BackBurner
User Reference Guide

High Performance Backup Utility for Wang/VS Computers

Tenth Edition, March 2000

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Address comments and questions to:

usi@overeasy.com

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Chapter 1

Introduction

BackBurner 4.0

BackBurner is a high performance backup utility for the Wang VS.

It has become the backup of choice for VS users around the world because of its reliability, speed, and powerful tape management system.

But what sets BackBurner 5.0 cleanly apart from other backup programs is the extraordinary lengths to which it goes to insure the reliability and integrity of your backups.

BackBurner 5.0 is the only program in the world which **automatically verifies all of your indexed files** as it backs them up. BackBurner detects and reports files with internal corruption caused by something as simple as a disk block gone bad or a disk controller error -- corruption which goes completely unnoticed by all other backup programs.

This level of data integrity protection, along with the many other great features built into BackBurner, give you what's needed most in a VS backup program -- *backups you can believe in!*

Features and Functions

- **Y2K Compliant** – Version 5.01 has been certified year 2000 compliant.

- **Exclusive mode VOLIO Backups** – Fast backups of disk volumes with many libraries/files.

- **Backup Open Indexed-plus Files** – BackBurner now allows open indexed and *indexed-plus* files to be copied while opened in SHARED mode.

- **Reorganize Files to Tape with OverEasy** – Backup indexed/index-plus files to OverEasy USI format and rebuild them with OVEREASY during restore.

- **MOREOPTS Screen** – Ability to specify many additional backup options for each run of BackBurner.

- **Backup Tape-to-Tape** – Ability to duplicate tapes for added data security.

- **Dataset Management** – New features have been added to the Tape Management System to more fully automate the backup cycle.

- **Software Compression** – With software data compression your tapes can now hold at least twice as much data.

- **Dynamic Backup Status** – Useful information about the status of your backup can now be displayed on the workstation as the backup progresses.

- **WIIS OD Support** – For an additional fee, you may purchase the BackBurner Platter option which allows backups and restores directly between optical drives and tape.

- **Automatically Verifies Indexed Files** – BackBurner verifies the integrity of every indexed file it backs up. BackBurner finds and reports many types of file corruption which are completely missed by other backup programs.

- **Mainframe-style Tape Management System (BACKTMS)** – Once you've used BackBurner's on-line tape catalog, you'll never have to search through stacks of backup listings again. BACKTMS keeps a detailed on-line catalog of all your tape backups which enables you to quickly identify, select, and restore files.

- **Easy, "Point & Shoot" File Restores** – Select files for restore directly from the tape catalog with an intuitive "point & shoot" interface. Then, press a single PFkey and BackBurner guides you effortlessly through the entire restore process -- prompting you to mount tapes, asking where you want to put the files, and then physically restoring the files back onto your VS.

- Backup Multiple Disks to a Single Tape

- Append Multiple Backups to a Single Tape

- **Faster Backups** – BackBurner significantly improves backup performance on nearly all tape and disk drives.

- **Faster Restores** – Using high-speed tape search technology, BackBurner will fast-forward to find your files unbelievably fast on 4mm, 8mm, 3480, WUBU and even some 9-track tapes.

- **Protection Against Accidental Tape Scratch** – BackBurner protects your off-line data from accidental overwrite by not processing tapes which are still active in the tape catalog.

- **Automatic Tape Initialization** – BackBurner will not force a re-run of an entire backup if you underestimate the number of tapes needed. Instead, it initializes new tapes, as required, to successfully complete your backup.

- Unlimited Input of Volumes, Files, and Libraries

- Automatic retry of 'in-use' files

- **True Incremental Backups** – Instead of depending on files modification dates, BackBurner can actually keep track of which files have changed since your last backup.

- **WUBU Support** – BackBurner can make your WUBU seem like a whole new tape drive by increasing backup speed (up to 100MB/hr faster), restoring files twice as fast, and fitting more data onto WUBU tapes. BackBurner's tape catalog is much 'snappier' and takes 75% less disk space on your system.

- **Unattended Backups** – BackBurner lets you conveniently schedule your backups for overnight, unattended operation.

- **Easy to Learn** – If you are familiar with VS Backup, it will take you less than 5 minutes to install and start using BackBurner. As a matter of fact, it's so compatible with VS Backup, you can probably use your existing backup procedures just by changing the Run statement.

Chapter 2

Installation

Preparation

Loading BackBurner is a one-step process managed by the INSTALL utility. You must have System Administrator rights while installing BackBurner.

Requirements

BackBurner runs on any Wang VS with VS/OS 7.10 or greater. You must have at least 1024 KB of stack space available to run BACKBURN.

Run INSTALL

Run the program **INSTALL** in library **BACKBURN** on volume **BURNER**.

INSTALL, by default, places all of BackBurner's files into library BACKBURN on your system volume. You may override the default installation library during the install process if needed. If you already have BackBurner installed in the target library on your system, INSTALL replaces the existing files with the new versions.

The BackBurner program files are stored on the installation diskette in compressed format. The INSTALL program must be used to decompress and copy the individual files to your system volume.

Configuring BackBurner

For most users, BackBurner is pre-configured for optimum use. Users with third-party tape devices need to configure those tape drives right away to enable the drive to run properly. To alter BackBurner's default settings or configure third-party tape drives, you will need to custom configure BackBurner via the CONFIG utility. The CONFIG utility presents you with two options, "Set Installation Defaults" and "Configure Tape Devices".

Setting Installation Defaults

Any time after installation, you may set some of BackBurner's defaults via the "Set Installation Defaults" menu pick of the CONFIG utility. The Default Options are described below

Specify how to mount input disk volumes.

Valid responses are PR (protected), SH (shared) and EX (exclusive). The default is PR. When set to PR and backing up the whole disk volume or specifying a wildcarded library, the input disk is mounted in Protected mode. When set to SH, input disks are always mounted in shared mode. When set to EX, the input disk is mounted in exclusive (BLP) mode. EX mode provides for the fastest backups of disk volumes with many libraries and/or files.

Verify the integrity of indexed files?

The default is YES. Specify whether or not indexed files should be verified by BackBurner as they are being copied. When verifying indexed files, BackBurner logs informational messages in the backup log for each file with possible integrity problems. You may restrict the types of verify messages reported by specifying WARN or FAIL. When set to FAIL, only verify failure messages are logged. When set to WARN, only verify warnings and failures are reported. When set to YES, all verify messages are logged, failures, warnings, information and bypassed.

Backup open files?

The default is YES. Specify whether or not to back up indexed files opened in SHARED mode. If set to NO, BackBurner will skip these files and report "Skipped: Possession Conflict". You must allow the use of 'Special I/O Mode' via GENEDIT to backup open files.

If backing up open files, should files be locked?

The default is YES. When set to YES, BackBurner will attempt to lock the open files to prevent updates while the data is being copied. Specifying NO will allow updates to the files as they are being copied.

If locking files, how many seconds should the time-out be?

The default is 10 seconds. When locking files, the time-out value specifies the amount of time to wait when requesting a lock on the file.

If open files cannot be locked, backup anyway?

The default is NO. When set to NO, files that cannot be locked are skipped. If set to YES, BackBurner will backup the file without locking it.

Display the backup status on the workstation?

The default is YES. When set to YES, the backup status is displayed on the workstation during the backup. You may inhibit the status display by specifying NO.

Restrict file access rights to those of the user?

The default is NO which causes BackBurner to run with System Administrator access rights. Specifying YES will restrict BackBurner's file access rights to those of the user running the program.

Specify how to use the tape catalog?

The default is ALWAYS. This option sets the default value for the CATALOG keyword on BackBurner's OUTPUT screen. CATALOG is used to control if and when tape backups are recorded in the tape catalog. The acceptable values are ALWAYS, NEVER, YES and NO. The values ALWAYS and NEVER are non-modifiable when displayed on the OUTPUT screen.

Specify the tape catalog volume (blank = ipl volume).

Specify the volume on which BackBurner will look for the tape catalog. The volume specified will be used for all access to the tape catalog. The default volume is the system ipl volume. If the volume specified is not mounted, the system ipl volume is used.

Configuring Tape Devices

The CONFIG utility provides the capability to configure non-standard or non-WANG tape devices for correct operation with BackBurner. The "Configure Tape Devices" menu pick allows up to ten tape devices to be custom configured. To configure a tape device you must supply the following information:

Device Number

Specify the device number of the tape device.

I/O Transfer Length

Specify the maximum amount of data (in kilobytes) written to the tape device in a single I/O operation. An integer value between 16 and 62 may be entered, the default is 16. The recommended value for most third-party tape devices is 16.

Filemark Spacing

Specify the minimum spacing (in megabytes) between filemarks. An integer value between 0 and 999 may be entered, the default is 32. BackBurner writes filemarks during the backup process in order to speed up restores.

Tape Label Type

Specify the label type of the tape drive. The acceptable values are NL (no label) and AL (ANSI label), the default is NL. Most third party tape devices require the NL setting. ANSI labels are only supported for 9-track reel-to-reel tape drives.

Chapter 3

General Information

Compatibility

BackBurner provides a superset of the functions contained in Wang BACKUP. As such, the backup function in BackBurner is highly Getparm and Keyword compatible with BACKUP. In most cases, you need only change the RUN statement in existing backup procedures to start using BackBurner.

BackBurner handles the restore from tape function somewhat differently than BACKUP. Since BackBurner can copy from multiple disk volumes onto a single tape, both the physical tape volume and the original volume, library, file specifications must be specified for restores from tape. You will find, however, that using BackBurner's Tape Management System (BACKTMS) is the easiest and most efficient way to restore data from tape. Because BACKTMS greatly simplifies the restore process, it is the recommended method of restoring files from tape.

The Tape Management System

The BackBurner Tape Management System, BACKTMS, significantly reduces the amount of time needed to restore files from tape. Its powerful search features coupled with the high-speed search capability of today's newer tape drive technologies (4MM, 8MM and 3480) allow for very efficient file restores. While files can be restored directly with the BACKBURN program, BACKTMS with its ability to utilize the information contained in the tape catalog is clearly the superior method of restoring files.

The tape catalog consists of the files residing in the @USICAT@ library on the disk designated as the tape catalog volume (normally your system IPL volume). This important information should be included in your backup strategy. You should include the tape catalog library as part of your normal backups. It is important to note that when backing up the tape catalog library, the backup detail log file for the backup in progress will not as yet have been saved in the catalog. For this reason, you will find it useful to append the tape catalog library, as a separate backup, onto the same tape volume as your normal backup.

The Tape Manager includes features for the definition and maintenance of BackBurner Datasets. Dataset management allows system administrators to more fully automate the complete backup cycle. Previous versions of BackBurner allowed users to set dataset names (DSN) when performing tape backups and, if you have been using dataset names to apply a naming convention to your backups, moving to the new dataset management features will be quick and easy.

Among the features available with dataset management are the ability to set retention periods and location information for tape volumes.

Tape Retention - When defining a dataset, you may specify the number of days to retain each backup tape volume. When a tape volume is created within a dataset, the daily retention value is added to its creation date to set that tape volume's expiration date. A tape volume's status is active during its retention period and becomes scratch on the day after its expiration date. In addition to the daily retention period, you may specify that tape volumes be kept active for one or more weekly, monthly or yearly periods.

Location Control - Tape volumes can now be assigned location codes to help manage your tape library. Separate location codes can be set for scratch tapes, tapes within the daily retention period, tapes on week hold, tapes on month hold and tapes on year hold status.

Automatic Tape Volume Selection - For dataset managed backups, you may allow BackBurner to choose which tape volume to use for the backup. The reserved volume name '@@@SCR' signifies that the oldest scratch tape from *within the dataset* is to be used for the backup. To be eligible for automatic volume selection a tape must have been previously written with the dataset name, must have a status of scratch and must be in the scratch location if specified.

Automatic Indexed File Verification

This unique feature of BackBurner defines the next generation in Backup technology. Other backup programs "blindly" copy the blocks of your files with no regard for whether the file contains damaged blocks or would be usable when restored. BackBurner verifies all indexed files using an exclusive technique that is a byproduct of our highly successful OverEasy® program. The file verification checks for block integrity, compression format (FS60), prime key sequence (FS21, 22), and prime data chain continuity. We also check and, if necessary, override the file label EBLK value to ensure that all of your records, even those in split blocks, can be recovered. Files that pass the BackBurner verification may contain index errors, but will always be recoverable using OverEasy or Copy.

Every indexed file backed up is automatically verified. The backup report and tape catalog will report any problems found. Additionally, BackBurner creates an EggShell list, @BBLIST@, which contains all files flagged with verify messages. Users may use EggShell interactively, or EggReorg via a procedure, to automatically reorganize these files after the backup.

There are four general categories of problems that may be encountered:

Verify Information - BackBurner has identified one or more files which should be reorganized. The files are not damaged in any way but are internally disorganized. The backup log detail message will provide more information about the problem.

Verify Warning - BackBurner has detected what may be a problem with the prime or alternate indexes of the file. The prime data chain has passed verification, but the file should be reorganized to rebuild the indexes. The backup log detail message will provide more information about the problem.

Verify Failed - A possible problem was found in the prime data chain of the file. Reorganization of the file will probably fail or, if successful, may result in lost records. If the file cannot be reorganized, the previous backup (if taken with BackBurner) should be restored to recover the file. The backup log detail message will provide specific information about the nature of the file damage.

Verify Bypassed - Indicates that the internal structure of the file was too disorganized to perform the verification with acceptable backup performance. This condition is indicative of a large file that is in a very disorganized state. You should run OverEasy on this file as soon as possible to both insure the validity of the file and reorganize the blocks.

Backing up Open Files

BackBurner supports backing up indexed files opened in SHARED mode. Open Indexed files can be backed up in either block or record mode. Open Indexed-plus files are backed up in record mode. You may specify whether or not to lock the files before copying them. Also, if a file cannot be locked you have the option of backing it up anyway. BackBurner's open file options are set via the CONFIG utility described in Chapter 2 and/or via the MOREOPTS screen described in Chapter 4.

Block Mode Backups - Open Indexed files are backed up in block mode by default. Block mode provides for the highest backup speeds but with some risk of file corruption. Users should always use BackBurner's Verify feature to identify any problems that do occur. You must enable 'Special I/O Mode' via GENEDIT to use BackBurner's block mode open file capability.

Record Mode Backups - Open Indexed-plus files are always backed up in record mode. Open Indexed files can be backed up in either block or record mode via the REORGTAP keyword on the MOREOPTS screen. Record mode open file backups provide slower backup speeds but eliminate the risk of backup file corruption associated with open file block mode backups. The file data is written to tape in OverEasy's USI format; only the data records are written. When restored, these USI format files are re-built by OverEasy, if available, with the appropriate index structures.

Reorganize Indexed Files Using Tape

BackBurner effectively provides the capability to reorganize indexed files using tape. Very large files, which previously could not be reorganized due to disk space constraints, can now use tape as the interim storage medium. By specifying REORGTAP=YES on the MOREOPTS screen, indexed and indexed-plus files are read in record mode and written to tape in OverEasy's USI format. When restored, these files are re-built by OverEasy, if available, using the reorg parameters set up via EggShell.

Exclusive Mode High Speed Backups

Disk volumes with a large number of files will benefit from BackBurner's exclusive mode backup. By mounting the volume 'no-label', BackBurner can dramatically improve backup performance by processing the VTOC and files directly, thereby avoiding the use of the DMS OPEN system service for each file. BackBurner processes the file data and writes it to tape in the same manner and format as non-exclusive mode backups so that files can be restored in the same 'point-and-shoot' manner that you've become accustomed to.

Tape -to- Tape Backups

BackBurner provides the ability to duplicate tapes for users with multiple tape drives. By specifying Function = BACKUP and Device = TAPE on the INPUT screen, users can copy an entire dataset from one tape to another. BackBurner will create a tape catalog entry for the new tape volume/segment with the same backup date/time as the original dataset.

Software Data Compression

Software data compression is supported for tape output utilizing a compression algorithm specifically tuned for the Wang VS. Typical compression rates of approximately 2:1 can be expected. Data compression is very CPU intensive and is most appropriate for unattended overnight backups.

Dynamic Backup Status

For interactive users, BackBurner displays the backup status on the workstation. Information such as input and output path names, the amount of data read and written, effective data transfer rate, number of files and volumes processed, number of errors, current return code and the most recent errors messages are updated and displayed as the operation proceeds.

Automatic Indexed File Packing

Indexed files are packed more efficiently on tape thereby reducing both the amount of tape used as well as the time required for the backup. BackBurner ensures that all the data within the file is copied regardless of the EBLK setting of that file. This indexed file packing feature is handled entirely within BackBurner and does not require any special input specification.

Hardware Restrictions

BackBurner supports most every WANG and third-party tape drive in use today. Specific tape drive restrictions are listed below.

The WANG **2238V3** streaming cartridge tape drive cannot append new data to a tape after being rewound. BackBurner supports the append function on the 2238V3 only when not rewinding the tape at the end of the backup and using the PF1 key to re-run BACKBURN.

The WANG **2238V1** cartridge tape drive is not supported.

Chapter 4

Getparm Reference

Overview

This chapter describes the BackBurner Getparm screens and associated Keywords. A summary table is provided in section 8 for quick reference.

Briefly, the BackBurner screens are used as follows:

INPUT screen – Lets you select the type of operation (Backup, Verify or Restore), specify the input volume(s), and invoke other general options.

INPUTn screen – Lets you specify additional input volumes.

MOREFILE screen – Lets you include or exclude specific libraries and files from the backup operation.

MOREFILn screen – Lets you include or exclude specific libraries and files from the backup operation for additional input volumes.

MOREOPTS screen – Lets you specify additional input options such as open file parameters.

SELECT screen – Lets you select files based on date, user ID, and file class parameters.

INCRBACK screen – Lets you specify a baseline full backup or an incremental backup.

OUTPUT screen – Lets you specify the first output volume and other options.

OUTPUTnn screen – Lets you specify additional output volume(s).

OPTIONS screen – Lets you specify how to handle duplicate files in general, or how to clear the output volume.

SAMEFILE screen – Lets you specify how to handle duplicate files on an individual basis.

LOGFILES screen – Provides a brief summary of the results of the operation, allows you to specify where the log file(s) should be stored, and whether or not they should be printed.

General Information

You can use special characters called wildcards when specifying volume, library and file names. Two wildcard characters are allowed:

- A plus sign (**+**) represents a string of zero or more characters. For example, SYS+ specifies all names beginning with SYS, regardless of how many characters follow SYS.

- A minus sign (**-**) represents a single character. For example, SYS2- specifies all 5-character names starting with SYS2 and ending in any one character.

For most option fields on the BackBurner screens you need only specify the first unique character of an acceptable value. For example, valid responses to the prompt *Is this a Backup or Restore?* would be B, BA, BAC, BACK, etc. Volume, Library, and File fields, of course, need to be fully specified.

INPUT Getparm

When you run BackBurner, the first screen displayed is the INPUT screen. This screen lets you specify input parameters for the Backup, Restore or Verify operation.

```
Wang VS GETPARM v 7                        Parameter Reference Name: INPUT
                                                       Message Id: 2000
                                                        Component: BURNER
                         Information Required by BACKBURN
                           Active Subprogram is BACKBURN

 Specify the volume, and optional, library and file for Backup or Restore.

        VOLUME  = ******  LIBRARY  = ********  FILE    = ********

  Is this a Backup, Restore or Verify operation?        FUNCTION = BACKUP*
  Is input from Disk, Tape or OD?                        DEVICE   = DISK
  If input from Tape, specify: TAPEVOL  = ******  and    TAPESEG  = NO*
  Do you want to include additional volumes?             MOREVOLS = NO*
  Do you want to include or exclude additional files?    MOREFILE = NO*
  Do you want to specify additional input options?       MOREOPTS = NO*
  Do you want to select files by attributes?             SELECT   = NO*
  Do you want to specify incremental backup options?     INCRBACK = NO*
  Do you want to prompt the workstation for errors?      ERRDISP  = YES

  Press: ENTER - continue,  PF1 - Volcopy
         PF4 - Mount volume,  PF9 - Run Tape Manager,  PF16 - Terminate
  BackBurner Backup Utility  -  V 5.01  - (c)1990-95, Utility Systems, Inc.
  SERIAL#: 000000, WANGNET-ID: USI     - Leased to: Utility Systems, Inc.
```

Figure 4-1 BackBurner INPUT Screen

The INPUT screen parameters and valid responses are described below.

VOLUME   Specify the volume(s) for backup or restore. Multiple volumes can be specified by using wildcards.

For disk, VOLUME refers to the physical input disk volume.

For tape, TAPEVOL specifies the physical tape volume and VOLUME specifies the disk volume where the file being restored originally came from. Specifying TAPEVOL, along with TAPESEG, and leaving volume, library and file blank will result in restoring the entire contents of that tape segment. If you wish to restore specific files, libraries or volumes from a tape segment, you will need to specify the tape volume, the tape segment and the specific volume, library and file information. However, we strongly recommend that you restore data through the Tape Management System (BACKTMS).

LIBRARY   If you want to copy a library or group of libraries on the volume, enter the library name here (with wildcards, if desired). Leaving this field blank will copy all libraries on the volume specified.

FILE   If you want to copy a file or group of files, enter the file name here (with wildcards, if desired). Leaving this field blank will copy all files in the library specified.

FUNCTION Specify the operation you want to perform: Backup (default), Restore or Verify.

BACKUP - Copies the specified data to another storage location of your choice. When backing up tape-to-tape, you must copy an entire tape segment.

RESTORE - Copies the backup version of the data from its storage location to one or more disk volumes.

VERIFY - Verifies that the contents of a tape segment are readable and creates a list of all files found on that tape segment. The Verify function always verifies the contents of an entire tape segment and may be used to re-catalog a deleted tape volume.

DEVICE   Specify the device type of the input volume: DISK (default), TAPE or OD (optical).

TAPEVOL   If you are restoring data from tape, or copying from tape to tape, use this field to specify the input tape volume on which the backup data resides.

TAPESEG   Use this field, along with TAPEVOL, to identify the segment to be restored. Segment numbers other than zero are used to restore files from datasets that have been appended to existing tape volumes.

MOREVOLS Use this option if you want to backup or restore multiple disk volumes. Valid responses are YES and NO (default).

Specify YES to access the INPUTn screen(s) to specify additional input volume parameters. See the *INPUTn Screen* description for details.

MOREFILE   Use this option if you want specific libraries and files to be included in (or excluded from) the Backup or Restore operation. Wildcards are permitted. Valid responses are YES and NO (default).

Specify YES to access the MOREFILE screen which allows you to specify the names of libraries and files that you wish to include or exclude from the operation. See the *MOREFILE screen* description for more details.

MOREOPTS Use this option if you want to specify additional backup options. Valid responses are YES and NO (default).

Specify YES to access the MOREOPTS screen which allows you to specify backup options such as: open file handling, reorganizing indexed files to tape, etc. See the *MOREOPTS screen* description for more details.

SELECT   Use this option if you want to further restrict the selection of files to be copied. The SELECT screen lets you filter the copying of libraries and files based on dates (creation, modification, or expiration), user IDs, or file protection class parameters. Valid responses are YES and NO (default).

Specify YES to access the SELECT screen on which you can enter the selection criteria for all libraries and files previously specified for each backup volume. See the *SELECT Screen* description for more details.

INCRBACK   Use this option if you want to use BackBurner's incremental backup features such as creating a baseline for future incremental backups, or backing up only files which have a status of 'modified'.

YES - Gives you access to the INCRBACK screen, where you can specify how BackBurner should handle the incremental backup.

NO - (default) Indicates that the incremental backup feature is disabled.

ERRDISP   Use this option to specify whether or not BackBurner should display error messages (or other prompts) during the backup or restore operation. Whether displayed or not, all messages are saved in the backup log file for future reference. Valid responses are YES (default) and NO.

Specify YES to allow error messages and other prompts to be displayed on the screen during the backup or restore operation.

Specify NO to prevent the backup or restore operation from being interrupted by any prompts (e.g. for unattended backups).

INPUTn Getparm

If you specified MOREVOLS = YES on the INPUT screen, an INPUTn screen will be displayed for each additional volume (the first INPUTn screen is INPUT2). After you've specified the parameters for a volume, press the Enter key. A new INPUTn screen will be displayed prompting you for information about the next volume. After you've finished specifying the last volume to be copied, leave the VOLUME field blank and press the Enter key. BackBurner will detect the blank VOLUME field and conclude that all volumes have been defined.

```
Wang VS GETPARM v 7                           Parameter Reference Name: INPUT2
                                                           Message Id: 2001
                                                            Component: BURNER
                              Information Required by BACKBURN
                                Active Subprogram is BACKBURN

 Specify another input volume, and optionally library and file.
 Leave volume blank to end input specification.

         VOLUME   = ******  LIBRARY  = ********  FILE     = ********

     The input device type is:                        DEVICE   = DISK
     Do you want to INCLUDE this volume/library/file?  INCL1    = YES
     Do you want to include or exclude additional files? MOREFILE = NO*
     Do you want to select files by attributes?        SELECT   = NO*

             Press: ENTER to continue.
                    PF1 to return to volume SYS000
                    PF16 to terminate.



         BackBurner Backup Utility, (c)1990-95  Utility Systems, Inc.
```

Figure 4-2 BackBurner INPUTn Screen

Input screen parameters already entered may be reviewed at any time by pressing PF1. Repeatedly pressing PF1 will result in the input screens being presented in reverse order until the first input screen is displayed.

The INPUTn screen parameters and valid responses are described below.

VOLUME   Specify the name of an additional volume to be copied.

LIBRARY   If you want to copy a single library (or part of a library or a group of libraries) in the specified volume, enter that library name (with optional wildcards) here. Otherwise, leave this field blank.

FILE   If you want to copy a single file (or group of files) in the specified volume or library, enter that file name (with optional wildcards) here. Otherwise leave this field blank.

DEVICE   Identifies the device type of the input volume(s) as either DISK or TAPE. This keyword is not modifiable.

INCL1   Specify if you want to include (YES, default) or exclude (NO) this volume from the backup or restore operation. Note that if you specify INCL1 = NO, the MOREFILE option will be forced to NO and this volume will be excluded.

MOREFILE   Use this option if you want to copy only portions of the specified volume or library. Valid responses are YES and NO (default). NO indicates that the input VOLUME/LIBRARY/FILE specification is sufficient.

                 If you specified MOREFILE = YES, on an INPUTn screen, a MOREFILn screen is displayed (the first MOREFILn screen is MOREFIL2).

SELECT   Use this option if you want to filter the copying of libraries and files based on dates, user IDs, or file class parameters. Valid responses are YES and NO (default). NO causes BackBurner to copy all the files previously specified.

MOREFILE Getparm

If you specified MOREFILE=YES in the INPUT screen, the MOREFILE screen will be displayed. This screen lets you define specific libraries and files that you wish to include or exclude from any volume in the backup or restore operation. Wildcard characters are permitted.

```
Wang VS GETPARM v 7                            Parameter Reference Name: MOREFILE
                                                            Message Id: 2100
                                                             Component: BURNER
                         Information Required by BACKBURN
                          Active Subprogram is BACKBURN

 Please specify additional libraries or files to include/exclude.

 VOLUME = SYS000    LIBRARY1 =            FILE1    =             INCL1   = YES
                    LIBRARY2 = ********   FILE2    = ********    INCL2   = NO
                    LIBRARY3 = ********   FILE3    = ********    INCL3   = NO
                    LIBRARY4 = ********   FILE4    = ********    INCL4   = NO
                    LIBRARY5 = ********   FILE5    = ********    INCL5   = NO
                    LIBRARY6 = ********   FILE6    = ********    INCL6   = NO
                    LIBRARY7 = ********   FILE7    = ********    INCL7   = NO
                    LIBRARY8 = ********   FILE8    = ********    INCL8   = NO
                    LIBRARY9 = ********   FILE9    = ********    INCL9   = NO
                    LIBRAR10 = ********   FILE10   = ********    INCL10  = NO
                    LIBRAR11 = ********   FILE11   = ********    INCL11  = NO
                    LIBRAR12 = ********   FILE12   = ********    INCL12  = NO
                    LIBRAR13 = ********   FILE13   = ********    INCL13  = NO

          Press: ENTER to continue, PF1 to return to previous screen
                            or PF16 to terminate
```

Figure 4-3   BackBurner MOREFILE Screen

The MOREFILE screen parameters and valid responses are described below.

You can enter a library or file specification on each of the 13 lines displayed on the MOREFILE screen. Wildcards are permitted in defining the library and file names. Each specification contains the following parameters:

LIBRARYn   Specify the name of a library that you want to include or exclude from the backup or restore operation.

FILEn   Specify the name of a file in LIBRARYn that you want to include or exclude from the backup or restore operation.

INCLn   Indicate if the library/file specified by LIBRARYn/FILEn should be included (YES) or excluded (NO) from the operation. For the first entry on this screen, INCL1 is non-modifiable.

INCL2 through INCLn defaults depend upon INCL1. If the INCL1 specification spans the entire volume, then INCL2 through INCLn are defaulted to NO; otherwise INCL2 through INCLn default to YES.

If you define fewer than 13 library/file specifications, BackBurner will detect the blank 13th line when you press the Enter key and assume you've completed the MOREFILE specifications.

Each time you fill all 13 lines in a MOREFILE screen, BackBurner will detect the non-blank 13th line and display a new screen. This will continue until you press the Enter key while the 13th line is blank. BackBurner imposes no limit on the number of library/file specifications you can enter. The first 9 libraries are represented by the keyword LIBRARYn; libraries 10 through 99 are represented by LIBRARnn; libraries greater than 100 are represented by LIBRAnnn and so on.

Excludes override includes regardless of where the exclude appears in the list of library/file specifications. Therefore, if a file is excluded by the INCL1 specification and then included by the following INCL2, the exclude from the INCL1 would override, and the file would be excluded.

MOREOPTS Getparm

If you specified MOREOPTS=YES on the INPUT screen, the MOREOPTS screen will be displayed. This screen lets you define additional backup options for this run of BACKBURN.

```
Wang VS GETPARM v 7                        Parameter Reference Name: MOREOPTS
                                                         Message Id: 2900
                                                          Component: BURNER
                           Information Required by BACKBURN
                             Active Subprogram is BACKBURN

 Please specify additional backup options.

 Specify how to mount input disk volumes.                    IDMOUNT  = PR
 Do you want to verify indexed files?                        VERIFY   = YES*
 Do you want to backup open indexed files?                   OPENFILE = YES
 If YES, Do you want to lock open files?                     LOCK     = YES
         If locking files, specify the timeout value (seconds). TIMEOUT = 010
         If files cannot be locked, backup anyway?           IFNOLOCK = NO*
         Backup all indexed files in shared mode?            SHARED   = NO*

 Do you want to backup indexed files using OVEREASY USI format? REORGTAP = NO*
 Do you want to exclude all non-indexed files?               NDXONLY  = NO*




                         PF1 to return, PF16 to terminalte
             BackBurner Backup Utility, (c)1990-95, Utility Systems, Inc.
```

Figure 4-4 BackBurner MOREOPTS Screen

The MOREOPTS screen parameters and valid responses are described below.

IDMOUNT   Specify how to mount input disk volumes. Valid responses are PR (protected), SH (shared) and EX (exclusive).

PR - (default) If backing up the whole input disk volume or specifying a wildcarded library, mount in Protected mode, otherwise mount in Shared mode.

SH - Always mount input disks in Shared mode.

EX - If possible, mount the input disk in exclusive mode. When mounted in EX mode, the disk shows as being "Mounted as NL" which allows BackBurner to access the contents of the disk (VTOC and file data) directly. EX mode allows for the fastest backups of volumes with large numbers of files and/or libraries. No other users may access the volume when mounted in EX mode.

VERIFY Specify whether or not indexed files should be verified by BackBurner as they are being copied. When verifying indexed files, BackBurner logs informational messages in the backup log for each file with possible integrity problems. Valid responses are YES, NO, WARN and FAIL.

YES - Report all verify messages.

NO - Do not verify any files.

WARN - Report only warnings and failures (i.e. do not report verfify information messages).

FAIL - Report only failure messages.

OPENFILE Specify whether or not to back up indexed files opened in SHARED mode. If set to NO, BackBurner will skip these files and report "Skipped: Possession Conflict". You must allow the use of 'Special I/O Mode' via GENEDIT to backup open files.

LOCK When set to YES, BackBurner will attempt to lock the open files to prevent updates while the data is being copied. Specifying NO will allow updates to the files as they are being copied.

TIMEOUT When locking files, the time-out value specifies the amount of time to wait when requesting a lock on the file.

IFNOLOCK When set to NO, files that cannot be locked are skipped. If set to YES, BackBurner will backup the file without locking it.

SHARED Specify whether or not to backup all indexed files in shared mode regardless of whether they're open or not.

REORGTAP Specify whether or not to backup indexed files, in record mode, to OverEasy USI format on tape. Files backed up in this manner are automatically reorganized by OverEasy (if installed) when restored.

NDXONLY Specify whether or not to backup only indexed files. If set to YES, only INDEXED and INDEXED-PLUS files are copied.

SELECT Getparm

If you specified SELECT = YES in the INPUT screen, the SELECT screen will be displayed. This screen lets you define selection criteria (dates, user IDs, and file class parameters) that will further restrict what libraries and files will be backed up or restored.

```
Wang VS GETPARM v 7                            Parameter Reference Name: SELECT
                                                             Message Id: 2400
                                                             Component: BURNER
                            Information Required by BACKBURN
                              Active Subprogram is BACKBURN

 Please specify file selection attributes for volume SYS000.
 This selection criteria will be applied to all files previously specified for
 the volume. Only files satisfying all the conditions below will be copied.

 Modification date...
  MBMONTH  = **    MBDAY   = **    MBYEAR   = **    USERID1  = ***  FPCLASS1 = *
  MAMONTH  = **    MADAY   = **    MAYEAR   = **    USERID2  = ***  FPCLASS2 = *
                                                   USERID3  = ***  FPCLASS3 = *
 Creation date...                                  USERID4  = ***  FPCLASS4 = *
  CBMONTH  = **    CBDAY   = **    CBYEAR   = **    USERID5  = ***  FPCLASS5 = *
  CAMONTH  = **    CADAY   = **    CAYEAR   = **    USERID6  = ***  FPCLASS6 = *
                                                   USERID7  = ***  FPCLASS7 = *
 Expiration date...                                USERID8  = ***  FPCLASS8 = *
  EBMONTH  = **    EBDAY   = **    EBYEAR   = **    (Blank use ***) (Blank use *)
  EAMONTH  = **    EADAY   = **    EAYEAR   = **

     Press ENTER to accept and continue, PF1 to return to previous screen,
                        or PF16 to terminate
```

Figure 4-5 BackBurner SELECT Screen

The SELECT screen parameters and valid responses are described below.

MBMONTH =, MBDAY =, MBYEAR =   Copies only those files that have a modification date before this date.

MAMONTH =, MADAY =, MAYEAR =   Copies only those files that have a modification date after this date.

CBMONTH =, CBDAY =, CBYEAR =   Copies only those files that have a creation date before this date.

CAMONTH =, CADAY =, CAYEAR =   Copies only those files that have a creation date after this date.

EBMONTH =, EBDAY =, EBYEAR = expiration date before this date.	Copies only those files that have an
EAMONTH =, EADAY =, EAYEAR =	Copies only those files that have an expiration date after this date.
USERID(1-8)	Copies only those files that have the user IDs specified here. You can specify up to eight user IDs. Enter *** to specify a user ID of all blanks.
FPCLASS(1-8)	Copies only those files that have the file protection class codes specified here. You can specify up to eight codes. (Refer to Wang's *VS System User's Introduction* for more information about file class protection). Enter * to specify a file protection class of blank.

INCRBACK Getparm

If you specified INCRBACK=YES on the INPUT screen, the INCRBACK screen will be displayed. This screen lets you specify BackBurner's incremental backup parameters.

```
Wang VS GETPARM v 7                          Parameter Reference Name: INCRBACK
                                                            Message Id: 2200
                                                             Component: BURNER
                          Information Required by BACKBURN
                            Active Subprogram is BACKBURN

  Please specify additional incremental Backup parameters.

  Incremental backup is the process of backing up only those files that were
  modified since the last backup was taken.  BackBurner uses a unique process
  to record the modification status of all files. All pre-existing as well as
  new files are considered to have modified status. You may reset the modified
  status of the files that you back up by specifying RESETMOD=YES. If a file
  is subsequently opened for update, the status will be changed to modified.
  A backup of only those modified files can be performed by specifying
  MODONLY=YES.

  Do you want to set the status of selected files to not modified? RESETMOD = NO
  Do you want to select only those files whose status is modified? MODONLY  = NO
  Is this a restart of an interrupted incremental backup?          RESTART  = NO

                          PF1 to return to previous screen
                                PF16 to terminate
             BackBurner Backup Utility, (c)1990-95, Utility Systems, Inc.
```

Figure 4-6 BackBurner INCRBACK Screen

The INCRBACK screen parameters and valid responses are as follows.

RESETMOD Lets you inform BackBurner how it should handle the modified/not-modified status of each file it copies. Valid responses are YES and NO (default).

Specifying YES resets the status of selected files to not-modified. Typically, a full backup would specify RESETMOD=YES to provide a baseline for future incremental backups.

MODONLY This option lets you select only those files that have been opened for modification since the previous full backup. Pre-existing and new files by default have a status of modified. Valid responses are YES and NO (default).

Specifying YES will backup only the files that have a modified status.

RESTART   This option is provided for the restart of an interrupted incremental backup (for example, by a system crash). Valid responses are YES and NO (default).

YES - Indicates the restart of an interrupted incremental backup. This option should only be selected if the interrupted backup was specified with RESETMOD=YES and MODONLY=YES.

If RESTART=YES, RESETMOD and MODONLY must also equal YES.

The following table summarizes the commonly used INCRBACK screen parameter combinations:

	RESETMOD	MODONLY	RESTART
FULL BACKUP *Establish baseline for future incremental backups*	YES	NO	NO
CUMULATIVE INCREMENTAL BACKUP *Backup of all files modified since the last baseline was established. The baseline values of modified files are not reset.*	NO	YES	NO
INCREMENTAL BACKUP *Backup of all files modified since the last incremental backup (or full backup, if that was the last type of backup performed). The baseline values of modified files are reset.*	YES	YES	NO

Table 4-1   Commonly used settings of INCRBACK Screen parameters

OUTPUT Getparm

The OUTPUT screen is displayed after all the input parameters have been defined. For output to disk, if you specified multiple input volumes (by using wildcards in a volume name or by specifying MOREVOLS=YES on the INPUT screen), BackBurner will display successive OUTPUTn screens prompting you to define the output parameters for each input volume (the first OUTPUTn screen is OUTPUT2).

```
Wang VS GETPARM v 7                          Parameter Reference Name: OUTPUT
                                                           Message Id: 3000
                                                            Component: BURNER
                            Information Required by BACKBURN
                              Active Subprogram is BACKBURN

 Please specify the primary output parameters.

    Specify the output parameters for input volume: SYS000

        VOLUME   = ******  LIBRARY  = ********  FILE     = ********

What is the output device type?                    DEVICE   = DISK
Do you want to first clear the output volume?      CLEAR    = NO*
For Tape, specify tape disposition at completion.  TAPEDISP = REWIND
For Tape, specify software compression option.     COMPRESS = NO**
Do you want to utilize the tape catalog?           CATALOG  = ALWAYS
For Tape, what is the dataset name?                 DSN      = RFN.910917.145741
For Disk, when should this volume be mounted?      MOUNT    = IMMEDIATELY

Press:   ENTER - Continue ,   PF1 - Return,    PF4 - Mount Volume,
         PF9 - Run Tape Manager,    PF16 - Terminate

         BackBurner Backup Utility, (c)1990-95, Utility Systems, Inc.
```

Figure 4-7 BackBurner OUTPUT Screen

The OUTPUT screen parameters and valid responses are described below.

VOLUME   Specify to which output volume the indicated input volume should be directed. For output to TAPE, the reserved volume name '@@@SCR' can be specified to cause BackBurner to use the oldest scratch tape from the dataset specified.

LIBRARY   For output to disk, specify the output library name.

FILE   For output to disk, specify the output file name.

DEVICE   Specify the output volume type as DISK (default), TAPE or OD (optical).

CLEAR   Specify if BackBurner should clear the output before backing up the data. Valid responses are YES and NO.

YES - If the output device is a disk, BackBurner will reformat the disk before copying the backup data to it. If the output device is a tape, BackBurner will overwrite the data on tape. Specify CLEAR=YES when you want BackBurner to automatically initialize a brand new tape.

NO - (default) If the output device is a disk, BackBurner will not reformat the disk. If the output device is tape, BackBurner will append the dataset to the output tape volume.

TAPEDISP   Indicate what to do with the tape at the completion of the backup.

REWIND - (default) Rewind the tape and leave it mounted.

UNLOAD - Rewind the tape and dismount the tape volume. On some tape devices the tape will be physically unloaded/ejected.

LEAVE - Leave the tape positioned at the end of the current backup. This option should only be used in situations where the PF1 option to re-run BackBurner is going to be used to append another dataset to the output tape volume.

COMPRESS   Indicate if the backup data should be compressed before being written to the tape. Valid responses are YES and NO. The default is NO.

NO - (default) Do not use software compression.

YES- Use software compression when writing data to tape.

CATALOG   Indicate if the backup log information should be saved in the tape catalog. If enabled via the CONFIG utility, valid responses are YES and NO. See Chapter 2 for a description of the CONFIG utility.

DSN   The dataset name is used to identify, for future reference, the set of files that have been copied to tape for a particular run of BACKBURN. This dataset name is saved along with all other information about the backup run in the tape catalog. The dataset name is generally chosen to reflect the nature and/or contents of the backup, although it may be set to any character string of your choice.

If BackBurner is run from a procedure, DSN will default to the procedure name. For example, MYPROCS.BACKPROC would indicate procedure BACKPROC in library MYPROCS. If BackBurner is run directly from the "Run Program" screen, DSN will default to the user ID, time, and date. For example, JAS.910104.221506 would indicate that the program was run by user JAS at 10:15 PM on January 4, 1991. These defaults may be overridden by the user.

MOUNT   Indicate when you will be mounting the output DISK volume:

IMMEDIATELY - (default) Indicates that you will mount all volumes before the backup or restore operation begins.

ASNEEDED - Causes BackBurner to display a prompt message whenever it needs a new volume mounted. If the volume is already mounted, no message is displayed.

PROMPT - Causes BackBurner to display a prompt message each time it encounters a new volume, regardless of whether or not that volume is already mounted.

OPTIONS Getparm

If you specified DEVICE = DISK and CLEAR = YES on the OUTPUT screen, this version of the OPTIONS screen will be displayed. This screen lets you specify the parameters for reformatting the output disk.

```
Wang VS GETPARM v 7                        Parameter Reference Name: OPTIONS
                                                          Message Id: 6200
                                                           Component: BURNER
                          Information Required by BACKBURN
                            Active Subprogram is BACKBURN

 Please specify DISKINIT REFORMAT options.

Output has been directed to disk volume SYS000 using the CLEAR option.
The previous contents of the volume will be destroyed and a new VTOC
will be created on the volume. You may change the size and tolerance.

Will this volume be used as an IPL volume?               IPLVOL  = NO*

Specify any change to the current number of VTOC blocks. VTOCSIZE = 512*

Specify any change to the fault-tolerance level.         TOLERANT = CRASH
 We recommend NONE for floppies, CRASH for all hard disks. MEDIA is useless.

                    Press: ENTER to continue.
                           PF1 to return to previous screen.
                           PF16 to terminate

         BackBurner Backup Utility, (c)1990-95, Utility Systems, Inc.
```

Figure 4-8a BackBurner OPTIONS Screen

This OPTIONS screen contains the parameters used by DISKINIT to reformat a disk.

IPLVOL   Specify whether or not the output disk will be used as an IPL volume. Valid responses are YES and NO. The current setting of the volume is used for the default.

VTOCSIZE Specify the size of the VTOC to be created on the output volume. The current size of the VTOC is used for the default.

TOLERANT Specify the fault tolerance level for the output volume. Valid responses are NONE, CRASH and MEDIA. The current setting of the volume is used for the default.

If you specified DEVICE = DISK and CLEAR = NO on the OUTPUT screen this OPTIONS screen will be displayed. This screen lets you specify how BackBurner should deal with naming conflicts (duplicate files) during the backup operation. A naming conflict occurs when BackBurner attempts to copy files to a disk volume and finds that the target library on disk already contains a file of the same name.

```
Wang VS GETPARM v 7                              Parameter Reference Name: OPTIONS
                                                              Message Id: 6200
                                                               Component: BURNER
                                Information Required by BACKBURN
                                 Active Subprogram is BACKBURN




 Output has been directed to disk volume SYS000. Please specify the action
 to be taken when a file already exists on that volume.

                                DUPFILES = PROMPT*

Enter: PROMPT  to receive a getparm prompt for each occurrence
       NOCOPY  to skip such files
       SCRATCH to replace the existing file
       UPDATE  to replace only those files with a more recent modification date

                        Press: ENTER to continue.
                               PF1 to return to previous screen.
                               PF16 to terminate

          BackBurner Backup Utility, (c)1990-95, Utility Systems, Inc.
```

Figure 4-8b BackBurner OPTIONS Screen

This OPTIONS screen contains the DUPFILES option, which lets you specify any one of the following parameters. BackBurner will use the DUPFILES parameter you specify here throughout the backup operation.

DUPFILES PROMPT - (Default) Causes BackBurner to display a prompt message each time it encounters a duplicate file, asking what action it should take. Do not use the PROMPT option for unattended operation. DUPFILES prompt messages are not considered error messages and will be displayed even if you specify ERRDISP = NO on the INPUT screen.

NOCOPY - Skips all duplicate files, so that duplicate files are not copied to the volume.

SCRATCH - Replaces each duplicate file on the volume with the backup file.

UPDATE - Replaces a duplicate file only if the backup file has a more recent modification date.

SAMEFILE Getparm

If you specified DUPFILES=PROMPT on the OPTIONS screen and BackBurner attempts to copy a file that already exists on the output volume, the SAMEFILE screen will be displayed. This screen lets you specify how BackBurner should handle each duplicate file individually.

```
Wang VS GETPARM v 7                          Parameter Reference Name: SAMEFILE
                                                          Message Id: 6300
                                                           Component: BURNER
                              Information Required by BACKBURN
                                Active Subprogram is BACKBURN

 Please specify the option desired.

 File TESTFILE in library #RFNPRT  on volume SYS000
 already exists on the output volume

      OPTION   = NOCOPY* NOCOPY  - Do not copy this file
                         SCRATCH - Replace the existing file
                         UPDATE  - Replace if input file modification date
                                   is greater than that of output file
                         RENAME  - Rename the existing file on SYS000
                                   to the name specified below
                                   and then copy the input file
                         NEWNAME - Copy the file giving it the new name
                                   specified below

      NEWNAME  = ******** (Specify for RENAME or NEWNAME)
                   (c)Copyright 1990-95, Utility Systems, Inc.
```

Figure 4-9 BackBurner SAMEFILE Screen

The SAMEFILE screen contains the OPTION field, which lets you specify any of the following parameters.

OPTION   NOCOPY - (Default) Skip the file.

SCRATCH - Replace the existing file.

UPDATE - Replace the file on the output volume only if the backup file has a more recent modification date.

RENAME - Rename the *existing file* on the output volume to the file name you specify in the NEWNAME field.

NEWNAME - Renames the *backup file* to the name you specify in the NEWNAME field.

NEWNAME If you selected OPTION=RENAME or OPTION=NEWNAME use this field to specify the new file name.

LOGFILES Getparm

The LOGFILES screen is displayed after the backup or restore operation is complete. It contains summary information: number of processed input volumes, output volumes, libraries, and files. If any errors were detected, the summary also includes a line indicating the number of errors.

The LOGFILES screen also lets you specify if and where the backup log print file should be stored and whether or not it should be queued for printing.

When using the tape catalog, all of the information contained in the backup log print file is saved online in a highly compressed format in the @USICAT@ library on your system volume. You may, at any time, view and or print the backup log from the BACKTMS program.

```
Wang VS GETPARM v 7                          Parameter Reference Name: LOGFILES
                                                           Message Id: 4000
                                                            Component: BURNER
                          Information Required by BACKBURN
                            Active Subprogram is BACKBURN

   Processing complete, please specify report options.

                     Input volumes processed:        1
                     Output volumes processed:       1
                     Libraries processed:            1
                     Files processed:                7
                     Errors Encountered:             1

      Do you want to put a backup log on your SPOOL volume? SPOOLVOL = YES
      Put the log on this disk (not your SPOOL volume):     DISKVOL  = ******
      Do you want to create a separate error log?           ERRLOG   = NO*
      Do you want to print a backup report now?             PRINT    = NO*
         How many lines per page?                           LINES    = 055

                 Press: ENTER - Continue,  PF1 - Skip the report.

            BackBurner Backup Utility - (c)1990-95, Utility Systems, Inc.
```

Figure 4-10 BackBurner LOGFILES Screen

The LOGFILES screen parameters and valid responses are described below.

SPOOLVOL   For backup to tape, specify whether or not to copy the log to your SPOOL volume. Valid responses are YES or NO (default).

OUTDEV   For backup (or restore) to disk, the keyword OUTDEV is displayed instead of SPOOLVOL. OUTDEV allows you to specify whether or not the log should be saved on the output disk volume. Valid responses are YES or NO (default).

DISKVOL   If you do not want the log stored on your SPOOL volume (or output volume), use this field to specify the volume where it should be stored.

ERRLOG   Specify whether or not you want to create a separate log file containing only error and informational messages. Valid responses are YES or NO (default). If OUTDEV=YES and ERRLOG=YES, the Error Logfile will be created on the output disk volume.

PRINT   Specify whether or not you want to print a copy of the log(s) now. Valid responses are YES and NO (default).

LINES   If you want the log printed (PRINT=YES), use this field to specify the number of lines per page (8 to 255). This field is set to the users default value as specified via the SET Usage Constants.

The log file contains the following information:

- Date and time of the backup

- Dataset name

- Output volume

- For each file backed up: Volume, Library and File names along with:

    - File organization
    - Record format
    - Record size
    - Number of records
    - File protection class
    - Userid of file owner
    - Creation, modification and expiration dates
    - Blocks allocated
    - Blocks used
    - Messages relating to the file

- Error messages and warnings

- Number of soft tape errors, if any

- Number of files processed in the backup run

- The amount of data copied (in megabytes).

- Number   of   errors   and   messages   encountered

Chapter 5

The Tape Management System

Overview

The Tape Management System (BACKTMS) maintains an on-line catalog of the tape datasets created by BackBurner, along with the detail listings for each of those datasets. Using this catalog, BackBurner can quickly search for and list the tape volume(s) that contain any backup disk volumes, libraries, and files you may specify. To restore these files, you simply mark them on the screen, then press a "restore" key ("point and shoot").

With BackBurner 3.0, the tape manager was enhanced to include dataset management. This powerful function allows backups to be grouped by dataset name with automatic daily, weekly, monthly, and year-end retention control. For example you could specify that each tape created in the dataset "FULL.SYSTEM" should be retained for 14 days. In addition, the last backup of each of the most recent five weeks should be retained, the last backup of each of the most recent twelve months should be retained, and the last backup of each year should be retained perpetually. Dataset retention control will automatically scratch backups that fall outside the retention parameters.

Dataset control also allows you to set the location codes at which the various volumes of a dataset are to be stored. For example you may keep the daily backups readily available in an on site vault, the weekly backups may be kept at a local offsite location, and the monthly and yearly backups may be sent to a bank vault. The "Move Tape Volumes" Administrative Function will assign your designated location codes as tapes age and will produce movement reports to indicate which tapes should be shuttled to new locations.

Several terms used in this section describe the grouping of backed-up files. These terms are defined as follows:

Dataset   The name assigned to a group of files backed-up via a single run of BACKBURN.

Tape Segment   The portion of a tape volume that contains one dataset.

Tape Volume   A physical tape volume containing one or more tape segments (or datasets).

Tape Volume Set   A series of two or more tape volumes containing a single dataset.

Typical applications for which you can use the Tape Management System include:

- Search for and mark files to be restored from tape.

- View a list of available tape volumes prior to a backup operation.

- Set dataset retention periods and location codes.

- Search for specific copies of off-line files.

- Scratch tape volumes prior to a backup operation.

- Create and print reports using data from the tape catalog.

A Word about Tapes

BackBurner's tape catalog contains all the information pertaining to tape backups. The tape catalog does not contain any information relating to disk-to-disk backups. BackBurner is designed to maintain a tape catalog consisting of permanently labeled, serialized tape volumes. With the extensive information that is easily accessible via BACKTMS, you no longer need to describe the contents of backup tapes by cryptically encoding the tape volume name. We recommend that tape volumes be permanently named and externally labeled when they are first used by BackBurner.

BackBurner automatically formats tape volumes before using them, thereby eliminating the need to use TAPEINIT. When BackBurner formats a tape, it writes a unique header at the beginning of the tape containing information such as tape volume name, date and time of the backup, etc. While BackBurner will format tapes 'on-the-fly', it will not allow you to rename a BackBurner tape. Once a tape has been written with a BackBurner header label, the only way to change its volume name is to erase the tape via TAPEINIT and rewrite it.

BackBurner supports and formats tapes with standard (ANSI) labels for 1600 and 6250 BPI 9 track reel-to-reel tapes, whenever possible. Standard ANSI labeled tapes provide an additional level of data protection by helping to prevent accidental overwriting of BackBurner backup tapes by other programs.

Tape Catalog

The tape catalog, which contains information about all of BackBurner's backup tape volumes, is located on the system volume in a library called @USICAT@. This catalog information is stored in a highly compressed format. On average, the catalog uses approximately one megabyte of disk storage for every 50-60 thousand files contained therein. The @USICAT@ library contains the following files:

@VOLCAT@ file
During the first backup operation, BackBurner creates a file called @VOLCAT@, which it updates during each subsequent operation. The @VOLCAT@ file is an indexed file that contains one record for each tape volume in the BackBurner database.

@DSNCAT@ file
This file contains dataset specific control information including retention and location control specifications. The file is created automatically when the first data set is defined using the "Control Datasets" function of TMS.

Backup Log Files
In addition to the @VOLCAT@ file, the @USICAT@ library also contains the log files for each backup operation recorded in the tape catalog. These backup log files contain all of the information relating to the backup operation such as: the files copied, errors encountered, return code, amount of data backed up, etc.

Bypassing the Tape Catalog

BackBurner can be configured, via the CONFIG utility, to allow some or all backups to tape to be excluded from the tape catalog. This option is particularly useful in environments where BackBurner is used for more than just system backups. For more information on the CONFIG utility see Chapter 9.

Main Menu Screen

When you invoke the BACKTMS utility, the following screen is displayed.

```
BackBurner Tape Management System -Ver 4.01- (c) 1991-95, Utility Systems, Inc.




                         * Manage Tape Volumes
                         * Manage Datasets
                         * Search For Backup Files
                         * Administrative Functions







ENT Perform selection    16) Exit tape manager
```

Figure 5-1 Tape Manager Main Menu

Four selections are displayed on this screen:

Manage tape volumes - Lets you examine the BackBurner tape catalog, view the contents of any dataset, scratch or re-activate datasets, delete entries from the catalog, mark files, and initiate a restore operation.

Manage datasets - Choose this selection to list the currently defined datasets, add and delete dataset definitions, and to set retention and location information for datasets.

Search for backup files - Searches through all the active tape volumes in the catalog to locate where certain user-specified file(s) are located. It also provides the ability to view the contents of any datasets selected via the search parameters, and to mark files for a restore operation.

Administrative functions - Allows you to perform administrative functions such as creating tape catalog reports.

Managing Tape Volumes Screen

This screen provides access to all of the tape volumes in the tape catalog. From this menu you can search for tape volumes, scratch or activate datasets, delete unwanted entries, display the contents of a dataset, and manage volume sets.

```
BackBurner Tape Management System -Ver 4.01- (c) 1991-95, Utility Systems, Inc.

  Volume Seg Stat Loc Dataset Name      Created              Expires   Root
* B00001      ACT   A  SYSTEM.BACKUP     Thu 10/07/1993 23:00 10/22/1993
* B00002      ACT   A  SYSTEM.BACKUP     Fri 05/28/1993 23:15 06/12/1993
* B00003      ACT   A  SYSTEM.BACKUP     Wed 03/31/1993 23:12 04/15/1993
* B00004      ACT   A  SYSTEM.BACKUP     Mon 08/31/1992 23:00 09/05/1992
* B00005      ACT   A  SYSTEM.BACKUP     Fri 02/26/1993 23:13 03/13/1993
* B00006      SCR(m)S  SYSTEM.BACKUP     Mon 09/27/1993 23:01 10/12/1993
* B00007      ACT   A  SYSTEM.BACKUP     Fri 10/30/1992 23:00 11/04/1992
* B00008      SCR   A* SYSTEM.BACKUP     Wed 09/29/1993 23:01 10/14/1993
* B00009      ACT   A  SYSTEM.BACKUP     Fri 04/30/1993 21:15 05/15/1993
* B00010      ACT   A  SYSTEM.BACKUP     Fri 10/01/1993 23:00 10/16/1993
* B00011      ACT   A  SYSTEM.BACKUP     Thu 09/30/1993 23:00 10/15/1993
* B00012      ACT   A  SYSTEM.BACKUP     Fri 01/29/1993 23:03 02/03/1993
* B00013      ACT   A  SYSTEM.BACKUP     Fri 10/02/1992 23:00
* B00014      ACT   A  SYSTEM.BACKUP     Mon 11/30/1992 23:00 12/05/1992
* B00015      ACT   A  SYSTEM.BACKUP     Tue 08/31/1993 23:00 09/15/1993
* B00016      ACT   A  SYSTEM.BACKUP     Tue 10/12/1993 23:00 10/27/1993
 (m) indicates tape was scratched manually   * indicates tape movement pending
ENT Volume contents  4) Prev          7) Next 1         9) Search
 2) First            5) Next          8) Change Status  12) Volumes in set
 3) Last             6) Prev 1       24) Delete         16) Return
```

Figure 5-2 Manage Tape Volumes

Tape Volume Statistics

The Manage Tape Volumes screen displays the following information for each tape volume.

Volume   The name of the physical tape volume

Seg   The segment number of the dataset. Segment number indicates the relative position or the dataset on the tape volume. Tape segments 01-99 are created when datasets are appended to existing tape volumes.

Stat	The current status of the tape segment. Scratch tapes have status "SCR" When the segment is actually being written to as a part of a backup operation, the status changes to output "OUT". When the backup completes, the status becomes active "ACT". For multi-tape backups, when a tape volume becomes full, the current segment's status is changed to incomplete "INC" until the backup completes, at which time the whole volume set becomes active.
Location	The current location code for the tape.
Dataset Name	This is the name you assigned to the backup operation when BackBurner copied the data to this tape.
Created	Indicates the day, date, and time when BackBurner started the backup operation to this tape.
Expires	Date that the tape will expire if a daily retention period was set for the associated dataset name when the tape was created.
Root	The root volume is the first tape volume in a volume set. When multiple tapes are needed for a single backup run, BackBurner identifies a root volume and root segment to which all tapes in the set are logically linked.

PF Keys

Enter (Volume Contents)	View the Backup Detail screen which lists the contents of the tape segment.
PF2 (First)	Display the first page.
PF3 (Last)	Display the last page.
PF4 (Prev)	Display the previous page.
PF5 (Next)	Display the next page.
PF6 (Prev 1)	Display the previous line.
PF7 (Next 1)	Display the next line.

PF8 (Change Status)	Produces a pop-up window to allow changing the status, expiration date, or location code.
	If scratching a tape segment and there are other segments beyond the segment being scratched, another pop-up window is displayed allowing you to apply the scratch function to all of those segments.
	Volume sets cannot be scratched via PF8. You must use PF12 to view and operate on volume set status.
PF24 (Delete)	Once tapes are scratched, they can be deleted from the tape catalog by pressing PF24 (shifted PF8). A pop-up window is displayed allowing you to confirm the operation.
PF9 (Search)	Searches the tape catalog for a specified tape volume. This feature is particularly helpful with lengthy tape catalog listings. Pressing PF9 causes a pop-up window to be displayed for entering the volume name to search for. Type the volume name, using wildcards, if desired, and press Enter.
PF12 (Volumes in set)	Displays a list of all the tape volumes in a specified backup data set. To display the Volume Set screen, move the cursor to any one of the volumes in the set, then press PF12. A list of all the volumes in that dataset will be displayed.
PF16 (Return)	Return to the Main Menu screen.

Volume Set Screen

```
 BackBurner Tape Management System -Ver 4.01- (c) 1991-95, Utility Systems, Inc.

  Dataset name: @SYSDEV@.BBB            Creation Date: 09/11/1991 Time: 09:59
   Root Volume: SHORT1 Seg: 00         Expiration Date:
 Volume status: A                        Pres Location: S

            The backup set is contained on the following volumes
   01 SHORT1
   02 SHORT2













 ENT List set contents      8) Change Status       16) Return
```

Figure 5-3 Volume Set Screen

PF Keys

This Volume Set screen displays the list of tape volumes which comprise the volume set. You may view the contents of the volume set, and scratch or activate the set.

Enter (View contents)	View the Backup Detail screen which lists the contents of the dataset.
PF8 (Change Status)	Produces a pop-up window to allow changing the status, expiration date, or location code.
PF16 (Return)	Return to the Manage Tape Volumes screen.

Backup Detail Screen

```
TAPEVOL=4MM001        DSN=@SYSDEV@.B      CREATED=08/09/91 10:41:50    9854
  *—————-Input---------*  Ow-  F     F *-—-Record—-*   Blocks *--—-Date——----*
  Volume Library  File    .ner P ORG V Size    Count   Alloc  Created Modified
 ****** ******** ********  To search: Set pattern(s) and press PF9 or PF10.
 SYS006 @SYSWORK @IPLNAME        CON F  256       1        1  2/24/75  6/19/91
 SYS006 @SYSWORK NETCNFIG        IND C 2024      21        6  2/24/75  2/24/75
 SYS006 @SYSWORK @OLDLOG         CON F   59  16,011      471  7/26/91  7/26/91
 SYS006 CISRPT   SH06     AME    PRT C  134      15        1  8/08/91  8/08/91
 SYS006 CISRPT   SH05     JRF    PRT C  134   1,646       49  7/17/91  7/17/91
 SYS006 @SYSFRM@ INFOFRM  CAM $  IND C 2024      99       17  9/15/88  9/16/88
 SYS006 @SYSFRM@ PROCFORM      $ IND C 2024      83        8  5/18/90  5/21/90
 SYS006 @SYSFRM@ LINKFORM $LK $ IND C 2024     202       57  9/07/88  9/07/88
 SYS006 @SYSFRM@ TRAINDBG DAG $ IND C 2024     155       61 10/07/88 10/07/88
 SYS006 @SYSTEM@ ASSEMBLE     @ PRG F 1024     106       53  2/12/86  8/22/89
 SYS006 @SYSTEM@ LSSAVE       $ PRG F 1024     229      115  4/30/90  5/15/90
 SYS006 @SYSTEM@ CLOGON       @ PRG F 1024      93       47  8/02/89  8/22/89
 SYS006 @SYSTEM@ @SHARER@     @ PRG F 1024      70       35  3/02/90  5/15/90
 SYS006 @SYSTEM@ @SHARERX     @ PRG F 1024      70       35  3/02/90  5/15/90
 SYS006 @SYSTEM@ @SYS004@     @ PRG F 1024     435      218  5/09/90  5/15/90
 1) Mark/Unmark One  4) Prev          9) Search Next    13) Errors & Msgs
17) Mark/Unmark All  5) Next         10) Search & Mark   15) Print
 2) First            6) Prev 1       26) Search & Unmark 16) Return
 3) Last             7) Next 1       12) Restore Marked
```

Fig 5-5 Backup Detail Screen

The Backup Detail screen displays the contents of a dataset. From this screen you can search for files, 'mark' and 'unmark' files, view the error log and initiate a restore operation.

The top line identifies the tape volume(s) which the displayed files reside on, the dataset name (assigned by the backup operation that copied the data onto that tape), the date and time when the backup operation occurred, and the number of files and messages in the backup log.

The rest of the display lists each volume/library/file on that tape, along with its attributes (file type, record size, create date, and update date).

To search for files, enter at the top of the screen, the search pattern for volume/library/file (wildcards are allowed) and then press PF9. The cursor will move to the first file that meets the search pattern. You can then use PF1 to mark or unmark that file. Press PF9 again to find the next file that meets the search pattern.

PF10 allows you to search for *and* mark files that meet the specified search pattern. This is very useful when searching for libraries and volumes to be restored.

PF Keys

PF1 (Mark/Unmark One)   Lets you mark or unmark one file at a time. Simply move the cursor to the file name and press PF1.

PF17 (Mark/Unmark All)   Marks all the files in the dataset. If the files are already marked, pressing PF17 unmarks them.

PF2 (First)   Display the first page.

PF3 (Last)   Display the last page.

PF4 (Prev)   Display the previous page.

PF5 (Next)   Display the next page.

PF6 (Prev 1)   Display the previous line.

PF7 (Next 1)   Display the next line.

PF9 (Search Next)   Lets you search for particular files.

PF10 (Search and Mark)   Automatically searches for and marks all the files that meet the search pattern. For very large backup sets, this operation could take up to several minutes to complete.

PF26 (Search and Unmark)   Automatically searches for and unmarks all the files that meet the search pattern.

PF13 (Errors and Msgs)   Display the Errors and Messages screen which lists only the errors and messages encountered during the backup.

PF15 (Print)   Prints the listing of the Backup Detail log. You may specify whether to print the complete listing or only the Errors and Messages.

PF16 (Return)   Return to the previous screen.

Initiating a Restore Operation

After you've marked the files to be restored, press the PF12 key to initiate the restore operation. For each input disk volume restored from, the following message will appear in the middle of the screen:

```
For files originally backed up from SYS006
-------------------------------------------
Enter output:  SYS006  @SYSTEM@  LSSAVE**
Clear the volume before restore?    NO*
Output device type DISK or OD?      DISK
```

This message indicates where the backup files originally came from. You can restore them to that same volume or you can specify another volume. For single library restores you may specify a different output library name. For single file restores, you may specify both a different library and file name. Also specify whether or not the output volume should be cleared first.

After entering your response to these prompts, press the Enter key. If you specified NO to 'Clear the volume before restore?', a second message will appear asking you how BACKBURN should deal with duplicate files:

```
Please specify the action to be taken when a file
already exists on the output volume.
--------------------------------------------------
* PROMPT each time a duplicate filename is found.
* NOCOPY do not restore if duplicate filename.
* SCRATCH existing file and replace with backup.
* UPDATE replace with backup copy if more recent.
```

These responses are the same as those described previously in section 4, *Getparm Reference*.

When all the output volume specifications have been specified, the following pop-up is displayed.

```
Do you want to unload the tape when finished?  YES
```

Specifying YES will cause the tape to be rewound and dismounted at the completion of the restore operation. Specifying NO will simply rewind the tape and leave it mounted. After specifying your selection, press Enter. BACKTMS will automatically link to BACKBURN which will begin the restore operation.

Search for Backup Files

If you do not know which tape volume contains the files to be restored, select the *Search for backup files* option from the Main Menu screen. A pop-up window will appear in which you may specify the volume, library and file names for the search (wildcards are permitted). You may restrict the scope of the search by specifying a location and/or dataset name.

Specify the volume/library/file names, using wildcards, if desired. After you press the Enter key, the tape manager will search through all the active datasets listed in the tape catalog. You may stop the search at any time by pressing PF1.

When the search is complete the results are displayed as follows.

```
  BackBurner Tape Management System -Ver 4.01- (c) 1991-95, Utility Systems, Inc.
  Search complete 00014 found out of 00014 searched.
                                           *------First Matched---*
    Volume Seg Loc Dataset Name       Creation Date  Volume Library  File
                                    Search pattern is: ****** ******** ********
  * A00012     B  WEEKLY.BACKUP      Mon 09/20/1993 SYS006 CISDB    CISDBTE
  * A00010     A  DAILY.BACKUP       Fri 09/17/1993 SYS005 CISBACK  BK000015
  * A00009     A  DAILY.BACKUP       Thr 09/16/1993 SYS005 CISBACK  BK000015
  * A00008     A  DAILY.BACKUP       Wed 09/15/1993 SYS005 CISBACK  BK000015
  * A00007     A  DAILY.BACKUP       Tue 09/14/1993 SYS005 CISBACK  BK000015
  * 4MM003        @SYSDEV@.B         Thr 09/16/1993 SYS004 BS       EXTRACT
  * A00006     B  WEEKLY.BACKUP      Mon 09/13/1993 SYS006 CISDB    CISDBTE
  * RFN004 01     @SYSDEV@.B         Sun 09/12/1993 SYS004 BS       EXTRACT
  * CART03        @SYSDEV@.B         Sun 09/12/1993 SYS005 @SYSTEM@ ASSEMBLE
  * CART01        @SYSDEV@.B         Sat 09/11/1993 USI001 @SYSWORK @IPLNAME
  * A00011     B  WEEKLY.BACKUP      Mon 09/06/1993 SYS006 CISDB    CISDBTE
  * CART05        @SYSDEV@.B         Sun 08/15/1993 OS7304 @SYSWORK QUEUE
  * 4MM001        @SYSDEV@.B         Mon 08/09/1993 SYS006 @SYSWORK QUEUE
  * WEEK01      B  WEEKLY.BACKUP      Mon 06/28/1993 SYS006 CISDB    CISDBAX


ENT Volume Detail         3) Last               6) Prev 1
 1) Stop Search           4) Prev Page          7) Next 1
 2) First                 5) Next Page         16) Return
```

Fig 5-4 Tape Volume Search Screen

The results of the search are listed in chronological order, where the first entry listed is the most recent. One entry is displayed on the screen for each dataset which contains at least one file which satisfies the search criteria. The entry lists the tape volume name, segment number, dataset name, backup date and time, and the first occurrence of a file, library or volume in the dataset that matched the search criteria.

You may view the Backup Detail screen for any of the datasets listed by positioning the cursor on the appropriate line and pressing Enter. The search criteria fields on the Backup Detail screen are defaulted to the one previously specified in anticipation that those are the files to be marked for restore.

Manage Datasets Screen

This screen lists the datasets that have been defined. From this menu you can define new datasets, delete a dataset definition, select a particular dataset to view the backup history, and set the tape retention period and location,

```
 BackBurner Tape Management System -Ver 4.01- (c) 1991-95, Utility Systems, Inc.
                                          Retention Settings
   Dataset Name        Most Recent Backup     Day   Week  Month Year
 _ FULL.SYSTEM         Tue 10/12/1993 23:00   14    5     YES   YES
 _ WEEKLY.PAYROLL      Wed 10/13/1993 14:27   10    13    YES   YES






















 ENT Show History    4) Prev              7) Next 1        11) Add new Dataset
  2) First           5) Next              8) Delete Dataset 16) Return
  3) Last            6) Prev 1           10) Modify Dataset
```

Figure 5-6 Manage Datasets

Dataset Statistics

The Manage Datasets screen displays the following information for each dataset:

Dataset Name   The 17 character name of the dataset.

Most Recent Backup   The day, date, and time of the most recent backup with the associated dataset name.

Retention Settings   The number of days that each tape created with this name should be retained, as well as the number of the most recent weekly, monthly, and yearly backups that should be retained. If no day retention period is displayed, tapes created with this dataset name are not to expire automatically, but rather must be scratched manually. A yes indication in weekly, monthly, or yearly, indicates that all of the corresponding period-end backups are to be retained forever.

PF Keys

Enter (Show History)	View the tapes associated with this dataset. The tapes are listed in chronological order with the most recent backup first and the oldest last. The format of the list is described in the next section.
PF2 (First)	Display the first page.
PF3 (Last)	Display the last page.
PF4 (Prev)	Display the previous page.
PF5 (Next)	Display the next page.
PF6 (Prev 1)	Display the previous line.
PF7 (Next 1)	Display the next line.
PF8 (Delete Dataset)	Delete the dataset definition from the catalog. A confirmation pop-up window is produced to avoid accidental dataset deletion.
	This function does not alter the status of tapes that have the dataset name. Tapes that were on weekly, monthly, or yearly hold will continue to be active until manually scratched or the dataset name is redefined. All other tapes will be scratched on their respective expiration dates.
PF10 (Modify Dataset)	View and modify the tape retention and location parameters for this dataset. Figure 5-7 describes the screen that is displayed.
PF11 (Add new Dataset)	Used to add a new dataset definition to the catalog. A pop-up window is issued to solicit the name of the new dataset. After that is supplied, the Modify Dataset screen is displayed to allow retention periods and locations to be set. When the Modify Dataset screen is exited (PF16) you will be returned to the Manage Datasets screen.
PF16 (Return)	Return to the Main Menu screen.

Backup Retention and Location Control

Whenever a new dataset is defined or when PF10 "Modify Dataset" is selected from the Manage Datasets screen, the following screen is produced to allow setting the retention parameters and corresponding tape storage locations.

```
 BackBurner Tape Management System -Ver 4.01 (c) 1991-95, Utility Systems, Inc


             Manage Datasets: Modify Retention and Location Control

     DSN: FULL.SYSTEM

     For how many days should each backup be retained?        14*

     You may optionally specify tape location information.
       At which location should the backups be stored?        A
       At which location should the scratch tapes be stored?  *

     The Tape Manager can also retain backups for historical
     purposes.  For the following questions you may specify
     YES, NO, or the maximum number to retain for the cycle.

       Do you want to keep the last backup of each week?       5**  Location: O
       Do you want to keep the last backup of each month?      12   Location: V
       Do you want to keep the last backup of each year?       YES  Location: V


 ENT Perform selection    16) Return
```

Fig 5-7 Backup Retention and Location Control Screen

The information solicited by this screen is not required to maintain backups grouped by dataset name, it simply provides an additional level of control to your backup strategy. If no retention information is supplied, tapes must be scratched manually in order to be used again.

Backup retention and control was the major TMS enhancement provided in BackBurner version 3. In prior versions, tapes had to be manually scratched in order to be re-used by BackBurner. While this was a simple enough matter and could be programmed into the backup procedure using the BACKSCR utility, the process was a manual one and subject to human error.   With this simple retention system,   backup tapes can be cycled automatically, removing another potential source of error and providing a higher level of security and auditability to your backup strategy.

This section describes the various parameters. Section 6 contains a full system backup example with retention and location control.

For how many days should each backup be retained?

This parameter is used to set the expiration date of new tapes that are created within the dataset. The specified value is added to the current date when the backup is initiated to produce the tape expiration date. If this parameter is not specified (left blank) subsequent backups for this dataset will not have an expiration date and will not be subject to automatic scratch.

At which location should the backups be stored?

This parameter specifies the location code that is to be assigned to active tapes in the dataset.

At which location should the scratch tapes be stored?

Tapes that are scratched continue to be associated with the dataset specified when the tape was last active. You may wish to keep the scratch tapes used for daily full system backup in a special place. Specify that location here.

Do you want to keep the last backup of each week?Location:

Do you want to keep the last backup of each month?   Location:

Do you want to keep the last backup of each year?   Location:

These three questions are used to specify retention of period-end backups for historical purposes . A weekly backup is defined as the last backup with this dataset name that was started during the week. A week is defined as beginning on Monday and ending on Sunday.) A monthly backup is the last backup with this dataset name started during the month. A yearly backup is the last backup with this dataset name that was started during the year. You may also specify unique location codes for each of these period-end backups.

Historical retention allows you to save none, all, or a given number of backups for the most recent weeks, months, and years.

Specify blank or NO to never save historical backups for the period. Specify YES to save all historical backups for the period. Specify a number to save that number of the most recent backups for the period.

Administrative Functions

Several tape manager utility functions can be accessed via the Administrative Functions menu pick. Facilities are provided which allow for creating and printing reports from information contained within the tape catalog.

When you invoke the Administrative Functions menu pick from the initial tape manager screen, the following screen is displayed:

```
BackBurner Tape Management System -Ver 4.01- (c) 1991-95, Utility Systems, Inc.




                         * Move Tape Volumes
                         * Print Catalog Reports
                         * Create Catalog File
                         * Import Dataset






ENT Perform selection    16) Return
```

Fig 5-8 Administrative Functions Screen

Move Tape Volumes

This function updates the location code for all tape volumes that are part of cataloged datasets. Location control is an optional attribute of cataloged datasets and is specified via the Manage Datasets function. All tapes with movement pending are assigned to their new locations and movement reports are generated showing which tapes are to be moved. When movement is complete, the name of the movement report is displayed in a pop-up window along with selections to display, print, or scratch the report.

Print Catalog Reports

This function allows users to produce print reports from the tape catalog. A pop-up window is display giving you the option of creating three different types of reports. You may create a FULL report listing all of the tape catalog, a SCRATCH report listing only the scratch tapes, or a LOCATION report listing only the tapes in a certain location. When completed, the name of the catalog report is displayed in a pop-up window along with selections to display, print, or scratch the report.

Create Catalog File

This function allows you to create a consecutive file with the information contained in the tape catalog. This consecutive file can then be used to create custom reports with programs such as CONTROL/REPORT and PACE. The record format for this file is described in detail in Chapter 9 of this manual. When selected, a pop-up window is displayed to solicit information needed to create the file.

Import Dataset

This function imports a foreign dataset into the tape catalog. The dataset must have been created by BackBurner and the tape volume(s) must not already exist in the host system's catalog. To import a dataset you must first copy the backup log detail file (i.e. the '@T' file from @USICAT@) onto the host system. When run, a pop-up window is displayed to solicit the name of the backup detail log file to import. The import function will copy (if necessary) the log file into @USICAT@ on the current system volume with the correct BackBurner tape catalog filename.

Chapter 6

Examples

Introduction

This chapter contains typical examples of how you would use BACKBURN and BACKTMS to backup files to disk or tape, and to restore them later. The examples were chosen to illustrate some of the unique features of BackBurner. For more information on writing procedures, please refer to the WANG VS Procedure Language manual.

In general, when using BACKBURN to perform a backup operation, you would proceed as follows:

1. Define the input parameters

2. Define the output parameters

3. Perform the backup operation

Similarly, when using BACKTMS to restore data from tape, you would take the following steps:

1. Search for and locate the files you wish to restore

2. Mark the files to be restored

3. Define the output parameters

4. Perform the restore operation

The following examples describe these steps in more detail.

Multiple Input Volumes

For reasons of capacity or performance, you place the various files of your database onto multiple disk volumes (VOLA, VOLB and VOLC). Instead of running Wang BACKUP three separate times, you can use BACKBURN to backup all three volumes in a single run. Here's how you would define the input specifications:

1. On the INPUT screen, specify the following parameters:

    ```
    VOLUME     =  VOLA
    LIBRARY    =  (blank)        indicates all libraries
    FILE       =  (blank)        indicates all files

    FUNCTION   =  BACKUP
    DEVICE     =  DISK
    TAPEVOL    =  (blank)        used for restore only
    TAPESEG    =  00             used for restore only
    INCRBACK   =  NO
    MOREFILE   =  NO
    SELECT     =  NO
    MOREVOLS   =  YES
    ERRDISP    =  YES
    ```

    Press the Enter key. The INPUT2 screen will appear.

2. On the INPUT2 screen, specify the following parameters:

    ```
    VOLUME     =  VOLB
    LIBRARY    =  (blank)
    FILE       =  (blank)

    DEVICE     =  DISK
    INCL1      =  YES
    MOREFILE   =  NO
    SELECT     =  NO
    ```

    Press the Enter key. An INPUT3 screen will appear.

3. On the INPUT3 screen, specify the following parameters:

```
VOLUME     =  VOLC
LIBRARY    =  (blank)
FILE       =  (blank)

DEVICE     =  DISK
INCL1      =  YES
MOREFILE   =  NO
SELECT     =  NO
```

Press the Enter key. An INPUT4 screen will appear.

4. This time, leave the *VOLUME* field blank and press the Enter key. This completes the input specification.

User-specified Files

You don't want to backup all of the libraries and files on volume VOLY. Instead, you want to specify 14 or more distinct files (for which wildcards are not applicable). To illustrate, suppose the files were named AAA, BBB, CCC, etc., and were all located in library LIBLX on volume VOLY. Instead of running the Wang BACKUP utility multiple times (due to Wang BACKUP having a limitation of a maximum of 12 INCLUDEs), BACKBURN allows you enter all of these file specifications in one run. Here's how you would define the input specifications:

1. On the INPUT screen, specify the following parameters:

```
VOLUME     =  VOLY
LIBRARY    =  LIBLX
FILE       =  AAA

FUNCTION   =  BACKUP
DEVICE     =  DISK
TAPEVOL    =  (blank)
TAPESEG    =  00
INCRBACK   =  NO
MOREFILE   =  YES
SELECT     =  NO
MOREVOLS   =  NO
ERRDISP    =  YES
```

    Press the Enter key. The MOREFILE screen will appear.

2. The first line on the MOREFILE screen displays the name of the library and file you already specified on the INPUT screen (in this case, LIBLX and AAA). Use the remaining 12 lines to specify the other libraries and files you want to backup:

```
LIBRARY2  =  LIBLX   FILE2   =  BBB     INCL2   =  YES
LIBRARY3  =  LIBLX   FILE3   =  CCC     INCL3   =  YES
    •           •        •          •         •          •
    •           •        •          •         •          •
    •           •        •          •         •          •
LIBRAR13  =  LIBLX   FILE13  =  MMM     INCL13  =  YES
```

    Then press the Enter key. A new MOREFILE screen will appear.

3. This new screen enables you to enter more library/file specifications. Simply repeat this procedure as many times as you need to specify all the files. When you finally leave the bottom line blank and press the Enter key, BACKBURN will conclude you've finished with the input specifications.

Cumulative Incremental Backups

On Friday night, you want to do a full backup of all files to establish a baseline. Then, each day, you want to do cumulative incremental backups of only those files modified since the Friday backup.

1. To perform the full Friday (baseline) backup:

    a. On the INPUT screen, in addition to all of your regular input parameters, specify :

        INCRBACK = YES

    b. On the INCRBACK screen, specify:

        RESETMOD = YES
        MODONLY = NO

    This will backup all the specified files and reset their status to 'not-modified', thus establishing a baseline.

2. To perform the cumulative incremental backups:

    a. On the INPUT screen, in addition to your regular input parameters, specify:

        INCRBACK = YES

    b. On the INCRBACK screen, specify:

        RESETMOD = NO
        MODONLY = YES

    This will backup only the files that were modified since the full (baseline) backup. Since *RESETMOD* = NO, the status of these backup files will remain 'modified' after each backup. As a result, each cumulative incremental backup will select **all the files modified since the full (baseline) backup.**

To restore with this backup strategy, you would:

1. Restore from the baseline backup.

2. Restore again from the most recent cumulative incremental backup. When BACKBURN indicates duplicate files, scratch the existing files so that they will be replaced by the modified files from the cumulative incremental backup. Since each cumulative incremental backup contains all the files modified since the baseline backup, only the last cumulative incremental backup is needed.

Daily Incremental Backups

On Friday night, you want to do a full backup of all files to establish a baseline. Then, each day, you do daily incremental backups of only those files which have changed during the course of the day.

Here's how you would do it:

1. To perform the full Friday (baseline) backup:

   a. On the INPUT screen, in addition to your regular input parameters, specify:

   INCRBACK   =   YES

   b. On the INCRBACK screen, specify:

   RESETMOD   =   YES
   MODONLY   =   NO

   This will backup all the specified files and reset their status to 'not-modified', thus establishing a baseline.

2. To perform the daily incremental backups:

   a. On the INPUT screen, in addition to your regular input   parameters, specify:

   INCRBACK   =   YES

   b. On the INCRBACK screen, specify:

   RESETMOD   =   YES
   MODONLY   =   YES

   This will backup only the files that were modified since the last daily incremental backup. Since *RESETMOD* = YES, the status of these files will be reset to 'not modified' after the backup. As a result, each incremental backup will select **only the files modified during the day** (i.e. since the last backup).

To restore files from a daily incremental backup, you would:

1. Restore from the baseline backup.

2. Restore those same files again from <u>each</u> daily incremental backup, starting with the oldest daily incremental backup and proceeding until the latest daily incremental backup has been restored. When BACKBURN indicates duplicate files, scratch the existing files so that they will be replaced by the modified files from the daily incremental backup.

The primary tradeoff between cumulative incremental backups and daily incremental backups is the time to perform the backup versus the time to restore files. Since a cumulative incremental backup selects all files since the last baseline, the amount of data transferred is potentially much greater than for a daily incremental backup which selects only those files modified since the last baseline or daily incremental backup. As a result, cumulative incremental backups generally take longer to complete. In addition, the amount of space required on the output device for cumulative incremental backups is, in general, always more than the space required by equivalent daily incremental backups. A restore operation, however, is much simpler and faster with cumulative backups since only the last cumulative backup along with the baseline is required to completely reconstruct files to their latest version.

A Multi-Volume Backup Procedure

The following procedure demonstrates how to use BackBurner to backup three input disk volumes to tape. The disk volumes SYS006, SYS005 and SYS000 are specified as the input volumes with work and print libraries excluded. The first output tape volume is MAG001. If more output tapes are needed, the procedure has statements for up to two additional output tape volumes (MAG002 and MAG003). An executable copy of this procedure, MULTIVOL, is located in the BACKBURN library on your system volume.

```
Procedure
*
***********************************************************
*                                                         *
*         Multi-volume Backup Procedure                   *
*                                                         *
***********************************************************
*

BB:       Run BACKBURN in BACKBURN

          Enter INPUT     Volume=SYS006,
                          Morefile=YES,
                          Morevols=YES,
                          Errdisp=NO
          Enter MOREFILE  Library2='#+W',       Incl2=NO,
                          Library3='#---PRT',  Incl3=NO
          Enter INPUT2    Volume=SYS005,
                          Morefile=YES
          Enter MOREFIL2  Library2='#+W',       Incl2=NO,
                          Library3='#---PRT',  Incl3=NO
          Enter INPUT3    Volume=SYS000,
                          Morefile=YES
          Enter MOREFIL3  Library2='#+W',       Incl2=NO,
                          Library3='#---PRT',  Incl3=NO
          Enter INPUT4
          Enter OUTPUT    Volume=MAG001,
                          Device=TAPE,
                          Clear=YES,
                          Tapedisp=UNLOAD,
                          Dsn='MULTIVOLUMEBACKUP'

          Enter OUTPUT02  Volume=MAG002
          Enter OUTPUT03  Volume=MAG003

          Enter LOGFILES  Spoolvol=NO,
                          Print=NO
          Enter EOJ

          Return code = BB
```

A Full System Unattended Backup Procedure

The following procedures demonstrate how to use BackBurner and its associated utility programs to perform an unattended backup of the whole system. The backup can be specified to run either in foreground or submitted as a background job. The FULLSYS procedure prompts the user to specify the tape volume, tape device number, dataset name, whether or not to first scratch the dataset, and the time to start the backup. If needed, the tape is then scratched via the BACKSCR utility program. The tape volume is then mounted on the device number specified. Once the tape is successfully mounted, the FULLSYSB procedure is either called immediately or submitted to background. The FULLSYSB procedure runs the WAITER program to wait until the time specified for the backup. The date and time is defaulted to the current date/time so that unless they are modified by the user, the backup begins immediately.

When the backup completes, the tape is unloaded by BACKBURN. If specified on the FULLSYS input screen, files which generated verify messages are automatically reorganized with EGGREORG. The procedure then returns with the return code as set by BACKBURN. Executable copies of these procedures, FULLSYS and FULLSYSB, are located in the BACKBURN library on your system volume.

```
        Procedure
        *
        ************************************************************
        *
        *        Full System Backup   FULLSYS
        *
        ************************************************************
        *
        Declare   &backgrnd    string(3)   initial "NO "
        Declare   &dev         string(3)   initial "   "
        Declare   &dsn         string(17)  initial "FULL.SYSTEM"
        Declare   &dt          string(6)
        Declare   &msg         string(72)
        Declare   &pfkey       integer
        Declare   &reorg       string(3)   initial "NO "
        Declare   &scr         string(3)   initial "YES"
        Declare   &sysvol      string(6)
        Declare   &tape        string(6)
        Declare   &tm          string(4)
        *
                Extract &sysvol=SYSVOL
                Assign  &dt=&date
                Assign  &tm=&time
        *
```

```
START:
            Prompt pfkey=&pfkey
            Center "Full System Backup Procedure";;
            Bright &msg;;;
 "          Specify the tape to be used:          Tape:   ",
            Bright upper &tape;;
 "          Specify the tape device number:    Device:   ",
            Bright upper &dev;;
 "          Specify the dataset name:              DSN:   ",
            Bright upper &dsn;;
 "          Scratch the tape before use?      Scratch:   ",
            Bright upper &scr;;
 "          What day should the backup begin?    Date:   ",
            Bright upper &dt;;
 "          What time should the backup begin?   Time:   ",
            Bright upper &tm;;
 "          Reorganize files in @BBLIST@?         Reorg:   ",
            Bright upper &reorg;;
 "          Submit to background?             Background:   ",
            Bright upper &backgrnd;;;
            Center "Press Enter to proceed, or";
            Center "PF16 to terminate"
            If &pfkey EQ 16  Return
            If &pfkey EQ 0   then goto CHKSCR
              Assign &msg='Invalid PFkey.'
              Goto START

CHKSCR:  If &scr NE "YES" Goto MNT
SCRATCH: Run BACKSCR in BACKBURN on &sysvol
             Enter INPUT      Volume=&tape
         If scratch EQ 0 then goto MNT
         If scratch EQ 3 then goto MNT
             Assign &msg='Tape scratch failed: RC = '!!SCRATCH
             Goto START

MNT:     Run BBTMOUNT in BACKBURN on &sysvol
TVOL:    Enter INPUT Tvolume=&tape, Tdevice=&dev, Clear=YES
         If mnt EQ 3 then goto MNTFAIL
         If mnt LT 16 then goto CHKBACK
MNTFAIL:  Assign &msg='BBTMOUNT program exited via PF16.'
             Goto START

CHKBACK: Assign &tape = (TVOL.TVOLUME)
         If &backgrnd NE "YES" Goto BB
             Submit FULLSYSB in BACKBURN on &sysvol as BACKBURN
               Using &dsn, &dev, &dt, &tape, &tm, &reorg,
               Environment=YES
             Return

BB:      Run FULLSYSB in BACKBURN on &sysvol
             Using &dsn, &dev, &dt, &tape, &tm, &reorg

             Return code = bb
```

```
          Procedure
          *
          ************************************************************
          *
          *         Full System Backup  FULLSYSB
          *
          ************************************************************
          *
          Using     &dsn          string(17),
                    &dev          string(3),
                    &dt           string(6),
                    &tape         string(6),
                    &tm           string(4),
                    &reorg        string(3)
          *
          Declare   &sysvol       string(6)

                    Extract &sysvol=SYSVOL
          WAIT:     Run WAITER in BACKBURN on &sysvol
                       Enter INPUT    Waitdate=&dt,   Waittime=&tm
                       If wait LT 8 then goto BB
                          Return code = WAIT

          BB:       Run BACKBURN in BACKBURN on &sysvol
                       Enter INPUT     Volume="+",
                                       Incrback=NO,
                                       Errdisp=NO
                       Enter INCRBACK  Resetmod=NO,
                                       Modonly=NO
                       Enter OUTPUT 4, Volume=&tape,
                                       Device=TAPE,
                                       Tapedisp=UNLOAD,
                                       Clear=YES,
                                       Dsn=&dsn
                       Enter MOUNT     Device=&dev
                       Enter LOGFILES Spoolvol=NO,
                                       Print=NO
                       Enter EOJ

          If &reorg EQ "NO " then Return Code=bb
          If not exists file EGGREORG in @SYSTEM@ on &sysvol
            then Return Code=bb

          Run EGGREORG
            Enter LISTNAME Listname=@BBLIST@
            Enter LISTNAME 16

          Return code = bb
```

Chapter 7

Return Codes

Return Code Summary

Return codes are used to indicate the success of a BACKBURN run or to indicate the reason for failure or some abnormal condition. If several abnormal conditions exist, the highest-valued return code is returned.

0   *Successful.* No abnormal conditions.

2   *Successful.* One or more files generated a verify information message or could not be verified (bypassed).

4   *Successful.*

              One or more indexed files generated a verify warning.

              One or more files were backed up while open. File reorganization is recommended.

6   *Successful.*

              One or more files were skipped due to possession or protection conflicts, or the volume was not mounted.

              One or more files failed indexed file verification and may be damaged.

8   *Successful.* One or more files were skipped due to I/O error.

12   *Unsuccessful.* BackBurner terminated due to I/O error.

16   *Unsuccessful.* Program integrity halt. Print the halt file in library BACKDIAG on the system volume and contact USI for assistance.

20   *Unsuccessful.* Insufficient modifiable data area available.

21   *Unsuccessful.* Insufficient file access rights.

22   *Unsuccessful.* BACKBURN cancelled.

24   *Unsuccessful.* User terminated via PF16.

40   *Unsuccessful.* License or Demo expiration date has expired or BACKBURN is not configured for your system.

Chapter 8

Getparm Quick Reference

BACKBURN Getparm Parameters

This chapter contains a summary of the PRNAMES and KEYWORDS used by the backup function of BackBurner. It is intended as a guide for writing procedures.

PRNAME	KEYWORDS/ PFKEYS	LENGTH/ FUNCTION	TYPE	DEFAULT	PERMITTED VALUES
INPUT	VOLUME	6	AN		
	LIBRARY	8	AN		
	FILE	8	AN		
	FUNCTION	7	AN	BACKUP	BACKUP, RESTORE OR VERIFY
	DEVICE	4	AN	DISK	DISK, TAPE or OD
	INCRBACK	3	AN	NO	YES or NO
	TAPEVOL	6	AN		
	TAPESEG	2	INT	00	00 - 99
	MOREFILE	3	AN	NO	YES or NO
	MOREOPTS	3	AN	NO	YES or NO
	SELECT	3	AN	NO	YES or NO
	MOREVOLS	3	AN	NO	YES or NO
	ERRDISP	3	AN	YES	YES or NO
	ENTER	Continue			
	PF1	Run VOLCOPY			
	PF2	Go ahead to next volume			
	PF4	Mount VOLUME			
	PF9	Run the Tape Manager			
	PF16	Exit			
INPUTn (disk)	VOLUME	6	AN		
	LIBRARY	8	AN		
	FILE	8	AN		
	INCL1	3	AN	YES	YES or NO
	MOREFILE	3	AN	NO	YES or NO
	SELECT	3	AN	NO	YES or NO
	ENTER	Continue			
	PF1	Return			
	PF16	Abort			

PRNAME	KEYWORDS/ PFKEYS	LENGTH/ FUNCTION	TYPE	DEFAULT	PERMITTED VALUES
INPUTnn (tape) (nn=blank, 02-99)	DEVICE	4	INT		
	ENTER	Continue			
	PF9	Run Tape Manager			
	PF16	Abort			
MOREOPTS	IDMOUNT	2	AN	PR	PR, SH or EX
	VERIFY	4	AN	YES	YES, NO , WARN or FAIL
	OPENFILE	3	AN	YES	YES or NO
	LOCK	3	AN	YES	YES or NO
	TIMEOUT	3	INT	010	0 - 256
	IFNOLOCK	3	AN	NO	YES or NO
	SHARED	3	AN	NO	YES or NO
	REORGTAP	3	AN	NO	YES or NO
	NDXONLY	3	AN	NO	YES or NO
INCRBACK	RESETMOD	3	AN	NO	YES or NO
	MODONLY	3	AN	NO	YES or NO
	RESTART	3	AN	NO	YES or NO
	ENTER	Continue			
MOREFILE MOREFILn	LIBRARYN	8	AN		
	FILEn	8	AN		
	INCLn	3	AN	YES	YES or NO
	ENTER	Continue			
	PF16	Abort			
SELECT	MBMONTH	2	INT		01 to 12
	MBDAY	2	INT		01 to 31
	MBYEAR	2	INT		00 to 99
	MAMONTH	2	INT		01 to 12
	MADAY	2	INT		01 to 31
	MAYEAR	2	INT		00 to 99
	CBMONTH	2	INT		01 to 12
	CBDAY	2	INT		01 to 31
	CBYEAR	2	INT		00 to 99
	CAMONTH	2	INT		01 to 12
	CADAY	2	INT		01 to 31
	CAYEAR	2	INT		00 to 99
	EBMONTH	2	INT		01 to 12
	EBDAY	2	INT		01 to 31
	EBYEAR	2	INT		00 to 99
	EAMONTH	2	INT		01 to 12
	EADAY	2	INT		01 to 31
	EAYEAR	2	INT		00 to 99
	USERIDn	2	AN		
	FPCLASSn	2	AN		
	ENTER	Continue			
	PF16	Abort			

PRNAME	KEYWORDS/ PFKEYS	LENGTH/ FUNCTION	TYPE	DEFAULT	PERMITTED VALUES
OUTPUT	VOLUME	6	AN		
	LIBRARY	8	AN		
	FILE	8	AN		
	DEVICE	4	AN	DISK	DISK, TAPE or OD
	CLEAR	3	AN	NO	YES or NO
	DSN	17	AN		
	TAPEDISP	6	AN	REWIND	REWIND, UNLOAD or LEAVE
	MOUNT	11	AN	IMMEDIATELY	IMMEDIATELY, ASNEEDED or PROMPT
	COMPRESS	4	AN	NO	YES or NO
	CATALOG	6	AN	ALWAYS (set by CONFIG)	ALWAYS, NEVER, YES or NO
	ENTER	Continue			
	PF1	Return			
	PF4	Mount VOLUME]			
	PF9	Run Tape Manager			
	PF16	Abort			
OUTPUTn (disk)	VOLUME	6	AN		
	LIBRARY	8	AN		
	FILE	8	AN		
	MOUNT	11	AN	IMMEDIATELY	IMMEDIATELY, ASNEEDED or PROMPT
	CLEAR	3	AN	NO	YES or NO
	ENTER	Continue			
	PF1	Return			
	PF4	Mount VOLUME			
	PF9	Run Tape Manager			
	PF16	Abort			
OUTPUTnn (tape) (nn = blank, 02 - 99)	VOLUME	6	AN		
	DEVICE	6	INT		
	ENTER	Continue			
	PF9	Run Tape Manager			
	PF16	Abort			
OPTIONS (disk) CLEAR=NO	DUPFILES	7	AN	PROMPT	PROMPT, NOCOPY SCRATCH or UPDATE
	ENTER	Continue			
	PF1	Return			
	PF16	Abort			
OPTIONS (disk) CLEAR=YES	VTOCSIZE	4	INT	Current Value	
	TOLERANT	5	INT	Current Value	NONE or CRASH
	IPLVOL	3	AN	Current Value	YES or NO
	ENTER	Continue			
	PF1	Return			
	PF16	Abort			

PRNAME	KEYWORDS/ PFKEYS	LENGTH/ FUNCTION	TYPE	DEFAULT	PERMITTED VALUES
SAMEFILE (disk)	OPTION	7	AN	NOCOPY	NOCOPY, SCRATCH UPDATE, RENAME or NEWNAME
	NEWNAME	8	AN		
	ENTER	Continue			
	PF16	Abort			
NEXTDISK	VOLUME	6	AN		
	CLEAR	3	AN	YES	YES or NO
	ENTER	Continue			
	PF16	Abort			
LOGFILES	OUTDEV (disk)	3	AN	YES	YES or NO
	SPOOLVOL	3	AN	NO	YES or NO
	DISKVOL	6	AN		
	PRINT	3	AN	NO	YES or NO
	ERRLOG	3	AN	NO	YES or NO
	LINES	3	INT		8 to 255
	ENTER	Continue			
	PF1	Skip the report			
	PF16	Terminate			
EOJ	ENTER	Terminate			
	PF1	Re-run BACKBURN			
	PF16	Terminate			
INPOPEN	ERRDISP	3	AN	YES	YES or NO
	ENTER	Skip the file			
	PF1	Re-try OPEN			
	PF4	Mount input volume			
	PF16	Abort			
WARN	ENTER	Continue			
	PF1	Re-try OPEN of @BAKREC@			
	PF16	Abort			
MOUNT (disk)	VOLUME	6	AN		
	CLEAR	3	AN	NO	YES or NO
	ENTER	Mount VOLUME			
	PF16	Abort			
MOUNT (tape)	DEVICE	4	INT		
	ENTER	Mount VOLUME			
	PF16	Abort			
MOUNTOPT	ENTER	Continue without PROTECTED mount			
	PF1	Re-try PROTECTED mount			
	PF16	Abort			
SPEED	ENTER	Continue with BACKBURN			
	PF2	Run VOLCOPY			
	PF16	Terminate			

Chapter 9

Utility Programs

Introduction

There are several utility programs that are included with BackBurner. These programs are generally available from within either BACKBURN or BACKTMS but can also be run standalone or from procedures.

BACKCAT

The BACKCAT program creates a consecutive format file of tape catalog or of a backup log detail file. These consecutive files can then be used as input to report generators (e.g. PACE, REPORT) to create various types of reports. BACKCAT is typically linked to from the BACKTMS program but can be run standalone as well.

There is a single OUTPUT getparm screen in BACKCAT with the following keywords:

TYPE   Specify the type of file to create. Valid responses are VOLCAT (default) and DETAIL.

TAPEVOL   For DETAIL type files, specify the tape volume for the backup detail log file.

SEGMENT   For DETAIL type files, specify the segment number of the backup detail log file.

VOLUME   Specify the volume on which to create the consecutive file.

LIBRARY   Specify the library on which to create the consecutive file.

FILE   Specify the name of the consecutive file to be created.

The VOLCAT consecutive file consists of one 96 byte record for each tape volume segment within the BackBurner tape catalog. The record format for the VOLCAT consecutive file is described below.

Description	Assembler	Cobol
Tape Volume Name	CL6	PIC X(6)
Segment on Volume	CL2	PIC 9(2)
Dataset Status	CL1 A - Active S - Scratched I - Incomplete O - Output	PIC X(1)
Date/Time Created	CL16 19yymmddhhmmsscc	PIC 9(16)
Root Volume Name	CL6	PIC X(6)
Root Segment on Volume	CL2	PIC 9(2)
Next Volume Name	CL6	PIC X(6)
Volume Sequence Number	CL2	PIC 9(2)
Current Location	CL1	PIC X(1)
Previous Location	CL1	PIC X(1)
Date of Last Movement	CL8 19yymmdd	PIC 9(8)
Dataset Name	CL17	PIC X(17)
Expiration Date	CL8 19yymmdd	PIC 9(8)
System WANGNET Id	CL8	PIC X(8)
Operator USERID	CL3	PIC X(3)
Backup Type (Full, Incremental)	CL1	PIC X(1)
Reserved	CL8	PIC X(8)

Table A-1. BACKCAT Record Format (VOLCAT)

The DETAIL consecutive file consists of three types of 96 byte records. The first record is the Header record which contains general information about the backup. The rest of the file consists of File and Message records. There is one File record for each file processed during the backup, and one Message record for each message generated during the backup. The record formats for the DETAIL consecutive file is described below.

Description	Assembler	Cobol
Record Type	CL1	PIC X(1)
	H - Header	
	F - File	
	M - Message	
H - Root Volume	CL6	PIC X(6)
H - Root Segment	CL2	PIC 9(2)
H - Dataset Name	CL17	PIC X(17)
H - Operator USERID	CL3	PIC X(3)
H - BACKBURN Version	CL4	PIC 9(4)
H - VS/OS Version	CL6	PIC 9(6)
H - WANGNET Id	CL8	PIC X(8)
H - Create Date	CL6	PIC 9(6)
H - Create Time	CL6	PIC 9(6)
H - Number of Files	CL9	PIC 9(9)
F - First Output Volume	CL6	PIC X(6)
F - Last Output Volume	CL6	PIC X(6)
F - Input Volume	CL6	PIC X(6)
F - Input Library	CL8	PIC X(8)
F - Input File	CL8	PIC X(8)
F - File Protection Class	CL1	PIC X(1)
F - File Creator	CL3	PIC X(3)
F - File Organization	CL1	PIC X(1)
F - Record Type	CL1	PIC X(1)
F - Record Size	CL4	PIC 9(4)
F - Number of Records	CL9	PIC 9(9)
F - Number of Blocks Allocated	CL9	PIC 9(9)
F - Number of Blocks Used	CL9	PIC 9(9)
F - File Creation Date	CL6	PIC 9(6)
F - File Modification Date	CL6	PIC 9(6)
F - File Expiration Date	CL6	PIC 9(6)
F - File Note	CL19	PIC X(19)
M - Message	CL95	PIC X(95)

Table A-1. BACKCAT Record Format (DETAIL)

BACKPRT

The BACKPRT program creates a report from the backup detail log file. You have the option to print only the errors and messages from the log. The BACKPRT program is typically linked to from within BACKBURN or BACKTMS but can be run standalone as well.

There is a single INPUT getparm screen in BACKPRT with the following keywords:

VOLUME   Specify the volume on which the log file resides (typically your system volume).

LIBRARY   Specify the library on which the log file resides (typically @USICAT@).

FILE   Specify the name of the log file, typically '@T' or 'nn' (where nn is the segment number) followed by a tape volume name.

REPORT   Specify the title to be used when generating the report. Valid responses are BACKUP(default), RESTORE or VERIFY.

ERRONLY   Specify whether or not to restrict the report to error and messages. Valid responses are NO(default) and YES.

LINES   Specify the number of lines per page for the report. Valid responses are 1 - 255. LINES defaults to the value specified via your 'SET usage constants'.

The output print file is created in your spool library on your spool volume.

BACKPRTC

The BACKPRTC program creates a report from the @USICAT@ tape catalog file @VOLCAT@. You have the option to print; the whole tape catalog, only the scratch tape volumes, or only tape volumes from a specified location. The BACKPRTC program is typically linked to from BACKTMS but can be run standalone as well.

There is a single INPUT getparm screen in BACKPRTC with the following keywords:

TYPE   Specify the report type. Valid responses are FULL (default), SCRATCH and LOCATION.

LOCATION For LOCATION reports, specify the tape location to report on.

LINES   Specify the number of lines per page for the report. Valid responses are 1 - 255. LINES defaults to the value specified via your 'SET usage constants'.

The output print file is created in the user's spool library on their spool volume.

BACKSCR

The program BACKSCR, which can be called from within a procedure, will scratch a dataset. To scratch a dataset that spans tape volumes (a volume set), you must specify the root volume and segment number. There is a single INPUT getparm screen in BACKSCR with the following keywords:

VOLUME   Specify the tape volume name.

SEGMENT   Specify the segment number.

DELETE   Specify whether or not to additionally delete the volume from the tape catalog.

The following return codes are defined for BACKSCR:

0	Success.
1	Tape catalog not found.
2	Unable to access tape catalog.
3	Volume/Segment not found.
4	Volume/Segment has status of "INC" and could not be scratched, or insuffcient access rights.
9	Insufficient access rights for catalog update.
32	Volume specified is not the root volume.
33	Volume/Segment is in use.
34	Dataset Expiration Date has not expired.
35	Cannot delete a segment when other segments follow.

BBTMOUNT

The BBTMOUNT program is used to mount tapes. The program contains a single INPUT getparm screen with the following keywords:

TVOLUME   Specify the name of the tape volume that you want to mount. The name of the tape is stored in a BackBurner header record on the tape. This name is checked to make sure that the correct tape is mounted. The reserved volume name '@@@SCR' can be used to cause BBTMOUNT to mount the oldest scratch tape from a particular dataset.

TDEVICE   Specify the device number of the tape drive.

MODE   Specify the mode in which to mount the tape. Valid responses are OUTPUT (default) and INPUT.

CLEAR   For OUTPUT tape volumes, specify whether or not you are going to clear the volume. The response to this question should be the same as the response to the CLEAR field on the OUTPUT getparm in BACKBURN. Valid responses are YES (default) or NO.

DSN   For auto-volume selection, specify the dataset name from which to pick the oldest scratch tape.

We recommend that when using procedures to automate BackBurner, this program is used instead of the MOUNT command for the following reasons:

BBTMOUNT will warn you if the wrong tape is mounted. Since unlabeled tapes are usually used for backups, MOUNT cannot verify that the mounted tape volume is the specified volume.

For OUTPUT mode, BBTMOUNT will warn you if the tape contains active data sets. When running unattended backups overnight, BackBurner will not clear a volume if it contains active data sets.

The following return codes are defined for BBTMOUNT:

0	Tape mounted successfully
1	Volume not available. If CLEAR=YES, it contains active data sets. If CLEAR=NO, the volume is full.
2	Wrong volume mounted.
3	Miscellaneous error.
4	Volume is write protected.
5	No available scratch tapes (when using '@@@SCR').
16	User exited via PF16.

WAITER

The WAITER program, when used within a backup procedure, allows you to delay the start of the backup until a specified date and time in the future. When invoked, the WAITER program requires you to specify a date and time in the future until which you want to delay the start of the backup. The procedure will be suspended until the VS time-of-day clock crosses the date and time boundary specified. There is a single INPUT getparm screen in WAITER with the following keywords:

WAITDATE Specifies the date, in *yymmdd* format, of the wait period.

WAITTIME Specifies the time, in *hhmm* (24-hour) format, of the wait period.

The wait period may be prematurely terminated by pressing PF13 at any time during the wait. The following return codes are defined for WAITER:

0	Wait period ended normally.
4	Wait period ended prematurely via PF13.
6	Specified date/time precedes current date/time
8	Invalid date or time specified.
16	Wait period terminated via PF16.
18	WAITER program canceled.