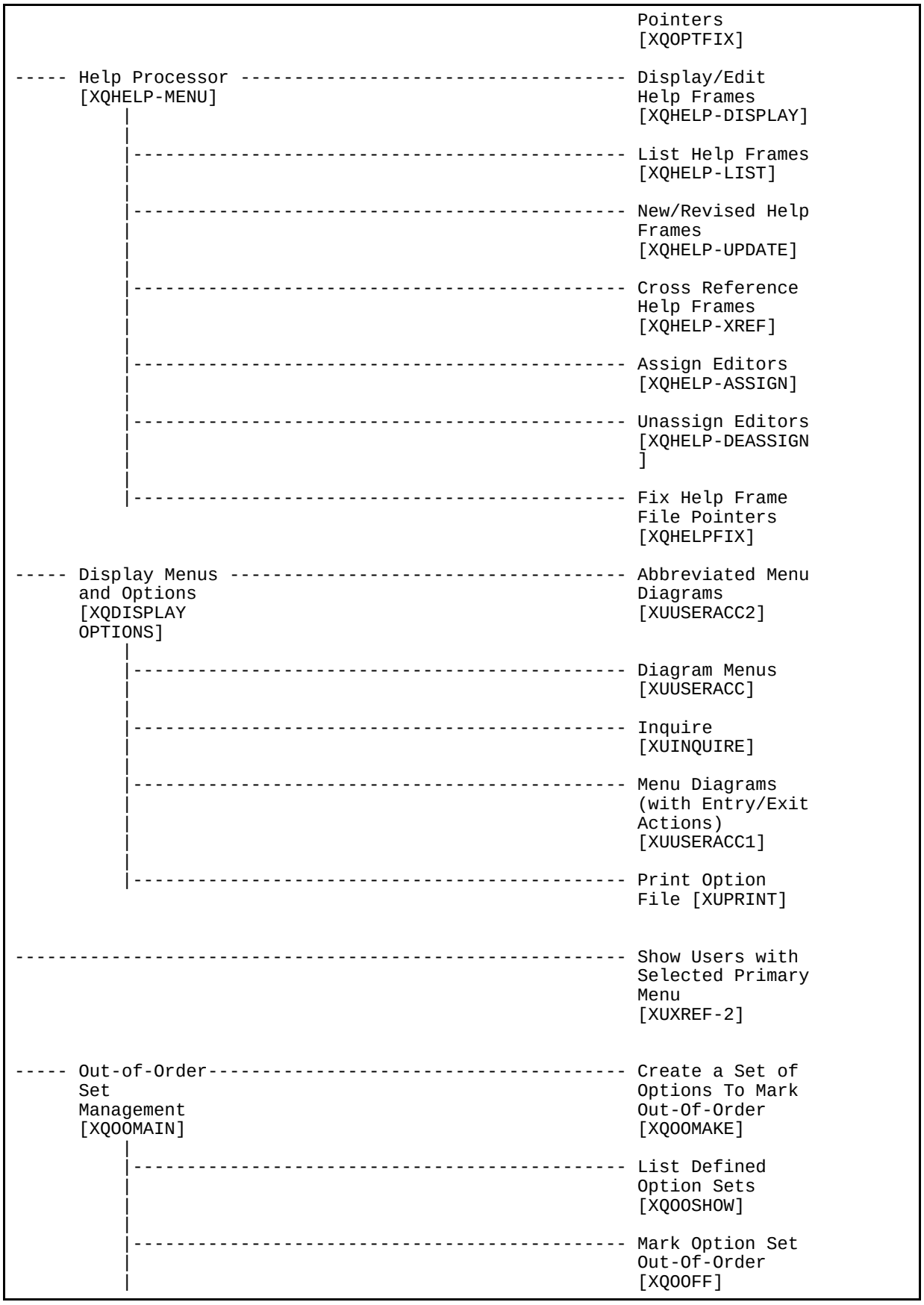
```
                                          [XUDEV LINEPORT ADDR EDIT]

------------------------------------------ Line/Port Address report
                                          [XUDEV LINEPORT ADDR RPT]
```

Table 6-2: XUTIO—Menu tree

XUMAINT


Menu Management (XUMAINT)
Edit options [XUEDITOPT]
Key Management [XUKEYMGMT]
Allocation of Security Keys [XUKEYALL]
De-allocation of Security Keys [XUKEYDEALL]
Enter/Edit of Security Keys [XUKEYEDIT]
All the Keys a User Needs [XQLOCK1]
Change user's allocated keys to delegated keys [XQKEYALTODEL]
Delegate keys [XQKEYDEL]
Keys For a Given Menu Tree [XQLOCK2]
List users holding a certain key [XQSHOKEY]
Remove delegated keys [XQKEYRDEL]
Show the keys of a particular user [XQLISTKEY]
Secure Menu Delegation [XQSMD MGR]
Select Options to be Delegated [XQSMD ADD]
List Delegated Options and their Users [XQSMD BY OPTION]
Print All Delegates and their Options


[XQSMD BY USER]
Remove Options Previously Delegated [XQSMD REMOVE]
Replicate or Replace a Delegate [XQSMD REPLICATE]
Show a Delegate's Options [XQSMD SHOW]
Delegate's Menu Management [XQSMD USER MENU]
Build a New Menu [XQSMD BUILD MENU]
Edit a User's Options [XQSMD EDIT OPTIONS]
Copy Everything About an Option to a New Option [XQCOPYOP]
Copy One Users Menus and Keys to others [XQSMD COPY USER]
Limited File Manager Options (Build) [XQSMD LIMITED FM OPTIONS] **LOCKED: XQSMDFM**
Specify Allowable New Menu Prefix [XQSMD SET PREFIX]
Restrict Availability of Options [XQRESTRICT]
Option Access By User [XUOPTWHO]
List Options by Parents and Use [XUXREF]
Build Primary Menu Trees [XQBUILDTREE]
Fix Option File


Pointers
[XQOPTFIX]
----- Help Processor ---------- Display/Edit
[XQHELP-MENU] Help Frames
[XQHELP-DISPLAY]
List Help Frames
[XQHELP-LIST]
New/Revised Help
Frames
[XQHELP-UPDATE]
Cross Reference
Help Frames
[XQHELP-XREF]
Assign Editors
[XQHELP-ASSIGN]
Unassign Editors
[XQHELP-DEASSIGN
]
Fix Help Frame
File Pointers
[XQHELPFIX]
----- Display Menus ---------- Abbreviated Menu
and Options Diagrams
[XQDISPLAY [XUUSERACC2]
OPTIONS]
Diagram Menus
[XUUSERACC]
Inquire
[XUINQUIRE]
Menu Diagrams
(with Entry/Exit
Actions)
[XUUSERACC1]
Print Option
File [XUPRINT]
---------- Show Users with
Selected Primary
Menu
[XUXREF-2]
----- Out-of-Order---------- Create a Set of
Set Options To Mark
Management Out-Of-Order
[XQOOMAIN] [XQOOMAKE]
List Defined
Option Sets
[XQOOSHOW]
Mark Option Set
Out-Of-Order
[XQOOFF]

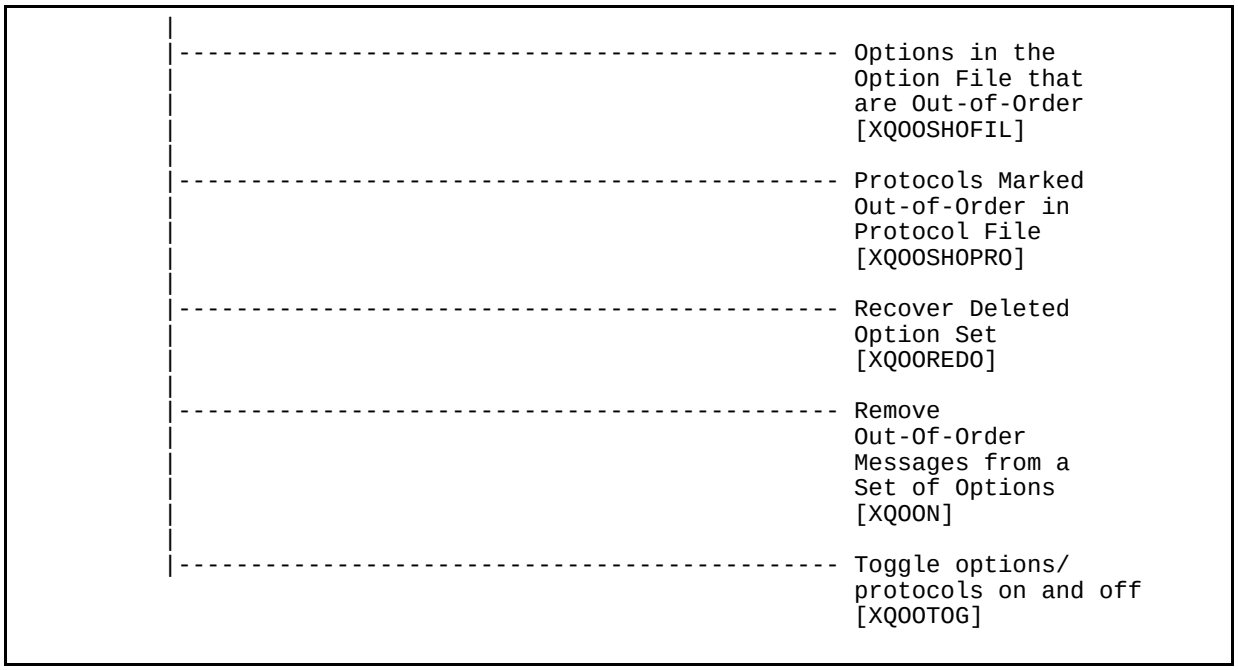
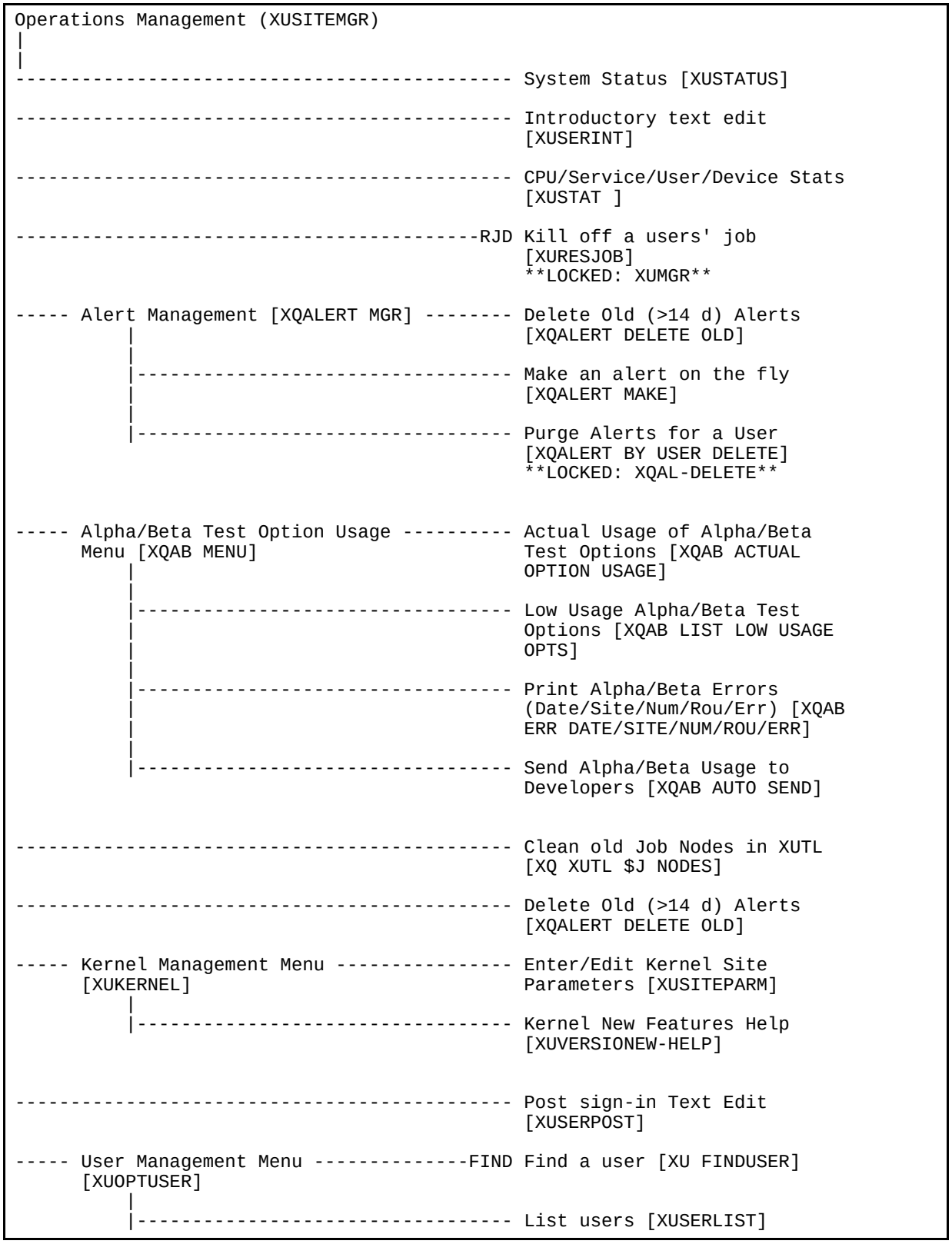


Table 6-3: XUMAINT—Menu tree

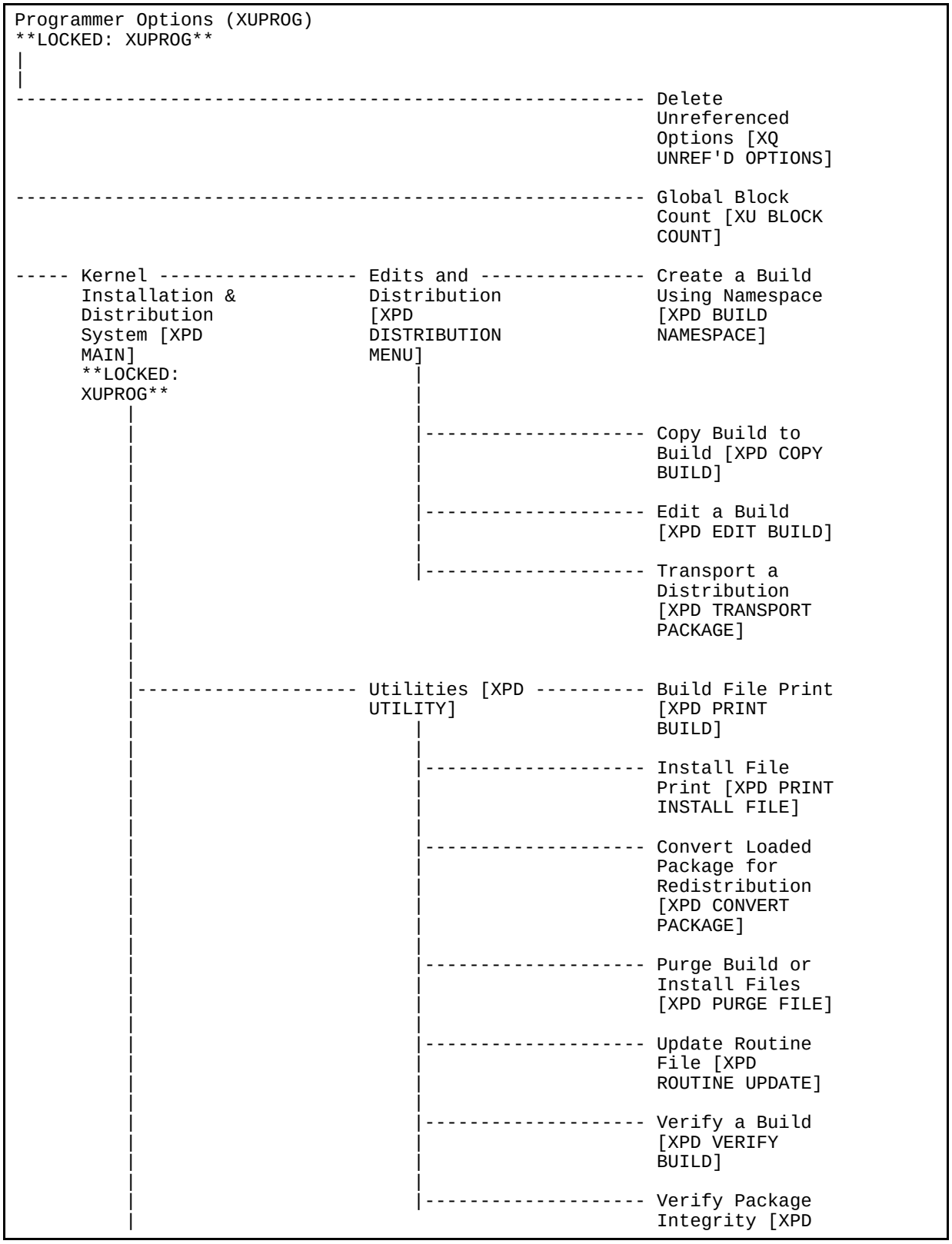
XUSITEMGR

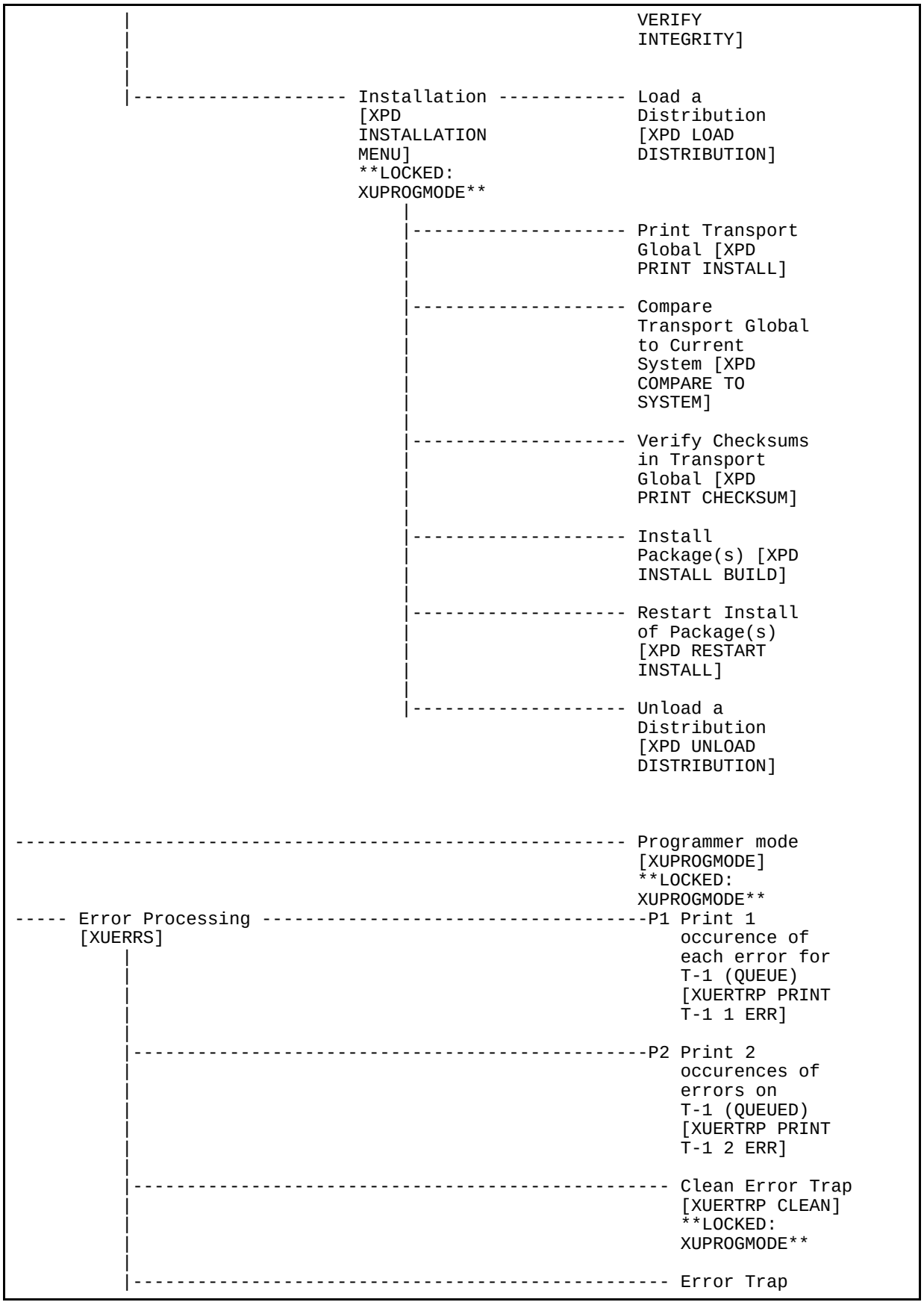

Operations Management (XUSITEMGR)
System Status [XUSTATUS]
Introductory text edit [XUSERINT]
CPU/Service/User/Device Stats [XUSTAT]
RJD Kill off a users' job [XURESJOB]
LOCKED: XUMGR
Alert Management [XQALERT MGR]
Delete Old (>14 d) Alerts [XQALERT DELETE OLD]
Make an alert on the fly [XQALERT MAKE]
Purge Alerts for a User [XQALERT BY USER DELETE]
LOCKED: XQAL-DELETE
Alpha/Beta Test Option Usage Menu [XQAB MENU]
Actual Usage of Alpha/Beta Test Options [XQAB ACTUAL OPTION USAGE]
Low Usage Alpha/Beta Test Options [XQAB LIST LOW USAGE OPTS]
Print Alpha/Beta Errors (Date/Site/Num/Rou/Err) [XQAB ERR DATE/SITE/NUM/ROU/ERR]
Send Alpha/Beta Usage to Developers [XQAB AUTO SEND]
Clean old Job Nodes in XUTL [XQ XUTL $J NODES]
Delete Old (>14 d) Alerts [XQALERT DELETE OLD]
Kernel Management Menu [XUKERNEL]
Enter/Edit Kernel Site Parameters [XUSITEPARM]
Kernel New Features Help [XUVERSIONEW-HELP]
Post sign-in Text Edit [XUSERPOST]
User Management Menu [XUOPTUSER]
FIND Find a user [XU FINDUSER]
List users [XUSERLIST]

```
          |
          |---------------------------------- Print Sign-on Log [XUSC LIST]
          |
          |---------------------------------- Release user [XUSERREL]
          |
          |---------------------------------- User Inquiry [XUSERINQ]
          |
          |---------------------------------- User Status Report
                                               [XUUSERSTATUS]
```

Table 6-4: XUSITEMGR—Menu tree

XUPROG


Programmer Options (XUPROG)
LOCKED: XUPROG
Delete Unreferenced Options [XQ UNREF'D OPTIONS]
Global Block Count [XU BLOCK COUNT]
Kernel Installation & Distribution System [XPD MAIN]
LOCKED: XUPROG
Edits and Distribution [XPD DISTRIBUTION MENU]
Create a Build Using Namespace [XPD BUILD NAMESPACE]
Copy Build to Build [XPD COPY BUILD]
Edit a Build [XPD EDIT BUILD]
Transport a Distribution [XPD TRANSPORT PACKAGE]
Utilities [XPD UTILITY]
Build File Print [XPD PRINT BUILD]
Install File Print [XPD PRINT INSTALL FILE]
Convert Loaded Package for Redistribution [XPD CONVERT PACKAGE]
Purge Build or Install Files [XPD PURGE FILE]
Update Routine File [XPD ROUTINE UPDATE]
Verify a Build [XPD VERIFY BUILD]
Verify Package Integrity [XPD


VERIFY INTEGRITY]
Installation [XPD INSTALLATION MENU] **LOCKED: XUPROGMODE**
Load a Distribution [XPD LOAD DISTRIBUTION]
Print Transport Global [XPD PRINT INSTALL]
Compare Transport Global to Current System [XPD COMPARE TO SYSTEM]
Verify Checksums in Transport Global [XPD PRINT CHECKSUM]
Install Package(s) [XPD INSTALL BUILD]
Restart Install of Package(s) [XPD RESTART INSTALL]
Unload a Distribution [XPD UNLOAD DISTRIBUTION]
Programmer mode [XUPROGMODE] **LOCKED: XUPROGMODE**
Error Processing [XUERRS]
P1 Print 1 occurence of each error for T-1 (QUEUE) [XUERTRP PRINT T-1 1 ERR]
P2 Print 2 occurences of errors on T-1 (QUEUED) [XUERTRP PRINT T-1 2 ERR]
Clean Error Trap [XUERTRP CLEAN] **LOCKED: XUPROGMODE**
Error Trap

```
          |                                                  Display
          |                                                  [XUERTRAP]
          |
          |------------------------------------------------- Interactive
                                                             Print of Error
                                                             Messages
                                                             [XUERTRP PRINT
                                                             ERRS]
```

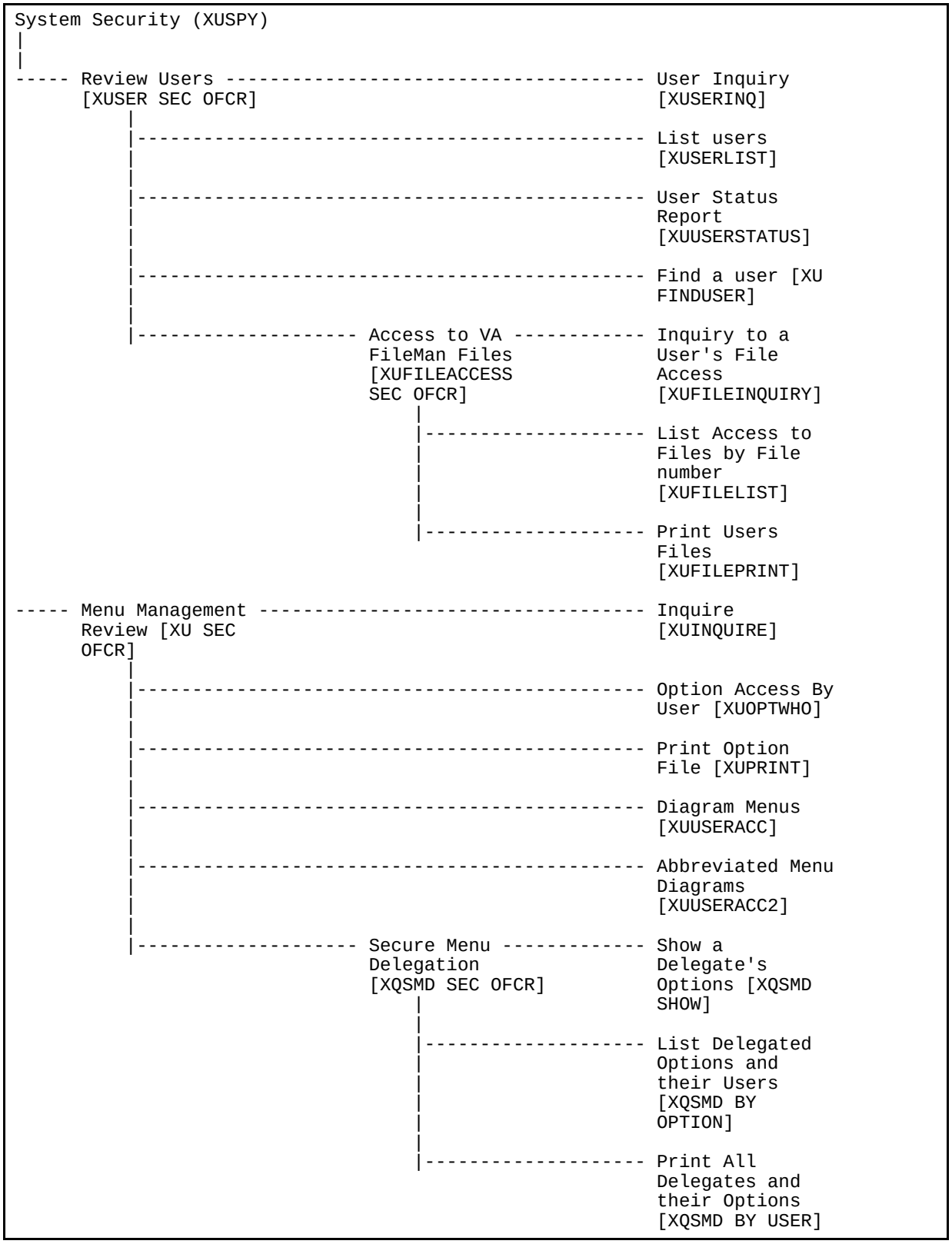
Table 6-5: XUPROG—Menu tree

XU-SPL-MGR

```
Spool Management (XU-SPL-MGR)
|
|
----- Delete A Spool Document
      [XU-SPL-DELETE]

----- Edit User's Spooler Access
      [XU-SPL-USER]

----- List Spool Documents
      [XU-SPL-LIST]

----- Print A Spool Document
      [XU-SPL-PRINT]

----- Spooler Site Parameters Edit
      [XU-SPL-SITE]
```

Table 6-6: XU-SPL-MGR—Menu tree

XUSPY


System Security (XUSPY)
----- Review Users [XUSER SEC OFCR]
User Inquiry [XUSERINQ]
List users [XUSERLIST]
User Status Report [XUUSERSTATUS]
Find a user [XUFINDUSER]
Access to VA FileMan Files [XUFILEACCESS SEC OFCR]
Inquiry to a User's File Access [XUFILEINQUIRY]
List Access to Files by File number [XUFILELIST]
Print Users Files [XUFILEPRINT]
----- Menu Management Review [XU SEC OFCR]
Inquire [XUINQUIRE]
Option Access By User [XUOPTWHO]
Print Option File [XUPRINT]
Diagram Menus [XUUSERACC]
Abbreviated Menu Diagrams [XUUSERACC2]
Secure Menu Delegation [XQSMD SEC OFCR]
Show a Delegate's Options [XQSMD SHOW]
List Delegated Options and their Users [XQSMD BY OPTION]
Print All Delegates and their Options [XQSMD BY USER]

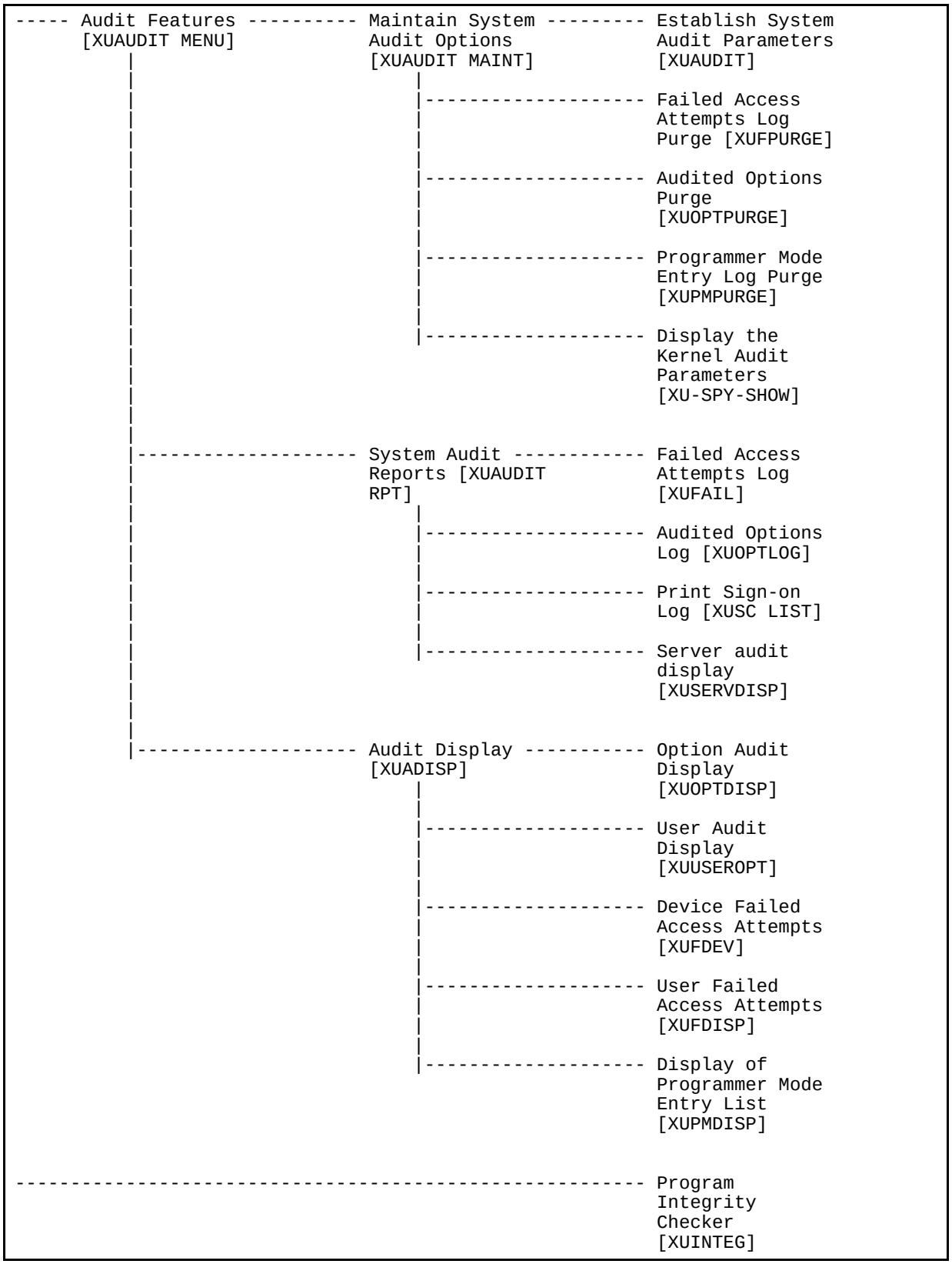
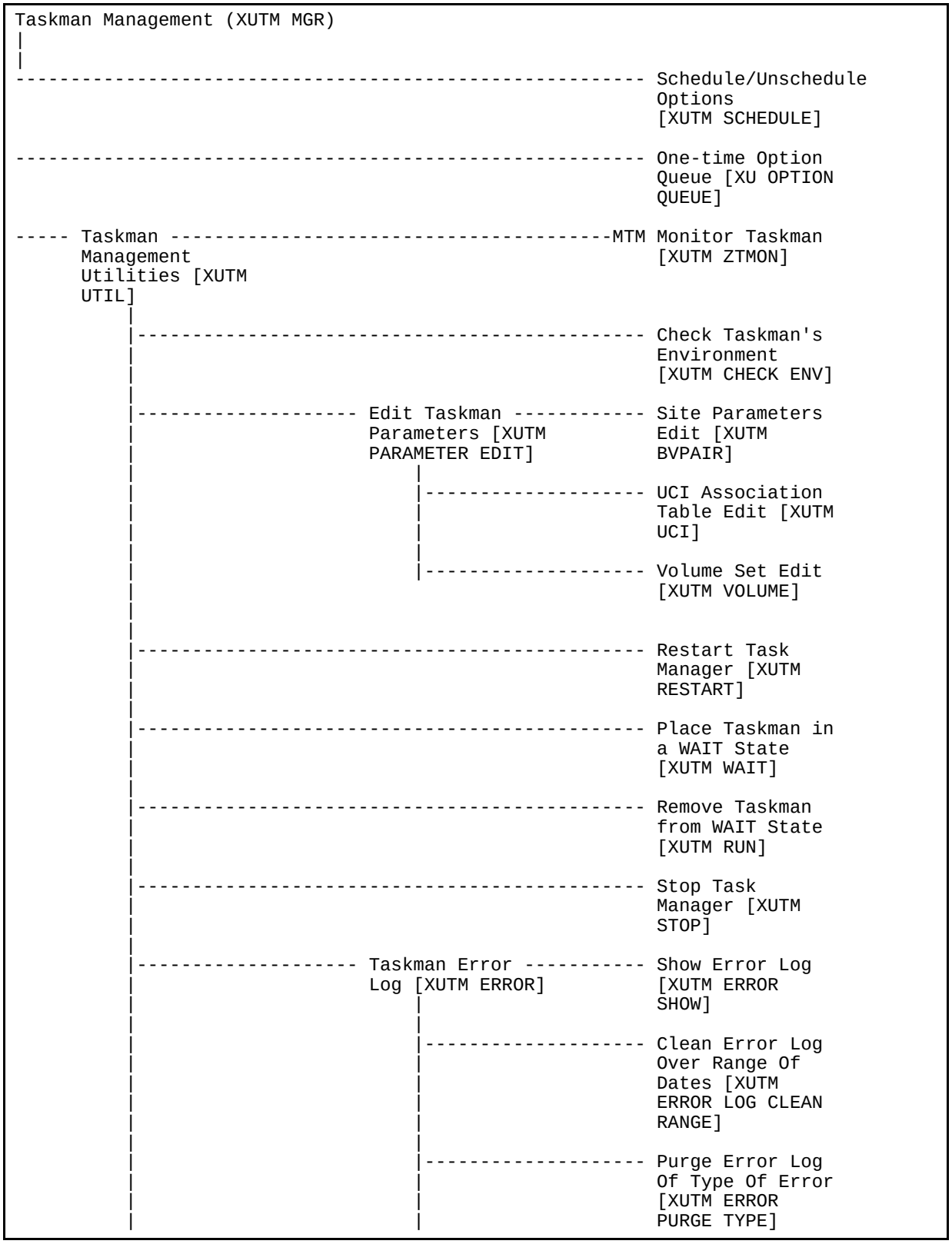


Table 6-7: XUSPY—Menu tree

XUTM MGR


Taskman Management (XUTM MGR)
Schedule/Unschedule Options [XUTM SCHEDULE]
One-time Option Queue [XU OPTION QUEUE]
Taskman Management Utilities [XUTM UTIL]
MTM Monitor Taskman [XUTM ZTMON]
Check Taskman's Environment [XUTM CHECK ENV]
Edit Taskman Parameters [XUTM PARAMETER EDIT]
Site Parameters Edit [XUTM BVPAIR]
UCI Association Table Edit [XUTM UCI]
Volume Set Edit [XUTM VOLUME]
Restart Task Manager [XUTM RESTART]
Place Taskman in a WAIT State [XUTM WAIT]
Remove Taskman from WAIT State [XUTM RUN]
Stop Task Manager [XUTM STOP]
Taskman Error Log [XUTM ERROR]
Show Error Log [XUTM ERROR SHOW]
Clean Error Log Over Range Of Dates [XUTM ERROR LOG CLEAN RANGE]
Purge Error Log Of Type Of Error [XUTM ERROR PURGE TYPE]

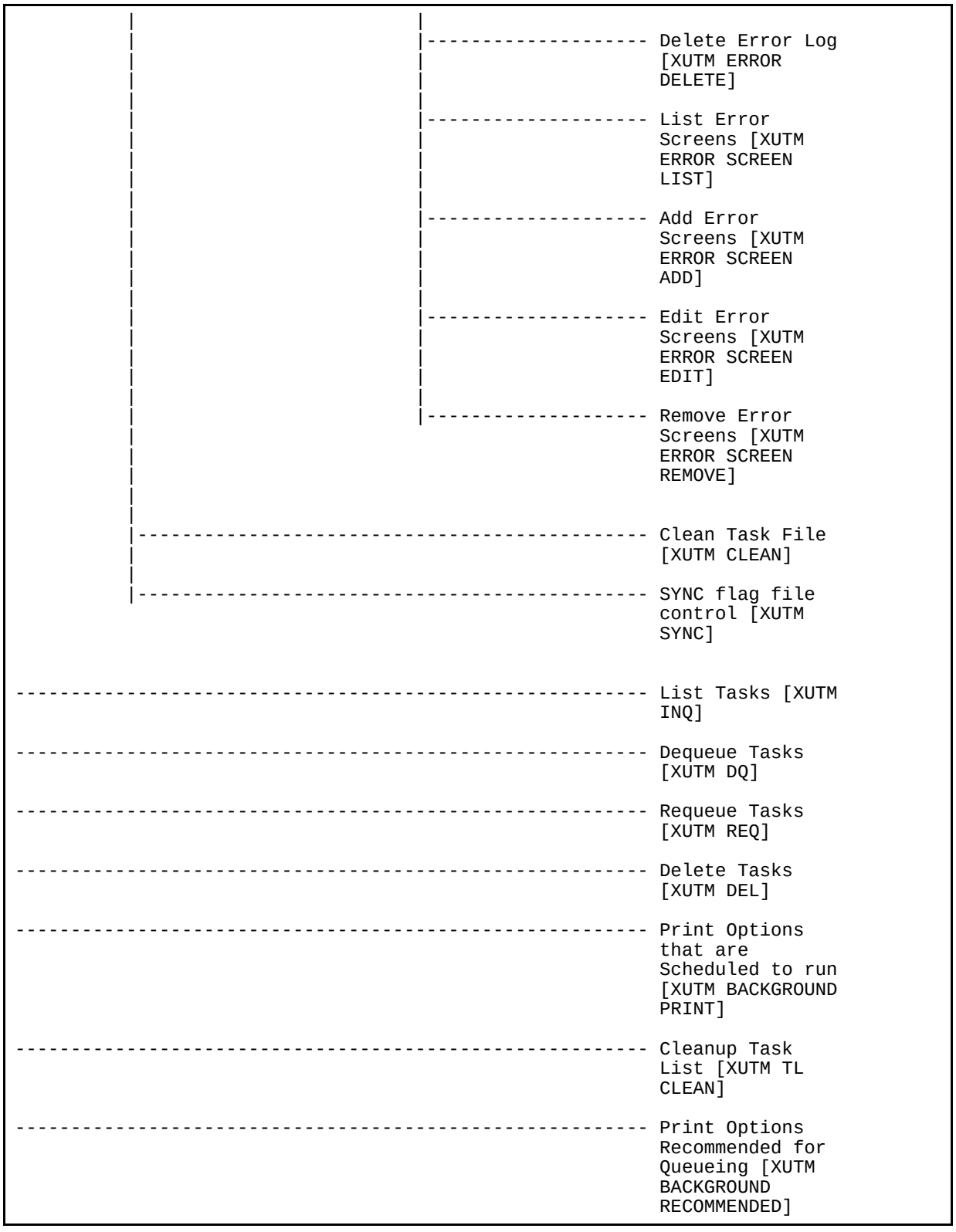
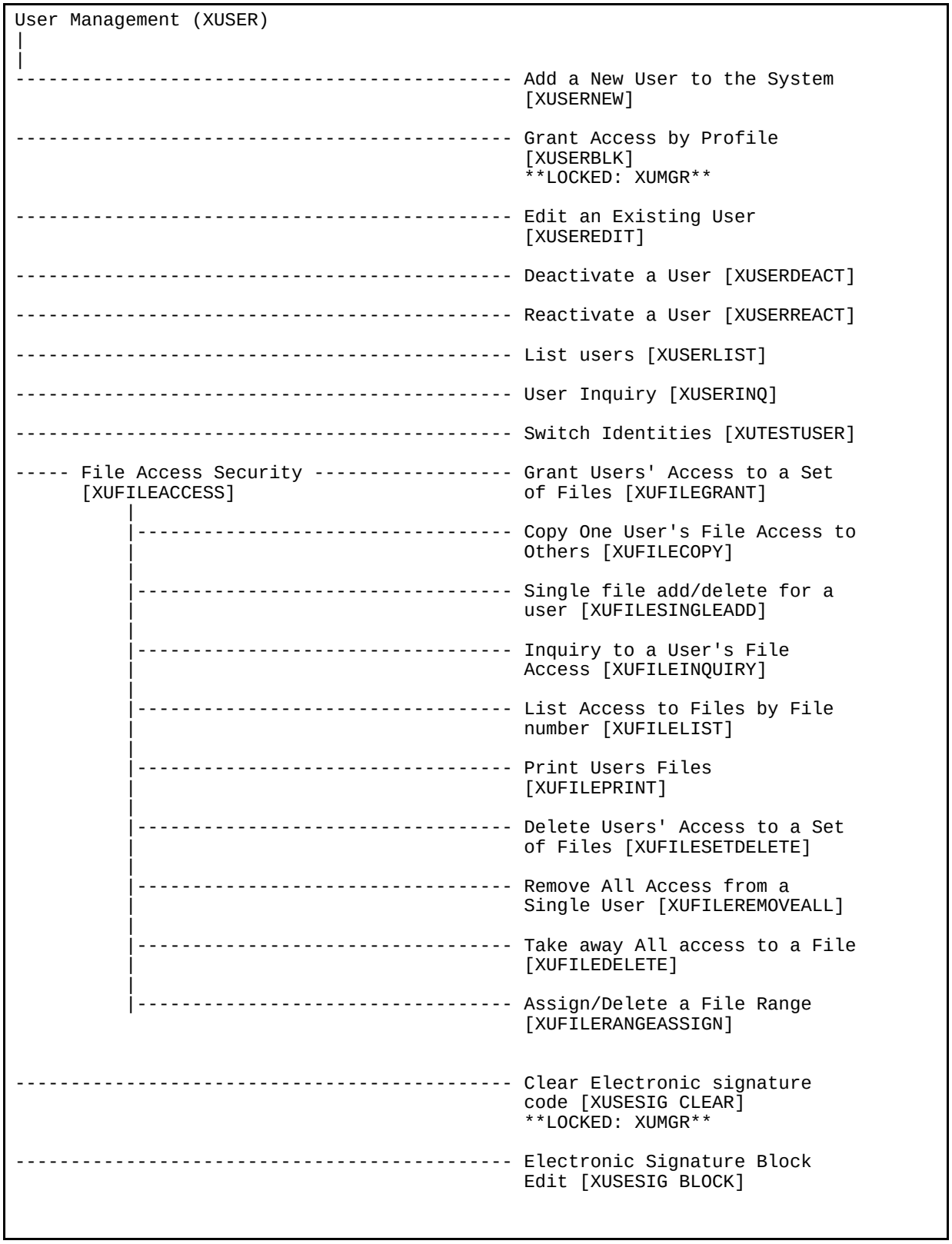


Table 6-8: XUTM MGR—Menu tree

XUSER


User Management (XUSER)
Add a New User to the System [XUSERNEW]
Grant Access by Profile [XUSERBLK] **LOCKED: XUMGR**
Edit an Existing User [XUSEREDIT]
Deactivate a User [XUSERDEACT]
Reactivate a User [XUSERREACT]
List users [XUSERLIST]
User Inquiry [XUSERINQ]
Switch Identities [XUTESTUSER]
File Access Security [XUFILEACCESS]
Grant Users' Access to a Set of Files [XUFILEGRANT]
Copy One User's File Access to Others [XUFILECOPY]
Single file add/delete for a user [XUFILESINGLEADD]
Inquiry to a User's File Access [XUFILEINQUIRY]
List Access to Files by File number [XUFILELIST]
Print Users Files [XUFILEPRINT]
Delete Users' Access to a Set of Files [XUFILESETDELETE]
Remove All Access from a Single User [XUFILEREMOVEALL]
Take away All access to a File [XUFILEDELETE]
Assign/Delete a File Range [XUFILERANGEASSIGN]
Clear Electronic signature code [XUSESIG CLEAR] **LOCKED: XUMGR**
Electronic Signature Block Edit [XUSESIG BLOCK]

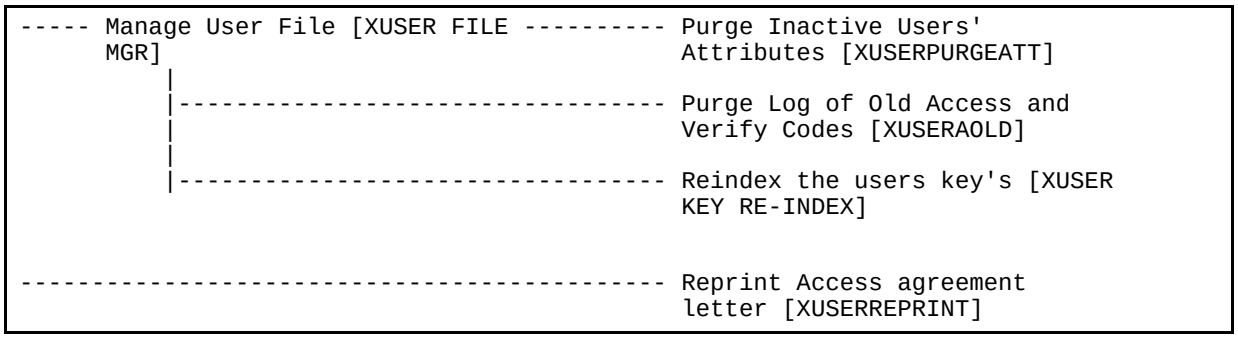


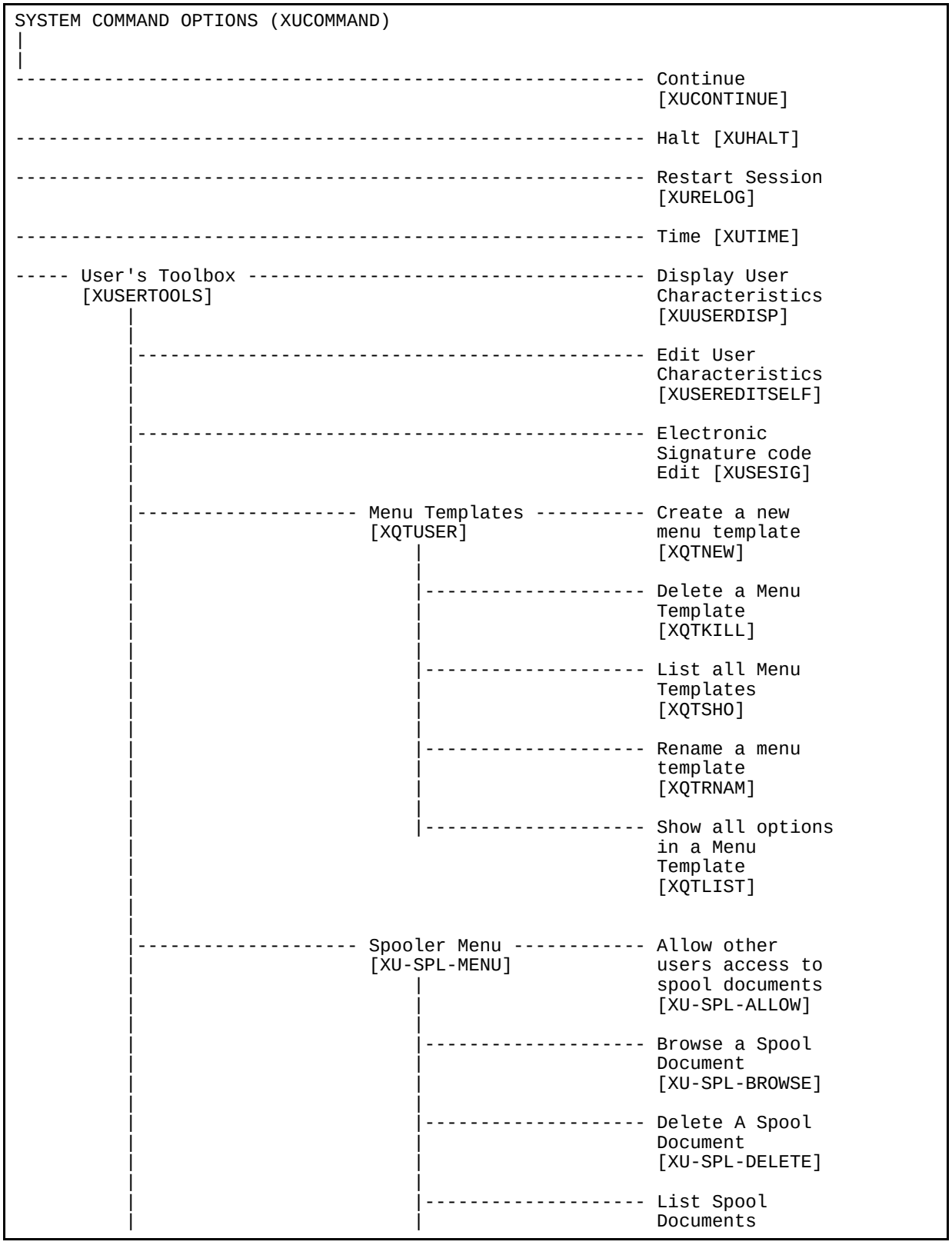
Table 6-9: XUSER—Menu tree

Parent of Queuable Options [ZTMQUEUABLE OPTIONS]

```
Parent of Queuable Options (ZTMQUEUABLE OPTIONS)
|
|
----- Automatic Deactivation of Users
      [XUAUTODEACTIVATE]

----- Clear all users at startup
      [XUSER-CLEAR-ALL]

----- Copy the compiled menus from the
      print server [XU-486 MENU COPY]

----- Error trap Auto clean [XUERTRP
      AUTO CLEAN]

----- Errors Logged in Alpha/Beta Test
      (QUEUED) [XQAB ERROR LOG XMIT]

----- Monitor Routines for Changes
      [XTRMONITOR]

----- Non-interactive Build Primary
      Menu Trees [XQBUILDTREEQUE]

----- One-time Option Start (Internal
      Use Only) [XU OPTION START]

----- Print 1 occurence of each error
      for T-1 (QUEUE) [XUERTRP PRINT
      T-1 1 ERR]

----- Print 2 occurrences of errors on
      T-1 (QUEUED) [XUERTRP PRINT T-1 2
      ERR]

----- Purge of the %ZUA global.
      [XUSAZONK]

----- Purge old spool documents
      [XU-SPL-PURGE]

----- Purge Sign-On log [XUSCZONK]

----- Queuable Task Log Cleanup [XUTM
      QCLEAN]
```

Table 6-10: ZTMQUEUABLE OPTIONS—Menu tree

SYSTEM COMMAND OPTIONS [XUCOMMAND]



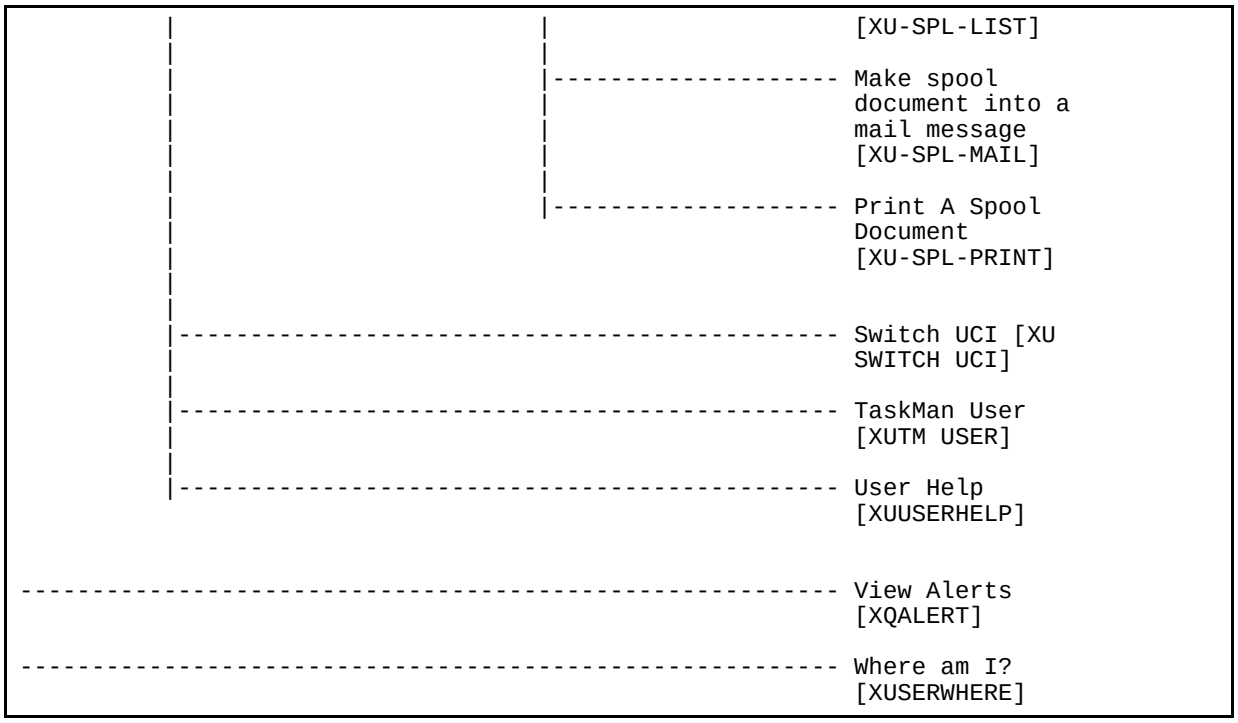


Table 6-11: XUCOMMAND—Menu tree

Extended-Action Options

Option	Description
XU USER SIGN-ON	This is a protocol option to link other software applications that want to know about a user signon event. The protocols must not READ/WRITE to the screen because it may be doing a GUI signon. They can set text that is displayed to the user by calling SET^XUS1A(string) The first character should be a "**!**" to cause the text to be placed on a new line. DUZ will be defined but other variables may not be. It is called from XUS1A.
XU USER TERMINATE	This is a protocol to link other software applications that want to know about a USER TERMINATE event. Other software can attach to this protocol option and they will be called when a USER is Terminated. The call is just after the users Access and Verify codes have been removed. DUZ will be the person that is running the terminate option. XUIFN points to the NEW PERSON file (#200) entry that is being terminated. Returns selected File #200 data to XUSR(field name) array for NEW PERSON components. It is called in XUSTERM from XUSERP.

Table 6-12: Extended-action options

Server Options

Option	Description
XQAB ERROR LOG SERVER	This server option is used to store data sent by the XQAB ERROR LOG XMIT option back to the developing site (usually an OIFO). As a server to which the mail messages containing data on the types and frequencies of errors associated with a software application in alpha or beta test, this option starts a routine that processes the message contents and stores the data in File #8991.5 (^XTV(8991.5,...). The contents of the file can be processed using several options or by the use of VA FileMan directly. The file contains data on the: • Type of error. • Routine involved. • Option that was in use at the time of the error. • Date. • Number of errors for that date, by site (and if multiple error traps are used at a site, by the VOL,UCI).
XQSCHK	This server-type option is used to test other servers by examining the host OPTION file (#19) and returning the data associated with the target server. A message is sent to the host site with the name of the server option to be examined on the first line of the message.
XQSPING	This is a PING server that works like PING under TCP/IP. If you send a message to this sever it sends it back to you, thereby showing that the network mail channel is open.
XU-PING-SERVER	This is a PING server that works like PING under TCP/IP. If you send a message to this server it sends it back to you.

Table 6-13: Server options

Options Attached to Menus for Other Software

Option	Description
XT-KERMIT SPOOL DL	"Download a Spool file entry"; attached to Kernel Toolkit's XT-KERMIT MENU option.

Table 6-14: Options attached to menus for other software

7. Cross-references

This chapter contains a description of the trigger and M-type cross-references that exist on fields in Kernel's files.

The cross-references are grouped by file. Within a file, cross-references are listed in cross-reference order. The field affected is identified along with the cross-reference's name (or number if there is no name) and a brief description.

No detailed description of the cross-references in the User and Person files is included because those files are being phased out.

USER File (#3)—(Obsolete) Replaced by NEW PERSON File (#200)

The USER file (#3) is obsolete and was replaced by the NEW PERSON file (#200). The USER file (#3) contained many M-type cross-references, ACX*, that were used to keep its data synchronized with the data in the NEW PERSON file (#200).

SIGN-ON LOG File (#3.081)

Field	Cross-reference ID	Description
SIGNOFF TIME	AC	This cross-reference clears ^XUSEC(0,'CUR' that keeps a list of user signons that is used by the FIND USER option.
DEVICE	ALDEV	This M-type cross-reference is used to tell which user last signed on to this device. There is no KILL logic. At most there would be one entry for each entry in the DEVICE file (#3.5).

Table 7-1: SIGN-ON LOG file (#3.081)—Cross-references

TERMINAL TYPE File (#3.2)

Field	Cross-reference ID	Description
XY CRT	(trigger)	This is a temporary trigger to phase out the old XY CRT field.

Table 7-2: TERMINAL TYPE file (#3.2)—Cross-references

DA RETURN CODES File (#3.22)

Field	Cross-reference ID	Description
DA RETURN STRING	B1	This is a workaround for VA FileMan only allowing 30 characters in a normal B cross-reference. Makes it look like an old MNEMONIC.

Table 7-3: DA RETURN CODES file (#3.22)—Cross-references

DEVICE File (#3.5)

Field	Cross-reference ID	Description
$I	(trigger)	Whenever the $I is edited, the new value of $I is triggered into the name field of the RESOURCE file (#3.54). This ensures that an entry in the RESOURCE File (#3.54) is established for every device entry of TYPE RESOURCE.
TYPE	(trigger)	Whenever the TYPE field of the DEVICE File (#3.5) is changed to TYPE RESOURCE, the value of $I is triggered into the NAME field of the RESOURCE file (#3.54). This ensures that an entry in the RESOURCE file (#3.54) is established for every device entry of TYPE RESOURCE.
TYPE	(trigger)	Whenever a device entry is created with a TYPE RESOURCE, a default value of "1" is triggered into the AVAILABLE SLOTS field of the RESOURCE file (#3.54).
RESOURCE SLOTS	(trigger)	This cross-reference triggers a value into the AVAILABLE SLOTS field (#1) of the RESOURCE file (#3.54). This value is the RESOURCE SLOTS (#35) of the DEVICE file (#3.5) minus the number of SLOTS IN USE (#2) of the RESOURCE file (#3.54).
VOLUME SET(CPU)	AC	This sets up the "G" cross-reference used to identify the primary device. The AC cross-reference is needed to support the "G" cross-reference because the "G" cross-reference is multi-field indexed.
$I	ACPU	This sets up the "CPU" cross-reference used to find devices that have a particular $I on a specified VOLUME SET(CPU).
$I	AD	This sets up the "G" cross-reference used to identify the primary device.
VOLUME SET(CPU)	CPU	This cross-reference is a multi-field index. The lookup key is a combination of $I (#1) and VOLUME SET(CPU) (#1.9) fields.

Field	Cross-reference ID	Description
SUBTYPE	D	This cross-reference updates the MARGIN WIDTH, FORM FEED, PAGE LENGTH, and BACKSPACE fields with values from corresponding fields of the TERMINAL TYPE file. This will occur whenever the subtype field is edited.
SIGN-ON/SYSTEM DEVICE	G	The "G" cross-reference is a multi-field index. This index is used to identify the primary device. The fields that affect this cross-reference are $I (#1), VOLUME SET(CPU) (#1.9), and SIGN-ON/SYSTEM DEVICE (#1.95).

Table 7-4: DEVICE file (#3.5)—Cross-references

SPOOL DOCUMENT File (#3.51)

Field	Cross-reference ID	Description
USER	AOK	The "AOK" cross-reference identifies who has access to this document. The creator of the document is automatically assigned access.
OTHER AUTHORIZED USERS (Subfield of OTHER AUTHORIZED USERS Multiple)	AOK2	The "AOK2" cross-reference sets the "AOK" cross-reference. The "AOK" cross-reference identifies who has authorized access to an individual document.

Table 7-5: SPOOL DOCUMENT file (#3.51)—Cross-references

INSTITUTION File (#4)

Field	Cross-reference ID	Description
AGENCY CODE	(trigger)	Link to keep Fields #95 and #97 in sync.
POINTER TO AGENCY	(trigger)	Link to keep Fields #95 and #97 in sync.
*PACKAGE X-REF	AP	Special software cross-reference.
NAME	AP1	Special software cross-reference.

Table 7-6: INSTITUTION file (#4)—Cross-references

MAILMAN SITE PARAMETERS File (#4.3)

Field	Cross-reference ID	Description
TIME ZONE	AC	This cross-reference is used to record the name of the time zone that is the correct time zone for the local site.
DOMAIN NAME	AD	This cross-reference is used to record the pointer to the domain that is the name of the local site.
PARENT	AE	This cross-reference is used to record the name of the domain that is the Parent of the local site.
DOMAIN NAME	AF	This cross-reference is used to record the human readable name of the local site's identity.
*TASKMAN PRIORITY	ATM13	This cross-reference is obsolete, as is the field.
*TASKMAN PARTITION SIZE	ATM14	This cross-reference is obsolete, as is the field.
*TASKMAN RETENTION TIME	ATM15	This cross-reference is obsolete, as is the field.
*TASKMAN HANG BETWEEN JOBS	ATM16	This cross-reference is obsolete, as is the field.
*VOLUME SET (Subfield of *VOLUME SET Multiple)	AC	This cross-reference is obsolete, as is the field.
*VOLUME SET (Subfield of *VOLUME SET multiple)	ATM01	This cross-reference is obsolete, as is the field.
*INHIBIT LOGONS? (Subfield of *VOLUME SET Multiple)	ATM1	This cross-reference is obsolete, as is the field.
*MAX SIGNON ALLOWED (Subfield of *VOLUME SET Multiple)	ATM2	This cross-reference is obsolete, as is the field.
*UCI (Subfield of *VOLUME SET Multiple)	AC	This cross-reference is obsolete, as is the field.
*LINKED VOLUME SET (Subfield of *LINKED VOLUME SET Multiple of *UCI Multiple of *VOLUME SET Multiple)	AC	This cross-reference is obsolete, as is the field.

Field	Cross-reference ID	Description
*LINKED UCI (Subfield of *LINKED VOLUME SET Multiple of *UCI Multiple of *VOLUME SET Multiple)	AT	This cross-reference is obsolete, as is the field.
*TASKMAN JOB LIMIT (Subfield of *VOLUME SET Multiple)	ATM7	This cross-reference is obsolete, as is the field.
*OUT OF SERVICE? (Subfield of *VOLUME SET Multiple)	ATM8	This cross-reference is obsolete, as is the field.
*REPLACEMENT VOLUME SET (Subfield of *VOLUME SET Multiple)	ATM9	This cross-reference is obsolete, as is the field.
*LOG RESOURCE USAGE?	ATM300	This cross-reference is obsolete, as is the field.

Table 7-7: MAILMAN SITE PARAMETERS file (#4.3)—Cross-references

PROVIDER File (#6)—(Obsolete) Replaced by NEW PERSON File (#200)

The PROVIDER file (#6) is obsolete and was replaced by the NEW PERSON file (#200). The PROVIDER file (#6) contained many M-type cross-references, ACX*, that were used to keep its data synchronized with the data in the NEW PERSON file (#200).

HELP FRAME File (#9.2)

Field	Cross-reference ID	Description
NAME	(trigger)	This trigger sets the DATE ENTERED field to the date and time when the help frame is created.
NAME	(trigger)	This cross-reference marks Help Frames with the creator in the AUTHOR field.

Table 7-8: HELP FRAME file (#9.2)—Cross-references

BUILD File (#9.6)

Field	Cross-reference ID	Description
SEND FULL OR PARTIAL DD (Subfield of FILE Multiple)	(trigger)	This cross-reference sets the DATA COMES WITH FILE field to "NO" if the Data Dictionary is a PARTIAL.
DATA COMES WITH FILE (Subfield of FILE Multiple)	(trigger)	This cross-reference sets the SEND FULL OR PARTIAL DD field to FULL when sending data with a file.
ENTRIES (Subfield of ENTRIES Multiple of BUILD COMPONENTS Multiple)	(trigger)	This trigger updates the FILE field (#.02), with the appropriate file number for this template. It is only triggered for VA FileMan template components.
SEND FULL OR PARTIAL DD (Subfield of FILE Multiple)	AC	This cross-reference is to clean up the partial DD information when you send a Full DD.
DD NUMBER (Subfield of DD NUMBER Multiple of FILE Multiple)	APDD	Used to create an array structure containing Partial DDs. This array is passed to FIA^DIFROMSU as a list of DD numbers and fields to transport.
FIELD NUMBER (Subfield of DD NUMBER Multiple of FILE Multiple)	APDD	Used to create an array structure containing Partial DDs. This array is passed from FIA^DIFROMSU as a list of DD numbers and fields to transport.

Table 7-9: BUILD file (#9.6)—Cross-references

INSTALL File (#9.7)

Field	Cross-reference ID	Description
INSTALL ORDER	AS	This cross-reference uses the STARTING PACKAGE field as the 3rd subscript. It is used to find the first software application (package) in a linked package and the order to install this software.
STARTING PACKAGE	ASP	This cross-reference uses the INSTALL ORDER field as the 4th subscript. It is used to find the first software application (package) in a linked package and the order to install this software.

Table 7-10: INSTALL file (#9.7)—Cross-references

VOLUME SET File (#14.5)

Field	Cross-reference ID	Description
VOLUME SET	AC	This cross-reference updates the cross-references in the UCI ASSOCIATION file (#14.6) whenever a pointed-to volume set changes.
VOLUME SET	AD	This cross-reference notifies TaskMan of changes to the field.
INHIBIT LOGONS?	AE	This cross-reference notifies TaskMan of changes to the field.
INHIBIT LOGONS?	AF	Tells MenuMan, Security, and TaskMan when logons are inhibited.
OUT OF SERVICE?	AE2	This cross-reference notifies TaskMan of changes to this field.

Table 7-11: VOLUME SET file (#14.5)—Cross-references

UCI ASSOCIATION File (#14.6)

Field	Cross-reference ID	Description
FROM VOLUME SET	(trigger)	This cross-reference triggers changing the free text value in Field #1.5 that corresponds to the pointer value in this field.
TO VOLUME SET	(trigger)	This cross-reference triggers changing the free text value in Field #2.5 to correspond to the pointer value in this field.
FROM UCI	AC	This cross-reference updates the "AT" and "AV" indices.
FROM VOLUME SET (FREE TEXT)	AD	This cross-reference updates the "AT" and "AV" indices.
TO VOLUME SET (FREE TEXT)	AE	This cross-reference updates the "AT" and "AV" indices.
TO UCI	AF	This cross-reference updates the "AT" and "AV" indices.

Table 7-12: UCI ASSOCIATION file (#14.6)—Cross-references

TASKMAN SITE PARAMETERS File (#14.7)

Field	Cross-reference ID	Description
TASK PARTITION SIZE	AC	This cross-reference notifies TaskMan of changes to the field.
TASKMAN JOB LIMIT	AD	This cross-reference notifies TaskMan of changes to the field.
TASKMAN HANG BETWEEN NEW JOBS	AE	This cross-reference notifies TaskMan of changes to the field.
BOX-VOLUME PAIR	AF	This cross-reference notifies TaskMan of changes to the field.

Table 7-13: TASKMAN SITE PARAMETERS file (#14.7)—Cross-references

PERSON File (#16)—(Obsolete) Replaced by NEW PERSON File (#200)

The PERSON file (#16) is obsolete and replaced by the NEW PERSON file (#200). The PERSON file (#16) contained many M-type cross-references, ACX*, that were used to keep its data synchronized with the data in the NEW PERSON file (#200).

OPTION File (#19)

Field	Cross-reference ID	Description
NAME	(trigger)	This trigger is used to record the user who created this option at the time that the name was created.
MENU TEXT	(trigger)	This cross-reference triggers the UPPERCASE MENU TEXT field that builds the C cross-reference. It is also used by the menu system to build the compiled menus.
REVERSE/ NEGATIVE LOCK	(trigger)	Trigger to set a value of 1 into field #.16 if a reverse key is present on this option.
QUEUING REQUIRED (Subfield of TIME PERIOD)	(trigger)	This trigger cross-reference sets a flag in the 0th node of the option when output restrictions are in effect. $P(XQY0,U,18) will be 1 if there are restrictions, and null if there are not. This flag is used by TaskMan to see if queueing is required in ^%ZTLOAD.
EXIT ACTION	(trigger)	This trigger sets the value 1 into field .15 when a value is entered on the current field. This permits identification of the presence of an exit action without having to determine whether a node 15 exists or not.

Field	Cross-reference ID	Description
ENTRY ACTION	(trigger)	This trigger sets the value 1 into field 14 when a value is entered on the current field. This permits identification of the presence of an entry action without having to determine whether a node 20 exists or not.
HEADER	(trigger)	This trigger sets the field HEADER PRESENT to "1" when there is M code in the field HEADER. HEADER PRESENT is carried as a flag in the 0th node of each option.
MENU TEXT	AE	This is a null cross-reference used to overwrite the previous cross-reference which set the uppercase text.
E ACTION PRESENT	AF	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
X ACTION PRESENT	AG	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
MENU TEXT	AOA	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
OUT OF ORDER MESSAGE	AOB	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
LOCK	AOC	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
PROHIBITED TIMES	AOD	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
TIMES/DAYS PROHIBITED (Subfield of TIMES PROHIBITED)	AOD1	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
MENU (Subfield of ITEM)	AOE	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
MENU (Subfield of SYNONYM)	AOF	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.

Field	Cross-reference ID	Description
HELP FRAME	AOG	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
TYPE	AOH	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
PRIORITY	AOI	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
RESTRICT DEVICES?	AOJ	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
MENU (Subfield of DISPLAY ORDER)	AOK	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
TYPE	AOR	This sets the AOR cross-reference on the file if the option type is either a protocol or a protocol menu.
MENU TEXT	AORK	This sets the "AORK" cross-reference on the file if the option type is either a protocol or a protocol menu.
REVERSE/ NEGATIVE LOCK	AREDO	This cross-reference causes the option to be flagged for updating in the menu trees so that the changes effecting display and/or access to the option are correctly updated.
*SPECIAL QUEUEING	ASTARTUP	This field and cross-reference are being replaced by a field in the new OPTION SCHEDULING file (#19.2).
*QUEUED TO RUN AT WHAT TIME	AZT	This field and cross-reference are being replaced by a field in the new OPTION SCHEDULING file (#19.2).
*DEVICE FOR QUEUED JOB OUTPUT	AZTIO	This field and cross-reference are being replaced by a field in the new OPTION SCHEDULING file (#19.2).
*QUEUED TO RUN ON VOLUME SET	AZTVOL	This field and cross-reference are being replaced by a field in the new OPTION SCHEDULING file (#19.2).

Table 7-14: OPTION file (#19)—Cross-references

SECURITY KEY File (#19.1)

Field	Cross-reference ID	Description
NAME	AC	This cross-reference cleans up the XUSEC global if a key is removed by an application calling DIK directly. If the UNEDITABLE flag was removed and the KEY name changed, it would clean up the old name from XUSEC but would *not* set in the new name. To do that, the M cross-reference on the KEY subfile of the NEW PERSON file (#200) needs to be re-indexed.
DESCRIPTIVE NAME	E	This is a normal cross-reference that has the special code to see that the cross-reference is in all uppercase for an easy lookup.

Table 7-15: SECURITY KEY file (#19.1)—Cross-references

OPTION SCHEDULING File (#19.2)

Field	Cross-reference ID	Description
QUEUED TO RUN AT WHAT TIME	AZT	This cross-reference causes the entry or deletion of a value (if it is not part of a software install) to set or remove the option as a task queued for the specified time.
DEVICE FOR QUEUED JOB OUTPUT	AZTIO	This cross-reference causes the update of the task record. To reflect changes to the device.
QUEUED TO RUN ON VOLUME SET	AZTVOL	This cross-reference causes the updating of the ZTVOL value (if it is not part of a software install) for the option as a queued task.
SPECIAL QUEUEING	ASTARTUP	This cross-reference causes the updating of the option as a startup option to be started when the system is started.

Table 7-16: OPTION SCHEDULING file (#19.2)—Cross-references

NEW PERSON File (#200)

Field	Cross-reference ID	Description
NAME	(trigger)	This is the cross-reference that keeps names in 3-16 the same as in 200. It also allows LAYGO of new entries if they are missing.

Field	Cross-reference ID	Description
VERIFY CODE	(trigger)	Triggers the DATE VERIFY CODE LAST CHANGED field.
DELEGATE OF	(trigger)	Triggers the DELEGATION DATE field.
DELEGATED OPTIONS (Subfield of DELEGATED OPTIONS Multiple)	(trigger)	This is a trigger cross-reference.
DELEGATED OPTIONS (Subfield of DELEGATED OPTIONS Multiple)	(trigger)	This is a trigger cross-reference.
KEY (Subfield of KEYS Multiple)	(trigger)	Edited trigger cross-reference.
KEY (Subfield of KEYS Multiple)	(trigger)	Edited trigger cross-reference.
DELEGATED KEY (Subfield of DELEGATED KEY Multiple)	(trigger)	This keeps track of who gave the key for delegation.
DELEGATED KEYS (Subfield of DELEGATED KEY Multiple)	(trigger)	This sets when a delegated key was given.
ACCESS CODE	A	ACCESS CODE lookup.
TYPE-AHEAD	AB2	If the user changes value, this changes the type-ahead value.
KEYS (Subfield of KEYS Multiple)	AC	This is the cross-reference that keeps the ^XUSEC (key name, DUZ) global in place. This global is used by the menu system and other to check if a new person holds a given key.
STREET ADDRESS 1	ACX1	Used to keep Files #3, #16, and #200 in sync.
STREET ADDRESS 2	ACX2	Used to keep Files #3, #16, and #200 in sync.
STREET ADDRESS 3	ACX3	Used to keep Files #3, #16, and #200 in sync.
CITY	ACX4	Used to keep Files #3, #16, and #200 in sync.
STATE	ACX5	Used to keep Files #3, #16, and #200 in sync.
ZIP CODE	ACX6	Used to keep Files #3, #16, and #200 in sync.
TEMPORARY ADDRESS 1	ACX7	Used to keep Files #3, #16, and #200 in sync.
TEMPORARY ADDRESS 2	ACX8	Used to keep Files #3, #16, and #200 in sync.
TEMPORARY ADDRESS 3	ACX9	Used to keep Files #3, #16, and #200 in sync.

Field	Cross-reference ID	Description
TEMPORARY CITY	ACX10	Used to keep Files #3, #16, and #200 in sync.
TEMPORARY STATE	ACX11	Used to keep Files #3, #16, and #200 in sync.
TEMPORARY ZIP CODE	ACX12	Used to keep Files #3, #16, and #200 in sync.
PHONE	ACX13	Used to keep Files #3, #16, and #200 in sync.
OFFICE PHONE	ACX14	Used to keep Files #3, #16, and #200 in sync.
PHONE #3	ACX15	Used to keep Files #3, #16, and #200 in sync.
PHONE #4	ACX16	Used to keep Files #3, #16, and #200 in sync.
START DATE OF TEMP ADDRESS	ACX17	Used to keep Files #3, #16, and #200 in sync.
END DATE OF TEMP ADDRESS	ACX18	Used to keep Files #3, #16, and #200 in sync.
SIGNATURE BLOCK PRINTED NAME	ACX20	Used to keep Files #3, #16, and #200 in sync.
SIGNATURE BLOCK TITLE	ACX21	Used to keep Files #3, #16, and #200 in sync.
DOB	ACX22	Used to keep Files #3, #16, and #200 in sync.
ELECTRONIC SIGNATURE CODE	ACX23	Used to keep Files #3, #16, and #200 in sync.
FILE MANAGER ACCESS CODE	ACX25	Used to keep Files #3, #16, and #200 in sync.
MAIL CODE	ACX26	Used to keep Files #3, #16, and #200 in sync.
NICK NAME	ACX27	Used to keep Files #3, #16, and #200 in sync.
SERVICE/SECTION	ACX28	Used to keep Files #3, #16, and #200 in sync.
TERMINATION DATE	ACX29	Used to keep Files #3, #16, and #200 in sync.
TITLE	ACX30	Used to keep Files #3, #16, and #200 in sync.
INITIAL	ACX31	Used to keep Files #3, #16, and #200 in sync.
SEX	ACX32	Used to keep Files #3, #16, and #200 in sync.
SSN	ACX33	Used to keep Files #3, #16, and #200 in sync.
INACTIVE DATE	ACX35	Used to keep Files #3, #16, and #200 in sync.
PROVIDER CLASS	ACX36	Used to keep Files #3, #16, and #200 in sync.
PROVIDER TYPE	ACX37	Used to keep Files #3, #16, and #200 in sync.
DEA#	ACX38	Used to keep Files #3, #16, and #200 in sync.
VA#	ACX39	Used to keep Files #3, #16, and #200 in sync.
NAME	AE	This cross-reference stuffs the DATE ENTERED and CREATOR fields on a new entry.
NAME	AF	Stuffs SIGNATURE BLOCK PRINTED NAME.

Field	Cross-reference ID	Description
NAME	AG	Builds the AK key special lookup cross-reference when there is a name change.
NAME	AH	This M cross-reference sets the PERSON FILE POINTER in place and sets the "A16" cross-reference of that field. For more information, please refer to the field description in the data dictionary.
KEYS (Subfield of KEYS Multiple)	AK	Special cross-reference to allow applications to do a lookup on just holders of a special key.
SECONDARY MENU OPTIONS (Subfield of SECONDARY MENU OPTIONS Multiple)	AOA	Stuffs the date and time of change into the TIMESTAMP subfield.
SECONDARY MENU OPTIONS (Subfield of SECONDARY MENU OPTIONS Multiple)	AOB	This cross-reference checks to see if this entry creates a new entry in the compiled menu tree in XUTL("XQO", If it is a new entry, then a flag is set by the code in XQ7 in the "AT" cross-reference of the OPTION file (^DIC(19,"AT", to cause the menu tree to be generated.
SYNONYM (Subfield of SECONDARY MENU OPTIONS Multiple)	AOB	Updates the timestamp field.
ACCESS CODE	AOLD	This is a list of used ACCESS CODES that *cannot* be used again until the OLD ACCESS CODE PURGE option is run.
CLASSIFICATION (Subfield of CLASSIFICATION Multiple)	ARC	This M cross-reference controls the "ARC" index.
SOCIAL WORKER?	ASWB	This M cross-reference is used for screening out non-social workers.
POSITION/TITLE	ASWE	This M cross-reference is used for chiefs, asst. chiefs, and supervisors only.
NAME	ASX	This builds a soundex cross-reference so that a check for similar names can be done at the time of LAYGOing to the file. It calls XUA4A71 to convert X. The LAYGO test calls XUA4A7.
ALERT DATE/TIME (Multiple) (Subfield of PACKAGE ID)	AXQA	This cross-reference is obsolete, as is the field.
PACKAGE ID (Subfield of ALERT DATE/TIME Multiple)	AXQAN	This cross-reference is obsolete, as is the field.

Field	Cross-reference ID	Description
NAME	BS5	This cross-reference builds the "BS5" cross-reference on name changes. The BS5 is the first letter of the last name concatenated with the last four digits of the SSN.
SSN	BS55	This is the "BS5" cross-reference on the SSN field. See the "BS5" cross-reference on the name field.
NICK NAME	D	The cross-reference is held in uppercase, it is a regular cross-reference otherwise.
VERIFY CODE	VOLD	This builds a list of old VERIFY CODEs that this user has had in the past. It is cleaned out with the same option the purges the old access code cross-reference.

Table 7-17: NEW PERSON file (#200)—Cross-references

KERNEL SYSTEM PARAMETERS File (#8989.3)

Field	Cross-reference ID	Description
DEFAULT INSTITUTION	AC	This keeps the default institution in sync between the MAILMAN SITE PARAMETERS file (#4.3, which previously contained the Kernel system parameters) and the KERNEL SYSTEM PARAMETERS file (#8989.3).
LOG RESOURCE USAGE?	AZTCP	This cross-reference updates TaskMan whenever the field changes. The code that supports this cross-reference loops through the VOLUME SET file (#14.5). For those with link access that are *not* out of service, it adjusts the LOGRSRC node to indicate whether or not what has changed.

Table 7-18: KERNEL SYSTEM PARAMETERS file (#8989.3)—Cross-references

ALERT File (#8992)

Field	Cross-reference ID	Description
ALERT DATE/TIME (Subfield of ALERT DATE/TIME Multiple)	B	This cross-reference prevents a "B" cross-reference from being built.
ALERT ID (Subfield of ALERT DATE/TIME Multiple)	AXQA	This is a cross-reference on the complete XQAID value for this alert, which can be used to identify those individuals who received this particular instance of the alert, and could be used to delete other entries that had received the alert.
ALERT ID (Subfield of ALERT DATE/TIME Multiple)	AXQAN	This cross-reference can be used to identify those users who received the alert with the software specified XQAID (the first ";" -piece of the complete XQAID value) for those cases in which the full XQAID value may not be known (e.g., an application that was selected by the user without selecting the ALERT ACTION option to process the alert).

Table 7-19: ALERT file (#8992)—Cross-references

Cross-references Brought in by Virgin Installation

The following additional files have M- or trigger-type cross-references. These additional files are brought in by Kernel V. 8.0 Virgin Install.

DOMAIN File (#4.2)

Field	Cross-reference ID	Description
FLAGS	AC	This cross-reference keeps track of domains that have the polling flag on.

Table 7-20: DOMAIN file (#4.2)—Cross-references (virgin installation)

SERVICE/SECTION File (#49)

Field	Cross-reference ID	Description
NATIONAL SERVICE	A2	This cross-reference represents a pointer to the NATIONAL SERVICE file (#730). The reference is ^DIC(49,"A2",DA,NATIONAL SERVICE)="".
COST CENTER	AD	This cross-reference represents the numeric value of cost center. Leading zeros are removed in setting this cross-reference. The reference is ^DIC(49,"AD",COST CENTER,DA)="".

Table 7-21: SERVICE/SECTION file (#49)—Cross-references (virgin installation)

8. Archiving and Purging

Archiving

There are no software-specific archiving procedures or recommendations for Kernel.

Purging

Kernel provides a number of options to facilitate the purging of Kernel files and the cleanup of Kernel-produced globals. The following table contains a list of the purging options. The recommended scheduling frequency is shown for some options; all such options are queueable. The Clear All Users at Startup option requires special queueing.

The location of a detailed discussion of each option is given in Table 8-1; unless otherwise noted, the reference given is to a chapter in the *Kernel Systems Manual*.

Purging Option	Frequency	References for More Information
Audited Options Purge		Menu Manager: System Management chapter & *Security Tools Manual*
Automatic Deactivation of Users	1 day	Signon/Security: System Management chapter
Clean Error Log over Range of Dates		TaskMan: System Management—Operation Chapter
Clean Old Job Nodes in ^XUTL	7 days	Menu Management: System Management Chapter
Clean Task File		TaskMan: System Management—Operation Chapter
Clear All Users at Startup		Signon/Security: System Management Chapter
Clean Error Trap		Error Processing Chapter
Deactivate a User		Signon/Security: System Management Chapter
Delete Error Log		TaskMan: System Management—Operation Chapter
Delete Old (>14 d) Alerts	1 day	Alerts Chapter
Failed Access Attempts Log Purge		Signon/Security: System Management Chapter & *Security Tools Manual*
Programmer Mode Entry Log Purge		Signon/Security: System Management Chapter & *Security Tools Manual*
Purge Error Log of Type of Error		TaskMan: System Management—Operation Chapter
Purge Inactive Users' Attributes		Signon/Security: System Management Chapter

Purging Option	Frequency	References for More Information
Purge Log of Old Access and Verify Codes	(up to site)	Signon/Security: System Management Chapter & *Security Tools Manual*
Purge of ^%ZUA Global	15 days	Signon/Security: System Management Chapter
Purge Old Spool Documents	7 days	Spooling Chapter
Purge Sign-on Log	1 day	Signon/Security: System Management Chapter & *Security Tools Manual*
Queuable Task Log Cleanup	1 day	TaskMan: System Management—Operation Chapter

Table 8-1: Kernel purging options

The "KIDS: System Management—Installations" chapter in the *Kernel Systems Manual* contains recommendations for purging the INSTALL (#9.7) and BUILD (#9.6) files.

9. Callable Entry Points

This chapter lists all Kernel Application Program Interfaces (APIs) that are available for general use.

A set of nodes is created during Kernel's installation that contains operating system-specific code. These nodes are descendent from ^%ZOSF. Most can be executed in application code.

Each operating system node is described in the "Operating System Interface: Programmer Tools" chapter in the *Kernel Programmer Manual*.

Every callable entry point and executable node is described in the *Kernel Programmer Manual*. Refer to the indicated chapter in that manual for details, including input and output variables for the calls.

Application Program Interfaces (APIs)

Entry Point	Description	Kernel Programmer Manual Reference Chapter
$$ATTRIB^MXMLDOM	XML—Get Attribute Name	XML: Programmer Tools
$$CHILD^MXMLDOM	XML—Get Child Node	XML: Programmer Tools
$$CMNT^MXMLDOM	XML—Extract Comment Text (True/False)	XML: Programmer Tools
$$EN^MXMLDOM	XML—Initial Processing, Build In-memory Image	XML: Programmer Tools
$$NAME^MXMLDOM	XML—Get Element Name	XML: Programmer Tools
$$PARENT^MXMLDOM	XML—Get Parent Node	XML: Programmer Tools
$$SIBLING^MXMLDOM	XML—Get Sibling Node	XML: Programmer Tools
$$TEXT^MXMLDOM	XML—Get Text (True/False)	XML: Programmer Tools
$$VALUE^MXMLDOM	XML—Get Attribute Value	XML: Programmer Tools
CMNT^MXMLDOM	XML—Extract Comment Text (True/False)	XML: Programmer Tools
DELETE^MXMLDOM	XML—Delete Document Instance	XML: Programmer Tools
TEXT^MXMLDOM	XML—Get Text (True/False)	XML: Programmer Tools
EN^MXMLPRSE	XML—Event Driven API	XML: Programmer Tools
$$XMLHDR^MXMLUTL	XML—Message Headers	XML: Programmer Tools
$$SYMENC^MXMLUTL	XML—Encoded Strings in Messages	XML: Programmer Tools
$$READ^XGF	Read Using Escape Processing	XGF Function Library: Programmer Tools

Entry Point	Description	Kernel Programmer Manual Reference Chapter
CHGA^XGF	Screen Change Attributes	XGF Function Library: Programmer Tools
CLEAN^XGF	Screen/Keyboard Exit and Cleanup	XGF Function Library: Programmer Tools
CLEAR^XGF	Screen Clear Region	XGF Function Library: Programmer Tools
FRAME^XGF	Screen Frame	XGF Function Library: Programmer Tools
INITKB^XGF	Keyboard Setup Only	XGF Function Library: Programmer Tools
IOXY^XGF	Screen Cursor Placement	XGF Function Library: Programmer Tools
PREP^XGF	Screen/Keyboard Setup	XGF Function Library: Programmer Tools
RESETKB^XGF	Exit XGF Keyboard	XGF Function Library: Programmer Tools
RESTORE^XGF	Screen Restore	XGF Function Library: Programmer Tools
SAVE^XGF	Screen Save	XGF Function Library: Programmer Tools
SAY^XGF	Screen String	XGF Function Library: Programmer Tools
SAYU^XGF	Screen String with Attributes	XGF Function Library: Programmer Tools
SETA^XGF	Screen Video Attributes	XGF Function Library: Programmer Tools
WIN^XGF	Screen Text Window	XGF Function Library: Programmer Tools
$$FIPS^XIPUTIL	FIPS Code for ZIP Code	Address Hygiene: Programmer Tools
$$FIPSCHK^XIPUTIL	Check for FIPS Code	Address Hygiene: Programmer Tools
CCODE^XIPUTIL	FIPS Code Data	Address Hygiene: Programmer Tools
POSTAL^XIPUTIL	ZIP Code Information	Address Hygiene: Programmer Tools
POSTALB^XIPUTIL	Active ZIP Codes	Address Hygiene: Programmer Tools
$$CRC16^XLFCRC	Cyclic Redundancy Code 16	XLF Function Library: Programmer Tools
$$CRC32^XLFCRC	Cyclic Redundancy Code 32	XLF Function Library: Programmer Tools

Entry Point	Description	Kernel Programmer Manual Reference Chapter
tag^XLFDT	Date Functions (many)	XLF Function Library: Programmer Tools
tag^XLFHYPER	Hyperbolic Trigonometric Functions (many)	XLF Function Library: Programmer Tools
tag^XLFMSMT	Measurement Functions (many)	XLF Function Library: Programmer Tools
tag^XLFMTH	Mathematical Computations (many)	XLF Function Library: Programmer Tools
tag^XLFNAME	Name Standardization functions (many)	Name Standardization: Programmer Tools
DELCOMP^XLFNAME2	Delete Name Components Entry (Controlled Subscription)	Name Standardization: Programmer Tools
UPDCOMP^XLFNAME2	Update Name Components Entry (Controlled Subscription)	Name Standardization: Programmer Tools
$$ADDRESS^XLFNSLK	Conversion (Domain Name to IP Addresses)	Domain Name Service (DNS): Programmer Tools
MAIL^XLFNSLK	Get IP Addresses for a Domain Name	Domain Name Service (DNS): Programmer Tools
tag^XLFSTR	String functions (many)	XLF Function Library: Programmer Tools
tag^XLFUTL	Utility functions (many)	XLF Function Library: Programmer Tools
EXIT^XPDID	Restore Screen, Clean Up Variables, and Display Text	KIDS: Programmer Tools
INIT^XPDID	Initialize Device and Draw Box Borders	KIDS: Programmer Tools
TITLE^XPDID	Display Title Text	KIDS: Programmer Tools
UPDATE^XPDID	Update Progress Bar	KIDS: Programmer Tools
EN^XPDIJ	Task Off KIDS Install (Controlled Subscription)	KIDS: Programmer Tools
$$PKGPAT^XPDIP	Update Patch History	KIDS: Programmer Tools
$$LKUP^XPDKEY	Look Up Security Key Value	Security Keys: Programmer Tools
$$RENAME^XPDKEY	Rename Security Key	Security Keys: Programmer Tools
DEL^XPDKEY	Delete Security Key	Security Keys: Programmer Tools
$$ADD^XPDMENU	Add Option to Menu	Menu Manager: Programmer Tools
DELETE^XPDMENU	Delete Menu Item	Menu Manager: Programmer Tools

Entry Point	Description	Kernel Programmer Manual Reference Chapter
LKOPT^XPDMENU	Look Up Option IEN	Menu Manager: Programmer Tools
OUT^XPDMENU	Edit Option's Out of Order Message	Menu Manager: Programmer Tools
RENAME^XPDMENU	Rename Option	Menu Manager: Programmer Tools
$$COMCP^XPDUTL	Complete Checkpoint	KIDS: Programmer Tools
$$CURCP^XPDUTL	Get Current Checkpoint Name/IEN	KIDS: Programmer Tools
$$LAST^XPDUTL	Last Software Patch	KIDS: Programmer Tools
$$NEWCP^XPDUTL	Create a Checkpoint	KIDS: Programmer Tools
$$OPTDE^XPDUTL	Disable/Enable an Option	KIDS: Programmer Tools
$$PARCP^XPDUTL	Get Checkpoint Parameter	KIDS: Programmer Tools
$$PATCH^XPDUTL	Verify Patch Installation	KIDS: Programmer Tools
$$PKG^XPDUTL	Parse Package Name from Build Name	KIDS: Programmer Tools
$$PRODE^XPDUTL	Disable/Enable a Protocol	KIDS: Programmer Tools
$$RTNUP^XPDUTL	Update Routine Action	KIDS: Programmer Tools
$$UPCP^XPDUTL	Update Checkpoint	KIDS: Programmer Tools
$$VER^XPDUTL	Parse Version from Build Name	KIDS" Programmer Tools
$$VERCP^XPDUTL	Verify Checkpoint	KIDS Programmer Tools
$$VERSION^XPDUTL	PACKAGE File Current Version	KIDS Programmer Tools
BMES^XPDUTL	Output Message with Blank Line	KIDS: Programmer Tools
MES^XPDUTL	Output a Message	KIDS: Programmer Tools
NEXT^XQ92	Restricted Times Check	Menu Manager: Programmer Tools
$$PENDING^XQALBUTL	Pending Alerts for a User	Alerts: Programmer Tools
$$PKGPEND^XQALBUTL	Pending Alerts for a User in Specified Software	Alerts: Programmer Tools
AHISTORY^XQALBUTL	Get Alert Tracking File Information	Alerts: Programmer Tools
ALERTDAT^XQALBUTL	Get Alert Tracking File Information	Alerts: Programmer Tools
DELSTAT^XQALBUTL	Get User Information and Status for Recent Alert	Alerts: Programmer Tools

Entry Point	Description	Kernel Programmer Manual Reference Chapter
NOTIPURG^XQALBUTL	Purge Alerts Based on Code	Alerts: Programmer Tools
PTPURG^XQALBUTL	Purge Alerts Based on Patient	Alerts: Programmer Tools
RECIPURG^XQALBUTL	Purge User Alerts	Alerts: Programmer Tools
USERDATA^XQALBUTL	Get User Information for an Alert	Alerts: Programmer Tools
USERLIST^XQALBUTL	Get Recipient Information for an Alert	Alerts: Programmer Tools
ACTION^XQALERT	Process an Alert	Alerts: Programmer Tools
DELETE^XQALERT	Clear Obsolete Alerts	Alerts: Programmer Tools
DELETEA^XQALERT	Clear Obsolete Alerts	Alerts: Programmer Tools
GETACT^XQALERT	Return Alert Variables	Alerts: Programmer Tools
PATIENT^XQALERT	Get Alerts for a Patient	Alerts: Programmer Tools
SETUP^XQALERT	Send Alerts	Alerts: Programmer Tools
USER^XQALERT	Get Alerts for a User	Alerts: Programmer Tools
USERDEL^XQALERT	Delete Alerts for a User	Alerts: Programmer Tools
FORWARD^XQALFWD	Forward Alerts	Alerts: Programmer Tools
$$CURRSURO^XQALSURO	Get Current Surrogate for Alerts	Alerts: Programmer Tools
$$GETSURO^XQALSURO	Get Current Surrogate Information	Alerts: Programmer Tools
REMVSURO^XQALSURO	Remove Surrogates for Alerts	Alerts: Programmer Tools
SETSURO1^XQALSURO	Establish a Surrogate for Alerts	Alerts: Programmer Tools
$$ACCESS^XQCHK	User Option Access Test	Menu Manager: Programmer Tools
OP^XQCHK	Current Option Check	Menu Manager: Programmer Tools
^XQDATE	Current Date/Time	Menu Manager: Programmer Tools
EN^XQH	Display Help Frames	Help Processor: Programmer Tools
EN1^XQH	Display Help Frames	Help Processor: Programmer Tools
ACTION^XQH4	Print Help Frame Tree	Help Processor: Programmer Tools
EN^XQOR	Navigating Protocols	Unwinder :Programmer Tools
EN1^XQOR	Navigating Protocols	Unwinder :Programmer Tools

Entry Point	Description	Kernel Programmer Manual Reference Chapter
MSG^XQOR	Enable HL7 Messaging	Unwinder :Programmer Tools
EN^XQORM	Menu Item Display and Selection	Unwinder :Programmer Tools
XREF^XQORM	Force Menu Recompile	Unwinder :Programmer Tools
DISP^XQORM1	Display Menu Selections From Help Code	Unwinder :Programmer Tools
$$EN^XUA4A71	Convert String to Soundex	XLF Function Library: Programmer Tools
$$CODE2TXT^XUA4A72	Get HCFA Text	User: Programmer Tools
$$GET^XUA4A72	Get Specialty and Subspecialty for a User	User: Programmer Tools
$$IEN2CODE^XUA4A72	Get VA Code	User: Programmer Tools
$$ACTIVE^XUAF4	Institution Active Facility (True/False)	Institution File: Programmer Tools
$$CIRN^XUAF4	Institution CIRN-enabled Field Value	Institution File: Programmer Tools
$$ID^XUAF4	Institution Identifier	Institution File: Programmer Tools
$$IDX^XUAF4	Institution IEN (Using Coding System & ID)	Institution File: Programmer Tools
$$IEN^XUAF4	IEN for Station Number	Institution File: Programmer Tools
$$LEGACY^XUAF4	Institution Realigned/Legacy (True/False)	Institution File: Programmer Tools
$$LKUP^XUAF4	Institution Lookup	Institution File: Programmer Tools
$$MADD^XUAF4	Institution Mailing Address	Institution File: Programmer Tools
$$NAME^XUAF4	Institution Official Name	Institution File: Programmer Tools
$$NNT^XUAF4	Institution Station Number, Name, and Type	Institution File: Programmer Tools
$$NS^XUAF4	Institution Name and Station Number	Institution File: Programmer Tools
$$O99^XUAF4	IEN of Merged Station Number	Institution File: Programmer Tools
$$PADD^XUAF4	Institution Physical Address	Institution File: Programmer Tools
$$PRNT^XUAF4	Institution Parent Facility	Institution File: Programmer Tools
$$RF^XUAF4	Realigned From Institution Information	Institution File: Programmer Tools
$$RT^XUAF4	Realigned To Institution Information	Institution File: Programmer Tools
$$STA^XUAF4	Station Number for IEN	Institution File: Programmer Tools

Entry Point	Description	Kernel Programmer Manual Reference Chapter
$$TF^XUAF4	Treating Facility (True/False)	Institution File: Programmer Tools
$$WHAT^XUAF4	Institution Single Field Information	Institution File: Programmer Tools
CDSYS^XUAF4	Coding System Name	Institution File: Programmer Tools
CHILDREN^XUAF4	List of Child Institutions for a Parent	Institution File: Programmer Tools
F4^XUAF4	Institution Data for a Station Number	Institution File: Programmer Tools
LOOKUP^XUAF4	Look Up Institution Identifier	Institution File: Programmer Tools
PARENT^XUAF4	Parent Institution Lookup	Institution File: Programmer Tools
SIBLING^XUAF4	Sibling Institution Lookup	Institution File: Programmer Tools
DEVICE^XUDHGUI	GUI Device Lookup	Device Handler: Programmer Tools
$$RES^XUDHSET	Set Up Resource Device	Device Handler: Programmer Tools
OPKG^XUHUI	Monitor New Style Cross-referenced Fields	Field Monitoring: Programmer Tools
$$IEN^XUMF	Institution IEN (Using IFN, Coding System, & ID)	Institution File: Programmer Tools
MAIN^XUMFI	HL7 Master File Message Builder (Controlled Subscription)	Institution File: Programmer Tools
MAIN^XUMFP	Master File Parameters (Controlled Subscription)	Institution File: Programmer Tools
$$DTIME^XUP	Reset DTIME for USER	User: Programmer Tools
$$GET^XUPARAM	Get Parameters	Signon/Security: Programmer Tools
$$KSP^XUPARAM	Return Kernel Site Parameter	Signon/Security: Programmer Tools
$$LKUP^XUPARAM	Look Up Parameters	Signon/Security: Programmer Tools
SET^XUPARAM	Output Message During Signon	Signon/Security: Programmer Tools
PROD^XUPROD	Production Vs. Test Account	Signon/Security: Programmer Tools
H^XUS	Programmer Halt	Signon/Security: Programmer Tools
SET^XUS1A	Display Information At Sign-On	Signon/Security: Programmer Tools

Entry Point	Description	Kernel Programmer Manual Reference Chapter
AVHLPTXT^XUS2	Get Help Text (Controlled Subscription)	Signon/Security: Programmer Tools
KILL^XUSCLEAN	Clear all but Kernel Variables	Signon/Security: Programmer Tools
$$ACTIVE^XUSER	Status Indicator	User: Programmer Tools
$$DEA^XUSER	Get DEA Number	Public Key Infrastructure (PKI): Programmer Tools
$$LOOKUP^XUSER	New Person File Lookup	User: Programmer Tools
$$NAME^XUSER	Get Name of User	Institution File: Programmer Tools
$$PROVIDER^XUSER	Providers in New Person File	User: Programmer Tools
DIV4^XUSER	Get User Divisions (Controlled Subscription)	User: Programmer Tools
$$ADD^XUSERNEW	Add New User	Signon/Security: Programmer Tools
^XUSESIG	Set Up Electronic Signature Code (Controlled Subscription)	Electronic Signatures: Programmer Tools
SIG^XUSESIG	Verify Electronic Signature Code	Electronic Signatures: Programmer Tools
$$CHKSUM^XUSESIG1	Build Checksum for Global Root	Electronic Signatures: Programmer Tools
$$CMP^XUSESIG1	Compare Checksum to $Name_Value	Electronic Signatures: Programmer Tools
$$DE^XUSESIG1	Decode String	Electronic Signatures: Programmer Tools
$$EN^XUSESIG1	Encode ESBLOCK	Electronic Signatures: Programmer Tools
$$ESBLOCK^XUSESIG1	E-Sig Fields Required for Hash	Electronic Signatures: Programmer Tools
DE^XUSHSHP	Decrypt Data String	Electronic Signatures: Programmer Tools
EN^XUSHSHP	Encrypt Data String	Electronic Signatures: Programmer Tools
HASH^XUSHSHP	Hash Electronic Signature Code	Electronic Signatures: Programmer Tools
$$CHECKAV^XUSRB	Check Access/Verify Codes (Controlled Subscription)	Signon/Security: Programmer Tools
$$INHIBIT^XUSRB	Check if Logons Inhibited	Signon/Security: Programmer Tools

Entry Point	Description	Kernel Programmer Manual Reference Chapter
$$KCHK^XUSRB	Check If User Holds Security Key (Controlled Subscription)	User: Programmer Tools
CVC^XUSRB	VistALink-Change User's Verify Code (Controlled Subscription)	Signon/Security: Programmer Tools
INTRO^XUSRB	VistALink-Get Introductory Text (Controlled Subscription)	Signon/Security: Programmer Tools
LOGOUT^XUSRB	VistALink-Log Out User From M (Controlled Subscription)	Signon/Security: Programmer Tools
OWNSKEY^XUSRB	Verify Security Keys Assigned to a User	Security Keys: Programmer Tools
SETUP^XUSRB	VistALink-Set Up User's Partition in M (Controlled Subscription)	Signon/Security: Programmer Tools
VALIDAV^XUSRB	VistALink-Validate User Credentials (Controlled Subscription)	Signon/Security: Programmer Tools
$$DECRYP^XUSRB1	Decrypt String	Signon/Security: Programmer Tools
$$ENCRYP^XUSRB1	Encrypt String	Signon/Security: Programmer Tools
DIVGET^XUSRB2	Get Divisions for Current User (Controlled Subscription)	User: Programmer Tools
DIVSET^XUSRB2	Set Division for Current User (Controlled Subscription)	User: Programmer Tools
USERINFO^XUSRB2	Get Demographics for Current User (Controlled Subscription)	User: Programmer Tools
EN^XUTMDEVQ	Run a Task (Directly or Queued)	TaskMan: Programmer Tools
DISP^XUTMOPT	Display Option Schedule	TaskMan: Programmer Tools
EDIT^XUTMOPT	Edit an Option's Scheduling	TaskMan: Programmer Tools
OPTSTAT^XUTMOPT	Obtain Option Schedule	TaskMan: Programmer Tools
RESCH^XUTMOPT	Set Up Option Schedule	TaskMan: Programmer Tools
EN^XUTMTP	Display HL7 Task Information (Controlled Subscription)	Spooling: Programmer Tools
$$CHECKAV^XUVERIFY	Check Access/Verify Codes	Signon/Security: Programmer Tools

Entry Point	Description	Kernel Programmer Manual Reference Chapter
^XUVERIFY	Verify Access and Verify Codes	Signon/Security: Programmer Tools
WITNESS^XUVERIFY	(Controlled Subscription)	Signon/Security: Programmer Tools
^XUWORKDY	Workday Calculation	Miscellaneous: Programmer Tools
$$REWIND^%ZIS	Rewind Devices	Device Handler: Programmer Tools
^%ZIS	Standard Device Call	Device Handler: Programmer Tools
HLP1^%ZIS	Display Brief Device Help	Device Handler: Programmer Tools
HLP2^%ZIS	Display Device Help Frames	Device Handler: Programmer Tools
HOME^%ZIS	Reset Home Device IO Variables	Device Handler: Programmer Tools
RESETVAR^%ZIS	Reset Home Device IO Variables	Device Handler: Programmer Tools
$$REWIND^%ZIS	Rewind Device	Device Handler: Programmer Tools
^%ZIS9		Device Handler: Programmer Tools
^%ZISC	Close Device	Device Handler: Programmer Tools
$$DEFDIR^%ZISH	Get Default Host File Directory	Host Files: Programmer Tools
$$DEL^%ZISH	Delete Host File	Host Files: Programmer Tools
$$FTG^%ZISH	Load Host File into Global	Host Files: Programmer Tools
$$GATF^%ZISH	Copy Global to Host File	Host Files: Programmer Tools
$$GTF^%ZISH	Copy Global to Host File	Host Files: Programmer Tools
$$LIST^%ZISH	List Directory	Host Files: Programmer Tools
$$MV^%ZISH	Rename Host File	Host Files: Programmer Tools
$$PWD^%ZISH	Get Current Directory	Host Files: Programmer Tools
$$STATUS^%ZISH	Return End-of-File Status	Host Files: Programmer Tools
CLOSE^%ZISH	Close Host File	Host Files: Programmer Tools
OPEN^%ZISH	Open Host File	Host Files: Programmer Tools
PKILL^%ZISP	Kill Special Printer Variables	Device Handler: Programmer Tools

Entry Point	Description	Kernel Programmer Manual Reference Chapter
PSET^%ZISP	Set Up Special Printer Variables	Device Handler: Programmer Tools
DSD^ZISPL	Delete Spool Data File Entry (Controlled Subscription)	Spooling: Programmer Tools
DSDOC^ZISPL	Delete Spool Document File Entry (Controlled Subscription)	Spooling: Programmer Tools
ENDR^%ZISS	Set Up Specific Screen Handling Variables	Device Handler: Programmer Tools
ENS^%ZISS	Set Up Screen Handling Variables	Device Handler: Programmer Tools
GKILL^%ZISS	KILL Graphic Variables	Device Handler: Programmer Tools
GSET^%ZISS	Set Up Graphics Variables	Device Handler: Programmer Tools
KILL^%ZISS	KILL Screen Handling Variables	Device Handler: Programmer Tools
CALL^%ZISTCP	Make TCP/IP Connection (Remote System)	Device Handler: Programmer Tools
CLOSE^%ZISTCP	Close TCP/IP Connection (Remote System)	Device Handler: Programmer Tools
CLOSE^%ZISUTL	Close Device with Handle	Device Handler: Programmer Tools
OPEN^%ZISUTL	Open Device with Handle	Device Handler: Programmer Tools
RMDEV^%ZISUTL	Delete Data Given a Handle	Device Handler: Programmer Tools
SAVDEV^%ZISUTL	Save Data Given a Handle	Device Handler: Programmer Tools
USE^%ZISUTL	Use Device Given a Handle	Device Handler: Programmer Tools
^%ZOSF	Global	Operating System Interface: Programmer Tools
$$ACTJ^%ZOSV	Number of Active Jobs	Operating System Interface: Programmer Tools
$$AVJ^%ZOSV	Number of Available Jobs	Operating System Interface: Programmer Tools
$$EC^%ZOSV	Get Error Code	Operating System Interface: Programmer Tools
$$LGR^%ZOSV	Last Global Reference	Operating System Interface: Programmer Tools

Entry Point	Description	Kernel Programmer Manual Reference Chapter
$$OS^%ZOSV	Get Operating System Information (Controlled Subscription)	Operating System Interface: Programmer Tools
$$VERSION^%ZOSV	Get OS Version Number or Name	Operating System Interface: Programmer Tools
DOLRO^%ZO	Display Local Variables (Controlled Subscription)	Operating System Interface: Programmer Tools
GETENV^%ZOSV	Current System Information	Operating System Interface: Programmer Tools
GETPEER^%ZOSV	VistALink-Get IP Address for Current Session (Controlled Subscription)	Signon/Security: Programmer Tools
LOGRSRC^%ZOSV		Operating System Interface: Programmer Tools
SETENV^%ZOSV	Set VMS Process Name (DSM for VMS Systems Only)	Operating System Interface: Programmer Tools
SETNM^%ZOSV	Set VMS Process Name (DSM for VMS Systems Only)	Operating System Interface: Programmer Tools
T0^%ZOSV	Start RT Measure	Operating System Interface: Programmer Tools
T1^%ZOSV	Stop RT Measure	Operating System Interface: Programmer Tools
^%ZTER	Kernel Standard Error Recording Routine	Error Processing: Programmer Tools
$$NEWERR^%ZTER	Verify Support of New Error Trapping	Error Processing: Programmer Tools
UNWIND^%ZTER	Quit Back to Calling Routine	Error Processing: Programmer Tools
$PSET^%ZTLOAD	Set Task as Persistent	TaskMan: Programmer Tools
$$S^%ZTLOAD	Check for Task Stop Request	TaskMan: Programmer Tools
$$TM^%ZTLOAD	Check if TaskMan is Running	TaskMan: Programmer Tools
^%ZTLOAD	Queue a Task	TaskMan: Programmer Tools
DQ^%ZTLOAD	Unschedule a Task	TaskMan: Programmer Tools
ISQED^%ZTLOAD	Return Task Status	TaskMan: Programmer Tools
KILL^%ZTLOAD	Delete a Task	TaskMan: Programmer Tools
PCLEAR^%ZTLOAD	Clear Persistent Flag for a Task	TaskMan: Programmer Tools
REQ^%ZTLOAD	Requeue a Task	TaskMan: Programmer Tools
STAT^%ZTLOAD	Task Status	TaskMan: Programmer Tools

Table 9-1: Kernel supported and controlled subscription APIs

10. Direct Mode Utilities

This chapter lists all Kernel direct mode utilities. Direct mode utilities can be used from programmer mode, but developers *cannot* call them from within applications.

Every direct mode utility is described in the *Kernel Systems Manual and Kernel Programmer Manual*. Refer to the indicated chapter in that manual for details on the use of the utility.

Direct Mode Utility	Description	Reference Documentation
D ^XPDCPU	Move Routines to Other CPUs	KIDS: System Management—Installations (*Kernel Systems Manual*)
D INSTALL^XPDCPU	Move Routines to Other CPUs	KIDS: System Management—Installations (*Kernel Systems Manual*)
D MOVE^XPDCPU	Move Routines to Other CPUs	KIDS: System Management—Installations (*Kernel Systems Manual*)
D ^XQ1	Test an Option	Menu Manager: Programmer Tools (*Kernel Programmer Manual*)
D ^XTER	Display Error Trap	Error Processing (*Kernel Systems Manual*)
D ^XTERPUR	Purge Error Log	Error Processing (*Kernel Systems Manual*)
D ENABLE^XUFILE3	Enable File Access Security System	File Access Security (*Kernel Systems Manual*)
D ^XUINCON	Run File Access Security Conversion	File Access Security (*Kernel Systems Manual*)
D ^XUP	Programmer Sign-On	Signon/Security: Programmer Tools (*Kernel Programmer Manual*)
D ^XUS	User Sign-On, No Error Trapping	Signon/Security: Programmer Tools (*Kernel Programmer Manual*)
D H^XUS	Programmer Halt	Signon/Security: Programmer Tools (*Kernel Programmer Manual*)
D ^XUSCLEAN	Programmer Halt	Signon/Security: Programmer Tools (*Kernel Programmer Manual*)
D ^%ZTBKC	Global Block Count	Operating System Interface: System Management (*Kernel Systems Manual*)
D ^ZTMB	Start TaskMan	TaskMan: System Management—Operation (*Kernel Systems Manual*)
D RESTART^ZTMB	Restart TaskMan	TaskMan: System Management—Operation (*Kernel Systems Manual*)
D ^ZTMCHK	Check TaskMan's Environment	TaskMan: System Management—Operation (*Kernel Systems Manual*)

Direct Mode Utility	Description	Reference Documentation
D ^ZTMGRSET	Update ^%ZOSF Nodes	Operating System Interface: System Management (*Kernel Systems Manual*)
D RUN^ZTMKU	Remove TaskMan from a WAIT state	TaskMan: System Management—Operation (*Kernel Systems Manual*)
D STOP^ZTMKU	Stop TaskMan	TaskMan: System Management—Operation (*Kernel Systems Manual*)
D WAIT^ZTMKU	Place TaskMan in a WAIT state	TaskMan: System Management—Operation
D ^ZTMON	Monitor TaskMan	TaskMan: System Management—Operation (*Kernel Systems Manual*)
D ^ZU	User Sign-On	Signon/Security: Programmer Tools (*Kernel Programmer Manual*)

Table 10-1: Kernel direct mode utilities

11. External Relations

Kernel's Place in VistA

The nature of the Kernel software is to establish external relations with all other VistA software and with the various implementations of ANSI M. Kernel provides a transparent interface between VistA and the host operating system.

All other VistA software depends upon the presence of Kernel, for two main reasons:

- Kernel provides a wealth of application mode entry points that software applications use to solve many common programming problems.
- Kernel provides other VistA applications with portability. In order to achieve independence from any particular vendor's implementation of the M standard, VistA adopted programming standards and conventions that advise software applications to avoid the use of the non-portable features of ANSI M. Though all VistA software depends upon an ANSI M environment, they also depend upon Kernel to replace non-portable features with standard Kernel entry points and services.

External Relations with M Operating Systems

Kernel itself depends upon the presence of one of the ANSI M environments it supports. Micronetics Standard M (MSM-DOS) and DSM for OpenVMS, as the two centrally procured M operating systems in use at the medical centers, are the primary ANSI M environment supported by Kernel. As VistA adjusts its strategies for configuring computer sites, the list of ANSI M environments supported by Kernel continues to change.

Operating system interfaces are involved in each aspect of Kernel. Identifying the M operating system upon Kernel installation starts processes that create the appropriate Kernel environment. To begin, the ^%ZOSF global is built from an operating system-specific routine. By executing nodes of the ^%ZOSF global, implementation-specific functions that are not part of ANSI M are possible. Functions include turning echo on or off, allowing type-ahead, or reporting the current UCI.

Other operating system-specific routines distributed with Kernel include %ZIS4 for spooling, %ZOSV for system viewing, %XUCI for UCI swapping, and ZU for tied terminals. The %ZOSV routine contains code that enables use of the VIEW command and $VIEW function to get information from the operating system. Another routine, TaskMan's %ZTM, similarly makes possible the use of a protected M procedure, the JOB command, to spawn jobs on a mounted volume set.

Kernel allows processors running different operating systems to be linked. The ^%ZOSF global makes this possible, too. The ^%ZOSF global is never translated, and thus, can retain processor-specific information.

The Manager account is generally reserved for operating system-specific routines and globals. Part of Kernel, however, must also reside in this account to take care of certain input/output procedures. To avoid collision with pre-existing operating system routines and globals, Kernel uses the local Z namespace. Globals in the Manager account include ^%ZTSK and ^%ZTSCH for TaskMan, ^%ZUA for audit data, and %Z as the routine editor. Routines include the %ZTM* (TaskMan) and %ZIS* (Device Handler).

Kernel's use of variables illustrates the way it functions as a buffer between the host operating system and VistA applications. It uses M special variables to create utilities for use by application programmers. $HOROLOG is used by VA FileMan in date/time routines such as %DT and %DTC, $JOB is used by TaskMan, and $IO is used by the Device Handler. In turn, Kernel has key variables that can be referenced by VistA application routines. Perhaps not surprisingly, one of these is DT and another is IO. As VistA system-wide variables, they are documented in the VistA Standards and Conventions (SAC).

Required Software

Kernel V. 8.0 requires the following VistA software:

- VA FileMan V. 21.0 or higher.
- MailMan V. 7.0 or higher.
- Kernel Toolkit V. 7.2 or V. 7.3.

For more details, please refer to the *Kernel Installation Guide*.

DBA Approvals and IAs

To communicate with the underlying operating system files, Kernel has the approval of the Database Administrator (DBA) to reference the following globals:

- ^%ET
- ^%IS
- ^%SY
- ^CPU
- ^RTH
- ^SPOOL
- ^SYS

In addition, Kernel is a party in the Integration Agreements (IAs) described in the following tables.

Kernel Supported References

Reference	DBIA #	Type	Name
XPDMENU ADD DELETE	1157	Routine	XPDMENU
HOLIDAY(HOLIDAY(	10038	File	HOLIDAY FILE
XUS H	10044	Routine	XUS
XUSHSHP DE EN HASH	10045	Routine	XUSHSHP
XUWORKDY XUWORKDY	10046	Routine	XUWORKDY
DIC(3, DIC(3,	10047	File	USER FILE
DIC(9.4, DIC(9.4,	10048	File	PACKAGE FILE
DIC(16, DIC(16,	10049	File	PERSON FILE
XUSESIG SIG	10050	Routine	XUSESIG
XUVERIFY XUVERIFY	10051	Routine	XUVERIFY
XUSCLEAN KILL	10052	Routine	XUSCLEAN
XUSERNEW $$ADD	10053	Routine	XUSERNEW

Reference	DBIA #	Type	Name
%ZTLOAD REQ KILL ISQED DQ $$S STAT$$TM	10063	Routine	%ZTLOAD
XQH EN EN1	10074	Routine	XQH
DIC(19, DIC(19,D0,0)	10075	File	OPTION FILE
XUSEC(XUSEC(KEY,DUZ)	10076	File	XUSEC GLOBAL
XQ92 NEXT	10077	Routine	XQ92
XQCHK OP	10078	Routine	XQCHK
XQDATE XQDATE	10079	Routine	XQDATE
XQH4 ACTION	10080	Routine	XQH4
XQALERT DELETE DELETEA SETUP delete	10081	Routine	XQALERT
%ZIS %ZIS HOME HLP1 HLP2 $$REWIND	10086	Routine	%ZIS
%ZIS9 %ZIS9	10087	Routine	%ZIS9

Reference	DBIA #	Type	Name
%ZISS KILL ENS ENDR GKILL GSET	10088	Routine	%ZISS
%ZISC %ZISC	10089	Routine	%ZISC
DIC(4, DIC(4,	10090	File	INSTITUTION FILE
XMB(1, XMB(1,D0,'XUS')	10091	File	KERNEL SITE PARAMETERS
%ZOSF(	10096	File	Z OPERATING SYSTEM FILE
%ZOSV GETENV T0 T1 LOGRSRC $$LGR $$EC	10097	Routine	%ZOSV
XLFDT $$HTFM(x,y) $$FMTH(x,y) $$HTE(x,y) $$FMTE(x,y) $$DOW(x,y) $$HDIFF(x1,x2,x3) $$FMDIFF(x1,x2,x3) $$HADD(x,d,h,m,s) $$FMADD(x,d,h,m,s) $$DT $$NOW	10103	Routine	XLFDT

Reference	DBIA #	Type	Name
XLFSTR $$UP(x) $$LOW(x) $$STRIP(x,y) $$REPEAT(x,y) $$INVERT(x) $$REPLACE(in,spec) $$LJ(s,i,p) $$RJ(s,i,p) $$CJ(s,i,p)	10104	Routine	XLFSTR
XLFMTH $$ABS(%X) $$MIN(%1,%2) $$MAX(%1,%2) $$LN(%X) $$EXP(%X) $$PWR(%X,%Y) $$LOG(%X) $$TAN(%X) $$SIN(%X) $$COS(%X) $$DTR(%X) $$RTD(%X) $$PI() $$E() $$SQRT(%X) $$SD(%s1,%s2,%n) $$TANDEG(X,PR) $$SINDEG(X,PR) $$COSDEG(X,PR) $$DMSDEC(X,PR) $$DECDMS(X,PR) $$CSCDEG(X,PR) $$CSC(X,PR) $$SECDEG(X,PR) $$SEC(x,pr)	10105	Routine	XLFMTH

Reference	DBIA #	Type	Name
$$COTDEG(X,PR) $$COT(X,PR) $$ASINDEG(X,PR) $$ASIN(X,PR) $$ACOSDEG(X,PR) $$ACOS(X,PR) $$ATANDEG(X,PR) $$ATAN(X,PR) $$ACOTDEG(X,PR) $$ACOT(X,PR) $$ASECDEG(X,PR) $$ASEC(X,PR) $$ACSCDEG(X,PR) $$ACSC(X,PR)			
%ZIS(1, %ZIS(1,D0,0)	10114	File	DEVICE FILE
XPDUTL $$VERSION(PKG)	10141	Routine	XPDUTL
DDIOL EN	10142	Routine	DDIOL

Table 11-1: Kernel supported references

Private IAs Where Kernel is the Custodian
(listed alphabetical by subscribing software)

Number	Name	Subscribing Software
128	DBIA128-A	ACCOUNTS RECEIVABLE
601	DBIA128-B	ACCOUNTS RECEIVABLE
200	DBIA200	ADP PLANNING (PLANMAN)
26	DBIA26	AUTO REPLENISHMENT
170	DBIA170	AUTOMATED MED INFO EXCHANGE
241	DBIA241-A	AUTOMATED MED INFO EXCHANGE
633	DBIA170-B	AUTOMATED MED INFO EXCHANGE
711	DBIA241-B	AUTOMATED MED INFO EXCHANGE
712	DBIA241-C	AUTOMATED MED INFO EXCHANGE
713	DBIA241-D	AUTOMATED MED INFO EXCHANGE
714	DBIA241-E	AUTOMATED MED INFO EXCHANGE
251	DBIA251-A	CLINICAL MONITORING
742	DBIA251-B	CLINICAL MONITORING
167	DBIA167	CONSULT/REQUEST TRACKING
323	DBIA323-A	CONTROLLED SUBSTANCES
835	DBIA323-B	CONTROLLED SUBSTANCES
100	DBIA100	CREDENTIALS TRACKING
289	DBIA289-A	DISCHARGE SUMMARY
478	DBIA478	DMMS
491	DBIA491	DMMS
290	DBIA290-A	FEE BASIS
812	DBIA290-B	FEE BASIS
79	DBIA79	HEALTH SUMMARY
294	DBIA294	HOSPITAL BASED HOME CARE
66	DBIA66	IFCAP
119	DBIA119	IFCAP
978	DBIA978	IFCAP
144	DBIA144	INPATIENT MEDICATIONS
232	DBIA232	INPATIENT MEDICATIONS
372	DBIA372	INTEGRATED BILLING
932	DBIA932	INTEGRATED BILLING
933	DBIA933	INTEGRATED BILLING

Number	Name	Subscribing Software
40	DBIA40	INTEGRATED PATIENT FUNDS
58	DBIA58	INTERIM MANAGEMENT
930	DBIA930	LAB SERVICE
58	DBIA58	INTERIM MANAGEMENT
98	DBIA98-A	LAB SERVICE
561	DBIA98-B	LAB SERVICE
930	DBIA930	LAB SERVICE
976	DBIA976	LETTERMAN
979	DBIA979	LETTERMAN
230	DBIA230	MAILMAN
231	DBIA231	MAILMAN
234	DBIA234	MAILMAN
305	DBIA305	MAILMAN
343	DBIA343	MAILMAN
1	DBIA1	ORDER ENTRY/RESULTS
2	DBIA2	ORDER ENTRY/RESULTS
3	DBIA3	ORDER ENTRY/RESULTS
7	DBIA7	ORDER ENTRY/RESULTS
122	DBIA122	ORDER ENTRY/RESULTS
178	DBIA178	ORDER ENTRY/RESULTS
507	DBIA4-B	ORDER ENTRY/RESULTS
224	DBIA224	OUTPATIENT PHARMACY
331	DBIA331	OUTPATIENT PHARMACY
334	DBIA334	OUTPATIENT PHARMACY
1064	DBIA1063-B	OUTPATIENT PHARMACY
1039	DBIA1039	PCE PATIENT/IHS SU
342	DBIA342	PROBLEM LIST
177	DBIA177	PROGRESS NOTES
1049	PNs use of Security Key file (19.1)	PROGRESS NOTES
42	DBIA42	REGISTRATION
248	DBIA248	REMOTE ORDER/ENTRY
1234	DBIA1234	REMOTE ORDER/ENTRY
10	DBIA10	SCHEDULING
295	DBIA295	TOOLKIT

Number	Name	Subscribing Software
1113	1113	TOOLKIT
1124	References to the PACKAGE File (#9.4)	TOOLKIT
1125	Index and BUILD file	TOOLKIT
1129	DBIA1129-A	TOOLKIT
1130	DBIA1129-B	TOOLKIT
351	DBIA351-A	UNWINDER
858	DBIA351-B	UNWINDER
860	DBIA351-D	UNWINDER
264	DBIA264	VA FILEMAN
1013	DOLRO LINE TAG IN ROUTINE %ZOSV	VA FILEMAN
1014	SET PIECE OF %ZOSF GLOBAL	VA FILEMAN

Table 11-2: Private IAs where Kernel is the custodian

Controlled IAs Where Kernel is the Custodian

Number	Name	Subscribing Software
936	XUSESIG	ADP PLANNING; ORDER ENTRY /RESULTS
1153	PACKAGE FILE REFERENCES CLEANUP	DRG GROUPER; REGISTRATION

Table 11-3: Controlled IAs where Kernel is the custodian

Private IAs Where Kernel is the Subscribing Software
(listed alphabetical by custodial software)

Number	Name	Custodial Software
249	DBIA249	DMMS
1019	UPDATE THE BULLETIN FILE	MAILMAN
1201	KERNEL transport MM routine	MAILMAN
1018	UPDATE FILE 101 & 100.99	ORDER ENTRY/ RESULTS REPORTING
1205	KERNEL transport of ORBUTL	ORDER ENTRY/ RESULTS REPORTING
1016	FIELD EDITOR - EN^DIR0()	VA FILEMAN
1017	CALLS TO FILEMAN FOR KIDS	VA FILEMAN
1052	DBIA1052-A	VA FILEMAN
1053	DBIA1052-B	VA FILEMAN
1054	DBIA1052-C	VA FILEMAN
1055	DBIA1052-D	VA FILEMAN
1056	DBIA1052-E	VA FILEMAN
1057	DBIA1052-F	VA FILEMAN
1058	DBIA1052-G	VA FILEMAN
9	DBIA9	VETERANS ADMINISTRATION

Table 11-4: Private IAs where Kernel is the subscribing software

12. Internal Relations

Independence of Options

All of Kernel's options can be invoked independently. None requires any special setup in order to run successfully.

When rearranging options on menus, care should be taken that security is preserved. In several cases, a menu is locked with a security key, but all the options on that menu are not locked with the same key. In other cases, items are assumed to be locked because the parent menu is itself locked. So, if an option were placed on another menu, the security on that option could be lost. This situation exists for some options on the following menus:

- Audit Menu (VA FileMan, locked with the XUADITING security key)
- Filegrams (locked with the XUFILEGRAM security key)
- KIDS Installation Menu (locked with the XUPROGMODE security key)
- KIDS Main Menu (locked with the XUPROG security key)
- Programmer Options (locked with the XUPROG security key)
- ScreenMan (locked with the XUSCREENMAN security key)
- VA FileMan Management (locked with the XUMGR security key)

13. Software-wide Variables

Kernel does *not* have any software-wide variables that have received SACC exemptions.

The following Kernel key variables can be assumed to be defined at all times when operating within the menu system, as per Appendix 10-B in of VA's *Veterans Health Administration Manual M-11(Medical Information Resources Management Office*:*, Operations Document):*

Variable	Description
DUZ	Internal entry number (IEN) from the NEW PERSON file (#200).
DUZ(0)	User's FILE MANAGER ACCESS CODE string.
DUZ(2)	User's institutional affiliation. It is the internal entry number from the Institution file.
DUZ("AG")	User's agency code.
DT	Current date in VA FileMan internal format.
DTIME	Integer value of the number of seconds the user has to respond to a timed read.
IO	Hardware name ($I) of the last selected input/output device.
IOF	Contains the code to issue a form feed for the last selected input/output device.
IOM	Column position of the right margin, for the last selected input/output device.
ION	Name of the last selected input/output device from the DEVICE file (#3.5) (.01 field value).
IOSL	Variable indicating the number of lines on the last selected input/output device (e.g., screen or page length).
IOST	The last selected input/output device's subtype from the TERMINAL TYPE file (#3.2) (.01 field value).
IOT	Type of the last selected input/output device, such as TRM for terminal.

Table 13-1: Kernel variables defined at all times

In addition to the variables described in Appendix 10-B of the M-11 manual, the following variables are defined by Kernel while a user is in the menu system:

Variable	Description
DUZ("AUTO")	Current auto-menu flag.
DUZ("LANG")	Contains a pointer to VA FileMan's LANGUAGE file (#.85), which VA FileMan uses for language-specific displays of prompts, dates and times, and dialogs (from the DIALOG file [#.84]).
IO(0)	$I value of the home device at the time of the call to the Device Handler (^%ZIS).
IOBS	Contains the code to issue a backspace for last selected input/output device.
IOS	Internal entry number of the last selected input/output device from the DEVICE file.
IOST(0)	The last selected input/output device's subtype from the TERMINAL TYPE file (#3.2) (internal entry number).
IOXY	Value of the XY field from the TERMINAL TYPE file (#3.2) for the last selected input/output device.

Table 13-2: Kernel variables defined while a user is in the menu system

The following software-wide variable is defined within the menu system if alpha-beta tracking is taking place:

Variable	Description
XQABTST	Flag that signals whether alpha-beta testing is in effect.

Table 13-3: Kernel variable defined while a user is in the menu system with alpha-beta tracking

14. SACC Exemptions

The following table lists the Standards and Conventions (SAC) exemptions that currently pertain to Kernel that were granted by the Programming Standards and Conventions Committee (SACC). The table includes the standards section number, nature of the exemption, date granted, and description:

#	Standards Section Number	Nature of Exemption	Date Created	Description
1	6D	**FM compatibility**		The ^XUTL global is exempted from VA FileMan compatibility. It is a non-translated, completely recreateable global used in MenuMan.
2	2D2	*** and # READs**	08/10/1989	The ZISL* and ^%Z editor can use ***** and **#-** readers.
3	6D	**FM compatibility**	08/10/1989	The following globals are exempt from VA FileMan compatibility: • ^%Z • ^%ZTSK • ^%ZTSCH • ^%ZOSF • ^%ZRTL(3, • ^%ZIS("C") and ^%ZIS("H")
4	1	**ANSI**	05/14/1990	TaskMan routines can use extended global references.
5	2B	**Exclusive & Argumentless KILL**	05/14/1990	The Submanager of TaskMan can use exclusive KILL commands in the portion of the Submanager that is responsible for recycling the partition.
6	2A	**H XUS**	05/14/1990	The routine %ZTM can use the HALT command.
7	2A	**OPEN, CLOSE device**	05/14/1990	TaskMan routines can use direct OPEN and CLOSE commands.
8	1	**ANSI**	06/18/1990	Kernel can use operating-specific code, which uses many implementation-specific language features.
9	3A	**Namespacing**	06/18/1990	Kernel can export "Z" namespaced routines and XUCI*,DIDT*, and DIRCR to be renamed as % routines when installed.
10	2B	**Exclusive & Argumentless KILL**	06/18/1990	The Kernel login (XUS) and the error trap restore variable routines (XTER*) can use exclusive KILL statements.

#	Standards Section Number	Nature of Exemption	Date Created	Description
11	4A	**DUZ-array SET & KILL**	06/18/1990	The following Kernel routines can SET or KILL the DUZ variable: • ZTM* • ZTEDIT3 • XQSMD31 • XQSRV • XQ1 • XQ12
12	2A	**OPEN, CLOSE device**	06/18/1990	The device handler and Kernel Operating-specific code can issue direct OPEN and CLOSE commands.
13	2A	**H XUS**	06/18/1990	Kernel (Signon/Security) can issue a HALT command in the routines ZU* without using the ^XUSCLEAN entry point.
14	9B	**%ZOSF nodes**	06/18/1990	Kernel Operating-specific code can make direct calls to operating system routines rather than using the ^%ZOSF global.
15	2D2	*** & # READs**	11/29/1990	Kernel can use a #255 READ in the ZOSV* routines.
16	2B	**Exclusive & Argumentless KILL**	02/07/1991	Kernel can use an exclusive KILL in the utility to clean up variables when exiting from an option.
17	8A	**Queueing, $I**	07/12/1993	Kernel is granted an exemption for the XUPR-RTN-TAPE-CMP option to be non-queueable.
18	NA	NA	12/07/1994	Permanent exemption for Kernel V. 8.0 to use the following M language Features. Merge Command $Order with two arguments $Get with two arguments $Name Set $Extract Pattern match with alternation Sorts After operator Missing parameters in calling list Set $x and $Y 10k routine size $Qlength $Qsubscript $Principal All Structured System Variable Names (SSVNs) M standard Error Processing Global subscript length not to exceed 240 character (KIDS *only*) or 200 characters for the remainder of Kernel. Length is determined by algorithm in 1994 draft SAC.

#	Standards Section Number	Nature of Exemption	Date Created	Description
19	NA	NA	12/07/1994	Permanent exemption for Kernel Installation and Distribution System (KIDS) to Set DUZ and DUZ(0).

Table 14-1: Kernel SAC exemptions

15. Global Protection, Translation, and Journaling

An outline of a possible scheme for the management of Kernel globals is presented on the following pages.

Cookbook recommendations should also be consulted. DSM for OpenVMS sites should refer to the most recent V*AX DSM Systems Guide* (otherwise known as the Cookbook) for recommendations concerning global characteristics. MSM-DOS sites should refer to the most recent *486 Cookbook and MSM System Managers Guide* for recommendations concerning global characteristics.

Kernel's recommendations and the cookbooks' recommendations should serve as examples as you manage your site's global configuration.

Globals in VAH

	Protection			
Global Name	**DSM for OpenVMS**	**MSM-DOS**	**Translate?**	**Journal?**
^DIC	System: RWP W/G/U: RW	All: RWD	Yes	See *VA FileMan Technical Manual*
^HOLIDAY	System: RWP W/G/U: RW	All: RWD	Yes	
^TMP	System:RWP W/G/U: RW	All: RWD	Separate Copy per CPU	
^UTILITY	System: RWP W/G/U: RW	All: RWD	Separate Copy per CPU	
^VA	System: RWP W/G/U: RW	All: RWD	Yes	Yes
^XMB	System: RWP W/G/U: RW	All: RWD	Yes	See *MailMan Technical Manual*
^XMBS	System: RWP W/G/U: RW	All: RWD	Yes	See *MailMan Technical Manual*
^XPD	System: RWP W/G/U: RW	All: RWD	Yes	
^XTV	System: RWP W/G/U: RW	All: RWD	Yes	Yes
^XTMP	System: RWP W/G/U: RW	All: RWD	Yes	
^XUSEC	System: RWP W/G/U: RW	All: RWD	Yes	
^XUTL	System: RWP W/G/U: RW	All: RWD	Separate Copy per CPU	

Table 15-1: Table 15-2: Globals in VAH account—Protection, translation and journaling information

Globals in MGR

MSM-DOS Sites: Kernel now recommends that the manager's account be set up on all servers: file, shadow, compute and print. Previously, the Kernel manager's account setup was only recommended for print and compute servers. Global characteristics for manager's account globals should be reviewed accordingly on all servers.

	Protection			
Global Name	**DSM for OpenVMS**	**MSM-DOS**	**Translate?**	**Journal?**
^%ZIS	System: RWP World: RW Group: RW UCI: RWP	All: RWD	Yes	
^%ZISL	System: RWP World: RW Group: RW UCI: RWP	All: RWD	Yes	
^%ZOSF	System: RWP World: R Group: R UCI: RWP	System: RWD World: R Group: R User: RWD	Separate Copy per CPU	
^%ZTER	System: RWP World: RW Group: RW UCI: RWP	All: RWD	Yes	
^%ZTSCH	System: RWP World: RW Group: RW UCI: RWP	All: RWD	Yes*	
^%ZTSK	System: RWP World: RW Group: RW UCI: RWP	All: RWD	Yes*	
^%ZUA	System: RWP World: R Group: RW UCI: RW	System: RWD World: RW Group: RW User: RWD	Yes	Yes

Table 15-3: Globals in MGR account—Protection, translation and journaling information

- There should be only one copy of the TaskMan globals (^%ZTSCH and ^%ZTSK) within TaskMan's reach. At VA sites, TaskMan's reach is across all CPUs. Other sites should evaluate TaskMan's reach in their configurations. Also, at DSM for OpenVMS sites, these globals should not be in a volume set that is cluster-mounted across all systems; instead, master from two nodes and DDP serve to the other nodes.

  For more information about TaskMan's reach, please refer to the *Kernel Systems Manual*.

16. Software Product Security

Security Management

To protect the security of VistA systems, distribution of this software for use on any other computer system by VistA sites is prohibited. All requests for copies of Kernel for *non*-VistA use should be referred to the VistA site's local Office of Information Field Office (OIFO).

Otherwise, there are no special legal requirements involved in the use of Kernel.

Mail Groups and Alerts

Mail Groups

The Kernel software itself does *not* create or utilize any specific mail groups but it does provide fields, files, options, APIs, and utilities for creating/processing mail groups.

Alerts

The Kernel software does *not* make use of alerts itself but it does provide fields, files, options, APIs, and utilities for creating/processing alerts.

Remote Systems

The Kernel software provides options and utilities for accessing remote (and local) systems.

Interfaces

The Kernel software interfaces with the following VA products:

- Kernel toolkit V. 7.2 or higher.
- VA FileMan V. 21.0 or higher.
- MailMan V. 7.0 or higher.

There are *no* other COTS (*non*-VA) products embedded in or requiring special interfaces by this version of the Kernel software, other than those provided by the underlying operating systems.

Electronic Signatures

There are *no* electronic signatures used within the Kernel software itself but it does provide fields, files, options, APIs, and utilities for creating/processing electronic signatures.

Security Keys

For a list of security keys exported with this version of the Kernel, please use the VA FileMan Inquire to File Entries option as shown below.

```
Select OPTION: INQUIRE TO FILE ENTRIES

OUTPUT FROM WHAT FILE: OPTION// security <Enter> KEY        (119 entries)
Select SECURITY KEY NAME: xu
1   XUARCHIVE
     2   XUAUDITING
     3   XUAUTHOR
     4   XUEXKEY
     5   XUFILEGRAM
Press <RETURN> to see more, '^' to exit this list, OR
CHOOSE 1-5: <Enter>
                                          .
                                          .
                                          .
```

Enter the Kernel application namespace.

Table 16-1: Security Keys: Obtaining security key information for Kernel

File Security

Kernel's file numbers range as follows:

3.05 - 3.54	49.00 - 49.00
4.00 - 4.11	101.00 - 101.00
5.00 - 5.00	200.00 - 200.00
5.12 - 7.10	8932.10 - 8935.91
9.20 - 9.80	8980.20 - 8980.22
14.40 - 14.80	8989.20 - 8989.30
19.00 - 20.00	8991.5 - 8992.00
40.50 - 40.50	

To print File Security Access for files for Kernel, go to the programmer prompt, enter FileMan, and do the following:

You can sort by Number and select a range of file numbers. ;Lnn gives you control over column width.

```
Select OPTION: PRINT FILE ENTRIES

OUTPUT FROM WHAT FILE: FILE// <Enter>
SORT BY: NAME// NUMBER
START WITH NUMBER: FIRST// 1.0
GO TO NUMBER: LAST// 4.6
  WITHIN NUMBER, SORT BY: <Enter>
FIRST PRINT ATTRIBUTE: [FILE
     1   FILE LIST            (Aug 01, 1990@18:41)          File #1
     2   FILE SECURITY ACCESS
                              (Jul 10, 2002@10:25) User #1529 File #1
     3   FILE SECURITY CODES
                                                            File #1
CHOOSE 1-3: 2 <Enter>                 (Jul 10, 2002@10:25) User #1529 File #1
WANT TO EDIT 'FILE SECURITY ACCESS' TEMPLATE? No// Y <Enter>  (Yes)
NAME: FILE SECURITY ACCESS  Replace <Enter>
READ ACCESS: @// <Enter>
WRITE ACCESS: @// <Enter>
FIRST PRINT ATTRIBUTE: NAME;L25// NAME;L30
THEN PRINT ATTRIBUTE: NUMBER;L6// <Enter>
THEN PRINT ATTRIBUTE: DD ACCESS;L3// <Enter>
THEN PRINT ATTRIBUTE: RD ACCESS;L3// <Enter>
THEN PRINT ATTRIBUTE: WR ACCESS;L3// <Enter>
THEN PRINT ATTRIBUTE: DEL ACCESS;L3// <Enter>
THEN PRINT ATTRIBUTE: LAYGO ACCESS;L3// <Enter>
THEN PRINT ATTRIBUTE: AUDIT ACCESS;L3// <Enter>
THEN PRINT ATTRIBUTE: <Enter>
Heading (S/C): FILE SECURITY ACCESS  Replace <Enter>
STORE PRINT LOGIC IN TEMPLATE: FILE
     1   FILE LIST            (Aug 01, 1990@18:41)          File #1
     2   FILE SECURITY ACCESS
                              (Jul 10, 2002@10:25) User #1529 File #1
CHOOSE 1-2: 2 <Enter>                 (Jul 10, 2002@10:25) User #1529 File #1
TEMPLATE ALREADY STORED THERE.... OK TO REPLACE? Y <Enter>  (Yes)

START AT PAGE: 1// <Enter>
DEVICE: <Enter>  Telnet terminal
FILE SECURITY ACCESS                                   JUL 10,2002  10:27    PAGE 1
                                        DD      RD      WR      DEL     LAYGO   AUDIT
NAME                            NUMBER  ACCESS  ACCESS  ACCESS  ACCESS  ACCESS  ACCESS

--------------------------------------------------------------------------------

COMMUNICATIONS PROTOCOL         3.4     #       @       #       #       #       #
DEVICE                          3.5     #       I       #       #       #       #
SPOOL DOCUMENT                  3.51    @       @       @               @       @
SPOOL DATA                      3.519
RESOURCE                        3.54
BULLETIN                        3.6     #               #       #               #
MAILBOX                         3.7     #               #       #       #       #
MESSAGES TO BE NEW AT A LATER   3.73    @       #       #       #       #       @
MAIL GROUP                      3.8     #               #       #               #
DISTRIBUTION LIST               3.816
MESSAGE                         3.9     ^       ^       ^       ^       #       ^
INSTITUTION                     4       @               #       @       #
INSTITUTION ASSOCIATION TYPES   4.05    @               @       @       @       @
FACILITY TYPE                   4.1     @               #       @       #       @
```

Enter a file number range within Kernel.

Here the user selected a print template previously created.

This report was reformatted to fit the display area (smaller font).

AGENCY	4.11	@		y	@	@	@
DOMAIN	4.2	#	#	#	#	#	#
INTER-UCI TRANSFER	4.281						
MAILMAN OUTSTANDING FTP TRANSA	4.2995						
INTERNET SUFFIX	4.2996						
REMOTE USER DIRECTORY	4.2997						
MESSAGE DELIVERY STATS	4.2998						
MESSAGE STATISTICS	4.2999						
MAILMAN SITE PARAMETERS	4.3	@	#	#	#	#	@
MAILMAN TIME ZONE	4.4						
NETWORK TRANSACTION	4.5						
NETWORK SENDERS REJECTED	4.501						
TRANSMISSION SCRIPT	4.6						

Table 16-2: File Security Access: Obtaining file security access information for Kernel files

Official Policies

To protect the security of VistA systems, distribution of this software for use on any other computer system by VistA sites is prohibited. All requests for copies of Kernel for *non*-VistA use should be referred to the VistA site's local Office of Information Field Office (OIFO).

Otherwise, there are no special legal requirements involved in the use of Kernel.

Glossary

AUDIT ACCESS	A user's authorization to mark the information stored in a computer file to be audited.
AUDITING	Monitoring computer usage such as changes to the database and other user activity. Audit data can be logged in a number of VA FileMan and Kernel files.
AUTO MENU	An indication to Menu Manager that the current user's menu items should be displayed automatically. When AUTO MENU is not in effect, the user must enter a question mark at the menu's select prompt to see the list of menu items.
CAPACITY MANAGEMENT	The process of assessing a system's capacity and evaluating its efficiency relative to workload in an attempt to optimize system performance. Kernel provides several utilities.
CARET	A symbol expressed as ^ (caret). In many M systems, a caret is used as an exiting tool from an option. Also, this symbol is sometimes referred to as the up-arrow symbol.
CHECKSUM	A numeric value that is the result of a mathematical computation involving the characters of a routine or file.
CIPHER	A system that arbitrarily represents each character as one or more other characters. (See also: ENCRYPTION.)
COMMON MENU	Options that are available to all users. Entering two question marks ("**??**") at the menu's select prompt will display any SECONDARY MENU OPTIONS available to the signed-on user along with the common options available to all users.
COMPILED MENU SYSTEM (^XUTL GLOBAL)	Job-specific information that is kept on each CPU so that it is readily available during the user's session. It is stored in the ^XUTL global, which is maintained by the menu system to hold commonly referenced information. The user's place within the menu trees is stored, for example, to enable navigation via menu jumping.
COMPUTED FIELD	This field takes data from other fields and performs a predetermined mathematical function (e.g., adding two columns together). You will not, however, see the results of the mathematical function on the screen. Only when you are printing or displaying information on the screen will you see the results for this type of field.

DEVICE HANDLER	The Kernel module that provides a mechanism for accessing peripherals and using them in controlled ways (e.g., user access to printers or other output devices).
DIFROM	VA FileMan utility that gathers all software components and changes them into routines (namespaceI* routines) so that they can be exported and installed in another VA FileMan environment.
DOUBLE QUOTE (")	A symbol used in front of a Common option's menu text or synonym to select it from the Common menu. For example, the five character string "TBOX selects the User's Toolbox Common option.
DR STRING	The set of characters used to define the DR variable when calling VA FileMan. Since a series of parameters may be included within quotes as a literal string, the variable's definition is often called the DR string. To define the fields within an edit sequence, for example, the programmer may specify the fields using a DR string rather than an INPUT template.
DUZ(0)	A local variable that holds the FILE MANAGER ACCESS CODE of the signed-on user.
ENCRYPTION	Scrambling data or messages with a cipher or code so that they are unreadable without a secret key. In some cases encryption algorithms are one directional, that is, they only encode and the resulting data cannot be unscrambled (e.g., Access and Verify codes).
FILE ACCESS SECURITY SYSTEM	Formerly known as Part 3 of the Kernel Inits. If the File Access Security conversion has been run, file-level security for VA FileMan files is controlled by Kernel's File Access Security system, not by File Manager Access codes (i.e., FILE MANAGER ACCESS CODE field).
FORCED QUEUING	A device attribute indicating that the device can only accept queued tasks. If a job is sent for foreground processing, the device will reject it and prompt the user to queue the task instead.
GO-HOME JUMP	A menu jump that returns the user to the primary menu presented at signon. It is specified by entering two carets ("^^") at the menu's select prompt. It resembles the Rubber-band Jump but without an option specification after the carets.
HELP PROCESSOR	A Kernel module that provides a system for creating and displaying online documentation. It is integrated within the menu system so that help frames associated with options can be displayed with a standard query at the menu's select prompt.
HOST FILE SERVER (HFS)	A procedure available on layered systems whereby a file on the host system can be identified to receive output. It is implemented by the Device Handler's HFS device type.

HUNT GROUP	An attribute of an entry in the DEVICE file (#3.5) that allows several devices to be used interchangeably; useful for sending network mail or printing reports. If the first hunt group member is busy, another member can stand in as a substitute.
INDEX (%INDEX)	A Kernel utility used to verify routines and other M code associated with a software application. Checking is done according to current ANSI MUMPS standards and VistA programming standards. This tool can be invoked through an option or from direct mode (>D ^%INDEX).
INIT	Initialization of a software application. INIT* routines are built by VA FileMan's DIFROM and, when run, recreate a set of files and other software components.
JUMP	In VistA applications, the Jump command allows you to go from a particular field within an option to another field within that same option. You can also Jump from one menu option to another menu option without having to respond to all the prompts in between. To jump, type a caret ("^", uppercase-6 key on most keyboards) and then type the name of the field or option you wish to jump to. (See also GO-HOME JUMP, PHANTOM JUMP, RUBBER-BAND JUMP, or UP-ARROW JUMP.)
JUMP START	A logon procedure whereby the user enters the "Access code;Verify code;option" to go immediately to the target option, indicated by its menu text or synonym. The jump syntax can be used to reach an option within the menu trees by entering "Access;Verify;^option".
KERMIT	A standard file transfer protocol. It is supported by Kernel and can be set up as an alternate editor.
MANAGER ACCOUNT	A UCI that can be referenced by non-manager accounts (e.g., production accounts). Like a library, the MGR UCI holds percent routines and globals (e.g., ^%ZOSF) for shared use by other UCIs.
MENU CYCLE	The process of first visiting a menu option by picking it from a menu's list of choices and then returning to the menu's select prompt. Menu Manager keeps track of information (e.g., the user's place in the menu trees) according to the completion of a cycle through the menu system.
MENU MANAGER	The Kernel module that controls the presentation of user activities (e.g., menu choices or options). Information about each user's menu choices is stored in the Compiled Menu System, the ^XUTL global, for easy and efficient access.
MENU SYSTEM	The overall Menu Manager logic as it functions within the Kernel framework.

MENU TEMPLATE	An association of options as pathway specifications to reach one or more final destination options. The final options must be executable activities and not merely menus for the template to function. Any user can define user-specific MENU templates via the corresponding Common option.
MENU TREES	The menu system's hierarchical tree-like structures that can be traversed or navigated, like pathways, to give users easy access to various options.
PAC	**P**rogrammer **A**ccess **C**ode. An optional user attribute that can function as a second level password into programmer mode.
PART 3 OF THE KERNEL INIT	See FILE ACCESS SECURITY SYSTEM.
PATTERN MATCH	A preset formula used to test strings of data. Refer to your system's M Language Manuals for information on Pattern Match operations.
PHANTOM JUMP	Menu jumping in the background. Used by the menu system to check menu pathway restrictions.
PRIMARY MENUS	The list of options presented at signon. Each user must have a PRIMARY MENU OPTION in order to sign on and reach Menu Manager. Users are given primary menus by IRM. This menu should include most of the computing activities the user will need.
PROGRAMMER ACCESS	Privilege to become a programmer on the system and work outside many of the security controls of Kernel. Accessing programmer mode from Kernel's menus requires having the programmer's at-sign security code, which sets the variable DUZ(0)=**@**.
PROTOCOL	An entry in the PROTOCOL file (#101). Used by the Order Entry/Results Reporting (OE/RR) software to support the ordering of medical tests and other activities. Kernel includes several protocol-type options for enhanced menu displays within the OE/RR software.
QUEUING	Requesting that a job be processed in the background rather than in the foreground within the current session. Kernel's TaskMan module handles the queuing of tasks.
QUEUING REQUIRED	An option attribute that specifies that the option must be processed by TaskMan (the option can only be queued). The option can be invoked and the job prepared for processing, but the output can only be generated during the specified time periods.
RESOURCE	A method that enables sequential processing of tasks. The processing is accomplished with a RES device type designed by the application programmer and implemented by IRM. The process is controlled via the RESOURCE file (#3.54).

RUBBER-BAND JUMP	A menu jump used to go out to an option and then return, in a bouncing motion. The syntax of the jump is two carets ("^^", uppercase-6 on most keyboards) followed by an option's menu text or synonym (e.g., ^^Print Option File). If the two carets are not followed by an option specification, the user is returned to the primary menu. (See also: GO-HOME JUMP.)
SCHEDULING OPTIONS	A way of ordering TaskMan to run an option at a designated time with a specified rescheduling frequency (e.g., once per week).
SCROLL/NO SCROLL	The Scroll/No Scroll button (also called Hold Screen) allows the user to "stop" (No Scroll) the terminal screen when large amounts of data are displayed too fast to read and "restart" (Scroll) when the user wishes to continue.
SECONDARY MENU OPTIONS	Options assigned to individual users to tailor their menu choices. If a user needs a few options in addition to those available on the primary menu, the options can be assigned as secondary options. To facilitate menu jumping, secondary menus should be specific activities, not elaborate and deep menu trees.
SECURE MENU DELEGATION (SMD)	A controlled system whereby menus and keys can be allocated by people other than IRM staff (e.g., application coordinators) who have been so authorized. SMD is a part of Menu Manager.
SERVER	In VistA, an entry in the OPTION file (#19). An automated mail protocol that is activated by sending a message to the server with the "S.server" syntax. A server's activity is specified in the OPTION file (#19) and can be the running of a routine or the placement of data into a file.
SIGNON/SECURITY	The Kernel module that regulates access to the menu system. It performs a number of checks to determine whether access can be permitted at a particular time. A log of signons is maintained.
SPECIAL QUEUEING	An option attribute indicating that TaskMan should automatically run the option whenever the system reboots.
SPOOLER	An entry in the DEVICE file (#3.5). It uses the associated operating system's spool facility, whether it's a global, device, or host file. Kernel manages spooling so that the underlying OS mechanism is transparent. In any environment, the same method can be used to send output to the spooler. Kernel will subsequently transfer the text to a global for subsequent despooling (printing).
SYNONYM	In VistA, a field in the OPTION file (#19). Options can be selected by their menu text or synonym. (See also: MENU TEXT.)

TASKMAN	The Kernel module that schedules and processes background tasks (a.k.a. Task Manager).
TIMED READ	The amount of time Kernel will wait for a user response to an interactive READ command before starting to halt the process.
UP-ARROW JUMP	In the menu system, entering a carets ("^", uppercase-6 on most keyboards) followed by an option name accomplishes a jump to the target option without needing to take the usual steps through the menu pathway.
Z EDITOR (^%Z)	A Kernel tool used to edit routines or globals. It can be invoked with an option, or from direct mode after loading a routine with >X ^%Z.
ZOSF GLOBAL (^%ZOSF)	The Operating System File—a manager account global distributed with Kernel to provide an interface between VistA software and the underlying operating system. This global is built during Kernel installation when running the manager setup routine (ZTMGRSET). The nodes of the global are filled-in with operating system-specific code to enable interaction with the operating system. Nodes in the ^%ZOSF global can be referenced by application programmers so that separate versions of the software need not be written for each operating system.

For a comprehensive list of commonly used infrastructure- and security-related terms and definitions, please visit the ISS Glossary Web page at the following Web address:

http://vista.med.va.gov/iss/glossary.asp

For a list of commonly used acronyms, please visit the ISS Acronyms Web site at the following Web address:

http://vista/med/va/gov/iss/acronyms/index.asp

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