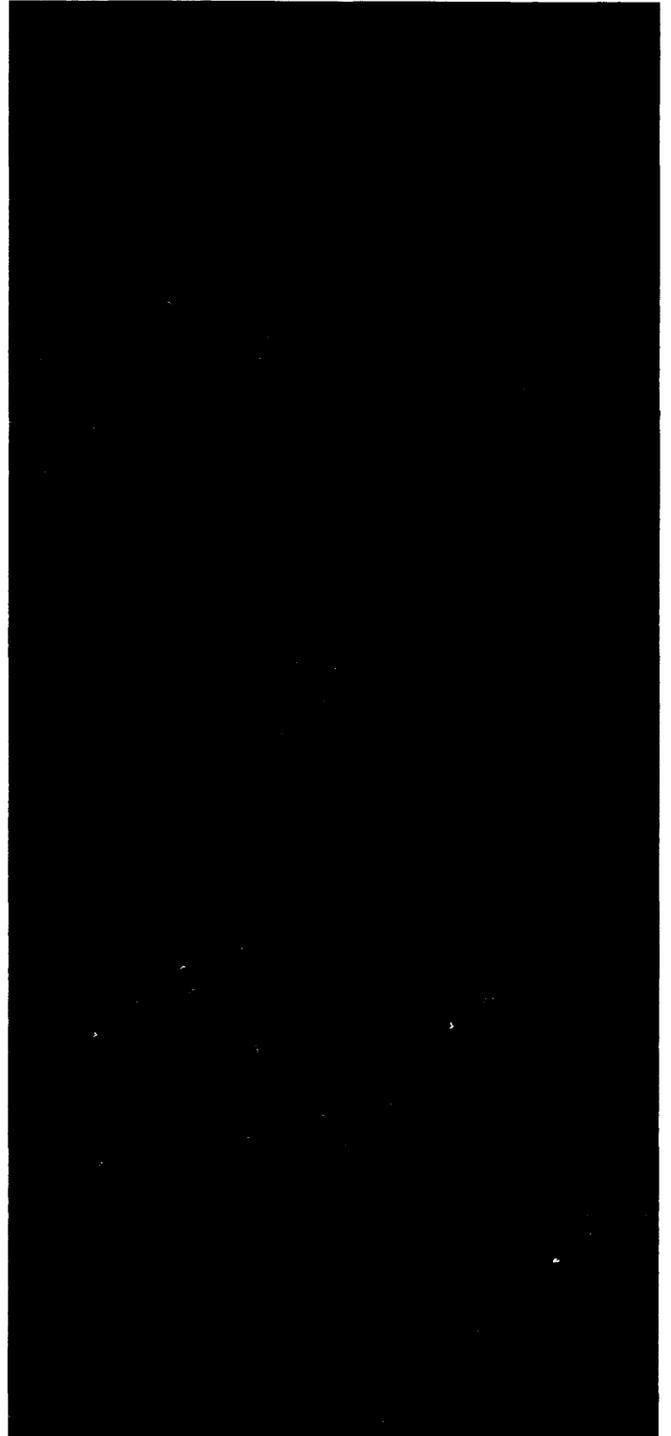# Honeywell

FILE SYSTEM

SERIES 600/6000

GCOS

SOFTWARE

Honeywell

FILE SYSTEM

SERIES 600/6000

GCOS

SUBJECT:

File System Facility of the General Comprehensive Operating Supervisor (GCOS, formerly GECOS).

SPECIAL INSTRUCTIONS:

This manual, Order Number BR38, Rev. 0, supersedes CPB-1513B, dated April 1970, and Addendum No. 1, dated March 1971. New material has been added in this edition making CPB-1513B obsolete. The new order number is assigned to be consistent with the overall Honeywell publications numbering system. This edition of the manual includes information in Series 600 Software Release 5.0 and Series 6000 Software Release C. New information and changes to the manual since the previous edition are indicated by change bars in the page margins; deletions are indicated by asterisks.

DATE:

November 1971

ORDER NUMBER:

BR38, Rev. 0 (Supersedes CPB-1513B)

PREFACE

This manual is intended as a reference for programmers communicating with the file system and using the batch and remote-batch facilities of the Series 600/6000 General Comprehensive Operating Supervisor.

File No.: 1633, 1733

FUNCTIONAL LISTING OF PUBLICATIONS
for
SERIES 600 SYSTEM

FUNCTION	APPLICABLE REFERENCE MANUAL TITLE	FORMER PUB. NO.	ORDER NO.
	Series 600:		
Hardware reference:			
Series 600	System Manual	371	BM78
DATANET 355	DATANET 355 Systems Manual	1645	BS03
Operating system:			
Basic Operating System	Comprehensive Operating Supervisor (GCOS)	1518	BR43
Control Card Formats	Control Cards	1688	BS19
System initialization:			
GCOS Startup	System Operating Techniques	DA10	DA10
Communications System	GRTS/355 Startup Procedures	1715	BJ70
Storage Subsystem Startup	DSS180 Disk Storage Subsystem Startup Procedures	DA11	DA11
Data management:			
File system	GCOS File System	1513	BR38
Integrated Data Store (I-D-S)	Integrated Data Store	1565	BR69
File Processing	Indexed Sequential Processing	DA37	DA37
Program maintenance:			
Object Program	Source Object Editor	1723	BJ71
System Editing	System Library Editor	1687	BS18
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Peripheral on-line testing	GCOS On-Line Peripheral Test System (OPTS-600)	1573	BR76
Language processors:			
Macro Assembly Language	Programming Reference Manual	1004	BN86
COBOL Language	COBOL Reference Manual	1652	BS08
COBOL Usage	COBOL User's Guide	1653	BS09
ALGOL Language	ALGOL	1657	BS11
JOVIAL Language	JOVIAL	1650	BS06
FORTRAN Language	FORTRAN	1686	BJ67
FORTRAN IV Language	FORTRAN IV	1006	BN88
DATANET 355	DATANET 355 Macro-Assembly Program	1660	BB98
Generators:			
Sorting	Sort/Merge	1005	BN87
Merging	Sort/Merge	1005	BN87
Simulators:			
DATANET 355 Simulation	DATANET 355 Simulator	1663	BW23
Remote terminal system:			
DATANET 355	GRTS/355 Programming Reference	1664	BJ66
DATANET 30	GRTS/30 Programming Reference	1558	BR68

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	Series 600:		
Service and utility routines:			
File I/O	File and Record Control	1003	BN85
Loader	General Loader	1008	BN90
Utility programs	Utility	1422	BQ66
Conversion	Bulk Media Conversion	1096	BP30
System Accounting	GCOS Accounting Summary Edit Program	1651	BS07
FORTRAN	FORTRAN IV Subroutine Libraries	1620	BR95
Controller loader	Relocatable Loader	DA12	DA12
Time-sharing systems:			
Operating System	GCOS Time-Sharing System General Information	1643	BS01
System Programming	GCOS Time-Sharing Terminal/Batch	1642	BR99
System Programming	GCOS Time-Sharing System - System Programmer's Reference	1514	BR39
BASIC Language	Time-Sharing BASIC	1510	BR36
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Text Editing	Time-Sharing Text Editor	1515	BR40
Handbooks:			
Console Messages	GCOS Typewriter Messages	1477	BR09
Index	Comprehensive Index	1499	BR28
Pocket guides:			
Time-Sharing Programming	GCOS Time-Sharing System	1661	BS12
Macro Assembly Language	GCOS GMAP	1673	BS16
COBOL Language	COBOL	1689	BJ68
Control Card Formats	GCOS Control Cards and Abort Codes	1691	BJ69
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FUNCTION	APPLICABLE REFERENCE MANUAL		
	TITLE	FORMER PUB. NO.	ORDER NO.
	Series 6000:		
Hardware reference:			
Series 6000	Summary Description	DA48	DA48
DATANET 355	DATANET 355 Systems Manual	1645	BS03
Operating system:			
Basic Operating System	Comprehensive Operating Supervisor (GCOS)	1518	BR43
Control Card Formats	Control Cards	1688	BS19
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GCOS Startup	System Startup and Operation	DA06	DA06
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Console Messages	GCOS Typewriter Messages	1477	BR09
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SECTION I

INTRODUCTION

GENERAL

The file system of the Series 600/6000 Comprehensive Operating Supervisor (the operating system) provides multiprocessor access to a common data base, full file protection, and highly selective access control. The file system allocates permanent file space and controls file access for users in all of the three modes of the operating system processing:

    a. local batch

    b. remote batch

    c. time-sharing

From the programmer's viewpoint, the file system provides automatic management of permanent-file storage space. He can store files by name and retrieve them readily. The user accesses his files logically, without concern for the physical characteristics or constraints of the device on which the file is stored.

Note that the file system does not itself provide facilities for reading or writing user's file content; see "File Space Versus File Content," below.

In addition to facilitating basic file storage and retrieval, the file system provides other important features:

    a. hierarchical catalog/file structures

    b. selective access control

    c. security protection

    d. communication between local batch, remote batch, and time-sharing modes, via permanent files

These features are optional in the sense that, if a given user does not need them, the file system allows him to proceed in a straightforward manner. He may, on the other hand, utilize the file system in as sophisticated a fashion as his needs require.

From the overall system viewpoint, the file system provides:

a. a permanent on-line data base common to the local batch, remote batch, and time-sharing modes of operation

b. efficient utilization of high-speed secondary storage space

c. a convenient method of referencing files contained on removable media

The common data base allows for a truly integrated 3-dimensional system, since the several processing modes not only co-exist, but can also interact with a common file. One application of this capability permits a large batch job to generate or update a file (perhaps based upon other files entered from time-sharing terminals) and have that file available for inquiry by time-sharing users.

Another application allows a time-sharing user to generate a job for batch processing. The user's program may be too large to execute conveniently in the time-sharing mode, or may be an existing program for which modification for time-sharing execution is not desirable.

The unified, efficient management of high-speed secondary storage (i.e., on-line shared-file devices) by the file system is essential to a multiprogramming, multiprocessing, and time-sharing environment, where such space is at a premium.

FILE SPACE VERSUS FILE CONTENT

The file system provides a straightforward means of defining physical file space for permanent files and controlling access to it; as such, it does not manage file content. Actual input/output is performed via the standard I/O facilities provided by the operating system and the File and Record Control facility routine. Thus, the phrase "creating a file" means the definition of a specific extent of space on a storage device, associated with a given file name and file creator.

COMMUNICATING WITH THE FILE SYSTEM

There are two modes of user communication with the file system. The local batch and remote batch user communicates via the FILSYS (file system) activity language, which is documented in this manual. The time-sharing user, at a remote terminal, communicates by means of the ACCESS subsystem, which is part of the Time-Sharing System. The use of ACCESS is described in Time-Sharing System General Information Manual.

ERROR MESSAGES

Error messages that may be encountered during a FILSYS activity are listed in Appendix A.

DECK SETUPS

Appendices B and C illustrate sample deck setups for FILSYS activities.

MERGE ACTIVITY PROGRAM

The Merge Activity Program (MACT) is a means by which a privileged user may merge his saved perm files into one file containing the most recent contents of each saved perm file. MACT is not a FILSYS activity; it is a utility routine which may be used, at the user's discretion, in conjunction with FILSYS activities. MACT is described in Appendix E.

SECTION II

ORGANIZATION OF THE FILE SYSTEM

LOGICAL STRUCTURE

The file system is, in formal terms, a tree structure whose origin is the system master catalog. The primary nodes of the tree are the user's highest level catalogs, referred to as the user's master catalogs. The lower-level nodes, if they exist, are subcatalogs. The terminal points of the structure are the files themselves. A schematic representation of the file system's hierarchical structure is shown in Figure 2-1.

System Master Catalog

The system master catalog (SMC) identifies by master catalog name each user known to the operating system. A log-on password and a user-id is associated with each master catalog name. Within the system master catalog are pointers to each user's master catalog (UMC) if one exists, and a record of each user's maximum file space allotment. Accounting information of the time-sharing system also is kept in the SMC. An SMC entry may not be created, modified, or listed except by personnel authorized to do so by the installation. Before using the file system, a user must have an SMC entry created for him.

Note

The term "catalog" should be understood to include UMC's and all lower level catalogs, and to exclude the SMC. The term "subcatalog" is used, where necessary, to exclude reference to UMC's as well.

Note that the SMC provides user identification to the system and an entry is needed for each TSS user even if no permanent files exist for him. The UMC may be created automatically, when the first subcatalog or file is created, or by an explicit catalog create.

Catalogs And Files

A catalog consists of a definition containing the catalog name, and password and/or permissions, and pointers to any files or subcatalogs emanating directly from the catalog. A catalog as such cannot be read or written by a user since it contains no user data.
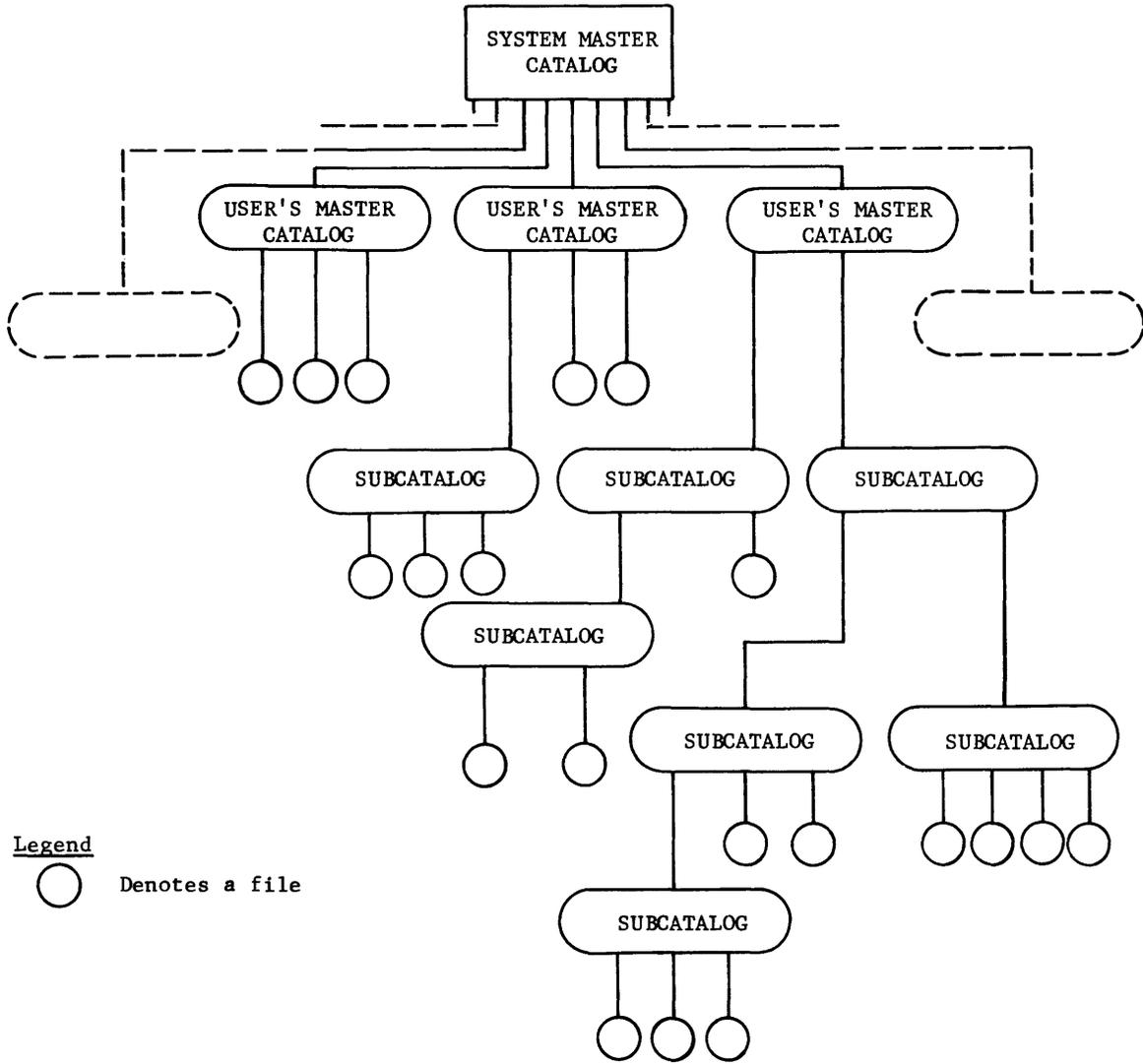
All SMC-entry names must be unique within the system; all subcatalog and file names are automatically qualified by the user's master catalog name and the names of any intermediate subcatalogs. The system master catalog cannot be accessed by the normal user.

Figure 2-1. Logical Structure of the File System

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A file, as known to the file system, consists of a definition containing the file name, file size, and password and/or permissions, and a description of the physical file space. The file definition is distinct from the physical file space, which may contain user data and can be read or written by the user.

Passwords

A password can be attached to any catalog or file. A password simply allows a user to traverse a catalog/file string. A user can get to a given catalog or file only if he can give the passwords for all higher-level catalogs in the string. (When traversing a string, a password must not be given if none has been attached.) The originator of a given string is not exempt from giving the required passwords when traversing that string.

Permissions

Permissions, both general and specific (as to users), can be attached to any catalog or file. When permissions are attached at the catalog level, they apply to all subordinate catalogs and files. The originator of a catalog/file string implicitly has all permissions for that string, but must give all applicable passwords. The allowable permissions are as follows:

General or Specific

READ   -- allows a file to be read

WRITE   -- allows a file to be written

APEND   -- presently treated as WRITE

EXECUTE -- presently treated as READ

Specific Only

PURGE   -- allows catalogs and/or files to be
            purged from the system

MODIFY   -- allows catalog and/or file definitions
            to be changed

Having been entered into the system as a valid user by the creation of an SMC entry via appropriate site operations, the user has only to create his own subcatalog structure, for the UMC will be created automatically, unless the user chooses to do so himself. If created automatically, it will contain no password and no permissions; i.e., anyone can pass through this level (by correctly naming the catalog) but gains no permission thereby.

IDENTIFYING A FILE

File names, and catalog names as well, need not be unique in the file system, except that all files emanating directly from a given catalog must be uniquely named within the level at which they are defined. To uniquely identify an individual file in the system, a catalog/file name string is given, beginning with the creator's master catalog (UMC) name and ending with the file name.

Each successive catalog name in the string qualifies the file name, thereby uniquely defining the file. This string is called the catalog/file description. The catalog/file description of any file or catalog must include the names of all of the higher-level catalogs that must be traversed in order to arrive at the desired point. (Any catalog/file description must include at least a UMC name.)

FILE AND CATALOG PROTECTION

The ability of a user to access files and to otherwise manipulate catalog/file structures (i.e., modify or purge) depends basically upon his knowing the necessary catalog/file descriptions. Beyond this, however, the file system provides an additional level of security protection -- passwords -- and selective access control -- permissions.

Security Protection

The creator of a catalog/file string can attach passwords at any point in his string, one password per catalog or file. The creator, or anyone else to whom he has given MODIFY permission, can modify, delete, or add passwords to an existent catalog/file string. The DUMP option will not be honored for unpriviledged FILSYS activities. This is a security measure to prevent unauthorized disclosure of file system catalogs and passwords.

Access Control

Permission may be granted to other users, by the file creator, for one or more kinds of access to his files or catalogs. (Files can be read, written, appended to, executed, or purged. Catalogs and file definitions can be modified or purged.) Permissions provide a positive protection feature in that, if the creator does not explicitly grant them, his catalog and files are by default protected against access by others. He must, therefore, actively assign to others any degree of access he wishes them to have. (An exception to this exists for time-sharing users, where general read-permission is assigned by default when the file is created as a result of a SAVE command.)

Two classes of permission may be granted: (1) <u>general</u> - to all users known to the file system; and (2) <u>specific</u> - to specified users, by user-id. General READ, WRITE, APEND, and EXECUTE permissions can be granted. Specific permission may include these, as well as PURGE and MODIFY. (The special EXCLUDE "permission" -- specific only -- is discussed below.)

Any combination of general permissions may be assigned at any catalog or file level (e.g., READ, APEND). As many specific permissions as are required may be assigned at any level. For instance, all of the following permissions could be specified in one catalog or one file definition:

```
READ -- general read-permission

APEND -- general append-permission

READ/JDOE,BSMITH,FJONES/ -- specific read-permission
                             for three named users

WRITE/JDOE,BSMITH,FJONES/ -- specific write-permission
                              for the same three users

PURGE/BSMITH,FJONES/ -- specific purge-permission for
                        two named users

MODIFY/FJONES/ -- specific modify-permission for a
                  single named user
```

There is no limit on the number of user-id's that may be specified.

Permissions are effective at and below the level at which they are granted. That is to say, a user accumulates permissions as he proceeds down a catalog/file string. However, he accumulates either general permissions or specific permissions, but not both. Since specific permissions for a given user do not add to, but replace, any general permission that may have been given, specific permissions may be used to exclude a given set of users from one or more types of access. The pseudo-permission EXCLUDE can be used to exclude a user or a set of users from any general permissions.

The MODIFY permission, which allows one user to change another's file names, catalog names, maximum file size, passwords, and/or permissions, also implies the ability to create catalogs and/or files emanating from that catalog at which the MODIFY permission is given.

This permission should be granted with considerable caution, since if permissions or passwords are changed without the knowledge of the originator, he is still charged for the space though he may not be able to access the file(s).

SELECTION OF MEDIA

Classes

The file system allows the user to catalog files located on disk, drum, and magnetic tape media. Each type of media belongs to one of the following classes:

Fixed Mass Storage — Media configured to the system at startup which will remain on-line for the life of the system (e.g., DSS270's; DSS200's; MDS200's; MSS800's; and DSS167, 170, and 180 packs whose labels indicate "PERM" and which are mounted on "PERM" spindles at startup.)

Structured Removable Media — Disk packs whose labels indicate "PERM" and which are mounted on spindles defined as "RMVBL" by startup.

Nonstructured Removable Media — All magnetic tapes and any disk packs whose label indicates "RMVBL". (Such disk packs should be mounted on "RMVBL" spindles only.)

When creating files and subcatalogs, the file systems uses media in the fixed mass storage class unless the user explicitly requests a device type or device name via the DEVICE option. Furthermore, unless the DEVICE option is present, the file system will automatically place any files or catalogs that emanate directly from the User Master Catalog (known as "level-1" entries) on the fixed mass storage device with the largest amount of space available for files. This results in optimizing overall system performance.

These automatic features have been included in the file system to obviate the use of the DEVICE option in normal file or catalog creation and its use is discouraged except in those cases where it is necessary (e.g., the file is on magnetic tape).

Special Considerations

Unusual situations may cause the user to be concerned about the physical location of his catalogs and files. Each class of media as defined above has a set of rules associated with it to control the allocation of file space and the creation of catalog/file structures. The rules are discussed here briefly to provide some guidance in these situations.

A. Fixed Mass Storage

1. The total amount of file space on fixed mass storage currently reserved for a given user is limited by the allowable file size defined on the System Master Catalog entry for the user. When a file is created, a current size is defined for that file. If the file grows in size, the current size is updated to reflect the growth. The sum of the current size for all files under a System Master Catalog may not exceed allowable file size as specified by the System Master Catalog.

2. The file content area always resides on the same device as the file description record.

3. Level-1 entries may reside on any fixed mass storage device.

4. Catalogs and files subordinate to a level-1 entry must reside on the same device as the level-1. For example, if the catalog "PAYROLL" resides on device DS3, all catalogs and files subordinate to PAYROLL will reside on DS3.

B. Structured Removable Media

1. The total amount of file space on any one structured removable pack for a given user is limited by the allowable file size defined in the pack master catalog entry for the user on the pack. When a file is created, a current size is defined for that file. If the file grows in size, the current size is updated to reflect that growth. The sum of the current size for all files under a master catalog may not exceed allowable file size specified by the master catalog.

2. All catalogs and files which reside on structured removable media must emanate from a level-1 catalog; i.e., the user must create a level-1 catalog using the DEVICE option to specify the placement of the catalog on the structured removable pack and make any catalogs or files that are to reside on that pack subordinate to that level-1 catalog. (More than one level-1 catalog may be used.)

C. Nonstructured Removable Media

1. The amount of file space on nonstructured removable media is not limited or controlled by the file system.

2. The file descriptions for files residing on nonstructured removable media must reside on fixed mass storage devices.

SECTION III

USE OF THE FILE SYSTEM

GENERAL

Batch-dimension usage of the file system to create or modify catalog structures (either local or remote) requires use of the file-system processor which is engaged via the $ FILSYS control card, much in the same manner as the FORTRAN compiler is called via the $ FORTRAN control card. The file-system processor interprets all FILSYS-language instructions, known as "directives," until another $-control card is encountered.

The format of the $ FILSYS control card is as follows:

1	8	16	
$	FILSYS	dump option	

The FILSYS language consists of directives that collectively provide the facility for the following:

- creating catalogs and files

- purging catalogs and files

- modifying catalogs and file definitions (name, password, permissions, maximum size, etc.)

- listing catalog/file structures

- creating, modifying, and deleting system master catalog (SMC) entries

- saving and restoring SMC entries, catalogs, and files

Once a permanent file has been created by means of a FILSYS activity, a batch user can identify and request this file for use in another activity with the $ PRMFL control card. This card is described in the Control Cards Reference Manual. Time-sharing modes of access to permanent files are described in the Time-Sharing System General Information Manual.

FILSYS DIRECTIVES

Functions Of Directives

The FILSYS directives and their functions are as follows:

USERID	-- identifies user to the file system
CCREAT	-- creates a catalog
FCREAT	-- creates a file
CPOS	-- positions user at a specified catalog level for subsequent operations
CMOD	-- modifies a catalog (name, password, and/or permissions)
FMOD	-- modifies a file definition (name, password, permissions, and/or maximum size)
CPURGE	-- purges (zeros and releases) a catalog/file string, starting at given catalog
CRELES	-- releases a catalog/file string, starting at given catalog
FPURGE	-- purges a file, zeroing the space prior to release
FRELES	-- releases a file
CLIST	-- lists a catalog or catalog/file string
CREL	-- releases user from the previous catalog position
SAVE	-- saves a catalog or file
RESTORE	-- restores a catalog or file
CRMAST	-- creates a SMC entry
MODMAS	-- modifies a SMC entry
RELMAS	-- releases a SMC entry
DELMAS	-- deletes (i.e., purges) a SMC entry
MASLST	-- lists the SMC
CRPACK	-- creates a pack master catalog
MODPAC	-- modifies a pack master catalog
RELPAC	-- releases a pack master catalog
DELPAC	-- deletes a pack master catalog
SAVEMAST	-- saves a master catalog
RESTOREMAST	-- restores a master catalog or file

directives authorized by the installation

Most of the directives require a catalog/file description as a variable field and allow options to be specified: SIZE, DEVICE, MODE, etc. The directives that affect the system and pack master catalogs are all protected against unauthorized use by special system controls. Use of one or more of these directives will cause the operator to be notified and FILSYS execution to be suspended until the user is verified as one authorized by the installation to maintain the master catalogs. If the user is not permitted to access the master catalogs, the activity will be aborted.

Format Of Directives

The general format of a FILSYS-language statement is:

directiveⱶvariable field

The variable field is separated from the directive by at least one blank. (The CREL directive is the only directive that takes no variable field.)

The directive statement can begin anywhere on the punched card. A variable field may be continued from one card to another by ending with a valid delimiter anywhere on the first card. The variable field is terminated by a blank immediately following a non-comma character.

A comment card may appear anywhere in a FILSYS-activity source deck. An asterisk in column 1 indicates a comment card.

The general format of the variable field is:

$$\left\{ \begin{array}{l} \text{catalog-string} \\ \text{catalog/file-string} \end{array} \right\} \text{,option,....,option}$$

Options must be separated by commas, as shown. No embedded blanks are allowed except immediately following a comma-separator.

The variable-field format applies to all directives except those requiring a SMC name. The options may appear in any order, but must be preceded by the catalog-string or catalog/file-string description.

The general format of a catalog-string is:

        catalog$password/.../catalog$password/<u>catalog</u>$password

The minimum required portion of this item is underlined. A password is
given only if a catalog name refers to an already existent catalog to
which a password is attached. The password is concatenated to the
catalog name by a dollar sign ($). Every catalog named within the
string, with perhaps the exception of the last one, must have been
previously created. The final (or only) catalog name in the string may
or may not refer to an already existent catalog, depending upon the
nature of the directive (e.g., CCREAT vs. CPURGE). If two or more
catalog names are given, they must be separated by a slant (/).

Examples:

        (1) cat-1$pass1/cat-2/cat-3

        (2) cat-1

The general format of a catalog/file-string is:

        catalog$password/.../<u>catalog</u>$password/<u>file</u>$password

The minimum required portion of this item is underlined. A password is
given only if a catalog/file name refers to a catalog or already
existent file to which a password is attached. The password is
concatenated to the catalog or file name by a dollar sign ($). The file
name may or may not refer to an already existent file, depending upon
the nature of the directive (e.g., FCREAT vs. FPURGE). All catalog names
must be separated from each other and from the file name by a slant
(/).

A special directive, CPOS -- position to catalog -- is provided for the
user's convenience in writing catalog-string and catalog/file-string
descriptions. When the user is to perform a series of operations
(create, modify, purge, etc.) at or below the level of a particular
catalog, he may save himself the trouble of writing a repetitive series
of complete string descriptions for a number of directives by first
using a CPOS directive. In the CPOS directive, he specifies the common
higher-level portion of the catalog string, and in subsequent
directives, only the lowest-level portion of the string, down to the
working level. Refer to "CPOS -- Position to Catalog", below, for a
detailed description of CPOS operation.

Option Descriptions

Each variable-field option is identified by a keyword. The options are:

● PASSWORD/password/

This option is used to assign a password to a catalog or file, or to replace an already assigned password with another. (A special form of this option is described under the CMOD and FMOD directive descriptions.)

● General permission options:

READ

WRITE

APEND

EXECUTE

● Specific permission options:

permission-name/user-id,...,user-id/

where permission-name is READ, WRITE, APEND, EXECUTE, PURGE or MODIFY, or the pseudo-permission EXCLUDE.

Both the general permission and the specific permission options are used to assign one or more permissions to a file, or to replace one or more already assigned permissions. The pseudo-permission EXCLUDE is used to exclude the named user(s) from any general permissions. As many permission options as needed may be specified in one statement. The combined use of both specific and general permissions may produce an implicit exclude for the user identified in the specific permissions.

● ${\begin{cases} \text{BLOCKS} \\ \text{LINKS} \\ \text{SIZE} \end{cases}}$ /x,y/

Variable x is the initial size of the file to be created, in links or 320-word blocks, and variable y is the maximum size to which the file may grow, in links or blocks. Both x and y are expressed as decimal integers, one to six digits in length. LINKS and SIZE are synonymous. Initial size(x) may not exceed maximum size(y). When creating a file that will reside on a MSS800 device, use of the BLOCKS option will result in x and y being rounded to the nearest multiple of 12. This rounding results from the fact that space on a MSS800 is allocated in links only.

- DEVICE/ $\left\{ \begin{array}{l} \text{type} \\ \text{name} \end{array} \right\}$ / -- form 1

- DEVICE/ removable type, file serial number / -- form 2

      Allowable type variables - DSS270, DSS200, MDS200, DSS167, DSS170, DSS180, DSS181, MSS800

      Allowable name variables - Any device names assigned to fixed mass storage devices by the installation (e.g., DS1, DP3)

      Allowable removable type variables - TAPE, TAPE7, TAPE9, 167PK, 170PK, 180PK, 181PK

      Allowable file serial number variables - Any combination of 1 to 5 characters from the character set used for identifiers. This field will appear as the file serial number in "GET" and "MNT" messages whenever this file or catalog name is referenced in a $ PRMFL card.

Form 1 of the DEVICE option is used only when creating a catalog or file that emanates directly from the User Master Catalog (known as a "level-1" entry). It should be used only when it is essential that the level-1 entry be located on a particular device or any device of a particular type (see "Selection Of Media" in Section 2).

Form 2 of the DEVICE option must be used when creating a level-1 catalog which is to reside on a structured removable pack or when creating a file whose content resides on nonstructured removable media. When creating a level-1 catalog for a structured removable pack, the removable type variables "TAPE", TAPE7", and "TAPE9" are not allowed. When creating a nonstructured file, the FILEINFO option must also be present.

Form 2 of the DEVICE option is used with the CRPACK, MODPAC, DELPAC, and RELPAC directives to uniquely identify the desired pack.

- MODE/ $\left\{ \begin{array}{l} \text{RAND} \\ \text{SEQ} \end{array} \right\}$ /

This option is used to indicate that the file to be created will be treated as a random file (RAND), or as a sequential (i.e., linked) file (SEQ). If the mode-option is not specified, SEQ is assumed unless the directive is FCREAT/IDS/, in which MODE is forced to RAND.

- NEWNAM/catalog name or file name/

This option is used to replace a catalog or file name.

- DELETE/ $\left\{ \begin{matrix} \text{user-id,...,user-id} \\ \text{GEN'L} \end{matrix} \right\}$ /

     This option is used to delete either specific permissions, by user-id, or all general permissions (GEN'L) from a catalog or file.

- LISTOPT/ $\left\{ \begin{matrix} \text{ALL} \\ \text{ONLY} \end{matrix} \right\}$ /

     This option is used to control the listing of catalog/file structures in directive statements other than SAVE, SAVEMAST, RESTORE, and RESTOREMAST. In the case of a SAVE, SAVEMAST, RESTORE or RESTOREMAST directive statement, the format of the option is

     LISTOPT/ $\left\{ \begin{matrix} \text{YES} \\ \text{NO} \end{matrix} \right\}$ /.

- DATE/ $\left\{ \begin{matrix} \text{mmddyy} \\ \text{TODAY} \end{matrix} \right\}$ /

     This option is used to indicate that the specified directive be performed only for those permanent files which were written upon on date specified. The date is expressed by means of six digits. The character string TODAY in place of an explicit date causes the current system day to be used.

- SINCE/ mmddyy /

     This option is used to indicate that specified file directive be performed only for those permanent files which were written upon since the date specified. Date is written by means of six digits.

- TIME/ $\left\{ \begin{matrix} \text{hhmmm} \\ \text{hhmm} \\ \text{hh:mm} \end{matrix} \right\}$ /

     This option is used to indicate that the specified directive be performed only for those permanent files written upon since or after the time specified. Time is written according to a 24-hour clock where hh is the hour, mm reflects minutes in hundredths if no colon is used or minutes past the hour if a colon is used, and mmm reflects minutes in thousandths. This option must be used in conjunction with the DATE or SINCE option; the use of the TIME option alone is invalid.

- RESOURCES/nnnnnn/

     This option is used to assign or modify the amount of a user's resources, in even dollars, for time-sharing system usage. The amount is expressed as a decimal integer, one to six digits in length. (Used in SMC directives only.)

● COMPARE/ $\left\{ \begin{array}{c} \text{YES} \\ \text{NO} \end{array} \right\}$/

This option is used in conjunction with the COPY option for SAVE and SAVEMAST directives. The option directs FILSYS to compare the data written in both saved files to ensure that the files contain identical data. If the copied data is incorrect, the save is restarted after an appropriate error message is printed. Note the COMPARE /YES/ is only valid when COPY/ YES/ has been specified.

● FILEINFO/file name $\left\{ \begin{array}{c} , \quad \text{xxx:yyy} \end{array} \left\{ \begin{array}{c} , \quad \text{xxx:yyy} \end{array} \left\{ \begin{array}{c} , \quad \text{xxx:yyy} \end{array} \right\} \right\} \right\}$/

xxx = first link number of string
yyy = number of links in the string

The FILEINFO option is used if, and only if, the DEVICE option on a FCREAT directive specifies that a nonstructured file is to be created. The FILEINFO option defines the file name attached to the removable media and, if the media is a disk pack, allows definition of up to three discrete link strings comprising the file. If no link strings are defined and the media is a disk pack, the following values are assumed:

Media Type	First Link	Number Of Links
167PK	0	666
170PK	0	1200
180PK	0	1200

Note: When the file is accessed by a user, the entire pack is allocated. The link strings defined at file create time have no affect on allocation and are for information only.

File name may consist of from 1-12 characters from the character set used for identifiers.

● LODX/ $\left\{ \begin{array}{c} \text{YES} \\ \text{NO} \end{array} \right\}$ /

● CARDIN/ $\left\{ \begin{array}{c} \text{YES} \\ \text{NO} \end{array} \right\}$ /

● TALK/ $\left\{ \begin{array}{c} \text{YES} \\ \text{NO} \end{array} \right\}$ /

● LODS (or LODSS)/ $\left\{ \begin{array}{c} \text{YES} \\ \text{NO} \end{array} \right\}$ /

These options are used with the CRMAST and MODMAS directives to allow a user to invoke the related subsystems in time-sharing.

If not specified, the NO variable is assumed.

● URGENCY /$\left\{ \begin{array}{c} \text{nn} \\ \text{NO} \end{array} \right\}$/

This option is used with the CRMAST and MODMAS directives to define an urgency value for CARDIN jobs run by the user. The allowable range of nn is defined as: $0 \leq nn \leq 40$. NO is the default value of the variable, implying normal urgency of 05 for CARDIN jobs.

• RESET/ $\left\{ \begin{array}{l} \text{BUSY-FILE,IDS-ABORT} \\ \text{BUSY-FILE} \\ \text{IDS-ABORT} \end{array} \right\}$ /

This option is used in conjunction with the FMOD directive to reset information in file description records. The BUSY-FILE variable will cause the "number of readers", "number of writers", "file is being appended," "file is busy recovery", and "file is busy" private fields to be cleared. The IDS-ABORT variable will reset the "I-D-S file in abort status" indicator.

The RESET option is protected against unauthorized use. The option is to be used only when it is certain that the status indicators are incorrectly set and that no user is currently accessing the file.

• $\left\{ \begin{array}{l} \text{DONTDO/ SMC-name,.../} \\ \text{DOONLY/ SMC-name,.../} \end{array} \right\}$

This option is used in conjunction with SAVEMAST and RESTOREMAST directives to bypass or do only specified SMC-names. The option is also used with the RESTORE directive to bypass or do only specified catalog and/or files entries in a catalog.

• FROM/ $\left\{ \begin{array}{l} \text{name-n} \\ \text{\#n} \\ \text{name-n} \\ \text{\#n} \end{array} \right\}$ / THRU/ $\left\{ \begin{array}{l} \text{name-m} \\ \text{\#m} \\ \text{***EOF} \\ \text{***EOF} \end{array} \right\}$ /

This option is used in conjunction with SAVEMAST directive for saving the specified "section" of permanent files; names or numbers may be used to indicate the range. Refer to the description of the SAVEMAST directive for details.

• COPY/ $\left\{ \begin{array}{l} \text{YES} \\ \text{NO} \end{array} \right\}$ /

This option is used in conjunction with SAVE, SAVEMAST, RESTORE and RESTOREMAST directives. When used with the SAVE or SAVEMAST directive the COPY/YES/ will direct FILSYS to produce a copy of the save file while the save file is being created. The copy file is defined by a $ TAPE XS,... control card when producing the save file. If the copy option is YES and no $ TAPE XS,... control card exists, FILSYS will attempt to do a GEMORE for the magnetic tape handler.

If write errors are encountered while producing the save file(s), FILSYS will notify the operator which of the units contained the errors and that the save will be restored. The operator can then take corrective action by changing both the magnetic tape handler and the tape reel on which the error occurred.

When used with a RESTORE or RESTOREMAST directive, the COPY/YES/ indicates that a copy of the save file exists. If read errors are encountered during the restore, FILSYS will ask the console operator for the reel number of a duplicate save tape. If no $ TAPE XR,... control card exists, FILSYS will do a GEMORE for the magnetic tape handler.

```
                 ( CONCURRENT   )
• ACCESS/        { NORMAL         } /
                 { MULTIPLE WRITE }
                 ( READ WHILE WRITE )
```

This option is used in conjunction with FCREAT and FMOD directives to specify an "access" mode at the time a file is created or is being modified. Absence of the ACCESS option when the FCREAT directive is used implies NORMAL.

The following table illustrates the interaction of "access" mode and current status of file usage to determine the response of a request to access a file with either "read" or "write" permission. The assumption is made that the user requesting access has either general or specific read and write permission on the file. YES indicates the access request will be allowed; NO indicates denial. Refer to the File System SMD for a complete description of file accessing rules.

Status of file usage at time access request is received	Access mode specified in FCREAT or FMOD							
	NORMAL (null)		MULTIPLE WRITE		READ WHILE WRITE		CONCURRENT	
	Permission requested at access time							
	READ	WRITE	READ	WRITE	READ	WRITE	READ	WRITE
BUSY READ	YES	NO	YES	NO	YES	YES	YES	YES
BUSY WRITE	NO	NO	NO	YES	YES	NO	YES	YES
NOT BUSY	YES	YES	YES	YES	YES	YES	YES	YES

Character Set For Identifiers

The identifiers in a FILSYS statement (i.e., catalog/file names, passwords, and user-id's) may be from 1 to 12 characters in length, and may be composed of alphanumerics, minus signs, and periods.

Directive Descriptions

A detailed description of each directive follows. The minimum required portion of the variable field is underlined in each case. Mutually exclusive options are bracketed. (See Appendix D for a listing of directives, their variable fields, and options.)

USERID -- IDENTIFY USER

Once a user has an entry in the SMC, he is free to use the catalog and file space allotted to him. He must, however, identify himself as a legitimate user by means of the USERID directive. The format of this directive differs from the general format. (This directive is not required for authorized users of SMC directives.)

Note

The user should not confuse this directive with the $ USERID control card. The use of a $ in conjunction with the directive will invalidate the directive.

Format

    USERID   master-catalog-name$log-on password

Options

    None

Rules

1. This directive must be the first one given in a FILSYS activity unless the purpose of the activity is to create the system-master-catalog.

2. The log-on password is the one associated with the SMC entry, and is distinct from the password that may be attached to the corresponding UMC. This is the only directive in which the log-on password is given.

Examples

(1) USERID ABCCORP$584031

ABCCORP is a master catalog name identifying an SMC entry. 584031 is the log-on password associated with this entry.

(2) USERID JPJONES$BHR

Here the master catalog name is JPJONES and BHR is the log-on password.

(3) USERID CLASS021$JAN15

The master catalog name is CLASS021 and JAN15 is the log-on password.

CCREAT -- CREATE CATALOG

The create-catalog directive is used to create a UMC or any level of subcatalog. A password and permissions may be attached to the catalog.

Format

CCREAT <u>catalog-string</u>,options

Options

PASSWORD, permissions, DEVICE

Rules

1. The final or only name in the catalog-string description is the name of the catalog to be created.

2. A catalog-string description containing only one name indicates explicit creation of the UMC (unless a CPOS directive has been given).

3. If DEVICE specifies a structured removable device (i.e., a "level-1" catalog is to be created on a removable pack), that pack must be on-line if any other options are specified.

4. If the new catalog is subordinate to a "level-1" catalog residing on a structured removable pack, that pack must be on-line.

Examples

(1) CCREAT ABCCORP,PASSWORD/XYZABC/,READ,
     READ/JDOE,WRITE/JDOE/

     ABCCORP is the UMC name, corresponding to the SMC entry ABCCORP. This UMC is created with the password XYZABC, general read-permission, and specific read- and write-permissions for user JDOE.

(2) CCREAT JPJONES/CAT1

     JPJONES is the UMC name; CAT1 is the first-level subcatalog to be created. No passwords have been assigned so far and no access permission is granted at CAT1 level.

(3) CCREAT PAYROLL/PAYMASTER,DEVICE/167PK,D352/,PASSWORD/1662/

PAYROLL is the UMC name; PAYMASTER is a "level-1" subcatalog to be created on structured removable DSS167 pack identified as D352. Since a password is to be attached to the catalog, pack D352 must be on-line for the catalog create to be successfully completed.

FCREAT -- CREATE FILE

The create-file directive is used to define file space by name. An initial and maximum file size may be specified, a password and permissions may be assigned, and a device or device type may be specified. Random or sequential file treatment may be specified.

Format

    FCREAT catalog/file-string,options

Options

    PASSWORD; permissions; DEVICE; MODE; ACCESS; BLOCKS, LINKS, or SIZE

Rules

    1. If the UMC does not already exist, a catalog/file description consisting of UMC-name/filename will cause the UMC to be created automatically (no password or permissions attached), as well as the named file.

    2. If the SIZE option is not given, a 1-link file is created.

    3. Random files may lose integrity after a SAVE directive and subsequent RESTORE directive are utilized for files wherein the physical block size of the device on which the files are saved differs from the block size on which they are restored. This problem may be circumvented by use of the "DEVICE type" option of FCREAT.

    4. If the new file is subordinate to a "level-1" catalog residing on a structured removable pack, that pack must be on-line.

Examples

    (1) FCREAT CLASS021/PROB1INPUT,READ

         CLASS021 is the UMC name; PROB1INPUT is the name of the file to be created, emanating directly from the UMC. The file is 1 link long, with general read-permission granted. No passwords are attached to the string.

(2)   FCREAT JPJONES/CAT1/FILE01.1,SIZE/2,5/

Here file FILE01.1 emanates from the subcatalog CAT1. Initial size is 2 links, maximum size is 5 links. No access permissions are granted at the file level.

(3)   FCREAT J.P.JONES/CAT1/FILE01.2,DEVICE/170PK,P0883/,
          FILEINFO/FILE2,366:40/

File FILE01.2 emanates from the subcatalog CAT1. The file content is located on a nonstructured DSS170 pack identified as P0883. The file name is FILE2 and the file occupies 40 links beginning at 366.

To accommodate I-D-S, the FCREAT directive is used as follows:

FCREAT/IDS/

The options listed above for FCREAT are applicable with additional options added for I-D-S:

Option	Range of n	Default Value
BASESIZE/n/	$1 \le n \le 262143$	(required field)
RNG/n_1,n_2/	$1 \le n_1 \le 262143$	(required field)
	$1 \le n_2 \le 262143$	
PAGESIZE/n/	$40 \le n \le 640$	320 (decimal)
LINESPERPAGE/n/	$1 \le n \le 63$	63 (decimal)
INVENTORY/n/	$1 \le n \le 100$ or NO	75 (BCD)

MULTIUSER/ $\left\{ \begin{matrix} YES \\ NO \end{matrix} \right\}$ /

The YES variable specifies that I-D-S multi-access protection is to be invoked when this file is accessed. The default variable is NO.

CPOS -- POSITION TO CATALOG

The position-to-catalog directive is used to specify a catalog level for subsequent operations. A string of existent catalogs is specified; the effect is to cause the catalog or file name in subsequent directives to be concatenated to the specified catalog string.

Thus, if several catalog/file creations, modifications, or purges are to be performed at the same level, repeated descriptions of higher level catalogs may be avoided by the use of CPOS. The effect of a CPOS directive is nullified by a subsequent CPOS or CREL (release from catalog position) directive.

Format

    CPOS catalog-string

Options

    None

Rules

    1. The CPOS directive affects the operation of the following directives: CCREAT, FCREAT, CPURGE, FPURGE, CMOD, FMOD, CLIST, CRELES, FRELES.

    2. Once a catalog position has been established, it remains in effect until another CPOS or a CREL is encountered.

Examples

    (1) CPOS JPJONES/CAT1

        JPJONES is the UMC name; CAT1 is a catalog emanating directly from it.

    (2) CPOS ABCCORP$XYZABC

        ABCCORP is the UMC name; XYZABC is the password attached to this catalog.

CMOD -- MODIFY CATALOG

The modify-catalog directive is used to modify the name, password, and/or permissions of an existent catalog.

Format

    CMOD catalog-string, option,...,option

Options

    NEWNAM, PASSWORD, permissions, DELETE

Rules

1. The final or only name in the catalog-string description is the name of the catalog to be modified. If this catalog resides on a structured removable pack, that pack must be on-line.

2. If the PASSWORD option is given without a following slant-enclosed identifier, the existing password is deleted.

3. If one or more general permissions are specified, the set of already assigned general permissions, if any, is replaced (not added to); if one or more sets of specific permissions are specified, any corresponding set(s) of already assigned specific permissions, by named user, are replaced (not added to).

4. The UMC name may not be modified.

Examples

(1) CMOD ABCCORP$XYZABC,PASSWORD/ZYXCBA/, READ,WRITE,READ/RFOX/, WRITE/RFOX/,PURGE/RFOX/,EXCLUDE/JDOE/

    ABCCORP is the name of the catalog to be modified; XYZABC is the password assigned to it. The password is replaced by ZYXCBA. The original set of general permissions (READ) is replaced by READ and WRITE. The set of specific permissions READ, WRITE, and PURGE for user RFOX is added, effectively (none originally assigned for this user). User JDOE is excluded from any permissions. (The previously assigned set of specific permissions for JDOE (READ and WRITE) is replaced by EXCLUDE. User JDOE has presumably been fired.) (See CCREAT, Example 1.)

(2)   CMOD   JPJONES/CAT1,NEWNAM/STORES/,
      PASSWORD/BNHMRCHD/,READ

      JPJONES/CAT1 is the catalog string description; CAT1 is the
      catalog to be modified. The catalog name is replaced (NEWNAM)
      by STORES. The password BNHMRCHD is added, effectively (none
      originally assigned), and general read-permission is granted.
      (See CCREAT, Example 2.)

FMOD -- MODIFY FILE

The modify-file directive is used to modify the name, password, permissions, and/or maximum size of a file. Mode and device may not be changed. In addition, any of the special options for I-D-S files may be used if the file is an I-D-S file. (Refer to the FCREAT directive for FCREAT/IDS/.)

Format

    FMOD   <u>catalog/file-string, option</u>,...,option

Options

    NEWNAM, PASSWORD, permissions, DELETE, size, ACCESS, RESET
    I-D-S only:BASESIZE,RNG,PAGESIZE,LINESPERPAGE,INVENTORY,MULTIUSER

Rules

1. The format of the size option for this directive is: BLOCKS or SIZE or LINKS /y/, where y specifies the new maximum size of the file.

2. The final or only name in the catalog file-string is the name of the file to be modified. If the file resides on a structured removable pack, that pack must be on-line.

Examples

(1) FMOD   CLASS021/PROB1INPUT,NEWNAM/BINSRCHDATA/,
       MODIFY/RFOX

     CLASS021/PROB1INPUT is the catalog/file-string description; PROB1INPUT is the file to be modified. The file is renamed BINSRCHDATA and MODIFY permission for RFOX is added.

(2) FMOD   JPJONES/STORES$BNHMRCHD/FILE01.1/,SIZE/4/,
          READ,PASSWORD/BOSN/

     JPJONES/STORES$BNHMRCH/FILE01.1 is the catalog/file description; FILE01.1 is the file to be modified. The previous maximum size is changed to 4 links, general read-permission is granted, and the password BOSN is attached.

CPURGE -- PURGE CATALOG

The purge-catalog directive is used to purge (i.e., remove from the file system) a specified catalog and any subcatalogs and/or files emanating from it. Space occupied by file content is zeroed prior to being released for system usage.

Format

        CPURGE catalog-string

Options

        None

Rules

    1. The final or only name in the catalog-string description is the name of the catalog to be purged. If the catalog resides on a structured removable pack, that pack must be on-line.

    2. If the catalog to be purged is a UMC, any "level-1" subordinate catalogs that reside on structured removable packs (and any catalogs or files subordinate to them) will be left intact on those packs. To purge such catalogs (and their subordinates) use an individual CPURGE directive for each level-1 catalog.

Example

        CPURGE UMCAT/CAT1$PASS1/CAT2$PASS2

        The catalog CAT2 and any catalogs and files subordinate to it are purged.

CRELES -- RELEASE CATALOG

The release-catalog directive is used to remove from the file system a
specified catalog and any subcatalogs and/or files emanating from it.
Space occupied by file content is not altered prior to being released
for further use.

Format

        CRELES catalog-string

Options

        None

Rules

    1. The final or only name in the catalog-string description is the
        name of the catalog to be released for system usage. If the
        catalog resides on a structured removable pack, that pack must
        be on-line.

    2. If the catalog to be released is a UMC, any "level-1"
        subordinate catalogs that reside on structured removable packs
        (and any catalogs or file subordinate to them) will be left
        intact on those packs. To release such catalogs (and their
        subordinates) use an individual CRELES directive for each
        level-1 catalog.

Example

        CRELES UMCAT/CAT1$PASS1/CAT2$PASS2

        Catalog CAT2 and any catalogs and files subordinate to it are
        released for system usage.

FPURGE -- PURGE FILE

The purge-file directive is used to purge a specified file from the file
system.   Space occupied by file content is zeroed prior to release for
further system usage.

Format

        FPURGE   catalog/file-string

Options

        None

Rules

    1. If the file is a nonstructured file, file content space is not
        zeroed.

    2. If the file resides on a structured removable pack, that pack
        must be on-line.

Example

        FPURGE UMCAT/CAT1$PASS1/FIL01.3$PASS01.3

        The file FIL01.3 is purged.

FRELES -- RELEASE FILE

The release-file directive is used to remove from the file system
content a specified file. The physical file space associated with the
file name is not altered prior to being released for system usage.

Format

FRELES   catalog/file-string

Options

None

Rule

If the file resides on a structured removable pack, that pack
must be on-line.

Example

FRELES UMCAT/CAT1$PASS1/FIL1$PASS1

The file FIL1 is released.

CLIST -- LIST CATALOG STRUCTURES

The list-catalog-structure directive is used to obtain a listing of all or a portion of a user's catalog/file structure. The listing includes the following information for each catalog or file, as appropriate: originator, password, device, creation date, date of last modification, date of last access, permissions, maximum and current file size, and file type.

The format of a catalog/file listing is described under "An Example of FILSYS-Activity Language Usage" in this section.

Format

        CLIST catalog-string, LISTOPT-option

Options

        LISTOPT/ALL/ or LISTOPT/ONLY/

Rules

    1. The final or only name in the catalog-string description is the name of the catalog at which the listing is to begin.

    2. If LISTOPT/ALL/ is specified, the name and contents of the named catalog and all subordinate catalogs and file definitions are listed.

    3. If LISTOPT/ONLY/ is specified, the name and contents of the named catalog and only those catalogs and file definitions immediately subordinate to it are listed.

    4. If the LISTOPT option is not specified, LISTOPT/ALL/ is assumed.

    5. Catalog and file descriptions that reside on removable media will be listed only if the final name in the catalog-string description resides on the removable media and if that media is currently on-line. However, references to removable media will be shown whenever they are encountered.

Examples

    (1)   CLIST UMCAT

        The complete catalog/file structure beginning with the catalog
        UMCAT is listed.

    (2)   CLIST UMCAT, LISTOPT/ALL/

        Equivalent to Example (1).

    (3)   CLIST UMCAT, LISTOPT/ONLY/

        The catalog UMCAT and any first-level subcatalogs and files
        emanating directly from it are listed.

    (4)   CLIST UMCAT/CAT1$PASS1

        The complete catalog/file structure beginning with the catalog
        CAT1 is listed.

CREL -- RELEASE FROM CATALOG POSITION

The release-from-catalog-position directive is used to cancel the effect
of a previous CPOS directive.

Format

        CREL

Options

        None

Rule

        This directive takes no variable field.

SAVE -- SAVE CATALOG OR FILE

The save-catalog-or-file directive is used to allow the "normal" user to save a specific catalog and the catalogs and files emanating from that catalog or to save a specific file on tape.

Format

SAVE catalog/file-string $\left[,\text{LISTOPT}/\left\{ \begin{matrix} \text{YES} \\ \text{NO} \end{matrix} \right\}/,\text{COPY }/\left\{ \begin{matrix} \text{YES} \\ \text{NO} \end{matrix} \right\}/,\text{COMPARE}/\left\{ \begin{matrix} \text{YES} \\ \text{NO} \end{matrix} \right\}/\right]$

Options

LISTOPT/ $\left\{ \begin{matrix} \text{YES} \\ \text{NO} \end{matrix} \right\}$ /,COPY,DATE,SINCE,TIME,COMPARE

Rules

1. The final or only name in the catalog/file-string description is the name of the catalog at which the saving is to begin, or of the file that is to be saved.

2. To assign a tape to a program, the control card $ TAPE must be inserted into the deck as illustrated in Appendix C.

3. If the COPY option is /YES/ then a $ TAPE XS,---control card should be inserted in the deck, as shown in Appendix C.

4. Files modified by use of the FMOD directive and not written upon in the specified interval will not be saved when an attempt is made to save these files. That is, file modification by use of the FMOD directive only does not constitute sufficient activity to have a file saved.

5. Catalog and files residing on structured removable packs will be saved only if the final name in the catalog/file-string resides on the removable pack and if that pack is currently on-line. However, sufficient information to restore the references to removable packs will be saved whenever it is encountered.

6. The save process will have "PRIVATE" permission to the file while the file content is being saved. If the file is "busy", save processing will wait up to two minutes for the file to become available. If the file remains "busy", the file content and file description will not appear on the save tape.

7. Files in "defective" status and files in "abort" status will not be saved. File contents for nonstructured files will not be saved.

Examples

    (1)   SAVE CLASS021,LISTOPT/YES/
            UMC CLASS021 and all subordinate catalogs and files are saved.
            The structure will be listed.

    (2)   SAVE CLASS021/PROB1INPUT
            The file PROB1INPUT is saved. No list will be made.

    (3)   SAVE CLASS021,COPY/NO/,LISTOPT/YES/
            UMC CLASS021 and all subordinate catalogs and files are saved.
            No copy of the save file will be produced. The saved structure
            will be listed.

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RESTORE -- RESTORE CATALOG OR FILE

The restore-catalog-or-file directive is used to allow the "normal" user
to restore a specific catalog and the catalogs and files emanating from
that catalog or to restore a specific file from magnetic tape. The
restored catalog/file structure may be listed, if desired.

Format

$$\text{RESTORE catalog/file-string} \left[,\text{LISTOPT}/ \begin{Bmatrix} \text{YES} \\ \text{NO} \end{Bmatrix} /,\text{COPY}/ \begin{Bmatrix} \text{YES} \\ \text{NO} \end{Bmatrix} /, \begin{Bmatrix} \text{DONTDO/name-n,...,name-m/} \\ \text{DOONLY/name-n,...,name-m/} \end{Bmatrix} \right]$$

Options

$$\text{LISTOPT}/ \begin{Bmatrix} \text{YES} \\ \text{NO} \end{Bmatrix} /,\text{COPY,DATE,SINCE,TIME}$$

Rules

1. The final or only name in the catalog/file-string description
   is the name of the catalog at which restoring is to begin, or
   of the file that is to be restored.

2. To assign a "restore" tape to the FILSYS activity, the control
   card $ TAPE must be inserted into the deck as illustrated in
   Appendix C. The file-code is PR for a restore operation.

3. To assign the copy of the "restore" tape, if one exists, the
   $ TAPE XR,...control card should be used as shown in Appendix
   C.

4. To restore to removable media, that media must be on-line.

5. The restore process will have "PRIVATE" permission to the file
   while the file content is being restored.

6. If the DOONLY/DONTDO option is used, the final or only name in
   the catalog/file-string description must be that of a catalog
   description.

Examples

    (1)   RESTORE CLASS021,LISTOPT/YES/
                 UMC CLASS021 and all subordinate catalogs and files is restored. The structure will be listed.

    (2)   RESTORE CLASS021/PROB1INPUT
                 The file PROB1INPUT is restored. No list is prepared.

    (3)   RESTORE CLASS021,COPY/YES/,LISTOPT/YES/
                 UMC CLASS021 and all subordinate catalogs and files is restored. If a magnetic tape read error is encountered FILSYS will ask the operator for the reel number of the copy of the same file. FILSYS will then use the copy file to continue the restore function.

    (4A)   RESTORE CLASS021,DONTDO/FILEA,CATONE/
                 All catalogs and files subordinate to CLASS021, with the exception of FILEA and CATONE, will be restored. No list is prepared.

    (4B)   RESTORE CLASS021,DOONLY/FILEA,CATONE/
                 Only the entries subordinate to CLASS021, FILEA and CATONE, will be restored. If the DOONLY name is a catalog entry, all catalogs or files subordinate to the DOONLY name will be restored.

CRMAST -- CREATE SMC ENTRY

The create-SMC-entry directive is used to create a user's entry in the SMC. This directive is protected against unauthorized use.

Format

    CRMAST   master-catalog-name/user-id,options

Options

    Required: PASSWORD (log-on); BLOCKS,LINKS,or SIZE
    Optional: RESOURCES,LODX,CARDIN,TALK,LODS(or LODSS),URGENCY

Rules

1. In the item BLOCKS or SIZE or LINKS /y/, y specifies the maximum number of links/blocks of file space that may be created on fixed mass storage under the SMC entry. y is expressed as a decimal integer from one to six digits in length.

2. RESOURCES is used to specify the even-dollar amount of time-sharing-usage resources assigned to the user. The amount is specified as a 1- to 6-digit decimal integer.

Examples

(1)   CRMAST ABCCORP/ABCCORP, PASSWORD/584031/, SIZE/20/

(2)   CRMAST JPJONES/JPJONES, PASSWORD/BHR/, SIZE/8/, RESOURCES/500/

MODMAS -- MODIFY SMC ENTRY

The modify-SMC-entry directive is used to replace the log-on password, file-space allotment, and/or dollar resources in a user's entry in the SMC. This directive is protected against unauthorized use.

Format

MODMAS master-catalog-name/user-id,option,...,option

Options

PASSWORD; BLOCKS,LINKS or SIZE; RESOURCES; LODX; CARDIN; TALK; LODS (or LODSS); URGENCY

Rules

1. At least one option must be specified in this directive.

2. The format of the RESOURCES and the BLOCKS, LINKS, or SIZE option for this directive are as described for CRMAST.

3. The option values replace (i.e., do not add to) the original or current values in the SMC.

Examples

(1) MODMAS ABCCORP/ABCCORP, SIZE/30/

(2) MODMAS JPJONES/JPJONES, PASSWORD/1792/, RESOURCES/500/

RELMAS -- RELEASE SMC ENTRY

The release-SMC-entry directive is used to release a user's entry from the SMC. The complete catalog/file structure emanating from that entry (except that on a structured removable pack) is purged. This directive is protected against unauthorized use. Space occupied by file content is not altered prior to being released for system usage.

Format

Format

    RELMAS master-catalog-name/user-id

                or

    RELMAS master-catalog-name

Options

    None

Examples

    (1) REMLAS CLASS021/CLASS021

    (2) RELMAS CLASS021

DELMAS -- DELETE SMC ENTRY

The delete-SMC-entry directive is used to delete a user's entry from the
SMC. The complete catalog/file structure emanating from that entry
(except that on a structured removable pack) is purged. Space occupied
by file content is zeroed prior to being released for further usage.

Format

     DELMAS master-catalog-name/user-id

                   or

     DELMAS master-catalog-name

Options

    None

Examples

    (1) DELMAS CLASS021/CLASS021

    (2) DELMAS CLASS021

MASLST -- MASTER LIST

The master-list directive can be used in four ways:

- To obtain a listing of the SMC (i.e., the contents of each SMC entry (ONLY).

- To obtain a listing of each SMC entry and the catalog/file structure emanating from each (ALL).

- To obtain a listing of a specific SMC entry (ONLY).

- To obtain a listing of a specific SMC entry and its subordinate catalog/file structure (ALL).

This directive is protected against unauthorized use.

Format

(1)   MASLST LISTOPT-option

(2)   MASLST master-catalog-name, LISTOPT-option

Options

LISTOPT/ALL/ or LISTOPT/ONLY/

Rules

1. In form (1), if LISTOPT/ONLY/ is specified, only the contents of each SMC entry is listed.

2. In form (1), if LISTOPT/ALL/ is specified, the contents of each SMC entry and all subordinate information is listed.

3. In form (2), if LISTOPT/ONLY/ is specified, only the contents of the named SMC entry is listed.

4. In form (2), if LISTOPT/ALL/ is specified, the contents of the named SMC entry and all information subordinate to it are listed.

5. In form (2), if the LISTOPT-option is not specified, LISTOPT/ALL/ is assumed.

6. Catalog/file structures residing on removable media will not be listed. However, references to removable media will be shown whenever they are encountered.

Examples

   (1)   MASLST LISTOPT/ONLY/

   (2)   MASLST JPJONES, LISTOPT/ONLY/

   (3)   MASLST JPJONES

CRPACK -- CREATE PACK MASTER CATALOG ENTRY

The create-pack-master-catalog-entry directive is used to create a user's entry in the device-master-catalog contained on a structured removable pack. This authorizes the file system to allow files and catalogs to be created on the pack under that master-catalog name. This directive is protected against unauthorized use.

Format

    CRPACK <u>master-catalog-name, options</u>

Options

    Required: DEVICE; BLOCKS, LINKS, or SIZE

Rules

    1. In the item BLOCKS, LINKS, or SIZE /y/,y specifies the maximum number of links/blocks of file space that may be created on the pack specified under the master-catalog name specified.

    2. The master-catalog-name specified need not be currently entered in the SMC. However, before any catalogs or files can be created on the pack the master-catalog-name must be entered in the SMC via a CRMAST directive.

    3. Form 2 of the DEVICE option must be used to specify the pack type and file serial number.

    4. The pack specified must be on-line.

Example

    CRPACK ABCCORP,DEVICE/167PK,D352/,LINKS/50/

MODPAC -- MODIFY PACK MASTER CATALOG ENTRY

The modify-pack-master-catalog entry directive is used to replace the file-space allotment in a user's entry in a pack master catalog. The directive is protected against unauthorized use.

Format

        MODPAC master-catalog-name, option

Options

        Required: DEVICE
        Optional: BLOCKS, LINKS, OR SIZE

Rules

    1. The master-catalog-name referenced must be present on the pack specified. The pack must be on-line.

    2. The value given for BLOCKS, LINKS, or SIZE will replace the current value in the pack's device-master-catalog entry for the specified user.

    3. Form 2 of the DEVICE option must be used to specify the pack type and file serial number.

Example

        MODPAC ABCCORP, DEVICE/167PK,D352/,SIZE/75/

RELPAC -- RELEASE PACK MASTER CATALOG ENTRY

The release pack-master-catalog-entry directive is used to release a user's entry from a pack's device master catalog. All catalog/file structure on the pack under the master catalog name specified is released. This directive is protected against unauthorized use. Space occupied by file content is not altered prior to being released for system usage.

Format

    RELPAC master-catalog-name, option

Option

    Required: DEVICE

Rules

    1. Form 2 of the DEVICE option must be used to specify the pack type and file serial number. The pack must be on-line.

    2. The master-catalog-name must be present in the SMC.

    3. All level-1 catalogs (resident on the pack) under the master-catalog-name specified must emanate from the user-master-catalog related to the SMC entry having the same master-catalog-name. Failure to observe this rule may result in file space not being returned to the system.

Examples

    RELPAC ABCCORP, DEVICE/167PK,D352/

DELPAC -- DELETE PACK MASTER CATALOG ENTRY

The delete-pack-master-catalog-entry directive is used to delete a user's entry from a pack's device master catalog. All catalog/file structure on the pack under the master catalog name specified is released. This directive is protected against unauthorized use. Space occupied by file content is zeroed prior to being released for further use.

Format

    DELPAC master-catalog-name, option

Option

    Required: DEVICE

Rules

    1. Form 2 of the DEVICE option must be used to specify the pack type and file serial number. The pack must be on-line.

    2. The master-catalog-name must be present in the SMC.

    3. All level-1 catalogs resident on the pack under the master catalog name specified must emanate from the user master catalog related to the SMC entry having the same master catalog name. Failure to observe this rule may result in file space not being returned to the system.

Examples

    DELPAC ABCCORP, DEVICE/167PK,D352/

SAVEMAST -- SAVE MASTER CATALOG

The save-master-catalog directive is used to allow the "privileged" user
to save the entire contents of SMC entries and their subordinate
catalogs and files; or to allow the "privileged" user to save a specific
SMC entry and its subordinate catalogs and files. Device master catalogs
on removable media are not saved.

Format

The SAVEMAST directive has the following forms:

(1) SAVEMAST LISTOPT/ $\left\{\begin{matrix} \text{YES} \\ \text{NO} \end{matrix}\right\}$/

(2) SAVEMAST $\left\{\begin{matrix} \text{name-n} \\ \text{DONTDO/name-n,...,name-m/} \\ \text{DOONLY/name-n,...name-m/} \end{matrix}\right\}$ $\left[\text{,LISTOPT/}\left\{\begin{matrix} \text{YES} \\ \text{NO} \end{matrix}\right\} \text{ /} \right]$

(3) SAVEMAST FROM/ $\left\{\begin{matrix} \text{name-n} \\ \text{\#n} \\ \text{\#name-n} \\ \text{\#n} \end{matrix}\right\}$ /THRU/ $\left\{\begin{matrix} \text{name-m} \\ \text{\#m} \\ \text{***EOF} \\ \text{***EOF} \end{matrix}\right\}$ /

(4) SAVEMAST COPY/ $\left\{\begin{matrix} \text{YES} \\ \text{NO} \end{matrix}\right\}$/,LISTOPT/YES/,COMPARE/ $\left\{\begin{matrix} \text{YES} \\ \text{NO} \end{matrix}\right\}$/

Options

LISTOPT/ $\left\{\begin{matrix} \text{YES} \\ \text{NO} \end{matrix}\right\}$/,DONTDO,DOONLY,FROM/THRU/,COPY,DATE,SINCE,TIME,COMPARE

Rules

1. In form (1), the LISTOPT option must be specified.

2. In form (2) the entire contents of an SMC entry and subordinate
    catalog and file are saved, the entire contents of SMC entries
    and their subordinate catalogs and files are saved with the
    exception of those SMC names appearing in the DONTDO clause, or
    only those SMC entries and subordinate catalogs and files whose
    SMC names appear in the DOONLY clause have their entire
    contents saved. The number of SMC entries listed in DONTDO or
    DOONLY clauses is limited to 150.

3. In form (3), a section of the SMC entry and its subordinate catalogs and files are saved. The option permits either explicit master catalog names or numbers in lieu of names to indicate the section range. In addition, ***EOF may be used if the section is through the last master catalog name. The number "n" must be less than the number "m" or the total of master catalog names. If the number "m" is greater than the total of master catalog names, the system will assume ***EOF is intended. Numbers must be whole numbers; i.e., no decimals are permitted. An intermix of an explicit master catalog name and a number to indicate a section range is prohibited.

4. To assign a "save" tape to the FILSYS activity, the control card $ TAPE PS must be inserted into the deck, and to assign a "duplicate save" tape to the FILSYS activity the control card $ TAPE XS,... should be inserted into the deck as illustrated in Appendix C.

5. Files modified by the use of the FMOD directive and not written upon in the specified interval will not be saved when an attempt is made to save these files. That is, modification by use of the FMOD directive only does not constitute sufficient activity to have a file saved.

6. Catalogs and files residing on structured removable packs will not be saved. However, sufficient information to restore the references to structured removable packs will be saved whenever they are encountered.

7. The save process will have "PRIVATE" permission to the file while the file content is being saved. If the file is "busy", save processing will wait up to two minutes for the file to become available. If the file remains "busy", the file content and file description will not appear on the save tape.

8. Files in "defective" status and I-D-S files in "abort" status will not be saved. File content for nonstructured files will not be saved.

Examples

(1) SAVEMAST LISTOPT/YES/
The entire contents of the SMC entries and their subordinate catalogs and files are saved and their structure listed.

(2.A) SAVEMAST JOHNDOE,LISTOPT/YES/
Only the SMC entries and their subordinate catalogs and files for JOHNDOE are saved and a list is prepared.

(2.B)   SAVEMAST DONTDO/JOHNDOE,JANEDOE/
         The entire contents of the SMC entries and their subordinate
         catalogs and files, with the exception of those belonging to
         JOHNDOE and JANEDOE, are saved. No list is prepared.

(2.C)   SAVEMAST DOONLY/JOHNDOE, JANEDOE/
         SMC entries and their subordinate catalogs and files JOHNDOE
         and JANEDOE only have their entire contents saved. No list is
         prepared.

(3.A)   SAVEMAST FROM/JOHNDOE/THRU/JANEDOE/
         The "section" of the SMC entries and their subordinate catalogs
         and files from JOHNDOE thru JANEDOE is saved.   No list is
         prepared.

(3.B)   SAVEMAST FROM/JOHNDOE/THRU/***EOF/
         The "section" of the SMC entries and their subordinate catalogs
         and files from JOHNDOE thru the last entry is saved. No list is
         prepared.

(3.C)   SAVEMAST FROM/#3/THRU/#10/
         The "section" of the SMC entries and subordinate catalogs and
         files from the third entry through the tenth entry is saved. No
         list is prepared.

(4)   SAVEMAST LISTOPT/YES/,COPY/YES/,COMPARE/YES/
         The entire contents of all SMC entries and their subcatalogs
         and files are saved and structure listed. Data is written to
         both files and, upon completion, files are compared to insure
         that data is the same.

RESTOREMAST -- RESTORE MASTER CATALOG OR FILE

The restore-master-catalog-or-file directive is used to allow the "privileged" user to restore the entire contents of SMC entries and their subordinate catalogs and file; or to allow the "privileged" user to restore a specific SMC entry and its subordinate catalogs and files from a previous SAVE tape. Device master catalogs on removable media cannot be restored.

Format

The RESTOREMAST directive has the following forms:

(1)   RESTOREMAST LISTOPT/ $\left\{ \begin{array}{l} YES \\ NO \end{array} \right\}$ /

(2)   RESTOREMAST $\left\{ \begin{array}{l} \text{name-n} \\ \text{DONTDO/name-n,...,name-m/} \\ \text{DOONLY/name-n,....,name-m/} \end{array} \right\}$ $\left[,\text{LISTOPT/} \left\{ \begin{array}{l} YES \\ NO \end{array} \right\} / \right]$

(3)   RESTOREMAST COPY/ $\left\{ \begin{array}{l} YES \\ NO \end{array} \right\}$ /

Options

LISTOPT/ $\left\{ \begin{array}{l} YES \\ NO \end{array} \right\}$ /,DONTDO,DOONLY, COPY,DATE,SINCE,TIME

Rules

1. In form (1), the LISTOPT option must be specified.

2. In form (2),the entire contents of an SMC entry and subordinate catalogs and files are restored, the entire contents of SMC entries and their subordinate catalogs and files are restored with the exception of those SMC names appearing in the DONTDO clause, or only those SMC entries and their subordinate catalogs and files whose SMC names appear in the DOONLY clause have their entire contents restored. The number of SMC entries listed in DONTDO or DOONLY clauses is limited to 150.

3. To assign a "restore" tape to the FILSYS activity, the control card $ TAPE PR must be inserted into the deck, and to assign a "duplicate restore" tape to the FILSYS activity, the control card $ TAPE XR,... must be inserted into the deck as illustrated in Appendix C.

4. The use of the COMPARE option in conjunction with the COPY option for the RESTOREMAST directive is meaningless, for COMPARE has no application to the restore process.

5. The restore process will have "PRIVATE" permission to the file while the file content is being restored.

Examples

    (1)   RESTOREMAST LISTOPT/NO/
              The entire contents of the SMC entries and their subordinate
              catalogs and file are restored. No list is prepared.

    (2)   RESTOREMAST JOHNDOE,LISTOPT/YES/
              Only the SMC entries and their subordinate catalogs and files
              for JOHNDOE are restored. The structure that is restored is
              listed.

    (3.A)   RESTOREMAST DONTDO/JOHNDOE,JANEDOE/
              The entire contents of the SMC entries and their subordinate
              catalogs and files, with the exception of those belonging to
              JOHNDOE and JANEDOE, are restored. No list is prepared.

    (3.B)   RESTOREMAST DOONLY/JOHNDOE,JANEDOE/
              SMC entries and their subordinate catalogs and files JOHNDOE
              and JANEDOE only have their entire contents restored. No list
              is prepared.

    (4)   RESTOREMAST DOONLY/JOHNDOE,JANEDOE/, LISTOPT/YES/, COPY/NO/
              SMC entries and their subordinate catalogs and files for
              JOHNDOE and JANEDOE are restored. A listing of the entire
              contents of all SMC's is produced after the restore is
              completed. If an unrecoverable Tape Read error is encountered
              during the restore, FILSYS will skip the record in question. It
              will not attempt to locate a copy file, even if a $ TAPE XR,...
              control card exists.

AN EXAMPLE OF FILSYS-ACTIVITY LANGUAGE USAGE

The following is an example of the use of the FILSYS-activity language. The example will refer to the following structure:

SYSTEM MASTER CATALOG
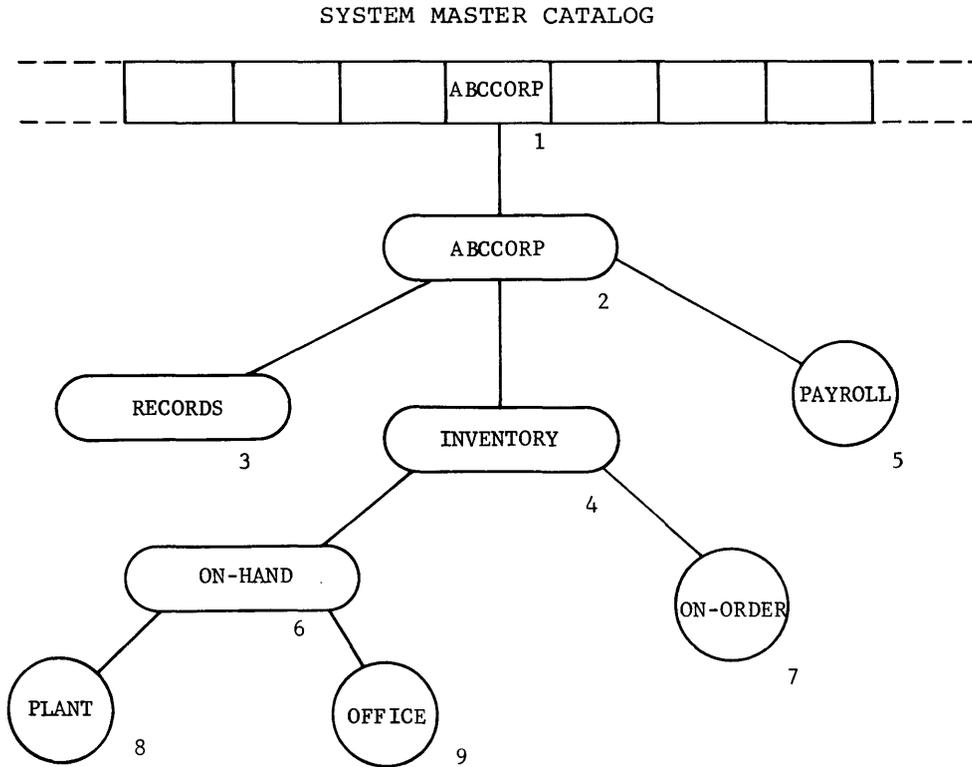
Only those users that have an entry in the SMC are authorized to have permanent file space. This entry is created under the strict control of the individual or individuals responsible for assigning and maintaining permanent-file space. The assumption is that an SMC entry (entry 1 in the illustration) has been made with the following CRMAST directive. (The special control cards necessary to the use of a master directive are not shown here.)

```
CRMAST  ABCCORP/ABCCORD,PASSWORD/584031/, SIZE/10/,
           RESOURCES/1000/
```

The following directive will allow user ABCCORP to create files on the structured removable DSS167 pack having serial number D352. He will be limited to 100 links of file space on that pack.

       CRPACK   ABCCORP,DEVICE/167PK,D352/,SIZE/100/

                            Note

       Passwords are shown in the following examples for the sake of
       illustration; normally, they will be overlaid by pound signs
       (#) in an actual source listing as a security measure.

USERID   To identify the user in this example:

         USERID   ABCCORP$584031

CCREAT   Entry 2 is referred to as the UMC. It may be created explicitly
         if the user desires. If not, it will be created implicitly by
         the file system the first time a file or subcatalog is created.
         In this example, the entry will be created explicitly using the
         create-catalog (CCREAT) directive.

         To create entry 2:

         CCREAT   ABCCORP, PASSWORD/XYZABC/, READ, READ/RFOX/,WRITE/RFOX/

CPOS   Entries 3, 4, and 5 can now be created. Since they emanate from
         entry 2, it would be desirable to be able to position to that
         level and not have to repeat the catalog-string for each of the
         directives to create these entries. This can be accomplished by
         using the catalog-position (CPOS) directive.

         To position to entry 2:

         CPOS   ABCCORP$XYZABC

         To create entries 3 and 4 (RECORDS will reside on the structured
         removable DSS167 pack having serial number D352):

         CCREAT   RECORDS, READ,WRITE,DEVICE/167PK,D352/

         CCREAT   INVENTORY, READ, READ/RFOX, LPRATT/,
                  WRITE/RFOX, LPRATT/, DEVICE/DSS167/,
                  PASSWORD/76954/

FCREAT   Entry 5 will be created using the create-file (FCREAT) directive and will be a nonstructured file residing on DSS167 pack with file serial number D282.

To create entry 5:

```
FCREAT  PAYROLL, READ, READ/RFOX/,WRITE/RFOX/,
        MODIFY/RFOX/,SIZE/3,5/, PASSWORD/23507/,
        DEVICE/167PK,D282/,FILEINFO/PAYROLL-PACK/
```

Entries 6 and 7 can now be created. Again, it is desirable to take advantage of the CPOS directive.

To position to entry 4:

```
CPOS    ABCCORP$XYZABC/INVENTORY$76954
```

To create entries 6 and 7:

```
CCREAT ON-HAND
```

```
FCREAT ON-ORDER
```

Entries 8 and 9 can now be created. Again, it is desirable to take advantage of the CPOS directive.

```
CPOS    ABCCORP$XYZABC/INVENTORY$76954/ON-HAND
```

To create entries 8 and 9:

```
FCREAT  PLANT, MODE/RAND/, SIZE/2/
```

```
FCREAT  OFFICE,PURGE/LPRATT/,MODIFY/LPRATT/
```

CREL   In order to release from current position, the catalog-release (CREL) directive must be used.

To release position:

```
CREL
```

CLIST   The catalog-list (CLIST) directive can be used to have the structure listed and have at one's disposal documentation of the descriptions of the catalogs and files.

To list "all" of ABCCORP:

```
CLIST   ABCCORP$XYZABC
```

See Figure 3-1 for a sample listing.

To list "only" ABCCORP:

CLIST   ABCCORP$XYZABC, LISTOPT/ONLY/

See Figure 3-2 for a sample listing.

To list "all" INVENTORY:

CLIST   ABCCORP$XYZABC/INVENTORY$76954

See Figure 3-3 for a sample listing.

To list "all" ON-HAND:

CLIST   ABCCORP$XYZABC/INVENTORY$76954/ON-HAND

See Figure 3-4 for a sample listing.

To list "all" RECORDS, including detail and subordinate information:

CLIST   ABCCORP$XYZABC/RECORDS

See Figure 3-5 for a sample listing.

In addition to the directives that allow a user to create and list catalog/file structures there are the directives that perform maintenance functions. These latter directives affect only descriptions and not file content.

CMOD   The modify-catalog (CMOD) directive allows a user to modify an existing catalog description.

To modify RECORDS:

CMOD   ABCCORP$XYZABC/RECORDS, NEWNAM/FILES/

RECORDS now must be referred to as FILES. If reference is made to old name, an error will occur. This can be demonstrated by trying to modify RECORDS again.

CMOD   ABCCORP$XYZABC/RECORDS, NEWNAM/FILES/

This produces the error message:

INCORRECT CAT/FILE DESCRIPTION

and

```
********************************************************
*** AN ERROR HAS OCCURRED - ONLY SYNTAX ANALYSIS
********************************************************

        **************************************************
        WILL BE DONE ON THE DIRECTIVES REMAINING TO BE
        **************************************************

                    **************
                    PROCESSED ***
                    **************
```

The message that appears above would be strictly adhered to in an actual file-system activity run. In order to continue with our examples, however, it will be ignored.

FMOD   The modify-file (FMOD) directive allows a user to modify an existing file description.

To modify PAYROLL:

FMOD   ABCCORP$XYZABC/PAYROLL$23507, READ/RFOX/,WRITER/RFOX/

PAYROLL has had its specific permissions for RFOX changed. This can be shown by listing ABCCORP and noting the specific permissions for PAYROLL.

CLIST   ABCCORP$XYZABC, LISTOPT/ONLY/

See Figure 3-6.

CPURGE The purge-catalog (CPURGE) directive allows a user to purge a catalog and all catalogs and files emanating from it.

To purge catalog ON-HAND:

CPURGE ABCCORP$XYZABC/INVENTORY$76954/ON-HAND

ON-HAND and all information subordinate to it has been purged. This can be shown by trying to modify one of the files that emanate from ON-HAND; namely, PLANT. Again, this produces the error message:

INCORRECT CAT/FILE DESCRIPTION

FPURGE The purge-file (FPURGE) directive allows a user to purge a specific file.

To purge ON-ORDER:

FPURGE ABCCORP$XYZABC/INVENTORY$76954/ON-ORDER

ON-ORDER no longer exists. An attempt to purge it again will show this to be true.

FPURGE ABCCORP$XYZABC/INVENTORY$76954/ON-ORDER

An error message is produced:

   INCORRECT CAT/FILE DESCRIPTION

```
BEGIN LIST AT:    ABCCORP

PARENT NAME          ORIGINATOR   GEN'L ****DEVICE ID**** ************DATE************ **********FILE INFORMATION************
    CATALOG NAME                  PERMS REQUESTED CURRENT ENTRY     OF LAST  OF LAST  TOD OF TYPE ACCESS MAX   LLINKS STATS
        FILE NAME                 RWAE                    CREATED   ACCESS   CHANGE   CHANGE      MODE  SIZE   USED

ABCCORP              ABCCORP      R     ST1       ST1.    10-28-71 10-28-71 10-28-71
                                  PASSWORD IXYZABC
                                  SPECIFIC PERMISSIONS - USER:RFOX          PERMISSION:RW

    RECORDS                       DETAIL AND SUBORDINATE INFORMATION BYPASSED
                                  PARENT FOR STRUCTURE CONTAINED ON REMOVABLE DSS167 PACK, FILE SERIAL NUMBER:D352

    INVENTORY        ABCCORP      R     DSS167    DP6     10-28-71 10-28-71 10-28-71
                                  PASSWORD I76954
                                  SPECIFIC PERMISSIONS - USER:RFOX          PERMISSION:RW
                                  SPECIFIC PERMISSIONS - USER:LPRATT         PERMISSION:RW

        PAYROLL      ABCCORP      R     DSS167    ST1     10-28-71 10-28-71 10-28-71 08.842 **NON-STRUCTURED FILE ** NULL
                                  FILE NAME:PAYROLL-PACK       FILE SERIAL NUMBER:D282
                                  LINK STRINGS:   S=0    #*666
                                  PASSWORD I23507
                                  SPECIFIC PERMISSIONS - USER:RFOX          PERMISSION:RW   M

*** LEVEL 01 ***
INVENTORY

    ON-HAND          ABCCORP                      DP6     10-28-71 10-28-71 10-28-71

        ON-ORDER     ABCCORP                      DP6     10-28-71 10-28-71 10-28-71 08.844 SEQ  N       12    12      NULL

*** LEVEL 02 ***
ON-HAND

    PLANT            ABCCORP                      DP6     10-28-71 10-28-71 10-28-71 08.846 RAND N       24    24      NULL

    OFFICE           ABCCORP                      DP6     10-28-71 10-28-71 10-28-71 08.847 SEQ  N       12    12      NULL
                                  SPECIFIC PERMISSIONS - USER:LPRATT         PERMISSION:   PM
```

Figure 3-1. Listing of "All" ABCCORP

BEGIN LIST AT: ABCCORP

PARENT NAME   ORIGINATOR   GEN'L ****DEVICE ID**** **********DATE********** **********FILE INFORMATION************
     CATALOG NAME   PERMS REQUESTED CURRENT ENTRY   OF LAST OF LAST TOD OF TYPE ACCESS MAX   LLINKS STATS
          FILE NAME   RWAE   CREATED ACCESS   CHANGE   CHANGE   MODE   SIZE USED

ABCCORP   ABCCORP   R   ST1   ST1   10-28-71 10-28-71 10-28-71
                                        PASSWORD :XYZABC
                                        SPECIFIC PERMISSIONS - USER:RFOX   PERMISSION:RW

     RECORDS   DETAIL AND SUBORDINATE INFORMATION BYPASSED
                                        PARENT FOR STRUCTURE CONTAINED ON REMOVABLE DSS167 PACK, FILE SERIAL NUMBER:D352

     INVENTORY   ABCCORP   R   DSS167   DP6   10-28-71 10-28-71 10-28-71
                                        PASSWORD 176954
                                        SPECIFIC PERMISSIONS - USER:RFOX   PERMISSION:RW
                                        SPECIFIC PERMISSIONS - USER:LPRATT   PERMISSION:RW

          PAYROLL   ABCCORP   R   DSS167   ST1   10-28-71 10-28-71 10-28-71 08.842 **NON-STRUCTURED FILE ** NULL
                                        FILE NAME:PAYROLL-PACK   FILE SERIAL NUMBER:D282
                                        LINK STRINGS: S=0   **666
                                        PASSWORD 123507
                                        SPECIFIC PERMISSIONS - USER:RFOX   PERMISSION:RW   M

Figure 3-2   Listing of "Only" ABCCORP

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BEGIN LIST AT: INVENTORY

PARENT NAME
   CATALOG NAME
     FILE NAME
	ORIGINATOR	GEN'L ****DEVICE ID****
		PERMS REQUESTED CURRENT
		RWAE
			***********DATE***********
			ENTRY OF LAST OF LAST
			   CREATED ACCESS CHANGE
				TOD OF
				CHANGE
					***********FILE INFORMATION***********
					TYPE ACCESS MAX LLINKS STATS
					     MODE SIZE USED

INVENTORY	ABCCORP	R DSS167 DP6 PASSWORD 176954 SPECIFIC PERMISSIONS - USER:RFOX PERMISSION:RW SPECIFIC PERMISSIONS - USER:LPRATT PERMISSION:RW	10-28-71 10-28-71 10-28-71		
ON-HAND	ABCCORP	DP6	10-28-71 10-28-71 10-28-71		
ON-ORDER	ABCCORP	DP6	10-28-71 10-28-71 10-28-71	08.844	SEQ N 12 12 NULL

*** LEVEL 01 ***
ON-HAND

PLANT	ABCCORP	DP6	10-28-71 10-28-71 10-28-71	08.846	RAND N 24 24 NULL
OFFICE	ABCCORP	DP6 SPECIFIC PERMISSIONS - USER:LPRATT PERMISSION: PM	10-28-71 10-28-71 10-28-71	08.847	SEQ N 12 12 NULL

Figure 3-3.   Listing of "All" INVENTORY

BEGIN LIST AT: ON-HAND

PARENT NAME	ORIGINATOR	GEN'L ****DEVICE ID****		***********DATE***********			***********FILE INFORMATION************				
CATALOG NAME		PERMS	REQUESTED CURRENT	ENTRY	OF LAST	OF LAST	TOD OF	TYPE	ACCESS	MAX	LLINKS STATS
FILE NAME		RWAE		CREATED	ACCESS	CHANGE	CHANGE		MODE	SIZE	USED

ON-HAND	ABCCORP		DP6	10-28-71	10-28-71	10-28-71					
PLANT\	ABCCORP		DP6	10-28-71	10-28-71	10-28-71	08.846	RAND	N	24	24 NULL
OFFICE	ABCCORP		DP6	10-28-71	10-28-71	10-28-71	08.847	SEQ	N	12	12 NULL

SPECIFIC PERMISSIONS - USER:LPRATT   PERMISSION: PM

Figure 3-4. Listing of "All" ON-HAND

BEGIN LIST AT: RECORDS

```
PARENT NAME          ORIGINATOR    GEN'L ****DEVICE ID**** ***********DATE*********** **********FILE INFORMATION***********
    CATALOG NAME                   PERMS REQUESTED CURRENT ENTRY     OF LAST  OF LAST  TOD OF TYPE ACCESS MAX   LLINKS STATS
        FILE NAME                  RWAE                    CREATED   ACCESS   CHANGE   CHANGE      MODE   SIZE  USED

RECORDS              ABCCORP       RW              DP7     10-28-71 10-28-71 10-28-71
                                   PARENT FOR STRUCTURE CONTAINED ON REMOVABLE DSS167 PACK, FILE SERIAL NUMBER:D352

        *** NO SUBORDINATE INFORMATION ***
```

Figure 3-5. Listing of "All" RECORDS

BEGIN LIST AT: ABCCORP

PARENT NAME	ORIGINATOR	GEN'L ****DEVICE ID****	***********DATE***********	***********FILE INFORMATION***********
CATALOG NAME		PERMS REQUESTED CURRENT	ENTRY OF LAST OF LAST TOD OF	TYPE ACCESS MAX LLINKS STATS
FILE NAME		RWAE	CREATED ACCESS CHANGE CHANGE	MODE SIZE USED

ABCCORP   ABCCORP   R   ST1   ST1   10-28-71 10-28-71 10-28-71
                                 PASSWORD IXYZABC
                                 SPECIFIC PERMISSIONS - USER:RFOX   PERMISSION:RW

    FILES   DETAIL AND SUBORDINATE INFORMATION BYPASSED
                                 PARENT FOR STRUCTURE CONTAINED ON REMOVABLE DSS167 PACK, FILE SERIAL NUMBER:D352

    INVENTORY   ABCCORP   R   DSS167   OP6   10-28-71 10-28-71 10-28-71
                                 PASSWORD 176954
                                 SPECIFIC PERMISSIONS - USER:RFOX   PERMISSION:RW
                                 SPECIFIC PERMISSIONS - USER:LPRATT   PERMISSION:RW

       PAYROLL   ABCCORP   DSS167   ST1   10-28-71 10-28-71 10-28-71 08.842 **NON-STRUCTURED FILE ** NULL
                                 FILE NAME:PAYROLL-PACK   FILE SERIAL NUMBER:D282
                                 LINK STRINGS: S=0   #=666
                                 PASSWORD 123507
                                 SPECIFIC PERMISSIONS - USER:RFOX   PERMISSION:RW

Figure 3-6.   Listing Showing Modification of PAYROLL
and Name RECORDS changed to FILES

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APPENDIX A

ERROR MESSAGES

The following error messages may be encountered during a FILSYS
activity.

1. FILE STAYS BUSY; TRY LATER

    If a file is in use during a perm-save operation, there is a
    waiting period of two minutes. If the file is still in use at the
    end of the waiting period, the error message is generated. The file
    structure and the file content are bypassed; they will not be
    saved.

2. DESCRIPTION TOO LONG

    The catalog-string or catalog/file-string description contained
    over 50 names.

3. UNDEFINED DEVICE TYPE XXXX
    UNDEFINED DEVICE NAME XXX

    An undefined device name or type has been specified.

4. DIRECTIVE NOT IMPLEMENTED

    The current version of FILSYS does not contain an implementation of
    the directive used.

5. EXPECTING A DIRECTIVE

    This message may be caused by a misspelled directive name or a
    syntax error (e.g., an embedded blank not following a comma).

6. EXPECTING AN IDENTIFIER

    A syntax error has been made (e.g., PASSWORD//).

7. EXPECTING AN INTEGER

    An upturned arrow marks the point at which a valid integer value is
    required.

8. EXPECTING AN OPTION

    Some directive statements require at least one option (e.g., CMOD).

9. INCORRECT CAT/FILE DESCRIPTION AT X....X

Some error has been made in the catalog-string or catalog/file-string specification other than an incorrect password, or the highest-level catalog name does not agree with the one established by the USERID directive.

10. INVALID DELIMITER

Use has been made of a symbol other than comma, slant, or dollar sign as a delimiter; the misuse of one of these; or an identifier exceeding 12 characters. An upward arrow identifies the symbol in error.

11. INVALID INTEGER VALUE

Use has been made of an integer over six digits long, use of one or more non-numeric digits, or the use of zero as a file-size specification.

12. INVALID OPTION

Use has been made of an option that is not applicable to the directive statement in which it was given.

13. I/O ERROR ON DEVICE XXX SA = n...n

An unrecoverable I/O error has been encountered on device XXX; the seek address is n...n.

14. LINK SPACE EXHAUSTED, DEVICE XXX

Additional file space is not currently available on device XXX.

15. LLINK SPACE EXHAUSTED, DEVICE XXX

Space for further catalogs or file definitions is not currently available on device XXX.

16. NAME NOT IN MASTER CATALOG

The master catalog name (name of SMC entry and UMC) given cannot be found in the SMC.

17. NON-UNIQUE NAME

An attempt has been made to modify a catalog or file with a name identical to one already existent at the same level, or the attempt to create an SMC entry synonymous to an existent one.

18. OPTION NOT IMPLEMENTED

The current version of FILSYS does not contain an implementation of the option used.

19. PASSWORD X....X AT X.....X INCORRECT

Either an incorrect password has been given, or one has been given where one is not required.

20. PERMISSIONS DENIED

One or more permissions have been requested, either explicitly ($ PRMFL card) or implicitly, that have not been granted.

21. SIZE REQUEST LS THAN ALLOCATED

An attempt has been made to modify the maximum file size to a value less than the extent currently occupied by the file.

22. SPACE REQUEST GR THAN ALLOWED

A file-size specification has been made that would cause the user's total link space to exceed that allotted to him in the SMC.

23. STATEMENT INCOMPLETE

A syntax error has been made.

24. ILLEGAL CHARACTER

(This message has been deleted.)

25. MASTER CATALOG ERROR

An attempt has been made to save or list SMC entries at a time when none were known to the file system.

26. FROM/THRU NAME UNDEFINED

An attempt has been made to save a nonexistent SMC entry.

27. TOO MANY $\left\{\begin{matrix} \text{DONTDO} \\ \text{DOONLY} \end{matrix}\right\}$ NAMES

Number of names specified exceeds the 150-name limit.

28. PRIVILEGED DIRECTIVE

The deck setup does not contain the special control card required to permit a particular directive to be processed.

29. NO USERID

The deck setup does not contain a user-id directive prior to the use of other directives.

30. INVALID USERID

The user catalog name does not match the catalog description of the current directive being processed.

31. SYSTEM MALFUNCTION

An undefined system malfunction from which recovery cannot be made.

32. UNRECOVERABLE TAPE ERROR

An attempt to read an SMC record on a perm-restore tape is unsuccessful. The tape is spaced forward to the next SMC record.

33. I-D-S FILE IN ABORT STATUS

An I-D-S file is left in abort status whenever a slave job ends in an abnormal condition. If the I-D-S file is found in this condition during a perm-save operation, the catalog/file structure is saved but the contents of the file are bypassed.

34. I-D-S FILE IN RECOVERY STATUS

An I-D-S file is left in abort status whenever a slave job ends in an abnormal condition. If the I-D-S file is found in this condition during a perm-save operation, the catalog/file structure is saved but the contents of the file are bypassed.

35. SEEK ERROR ON DEVICE XXX SA = n...n

An address obtained from a catalog record is invalid on device XXX; seek address is n...n.

36. FAILURE IN NAME SCAN (IMP.)

A specified catalog/file entry cannot be located. If the entry is valid, the error message should not be generated; system malfunction is indicated.

37. UNDEFINED DEVICE (IMP.)

    A device name (e.g., DS1,DS2...) cannot be located in the .CRSCN table. If the device name is valid, the error message should not be generated; system malfunction is indicated.

38. INTERNAL LINK TABLE CHKSUM ERROR

    Return from system to indicate malfunction.

                                                                              *

39. BAD STATUS ON FILE BODY I/O

    Error encountered in reading/writing file content during a perm-save or perm-restore operation.

40. CHAR. RES. ON FILE BODY I/O

    Error encountered in reading/writing file content during a perm-save or perm-restore operation.

41. # WORDS I/O NOT MULTIPLE OF 320

    Error encountered in reading/writing file content during a perm-save or perm-restore operation.

42. I/O ERROR DEACCESSING FILE

    An I/O error has occurred on a catalog record during a perm-save or perm-restore operation, after the file content has been processed.

43. DOUBLE I/O ERROR DEACC. FILE

    An I/O error has occurred on a catalog record during a perm-save or perm-restore operation, after the file content has been processed.

44. INCONSISTENT FDW BLOCK COUNT

   The file descriptor words contained in the file description record
   are invalid.

45. ILLEGAL USAGE OF OPTION

   The DONTDO and DOONLY options have both been used in one directive.

46. PASSWORD REQUIRED AT X....X

   Password not given where one is required.

47. ILLEGAL USAGE OF TALK OPTION

   An attempt has been made to assign the time-sharing TALK option to
   a SMC without having assigned the CARDIN option.

48. ILLEGAL USAGE OF URGENCY OPTION

   An attempt has been made to assign an URGENCY to a SMC without
   having assigned the CARDIN option.

49. DEVICE LINK TABLE CHKSUM ERROR

   Return for system to indicate malfunction.

APPENDIX B

SAMPLE DECK SETUP FOR FILSYS ACTIVITY

$ ENDJOB

DIRECTIVES TO FILSYS ACTIVITY

USERID

$ FILSYS

$ IDENT

$ SNUMB
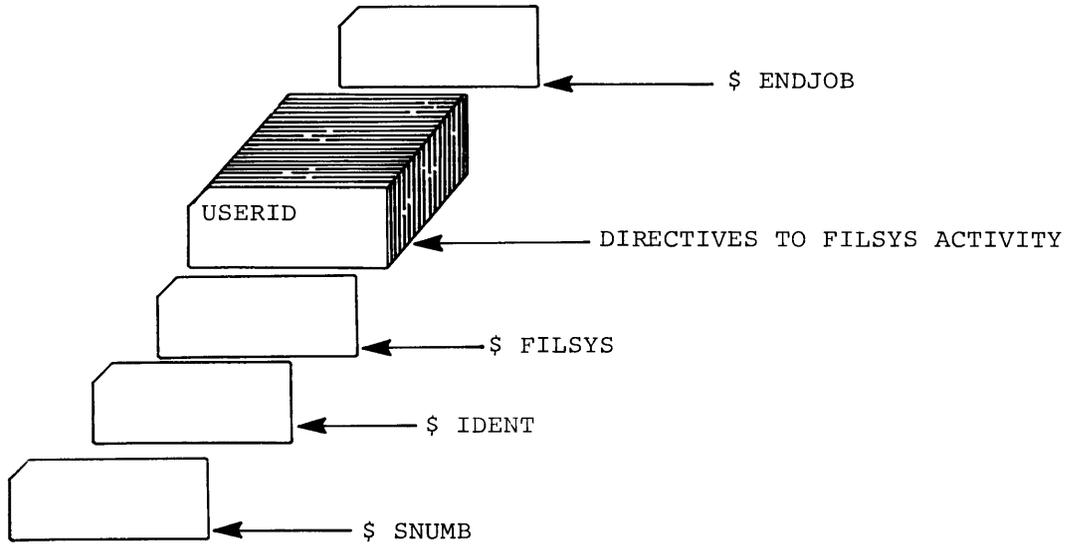
If any of the directives reference structure contained on removable media, that media must be on-line at the time the directive is processed. This can be accomplished by including a $ PRMFL card referencing a file contained on the media in the deck setup.

APPENDIX C

SAMPLE DECK SETUP FOR FILSYS ACTIVITY USING SAVE OR RESTORE DIRECTIVES


```
                                                    $ ENDJOB

                                          DIRECTIVES TO
          USERID                          FILSYS ACTIVITY


                                  $ TAPE PS OR PR¹

                                  $ TAPE XS OR XR²

                            $ FILSYS

                      $ IDENT

                $ SNUMB
```
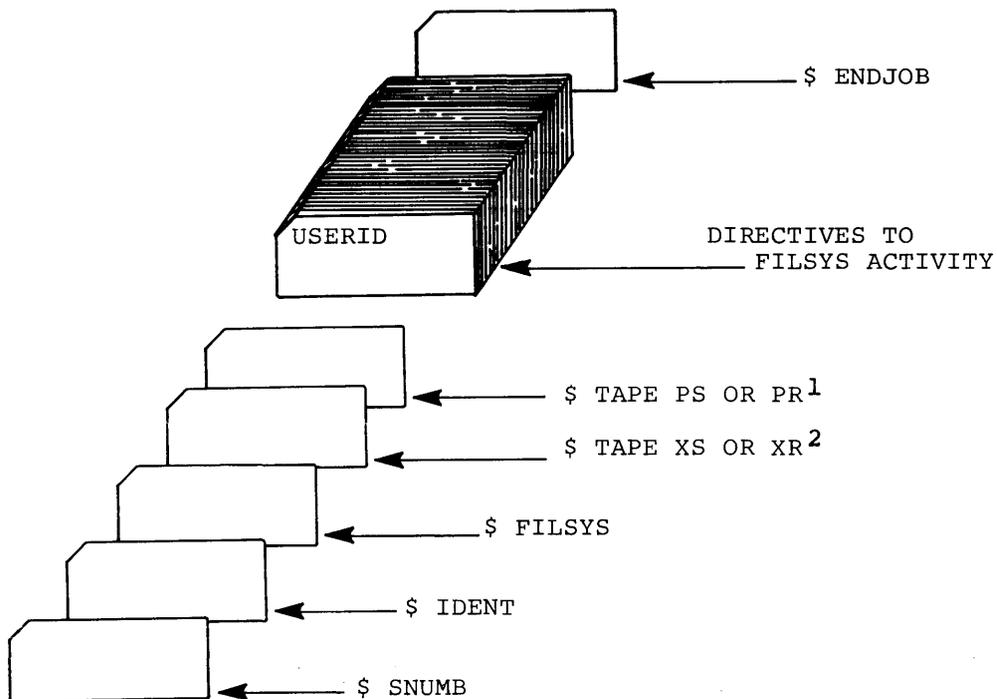
¹ PS for use of SAVE directive, PR for use of RESTORE directive

² XS for producing copy of save file, XR for copy of restore file.

If the save or restore is to affect structure or files contained on
removable media, that media must be on-line at the time the save or
restore enters execution. This can be accomplished by including a
$ PRMFL card referencing a file contained on the media in the deck
setup.

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APPENDIX D

TABLE OF DIRECTIVES

Directive	Variable Field	Options
CCREAT	catalog-string	PASSWORD/password/ permissions DEVICE/forms 1 or 2/
CLIST	catalog-string	LISTOPT/ $\left\{ \begin{array}{l} ALL \\ ONLY \end{array} \right\}$ /
CMOD	catalog-string	NEWNAM/new name/ PASSWORD/password/ permissions DELETE
CPOS	catalog-string	none
CPURGE	catalog-string	none
CREL	none	none
CRELES	catalog-string	none
CRMAST	master-catalog-name/ userid,PASSWORD/password/,	RESOURCES/resources/ LODX CARDIN SIZE/size LODS LODSS TALK URGENCY
CRPACK	master-catalog-name	DEVICE/type,number/ SIZE/size/
DELMAS	master-catalog-name/ userid	none
DELPAC	master-catalog-name	DEVICE/type,number/
FCREAT	catalog/file-string	PASSWORD/password/ permissions DEVICE/forms 1 or 2/ MODE/mode/ ACCESS/access/ SIZE/size/

FMOD	catalog/file-string	NEWNAM/new name/ PASSWORD/password/ permissions DELETE SIZE/size/ ACCESS/access/ RESET $\left\{\begin{array}{l}\text{BUSY-FILE,IDS-ABORT}\\\text{BUSY-FILE}\\\text{IDS-ABORT}\end{array}\right\}$
FPURGE	catalog/file-string	none
FRELES	catalog/file-string	none
MASLST	master-catalog-name or none	LISTOPT/ $\left\{\begin{array}{l}\text{ALL}\\\text{ONLY}\end{array}\right\}$ /
MODMAS	master-catalog-name/ userid	PASSWORD/password/ SIZE/size/ RESOURCES/resources/ LODX CARDIN LODS LODSS TALK URGENCY
MODPAC	master-catalog-name	DEVICE/type,number/ SIZE/size/
RELMAS	master-catalog-name/ userid	none
RELPAC	master-catalog-name	DEVICE/type,number/
RESTORE	catalog/file-string	LISTOPT/ $\left\{\begin{array}{l}\text{YES}\\\text{NO}\end{array}\right\}$ / COPY DATE SINCE TIME DOONLY DONTDO
RESTOREMAST	none or $\left\{\begin{array}{l}\text{name}\\\text{DONTDO/name}_i\text{ /}\\\text{DOONLY/name}_i\text{ /}\end{array}\right\}$	LISTOPT/ $\left\{\begin{array}{l}\text{YES}\\\text{NO}\end{array}\right\}$ / COPY DATE SINCE TIME

```
SAVE              catalog/file-string        LISTOPT/ { YES } /
                                                      { NO  }
                                             COPY
                                             COMPARE
                                             DATE
                                             SINCE
                                             TIME

SAVEMAST               none                  LISTOPT/ { YES } /
                        or                            { NO  }
                 ⎧ name           ⎫          COPY
                 ⎨ DONTDO/name i / ⎬          COMPARE
                 ⎩ DOONLY/name i / ⎭          DATE
                                             SINCE
                                             TIME
                                                      ⎧ name   ⎫         ⎧ name   ⎫
                                             FROM/    ⎨ number ⎬ /THRU/   ⎨ number ⎬ /
                                                      ⎩        ⎭         ⎩ ***EOF ⎭

USERID           master-catalog-name         none
                 $password
```

APPENDIX E

MERGE ACTIVITY PROGRAM

MERGE ACTIVITY FUNCTION

The Merge Activity program (MACT) permits a user to merge his saved perm files into one file containing the most recent contents of each perm file. This output file reflects the condition of the perm files at the time of the last save operation and is used to restore the files.

The input files (the number may vary) for MACT are created by FILSYS in a save operation. There must be at least one file created by the SAVEMAST directive or by a previous Merge operation. This file will contain the contents of the system master catalogs, subcatalogs, and files, and it must be given the file code M0. If other input files are to be created, file M0 must be created first or an FS abort will occur. Other input files, if any, must be created by the same form of the SAVEMAST directive plus a combination of DATE, SINCE and TIME options. File codes for the additional input files must begin with M1 and continue sequentially.

The following deck setup is needed to execute this program:

```
1       8        16
$       SNUMB
$       IDENT
$       PROGRAM  MPSAVE,DUMP
$       LIMITS   ,24K,,10000
$       TAPE     MR,X1D,,99999,MRGOUT1
$       TAPE     MS,X2D,,99999,MRGOUT2
$       TAPE     M0,X3D,,tttt,FULLSAVE
$       TAPE     M1,X4D,,tttt,SLCTSAVE1
$       TAPE     M2,X5D,,tttt,SLCTSAVE2
             .
             .
             .
$       TAPE     My,X(y+3)D,,tttt,SLCTSAVEy
MERGE options
$       ENDJOB
***EOF
```

where: tttt = tape reel number
           y = number of last file code

The program MPSAVE is included in the software system library.

If the sequence of file codes is broken, the file codes after the break will not be used by the Merge program. In this program, output files MR and MS are written concurrently and can be used as input files for the RESTOREMAST operations or for another Merge operation. They permit the user to restore all permanent files to the condition of the last selective SAVEMAST.

Processor run time and the number of SYSOUT lines required varies with the number of input files and the number of records to be processed for each file. The storage requirement also varies with the number of input files. It can be calculated as follows:

$$1400 + n*3200$$

where: n = number of input files

If specified storage is inadequate, MACT will attempt to GEMORE the additional storage required. If adequate storage cannot be obtained, an FS abort occurs.

The options for the Merge directive fall into two categories: selective merge and selective output. The options pertain to all input files and must be comma separated.

The selective merge options are as follows:

- If no selective merge options are specified (null option field), all system master catalogs from all input files are passed to the merge process. Only one Merge directive per activity will be processed.

- FROM/name-i/THRU/name-j/

  The section of system master catalogs from name-i through name-j are passed to the merge process. All others are bypassed.

- DOONLY/name-1,name-2,...,name-n/

  The system master catalogs specified are passed to the merge process, and all others are bypassed.

- DONTDO/name-1,name-2,...,name-n/

  All system master catalogs except those specified are passed to the merge process. The specified system master catalogs are bypassed.

The selective output options to the Merge directive are as follows:

- LISTOPT/YES or NO/

    This option controls the listing of catalog/file structures passed to the merge process. If YES is given, a listing is produced. If NO is given, no listing is produced. If LISTOPT does not appear as an option, no listing is prepared.

- COPY/YES or NO/

    This option controls the creation of a duplicate file. If YES is given, a duplicate file is generated concurrently with the original output file. If NO is given, or when no COPY option is specified, no duplicate file is produced.

- COMPARE/YES or NO/

    This option specifies a comparison of the merged files to ensure that both files contain exactly the same data. If YES is given, the COPY/YES/ option must also be given so that the comparison may be made. If NO is given or if the COMPARE option is not specified, the comparison will not be made even if the COPY option is used. If the two files are not the same (no compare), a message is entered in the processing commentary report and the merge process will be repeated.

PROGRAM REPORTS

This program generates three reports for the SYSOUT execution report. These reports resemble reports generated by FILSYS when it is processing a SAVEMAST directive. These reports are as follows:

1. System master catalog summary including passwords associated with the system master catalog.

2. System master catalog contents.

3. Processing commentary including an indication of the number of print lines required.

If an unrecoverable read error occurs on one of the input files created by FILSYS, MACT attempts to have the duplicate file mounted to continue processing. If there is no duplicate file, the merge process will be restarted.

If an unrecoverable read or write error occurs on the merged file, the program will restart processing the file from the beginning.

DIAGNOSTIC MESSAGES

If an unrecoverable I/O error occurs on IOC-i, unit cc, device dd, the
operator gets the following message:

    UNRECOVERABLE I/O ERROR ON i cc ddPROGRAM WILL RESTART
       MERGE OPERATIONS***

The error may be caused by a write to one of the merged files, a read of
the merged files, or a read error from an input file that has no
duplicate copy. MACT will attempt to reprocess from the beginning.

If the merged files do not contain the same data, the operator will get
the following message, and MACT will attempt to reprocess from the
beginning:

    COMPARE ERRORPROGRAM WILL RESTART MERGE OPERATIONS***

If a file cannot be repositioned after a block serial error or an
unrecoverable read error on an input file, the following message will be
sent to the operator:

    UNABLE TO REPOSITION i cc dd SUCCESSFULLY

This message is followed by job termination with an FS abort code.

JOB TERMINATION

If the job terminated during the initialization phase before processing
began the following message is given, followed by a reason:

    JOB TERMINATED

The job terminates with an FS abort code.

The specific reasons for the abort are listed after the error message.
The specific reason my be any of the following:

    FULL SAVE FILE SHOULD HAVE BEEN ON i cc dd (FILE CODE M0), NOT ON j
    ee ff

The full save file was on device j ee ff, when it should have been on
device i cc dd, which should have file code M0. This reason may also be
given if a selective save file was created before the full save file.

If the header label for an input file was not created by FILSYS, the following reason is given:

    HEADER LABEL OF FILE fc AT: i cc dd, NOT MADE BY FILE SYSTEM

    where: fc = file code of input file in error

When an attempt is made to run the merge program with no input files configured, the following reason is given:

    NO INPUT FILES CONFIGURED

If the user did not request enough storage on the $ LIMITS card and did not use a $ LOWLOAD card, the following reason message is generated:

    USE A $ LOWLOAD CONTROL CARD

If the user did not request enough storage on the $ LIMITS card and the resulting GEMORE request is denied, the following reason message is given:

    JOB NEEDS xxxx MORE WORDS OF MEMORY

    where: xxxx = Number of additional words of memory requested by
                   the GEMORE function

PROGRAMMING EXAMPLES

The following examples illustrate the variations of the Merge directive on the MPSAVE program:

    MERGE LISTOPT/YES/,COPY/YES/,COMPARE/YES/

The entire contents of all input files are used in the merge process. The contents and structures of all catalogs are printed, two tape files will be created concurrently, and at the completion of the merge process, the output files will be compared. If no directive is used in the merge process, the conditions specified in this example are automatically used.

    MERGE DOONLY/aaa,bbb,ccc,ddd/,LISTOPT/YES/

System master catalogs aaa, bbb,ccc, and ddd are passed to the merge process, and a listing of the structures is prepared. There is no duplicate file or comparison.

    MERGE LISTOPT/YES/,COPY/YES/

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The entire contents of all input files are passed to the merge process, a listing of the catalog structures is prepared, and a duplicate file is generated. No compare is made.

    MERGE COPY/NO/,COMPARE/YES/,DONTDO/xyz/

This is an illegal directive because of the contradiction between the COPY and COMPARE options. No merge is performed.

    MERGE

All system master catalogs from all input files are passed to the merge process. No listing is prepared, only one output file is created, and no comparison is made.

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