V4.5

FATS/FATAR
USER DOCUMENTATION

FATS®
Fast Analysis of Tape Surfaces

FATAR™
Fast Analysis of Tape And Recovery

INNOVATION® DATA PROCESSING

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FATS® & FATAR™

USER DOCUMENTATION

INNOVATION® DATA PROCESSING

1.0 INTRODUCTION

FATS (Fast Analysis of Tape Surfaces) and FATAR (Fast Analysis of Tape and Recovery) are magnetic tape utility programs which provide a number of functions, including certification and verification of tape volumes, erasing tapes, labeling tapes, analyzing tapes and copying tapes.

FATAR allows users to copy data from older media drives to newer media, such as IBM Magstar (3590) or STK Redwood, drastically reducing tape storage cost and processing time.

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1.1 SUMMARY OF NEW FEATURES

The following are new features of FATS and FATAR V4.5.

NEW TAPE TECHNOLOGIES

FATS and FATAR now support new tape drives now available for MVS, including

– IBM Magstar 3590

– STK Redwood (helical) and Timberline (3490E compatible, double speed)

Wherever appropriate, byte counts and block counts have been increased in size to accommodate the larger capacity of these tapes.

NEW MVS UCB OPTIONS

FATS and FATAR now support 4-digit device addresses and UCBs above the 16MB line.

ANSI LABEL TAPES

FATS can now label tapes with ANSI labels instead of IBM labels during LABEL and WRITE operations.

DATA RECOVERY

The ability to recover data from overwritten 3490E and 3590 cartridges with FATAR has been enhanced.

IMAGE COPY ENHANCEMENTS

The image copy function of FATAR is now invoked by the LABELS=IMAGE operand:

– One input tape will be completely copied. It will be rewound to the beginning. Additional tape volume serials on TAPEIN will be ignored.

– Labels will now be printed whenever they are detected

– Empty data files in the middle of a labeled tape will not terminate image copy.

– OUTBLP will be forced to insure that FATAR can write the copied labels on the output tape.

– An option is available to preserve the volume serial of the output tape; all other data and labels are copied.

– FATAR will attempt to compensate when the output tape is slightly too short to contain all the data.

TAPE MANAGEMENT SUPPORT

FATAR includes interfaces to CA-1 (TMS) and CA-TLMS tape management systems to get the full data set names of tapes being copied. This allows tapes to be easily copied to new volumes or new media types while retaining their full original names. FATAR can also read all tapes in a multi-volume tape set even if only the first tape serial is provided.

RENAME AND CATALOG

Whenever the full data set name of an input file is available (usually when the tape management interface described above is in use), tape files copied by FATAR can be renamed and can be cataloged by FATAR.

LABEL PRINTING

Even when label processing has been suppressed by LABELS=NO, FATAR will still detect and print any tape labels that it encounters. Even when an image copy is being done, FATAR will print label information to provide better documentation on the tape that was copied.

LBLPRT=FORMAT is now the default; label fields will be formatted and interpreted.

PERFORMANCE IMPROVEMENTS

FATS has improved certify (WRITE) performance by chaining multiple WRITE CCWs together.

FATAR has improved copy performance by overlapping input READs and output WRITEs.

YEAR2000 SUPPORT

FATS and FATAR have contained all necessary changes for YEAR2000 support since V4.0 (1985).

FATS® & FATAR™

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FATS

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10.0 FATS FUNCTIONAL DESCRIPTION

WHAT IS FATS?

FATS (Fast Analysis of Tape Surfaces) is a special-purpose magnetic tape utility, which can be executed under MVS/XA, MVS/ESA and OS/390. FATS is used to perform many of the functions for which a tape librarian is responsible in most shops, such as certifying usability of new or scratch tapes, verifying readability of tapes, erasing data from tape, and labeling tapes. However, these operations are done on the actual tape drives where the tapes will be used rather than on expensive stand-alone hardware devices. This results in a savings of money and of time, since FATS can perform as many concurrent operations as there are tape drives available.

WHAT IS FATS USED FOR?

FATS has several specific applications, including:

– Certifying the usability of tapes, both new and old, by writing a pattern on the full length of the tape (this is equivalent to the function of hardware tape certifiers). This helps to avoid write data errors at application run time by identifying potentially defective tapes.

– Verifying the readability of critical or archival data tapes, to avoid read data errors at application run time. Tapes with read errors may be recovered using FATS' companion product FATAR.

– Labeling tapes with specified volume serials. This can be done by itself, or in combination with a certification process.

– Erasing data from a tape, to insure that confidential information is not left on a tape (as when a tape volume is being sold or shipped to another location). This is similar to stand-alone tape degaussers, but is superior since tape serials can be verified and preserved.

– Interfacing with its companion product FATAR to perform detailed data analysis and copying of tapes.

Regular use of the certification and verification functions of FATS can significantly reduce the number of application abends due to data checks. In addition, many tape data checks are recoverable by operating system error recovery, but cause significant run time degradation while this recovery is taking place; FATS can reduce this degradation.

WHO USES FATS?

FATS is normally used by tape librarians and operations personnel but may be used by systems and applications programmers.

TAPE OPERATIONS

Depending on the command statements provided, FATS will perform any of its supported functions on from 1 to 9 tape drives simultaneously. The same operation could be performed on all of the allocated tape drives, or, if desired, different functions could be done on different drives. FATS uses an internal task control so that all of these operations can proceed independently of one another. By the use of FATS parameters, FATS can be instructed to request multiple tapes on a drive, calling either for scratch tapes or specific volume serials, so that the same operation can be performed on many tapes using one tape drive. FATS will terminate when instructed by the operator or when all requested functions are completed.

SUPPORTED DEVICES

FATS will function on any IBM or IBM-compatible tape drive supported by the host MVS system including:

– IBM 3420 and 3422 9-track round (reel-to-reel) drives up to 6250 BPI and equivalent drives from other vendors. By default, multi-density drives certify tapes at the highest density they are capable of, although this can be overridden if required.

– IBM 3480 and 3490 tape cartridge systems (18 track) and equivalent drives from other vendors such as STK and Memorex

– IBM 3490E tape cartridge systems (36 track) and equivalent drives from other vendors such as STK and Memorex

– IBM 3590 (Magstar) tape cartridge systems (128 track) including 3590s attached to a 3591 control unit (which emulates a 3490E).

– STK Timberline and Redwood tape cartridge systems

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PROCESSING SPEED

The speed at which FATS can process a tape is dependent on three variables: the speed of the tape drive, the contention for the tape channel and control unit, and the quality of the tapes being tested. When testing tapes suspected of being exceptionally poor, a low permanent error retry level can be specified to accelerate processing. FATS may also contend with itself if multiple tapes being tested concurrently are on the same tape control unit or channel; when processing more than three tapes in one FATS job (except for ERASE functions), it is wise to process multiple tapes using more than one channel and control unit, if available.

When certifying or erasing a single tape, you can expect elapsed times similar to:

Certify a 3480 cartridge	2.5 minutes
Erase a 3480 cartridge	1.8 minutes
Certify a 3490E standard (500 ft) cartridge	5.0 minutes
Erase a 3490E standard cartridge	3.6 minutes
Certify a 3490E Enhanced (1100 ft) cartridge	10.0 minutes
Erase a 3490E Enhanced cartridge	7.2 minutes
Certify a STK Timberline standard cartridge	1.9 minutes
Certify a STK Timberline Enhanced cartridge	3.2 minutes
Certify a 3590 (Magstar) cartridge	26.1 minutes
Erase a 3590 (Magstar) cartridge	19.6 minutes

Erase times will be independent of other tape activity, but certify times will increase if there is other tape activity (including other FATS or FATAR activities) on the same tape channel or control unit. Read times will vary depending on the amount of data and blocksize on the tape and cannot be estimated.

SECURITY CONSIDER-ATIONS

FATS does not have any special security interfaces, but since it does OPEN and CLOSE the input and output tapes, your security system will be invoked. If you have configured it to protect tape data sets and/or tape volumes, those security rules will apply, so the userid under which FATS is run must be authorized to read the input volumes and data sets and write to the output volumes and to create the output data set names used.

When label processing on input or output volumes is bypassed (the BLP option in JCL or the BLP operand on the FATS statements), volume labels and data set names are not verified by OPEN and so authorization to the volume and data sets cannot be guaranteed; if anything, your security system will check authority to the volser and dsname provided in the JCL when BLP is used, these may not match the actual tape. For this reason, most security systems restrict the use of BLP. However, some functions of FATS (such as labeling or certifying virgin tapes) require the use of BLP. Innovation suggests that you provide BLP authority to a limited number of users (operators, tape librarians, and/or system programmers) so that they can run these functions when required.

11.0 FATS TECHNICAL SUMMARY

11.1 GENERAL

THE FATS PROGRAM

FATS (Fast Analysis of Tape Surfaces) is a utility program for certifying, verifying, labeling, and erasing magnetic tapes.

FATS requires 256K of memory. If FATS' companion product FATAR is invoked as a sub-task (via the ANALYZE(n) operation), then the memory requirements of FATAR (detailed elsewhere in this manual) must be added to that of FATS for each FATAR sub-task.

FATS must be linkedited and executed as an authorized program.

CONTROL AND REPORT I/O

FATS accepts its control statement input from DD statement SYSIN. The control statements are 80-byte records, of which only columns 1 to 71 may contain information.

Report output is directed to several print datasets. DD statement SYSPRINT is required, and will contain general messages and control statement listings. Up to 9 optional SYSPRINx DD statements may be included (where "x" is a digit from 1 to 9 and corresponds to the 9 tape drives used by FATS); if present, detail reports on the results from the associated tape drive will be printed on SYSPRINx, but if omitted, the detail reports will go to SYSPRINT. DD statement SUMMPRT is also optional; if present, it will receive a summary report on each tape volume processed by FATS; if absent, the summary report will go to the associated SYSPRINx or to SYSPRINT.

TAPE OPEN PROCESSING

FATS always opens every tape with a standard data management OPEN, so that label processing will be performed (unless bypassed by JCL or control statement options), and tape management and security systems, if present, will be invoked. So, for all FATS operations, you have assurance that the tapes mounted are the proper tapes and that they may be written on or read from as long as you do not bypass these checks yourself.

If label processing is bypassed (LABEL=(,BLP) in JCL or the BLP control statement option), the FATS option VALIDATE= may be used to check the volume serial and expiration date on tapes used by FATS.

FATS CONTROLS

The system operator or tape librarian can exercise control over FATS by optionally replying to an outstanding WTOR (write-to-operator-with-reply) or by issuing a console STOP or MODIFY command. Use of WTOR=YES operand (the default) will cause a WTOR to be issued to the tape pool console (route code 3) when FATS is executing. The operator or librarian can terminate FATS at any time by replying to this message; FATS can also be instructed to abandon processing of a particular tape (if, for example, the tape is too damaged to mount). Alternatively, by using the MODIFY=YES parameter (default is MODIFY=NO), the operator or librarian may use console STOP and MODIFY commands to gain the same control over FATS.

ISPF PANEL SUPPORT

Extensive ISPF Panels are available to perform many of the FATS/FATAR functions like labeling, certifying and copying tapes. See Section 93.0 ISPF INTERFACE INTRODUCTION on "How to Use the ISPF Panels."

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11.2 TAPE CERTIFICATION

OPERATING SYSTEM RECOVERY

When a WRITE command is issued to a tape drive, the tape hardware reads back the data just written to verify it and indicates the success or failure of the WRITE. If the readback fails a WRITE DATA CHECK is indicated and a recovery action is initiated which generally involves:

– Backspace over the bad record.

– Erase a section of tape

– Retry the failing WRITE command.

This will normally be done until the write completes normally or a retry limit is reached. For round tapes, this recovery is done by operating system software, but in tape cartridge systems, the recovery operations are done by the tape control unit without assistance from the operating system. The effect is the same in either case.

If all retries fail, a permanent WRITE DATA CHECK is indicated, and the operating system will write an I/O error message on the console and report the error back to the requesting application program, which usually results in abnormal termination of that job.

Even if the recovery is eventually successful, all of the repositioning and retrying can impact the performance of tape channels and control units. In the worst case, many inches of tape may be erased to recover from a very long error; a large number of these errors can significantly reduce the usable length of a tape and elongate the run time of the job.

Permanent (unrecoverable) and temporary (eventually successful) data check counts are accumulated by the operating system and tape hardware and are recorded both on "SYS1.LOGREC" (EREP) and on SMF (if you are keeping SMF type 21 records which are "ESV" -- Error Statistics by Volume). However, all of the above RETRY operations are recorded as only one permanent or temporary error even through the WRITE may have failed at up to 16 different locations on the tape. No indication is given of the length of an error.

The purpose of operating system error recovery is to attempt to let an application job complete successfully despite WRITE errors on output tapes, regardless of the cost. This is an excellent goal, but greater reliability and performance could be achieved if the errors could be avoided in the first place.

TAPE CERTIFICATION

The FATS certification function identifies error locations on a tape before it is used by an application program.

The technique used is simple. FATS writes large blocks of patterned data. The hardware readback function of the tape drive is used to detect blocks which were not written successfully (data checks). FATS will inhibit the operating system and tape hardware from automatically attempting to recover from such data checks, since we want to identify and report on them.

When data checks occur, FATS will backspace over the bad block and retry the WRITE in the same location. If a user-specified RETRY limit is exceeded for errors at one location (default is 10), the error is considered permanent and is probably due to some tape media defect. If the WRITE is completed successfully before the RETRY limit is reached, it is considered a temporary data check (this may be due to debris on the tape which was dislodged during the retry process).

FATS will report, in the associated detail report for the tape, the location (in feet from the beginning of the tape) of any temporary or permanent error. The length of permanent errors in inches will also be reported. If permanent errors occur at consecutive locations, FATS will report the cumulative length of the error. The summary report for the tape will report the total number of permanent errors, and temporary error totals by number of RETRIES. Lengths and locations can optionally be reported in metric units (meters and centimeters).

By reporting the number, length, and location of all errors, FATS provides sufficient information to make an informed decision on whether a given tape should be put into use, discarded, or repaired (more detail on this is given in the section "FATS GUIDELINES").

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11.2 CONTINUED . . .

TAPE CERTIFICATION (continued)

The location of errors is calculated by FATS in feet since the beginning of the tape as a function of the number and length of FATS records written, and the number of inter-record gaps. FATS assumes the nominal inter-record gap size for each tape drive and density as documented in IBM tape drive hardware manuals. However, the actual length of this gap can vary from drive to drive, so a given tape certified on two different drives may report errors at slightly different locations. FATS will also report the total length of the tape, but this may also vary due to gap variations.

Tape data checks may be caused by tape drive equipment checks, by dirty tape read/write heads, by tape surface damage (or improper manufacture), or by dirt or other contaminants on the surface. Equipment failure is the least likely and will usually show up as errors across the entire length of a number of tapes. Errors caused by dirt are often transitory; they may move or disappear if the tape drive picks up the dirt and re-deposits it in a different location.

When certifying new tapes, FATS can be instructed to mount a range of sequentially numbered tapes with simple control statements.

IDRC ON CARTRIDGE DRIVES

Although most cartridge drives (except some early 3480 drives) are capable of hardware compression of tape data using a feature known as IDRC (Improved Data Recording Capability), IDRC will always be suppressed during certification, even if it is called by the tape JCL (TRTCH=COMP) or by the system default. IDRC compression is not relevant to a certification process and will simply make the certification take longer.

LABELING TAPES

FATS can label new tapes or relabel existing tapes during the certification process. Labels can be IBM standard or ANSI labels. FATS can also create unlabeled tapes. See Section 11.4 TAPE LABELING for more information.

CERTIFICATION OF TAPE CARTRIDGES

Tape cartridges have resulted in a significant reduction in the number of data checks compared to round tapes, yet data checks do occur, and when they do they tend to be more severe than those on round tapes. FATS is an excellent tool to certify new cartridges and insure that the existing cartridges in the scratch pool that have potential for errors are identified and eliminated from the tape library.

If bad cartridges are introduced into your tape pool, significant cost and time is required to identify them and to copy the data to a new set of tapes.

ISPF PANELS FOR CERTIFICATION

Below are examples of the FATS ISPF panels for certification of new and existing tapes. See Section 93.0 ISPF INTERFACE INTRODUCTION for more information on the use of ISPF with FATS. Option numbers shown are options on the FATS/FATAR main menu.

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FATS CERTIFY NEW TAPES (OPTION A)

```
(V4.50)-------------------- FATS CERTIFY NEW TAPES ----------------------------
COMMAND ===>

TAPE1  DD Dsname= BAB.FATSOUT.JOBD                                        <
          Unit  =( TAPE     )
          Label =( ,BLP,EXPDT=98000                     )

VOL     - Volume serial number(s)  1: ______  2: ______  3: ______  4: ______
                                   5: ______  6: ______  7: ______  8: ______
                                   9: ______ 10: ______ 11: ______ 12: ______
                                  13: ______ 14: ______ 15: ______ 16: ______
                                  17: ______ 18: ______ 19: ______ 20: ______

MAXVOLN - Maximum number of volumes : ___
NOLABEL - Create no label (NL) tapes: NO  (yes/no)
ANSI    - Create ANSI labeled tapes : NO  (yes/no)

Display more FATS Operands? NO (yes/no)
```

FATS CERTIFY EXISTING SCRATCH TAPES (OPTION B)

```
(V4.50)-------------------- FATS CERTIFY EXISTING TAPES ----------------------
COMMAND ===>

TAPE1  DD Dsname=  BAB.FATSOUT.JOBD                                        <
          Unit  =( TAPE     )
          Label =( ,SL                                  )

VOL     - Volume serial number(s)  1: ______  2: ______  3: ______  4: ______
                                   5: ______  6: ______  7: ______  8: ______
                                   9: ______ 10: ______ 11: ______ 12: ______
                                  13: ______ 14: ______ 15: ______ 16: ______
                                  17: ______ 18: ______ 19: ______ 20: ______

MAXVOLN - Maximum number of volumes : ___
NOLABEL - Create no label (NL) tapes: NO  (yes/no)
ANSI    - Create ANSI labeled tapes : NO  (yes/no)

Display more FATS Operands? NO (yes/no)
```

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11.3 TAPE VERIFICATION

TAPE VERIFICATION

When reading tape, the operating system or tape control unit will retry any read data check many times by backspacing and re-reading the block. Cleaning actions (attempts to dislodge any dirt by moving the tape rapidly back and forth) are done periodically. In the end, if the tape drive is unable to read the block successfully, the error is reported to the application program which usually abnormally terminates.

FATS read verification may be used on critical or archival tapes before they are required by an application job to verify their readability. FATS will read each block on the input file, and will attempt to re-read each data check block a user-specified number of times (10 retries by default) to see if the error will go away with repeated reads.

FATS will report in its detail report the location (in feet), file number, and record number of any temporary or permanent read data check encountered. Much like the certification function, FATS will report the length of any permanent error, and the total length of any consecutive permanent errors. The summary report for the verification will show the number of permanent errors, and the number of temporary errors by the number of retries. Lengths and locations can optionally be reported in metric units (meters and centimeters).

FATS performs its verification by reading without actually transferring the data read to the CPU; this is sufficient to identify data checks. For a more detailed look at the data causing the errors, or to attempt to correct or bypass the errors, FATS' companion product FATAR may be used. FATAR can be executed directly, or as a sub-task of FATS. FATAR is more appropriate for verifying tapes where the number of data files on the tape is unknown.

IDRC ON CARTRIDGE DRIVES

Most cartridge drives (except some early 3480s) support hardware data compaction through a feature called IDRC (Improved Data Recording Capability). FATS verification will automatically support tapes created with IDRC; no special parameters or JCL is required. A message in the FATS detail report will indicate when an IDRC-compacted tape file is read (called 3480XF or 3490E format). For IDRC tapes, compaction information read from the tape will be used to calculated accurate locations of errors and files; the percentage of data compaction (original data size vs. compacted data size) is also reported.

TAPE COMPATI-BILITY

In most cases, tapes written on one type of tape drive cannot be read on another, even when the tape types are similar and allow the tape to be mounted on the wrong type of drive. An attempt to read a tape on a drive which is not capable of reading its format will receive an error; in most cases it includes the text "NOT CAPABLE". Also, an attempt to read a 3480 cartridge written in IDRC format on a 3480 drive which does not have the IDRC feature gets a similar error.

Exceptions include:

– cartridges written on an IBM 3480/3490 drive (or compatibles) can be read on an IBM 3490E drive.

– many round (3420-type) tape drives are capable of reading tapes written in several densities.

Note that tapes created on an IBM Magstar (3590) tape drive attached to a 3591 control unit (which emulates a 3490E tape subsystem) may be read or written on a standard Magstar (attached to a 3590 control unit), and may not be read or written on a standard 3490E drive. All Magstar tapes are in the same format which can be handled only by a Magstar drive; Magstar cartridges may not even be mounted on other cartridges drives, even though the cartridges are similar in size and appearance.

Also, tapes created on a STK Redwood drive, which also emulates a 3490E tape subsystem, cannot be read or written on any other type of drive. However, STK Timberline drives are fully compatible with IBM 3490E drives.

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11.3 CONTINUED . . .

ISPF PANEL FOR VERIFICATION

Below is an example of the FATS ISPF panel for verification of active tapes. See Section 93.0 ISPF INTERFACE INTRODUCTION for more information on the use of ISPF with FATS. Option numbers shown are options on the FATS/FATAR main menu.

FATS VERIFY (READ) OF EXISTING DATA ON TAPE (OPTION F)

```
(V4.5.0)------------------------ FATS VERIFY (READ) TAPES -------------------------
COMMAND ===>

TAPE1  DD Dsname=  FATS                                        <
          Unit  =( 3480     )
          Label =( ,BLP,EXPDT=98000                        )

VOL     - Volume serial number(s)  1: ______  2: ______  3: ______  4: ______
                                   5: ______  6: ______  7: ______  8: ______
                                   9: ______ 10: ______ 11: ______ 12: ______
                                  13: ______ 14: ______ 15: ______ 16: ______
                                  17: ______ 18: ______ 19: ______ 20: ______

MAXVOLN - Maximum number of volumes : ___
FILES   - Number of Physical files to be read: 3
```

CONTINUED . . .

11.4 TAPE LABELING

FATS labels a tape by writing an IBM standard (SL) or ANSI (AL) label set.

FATS can write labels during certification or erase of a tape, and can also label tapes as a separate function (at considerable savings in elapsed time). Because FATS can request mounting of a large number of volumes, it is ideal for initializing a sequence of new tapes, or re-labeling old tapes with new serials.

The serial number can be specified in FATS control statements, in JCL or via the operator's console. However, for ease in certifying tapes which are already labeled, the FATS default option SAVLAB will read the existing volume serial from the tape being certified and re-label the tape with it, thus "saving" the volume serial.

FATS can also create unlabeled tapes, writing only a tape mark at the beginning of the tape.

When labeling new tapes, FATS can be instructed to mount a range of sequentially numbered tapes with simple control statements.

FATS LABEL SET

When labeling tapes, either directly via the LABEL function, or as an option of the WRITE or ERASE functions, FATS will write the following records:

VOL1 label - with the specified volume serial, and optional OWNERID
HDR1 label *
HDR2 label - showing RECFM=U and BLKSIZE=32760
Tape Mark
Tape Mark - empty data file
EOF1 label *
EOF2 label - showing RECFM=U and BLKSIZE=32760
Tape Mark
Tape Mark - end of tape

* the HDR1 and EOF1 labels will contain the data set name that appeared in the TAPEx DD statement, except that if LABEL=EXPDT=98000 also appeared on that DD statement, the dsname will consist of 17 "0"s (zero character) so that the tape will be immediately acceptable as a scratch tape for tape management systems. The creation and expiration dates are set to the current date.

The labels will be IBM standard, except that if the ANSI operand is specified, they are ANSI V3 standard labels.

Note: the labels written by FATAR differ from IEHINITT and some other tape labeling products, which only write a VOL1, HDR1, and one Tape Mark. Although this minimal label set is valid, it may cause some tape mapping software to attempt to read past the tape mark and get a read error.

ISPF PANEL FOR LABELING

Below is an example of the FATS ISPF panel for labeling of new tapes or relabeling old tapes with new serial numbers. See Section 93.0 ISPF INTERFACE INTRODUCTION for more information on the use of ISPF with FATS. Option numbers shown are options on the FATS/FATAR main menu.

CONTINUED . . .

11.4 CONTINUED . . .

FATS LABELING OF NEW TAPES (OPTION C)

```
------------------------- FATS LABEL NEW TAPES ------------------------------
COMMAND ===>

TAPE1  DD Dsname=  FATS                                            <
          Unit  =( TA80     )
          Label =( ,BLP,EXPDT=98000                     )

VOL     - Volume serial number(s)  1: ______  2: ______  3: ______  4: ______
                                   5: ______  6: ______  7: ______  8: ______
                                   9: ______ 10: ______ 11: ______ 12: ______
                                  13: ______ 14: ______ 15: ______ 16: ______
                                  17: ______ 18: ______ 19: ______ 20: ______
MAXVOLN - Maximum number of volumes : ___
NOLABEL - Create no label (NL) tapes: NO  (yes/no)
ANSI    - Create ANSI labeled tapes : NO  (yes/no)
```

CONTINUED . . .

11.5 ERASING TAPES

ERASING TAPES

All tape drives support a "Data Security Erase" feature, which can be used to erase data on a tape at high-speed without tying up the tape control unit. In other words, this erase function can clear all data from a tape without impacting other jobs using tape drives on the same tape control unit. The erase takes place at maximum tape write speed (which varies by tape drive model).

"Data security Erase" is not supported by any standard IBM software. However, FATS fully supports the erase function. When invoked, FATS ERASE will write labels on the tape (if indicated), and then start the hardware erase function which will continue without intervention from the CPU or control unit until the end-of-tape is reached. For tape cartridge systems, erase involves writing a random pattern on the tape for complete security. For round tapes, the tape drive's erase head is used to erase the tape to "unrecorded" status.

By default, ERASE will preserve the existing volume serial on the tape, performing a FATS label function before starting the hardware erase (See Section 11.4 TAPE LABELING). Optionally, you can relabel it with a new serial number, or create an unlabeled tape.

This ERASE function may be important to installations which are upgrading to new tape technology and are planning to sell many of their old tapes. ERASE may be used to insure that all company confidential data is gone from those tapes before they leave the site.

Note that the ERASE function, because it is a single very long I/O operation, may receive IBM message

OS071I uuu DEVICE END MISSING

This is normal and can be ignored. If these messages become annoying, you can eliminate them by increasing the MIH (Missing Interrupt Handler) timeout value for the tape drives (this may be modified in the IECIOSxx member of PARMLIB or by a SETIOS console command). Tape cartridge drives will display the message "ERASE" or "ERASING" while the ERASE operation is in progress.

WARNING: This function will erase all data on a tape/cartridge with no possibility of recovery. Use caution when using ERASE.

ISPF PANEL FOR ERASE

Below is an example of the FATS ISPF panel for erasing tapes. See Section 93.0 ISPF INTERFACE INTRODUCTION for more information on the use of ISPF with FATS. Option numbers shown are options on the FATS/FATAR main menu.

FATS ERASE FUNCTION (OPTION E)

```
-------------------- FATS ERASE OLD DATA -------------------------------
COMMAND ===>

TAPE1  DD Dsname=  FATS                                          <
          Unit  =( TA80     )
          Label =( ,SL                                    )

VOL     - Volume serial number(s)  1: ______  2: ______  3: ______  4: ______
                                   5: ______  6: ______  7: ______  8: ______
                                   9: ______ 10: ______ 11: ______ 12: ______
                                  13: ______ 14: ______ 15: ______ 16: ______
                                  17: ______ 18: ______ 19: ______ 20: ______

MAXVOLN - Maximum number of volumes : ___
SAVLAB  - Preserve volume serial?   : YES (yes/no)
NOLABEL - Create no label (NL) tapes: NO  (yes/no)
ANSI    - Create ANSI labeled tapes : NO  (yes/no)
```

CONTINUED . . .

11.6 TAPE MANAGEMENT SYSTEMS

TAPE MANAGEMENT SYSTEMS

Although FATS has no formal interface to any tape management system, it is designed to be compatible with them. FATS takes the following actions for the benefit of tape management systems:

– Tapes will always be opened with the label type indicated in the JCL (unless the FATS BLP operand is used). If tapes are opened as labeled, the tape management system knows the volume serial of the tape and can approve or disapprove its use. If they are opened as unlabeled, an operator response may be required to provide the volume serial for the tape management system.

– When tapes are opened for output (certification, labeling or erasure), the expiration date of the dataset will be set to the current date, so that the dataset will be immediately available as a scratch tape.

– If labels are written on the tape, the dataset name will be the name given in the JCL for the tape, unless EXPDT=98000 is given when a dataset name of 17 "0"s is used. Some tape management systems will not allow a tape to be used as scratch if the name in the tape labels is different from the name recorded in its database, unless the name is 17 "0"s indicating it has been initialized.

Most tape management systems provide the ability to bypass their operation on a particular TAPE DD Statement; in many cases, EXPDT=98000 in the JCL is used for this bypass (but check your tape management documentation to be sure). This may be required for certain operations with FATS. For example, if multiple volumes are being verified (read) by FATS, and their dataset names differ, FATS will open them all with the dataset name on the TAPE DD Statement; this may fail unless the tape management system is bypassed.

CONTINUED . . .

11.7 REPORT FORMATS

DETAIL REPORT

The FATS detail report contains one line for each significant event which occurs on a tape being processed by FATS. Significant events include labels written or saved, permanent or temporary data checks, end-of-tape (TAPE INDICATE), tape marks read, and certain error conditions. Each detail line will include:

– The TAPE DD name (ID), e.g., TAPE1

– The tape unit address (UCB) as a 4-digit hex number, e.g., 0381 or 4751

– The tape volume serial (LABEL)

– The FATS operation keyword (OPTION), e.g., WRITE

– The PASS number (for WRITE only, to differentiate the results of the two tape certifications when PASS=2)

– The file number (FILE NO) and record number (RECORDS) within the file (for READ only)

– The LOCATION, in feet or meters from the beginning of the tape, of the event

– The LENGTH, in inches or centimeters, of any permanent data check (if contiguous data checks occur, this length is cumulative)

– The number of RETRIES attempted for any data check

– An ACTION message detailing the type of event (these messages are listed in the "Messages and Codes" section of this manual).

From this detail report, it is possible to see where the errors are and how they are grouped. For a WRITE operation, the location listed for TAPE INDICATE (end-of-tape) shows the total length of the tape. For a READ operation, the line for TAPE MARK gives the number of records in the file and length of tape read to that point (the length is cumulative, so you must subtract to get individual file lengths).

By default, FATS will print a blank line for every four detail report lines, and will print a blank line whenever a new volume is mounted on a tape unit. If the detail report is printed on a separate report file (DD name SYSPRINx rather than SYSPRINT), options are available to control the number of detail lines grouped together, and to skip to a new page for a new volume.

SUMMARY REPORT

The FATS summary report will contain several lines for each tape volume processed by FATS. The first line will contain ID, UCB, LABEL, and option (same as in the detail report above), plus the completion code (NORMAL or ABNORM), and the total length, in feet or meters, of the tape as processed by FATS.

The second line will appear once or twice (if two passes are done), and gives the number of data checks encountered on the tape summarized by the number of retries performed for each. Counters for retry levels 1 through 10 appear on this line; the word "*PERM" appears above the column which is considered a permanent error by FATS (the value of the RETRY= parameter); non-zero counts for any lesser retry values indicate temporary errors. If RETRY= had a value greater than 10, this line will contain only the total number of temporary and permanent data checks, with appropriate headings above.

CONTINUED . . .

11.7 CONTINUED . . .

FATS CONTROL REPORT

```
FAST ANALYSIS OF TAPE SURFACES -- CONTROL -- FATS   VER 4.5.0   INNOVATION DATA PROCESSING  AUTHORIZED 11/21/96 PAGE  1
FATS100 FOR INSTRUCTIONS AND MESSAGES AND CODES USE PARM=I
FATS110   WRITE(1) MAXERR=3,
FATS110     VOL=(001210,001540,003320)

FATS111 CHARACTERISTICS OF THE TAPES TO BE ANALYZED
FATS111   ID    PASS  OPTION LABEL FILES RETRY MODE BPI     GAP   REWIND THRESHOLD MAXERR BLKSIZE
FATS111  TAPE1   1    WRITE   SAV         10    D4  038000  3040    YES    01000    00003  65528
FATS301 END OF REPORT
```

FATS DETAIL REPORT

```
FAST ANALYSIS OF TAPE SURFACES -- DETAIL  -- FATS   VER 4.5.0   INNOVATION DATA PROCESSING  AUTHORIZED 11/21/96 PAGE 1
MESSAGE   ID    UCB  LABEL   OPTION PASS FILE NO  RECORDS   LOCATION  LENGTH  RETRIES    ACTION
FATS107  TAPE1 0381  001210  WRITE    1                        0 FT                     LABEL SAVED
FATS107  TAPE1 0381  001210  WRITE    1                        5 FT             05      TEMP DATA CHECK
FATS107  TAPE1 0381  001210  WRITE    1                       56 FT             05      TEMP DATA CHECK
FATS107  TAPE1 0381  001210  WRITE    1                       67 FT             08      TEMP DATA CHECK

FATS107  TAPE1 0381  001210  WRITE    1                      104 FT    1 IN     10      PERM DATA CHECK
FATS107  TAPE1 0381  001210  WRITE    1                      104 FT    2 IN     10      PERM DATA CHECK
FATS107  TAPE1 0381  001210  WRITE    1                      105 FT    3 IN     10      MAX ERROR EXCEEDED *

FATS107  TAPE1 0381  001540  WRITE    1                        0 FT                     LABEL SAVED
FATS107  TAPE1 0381  001540  WRITE    1                      384 FT             02      TEMP DATA CHECK
FATS107  TAPE1 0381  001540  WRITE    1                      506 FT                     TAPE INDICATE *****

FATS107  TAPE1 0381  003320  WRITE    1                        0 FT                     LABEL SAVED
FATS107  TAPE1 0381  003320  WRITE    1                      510 FT                     TAPE INDICATE *****
FATS301 END OF REPORT
```

FATS SUMMARY REPORT

```
FAST ANALYSIS OF TAPE SURFACES -- SUMMARY -- FATS   VER 4.5.0   INNOVATION DATA PROCESSING  AUTHORIZED 11/21/96 PAGE
MESSAGE  ID    UCB  LABEL  OPTION  COMP    LENGTH   ****************  DATA CHECKS BY NUMBER OF RETRIES  **************
                                   CODE               ONE    TWO  THREE   FOUR   FIVE    SIX  SEVEN  EIGH   NINE    TE
FATS300 TAPE1 0381  001210  WRITE  ABNORM  00105 FT                                                                *PER
FATS300                                   PASS 1         0     0      0      0      2      0      0      1     0
FATS300 TAPE1 0381  001540  WRITE  NORMAL  00506 FT                                                                *PER
FATS300                                   PASS 1         0     1      0      0      0      0      0      0     0
FATS300 TAPE1 0381  003320  WRITE  NORMAL  00510 FT                                                                *PER
FATS300                                   PASS 1  NO DATA CHECKS ON THIS TAPE
FATS301 END OF REPORT
```

12.0 FATS GUIDELINES

USAGE GUIDELINES

Many customers have asked for suggestions on the use of FATS as part of a regular program of tape maintenance. The following section contains explanations and guidelines designed to help you in the development of such a program. However, each installation should develop its own cost-justified procedure establishing what level of certification is required, at what point tapes are to be discarded, how often archival tapes are to be verified, and so forth. These guidelines are presented only as an example and an aid.

This section also contains answers to questions on FATS which customers have often asked.

12.1 CAUSES OF TAPE ERRORS

CAUSES OF TAPE ERRORS

To better understand the usage of FATS you must understand the causes of error on magnetic tape. Any of the following can cause errors:

1. Excessive oxide on the tape surface.
2. Dirt or debris on the surface (often microscopic).
3. An oxide coating on the tape surface which does not retain an acceptable signal.
4. Tape surface damage such as pinholes, scratches, creases, and edge damage.
5. Dirt or oxide buildup on the tape drive heads.
6. Malfunction of the tape drive itself.

Many errors may be caused by loose oxide or dirt on the tape surface. These errors may show up as temporary (meaning that FATS retry actions caused the contaminant to be dislodged), or permanent. Even if they are permanent, surface cleaning by a stand-alone tape cleaning machine, or repeated certifications by FATS, may cause the errors to disappear.

Truly permanent errors may be caused by defective oxide coatings or surface damage. These errors cannot be rectified by FATS or a tape cleaner.

Dirty tape heads or tape drive malfunctions may cause reported errors which do not truly exist on the tape itself. FATS depends on the proper functioning of the tape drive to detect and report errors, so any errors in the tape drive mechanism will produce spurious errors. We recommend that the tape drive heads be cleaned at regular intervals when certifying tapes (e.g., every 10 or 20 tapes, more often if certifying brand new tapes); the FATS parameters MAXCLEAN= and ERRCLEAN= can be used to insure this. If FATS reports many errors on a tape, we recommend re-certifying it on another tape drive before deciding to discard it.

12.2 OPERATING SYSTEM VS. FATS ERRORS

OPERATING SYSTEM VS. FATS ERRORS

We are often asked why a tape on which FATS has reported one or more errors can be used successfully as an output tape by an application program. The answer has to do with the purpose of FATS error reporting versus the operating system error recovery (full details of error recovery and FATS operation are found in Section 11.0 FATS TECHNICAL SUMMARY).

FATS PURPOSE

FATS certification has the purpose of identifying every section of the tape (in increments of a few inches) which has a permanent or temporary write error. As explained below, this can allow you to predict where the operating system will experience permanent write errors or degradation due to error recovery.

CONTINUED . . .

12.0 CONTINUED . . .

(12.2 continued) OPERATING SYSTEM ERROR RECOVERY

Operating system error recovery has the purpose of letting the application program run to successful completion despite I/O errors on tape. To accomplish this, write errors are retried by erasing a length of tape and attempting to write the block again. Depending on the location of the error, and the length of the block, this action may need to be repeated until it is successful or until error recovery considers it a permanent error at which point the application program is usually terminated.

As an example, assume that a tape has a permanent error in the middle of a tape with no other errors around it. That tape is being used by an application program writing blocks of length 32000 bytes (about 1 inch on a 3480/3490 cartridge). At the first attempt to write a block, that permanent error falls in the last fraction of the block. Hardware error recovery erases about .5 inches of tape and writes again, but the error is still within the block (now about in the middle). The system erases .5 inches again, but the error occurs again, right near the beginning of the block. Another .5 inches are erased again, and the block is now written past the error and writes successfully. No error is apparent to the program or the operator, but time was wasted doing this recovery, and 1.5 inches of blank tape were wasted.

If however, there is a cluster of permanent errors on the tape, spaced about an inch apart, this same situation will probably result in a permanent write error indication from error recovery. As error recovery erases tape (.5 inches at a time) to move the block up, it keeps encountering a new error on the tape, since the data block is longer than the distance between errors. Obviously, a given pattern of permanent errors reported by FATS may or may not result in a permanent error to an application program depending on the tape density and data block length.

TAPE ERROR STATISTICS

Although tape write errors may be bypassed by this error recovery process, the existence of the errors is always recorded by the operating system. The system error recording file "SYS1.LOGREC" will always contain the total number of temporary and permanent read and write errors encountered on every tape volume processed, and can be printed by the EREP (Environmental Recording, Editing, and Printing) program appropriate for your system. If the SMF sub-system is set up to record type 21 ESV (Error Statistics by Volume), these records will also contain this information and can be printed by the IFHSTATR utility documented in the appropriate system utilities manual. These statistics may help to make clear the hidden cost of "unseen" tape errors.

12.3 VARIATIONS IN FATS RESULTS

We are often asked why the results of a FATS certification or verification will vary on two consecutive runs on the same tape. If you review the causes of tape errors above, the reasons are fairly obvious.

For errors caused by dirt or debris on the tape, these contaminants may be removed by one FATS execution, or may be picked up by the tape drive heads and re-deposited in another location, causing an error to "move", even if re-certified on the same drive.

If errors are caused by marginal oxide surface on the tape, the surface may be able to record and reread a signal using the amplifiers and heads on one tape drive, while being just barely inadequate on another, causing errors to appear and disappear.

Naturally, if the errors are caused by dirty tape heads or tape drive malfunction, the results will be different on different drives.

CONTINUED . . .

12.4 ANALYSIS OF CERTIFICATION RESULTS

FATS certification (WRITE function) is designed for new tapes or tapes currently in scratch status in order to decide if they are acceptable for use as output tapes. It is impossible to make firm recommendations on the action to take on a particular tape based on its FATS results; each installation must decide for itself what level of error recovery degradation it is willing to accept (based on the number of permanent errors on a tape) versus the cost of replacing a tape volume. However, we can provide some guidelines for arriving at this value, as well as some circumstances when action is definitely indicated.

These decisions will usually require examination of the FATS detail report to analyze the number and position of the errors on a given tape. It is possible to automate some of this decision process (the FATS parameters MAXERR= and MAXCERR= will cause automatic rejection of a tape with an excessive number of errors or contiguous errors), but most of the analysis is beyond the capabilities of FATS to perform dynamically. The user will have to examine the total number of permanent errors, the location on the tape of these errors, and the clustering of the errors (FATS will report on errors which are contiguous, but some errors may be separated by small lengths of good tape but still be close enough to cause problems).

In most installations, the majority of tape datasets occupy only the first 10-20% of the tape volume. As a result, the beginning of the tape gets the most repeated use and is subject to the most errors due to tape wear. If a tape shows permanent errors (even only 1 or 2) in the early part of the tape, some action is indicated. It is possible to cut off the portion of the tape containing the errors (except tape cartridges) and put a new beginning-of-tape reflective marker on it, resulting in a shorter but usable tape. Most installations set some minimum acceptable length for a tape (such as 2000 or 2200 feet); since FATS shows both the total length of the tape and the length to remove (the location of the last error), you can easily calculate whether a tape is worth this "stripping" action. For cartridge tapes, it is possible on 3480/3490/3490E cartridges to remove a small part of the tape and connect a new leader block, but the tape drives will reject tapes that are very much shorter than the standard lengths, so this is usually not practical.

Next, look for contiguous or clustered permanent errors. Clusters of errors exceeding a few inches in length on cartridges or 3 feet in length on round tapes are almost certain to cause permanent write errors; clusters shorter than this may be recoverable but will cause degradation. If a tape contains any long clusters or more than one short cluster, it should be removed from use.

If a tape is free from the above problems, it can be categorized by the number of permanent errors. The following categories are suggestions only:

For Round Tape:

0-10 Errors	– Good tape
11-25 Errors	– Marginal tape. Clean if possible. Do not use for critical applications.
Over 25 Errors	– Bad tape. If possible, clean and re-certify. If errors persist, remove from use.

For Cartridges:

0-5 Errors	– Good tape
Over 5 Errors	– Clean and re-certify. If errors persist, remove from use.

CONTINUED . . .

12.5 ANALYSIS OF VERIFICATION RESULTS

VERIFICATION RESULTS

FATS verification (READ or ANALYZE functions) have the purpose of verifying the readability of existing data files on tape. This can be used for various critical production data (to avoid data checks in the middle of critical runs) or verification of archival data which is rarely read but which must be retained.

FATS will report on every data block (by file number and block number within file) on which a permanent or temporary data check occurred. FATS does not attempt to reproduce the complete actions of the operating system error recovery in the case of a read data check, so it is possible that a data check reported by FATS will in fact be readable by an application program.

However, even one data check on such a tape means that the tape is suspect and may cause application failures now or in the future. To be safe, the tape should be copied as soon as possible to a certified scratch tape. Because of its superior facilities for recovering from data checks and its ability to copy multiple files, the FATAR program is recommended for this purpose.

12.6 RECOMMENDATIONS FOR FATS USAGE

The following is a suggestion for a formal program of FATS usage to certify scratch tapes and verify data files. As explained above, each installation will have to select the intervals and values that make sense for it.

ARCHIVAL DATA TAPES

Archival data tapes (long term retention tapes which are rarely read but must be retained for legal or other reasons) should be verified for readability at intervals not exceeding two years. Tapes which sit on the rack for long periods have a tendency to "dry out" causing data checks. The action of reading them with FATS will help to prevent this as well as identifying any data checks which have occurred. Any data check is good reason to copy the tape.

CRITICAL DATA TAPES

It is reasonable to assume that a tape which was recently written successfully will be readable without error, but if certain data tapes are critical to the successful execution of important programs, especially if those programs are long-running or difficult to restart, it is useful to run FATS against each data file before starting the application. This verification only takes a few minutes per tape, but may save hours of recovery if data checks are found.

NEW TAPES

New tapes should be cleaned (if a manual cleaner is available), and certified and labeled using FATS. If the tapes cannot be separately cleaned and they do get errors, certify them several times to remove all loose oxide; be sure to clean the tape drives frequently. If certification of a new tape discovers errors which would classify it as a marginal or bad tape, you may wish to discuss it with your tape supplier.

SCRATCH TAPES

Tapes which are in scratch status (available for use as output tapes), should be certified if:

a) A certain interval (such as 4 months) has elapsed since their last cleaning

b) They have been used for output more than a certain number of times (such as 50)

c) They have received more than a certain number of temporary or permanent read or write errors (such as 5) as reported by SMF or EREP.

Some tape management systems will track these numbers and recommend cleaning/certification of specific volumes based on user provided thresholds. Disposition of the certified tape should be based on the recommended analysis technique outlined above.

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12.7 QUESTIONS AND ANSWERS

These are some commonly asked questions about FATS.

PASS=2

What are the benefits of the PASS=2 option?

FATS certifies by writing data blocks on tape and noting which get write data checks. However, the normal function of the tape drive erases a short inter-block gap between each block; this gap is not checked by FATS. PASS=2 rewinds the tape after certification and re-certifies it, using a different test blocksize so that those gaps will be certified. This obviously takes twice as long as PASS=1. The normal operation of FATS will certify 90-97% of a tape's surface (depending on the tape density) in one pass; this is usually adequate to make a decision on the condition and usability of a tape. If 100% surface certification is a necessity, PASS=2 can be used but it is not recommended.

DATA CHECKS AT EOV

Why do round tapes sometimes show data checks at end of reel?

The end of a round tape reel is indicated by a reflective marker on the tape. If the tape is wound too tightly by the manufacturer or by the tape drive, impressions of this marker will appear every 14 inches for several layers of tape above and below the reflector. These impressions can cause data checks, especially when writing large data blocks. FATS will report these errors as data checks about 1 foot apart at the end of the tape. The end of tape reflector can be moved up to eliminate this error.

Cartridge tapes do not use physical markers for beginning and end of tape and are not subject to this kind of error.

FATS RESOURCES

What resources does FATS use?

FATS CPU usage is minimal, but, by the nature of the function it performs, it is a heavy user of the tape channels and control units. We recommend that FATS be run primarily when other tape usage is low. If multiple FATS operations are being performed, FATS will perform better if the tape drives are on separate channels and control units, if possible. There is little point in allocating more than three tape drives on the same channel or control unit to FATS, since no performance gain will result. Note that this does not apply to the FATS ERASE function which does not tie up the channel or control unit. Also, tape cartridge sub-systems, because of their multiple channel paths and buffering, may be able to achieve better performance under high load.

SMF/EREP RECORDING

Why are FATS data check reports different from what I see in SMF/EREP?

Temporary and permanent data checks detected by FATS may not be reported differently (or not reported at all) in SMF (type 21 ESV records) and "SYS1.LOGREC" (EREP). FATS is able to do what it does only by inhibiting system and hardware error recovery. This causes errors on round tape to go unrecorded, while errors on cartridges are reported; however, every FATS retry will count as one error, so the SMF/EREP values will be much higher than the FATS totals. Operators and hardware maintenance personnel should be instructed to ignore errors recorded because of FATS runs, since they do not indicate the type of device or volume problems that usually invoke such records.

RETRY LEVEL

What retry level should be used?

Although the default value for RETRY= in FATS is 10, experience and analysis of many FATS reports has shown that if an error repeats 5 times, it is likely to still be present after 10 retries. If a tape has many errors, specifying RETRY=5 may significantly reduce the elapsed time of the certification, while still providing the same information on the condition of the tape.

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12.7 CONTINUED . . .

FULL-TAPE VERIFY

Why can't FATS READ verify to the physical end-of-tape?

Many customers have asked for the ability in FATS to READ verify to the physical end-of-tape reflector, rather than stopping at two tape marks (logical end-of-data). This is not practical for several reasons:

a) The tape drive raises an exception condition when you attempt to write past the end-of-tape (this is how the FATS WRITE operation knows when to stop), but it gives no indication when you are reading past the physical end-of-tape. It would be likely that FATS would read past EOT, which can cause errors and (on round tapes) require operator intervention to rethread the tape.

b) It is possible to discover if the tape is positioned past the reflector (at the cost of an extra I/O operation for every data block), but this will work only if there are data blocks recorded out to the end-of-tape. If there is blank tape preceding the reflector, the first read in this blank area will not end until the tape runs off the reel; FATS has no way to predict and avoid this.

In any case, the function of FATS verification is to prove the readability of the recorded data on the tape. There is no point in verifying data past the current logical end-of-data.

13.0 FATS EXECUTION JCL

To execute FATS, the following JCL statements are required:

EXEC STATEMENT

The EXEC statement specifies the FATS program name, memory requirements (if your installation defaults are insufficient), and parameter field.

The basic memory requirements of FATS are 256K. If FATS' companion product FATAR is invoked as a FATS sub-task (via the ANALYZE(n) control statement), then the memory requirements of each concurrent FATAR sub-task must be added to the basic requirement (FATAR requirements are documented in Section 22.0 FATAR EXECUTION JCL of this manual).

If PARM=I is specified on the EXEC statement, FATS will print on SYSPRINT a brief summary of its control statements and messages.

STEPLIB/ JOBLIB DD STATEMENT

A STEPLIB or JOBLIB DD Statement will be required if FATS has been linkedited into a private library. It can be omitted if FATS is in a system library which can be accessed without a STEPLIB/ JOBLIB statement (that is, a library in the system link list). The library must be an MVS APF authorized library.

SYSPRINT DD STATEMENT

SYSPRINT receives the listing of all FATS control statements, a summary of the operations to be performed, and messages about major errors. In addition, it may receive the detail reports for each tape drive and the summary report if the DD Statements for those reports are absent. SYSPRINT is normally allocated to a SYSOUT data set. Its DCB attributes are RECFM=FBA,LRECL=121. If blocksize is specified, it must be a multiple of 121, otherwise it will default to 121 for SYSOUT or 1210 for other devices.

SYSPRINx DD STATEMENT

SYSPRINx receives the detail report for the operations performed against tapes mounted on DD Statement TAPEx, where "x" is a digit from 1 to 9. This allows the detail reports for simultaneous FATS operations to be printed separately. SYSPRINx is normally allocated to a SYSOUT data set. If SYSPRINx is not present for a particular TAPEx, its detail report will go to SYSPRINT; however, SYSPRINx DD statements are required when running ANALYZE operations (FATAR under FATS). DCB attributes for SYSPRINx are the same as those for SYSPRINT.

SUMMPRT DD STATEMENT

SUMMPRT receives the summary report, consisting of several lines summarizing the results of FATS operation against each tape processed. SUMMPRT is normally allocated to a SYSOUT data set. If SUMMPRT is not present, summary reports will go to the SYSPRINx data set associated with the TAPEx DD Statement on which the tape was mounted; if it is also absent, summary reports go to SYSPRINT. DCB attributes are the same as for SYSPRINT.

TAPESUMM DD STATEMENT

When running ANALYZE operations (FATAR under FATS), TAPESUMM may optionally be included to receive the FATAR tape summaries, including data set name, tape label information, block and byte counts, lengths, minimum/maximum/average blocksizes and error counts. DCB attributes are the same as for SYSPRINT.

SYSUDUMP DD STATEMENT

SYSUDUMP requests an abend dump if major errors occur (note that most internal abends in FATS are for the user's information only and do not cause dumps). SYSUDUMP is usually allocated to SYSOUT. If you have the ABEND-AID product from COMPUWARE include the following so that a fully-formatted dump is produced: //ABNLIGNR DD DUMMY

TAPEx DD STATEMENT

TAPEx defines a tape unit (and optionally a volume) to be used for one operation by FATS. "x" is a digit from 1 to 9 and corresponds to the digit on a FATS control statement (e.g., WRITE(1) uses DD statement TAPE1).

The DD statement must specify UNIT= parameter appropriate to allocate the type of tape drive required for the tapes to be processed. This can be a generic device type (such as UNIT=3480, UNIT=3590-1) or an installation-defined esoteric name (such as UNIT=TAPE, UNIT=CART).

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Any type of label processing may be specified (SL, AL, NL, BLP), but it is frequently desirable with FATS to specify LABEL=(,BLP). If installation conventions do not allow the use of BLP, the FATS parameter BLP can be used to internally change the label type to BLP before open; security systems may still prevent its use.

WARNING: For proper operation of FATS, the TAPEx DD statement must contain a DSN= parameter and it must not specify a temporary (&&) name. Also the parameters DISP=(...,PASS) or VOL=(...,RETAIN) must not be specified. Otherwise, the tape may forward space to the end of tape or other errors may occur.

For output volumes (WRITE, LABEL, ERASE):

The TAPEx DD statement will usually say DISP=(NEW,KEEP). A volume serial (VOL=SER=) can be specified to request a specific volume, or omitted to request a scratch volume allowing the operator to mount any appropriate volume.

The volume serial can also be omitted when FATS is supplying the serials internally (via its own VOL= parameter). In this case, the JCL parameter DEFER (as in UNIT=(xxxx,,DEFER)) should be used so that the operating system will not call for a tape mount before FATS fills in the proper volume serial.

NOTE: if a volume serial if specified, the label type is SL, and the FATS MULT parameter is given, for subsequent mounts (after the first) the volume serial will be blanked to request scratch tapes; if this wasn't done, MVS would just reuse the tape already mounted and process it over and over.

Examples:

```
//TAPE1   DD  DSN=FATS.OUT1,UNIT=3490,DISP=(,KEEP),LABEL=(,BLP)
//TAPE2   DD  DSN=DUMMY,UNIT=(TAPE,,DEFER),DISP=(NEW,KEEP)
```

For input volumes (READ, ANALYZE):

DISP=(OLD,KEEP) should be specified, and a data set name (DSN=) and volume serial (VOL=SER=) must be given (if the FATS parameter VOL= is being used to supply serial numbers, the volume serial in JCL may be any dummy serial, e.g., VOL=SER=DUMMY). If LABEL=(,BLP) is specified, the data set name and volume serial do not have to be the actual values.

If FATS parameter VOL= is used to supply volume serials, the JCL parameter DEFER (as in UNIT=(xxxx,,DEFER)) should be used so that the operating system will not call for a tape mount before FATS fills in the proper volume serial.

Examples:

```
//TAPE1   DD  DSN=INPUT.DSN,UNIT=3490,VOL=SER=901234,DISP=(OLD,KEEP)
//TAPE2   DD  DSN=DUMMY,UNIT=(TAPE,,DEFER),VOL=SER=DUMMY,
//         DISP=OLD,LABEL=(,BLP
```

TAPExOUT DD STATEMENT

TAPExOUT (where "x" is the same 1 digit number as in TAPEx above) is used only for the FATS ANALYZE(x) function, which causes the companion product FATAR to be invoked. If present, TAPExOUT will request FATAR to copy the tape mounted on TAPEx. See FATAR documentation elsewhere in this manual for details.

SYSIN DD STATEMENT

The SYSIN DD Statement is the source of FATS control statements. It is normally a "DD *" spool file, but can be any disk or tape file with DCB characteristics RECFM=FB and LRECL=80.

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13.1 OPERATOR CONTROL

OPERATOR CONTROL

FATS will terminate by itself when all requested operations have completed. However, sometimes you may wish to terminate FATS early (especially when processing a long list of tape volumes) or to terminate processing of a particular tape volume. There are 2 ways to do this:

– by default, FATS issues a WTOR to the operator's console (message FATSW02). This message can be left outstanding and will delete itself when FATS terminates. However, you may reply to it at any time to terminate FATS or terminate processing of a tape volume. The WTOR can be suppressed by the WTOR=NO operand.

– if the optional MODIFY=YES parameter is specified, MVS console command STOP (P) and MODIFY (F) can be used for the same purposes.

WTOR RESPONSES

The FATSW02 message can be replied to at any time with one of these replies ("nn" is the WTOR reply number associated with the message):

R nn,EOJ - FATS will complete processing of all tapes currently in progress, then will terminate. If any tape mounts are pending, they must be satisfied (those tapes will be processed before termination).

R nn,KEOJ - FATS will terminate immediately with a U0888 abend or return code 12. Tapes in progress will be immediately halted.

R nn,Kuuuu - "uuuu" is the MVS 3- or 4-digit hexadecimal device address of a tape drive currently in use by FATS. The tape volume being processed on that device will be immediately halted; however, another tape may be mounted on that drive if called for by the FATS control statements. Other drives in use by FATS will not be affected.

STOP/MODIFY COMMANDS

If MODIFY=YES was specified, the MVS console commands STOP (abbreviated P) and MODIFY (abbreviated F) can be used for the same purposes. In the examples below, "id" is the jobname of the FATS job or started task:

P id - stops FATS immediately and is equivalent to the KEOJ reply above.

F id,QUIT - terminates FATS after all tapes which are currently in progress have completed and is equivalent to the EOJ reply above.

F id,Kuuuu - stops processing on the specified tape unit (3- or 4-digit hexadecimal device address "uuuu") and is equivalent to the Kuuuu reply above.

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14.0 FATS CONTROL STATEMENTS

14.1 GENERAL

GENERAL RULES All FATS control statements must be input on 80-character records of which only columns 1 to 71 are used by FATS. Each control statement contains:

OPERATION KEYWORD Identifies the operation to be performed by FATS. It can start in any column from 1 to 50 on the input record, but any columns before it must be blank. Only one operation keyword can be specified for each tape drive used by FATS. Valid operation keywords are:

DEFAULT – Set defaults for other operations

WRITE – Certify a tape

READ – Verify readability of a tape

ERASE – Erase data from a tape

LABEL – Write standard labels on a tape

ANALYZE – Invoke FATAR to read/copy a tape

TAPE NUMBER Immediately follows the operation keyword (no intervening blank spaces) and is enclosed in parentheses. It must be a single digit from 1 to 9 and identifies to which TAPEx DD Statement this operation applies (e.g., "(1)" indicates DD Statement TAPE1). Each digit may appear on only one control statement in a given FATS execution. The tape number is not used on the DEFAULT control statement, but is required on all other control statements.

OPERANDS Are separated from the operation keyword (and tape number) by one or more blank spaces. Each control statement may have one or more operands (separated by commas) or none at all. The operands modify the function of the operation keyword; they control labeling, tape mode, error retries, etc. The last operand must be followed by a blank space.

CONTINUATION Operands can be continued onto another control statement by following the last operand with a comma and a blank space, and continuing the operands in any column of the next statement.

COMMENTS May appear on any FATS control statement. They must be separated from the last operand by at least one blank space (a control statement containing no options cannot contain comments). Any control statement with an asterisk ("*") in column 1 will be bypassed by FATS and treated entirely as comments.

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14.2 OPERATION KEYWORDS

DEFAULT Used to change the defaults of FATS operands. It affects any other operation keywords which follow it. If several operations are to be used in a FATS step, and they all require one or more of the same operand specifications, DEFAULT is a simple way to enter the options only once. Operands specified on DEFAULT can still be overridden on a specific operation statement.

WRITE(n) Used to certify the quality of new or old scratch tapes by writing special patterns on the entire length of the tape and checking for write errors. This will destroy any existing data on the tape, so the tape must be in scratch status.

READ(n) Used to verify the readability of existing data on a tape. READ(n) can read one or more data files, but cannot read past the end of currently recorded data since FATS has no way of detecting the end-of-tape marker in read mode. Can be used on non-scratch tapes since it will not destroy any data.

ERASE(n) Invokes the "Data Security Erase" hardware function to erase all data from a tape. It may be used to totally erase a tape, or to erase data past currently existing files. Unlike WRITE(n), the "Data Security Erase" does not involve the tape control unit, so other FATS operations or tape I/O from other jobs can proceed without contention.

WARNING: ERASE will erase all data from a tape or cartridge with no possibility of recovery. Use with caution.

LABEL(n) Writes an IBM standard volume label and data set labels on a scratch tape. LABEL(n) can be used to label new tapes or to re-initialize old tapes. It does destroy any data on the tape. Can also create unlabeled tapes.

ANALYZE(n) Invokes FATS' companion product FATAR to read and optionally copy a tape. Complete information on FATAR is contained in other sections of this manual. Although FATAR can be executed as an independent program, execution under FATS allows multiple FATAR tasks to execute in one jobstep and allows the use of FATS parameters for the selection of tapes to be processed. Your installation must be licensed for FATAR to use this operation.

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14.3 OPERANDS

All operands can appear on all operation statements, but some actually apply only to one or more of the operation keywords. They are grouped together by their functional type (as shown in the section headings below), but parameters which apply only to one or more operations are marked as such. All option parameters (except VOL=) can appear on a DEFAULT Statement.

14.3.1 RETRY/ERROR OPERANDS

ERRCLEAN=n Applies to: WRITE, READ

If more than "n" permanent or temporary errors are encountered on a tape, FATS will request the operator to clean the tape drive, and then re-certify or re-verify that tape. "n" may be from 1 to 32767. This cleaning action will be requested only once per tape drive.

Default: 32767

MAXCERR=n Applies to: WRITE, READ

If contiguous permanent errors totaling more than "n" inches are encountered on a tape, FATS will terminate processing of that tape. "n" may be from 1 to 32767.

Default: 200

MAXERR=n Applies to: WRITE, READ, ANALYZE

If more than "n" permanent errors are encountered on a tape, FATS will stop processing of that tape. "n" may be from 1 to 32767.

Default: 200

PASS=1
PASS=2 Applies to: WRITE

This option specifies the number of times that FATS will write over a tape during certification. With PASS=1 (the default), FATS will certify the entire surface of the tape except for the inter-record gaps between the pattern records written by FATS, resulting in 90-97% certification depending on tape density. PASS=2 will cause the tape to be rewound and recertified using a different blocksize which will insure 100% certification. Some errors reported during the first pass may appear again during the second pass. PASS=2 is not recommended.

Default: PASS=1

RETRY=h
RETRY=(l,h) Applies to: WRITE, READ, ANALYZE

"h" defines number of retries required before an error is considered permanent, and "l" the number of retries before an error (temporary or permanent) will be printed in the detail report. "h" may have values from 1 to 99, and "l" may go from 0 to 99 but must be less than "h". The value of "h" affects the summary report: for 10 or less the summary report will show temporary and permanent errors by number of retries; for over 10 all temporary and permanent errors will be totaled.

Default: (1,10)

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STOP Applies to: WRITE, READ

When this option is specified, FATS will stop and issue message FATSW05 to the system operator whenever a permanent error is encountered, allowing inspection of the tape. After inspection, the operator may reply to the message requesting continuation (and stopping at the next error), termination, or continuation without stopping. Physical inspection of the tape may not be possible on all types of tape drives.

Default: Do not stop on errors.

STOPNUM=n Applies to: WRITE,READ

Invokes the STOP option (above) after "n" permanent errors have been encountered, allowing the first "n" errors to be skipped without operator interaction. Do not specify STOP if STOPNUM=n is specified.

Default: Do not stop on errors.

14.3.2 VOLUME MOUNTING OPERANDS

BLP Applies to: ALL

The BLP operand is provided to help when installation conventions do not allow LABEL=(,BLP) to be specified on a JCL DD statement, but it desired to bypass label processing on FATS tapes. BLP processing may be required when certifying/labeling virgin or unknown tapes, or when reading multiple input tapes with varying data set names. When BLP is specified, the JCL label parameter is internally changed to BLP before the tape is opened. BLP may be disallowed by installation exits or security systems; FATS may need to be run under a security userid that is authorized for BLP use.

Default: Honor the JCL LABEL= parameter.

MAXCLEAN=n Applies to: ALL

When multiple tapes are being processed on a tape drive, specifies that the system operator is to be requested (via console message FATSW06) to clean the tape drive after every "n" tapes are completed. This is to prevent dirt or oxide deposited on the read/write heads by previous tapes from causing spurious errors.

Default: No cleaning requested between tapes.

MAXVOLN=n Applies to: ALL

Limits the number of volumes which FATS will request on a given tape drive when either the MULT or VOLINCR=n operands are used.

Default: No limit for MULT or 682 for VOLINCR=n.

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MULT
NOMULT

Applies to: ALL

MULT requests that multiple tapes be processed. As each tape is completed, a mount for a new tape will be issued. This will continue until the operator terminates FATS (See Section 13.1 OPERATOR CONTROL), or until the number of tapes specified by the MAXVOLN=n parameter have been processed. NOMULT (the default) is used to turn off MULT if it has been specified on a DEFAULT statement.

Default: Process only one tape unless VOL= specified.

VALIDATE=

Applies to: WRITE, ERASE, READ, ANALYZE

If label processing is bypassed because of the FATS BLP operand or LABEL=(,BLP) on TAPEx DD statements, data management will not verify the volume serial or expiration date of the tape, so it is possible that the wrong tape may be accidentally mounted and overwritten. However, if VALIDATE= is specified, FATS will verify the volume serials of the mounted tapes for input tapes (VALIDATE=INPUT), output tapes (VALIDATE=OUTPUT), or both (VALIDATE=ALL). The volume serial compared is the serial in the TAPEx DD statement or that provided by the FATS VOL= parameter. For output tapes, the expiration date in the tape labels will also be checked. If the wrong volume serial is mounted, or if the expiration date is not yet reached, FATS will issue message FATSW08 to the system operator giving the option of ignoring the error, mounting another tape, or skipping the tape. For WRITE and ERASE operations, validation will be done only if the SAVLAB operand is specified or defaulted. VALIDATE= will be ignored if the NOREWIND operand is given.

Default: No validation.

VOL=v
VOL=(v,..,v)

Applies to: ALL (cannot appear on a DEFAULT statement).Specifies one or more tape volume serials to be processed by the operation statement on which it appears. "v" is a 1-to-6 character volume serial. VOL=v requests one volume. VOL=(v,v,...,v) requests multiple volumes; in this format, up to 682 serials may be supplied; the serial list may be continued onto multiple input statements by placing a blank space after any comma in the volume list, and continuing the list in any column of the next input record. When used in conjunction with the VOLINCR=n and MAXVOLN=n parameters, VOL= can be used to request a sequence of tapes without actually entering all of their serials. Note that VOL= on a LABEL statement implies that FATS will label the tapes with the given volume serial; on a WRITE or ERASE statement, this is true only if the NOSAVE parameter is also specified.

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VOLINCR=n Applies to: ALL

This operand can be used only in conjunction with the VOL= operand. When specified, the last (or only) volume serial specified by VOL= will be incremented by "n" which must be a 1-to-6 digit decimal number. That volume serial must end in at least one numeric digit; only the trailing numeric part of the serial is incremented. The serial will be repeatedly incremented by "n" until either 682 volume serials have been generated or until the serial cannot be incremented further without "overflowing" the numeric portion. Although a large number of such serials may be generated by VOLINCR=, the MAXVOLN=n operand may be used to limit the number of volumes which will actually be requested by FATS. VOLINCR=1 may be used to cause a number of consecutively numbered tapes to be requested.

Default: No incremented serials are generated.

14.3.3 LABELING OPERANDS

ANSI Applies to: WRITE, LABEL, ERASE

Requests that tapes are to be labeled with ANSI V3 labels instead of IBM standard labels.

Default: IBM standard labels will be written

DD=LABEL Applies to: WRITE, LABEL, ERASE

Causes the tape to be labeled with the volume serial specified on the associated TAPEx DD statement. Cannot be used with the MULT parameter.

LABEL=vvvvvv Applies to: WRITE, LABEL, ERASE

Causes the tape to be labeled with volume serial "vvvvvv". Cannot be used with the MULT parameter.

NOLABEL Applies to: WRITE, ERASE, LABEL

Resets all LABEL options (including SAVLAB). The tape being processed will become an unlabeled tape. When used with the LABEL(n) statement, NOLABEL will quickly initialize unlabeled tapes.

OPERATOR
NOOPERATOR Applies to: WRITE, LABEL, ERASE

If OPERATOR is specified, as each tape is opened, the system operator will receive message FATSW01 and must reply with the volume serial to be written on the tape. NOOPERATOR is used only in conjunction with SAVLAB (specified or by default) to prevent SAVLAB from going into OPERATOR mode if a tape is not labeled (see below), so that unlabeled tapes will remain unlabeled.

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OWNERID='....' Applies to: WRITE, LABEL, ERASE

Specifies the contents of the owner ID field in volume labels written by FATS. 1 to 10 characters (including blanks) may appear between the apostrophes. OWNERID= has an effect only if FATS is writing a volume label due to other labeling options. Even if SAVLAB is used, OWNERID= may be used to change the owner ID.

Default: 10 blank spaces (or original value if SAVLAB)

SAVLAB
NOSAVE Applies to: WRITE, ERASE

If SAVLAB is specified or defaulted, and the tape being certified contains IBM standard labels, the tape will be re-labeled with its original volume serial; if the tape does not contain IBM standard labels, the tape will be labeled with a serial provided by the system operator (see OPERATOR above) unless the NOOPERATOR parameter is present. NOSAVE will prevent the volume serial from being preserved. Note that SAVLAB preserves only the volume serial and owner ID from the volume label; the contents of data set header labels is not saved.

Default: SAVLAB

14.3.4 PRINT OPERANDS

LINECNT=n Applies to: ALL

Specifies the number of lines per page to be printed on FATS reports. If specified on a DEFAULT statement, it will control the page size of the FATS control report and summary report as well as providing a default for the detail reports. If specified on any other operation statement, it modifies only the detail report page size for that operation.

Default: 56 lines per page

MAXDETCNT=n Applies to: ALL (except ANALYZE)

Specifies the maximum number of detail report lines which will be printed together before double spacing. This will be effective only if a separate detail report DD statement SYSPRINx has been provided.

Default: 4

NEWPAGE Applies to: ALL (except ANALYZE)

When multiple tapes are processed on a tape drive, the NEWPAGE operand requests that the detail report will skip to a new page whenever a new volume is processed, making the report easier to separate by volumes. This will be effective only if a separate detail report DD statement SYSPRINx has been provided.

Default: Skip a single blank line between volumes.

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NONMETRIC
METRIC

Applies to: ALL

When NONMETRIC is specified (or defaulted) FATS will list tape lengths and error positions and lengths in American units (feet and inches). When METRIC is specified FATS will list tape lengths and error positions and lengths in metric units (meters and centimeters).

Default: NONMETRIC.

THRESHOLD=n

Applies to: WRITE, READ

Specifies the maximum number of permanent and temporary errors which will be printed in the detail report for any given tape before printing is suspended. The summary report will still recap the total number of errors. This is used to limit the size of the printout.

Default: 1000 errors.

14.3.5 CONTROL OPERANDS

MODIFY=YES
NO

Applies to: DEFAULT

Specifies whether FATS will respond to an operator's MODIFY (F) and STOP (P) console commands. FATS ordinarily issues a WTOR to the console at startup which the operator can reply to at any time to control FATS execution (see the WTOR parameter). If MODIFY=YES is specified the operator may use the OS MODIFY (F) and STOP (P) commands to control FATS processing.

Default: MODIFY=NO

WTOR=YES
NO

Applies to: DEFAULT

Specifies whether FATS will issue its WTOR message (FATSW02) in order to provide operator control over FATS processing. If MODIFY=YES is specified to allow operator control with OS commands, it is not necessary to have the outstanding reply available to control processing.

Default: WTOR=YES

See Section 13.1 OPERATOR CONTROL for more information on the use of these operands.

14.3.6 MISCELLANEOUS OPERANDS

BLKSIZE=n

Applies to: WRITE

Specifies the size of the block which will be written to tape during certification, in bytes. "n" must be less than 65536 and more than twice the density (BPI) of the tape being certified (except for tape cartridges).

Default: 65535

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FILES=n

Applies to: READ

"n" specifies how many physical files FATS is to read from its input tape. A physical file is defined as all records up to and including one tape mark. If the input tape contains labels, the labels before and after each data file will each count as one file, so each labeled file is actually three files. If NOREWIND is specified, the header label file of the first data file will not be read. If "n" is 0, FATS will terminate when it reads two consecutive tape marks (with no intervening data); this is usually sufficient to read all data files on the tape.

Default: 3 files (one labeled file).

WARNING: If "n" specifies more files than are present on the tape, or if "n" is 0 and the tape does not end in two tape marks, the tape may physically run off the end of the reel and require operator intervention to rethread it (tape cartridges do not have this problem, but will get an error instead). Multi-volume data sets do not have double tape marks at the end except for the last volume. FATAR, the companion product to FATS, can properly read multi-volume tapes and is a better choice for most verification operations.

NUMWRITES=

Applies to: WRITE

Specifies the number of WRITE CCWs which will be chained together during a certify operation. In other words, this is the number of test blocks that will be written in one I/O. Increasing the value may improve certification performance but may impact other jobs using tape drives on the same string. The value can be from 1 to 50. WRITEs to round (3420-type) tapes are never chained.

Default: 20

RETCODE

Applies to: ALL

Causes FATS to terminate with a return code of 12 rather than abending in all cases where it would terminate with a U0888 abend code (due to major errors).

Default: Abend with U0888 if major errors occur.

REWIND
NOREWIND

Applies to: ALLREWIND

(the default) causes FATS to rewind all tapes to load point before starting the specified operation, regardless of any LABEL= parameter in JCL. NOREWIND will tell FATS to leave the tape at the user specified position; for WRITE and ERASE statements, this can be used to certify/erase the remainder of a tape beyond existing files. NOREWIND resets all label options.

Default: REWIND

WTO

Applies to: ALL

Causes FATS to report the results of each operation on the system console via a one line message indicating the total number of permanent and temporary errors, or abnormal completion of the operation.

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MODE=xx Applies to: WRITE, LABEL, ERASEMODE= is used on 9-track (round) tapes when the drive is capable of writing multiple densities, to choose the density at which the output operation is to be performed (density selection is automatic on input tapes). Valid values are:MODE=CB (800 BPI)MODE=C3 (1600 BPI) MODE=D3 (6250 BPI)If the drive is not capable of the density indicated, an error will occur. Default: the highest density supported by the tape drive

14.3.7 ANALYZE OPERANDS

All of the operands which are valid on an ANALYZE statement input to FATAR (as described in a later section of this manual), are valid on a DEFAULT statement or an ANALYZE(n) statement when FATAR is invoked as a subtask of FATS.

16.0 FATS EXAMPLES OF USAGE

INTRO-DUCTION

Examples are provided here to guide you in the use of FATS. As many of the common uses of FATS as possible have been included, and most of the control statements and parameters are illustrated here. However, be aware that they are just examples and must be customized to your installation and situation before use. Areas of such customization will probably include: data set names, unit names for tape, special parameters for tape management systems. The examples assume that no special STEPLIB DD statement is required to execute FATS; this may not be true in your installation.

Because of the many possible combinations of operands, control statements, tape label types, etc., it is not practical to create examples which cover all potential FATS usage. Many examples illustrate more than one aspect of FATS use, e.g., two or more operands together. This does not mean that the two must always go together unless the accompanying text says so.

Many examples use LABEL=(,BLP) (bypass label processing) on the tape DD statements. For input tapes, BLP allows you to mount a labeled tape without knowing its volume serial or data set name; for output, it allows creation of unlabeled tapes. Sometimes this is simply a convenience, but for many FATS operations, such as labeling and certifying new tapes, it is essential. In some installations, system parameters prevent the usage of BLP by most users; in this case, the FATS control statement parameter BLP can be substituted. However, security systems may prevent the use of BLP by either means, so the FATS job may need proper authorization to use BLP.

INDEX TO EXAMPLES

The first-time or infrequent user of FATS should review many of the examples below since they frequently build upon one another in illustrating the usage and effects of various parameters. For your convenience, however, here is a list of the examples provided to aid in quickly finding the one you need. It shows the title of the example and the operations and keywords it illustrates.

#	EXAMPLE NAME	OPERATION	KEYWORDS
1	Certify SL tapes	DEFAULT WRITE	MULT,MODIFY
2	Certify SL tapes on multiple drives	WRITE	VOL
3	Certify and label tapes	WRITE	VOL,VOLINCR,NOSAVE, MAXVOLN,MAXERR, MAXCERR,NEWPAGE
4	Certify scratch tapes on 3 drives	DEFAULT WRITE	MULT,MAXVOLN,MAXCL EAN,METRIC
5	LABEL tapes	DEFAULT LABEL	LINECNT,OWNERID,VOL, VOLINCR,MAXVOLN,BLP
6	Label and certify new tapes	WRITE	VOL,VOLINCR,MAXCLEA N,WTO,NOSAVE
7	Visually examine bad tape	WRITE	STOP,VOL
8	Verify a SL tape	ANALYZE	
9	Verify a multi-file SL tape	READ	VOL,FILES
10	Verify on several drives	DEFAULT READ	VOL,FILES
11	Erase on multiple drives	DEFAULT ERASE	VOLINCR,MAXVOLN,VOL

ISPF DIALOG SUPPORT

Most of the FATS functions can be performed by using the FATS ISPF interface.

See Section 93.0 ISPF INTERFACE INTRODUCTION for further details.

CONTINUED . . .

16.1 EXAMPLES

EXAMPLE 1: CERTIFY SL TAPES

This example certifies any number of standard labeled tapes. The UNIT= parameter controls which type of tape drive is allocated for certification (e.g., 3480, 3490, 3590-1). Since no volume serial is specified, the operating system will ask for a scratch tape. With LABEL=(,SL) specified in JCL, tapes with any volume serials can be mounted. A tape management system, if present, can protect against accidentally overwriting active data by confirming the scratch status of any tape mounted. The MULT parameter will cause FATS to continuously request new scratch tapes until the system terminates FATS (See Section 13.1 OPERATOR CONTROL). Since the SAVLAB parameter is the FATS default, the original volume serial of each tape will be preserved. The PARM=I on the EXEC statement causes FATS internal documentation to be printed on SYSPRINT.

```
//FATS          EXEC     PGM=FATS,PARM=I
//SYSPRINT       DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE1          DD      DSN=FATS,UNIT=TAPE,
//              LABEL=(,SL),DISP=(,KEEP)
//SYSIN          DD      *
     DEFAULT    MODIFY=YES
     WRITE(1)   MULT
```

EXAMPLE 2: CERTIFY SL TAPES ON MULTIPLE DRIVES

Certify 3 standard labeled tapes on two tape drives, specifying the required volume serials in FATS control statements via the VOL= parameter. UNIT=(3490,,DEFER) on the TAPE DD statements will prevent the operating system from requesting a mount until FATS passes it the required volume serial. This example certifies 3490E cartridges, but any valid tape device type can be substituted. Each tape must be previously labeled with the proper volume serial since FATS is opening them as labeled. Since the SYSPRIN1 and SYSPRIN3 DD statements are present, separate detail reports will be printed for each tape drive. Since the SUMMPRT DD statement is present, a separate summary report for all tapes on all drives will be printed.

```
//FATS          EXEC     PGM=FATS
//SYSPRINT       DD      SYSOUT=*
//SYSPRIN1       DD      SYSOUT=*
//SYSPRIN3       DD      SYSOUT=*
//SUMMPRT        DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE1          DD      DSN=FAT1,UNIT=(3490,,DEFER),DISP=(,KEEP)
//TAPE3          DD      DSN=FAT2,UNIT=(3490,,DEFER),DISP=(,KEEP)
//SYSIN          DD      *
     WRITE(1)   VOL=111111
     WRITE(3)   VOL=(222222,333333)
```

EXAMPLE 3: CERTIFY AND LABEL TAPES

Twenty tapes, with volume serials "AX0001" to "AX0020" are to be labeled and certified. Their current internal volume labels are unknown so label processing must be bypassed (LABEL=(,BLP) in JCL). VOL=AX0001 provides the first volume serial to be requested, VOLINCR=1 specifies that the serial is to be incremented by 1 each time, and MAXVOLN=20 limits FATS to 20 such volumes. The presence of VOL= and NOSAVE causes the new tapes to be re-labeled with the AXnnnn volume serials. NEWPAGE causes the detail report for each tape to start on a new page (for easier separation), and MAXERR=5 and MAXCERR=3 will cause any given tape to terminate if it has more than 5 permanent errors or a 3 inch continuous error.

```
//FATS          EXEC     PGM=FATS
//SYSPRINT       DD      SYSOUT=*
//SUMMPRT        DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE5          DD      DSN=FATS,UNIT=(TAPE,,DEFER),
//              LABEL=(,BLP),DISP=(,KEEP)
//SYSIN          DD      *
     WRITE(5)   VOL=AX0001,VOLINCR=1,NEWPAGE,NOSAVE,
     MAXVOLN=20,MAXERR=5,MAXCERR=3
```

CONTINUED . . .

16.1 CONTINUED . . .

EXAMPLE 4: CERTIFY SCRATCH TAPES ON 3 DRIVES

94 scratch tapes are to be certified on three Magstar (3590) tape drives. The system operator knows which tapes to mount, so FATS is to simply call for scratch tapes. The DEFAULT statement is used so that the other FATS parameters only need to be specified once. MULT will cause FATS to repeatedly call for new tapes on each drive (since no volume serial is given in the JCL, scratches will be requested). MAXVOLN=31 causes each drive to terminate when 31 tapes have been certified on it (for the third drive, 32). MAXCLEAN=10 instructs FATS to ask the operator (via a console message FATSW06) to clean each tape drive between every set of 10 tapes (i.e., 3 cleanings per drive in this example) so that dirty tape drives don't cause false errors. Lengths will be reported in metric meters and centimeters.

Note: The SAVLAB parameter, which is the default, causes FATS to preserve the volume serials on the tapes; if any tape does not contain a label, FATS will ask the operator for the correct label.

```
//FATS          EXEC     PGM=FATS
//SYSPRINT       DD      SYSOUT=*
//SYSPRIN1       DD      SYSOUT=*
//SYSPRIN2       DD      SYSOUT=*
//SYSPRIN3       DD      SYSOUT=*
//SUMMPRT        DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE1          DD      DSN=FATS,UNIT=(3590-1,,DEFER),
//              LABEL=(,BLP),DISP=(,KEEP)
//TAPE2          DD      DSN=FATS,UNIT=(3590-1,,DEFER),
//              LABEL=(,BLP),DISP=(,KEEP)
//TAPE3          DD      DSN=FATS,UNIT=(3590-1,,DEFER),
//              LABEL=(,BLP),DISP=(,KEEP)
//SYSIN          DD      *
     DEFAULT    MULT,MAXVOLN=31,MAXCLEAN=10,METRIC
     WRITE(1)   WRITE(2)    WRITE(3)   MAXVOLN=32
```

EXAMPLE 5: LABEL TAPES

Volumes "TST990", "TST994", and "TST998" are to be labeled with those volume serials. The VOL= parameter specifies the first of those serials. The VOLINCR=4 parameter causes that serial (TST990) to be incremented by 4. Although MAXVOLN=50 is specified, the incrementing stops when the numeric portion of that serial cannot be incremented without overflowing. LINECNT=80 requests 80 lines per page on all FATS reports.

The BLP operand was specified on the DEFAULT statement. This can be used in installations where the LABEL=(,BLP) operand is treated as LABEL=(,NL) due to installation options. The FATS BLP operand forces BLP (bypass label processing) internally at OPEN time), overriding the JCL specification. Note that security systems may inhibit the use of BLP; the FATS job may need proper security authorization to use BLP.

```
//FATS          EXEC     PGM=FATS
//SYSPRINT       DD      SYSOUT=*
//SYSPRIN1       DD      SYSOUT=*
//SUMMPRT        DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE1          DD      DSN=FATS,UNIT=(TAPE,,DEFER),
//              LABEL=(,BLP),DISP=(,KEEP)
//SYSIN          DD      *
     DEFAULT    LINECNT=80,OWNERID='TEST TAPE',BLP
     LABEL(1)   VOL=(TST990),
     VOLINCR=4,MAXVOLN=50
```

CONTINUED . . .

16.1 CONTINUED . . .

EXAMPLE 6: LABEL AND CERTIFY NEW TAPES

The tape librarian has 250 brand new tapes to label and certify (certifying is recommended to clean loose oxide from the new tapes) starting at volume serial 500001. The VOL= and VOLINCR= parameters will cause this to happen. Since no MAXVOLN= parameter was specified, FATS will call for up to 682 volume serials (up to 500682). However, when all tapes are done, or if the certification process must be stopped to do other work, the librarian can stop FATS from the MVS console (See Section 13.1 OPERATOR CONTROL). The WTO parameter will cause a 1-line summary of the errors on each tape to be written to the console so that potential problem tapes can be immediately identified. Since these are new tapes, the MAXCLEAN=5 parameter requests tape drive cleaning after every five tapes to remove accumulated oxide.

NOSAVE prevents reading blank tape and allows labeling to take place.

Note: to simply label the tapes without certification, change WRITE(1) to LABEL(1).

```
//FATS          EXEC     PGM=FATS
//SYSPRINT       DD      SYSOUT=*
//SYSPRIN1       DD      SYSOUT=*
//SUMMPRT        DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE1          DD      DSN=FATS,UNIT=(TAPE,,DEFER),
//              LABEL=(,BLP),DISP=(,KEEP)
//SYSIN          DD      *
     WRITE(1)   VOL=500001,VOLINCR=1,MAXCLEAN=5,WTO,NOSAVE
```

EXAMPLE 7: VISUALLY EXAMINE BAD TAPE

The tape librarian wants to visually examine the bad spots on a known bad tape. The STOP parameter will cause FATS to stop and issue a message to the console when permanent data checks are encountered, at which time the tape can be examined. The operator may reply to the message, telling FATS to terminate, continue (and stop again on the next error), or turn off "STOP MODE" and continue normally. Stop mode might be used to determine if tape errors are due to damage or simply due to removable contamination.

```
//FATS          EXEC     PGM=FATS
//SYSPRINT       DD      SYSOUT=*
//SYSPRIN1       DD      SYSOUT=*
//SUMMPRT        DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE1          DD      DSN=FATS,UNIT=(TAPE,,DEFER),DISP=(,KEEP)
//SYSIN          DD      *
     WRITE(1)   VOL=111111,STOP
```

EXAMPLE 8: VERIFY A SL FILE

A standard labeled tape "222222" is to be verified for readability. The FATS companion product FATAR is to be used to do so. Since FATAR is opening it as labeled, the proper data set name and volume serial must be given. Since the FILES= parameter is not given, FATAR will read to the end of the tape (2 tape marks or EOV labels).

```
//FATS          EXEC     PGM=FATS
//SYSPRINT       DD      SYSOUT=*
//SYSPRIN7       DD      SYSOUT=*
//SUMMPRT        DD      SYSOUT=*
//TAPESUMM       DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE7          DD      DSN=DATA.SET.NAME,UNIT=TAPE,
//              VOL=SER=222222,DISP=OLD
//SYSIN          DD      *
   ANALYZE(7)
```

CONTINUED . . .

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EXAMPLE 9: VERIFY A MULTI-FILE SL TAPE

A standard labeled tape "333333" containing two files is to be certified for readability. The volume serial is specified via the FATS parameter VOL=, but a dummy serial must be given on the TAPE DD statement to satisfy operating system requirements; UNIT=(TAPE,,DEFER) keeps the system from requesting the mount until FATS sets the actual serial. LABEL=(,BLP) is specified since the true data set name of the first file is unknown. FILES=6 causes two standard label files to be read (the header and trailer label files count as files to FATS).

```
//FATS          EXEC     PGM=FATS
//SYSPRINT       DD      SYSOUT=*
//SYSPRIN1       DD      SYSOUT=*
//SUMMPRT        DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE1          DD      DSN=DATA.SET.NAME,UNIT=(TAPE,,DEFER),
//   VOL=SER=DDDDDD,DISP=OLD,LABEL=(,BLP)
//SYSIN          DD      *
  READ(1)       VOL=333333,FILES=6
```

EXAMPLE 10: VERIFY ON SEVERAL DRIVES

Several tapes are to be verified for readability using two tape drives. The VOL= parameter specifies which tapes are to be mounted on each drive. FILES=0 tells FATS that each tape is to read until two consecutive tape marks are encountered (two tape marks normally indicates end of data on the tape).

WARNING: Tapes which are part of a multi-volume set (except the last) DO NOT end in two tape marks and may run off the end of the reel if read with FILES=0. FATAR is recommended to verify such tapes.

```
//FATS          EXEC     PGM=FATS
//SYSPRINT       DD      SYSOUT=*
//SYSPRIN1       DD      SYSOUT=*
//SYSPRIN2       DD      SYSOUT=*
//SUMMPRT        DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE1          DD      DSN=ANY.NAME,UNIT=(TAPE,,DEFER),
//              LABEL=(,BLP),VOL=SER=DUMMY1,DISP=OLD
//TAPE2          DD      DSN=ANY.NAME,UNIT=(TAPE,,DEFER),
//              LABEL=(,BLP),VOL=SER=DUMMY2,DISP=OLD
//SYSIN          DD      *
     DEFAULT    FILES=0
     READ(1)    VOL=(111111,222222,
                     333333)
     READ(2)    VOL=(444444,
                     555555,666666)
```

CONTINUED . . .

16.1 CONTINUED . . .

EXAMPLE 11: ERASE ON MULTIPLE DRIVES

A large number of tapes are to be "Data Security Erased" before they are sold. Since they have consecutive serial numbers, the FATS parameters VOL=, VOLINCR=1, and MAXVOLN=50 are used to erase 50 tapes on each of 3 tape drives. FATS will call for the tapes by serial as needed. Although LABEL=(,BLP) has been specified to suppress operating system label handling, FATS will re-label each tape as it erases it. Note that "Data Security Erase" operations do not tie up the tape control unit, so that each of the three erase operations can proceed at full tape speed, and other tape jobs will not be impacted. Innovation strongly recommends that you run ERASE on a tape before writing data to be sent to a third party to insure that all corporate data left from previous use of the tape is removed.

```
//FATS          EXEC     PGM=FATS
//SYSPRINT       DD      SYSOUT=*
//SYSPRIN1       DD      SYSOUT=*
//SYSPRIN3       DD      SYSOUT=*
//SYSPRIN5       DD      SYSOUT=*
//SUMMPRT        DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE1          DD      DSN=FATS,UNIT=(TAPE,,DEFER),
//              LABEL=(,BLP),DISP=(,KEEP)
//TAPE3          DD      DSN=FATS,UNIT=(TAPE,,DEFER),
//              LABEL=(,BLP),DISP=(,KEEP)
//TAPE5          DD      DSN=FATS,UNIT=(TAPE,,DEFER),
//              LABEL=(,BLP),DISP=(,KEEP)
//SYSIN          DD      *
     DEFAULT    VOLINCR=1,MAXVOLN=50
     ERASE(1)   VOL=100001
     ERASE(3)   VOL=100051
     ERASE(5)   VOL=100101
```

FATS® & FATAR™

FATAR

USER DOCUMENTATION

INNOVATION® DATA PROCESSING

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20.0 FATAR FUNCTIONAL DESCRIPTION

WHAT IS FATAR?

FATAR (Fast Analysis of Tape And Recovery) is a multi-purpose magnetic tape utility, which can be executed under MVS/XA, MVS/ESA and OS/390. FATAR can read any magnetic tape which is usable by those operating systems, and can process multiple files and multiple volumes in one execution. It offers the ability to summarize or examine in detail the data read from the tape. FATAR's error recovery procedures are often capable of reading data which causes data check errors when read by normal access methods.

FATAR can also create a copy of the input data on another tape, optionally applying user-specified modifications as it copies. FATAR never modifies the input tape, so creating a copy is the only way to recover from errors on the original input. FATAR can also be used to move data to new media (such as from round tapes to cartridges, or 3480 cartridges to higher density media such as 3590 Magstar).

In many installations, much of the installation's data is stored on magnetic tape, which is subject to many hazards. This data will be useful only if it was written correctly when first recorded and is still readable when needed. Many hours of man and computer time can be wasted trying to recover from physical (hardware) or logical (data) errors on tape. FATAR can greatly reduce this recovery time, or even discover problems before they occur.

WHO USES FATAR?

FATAR is ideal for use by tape librarians and operations personnel, by applications programmers, and by systems programmers.

WHAT IS FATAR USED FOR?

FATAR has many applications, including:

– Investigating an "unknown" tape, to discover its label type, file count, DCB characteristics, etc.

– Mapping a tape, providing a compact summary of the characteristics of all files on the tape.

– Examining the data on a tape.

– Verifying that a tape file is properly formatted (every block is checked against its DCB information).

– Detecting and correcting invalid variable spanned records.

– Verifying that certain data fields contain valid data.

– Scanning a tape for a certain type of data.

– Scanning a tape for read data checks, which may cause application job failures.

– Verifying the readability of critical or archive tapes.

– Correcting invalid data or data checks by creating a copy of the input tape(s) with the bad data corrected or dropped.

– Creating a good copy of a tape which was not properly closed (such as during a system failure).

– Recovering data from a tape partially overwritten in error with a shorter file.

– Creating a backup copy of any tape (or multi-volume set of tapes), even if multiple files exist on the tape.

– Replacing tapes with small blocksizes with copies using a larger blocksize (reducing elapsed and CPU times of applications which read that data).

– Creating a copy of a tape with a different label type from the original (such as AL-to-SL or NL-to-SL).

– Creating copies of tapes at higher density or on a different type of tape drive.

– Copying FDR/ABR tapes (similar to the operation of the FDR utility FDRTCOPY) or other tapes with blocksizes over 32K.

– Making an "image copy" (an exact bit-for-bit copy) of a tape volume.

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FATAR CONTROLS

FATAR has a flexible set of command statements entered as 80-character records, of which only columns 1-71 are used by FATAR. For many operations, the commands required are very simple since the default operations of FATAR are designed to handle the most common user requirements. However, the FATAR statements allow you to greatly modify FATAR operation, including the ability to specify an operation down to a specific block and record on the tape if required.

INPUT TAPE PROCESSING

Unless you instruct it otherwise, FATAR will read all files on the tape volume (or multi-volume tape set) specified on its TAPEIN DD statement. If DCB information is available (from JCL or from the tape labels), FATAR will deblock each tape block into individual records if the record format is fixed or variable, allowing you to examine or modify each logical record. If you prefer, or if DCB information is not available, FATAR will treat each tape block as one record.

Since most tapes in IBM installations are labeled, FATAR will normally expect input tapes to contain labels (either IBM standard or ISO/ANSI), and will intelligently print the labels, extract data set name and DCB information from them and treat only real data files as data. This will be true even if you have specified LABEL=(,BLP) in JCL, so that you can mount tapes whose volume serial you don't know or don't care about and still print and process their labels. However, FATAR will recognize unlabeled tapes automatically and treat all files on them as data. If you have a need to process label files as data, you can instruct FATAR to do so.

If the input data is in ASCII, FATAR will translate it to EBCDIC before processing.

If hardware data checks occur reading a block from a round (9-track reel-to-reel) tape, FATAR will perform a variety of RETRY operations to attempt to successfully perform the read. Even if all recovery is unsuccessful, FATAR will still make the block as read available for manual correction. On cartridge tapes, hardware error recovery is invoked to recover from data errors.

DATA BLOCK PROCESSING

Once a block has been read, FATAR offers facilities via FATAR commands to:

– Print the block (in EBCDIC, HEXADECIMAL, or DUMP format (HEX and EBCDIC together)).All or part of the block may be printed.

– Change the length of the block (extra bytes may be added at the beginning or end of the block or both).

– Change data in the block (either at a specified location or by scanning for a string).

– Scan specified fields in the block for valid packed or zoned decimal numbers (to help eliminate data exceptions in application programs).

– Scan specified fields in the block for validity by comparison to a user specified table of valid or invalid values.

– Scan for specific strings of data, in specified locations or in any location.

– Drop data (prevent copy to output tape).

If logical records are being deblocked, all of the above (except block length changing) can be applied to each logical record.

NOTE: Changes to the input blocks never affect the input tape. Modified blocks are written only to the output tape, if present.

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OUTPUT TAPE PROCESSING

If the output tape DD statement TAPEOUT is present, FATAR will copy each file read from TAPEIN to the output tape. This will be an exact copy of the input, unless you request modification of one or more data blocks, or dropping of certain data blocks. You may also request that entire files be dropped from the copy.

By default, any block which had an unrecoverable data check when read from TAPEIN will not be written to TAPEOUT, but you may override this.

FATAR will issue a standard OPEN and CLOSE for each file on TAPEOUT.

If the output tape is in ASCII format, the data blocks will be converted from EBCDIC to ASCII before they are written. If the records are variable format, appropriate conversion to or from the ASCII variable format and the IBM format will be done.

SECURITY CONSIDER-ATIONS

FATAR does not have any special security interfaces, but since it does OPEN and CLOSE the input and output tapes, your security system will be invoked. If you have configured it to protect tape data sets and/or tape volumes, those security rules will apply, so the userid under which FATAR is run must be authorized to read the input volumes and data sets and write to the output volumes and to create the output data sets.

One multi-file input tapes, FATAR only OPENs the first data set on each tape, so only that file will be checked for READ authority. Other files on the same volume are read by FATAR without OPENing them, but it will be rare that a user is authorized to read one file on a tape volume and not others. For multi-volume tape sets, FATAR will open the first data set on each volume.

For output tapes, every data set created on TAPEOUT will be separately OPENed, so authority to create every file is checked.

When label processing on input or output volumes is bypassed (the BLP option in JCL or the BLP and OUTBLP options on the FATAR ANALYZE statement), volume labels and data set names are not verified by OPEN and so authorization to the volume and data sets cannot be guaranteed. For this reason, most security systems restrict the use of BLP. However, some functions of FATAR (such as mapping unknown labeled tapes and creating image copies of tapes) require the use of BLP. Innovation suggests that you provide BLP authority to a limited number of users (operators, tape librarians, and/or system programmers) so that they can run these functions when required.

FATAR PERFORM-ANCE

FATAR must read every block on the input tape(s) and, when copying, write each block to the output, its performance is dependent on several things, including:

– the blocksize of the data file (smaller blocks will take longer)

– the type of tape drive

– the type of channel on which the drive is attached (parallel or ESCON)

– whether the data is IDRC-compressed or not

To give you some idea of what to expect, we ran a few tests at Innovation using tapes containing an FDR disk backup (which uses large blocksizes, up to 56K). We used IBM 3480s on a parallel channel, and IBM 3590s (Magstars) on an ESCON channel. The 3480 backup was on 5 volumes, so tape rewind and mount times are taken out of these sample times. Both the 3480 and 3590 backups were IDRC-compressed. Each 3480 volume contained 300-400MB of data (before compression) and the whole backup was 1600MB.

– ANALYZE 1 3480 VOLUME (300MB) - 1.75 minutes (105 seconds, 2.8MB/sec)

– ANALYZE 1 3590 VOLUME (1600MB) - 5.5 minutes (330 seconds, 4.8MB/sec)

– COPY 5 3480 VOLUMES TO 1 3590 VOLUME (1600MB) - 8.5 minutes (510 seconds, 3.1MB/sec)

These are sample times from a specific environment ; your results will vary.

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21.0 FATAR TECHNICAL SUMMARY

21.1 GENERAL

THE FATAR PROGRAM

FATAR (Fast Analysis of Tape And Recovery) requires about 256K of memory, but a larger region size is recommended to accommodate special requirements and future enhancements.

FATAR must be linkedited and executed as an authorized program.

FATAR may also be called as a sub-task of its companion product FATS. This mode of operation allows multiple FATAR sub-tasks to operate in the same job, and also allows use of FATS keywords for specifying multiple executions of FATAR using the same input tape drive, but with different input tapes. In this case the memory requirements of FATAR will be the values listed above times the number of concurrent FATAR sub-tasks (plus the memory requirements of FATS itself, detailed elsewhere in this manual).

CONTROL STATEMENTS AND REPORT OUTPUT

FATAR accepts its control statement input from DD statement SYSIN. If no SYSIN DD is present in the step, all defaults are assumed. The control statements are 80-byte records, of which only columns 1 to 71 may contain information.

Report output is directed to DD statement SYSPRINT, which may be a SYSOUT file or any tape or disk file valid for output. SYSPRINT always has a logical record length (LRECL) of 121 bytes and writes Fixed Block (RECFM=FB) records. If SYSPRINT is directed to SYSOUT or if the blocksize is unspecified, 121 is assumed. The user may specify a blocksize for tape or disk output, but if it is not a valid multiple of 121, 1210 will be assumed.

SYSPRINT will contain a report identifying the tape or tapes read, including the volume serials, tape and drive type, and density (if applicable). For each file read, the header and trailer labels are displayed (if it is a labeled tape), and the number of records read are shown for each data file. Total data blocks and bytes are displayed for the entire tape. Any blocks which had data checks on the input are identified and displayed. If the input tapes are compacted by IDRC hardware, compaction information is displayed. FATAR control statements can request additional printout, such as printing data blocks or formatting label fields.

If the optional TAPESUMM DD statement is included, it will contain a page for each tape processed, with a 2 line summary of each file read, including information from the tape labels and a summary of the data read. DCB characteristics of TAPESUMM are the same as for SYSPRINT, described above. For compacted input tapes, IDRC statistics are displayed for each file and for the entire tape.

Section 25.0 FATAR REPORT EXAMPLES contains examples of SYSPRINT and TAPESUMM output.

If FATAR is run as a sub-task of FATS, these differences apply:

– printout will be directed to SYSPRINx (where "x" is the same as the digit on the FATS control statement ANALYZE(x)).

– Most ANALYZE operands can be specified on the FATS ANALYZE(x) statement, but the user can override those options or provide MODIFICATION/SCAN statements by supplying them in a DD statement SYSINx ("x" same as above).

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21.2 INPUT TAPE PROCESSING

INPUT TAPE TYPES

The input to FATAR may be any one of the following:

– A standard labeled (SL) tape containing one or more files (data sets).

– A multi-volume set of standard labeled tapes containing one or more files.

– A tape with ISO/ANSI labels (AL) containing one or more files in ASCII.

– A multi-volume set of ISO/ANSI labeled tapes containing one or more files in ASCII.

– An unlabeled tape containing one or more files, recorded in EBCDIC or ASCII.

– An unlabeled multi-volume set containing only one file (unlabeled multi-volume multi-file tape sets cannot be supported by FATAR since it cannot tell how many files are on each tape).

FATAR can read tapes on any IBM or IBM-compatible tape drive including:

– IBM 3420 and 3422 9-track round (reel-to-reel) drives and equivalent drives from other vendors. Since these drives are capable of reading and writing at several densities (800 BPI, 1600 BPI and 6250 BPI), FATAR can read a tape written at a given density only if the assigned drive is capable of that density.

– IBM 3480 and 3490 tape cartridge systems (18 track) and equivalent drives from other vendors such as STK and Memorex

– IBM 3490E tape cartridge systems (36 track) and equivalent drives from other vendors such as STK and Memorex. Note that 3490E drives can read tapes written on 3480/3490 drives (18-track format) but cannot write that format.

– IBM 3590 (Magstar) tape cartridge systems (128 track) including 3590s attached to a 3591 control unit (which emulates a 3490E but uses the 3590 tape format).

– STK Timberline and Redwood tape cartridge systems

– Input tape cartridges may be compressed by the IDRC option or uncompressed (IDRC compression is also called "compaction").

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INPUT TAPE LABEL HANDLING

Labeled tapes are handled by FATAR independently of the LABEL= parameter in the JCL. In other words, the TAPEIN DD statement may say LABEL=(,SL) or LABEL=(,AL) or LABEL=(,BLP)and FATAR will still be able to recognize and process the labels on the tape. Standard labels (SL) and ANSI labels (AL) will be detected even when operating system label processing is bypassed. If ANSI labels are found, it is assumed that the associated data file is written in ASCII code, and an ASCII-to-EBCDIC translation will be done on the labels and associated data files.

Unlabeled tapes, mounted with LABEL=(,NL) or LABEL=(,BLP) are automatically recognized by FATAR. When it reads the first input block, FATAR sees that it is not a label and treats the tape as unlabeled automatically.

If LABEL=(,BLP) is permitted in your installation, it is often useful with FATAR since it allows you to mount a tape whose volume serial or first data set name are unknown, or to set up a standard FATAR procedure which does not need to be modified for every run. Even if BLP is not permitted in JCL, FATAR has an operand BLP which invokes BLP processing internally. However, note that security systems may prevent the use of BLP by any means; you may need special authorization for FATAR in order to analyze unknown tapes.

You can force FATAR to process a labeled tape as unlabeled so that all files on the tape (including files containing labels) are handled as data by FATAR, even if LABEL=(,SL) or LABEL=(,AL) is specified in the JCL (in this case, the tape is positioned so that the first file processed is the header labels of the file specified in the JCL).

If the LABEL= parameter on the TAPEIN DD statement specifies a file other than the first, e.g., LABEL=5 or LABEL=(4,BLP) FATAR will start its processing with that file. If the input tape is a labeled tape but you have specified BLP in the JCL, the file number should point FATAR to the header labels of some file on the tape (header labels normally start at files 1, 4, 7, etc.); if you point to a data file instead of a label file, FATAR will treat the tape as unlabeled.

Unless you override normal FATAR operation with the LABELS= operand on the FATAR ANALYZE statement, FATAR will automatically recognize the label type of the first input tape and automatically do the right processing. SL and AL tapes will be automatically identified, the labels will be formatted, and information from the labels will be used to process the input tape (and for creation of files on the output tape, if present). Unlabeled tapes will be automatically recognized and processed.

When reading header labels, FATAR will extract the data set name (only the last 17 characters of the name are recorded in the label), and DCB information (RECFM, LRECL, and BUFOF (ANSI only)). These values will be used for opening the output tape file (if any) and for deblocking the blocks of the following data file. If you have the tape management interface enabled (See Section 21.5 TAPE MANAGEMENT SYSTEM SUPPORT), FATAR will query it to get the full 44-character data set name for all files on the input tape, and will use that name for output files.

When reading trailer labels, FATAR will verify the block count against the actual count of blocks read in the preceding data file, and produce a warning message if they do not match.

If a multi-volume labeled tape set is being read by FATAR, it will perform the processing described above on the EOV labels of at the end of each tape and the header labels at the beginning of the next tape, but will process the file that crossed tapes as one large file.

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INPUT FILE HANDLING

For labeled tapes, FATAR will process all of the files on all of the volumes specified on the TAPEIN DD statement unless you deliberately limit it to a certain number of files with the NUMFILES= or ENDAFTER= parameters. FATAR will continue to read and process files until either:

– Two consecutive tape marks are read, with no data or labels between, but only if the two consecutive tape marks are found where header (HDRx) labels would normally be expected.

– The number of data files specified by NUMFILES= has been read.

– The block specified by the ENDAFTER= parameter has been read.

– EOV labels at the end of a tape are read (indicating that the data set is continued on another tape), but no more tape volume serials were specified.

This means that, when in label mode, FATAR can read and copy an entire multi-file, multi-volume tape set automatically.

For unlabeled tapes, FATAR will process multiple files on the input tape, but is unable to switch to new volumes since there is no way to tell how many files are on the current volume, and therefore when to switch volumes. By default, FATAR will process all files on one unlabeled tape volume until two consecutive tape marks are read (as for labeled tapes). FATAR will also stop when it encounters EOV labels (it checks for EOV even though labels are not being processed) since EOV labels are followed by only one tape mark; this prevents FATAR from running off the end of round tapes or getting errors on cartridges. If NUMFILES= was specified, FATAR will stop after reading that many physical files.

For a truly unlabeled tape which is part of a multi-volume set, there is no way for FATAR to detect the end of the recorded data on the tape. In order to avoid an I/O error after the last data (and possibly running off the tape for round tapes), you must tell FATAR how many files exist on the tape with NUMFILES=.

OS LABEL MODE

FATAR has a special label mode, LABELS=OS, where all label processing and tape positioning is left to the operating system. Input tapes are handled the same as any utility program or user program, except that they must be on tape. In this mode, FATAR will handle exactly one input file (NUMFILES=1 is forced), but that file can be multi-volume, either labeled or unlabeled, and can even be several files concatenated together, as long as all the files are tape. LABELS=OS can be used to bypass the restriction on multi-volume unlabeled tapes, or to create one output tape file from multiple input files.

IMAGE COPY MODE

FATAR's special image copy mode, LABELS=IMAGE, is used to make an exact bit-for-bit copy of a tape volume onto another tape volume. Exactly one input volume (labeled or unlabeled) will be completely copied to the output tape, including copying all labels and data exactly as read from the input. However, image copy includes special functions, such as printing input tape labels (even though they are being copied as data) and copying empty data files (which would normally cause FATAR to stop prematurely).

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FATAR INPUT TAPE I/O

FATAR uses EXCP rather than any standard access method when reading input tape (from DD name TAPEIN) in order to have more control over error recovery processes and to bypass some access methods restrictions. Normal access methods can only handled blocksizes up to 32K; FATAR can handle blocks up to 64K, including those created by FDR and IBM's DSS).

FATAR will issue a normal OPEN for the first file on each input volume, allowing security and tape management systems to perform their normal checking and authorization. However, if a tape volume contains more than one file, FATAR will switch files without any intervening CLOSE/OPEN to improve performance. If a data set occupies more than one input tape volume, FATAR will CLOSE at the end of the current volume and re-OPEN the next input volume using the current data set name. This allows FATAR to process any multi-file and/or multi-volume tape or tapes in one execution.

If FATAR is invoked as a sub-task of FATS, it will read the input tape from DD name TAPEx rather than TAPEIN, where "x" is the same as the digit on the FATS control statement ANALYZE(x). This is compatible with the FATS DD name.

EXTENDED I/O ERROR RECOVERY

Note: Because of the extensive error recovery built into the hardware of cartridge drives (often using recovery methods not available to FATAR), extended I/O error recovery is not used on cartridge tapes and the following description does not apply to them. Data checks on cartridge tapes are considered to be permanent.

I/O errors on a tape are often fatal to an application program. If the operating system or tape hardware cannot recover from an error, the program has little choice except to abort and leave it up to a human to investigate and correct the problem. FATAR is an ideal tool for fixing these problems due to its extended error recovery and its response to unrecoverable errors.

FATAR's extended I/O error recovery is used on round (3420-type) tapes, and attempts to RETRY most errors in much the same way that the operating system's error recovery does. However, FATAR has the capability of retrying a read operation up to 256 times in both the forward and backward directions. Operating system error recovery does less that 1/6 of this and will not always RETRY in the backwards direction (particularly for large blocks).

To further improve recovery, FATAR will execute a special tape cleaner action on every fourth retry, moving the tape rapidly back and forth across the cleaner blade built-in to the tape drive, in order to attempt to dislodge any dirt or loose oxide on the tape surface.

Sometimes, the nature of an error on a particular data block is such that any attempt at recovery causes the tape to be mis-positioned, resulting in either lost data or an error recovery loop. Operating system error recovery cannot be totally shut off, and therefore cannot recover from this situation. FATAR can be instructed to do absolutely no recovery actions during a given run, and can often successfully bypass the bad block and recover the remainder of the data on the tape.

If FATAR's error recovery actions are unsuccessful, the data block is considered to be a permanent error. By default, such blocks will be dropped (not written) if you are copying to an output tape. However, FATAR gives the option of examining what data it was able to read and of modifying or replacing the invalid data. Most of the FATAR command statements can be specified to only apply to blocks which had a permanent data check.

Since FATAR must inhibit normal operating system error recovery in order to control its own error recovery actions, errors encountered by FATAR may not be recorded in the operating system "SYS1.LOGREC" (EREP File) or in SMF Type 21 (ESV -- Error Statistics by Volume) records. For cartridge drives, the total errors encountered by the tape drive will still be recorded on LOGREC and SMF, but individual errors will not.

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INPUT TAPE DATA BLOCK PROCESSING

As FATAR begins processing each data file, it analyzes the DCB information (record format and logical record length) it has available. If labels are being processed, FATAR will extract this DCB information from them. However, if DCB parameters were supplied on the DD statement for the input tape, they will override the tape labels. This allows you to suppress FATAR deblocking operations (by specifying DCB=RECFM=U) or to correct invalid DCB information on the tape labels.

If the input tape has ANSI labels, or if DCB=OPTCD=Q was specified on the TAPEIN DD statement, then all data records are translated from ASCII to EBCDIC as soon as they are read.

If the record format of the file is fixed (RECFM=F or FB) or variable (RECFM=V, VB, VS or VBS), FATAR will attempt to deblock each data block it reads from the input tape into its logical records. Note that FATAR does not depend on the blocksize from the labels or JCL but will read all the data in each tape block and then attempt to deblock it according to the format and logical record length found. In fact, if the records are variable length, the record length from the labels/JCL is also not used, but rather the length fields at the start of each record are used to locate the records. If the record format is variable spanned (VS or VBS), FATAR will deblock each record segment individually.

If FATAR finds an error during deblocking (which may be a fixed length block which does not contain an exact number of full records, or a variable length block whose last record is too long for the length remaining in the block), FATAR will print an error message and treat that block as unblocked for printing. This may aid in identifying improperly formatted tapes, but remember that blocks that were read with data checks may cause these errors simply because the data is invalid.

When deblocking is in effect, FATAR will not print or make available for modification the block prefix (for ASCII Tapes) or the block descriptor word ("BDW" -- for variable format blocks). However, each record (including the record descriptor word or "RDW" for variable format) is printed and available for modification.

The FATAR control statements SCAN and REPLACE (which validate and modify data respectively), will operate on individual records within the block, and can refer to specific records in specific blocks. The DROP statement can delete whole blocks or records within blocks. The PRINT statement always selects whole blocks but will print individual records within those blocks. The KEEP statement always operates on whole blocks.

If deblocking is suppressed or not possible, then the entire contents of each block (including any prefix or BDW) is printed or available for modification as if it were one single record.

21.3 MODIFICATION AND SCANNING

MODIFICATION AND SCAN STATEMENTS

FATAR MODIFICATION/SCAN Control Statements are edited by FATAR and stored in a table at initialization. As each block is read by FATAR, this table is scanned to see if any of these statements apply to the current block.

MODIFICATION/SCAN statements allow you to:

– Print the contents of any block

– Drop a block or record (suppress it from being written to the output tape)

– Keep a block (override FATAR's automatic drop of blocks which get data checks)

– Change the length of a block, making it shorter or longer than the original, and reposition the original data in the new block

– Replace data at a given position in a block or record, optionally verifying the original contents first

– Scan a block or record for any field containing a given value, and replace that with a new value (for either the first or every occurrence in the block or record)

– Validate that certain fields in a block or record contain valid packed or zoned (printable) decimal data

– Validate that certain fields in a block or record contain valid data bytes according to a user-specified test table (which can specify either all of the valid byte values or all invalid byte values).

More than one modification may apply to a given block or record, so FATAR will scan the table for all applicable control statements, executing them in the order that they originally appeared in the control statement input. Also, one statement may apply to more than one block or record; a range of blocks, or a range of records within a block may be specified, or a statement may apply to all blocks and records in a file (to provide a global MODIFICATION/SCAN facility).

Normally, all blocks which are modified will be printed after modification, although this can be suppressed. If fields are being validated (the SCAN statement), FATAR will PRINT a warning about each field which fails validation. In any case, a message will be printed about every block which was affected by a control statement (documenting that it was "DROPPED", "PRINTED", etc.). If the control input contains MODIFICATION/SCAN statements which are never selected by FATAR (if, for example, they specify a block number which does not appear on the tape), they will be identified at the end of the FATAR run so that you can investigate the reason.

Although the DROP, KEEP and REPLACE statements are most meaningful when an output tape is being produced, they will be processed normally even when no output tape is present. This allows you to "dry run" your control statements before you actually create an output.

RENAME STATEMENT

RENAME statements allow you to change the names of output files created by FATAR. They are processed like other MODIFICATION/SCAN statements and stored in the same table. However, they are used only at the point that an output tape file is being opened. Normally, FATAR will use the data set name of the input file when opening the equivalent output file, but RENAME allows you to completely specify a new name (NEWN=), or specify a special string (NEWI=) which selectively modifies the input name, index level by level. Each RENAME statement can apply to one specific input file, or to all input files.

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21.4 OUTPUT TAPE PROCESSING

OUTPUT TAPE PROCESSING

If the DD statement TAPEOUT is present, a logical duplicate of the input tape(s) will be generated. It is a "Logical" duplicate since FATAR will allow the copy to have a different type of labels from the original, tape density or tape type may be different, and user-specified modifications may be applied. The output tape will normally have the same number of files as were found on the input tapes, in the same order, with the same data set names (the RENAME statement and the output exit allow you to rename files on the output tape).

As each file is encountered on the input tape, the equivalent file will be opened on the output tape; if the input tape contains 5 files, 5 files will be created on the output, with the same contents as the input. However, it is possible to request FATAR to drop an entire file (e.g., DROP LF=2,B=ALL) in which case the output file corresponding to the dropped input file will not be opened at all.

OUTPUT LABEL PROCESSING

Label creation on TAPEOUT is totally controlled by the LABEL= operand on the TAPEOUT DD statement. The tape will be created as standard label (SL), ANSI label (AL) or unlabeled (NL or BLP).

FATAR will generate a data set name for each file opened on TAPEOUT; it may be recorded by your tape management system. If the output tape is labeled (LABEL=SL or AL), this name will also be recorded in the tape labels created. The name is derived by these rules:

– if the input tape is not labeled (or label processing is suppressed by LABELS=NO), the DSN= specified on the TAPEIN DD statement is used. However, if you have the tape management interface enabled (See Section 21.5 TAPE MANAGEMENT SYSTEM SUPPORT) and the tape is recorded as unlabeled in the tape management data base, the data set names recorded by tape management will be used.

– if the input tape is labeled and labels are read by FATAR, the data set name is extracted from the HDR1 label that precedes each data file. However, although tape data set names can be 44 characters, only the last 17 characters are recorded in the tape label. So FATAR does some additional processing to attempt to derive a proper data set name:

  * if the name read from the label matches the last 17 characters of the DSN= parameter provided on the TAPEIN DD statement, that name is used.

  * if you have the tape management interface enabled (See Section 21.5 TAPE MANAGEMENT SYSTEM SUPPORT), the input tape is recorded as labeled in the tape management data base, and the name from the HDR1 label matches the end of the full name of the equivalent input data set from that data base, that full name is used.

  * if the EXIT= parameter was specified on the FATAR ANALYZE statement, a user-coded exit routine is called which can modify the output data set name (described later in this section).

  * if a RENAME statement (Section 23.3.4 REPLACE STATEMENT) was specified which applies to this input file, the replacement name (NEWN=) or name modification string (NEWI=) will be used to name the output data set.

– if none of the above provide the output name, the truncated 17 character name will be used (which may result in security errors).

If the output tape is labeled, the file sequence numbers of the output files created are controlled by the TAPEOUT DD statement. Normally, the first output file will be file sequence 1 regardless of the file sequence of the input file; the next output file will be 2, etc. If some input files are being dropped (via DROP LF=n,B=ALL) then no equivalent output file created; there will never be gaps in the file sequence numbers created on the output tape. If you want to use FATAR to add files to an existing tape, you can specify LABEL=n to specify the next available sequence number.

If labels are being processed on the input tape, DCB information read from the header labels of each file will be used to open the output file; if DCB= parameters are provided on the TAPEIN DD statement, they will override those from the tape labels. This DCB information may be recorded by your tape management system; if the output tape is labeled, DCB characteristics are recorded in

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the output tape labels.

When output files are closed, an option (CAT= operand) can be used to cause FATAR to catalog the each file it created on the output tape. This allows you to easily do a logical copy of any input tape and recatalog the data sets to the new volume. This is especially useful when copying tapes to a new media type (such as 3490 cartridge to 3590 Magstar cartridge).

However, if FATAR was unable to identify the full data set name of the output data set using the rules above, cataloging will not be done. Since the truncated data set name from the tape labels is the last 17-characters of the name, it is not useful for cataloging. There are 2 exceptions:

– if NEWN= is used on a RENAME statement to provide a complete new name for a data set being copied, CAT= will be honored.

– if the name from the input tape labels is 16-characters or less (blanks at the end), it is the complete name so CAT= will be honored.

OUTPUT BLOCK PROCESSING

FATAR uses EXCP to write blocks to the output tape, so the output blocks will be an exact duplicate of the input blocks in each file regardless of DCB characteristics, unless reblocking or modification is requested.

By default, any block which gets a permanent data check when read from the input tape will not be written to the output tape, under the assumption that the data that was read is probably not usable.

After all modifications have been applied to a given block from the input tape, it will be written to the output tape (unless it is being dropped). Standard system error recovery is permitted on the output tape, so any WRITE error reported back to FATAR will cause the entire run to be aborted at that point.

If the output tape has ANSI labels (LABEL=(,AL)), or if DCB=OPTCD=Q is specified on the TAPEOUT DD statement), the block will be translated from EBCDIC to ASCII; for variable format tapes, the block format is converted to ANSI variable format.

Data set reblocking may be requested by the REBLOCK= keyword on the ANALYZE statement. If so, FATAR will reblock each copied file if it is fixed or variable format (except variable spanned and ANSI variable), if its logical record length is less than the new blocksize, and if its current blocksize is not greater than the value of MAXRBLK= (maximum blocksize to reblock) if specified. When reblocking, each logical record is copied into a reblocking buffer which is written to TAPEOUT only when full (or at end-of-file).

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FATAR OUTPUT FILE EXIT

An optional user open exit may be used to modify the data set names of the output files. If specified by the operand EXIT=(OPENEXIT,exitname), the module "exitname" will be loaded and will be called before opening each output file copied to TAPEOUT. If "exitname" cannot be found FATAR will abend with a S806 upon parsing the EXIT= keyword statement.

The register conventions when the exit is called are:

R1 – Pointer to PLIST containing:
- +0 Pointer to a fullword containing a function code:
  4 is a normal entry, pointers at +8 to +16 are valid
  8 is last call: allows you to clean up exit environment (such as freeing work areas).
- +4 Pointer to double word on double word boundary that can be used by the exit routine for any purpose such as remembering the subpool, length, and address of any area the exit acquired for operation.
- +8 Pointer to TAPEIN JFCB
- +12 Pointer to TAPEOUT JFCB
- +16 Pointer to a 44-byte field containing the dsname that FATAR intends to use for TAPEOUT.

R13 – Pointer to a standard save area
R14 – Return address
R15 – Entry point of exit routine
The registers should be saved and restored by the exit routine. Only the TAPEOUT JFCB should be modified; you can change the data set name and/or data set characteristics (RECFM, LRECL, etc.). The IBM macro IEFJFCBN can be used to define the JFCB fields.

Initially the data set name in the TAPEOUT JFCB and the dsname field pointed to by the parmlist+16 are the same; both are provided to simplify exit coding, using the dsname field as input while you modify the JFCB dsname. If the tape management interface is in use (See Section 21.5 TAPE MANAGEMENT SYSTEM SUPPORT), the dsname in the TAPEIN JFCB will be that determined by the interface. If the RENAME statement was used, the output data set names will be the new name specified.

A sample exit routine (named "OPENEXIT") is included in the Installation Control Library (ICL) which was loaded from the FATS/FATAR installation tape (See Section 90.0 FATS AND FATAR INSTALLATION). The sample exit replaces the high level qualifier (or everything in front of the first period) of the tape data set name with a new qualifier hard coded in the exit. This shell could be expanded to add additional functions. However, note that the RENAME statement (See Section 23.2.4 PRINT CONTROL OPERANDS) is an easier way of renaming FATAR output data sets in most cases.

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MAKING AN IMAGE COPY

FATAR has a special mode where it will create an "image copy" of a tape. Image copy will essentially create an exact bit-for-bit copy of an input tape on an output tape, including an exact copy of all of the labels on the input tape, so the output tape will even have the volume serial of the input (although an option is available to preserve the output serial).

This function is useful when you need to replace a tape that is damaged by copying all the data to a new volume; the new volume will be externally relabeled with the serial of the original tape and will take its place in the tape library. No catalogs or tape management information need be updated since the new tape looks just like the original.

Some years ago a tape vendor had to replace many thousands of tapes in hundreds of installations when it was found that manufacturing defects were causing the tapes to fail prematurely. FATAR image copy was used to copy many of the suspect tapes to new volumes transparently.

Image copy is invoked by specifying LABELS=IMAGE on the ANALYZE statement. LABELS=IMAGE is similar the to the operation of the default LABELS=YES in that FATAR will process and display all labels on the input tape and will automatically switch to LABELS=NO mode if the tape is not labeled. However, LABELS=IMAGE causes some differences from normal processing in order to accomplish the image copy:

– the input tape will always be rewound and processed from the beginning, even if you have OPENed it to another position with the LABEL= parameter in JCL.

– only one input tape volume will be processed, even if you specify additional input volume serials.

– the OUTBLP option will be assumed, so that the output tape will be opened as an unlabeled tape. This is required so that FATAR can write the labels from the input tape onto the output.

– as labels and tape marks are read from the input tape, they will be written directly to the output (normally FATAR allows OPEN to create labels and tape marks on the output). FATAR will do only one OPEN on the output tape; it will not open every output file as it normally does.

The result is that the output tape will be a faithful, bit-for-bit image copy of the input tape volume (except that you can request that the output tape volume serial be preserved with the OUTSER=YES option). Of course, you can still use FATAR MODIFICATION statements to change data as it is being copied, but this is usually not done during an image copy.

Because the labels are copied as data, there are some restrictions when using image copy:

– only one tape will be read in a FATAR step doing image copy. If a multi-volume tape set must be copied, each tape must be copied in a separate step.

– for multi-volume tape sets, each tape volume must be completely copied to a separate output tape. Since all input volumes in a set (except the last) will contain data all the way to the end of the tape, you must be sure that the output tape used is long enough to contain all of the input tape data. Since tapes can come in various lengths, you must be sure that an output tape of the same length (or longer) is used. Even tapes that are supposed to be the same length may vary slightly, causing the copy to fail if the output is too short (some tape vendors provide "extra length" cartridges just to solve this restriction). To try to avoid this problem, FATAR will attempt to write output blocks beyond the normal logical EOT (End-of-Tape) during an image copy; for cartridges, it will continue writing until the drive reports it cannot continue (Physical EOT); if the difference in the tape lengths is slight, this is usually enough to allow the copy to complete.

– since FATAR does not OPEN each output file, they will not be recorded by your tape management system. For this reason, LABEL=EXPDT=98000 is usually coded on TAPEOUT (or whatever is required to bypass recording by your tape management system). Since image copy is usually used when a damaged or suspect tape is being copied to a new volume with the original serial number, this is not a problem since the new tape volume will simply replace the old volume in your tape library after being externally labeled with the input tape's volume serial; the existing tape management records are still valid for the new tape.

– no cataloging of the copied files can be done, but again, since the image copy will usually have the serial number of the input, the existing catalog records are valid and recataloging is not required.

Note: in previous releases of FATAR, image copy was invoked with LABELS=NO plus LABEL=(,BLP) on TAPEOUT. This can still be used, but the function provided by LABELS=IMAGE in FATAR V4.5 (and above) is easier to use, less error prone, and provides more information about the data being copied.

21.5 TAPE MANAGEMENT SYSTEM SUPPORT

FATAR V4.5 (and above) contains support to interface to tape management systems to get complete information about the names of data sets being read by FATAR. This is often necessary because the tape labels contain only a truncated version of that name (the last 17 characters of the original name).

Currently, CA-1 (TMS) and CA-TLMS, both from Computer Associates, are supported. As part of the installation of FATS and FATAR, you must assemble an interface module for your tape management system (See Section 90.3 IMPLEMENTING THE TAPE MANAGEMENT INTERFACE); it will need to be reassembled if you install a new release of tape management.

USING THE TAPE MANAGEMENT INTERFACE

Invocation of the tape management support in FATAR is automatic. Once the true volume serial of the first input tape has been determined, FATAR will detect which tape management system you are using, if any, insure that the proper interface module has been assembled, and will interface to your tape management data base to query that volume serial.

The interfaces builds 2 tables used by FATAR:

1) a table of the full data set names of each file on the tape. If the tape is part of a multi-volume tape set, all data set names on the tape set are tabled.

2) if the tape is part of a multi-volume tape set, all volume serials which are part of the tape set. The label type (SL, AL, NL) and the tape status (active, scratch) of each tape is also in this table.

Of course, the interface may report that the input volume serial was not found in the tape management data base; this will be normal if the input volume is a foreign tape or if its true volume serial cannot be determined (for unlabeled tapes and tapes processed with LABELS=NO, FATAR will use the volume serial provided on the TAPEIN DD statement, which may not be the true serial). Other interface errors may prevent FATAR from getting the desired information.

USING THE TAPE MANAGEMENT TABLES

As FATAR reads each file from the input tape, it will attempt to match that file against the table of data set names, in order to get the full 44-character data set name.

For labeled input tapes it will extract the truncated 17-character data set name from the tape labels, and compare it against the end of the name recorded by tape management for this file. If they match, the full name is used by FATAR. If they do not match, the name from the labels is used. In either case, the name is reported in the FATAR listings.

For unlabeled input tapes, the name from the data set table will always be used.

If the input is a multi-volume tape set, as each new tape is mounted FATAR will verify that its volume serial is the expected next volume according to the tape management volume table. If not, a warning message is issued, but processing continues. An option (NEXTVOL=TMS) is available which causes FATAR to mount and process the volumes from the volume table, ignoring the JCL; this allows you to specify only the first volume in a multi-volume tape set and still have FATAR process the entire set.

CONTINUED . . .

22.0 FATAR EXECUTION JCL

To execute FATAR, the following JCL statements are required:

ISPF PANEL SUPPORT

Extensive ISPF panel support is available to generate jobstreams and control statements for FATAR.

See Section 93.0 ISPF INTERFACE INTRODUCTION for further details.

EXEC STATEMENT

The EXEC statement specifies the FATAR program name, memory requirements (if your installation defaults are insufficient), and parameter field.

The memory requirements of FATAR are about 256K, but a larger region (at least 512K) is recommended to accommodate special requirements of certain parameters and future changes.

The parameter field (PARM=) is used to define to FATAR the amount of memory required for storing FATAR modification and scan control statement information. FATAR requires about 30 bytes per control statement plus the data length of any D=, V=, or S= data fields given. The default table size of 16K bytes is sufficient for most FATAR applications, but if it proves to be inadequate, override it by PARM='SIZE=nnnnnn' where nnnnnn can be 1-999999.

Examples:

```
//FATAR        EXEC     PGM=FATAR,REGION=512K
//FATAR        EXEC     PGM=FATAR,PARM='SIZE=24576',REGION=1M
```

STEPLIB/ JOBLIB DD STATEMENT

A STEPLIB or JOBLIB DD statement will be required if FATAR has been linkedited into a private library. It can be omitted if FATAR is in a system library which can be accessed without a STEPLIB/ JOBLIB statement (that is, a library in the system link list). This must be an APF authorized library.

SYSPRINT DD STATEMENT

SYSPRINT receives all FATAR printout and reports (except the tape summary), and is normally allocated to a SYSOUT data set. Its DCB attributes are RECFM=FBA,LRECL=121. If blocksize is specified it must be a multiple of 121, otherwise it will default to 121 for SYSOUT or 1210 for other devices.

TAPESUMM DD STATEMENT

TAPESUMM is optional, but if present receives a summary of all files on each tape processed, including data set name, tape label information, block and byte counts, length of each file, minimum, maximum and average block sizes, and read error counts. Its DCB attributes are the same as for SYSPRINT.

SYSUDUMP DD STATEMENT

SYSUDUMP requests an abend dump if major errors occur (note that most internal abends in FATAR are for the user's information only and do not cause dumps). SYSUDUMP is usually allocated to SYSOUT. Abend dumps are necessary for analysis of problems by Innovation. If you have the ABEND-AID product from COMPUWARE include the following so that a fully-formatted dump is produced:

```
//ABNLIGNR     DD       DUMMY
```

CONTINUED . . .

22.0 CONTINUED . . .

TAPEIN DD STATEMENT

TAPEIN specifies the tape or tapes to be analyzed. If more than one volume serial is specified, the volumes should be part of a single multi-volume tape set, in the proper order. If the input data set is cataloged, UNIT= and VOL= can be omitted, but be aware that for multi-volume, multi-file tapes, each catalog entry points only to the volumes that file occupies, so you may have to specify volume serials in the JCL in order to process the entire tape set. However, if you have the tape management interface enabled (See Section 21.5 TAPE MANAGEMENT SYSTEM SUPPORT), you can code the NEXTVOL=TMS option which will use tape management information to mount and process all the volumes in the tape set automatically.

LABEL= can specify SL (the default), AL, NL, or BLP; FATAR's decision to process the tape as labeled or unlabeled is independent of JCL. However, the LABEL= parameter can be used to position the input tape to a particular file at which to start processing. If SL or AL is specified, the data set name of the first file to be processed must be properly specified, and FATAR will position to the header labels of that input file before starting. Since this is an input file, DISP=OLD is appropriate.

If LABEL=(,BLP) is permitted in your installation, its use on TAPEIN is desirable to be able to analyze unknown tapes, or to analyze tapes without having to update the JCL with the proper volume serial and data set name. Even if BLP cannot be specified in JCL, the BLP operand on the FATAR ANALYZE statement can be used to invoke BLP processing internally. However, note that security systems may prevent use of BLP by any means; you may need to establish special security for FATAR jobs using BLP.

If labels are being processed from TAPEIN, FATAR will usually receive sufficient information from those labels to deblock the data blocks in each file. However, if label information is missing or incorrect, it can be supplied by the DCB= parameter on TAPEIN. Even if label information is present, FATAR can be forced to treat input blocks as single large records for printing and modification by putting DCB=RECFM=U on the TAPEIN statement (the DCB information in the labels will still be used to open TAPEOUT files).

If LABEL=(,AL) or DCB=OPTCD=Q appears on the DD statement, or if FATAR detects ANSI labels on the tape, all labels and data read will be translated from ASCII to EBCDIC.

For image copy (LABELS=IMAGE), TAPEIN should specify only one volume serial; additional serials are ignored.

EXAMPLES:

```
//TAPEIN          DD      DSN=FILE.NAME,UNIT=TAPE,
//               VOL=SER=111111,DISP=OLD
//TAPEIN          DD      DSN=ANY.FILE,UNIT=TAPE,
//               VOL=SER=(222222,333333),
//               LABEL=(4,BLP),DISP=OLD
//TAPEIN          DD      DSN=CATALOG.ED.DATASET,DISP=OLD
```

CONTINUED . . .

22.0 CONTINUED . . .

TAPEOUT DD STATEMENT

The TAPEOUT DD statement is optional. If TAPEOUT is omitted FATAR will simply analyze the input tape, but if present specifies a tape on which to create a copy of the input files read from TAPEIN. The LABEL= parameter on the TAPEOUT DD statement may be anything (SL, AL, NL, BLP) and FATAR will create the specified type of labels. Note that SUL or AUL is not required for the creation of user labels on TAPEOUT; if the input tape contains user labels, they will be copied to TAPEOUT (if labeled) unless the SUPULAB parameter is specified. Since this is an output file, DISP=NEW is usually appropriate. Volume serials may be specified, or may be omitted to call for scratch tapes.

If labels are not being processed on TAPEIN, the DSN= JCL parameter on the TAPEOUT DD is ignored and the DSN= specified on TAPEIN will be used to name every file created on TAPEOUT. If labels are processed on TAPEIN, the DSN= is still ignored, and every file name will be copied from TAPEIN labels. The RENAME statement can be used to override the output data set names in both cases. If LABELS=OS is specified, the DSN= on the TAPEOUT DD will be used to name the output data set.

The LABEL=EXPDT= or LABEL=RETPD= parameter may be specified to provide an expiration date for the output files created. If omitted, the expiration dates of labeled files read from TAPEIN will be used.

If LABEL=(,AL) or DCB=OPTCD=Q appears on the DD statement, all data written will be translated from EBCDIC to ASCII.

EXAMPLES:

```
//TAPEOUT        DD      DSN=NOT.USED,UNIT=TAPE,DISP=(,KEEP)
//TAPEOUT        DD      DSN=FILE.NAME,UNIT=CART,
//              VOL=SER=444444,DISP=(,KEEP)
```

SYSIN DD STATEMENT

The SYSIN DD statement is the source of FATAR control statements. It is normally a "DD *" spool file, but can be any disk or tape file with DCB characteristics RECFM=FB and LRECL=80. It can also be omitted entirely, in which case FATAR will assume all defaults and no modification or scan statements.

JCL WHEN FATAR IS A FATS SUB-TASK

FATAR may be invoked as a sub-task of its companion product FATS in order to execute more than one FATAR task simultaneously in the same jobstep. In this case several differences from the above rules apply (in each case, the "x" referred to is the number "x" in the FATS control statement ANALYZE(x)):

– FATAR will write its report to Print DD statement SYSPRINx rather than SYSPRINT (e.g., SYSPRIN1).

– The TAPEx DD statement rather than TAPEIN will be used for the input tape (e.g., TAPE1).

– If present, the TAPExOUT DD statement rather than TAPEOUT will be used for the output tape copy.

– Most ANALYZE statement parameters can be specified in the FATS ANALYZE(x) control statements. However, if you wish to override what FATS has specified, or wish to specify scan or modification control statements, use a SYSINx rather than a SYSIN DD statement (e.g., SYSIN1).

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23.0 FATAR CONTROL STATEMENTS

23.1 GENERAL

GENERAL RULES

All FATAR control statements must be input on 80-character records of which only columns 1 to 71 are used by FATAR.

Every FATAR control statement must begin with an operation keyword from the list below. This keyword may begin in column 1 or be preceded by any number of spaces. It must be followed by one or more spaces. Every operation keyword accepts a number of operands which follow those blanks and are separated by commas with no intervening spaces. Control statements may be continued onto multiple input records by following the last operand with a comma and a space, and starting the next operand on the next record in any column (preceded by spaces).

Any FATAR control statement may contain comments; FATAR stops its scan of the control statement whenever it finds an operand followed by a space (or comma-space for continuation), so the rest of the statement may be filled with any comment desired. Any control statement record containing an asterisk ("*") in column 1 will be bypassed by FATAR and may entirely contain comments.

FATAR operation keywords:

ANALYZE	Perform FATAR analyze/copy (required)
DROP	Do not copy one or more blocks
KEEP	Copy a block even if permanent data checks or change its length
PRINT	Print one or more blocks
REPLACE	Replace data in a block or record
SCAN	Validate data fields in a block or record for packed or zoned numeric or against a user-defined table
TABLE	Define valid characters for a scan operation
RENAME	Rename one or more files while copying

23.2 ANALYZE STATEMENT

ANALYZE

BLP
,BYTEFACTOR=1000|1024
,CAT=NO|YES|RECAT
,CHANEXTENDER=YES
,CHAR|HEX|DUMP
,CHARTAB=tabname
,COMBFILES
,COMPACTION=SYSTEM|COPY|COMP|NOCOMP
,CRDATE=COPY|TODAY
,ENDAFTER=(LF=nnnnn,B=bbbbbb)
,EODRETRY=nnn
,EOTBLOCKS=nnn
,EOV=NO
,EXIT=(OPENEXIT,exitname)
,KEEP
,LABELS=YES|NO|OS|REQUIRED|IMAGE
,LBLPRT=CHAR|HEX|DUMP|FORMAT|NONE
,LENCHK
,LINECNT=nn
,MAJERR=nnn
,MAXERR=nnn
,,MAXTERR=n
,METRIC|NONMETRIC
,NEXTVOL=JCL|TMS
,MSGLEVEL=0
,NUMFILES|NF=nnnnn
,OUTBLP
,OUTDSN=YES
,OUTSER=YES
,OUTVOL=INVOL
,PRINTTMS=YES|NO
,PRTLEN=nnnnn
,REBLOCK=nnnnn,MAXRBLK=mmmmm
,RETCODE
,RETRY=nnn
,ROR=NO
,STOP
,SUPULAB
,VALIDATE=INPUT|OUTPUT|ALL
,VERIFY
,WTO

The ANALYZE Control Statement is required (unless FATAR control statement input is omitted altogether). However, all of its operands are optional. Operands may appear in any order on the statement. Operands are available to control the input tape operation, error recovery actions and printing plus a few others; they are presented in those categories below. One ANALYZE statement must be first in the input.

If ANALYZE has no operands, or if the control statement data set is omitted altogether, FATAR will perform the following functions:

– Input tape will be tested for presence of labels. If not labeled, all files on one tape will be read up to a double tape mark (end of tape). If labeled, all files on all input volumes will be read until a double tape mark is read or the list of volumes is exhausted (EOV labels will cause tape switching).

– If labels are ANSI, all labels and data will be translated from ASCII to EBCDIC.

– If present, all labels will be printed. If the TAPESUMM DD statement is present, a summary of the files read will be printed for each input tape.

– All temporary and permanent data checks will be noted, including printing 80 bytes from the blocks preceding and following the data check block.

CONTINUED . . .

23.2 CONTINUED . . .

– If DCB information is available (from tape labels or JCL), all blocks on TAPEIN will be checked to ensure that they don't exceed the blocksize, that they contain validly formatted fixed or variable records, and, for variable spanned records, that the record segments are valid.

– If the TAPEOUT DD statement is present, all data read from TAPEIN will be written to TAPEOUT, except that data check blocks will be dropped. The label type of TAPEOUT is controlled by the JCL for TAPEOUT. If TAPEIN is labeled, the output data sets will have the same names as the input data sets.

23.2.1 INPUT TAPE OPERANDS

BLP

The BLP operand is provided to help when installation conventions do not allow LABEL=(,BLP) to be specified on a JCL DD statement, but it is desired to bypass label processing on TAPEIN so that FATAR can open and process any tape (such as when the true volume serial is unknown). When BLP is specified on the ANALYZE statement, the JCL label parameter will be changed to BLP internally before TAPEIN is opened. If a file number is specified in JCL it is not changed, e.g., LABEL=3 will become LABEL=(3,BLP). BLP may still be disallowed by installation open exits or security systems.

CHANEXTENDER =YES

When the input tape is connected to the system by a channel extender (a device that allows tapes to be located far from the CPU), the I/O techniques used by FATAR may cause poor performance. If FATAR appears to run exceptionally slow when analyzing or copy tapes over a channel extender, specify CHANEXTENDER=YES. This will modify the FATAR READ I/Os to improve performance. Note that on 3490E cartridge drives, FATAR will no longer be able to report on the WRAP point (the point where the tape reverses and starts back toward the physical beginning.

ENDAFTER=

The ENDAFTER operand causes FATAR to stop reading TAPEIN after a certain block in a given file has been processed; it is much like the NUMFILES= parameter above except that it can terminate at any point within a file. "nnnnn" is the logical file number (see "MODIFICATION/SCAN OPERANDS" in Section 23.4 MODIFICATION/SCAN OPERANDS) and "bbbbbb" is a decimal number giving the block number (the first block in each file is block 1).
"n" may be 1-32767, "b" may be 1-999999.

EOV=NO

If LABELS=NO has been specified to suppress processing of TAPEIN tape labels but the tape is actually labeled (such as when doing an "image copy"), FATAR will still perform 2 label checks: it will identify EOV labels since they are not be followed by two tape marks, and FATAR cannot otherwise tell when it has reached the end of the tape. Also, if copying to an output tape, block counts will be updated in any EOF or EOV labels encountered. Specifying EOV=NO suppresses both of these actions.

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LABELS= Controls processing of tape labels on TAPEIN.

YES specifies that the input tape is to be checked for standard IBM labels or ISO/ANSI labels; if present, these labels will be processed and printed, and the data set name and DCB information will be used for copying the data set; if not present, the tape will be treated as unlabeled (as if LABELS=NO was given).

NO forces the input tape to be treated as unlabeled (even if it does have labels); all physical files will be treated as data. This can be used on a labeled tape to perform an "image copy".

OS requests that the operating system is to handle all label processing instead of FATAR. In this mode FATAR does a analyze or copy of a single file only. NUMFILES=1 is assumed and JCL parameters control whether TAPEIN is treated as labeled or not.

REQUIRED is the same as LABELS=YES, but in addition, if VALIDATE=ALL or INPUT is specified, the input tape will be rejected if it is not labeled.

IMAGE is invokes a special "image copy" mode, used to make an exact bit-for-bit duplicate of a single input tape volume on an output tape. It acts similar to LABELS=YES for processing of labeled and unlabeled input tapes. See See Section 21.4 OUTPUT TAPE PROCESSING for details.

Default: LABELS=YES

NOTE: LABELS=YES will be automatically changed to LABELS=NO if the first block read is not a label; this means that LABELS= rarely needs to be used since FATAR will properly handle a labeled or unlabeled tape automatically.

4 Controls how FATAR determines the next input volume for multi-volume input tape sets.

JCL causes FATAR to mount and read all of the volumes specified by the TAPEIN DD statement. These volumes must all be part of a multi-volume tape set, in the proper order. Note that if the tape set contains multiple data sets (multi-volume multi-file) and the TAPEIN DD references a data set on the tape via the system catalog (UNIT and VOLUME not given), it may not mount all the tapes in the set; in this case you will usually have to specify all the volumes in the set in the JCL.

TMS causes FATAR to use the table of tape serials obtained from your tape management system to mount and read all the tapes in the multi-volume set. The first tape is determined by the TAPEIN DD statement, but any other volumes which follow that first volume are taken from the tape management information. If the FATS/FATAR tape management interface has not been installed (See Section 90.3 IMPLEMENTING THE TAPE MANAGEMENT INTERFACE) or if the first input tape is not recorded in your tape management data base, it will revert to NEXTVOL=JCL processing.

Default: NEXTVOL=JCL

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NUMFILES=
NF=

"n" is a decimal number specifying the number of logical files which FATAR is to read from TAPEIN. A logical file is one standard label file if labels are being processed, or one physical file if not. If labels are processed and an input file extends to more than one volume, it is still considered one logical file. If "n" is 0, FATAR will read all files until two consecutive tape marks are read (signifying the logical end-of-tape), or until all input tape volumes have been processed. Also, if labels are not being processed and "n" is 0, FATAR will stop if EOV labels are read. Note that if "n" is a value greater than the actual number of files on a tape, round tapes may run off of the reel and require operator intervention to rethread; this cannot occur on cartridge tapes. "n" may be 1-32767.

Default: NUMFILES=0

PRINTTMS=

If the FATS/FATAR tape management interface is installed, FATAR will query your tape management system using the volume serial of the first input tape; the interface will return a table showing all data sets on the tape (or tape set) and all volumes in the tape set (See Section 21.5 TAPE MANAGEMENT SYSTEM SUPPORT).
YES will print the tables returned by the tape management interface.
NO will not print the tables.

Default: PRINTTMS=NO

STOP

When specified, message FATSW12 will be written to the operator at the end of each file read from TAPEIN, giving the option of terminating FATAR or continuing. This provides a measure of dynamic control of FATAR.

WTO

When specified, message FATSW11 will be written to the operator at the end of each file read from TAPEIN or verified from TAPEOUT, giving the block and error counts.

23.2.2 ERROR RECOVERY OPERANDS

EODRETRY=

"n" is a decimal number specifying the number attempts that FATAR will make to reposition and continue after an EOD (End of Data) mark is encountered on cartridge tapes. 3490E, 3590 (Magstar) and similar drives record an EOD mark after the last valid data on an output cartridge; EOD marks are usually encountered by FATAR only when trying to recover data from an overwritten tape; the EOD mark precedes the data to be recovered. Note that 3480 drives do not record an EOD mark. Depending on the type and vendor of the drive, FATAR will make the specified number of attempts to position past the EOD and read the overwritten data; it may not be successful, and even if successful may be forced to space past some of the original data. "n" may be from 0 to 255.

Default: EODRETRY=0

KEEP

By default, FATAR will not copy to TAPEOUT any blocks which had permanent data checks when read from TAPEIN. If KEEP is specified, FATAR will write to TAPEOUT whatever data it was able to read from TAPEIN during the last recovery attempt on a data check block. Note that the block length may be incorrect due to the data check.

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MAJERR= If "n" major errors (FATS046/7/8/9 messages) are detected on TAPEIN, FATAR will issue message FATS016 and abend with a U0888 Abend. "n" may be 1-32767.

Default: MAJERR=1

MAXERR= If "n" permanent data checks are detected on TAPEIN, FATAR will abend with a U0888 Abend. "n" may be 1-32767.

Default: MAXERR=20

MAXTERR= If "n" temporary data checks are detected on TAPEIN, FATAR will abend with a U0888 Abend. A temporary data check is one which FATAR reads successfully during recovery processing. "n" may be 1-32767.

Default: MAXTERR=100

RETRY= "n" specifies the number of times FATAR will attempt to re-read a block on TAPEIN which results in a data check before considering the error permanent. FATAR will attempt this many retries in each direction (forward read and backward read). "n" must be from 0 to 256. "RETRY=0" suppresses all re-read attempts and considers the error permanent immediately; if a tape drive cannot seem to "get past" an error on a tape, this may allow the tape to be read. RETRY= is used only on round (3420-type) tapes; for tape cartridge systems, because of the extensive error recovery done by the tape control unit, RETRY=0 will be forced and cannot be overridden.

Default: RETRY=40 on round tapes, RETRY=0 on cartridges

ROR=NO ROR=NO suppresses "READ-OPPOSITE-RECOVERY", the attempt to recover from a data check by reading it in the backwards direction. With this parameter specified, FATAR will only attempt forward re-reads for data checks. ROR is used only on round (3420-type) tapes.

23.2.3 OUTPUT TAPE OPERANDS

COMPACTION= If TAPEOUT is a cartridge tape capable of writing compacted (IDRC) format, COMPACTION= (which can be abbreviated COMP=) controls compaction on the output tape.

SYSTEM uses the system default for your installation.COPY will use compaction if the input file was compacted, otherwise the output file is not compacted.

COMP will always compact the output tape.

NOCOMP will never compact the output tape.Following MVS standards, labels on cartridge tapes are never compacted by FATAR.

Default: COMPACTION=COPY

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CAT=

Controls cataloging of tape files copied to the output tape:NO - output tape files will not be cataloged.
YES - output tape files will be cataloged if they are not already cataloged

RECAT - output tapes files will be cataloged; if they are already cataloged, the catalog will be updated. If you are copying a tape and are not renaming the output files (no RENAME statement), CAT=RECAT is required to change the catalog to point to the new output volume and device type.

Cataloging will be attempted only if FATAR knows the full output data set name; in most cases this is true only if the FATS/FATAR tape management interface is enabled; See Section 21.4 OUTPUT TAPE PROCESSING and See Section 21.5 TAPE MANAGEMENT SYSTEM SUPPORT for details. Cataloging is ignored for an image copy (LABELS=IMAGE).

Default: CAT=NO

CRDATE=

If TAPEOUT is a labeled tape, the creation date recorded in the labels on TAPEOUT will be the current run date, unless CRDATE=COPY is specified, causing the creation date to be copied from the corresponding labels on TAPEIN if it is also labeled. CRDATE=COPY is not recommended for CA-1 (TMS) tape management system users since it affects the expiration date on TAPEOUT in unpredictable ways.

Default: CRDATE=TODAY

EOTBLOCKS=

When performing a image copy (LABELS=NO), the output tape volume must always be long enough to hold all of the data on the input tape volume. However, when the input volume was originally written all the way to the end (usually because it was part of a multi-volume tape set), minor differences in tape lengths may make the chosen output tape just slightly too short to hold all the input data before logical EOT (End of Tape) is reached. EOTBLOCKS= specifies the number of additional blocks FATAR will attempt to write to TAPEOUT even after reaching logical EOT. Care must be used on round (3420-type) tapes since writing too much data after EOT may cause the tape to run off the reel and require operator intervention; this cannot occur on cartridge drives.

Default: EOTBLOCKS=10 on round tapes, EOTBLOCKS=999 on cartridge tapes.

OUTBLP

OUTBLP is provided to help when installation conventions do not allow LABEL=(,BLP) to be specified on JCL DD statement, but it is desired to bypass label processing on TAPEOUT so that FATAR can open and process any tape (such as when the true volume serial is to be overwritten in an image copy). When OUTBLP is specified on the ANALYZE statement and DEFER is coded in the UNIT parameter of the DD statement, the JCL LABEL parameter will be changed to BLP internally before the tape is opened. If a file number is specified in JCL it is not changed, e.g., LABEL=3 will become LABEL=(3,BLP). BLP may still be disallowed by installation open exits or security systems.
OUTBLP is forced if LABELS=IMAGE is specified, since BLP processing on the output tape is required for image copies (See Section 21.4 OUTPUT TAPE PROCESSING).

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MAXRBLK= "n" is a decimal number giving the largest blocksize to be considered for reblocking (MAXRBLK= is meaningful only if REBLOCK= is also specified). Any input file whose blocksize on TAPEIN is greater than "n" will not be reblocked. "n" may be 4-32767.

Default: All files are reblocked (if REBLOCK= given).

OUTDSN=YES When LABELS=NO is specified (an "image copy"), and VALIDATE=OUTPUT or ALL is specified, OUTDSN=YES requests FATAR to verify that the data set name in the labels of the output tape consists of 17 character zeros ("0"). This is the state that a tape freshly initialized by FATS or by IEHINITT will be in, so this verifies that the output tape is a newly initialized tape.

Default: the output data set name is not verified.

OUTSER=YES When LABELS=NO is specified (an "image copy"), OUTSER=YES will cause the volume serial of the output tape mounted to be preserved, i.e., the image copy is modified so that the output tape volume serial is inserted in the volume label (VOL1) and data set labels as the data is copied. In most cases, this type of copy should be done as a logical copy (LABELS=YES), but OUTSER=YES can be used when the exact layout of the tape must be preserved.

Default: the volume serial of the input tape will be copied to the output during an image copy.

OUTVOL=INVOL When LABELS=NO is specified (an "image copy"), and VALIDATE=OUTPUT or ALL is specified, OUTVOL=INVOL requests FATAR to verify that the tape mounted on TAPEOUT has the same volume serial as the tape on TAPEIN, in other words, that the output tape has been initialized and labeled with the same volser as the input tape in preparation for the image copy.

Default: the output tape serial will be used for validation (if requested).

REBLOCK= "n" is a decimal number specifying the target blocksize for data reblocking. When this keyword is specified, all files will be reblocked as they are copied to have blocksizes as close to "n" as possible. "n" may be 4-32767. MAXRBLK= may be specified to bypass reblocking on files which already have an acceptably large blocksize.

Default: Blocks are copied as read from TAPEIN.

SUPULAB If any file read from the input tape contains user labels and the output tape is a labeled tape, the user labels will be copied to the output tape unless SUPULAB is specified.

Default: User labels copied if output tape labeled

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23.2.4 PRINT CONTROL OPERANDS

BYTEFACTOR=

Whenever byte counts are rounded to kilobytes or megabytes, BYTEFACTOR specifies the divisor used to calculate the values. Only 2 values are accepted: BYTEFACTOR=1000 (the default) divides the byte counts by 1000 or 1000000. BYTEFACTOR=1024 divides by 1024 or 1048576.

Default: BYTEFACTOR=1000

CHAR
HEX
DUMP

CHAR specifies that FATAR will print any required blocks or records in EBCDIC, 80 characters per print line.

HEX specifies that FATAR will print in hexadecimal format, 8 groups of 4 bytes (32 bytes total) per print line.

DUMP specifies a combination, with the 32 characters of EBCDIC printed to the right of the same 32 bytes of data in hexadecimal.

This format can be overridden for specific blocks on a PRINT Control Statement.

Default: CHAR

CHARTAB=

Specifies the name of a load module containing a 256-byte translate table. This will be used by FATAR whenever it translates hexadecimal data to EBCDIC for printing. This can be used for special printer character sets or for special national characters. The load module will be LOADed by FATAR so it must be in the FATAR load library or some other library accessible to FATAR. See Section 90.4 for instructions on creating your own translate table. The translate table name can be anything you like, except that FATCHRTB cannnot be used.

Default: an internal translate table (FATCHRTB) is used which prints standard US printer numerics, uppercase alphabetics and normal special characters. All other characters are translated to periods.

LBLPRT=

Whenever FATAR recognizes labels on the input tape, it will normally print those labels (even if label processing has been suppressed by LABELS=NO). Formatting of labels is independent of the CHAR, HEX, and DUMP operands described above. LBLPRT= specifies an overriding print format for labels only. The values CHAR, HEX, and DUMP have the same meanings as the equivalent operands described above. **LBLPRT=FORMAT** causes the labels to print in character format, followed by a two line breakdown of the individual fields in each label so that the contents of those fields can be determined more easily. **LBLPRT=NONE** suppresses label printing. Labels will be recognized and printed even when label processing has been suppressed by LABELS=NO.

Default: LBLPRT=FORMAT

23.2 CONTINUED . . .

MSGLEVEL=0 By default, FATAR will print the contents of any block which has been modified by a REPLACE or KEEP Statement (up to the limit specified by PRTLEN=). MSGLEVEL=0 will suppress this print (FATAR will continue to print a line documenting that the block was modified).

PRTLEN= Whenever a block from the input tape is to be printed, for whatever reason, FATAR will print only the first "n" bytes or characters of data unless overridden by a PRINT Control Statement. If the block is being deblocked, FATAR will print as many logical records as exist in the first "n" bytes (and may truncate the last record). "n" may be 0-65535.
Default: PRTLEN=80

NONMETRIC
METRIC When NONMETRIC is specified (or defaulted) FATAR will list tape lengths and error positions and lengths in American units (feet and inches). When METRIC is specified FATAR will list tape lengths and error positions and lengths in metric units (meters and centimeters).Default: NONMETRIC

23.2.5 MISCELLANEOUS OPERANDS

COMBFILES Combine all files found on TAPEIN into a single file on TAPEOUT. The tape labels on TAPEOUT will show the DCB characteristics copied from the first file on TAPEIN; COMBFILES is intended for use when all the files on TAPEIN have similar characteristics. If the DCB characteristics of the TAPEIN files vary, various FATAR errors may occur, and any application which reads the combined output tape may also experience errors.

EXIT= Activate FATAR user open exit facility described in Section 21.4 OUTPUT TAPE PROCESSING, output tape processing. The parameter "exitname" is the name of the load module to be loaded by FATAR and executed at open time for TAPEOUT.
Default: No exit is activated.

LENCHK If specified, FATAR will compare the length of every block read to the length of the preceding block and print the contents of the block if the lengths do not match. The first block in every file will always print. This can be used to scan a fixed length file for improper length blocks.

RETCODE RETCODE causes FATAR to terminate with a return code (condition code) of 12 rather than a U0200 or U0888 abend when serious errors are found.

23.2 CONTINUED . . .

VALIDATE= If LABEL=(,BLP) is specified on TAPEIN or TAPEOUT DD Statements, data management will not VERIFY the volume serial or expiration date of the tapes. However, if VALIDATE= is specified, FATAR will verify the volume serial of TAPEIN (VALIDATE=INPUT), TAPEOUT (VALIDATE=OUTPUT) or both (VALIDATE=ALL). The volume serial compared is the serial in the DD statement. For TAPEOUT, the expiration date in the tape label will be checked. If the wrong volume is mounted or if the expiration date is not yet reached, FATAR will issue message FATSW08 to the system operator giving the option of ignoring the error, mounting another tape, or terminating. TAPEOUT validation applies only to the first output volume.
Default: No validation

VERIFY If VERIFY is specified and an output tape is being produced, at the conclusion of the copy FATAR will reopen the output tape as input and re-read it to verify its readability and contents (it is not compared to the input tape). All FATAR options are reset to their defaults and all MODIFICATION and SCAN Control Statements are ignored during the verification.

23.3 MODIFICATION/SCAN STATEMENTS

MODIFICATION & SCAN STATEMENTS

The FATAR block MODIFICATION and SCAN Control Statements (PRINT, DROP, KEEP, REPLACE, and SCAN) invoke optional facilities of FATAR to print data from TAPEIN, to scan TAPEIN data blocks for certain data or types of data, and to modify TAPEIN data blocks before they are written to TAPEOUT. The RENAME statement is also a MODIFICATION statement, but is used to rename files as they are copied to the output tape.

There may be as many MODIFICATION/SCAN statements as required. More than one statement may refer to the same block on TAPEIN; if so, the statements are executed in the order in which they appear in the control statement input. An exception to this is the PRINT Statement, since each data block will be printed only once; the last PRINT Statement which applies to a given data block is the one which will control its printing.

All operands must be specified on the MODIFICATION/SCAN Control Statements in the order shown in the statement formats below. However, it is not necessary to indicate the absence of optional operands with a comma. Because many of the operands are common on these statement, the operands are described separately in Section 23.4 MODIFICATION/SCAN OPERANDS, except where special notes apply to a particular statement.

Use of these statements can be confusion. The FATAR examples in Section 26.0 FATAR EXAMPLES OF USAGE contain examples of the use of each kind of MODIFICATION/SCAN statement. You may wish to review them as you read the following descriptions.

23.3.1 PRINT STATEMENT

PRINT STATEMENT

PRINT **ALL**

,LF=ALL|n**H**|n|n**T**

,B=ALL|b1|b1-b2

,L=l

,CHAR|HEX|DUMP

The PRINT statement requests that data blocks from TAPEIN be printed after other MODIFICATION Statements have been applied. By default, the length and format of the printout are controlled by the PRTLEN=, CHAR, HEX, and DUMP operands on the ANALYZE Statement (which themselves default to 80 bytes in character format), but this can be overridden by the L= and CHAR/HEX/DUMP operands on the PRINT statement itself.

Note that the print length refers to the number of characters or bytes to print from each block, even if the blocks are being deblocked into logical records. If the length to print is longer than one logical record, the printout will be formatted into logical records.

The PRINT ALL statement causes all blocks in all files on TAPEIN to be printed, and cannot have any other operands on it. In this case, the length and format are controlled by the above-mentioned ANALYZE operands.

Examples:

```
PRINT ALL
PRINT LF=ALL,B=1-5
PRINT LF=3,B=4-7,L=400,DUMP
PRINT LF=1T,B=ALL,HEX
```

CONTINUED . . .

23.3 CONTINUED . . .

23.3.2 DROP STATEMENT

DROP STATEMENT

DROP **DCK**

,LF=ALL|n**H**|n|n**T**

,B=ALL|b1|b1-b2|b1.r1|b1.r1-b2.r2

The DROP statement causes one or more blocks or records to be dropped (not copied from TAPEIN to TAPEOUT). If the DCK operand is specified, the drop will be done only if the affected block had a permanent data check when read from TAPEIN. If B=ALL is given, the entire file referenced by LF= will be dropped from TAPEOUT, including all tapemarks and labels (to drop all data from a file without dropping the file itself, specify "B=1-999999").

Dropping individual records (the "B=b1.r1" or "B=b1.r1-b2.r2" formats), is effective only if the blocks on TAPEIN are being deblocked into records. If all of the records in a block are individually dropped, the entire block will be dropped.

Note: unless the KEEP operand is specified on the ANALYZE statement, the default operation of FATAR is to drop (not copy to TAPEOUT) any block that has a permanent data check on TAPEIN. It is not necessary to include a DROP DCK,LF=ALL,B=ALL statement to accomplish this. Including such a DROP statement will cause FATAR to unnecessarily generate a message for every block that it did not drop.

Examples:

```
DROP LF=3,B=ALL
DROP  LF=1,B=1-2
DROP  LF=3,B=5.6-6.2
DROP  DCK,LF=7,B=ALL
```

CONTINUED . . .

23.3 CONTINUED . . .

23.3.3 KEEP STATEMENT

KEEP STATEMENT

KEEP **DCK**
,LF=ALL|n**H**|n|n**T**
,B=ALL|b1|b1-b2
,L=l
,P=p
,J=R

The KEEP statement causes blocks from TAPEIN to be copied to TAPEOUT, even if they would be dropped because of a DROP statement, or because of a permanent data check (the DCK operand is required to keep a data check block). Note that if you want to keep all such data check blocks, use the KEEP operand on the ANALYZE statement instead of a KEEP statement.

If the optional L= operand is given, the KEEP statement may be used to change the length of a block as it is being copied from TAPEIN to TAPEOUT. L= specifies the new block length and P=, if given, specifies location in the new block (relative to 1) where the old data will be placed. J=R requests that the old data be right-justified in the new block, with the rightmost byte of the old data block positioned at the location specified by P=; if J=R is omitted, the data is left justified, with the leftmost byte placed at the P= location. These combinations allow full control over repositioning of the data. Any extra bytes added at the front or end of the new block will be set to spaces (blanks). Whenever the length of a block is changed, deblocking of that block into logical records will be terminated.

Examples:

```
KEEP
LF=1,B=ALL
KEEP  LF=ALL,B=1-5
KEEP  DCK,LF=1,B=ALL,L=5000
```

CONTINUED . . .

23.3 CONTINUED . . .

23.3.4 REPLACE STATEMENT

REPLACE STATEMENT

REPLACE	**DCK**
	,LF=ALL|n**H**|n|n**T**
	,B=ALL|b1|b1-b2|b1.r1|b1.r1-b2.r2
	,P=p
	,V=string
	,S=string
	,D=string
	,ALL

The REPLACE statement is used to modify data within blocks being copied from TAPEIN to TAPEOUT, and also to scan for blocks or records containing a specified data string (even if TAPEOUT is not present). If TAPEIN data blocks are being deblocked, the REPLACE Statement operates on a logical record basis.

If D= is specified without V= or S=, the data string specified by D= will be placed in every affected data record or block at the location given by P=.

If D= is specified with V=, the data in every affected data record or block will be verified for the current contents specified by V= before the data from D= is placed there (again, the location within the block or record is given by P=). This allows you to be sure the proper data field is being replaced, or to search a set of records for the proper one to modify.

If D= is specified with S=, every affected record or block will be scanned (starting at the location specified by P=, default 1) for the data string specified by S=. If found, the replacement data given by D= will be stored at the location where the S= data was found. Normally, only one such replacement will be done in each record or block, but if the parameter ALL is also given, the scan will continue until the end of the record/block.

If V= or S= is given without D=, verification or scanning will take place as described above, but no data modification will be done. This allows the REPLACE statement to be used to scan data for specific data strings, since any block on which REPLACE successfully operates will be eligible for printing.

Examples:

```
REPLACE LF=ALL,B=ALL,S=C'ORIGINAL',D=C'NEW DATA',ALL
REPLACE LF=3,B=ALL,P=10,V=X'1302',D=X'1503'
REPLACE LF=ALL,B=5.2-20.6,S=C'FIND THIS STRING'
```

23.3 CONTINUED . . .

23.3.5 SCAN STATEMENT

SCAN STATEMENT

SCAN	**DCK**
	,LF=ALL|n**H**|n|n**T**
	,B=ALL|b1|b1-b2|b1.r1|b1.r1-b2.r2
	,L=l
	,P=p
	,T=t

The SCAN statement causes specified data fields to be validated for specific type of content. Scans are performed on a logical record basis if records are being deblocked. The field to be scanned is at the location specified by P= (relative to 1) for the length specified by L=. If T=Z is specified, the field is checked for valid zoned decimal characters including decimal sign characters. If T=P is specified, the field is checked for valid packed decimal characters. For any other value of T=, there must be a corresponding TABLE Statement with the same T= value, and the SCAN statement will validate the presence or absence of the characters specified there. A message will be issued for every field which fails the SCAN test and the failing block will be printed.

Examples:

```
SCAN  LF=1,B=ALL,L=5,P=22,T=P
SCAN  LF=ALL,B=ALL,L=7,T=Z
SCAN  LF=3,B=1-20,L=5,P=20,T=A   (see TABLE example)
```

23.3.6 TABLE STATEMENT

TABLE STATEMENT

TABLE	**,R**
	,T=t
	,D=string

The TABLE statement is used to define a set of characters for SCAN statement operations. T= must specify a unique letter (except for P and Z which are reserved) for naming the table, so up to 24 tables can be defined. Each table can contain up to 256 characters, specified by the D= operand. The TABLE statement must precede any SCAN statement which references it. If a field being scanned contains any character not in the table, it will be flagged and its block printed. If the optional operand R is included, this operation is reversed, so that if the field contains any character which is in the table, it is flagged.

Examples:

```
TABLE T=A,D=C'0123456789ABCDEF'  printable hex
TABLE T=A,D=C' ADFQR',
 X'FF7F',C'269'
```

CONTINUED . . .

23.3 CONTINUED . . .

23.3.7 RENAME STATEMENT

RENAME STATEMENT

RENAME **,LF=ALL**|n

,NEWN=newname|**NEWI=**newindexmask

When an output tape is being created, RENAME can be used to change the name of the file(s) created on the output tape. The LF= operand specifies to which files on the input tape this RENAME statement applies; it can be for a single file, or for all files on the tape (in the latter case, the NEWI= operand is usually used).

NEWN= specifies a full replacement data set name, up to 44 characters. If the name ends in a GDG relative generation number, e.g., NEWN=PROD.MAST(+1), a LOCATE done to get the proper absolute generation number. Note that if NEWN= is used with LF=ALL, all copied files on the output tape will have that name.

NEWI= specifies that the output data set name is to be constructed by adding or replacing one or more index levels in the original name (from the input tape); replacement index levels do not have to be the same length as the original indexes they replace. In the simplest case, FATAR will use each index level specified in NEWI in place of the corresponding index in the original name. Any remaining index levels at the end of the name are copied unchanged. This can easily be used to change the first indexes of the name.

For example, if copying data set A.B.C.D,

NEWI=D	results in	D.B.C.D	(first index replaced)
NEWI=DD.E	results in	DD.E.C.D	(first 2 indexes replaced)

If a period is specified without any preceding characters, FATAR will copy one original index level from the input data set name to the output. This allows you to easily modify indexes in the middle of the name.

For example, if copying data set A.B.C.D,

NEWI=..E	results in	A.B.E.D	(third index replaced)
NEWI=FF...G	results in	FF.B.C.G	(first and fourth indexes replaced)

If + is specified before a new index level, FATAR will insert that new index into the output data set name at that point. If ++ precedes the new index, it will be added to the end of the name. If - is specified, the next input index level will be dropped from (not copied to) the output name.

For example, if copying data set A.B.C.D,

NEWI=+F	results in	F.A.B.C.D	(new first index added)
NEWI=..+F	results in	A.B.F.C.E	(new third index added)
NEWI=++F	results in	A.B.C.D.F	(new last index added)
NEWI=..++F	results in	A.B.F.C.E	(new third index added)
NEWI=..-	results in	A.B.E	(third index dropped)
NEWI=Q.-.+E	results in	Q.C.E.D	(combination)

Note that, except for the ++ option, every period in the NEWI= mask corresponds to a period (one index level) in the original (input) data set name. FATAR will check the resulting new name to insure it meets IBM standards.

CONTINUED . . .

23.3 CONTINUED . . .

23.3.7 RENAME STATEMENT

If the NEWI= value ends in a GDG relative generation number, e.g., NEWI=..NEWMAST(--2), that relative number will be added to the end of the newname, and a LOCATE done to get the proper absolute generation number.

NEWI= is a convenient way to rename every file on a multi-file input tape as it is copied to the output tape, while using some index levels from the original name and replacing other indexes or adding new indexes. However, the NEWI= statement is honored only if FATAR knows the full, accurate data set name of the input file being copied; this is usually true only if the FATS/FATAR tape management interface is enabled (See Section 21.5 TAPE MANAGEMENT SYSTEM SUPPORT).

23.4 MODIFICATION/SCAN OPERANDS

The following are details of the keyword parameters which may appear on the MODIFICATION/ SCAN Statements in the preceding sections. Consult the definitions of each statement to see which parameters are valid on each statement, and in what form.

ALL
On a REPLACE statement containing the S= operand, specifies that all occurrences of the scan string in the current block or record are to be replaced. If omitted, only the first occurrence of the scan string is replaced.On a PRINT statement, specifies that all data blocks are to be printed, using the formatting requested by the PRTLEN= and CHAR/HEX/DUMP operands on the ANALYZE statement.

B=ALL
B=b1
B=b1-b2
B=b1.r1
B=b1.r1-b2.r2
Specifies to which blocks within the file specified by LF= the statement applies.
B=ALL requests all blocks in the file.
B=b1 causes it to apply only to one specified block.
B=b1-b2 specifies a range of blocks (b1 less than b2).
B=b1.r1 indicates a specific record within a specific block (record deblocking must be in effect).
B=b1.r1-b2.r2 causes the statement to apply to a range of records from record r1 in block b1 to record r2 in block b2 (b1 and b2 may be the same).
b1, b2, r1, and r2 are all unsigned decimal numbers from 1 to 2,147,483,647 (without commas). Blocks within a file and records within a block are numbered starting with 1.

CHAR
HEX
DUMP
On a PRINT Statement, specifies an overriding print format (character, hexadecimal, or dump) for this PRINT Statement only. If omitted, the print format specified on the ANALYZE Statement will control the format for this PRINT Statement.

DCK
Specifies that FATAR is to perform the indicated operation only if the block affected had a permanent data check when read from TAPEIN.

J=R
On KEEP Statements only, specifies that the old data block is to be right-justified in the new data block (if not specified, the old data block is left-justified).

L=l
For PRINT, specifies an overriding print length.For KEEP, specifies the new length of the block.For SCAN, specifies the length of the field to verify. l must be an unsigned decimal number.

CONTINUED . . .

23.4 CONTINUED . . .

LF=ALL
LF=nH
LF=n
LF=nT

Specifies the logical file on the input tape to which this statement applies. "n" is a decimal number from 1 to 32767 giving the logical file number. If the input tape is labeled, this is the file sequence number, the same value you would specify in the LABEL=n parameter in JCL. Specifying "n" alone will cause the statement to apply to the equivalent data file. Appending an "H" or "T" after the file number causes it to apply to the header or trailer label file, respectively, preceding or following that data file. If the input tape is not labeled, or if labels are not being processed (LABELS=NO), then "n" is the physical file number relative to the beginning of the tape (file 1).
LF=ALL specifies that this statement applies to all files of the input tape.

NOTE: For compatibility with Version 3.0 of FATAR, the parameter F=n will be accepted in place of LF=. However, in this case, "n" specifies the physical file number only regardless of the label status of the tape, and header and trailer label files must be counted. Use of F= is not recommended for new applications.

P=p

For SCAN and REPLACE, specifies the starting location for the operation (if FATAR is deblocking logical records, specifies a location within a record). For KEEP, specifies the starting location (or ending location if J=R) of the old data block within the new block.
"p" must be an unsigned decimal number. P=1 is the default and specifies the first byte of the record or block. For deblocked variable format records, the first data byte is at location 5, past the 4 byte RDW (Record Descriptor Word).

T=t

On a TABLE Statement, defines the name of a table for reference by a SCAN Statement. "t" must be a unique letter other than P and Z, which are reserved.

On a SCAN Statement, specifies the type of scan to be performed:

T=Z – scan for zoned decimal numbers

T=P – scan for packed decimal numbers

T=t – scan according to user table "t"

V=string
S=string
D=string

Defines a data string on a REPLACE or TABLE statement. The data may be in EBCDIC characters or hexadecimal bytes, or a combination of both, using this format:C'chardata' - defines an EBCDIC string up to 255 bytes in length.X'hexdata' - defines a hexadecimal string up to 255 bytes in length.A string consisting of both character and hexadecimal data may be defined by simply placing the C and X operands after one another, separated by commas. For example,D=C'ABC',X'43C721',C'XYZ'defines a 9-byte string consisting of the 3 separate strings concatenated together.

Longer strings obviously cannot fit on a single control statement record, so a data string is continued onto another record by closing the string with a quote and comma followed by a blank, and starting on the next card (in any column) with X' or C'.

For example,V=C'THIS IS A VERY LONG STRING THAT IS GOING TO BE ', C'CONTINUED ON THE NEXT RECORD'

24.0 FATAR SPECIAL CONSIDERATIONS

This section will examine special considerations for the use of FATAR, primarily recovering from special sorts of errors.

24.1 VARIABLE SPANNED RECORDS

S002 ABENDS

S002 abends on variable spanned format tapes (RECFM=VBS or VS) can be very frustrating because of the difficulty in diagnosing and correcting the errors. By far the most common use of VBS format is for SMF/RMF data, since their format is variable with few limitations on the maximum logical record size, so a S002 abend on those tapes may threaten an installation's accounting and performance data.

S002 abends usually indicate an improperly spanned logical record, due to some logical or physical error when creating the tape, or possibly due to blocks dropped when copying with FATAR because of permanent data checks. FATAR is one of the few programs which can detect and correct these spanning errors, but it is a process requiring several passes of the tape and some human analysis.

VARIABLE SPANNED FORMAT

Variable spanned tapes have the characteristic that logical records may "span" across two or more physical blocks. Because of this, a logical record may be larger than the blocksize of the file. Because VBS format attempts to fill each physical block to capacity, the last logical record in each block, regardless of size, will almost always span to the next block, so almost every block begins and ends with a spanned record.

When a record is broken into pieces for spanning, each piece is referred to as a segment. There are flags in the RDW (record descriptor word, preceding each variable length record) which indicate "first segment", "middle segment", or "last segment" of the total logical record ("middle segment" exists only when a logical record spans three or more blocks).

Note: IBM uses VBS format for SMF data on disk because the maximum SMF record size (32760) exceeds the blocksize typically used for the SMF data sets. However, when SMF data is copied to tape, there is no reason that it must remain in VBS format. Since tapes can easily support blocks up to 32767 bytes in length, Innovation recommends that SMF data be converted to RECFM=VB (not spanned) during the copy to tape so that spanning errors on SMF data can be avoided altogether. Many utilities that are used for the SMF data copy can do this conversion. Unfortunately, even on a tape-to-tape copy, FATAR cannot do this type of conversion.

FATAR SPANNED FORMAT CHECKING

FATAR automatically performs spanning checks on VS or VBS tapes, detecting missing first or last segments. When FATAR detects a missing segment, it prints the message FATS069 START (or END) OF SEGMENT MISSING. The block and record numbers printed to indicate where the error was detected, but the actual problem is usually in the preceding block. End of segment missing indicates that FATAR found the start of a new logical record before finding the end of the preceding logical record, which started in one of the immediately preceding blocks.

Start of segment missing indicates that FATAR found a middle or end segment not preceded by a start segment, which again should have been in the preceding block. One situation FATAR cannot detect is a missing middle segment where the start and end segments exist; it might even be that those start and end segments do not even belong together because of lost intermediate blocks, but there is no way to detect that. These errors will not usually cause S002 abends, but may cause data errors in the application programs reading them. If you can identify the records causing the error, FATAR may still be used to correct this problem.

CORRECTING S002 ABENDS

To correct these problems with FATAR, follow this procedure:

1) Analyze the tape once with FATAR (no TAPEOUT) and note which blocks and records FATAR identifies as having spanning errors (FATS069 messages).

CONTINUED . . .

24.0 CONTINUED . . .

2) Analyze the tape again, printing the complete blocks for at least three blocks before and after each block identified by FATS069, using this input:

```
ANALYZE  PRTLEN=32760,DUMP
PRINT   LF=f,B=b1-b2
```

substituting the proper file number (f) and a range of block numbers (b1-b2). Include multiple PRINT statements if multiple FATS069 messages occurred.

3) Examine the printout to see where various logical records start and end. FATAR will print each physical block broken down into logical records; it prints the block number and then numbers the logical records (or segments) in the block. You can see the spanning flags in the printout in byte 3 of each segment:

   00 -- complete logical record (not spanned)

   01 -- start segment

   02 -- end segment

   03 -- middle segment

4) If you received START OF SEGMENT MISSING, then the middle and end segments left must be deleted. Starting at (and including) the block and record number indicated in the FATS069 message, look at each segment until you find the end segment (byte 3 = x '02'). Write down the block number and record number of each segment you examine (including the end segment) since each must be deleted.

5) If you received END OF SEGMENT MISSING, then start at the record preceding the one identified in the FATS069 message and look at each record going backwards until you find the start segment (byte 3 = x '01'). Write down the block and record number of each segment examined in order to delete them. Do not include the record from the FATS069 message.

6) Run FATAR again with a TAPEOUT DD statement in order to copy and correct the spanned tape, using this input:

```
ANALYZE VERIFY
DROP  LF=f,B=b.r
```

substituting the proper file number (f), block number (b) and record number (r) to be deleted. Include a DROP statement for each segment you identified above. The dropped segments should eliminate the spanning errors, and the verify option will cause the output tape to be analyzed to be sure (no FATS069 messages should occur during the verification phase).

24.2 RECOVERING DATA FROM OVERWRITTEN TAPES

OVERWRITTEN TAPES

A special recovery problem exists when a tape which still contains important data is accidentally used for output, resulting in an overwritten tape. Although tape management systems usually prevent accidentally overwriting of a tape which is not in scratch status, sometimes a tape will expire and be used for output while the original data is still needed, probably because of incorrect assignment of tape expiration dates.

Any data that is physically overwritten is gone, unfortunately, but if the new data file is shorter than the original data file, it is possible to recover the remains of the original data and copy it to another tape. This recovered data may or may not be useful, depending on the format of the data and its intended use.

To recover the remains of the partially overwritten data file, you must position FATAR to the beginning of that data (using LABEL=(n,BLP) on the TAPEIN DD statement. Since the header labels of the file are also overlaid, you will need some knowledge of the original data to be able to specify proper DCB information. Example 22 in Section 26.2 EXAMPLES shows how you might do this. See the tape layout examples below for guidance in setting "n" (5 is the most common value).

Because the first block of the remaining original data is probably partially overwritten, you will almost always get a data check on that block. Since FATAR will automatically discard that block, this can be ignored; the remaining blocks should be readable. Occasionally, the error on that first block will make the tape drive believe that a more serious error exists and refuse to read further. If this reoccurs on several different tape drives, the tape is probably not recoverable.

If the tape originally contained multiple data files, it may be that some of the original file are intact, yet they cannot be opened normally because of the overlaying data earlier on the tape. You can use FATAR to completely and automatically copy those files, but you need to position FATAR to the header labels of the first such file with LABEL=(n,BLP). Example 23 in Section 26.2 EXAMPLES shows an example of this function. The tape layouts below will help you understand the value of "n" to be used, but it may require some experimentation to get the right value.

EOD MARKS

On round (3420-type) tape and 3480-format cartridges, recovery from overwritten tapes is fairly simple, once the right value of "n" is found to access the original data.

But for tapes written on 3490E and 3590 (Magstar) cartridge drives, and similar drives from other vendors, the recovery is made more complex by the presence of an EOD (End-of-Data) mark which the tape drive writes after the last written data on each tape volume. The EOD was apparently designed to make it more difficult for an end-user to read past the end of a data file to which he is authorized and read residual unauthorized data from the tape. But it makes the job of a legitimate recovery more difficult. When the tape is overwritten, an EOD is written immediately after the overwriting file. Normal access methods cannot get past the EOD.

Using techniques which Innovation has obtained from IBM and other vendors, FATAR will attempt to bypass the EOD mark and recover the data beyond it. The technique used may depend on the manufacturer of the drive. In some cases the recovery may not be successful. In others, it may work but is forced to skip over some of the original data before beginning the recovery.

CONTINUED . . .

24.2 CONTINUED . . .

EXAMPLES OF OVERLAYING DATA

In these examples, TM represents a tape mark, a hardware end-of-file. To derive the "n" value to be passed to FATAR as LABEL=(n,BLP), count the tape marks preceding the data you want to recover and add 1. EOD represents a hardware End-of-Data mark, which will exist only on tapes created on IBM 3490E and 3590 (Magstar) drives and compatible drives.

If the tape originally contained a single data file, it looked like this:

VOL1	HDR1	HDR2	TM	DATA1	TM	EOF1	EOF2	TM	TM	EOD

If it is overlaid with a single data file shorter than the original it will look like:

VOL1	HDR1	HDR2	TM	DATA2	TM	EOF1	EOF2	TM	TM	EOD	DATA1 remainder	TM	EOF1	EOF2	TM	TM	EOD

There are 4 tape marks before the remainder of the original data file, so use LABEL=(5,BLP)

If the same tape is overlaid with a two short data files it will look like:

VOL1	HDR1	HDR2	TM	DATA2	TM	EOF1	EOF2	TM	HDR1	HDR2	TM	DATA3	TM	EOF1	EOF2	TM	TM	EOD	DATA1 remainder	TM	EOF1	EOF2	TM	TM	EOD

There are 7 tape marks before the remainder of the original data file, so use LABEL=(8,BLP) to recover the remainder of the original file 1,

If the tape originally contained two data files, it looked like this:

VOL1	HDR1	HDR2	TM	DATA1	TM	EOF1	EOF2	TM	HDR1	HDR2	TM	DATA2	TM	EOF1	EOF2	TM	TM	EOD

If it is overlaid with a single data file shorter than the first original file it will look like:

VOL1	HDR1	HDR2	TM	DATA3	TM	EOF1	EOF2	TM	TM	EOD	DATA1 remainder	TM	EOF1	EOF2	TM	HDR1	HDR2	TM	DATA2	TM	EOF1	EOF2	TM	TM	EOD

There are 4 tape marks before the remainder of the original first data file, so use LABEL=(5,BLP) to recover it. There are 6 tape marks before the header labels of the second data file, so LABEL=(7,BLP) is used to recover it.

If you are unsure of the format or size of the original or overlaying files, you can run a FATAR ANALYZE on the tape with NUMFILES=999; this will continue reading past the 2 consecutive tape marks at the end of the overlaying data file and show you what remains on the tape.

25.0 FATAR REPORT EXAMPLES

In this example, FATAR was executed with no control statements (all defaults). The input was a standard label 3480 cartridge containing 2 files; device type 3480XF is a drive capable of IDRC compaction, but this tape is not compacted. There is a data check on a block in the middle of the second file. 80 bytes of the block with the data check are displayed, as well as for the block before and after the data check block.

CONTINUED . . .

25.0 CONTINUED . . .

```
FAST ANALYSIS OF TAPE AND RECOVERY -- FATAR   VER 4.5.0   -- INNOVATION DATA PROCESSING  AUTHORIZED  12/27/96   PAGE   1

FATS070 CONTROL CARD TABLE SIZE IS   4096 BYTES
FATS014 NO CONTROL CARD DATASET. DEFAULTS ASSUMED
FATS071 TAPE BUFFER SIZE IS 65535 BYTES
                                      CHARACTERISTICS OF THE TAPE TO BE ANALYZED
                                                UNIT  DEVICE   SERIAL
                                                0391  3480XF   800432
                                                 FATAR DETAIL REPORT
 BLOCK  LNGTH/  MESSAGE/                1...5...10...15...20...25...30...35...40...45...50...55...60...65...70...75...80
 NUMBER DISPL  BLOCK TYPE                         (COLUMN GRID IS VALID ONLY FOR CHARACTER FORMATTED DATA)
* * * * * * *  START FILE       1H
      1    80  INPUT LABEL              VOL1800432
               ***VOLUME LABEL***            VOLSER=800432 OWNER=
      2    80  INPUT LABEL              HDR1RAY.SCR010       80043200010001       86192 000000000000IBM OS/VS 370
               ***HEADER LABEL***            DSNAME=RAY.SCR010        SERIAL=800432 VOLSEQ#=0001 FILESEQ#=0001
                                             CRTDT= 86192 EXPDT= 00000 SECURITY=0 BLOCKCOUNT=    000000
      3    80  INPUT LABEL              HDR2U327600000000SPSN    /COPY1           14850
               ***HEADER LABEL***            RECFM=U    LRECL=00000 BLKSIZE=32760 BUFOFF(ANSI)=
                                             DENSITY=0 TRTCH=   CREATING JOB/STEP=SPSN    /COPY1
* * * * * * *  END OF FILE      1H -- FILE CONTAINED       3 BLOCKS
* * * * * * *  START FILE       1
* * * * * * *  END OF FILE      1  -- FILE CONTAINED     486 BLOCKS
* * * * * * *  START FILE       1T
      1    80  INPUT LABEL              EOF1RAY.SCR010       80043200010001       86192 000000000486IBM OS/VS 370
               ***END-OF-FILE***             DSNAME=RAY.SCR010        SERIAL=800432 VOLSEQ#=0001 FILESEQ#=0001
                                             CRTDT= 86192 EXPDT= 00000 SECURITY=0 BLOCKCOUNT=    000486
      2    80  INPUT LABEL              EOF2U327600000000SPSN    /COPY1           14850
               ***END-OF-FILE***             RECFM=U    LRECL=00000 BLKSIZE=32760 BUFOFF(ANSI)=
                                             DENSITY=0 TRTCH=   CREATING JOB/STEP=SPSN    /COPY1
* * * * * * *  END OF FILE      1T -- FILE CONTAINED       2 BLOCKS
* * * * * * *  START FILE       2H
      1    80  INPUT LABEL              HDR1RAY.SCR501       80043200010002       86192 000000000000IBM OS/VS 370
               ***HEADER LABEL***            DSNAME=RAY.SCR501        SERIAL=800432 VOLSEQ#=0001 FILESEQ#=0002
                                             CRTDT= 86192 EXPDT= 00000 SECURITY=0 BLOCKCOUNT=    000000
      2    80  INPUT LABEL              HDR2U327600000000SPSM    /COPY1           14850
               ***HEADER LABEL***            RECFM=U    LRECL=00000 BLKSIZE=32760 BUFOFF(ANSI)=
                                             DENSITY=0 TRTCH=   CREATING JOB/STEP=SPSM    /COPY1
* * * * * * *  END OF FILE      2H -- FILE CONTAINED       2 BLOCKS
* * * * * * *  START FILE       2
      8 17718  ***PERMANENT DATA CHECK -- RETRIES= 0, CLEANING ACTIONS= 0, ROR RETRIES= 0
               DATA TRANSFERRED                  ::      :      :      :      :      :      :      :      :      :   ::
               BLOCK DROPPED
      7 47626  BLOCK PRECEEDING D/C     :::: :     : :  :    :  :: :00000050:   :  ::: :  :: :00000050:   :  ::: :  :: :
      9 44970  BLOCK FOLLOWING D/C      :::d : :   : : ::    : :::::0000162000001611CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
* * * * * * *  END OF FILE      2  -- FILE CONTAINED     580 BLOCKS
* * * * * * *  START FILE       2T
      1    80  INPUT LABEL              EOF1RAY.SCR501       80043200010002       86192 000000000580IBM OS/VS 370
               ***END-OF-FILE***             DSNAME=RAY.SCR501        SERIAL=800432 VOLSEQ#=0001 FILESEQ#=0002
                                             CRTDT= 86192 EXPDT= 00000 SECURITY=0 BLOCKCOUNT=    000580
      2    80  INPUT LABEL              EOF2U327600000000SPSM    /COPY1           14850
               ***END-OF-FILE***             RECFM=U    LRECL=00000 BLKSIZE=32760 BUFOFF(ANSI)=
                                             DENSITY=0 TRTCH=   CREATING JOB/STEP=SPSM    /COPY1
* * * * * * *  END OF FILE      2T -- FILE CONTAINED       2 BLOCKS
* * * * * * *  START FILE       3H
* * * * * * *  END OF FILE      3H -- FILE CONTAINED       0 BLOCKS
FATS020 ANALYSIS TERMINATED AT TAPEMARK SEQUENCE
                                                  FINAL TOTALS
          FILES READ  BLOCKS READ  BYTES READ   FEET READ  TEMP ERRS  PERM ERRS  FILES WRITTEN  BLOCKS WRITTEN
                2          1066      40367286         96          0          0            0               0
```

```
FATAR                          TAPE SUMMARY FOR TAPE VOLUME -800432- AT DENSITY   38000 BPI                    12/27/96
PHYS DATASET NAME       FILE  FIL#                  REC- LRECL CREATING     BLOCKS   BYTES  PERM ---BLOCKSIZES---- EST.
FILE  (LAST 17 CHARS)  SERIAL VOL#  CRDATE   EXPDATE  FM  BLKSZ JOB&STEP SEC  READ     READ  TEMP  MIN   AVG   MAX  FEET
---- ---------------- ------ ---- -------- -------- ---- ----- -------- --- ------- ------- ---- ----- ----- ----- ----
   2 RAY.SCR010        800432 0001 1986/192   00/000 U    00000 SPSN      0      486     17M    0    24 34213 48092   39
                              0001                         32760 COPY1                           0
   5 RAY.SCR501        800432 0002 1986/192   00/000 U    00000 SPSM      0      580     24M    0    24 40931 49060   56
                              0001                         32760 COPY1                           0
                                                 ________                        _______ _______ ____                    ____
                    HIGHEST EXPIRATION ====>   00/000           TOTALS ====>     1066     40M    0                      95
```

25.0 CONTINUED . . .

In this example, a 3590 (Magstar) tape volume is copied to another Magstar. The input tape is IDRC compacted, so compaction statistics are displayed. Lengths are to be displayed in metric, and 64 bytes from the first 3 blocks of every file are to be displayed in dump format (hex and EBCDIC).

CONTINUED . . .

25.0 CONTINUED . . .

```
FAST ANALYSIS OF TAPE AND RECOVERY -- FATAR   VER 4.5.0   -- INNOVATION DATA PROCESSING  AUTHORIZED   1/02/97   PAGE   1

FATS070 CONTROL CARD TABLE SIZE IS   4096 BYTES
FATAR CONTROL CARDS

   1--  ANALYZE METRIC,BLP,PRTLEN=64,DUMP                                    00200026
   2--  PRINT LF=ALL,B=1-3                                                    00210026
FATS071 TAPE BUFFER SIZE IS 65535 BYTES
FATS072 TAPEIN DATA WILL BE COPIED TO TAPEOUT
FATS076 TAPE MANAGEMENT SYSTEM NOT ACCESSIBLE: FATTMGET NOT LOADED
                                      CHARACTERISTICS OF THE TAPE TO BE ANALYZED
                                         UNIT  DEVICE   SERIAL  MFR CARTRIDGE
                                         03A0  3590     900021  IBM SHORT
                                                 FATAR DETAIL REPORT
 BLOCK  LNGTH/  MESSAGE/
 NUMBER DISPL  BLOCK TYPE
* * * * * * *  START FILE       1H
      1    80  INPUT LABEL              VOL1900021
               ***VOLUME LABEL***            VOLSER=900021 OWNER=
      2    80  INPUT LABEL              HDR1BAB.LINK         90002100010001       9700200000000000000IBM
               ***HEADER LABEL***            DSNAME=BAB.LINK          SERIAL=900021 VOLSEQ#=0001 FILESEQ#=0001
                                             CRTDT= 97002 EXPDT=000000 SECURITY=0 BLOCKCOUNT=    000000
      3    80  INPUT LABEL              HDR2V061640616000BABFATTS/IEBCOPY P   S  9C8F10
               ***HEADER LABEL***            RECFM=VS   LRECL=06160 BLKSIZE=06164 BUFOFF(ANSI)=
                                             DENSITY=0 TRTCH=P  CREATING JOB/STEP=BABFATTS/IEBCOPY
* * * * * * *  END OF FILE      1H -- FILE CONTAINED       3 BLOCKS
* * * * * * *  START FILE       1
      1    64  PRINT REQUESTED 00000006
              003C0000 00CA6D0F 02001800 0000C000  00001814 3030200F 00007FF8 08B3000F  ......_....................8....
       +00033 E5A20000 22500000 00020061 00020000  00800002 3F09A71A 947C0000           V....&...../............@..
      2   284  PRINT REQUESTED 00000006
              01180000 02000000 FF000000 8F009000  047BDD88 58F47A40 000000AF 000C0148  .................#...4: ........
       +00033 000E08FA 58F47A40 00000601 00000627  0004023F 00000000 00000000 00000000  .....4: ......................
      3  6080  PRINT REQUESTED 00000006
              17BC0000 00000000 00000000 00080100  C1C4C4E2 C4404040 00EAC1C2 C1404040  ................ADDSD   ..ABA
       +00033 404000B2 412C00B3 02000000 000002C2  00408002 A00002A0 88020101 0000C1C3    .............B. ............AC
* * * * * * *  END OF FILE      1  -- FILE CONTAINED   21127 BLOCKS -     136 IDRC (COMPACTED) BLOCKS
* * * * * * *  START FILE       1T
      1    80  INPUT LABEL              EOF1BAB.LINK         90002100010001       9700200000000021127IBM
               ***END-OF-FILE***             DSNAME=BAB.LINK          SERIAL=900021 VOLSEQ#=0001 FILESEQ#=0001
                                             CRTDT= 97002 EXPDT=000000 SECURITY=0 BLOCKCOUNT=    021127
      2    80  INPUT LABEL              EOF2V061640616000BABFATTS/IEBCOPY P   S  9C8F10
               ***END-OF-FILE***             RECFM=VS   LRECL=06160 BLKSIZE=06164 BUFOFF(ANSI)=
                                             DENSITY=0 TRTCH=P  CREATING JOB/STEP=BABFATTS/IEBCOPY
* * * * * * *  END OF FILE      1T -- FILE CONTAINED       2 BLOCKS
* * * * * * *  START FILE       2H
* * * * * * *  END OF FILE      2H -- FILE CONTAINED       0 BLOCKS
FATS020 ANALYSIS TERMINATED AT TAPEMARK SEQUENCE
FINAL TOTALS
          FILES READ  BLOCKS READ  BYTES READ METERS READ  TEMP ERRS  PERM ERRS  FILES WRITTEN  BLOCKS WRITTEN COMPACTED
                 1         21127       83081159     ****         0          0           1           21127
IDRC (COMPACTED)            136       43470848       11                                                          48%
                      ****    ****************************************************************
                              ***   3590  AND COMPACTION REDUCED TAPE  REQUIREMENTS BY  48%   ***
                              ****************************************************************
FATS026 * * * *  TAPEIN DATA SUCCESSFULLY COPIED TO TAPEOUT  VOLUME 90023
```

```
FATAR                          TAPE SUMMARY FOR TAPE VOLUME -900021- AT DENSITY  105219 BPI                    1/02/97
PHYS DATASET NAME       FILE  FIL#                  REC- LRECL CREATING     BLOCKS   BYTES  PERM ---BLOCKSIZES---- EST.
FILE  (LAST 17 CHARS)  SERIAL VOL#  CRDATE   EXPDATE  FM  BLKSZ JOB&STEP SEC  READ     READ  TEMP  MIN   AVG   MAX   M.
---- ----------------- ------ ---- -------- -------- ---- ----- -------- --- ------- ------- ---- ----- ----- ----- ----
   2 BAB.LINK          900021 0001 1997/002   00/000 VS   06160 BABFATTS  0    21127     83M    0    20  3932  6164 ****
                              0001                        06164 IEBCOPY IDRC>    136     43M    0      319639         11
                                                                                                                    ____
                   HIGHEST EXPIRATION ====>   00/000           TOTALS ====>    21127     83M    0                   ****
                              IDRC COMPACTION ====>  48%  IDRC TOTALS ====>      136     43M                           11
```

CONTINUED . . .

26.0 FATAR EXAMPLES OF USAGE

INTRO-DUCTION

Examples are provided here to guide you in the use of FATAR. As many of the common uses of FATAR as possible have been included, and most of the control statements and keywords are illustrated here. However, be aware that they are just examples and must be customized to your installation and intended use. Areas of customization will probably include: data set names, unit names for tape, special parameters for tape management systems. The examples also assume that no special STEPLIB DD Statement is required to execute FATAR; this may not be true in your installation.

Because of the many possible combinations of options, control statements, tape label types, etc., it is not practical to create examples which cover all possible FATAR uses. Many examples illustrate more than one aspect of FATAR use, e.g., a particular tape label type and use of some FATAR keyword. This does not mean that the two must always go together unless the accompanying text says so.

Some examples use LABEL=(,BLP) on the input tape in order to be able to mount a labeled tape without knowing its volume serial or data set names. Sometimes this is simply a convenience, but for some operations, such as printing the labels from an unknown tape, it is essential. In some installations, system parameters prevent the usage of BLP by most users; in this case, the FATAR option BLP on the ANALYZE Statement can be substituted. In either case, use of BLP may be restricted by your security system; when BLP is required, you must execute under a userid authorized to use BLP.

Some examples illustrate the use of the CAT= operand to catalog output data sets and the RENAME statement with NEWI= to rename copied data sets. These may not work as shown unless you have the FATAR tape management interface (Section 21.5 TAPE MANAGEMENT SYSTEM SUPPORT) enabled, to allow FATAR to get the full 44-character data set name of the input data set.

ISPF DIALOG SUPPORT

Most of the FATAR functions can be performed using the FATAR ISPF Interface. See Section 93.0 ISPF INTERFACE INTRODUCTION for further details.

CONTINUED . . .

26.1 INDEX TO EXAMPLES

INDEX TO EXAMPLES

The first-time or infrequent user of FATAR should review the examples below in order since they frequently build upon one another in illustrating the usage and effects of various parameters. For your convenience, however, here is a list of the examples provided to aid in quickly finding the one you need. It shows the title of the example, the ANALYZE Statement keywords it illustrates, and the other Control Statements it illustrates.

#	EXAMPLE NAME	KEYWORDS	STATEMENTS
1	Analyze any tape		
2	Analyze an SL tape	LENCHK,LBLPRT	PRINT
3	Analyze a partial SL tape	NUMFILES,PRTLEN	PRINT ALL
4	Copy an SL tape	CAT	
5	Copy any tape to an SL tape	VERIFY,KEEP	DROP
6	Partial copy of an SL tape	NUMFILES,REBLOCK, COMPACTION,CAT	RENAME
7	Partial copy of an SL tape in BLP mode		PRINT
8	Analyze a multi-volume tape set		PRINT,SCAN
9	Analyze an SL tape with no label processing	LABELS	
10	Analyze an NL tape	NF,PRTLEN PRINT,SCAN,TABLE	
11	Search a partial file	ENDAFTER,PRTLEN,LBLPRT	REPLACE
12	Copy an ANSI tape		
13	Copy an NL tape	NUMFILES,VERIFY	KEEP
14	Copy an SL file to NL	NUMFILES	
15	Image copy a tape	LABELS	
16	Copy a multi-file, multi-volume to 3590	VERIFY,CAT	RENAME
17	Copy and modify a tape file	MSGLEVEL,CAT	REPLACE
18	Copy and modify a tape file	CAT	REPLACE
19	Recover from data checks	RETRY,KEEP	REPLACE
20	Recover from data checks on multi-volume tape		
21	Recover from data checks	LABELS	
22	Recover data from an overwritten tape	NF,CAT	
23	Copy files from an overwritten tape	CAT	RENAME
24	Copy an improperly closed tape	ENDAFTER	
25	Exclude files from a multi-file copy	VERIFY	DROP
26	Copy user labels		
27	Drop an extra tape mark	NUMFILES,CAT	DROP
28	FATAR as a FATS sub-task	VOL,CAT	
29	FATAR as a FATS sub-task	VOL,VOLINCR,MAXVOLN,VERIFY	

CONTINUED . . .

26.2 EXAMPLES

EXAMPLE 1: ANALYZE ANY TAPE

Analyze any tape. Since LABEL=(,BLP) is specified on the TAPEIN DD Statement, any tape can be mounted when a mount for volser 999999 is issued; the DSN= in the JCL does not have to be correct. You may need to specify EXPDT=98000 (as shown) so that your tape management system does not attempt to verify volume 999999. The tape may have any type of labels (IBM standard, ANSI, or none at all); FATAR will automatically determine the label type and handle them if present. If the labels are ANSI, both labels and data will be translated to EBCDIC. FATAR will print a summary of the files and data on the tape on the optional TAPESUMM DD Statement. FATAR will print all tape labels, count the blocks in every file, and identify any block causing a temporary or permanent data check, printing the first 80 characters of that block as well as the blocks preceding and following it. All blocks will be deblocked into logical records (if the tape is labeled). All files on the tape will be processed.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=FIRSTDS,UNIT=TAPE,VOL=SER=999999,
//               LABEL=(,BLP,EXPDT=98000),DISP=OLD
//SYSIN           DD      *
  ANALYZE
```

EXAMPLE 2: ANALYZE AN SL TAPE

Analyze standard label tape 111111. Since it is being opened as a labeled tape (no LABEL parameter on the TAPEIN DD Statement), the volume serial and first data set name must be specified correctly; your tape management system may verify these values. The parameter LENCHK causes FATAR to print the beginning of any block which differs in length from the preceding block (for checking fixed length files). The parameter LBLPRT=DUMP causes labels to be printed in dump format (hex and EBCDIC). The PRINT statement causes blocks 1 to 3 of every data file to be printed. All other operations are the same as Example 1 above.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=FIRSTDS,UNIT=TAPE,VOL=SER=111111,
//               DISP=OLD
//SYSIN           DD      *
     ANALYZE LENCHK,LBLPRT=DUMP
     PRINT LF=ALL,B=1-3
```

EXAMPLE 3: ANALYZE A PARTIAL SL TAPE

Analyze the fourth and fifth files on standard labeled tape 111111, where the fourth file is called "FOURTHDS"; your tape management system may verify these values. The LABEL=4 parameter on the TAPEIN DD Statement tells FATAR to begin with that data set, and the NUMFILES=2 parameter on the ANALYZE Statement limits the number of files FATAR will analyze. The PRINT ALL Control Statement directs FATAR to print all data blocks (first 200 bytes).

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=FOURTHDS,UNIT=TAPE,VOL=SER=111111,
//               LABEL=4,DISP=OLD
//SYSIN           DD      *
  ANALYZE NUMFILES=2,PRTLEN=200
  PRINT ALL
```

CONTINUED . . .

26.2 CONTINUED . . .

EXAMPLE 4: COPY AN SL TAPE

Standard labeled tape 111111 will be copied to standard labeled tape 222222. All files will be copied. Each file on tape 222222 will receive the data set name of the original file on tape 111111; the data set name on the TAPEOUT DD statement will not be used. If any blocks have unrecoverable data checks, they will be dropped from the output tape, and the block counts in the data set trailer labels adjusted. If you have the FATAR tape management interface enabled, it will be used to get the full 44-character data set names of every input file; if this is successful, CAT=RECAT will cause every output data set to be recataloged to the output tape.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=FIRSTDS,UNIT=TAPE,VOL=SER=111111,
//               DISP=OLD
//TAPEOUT         DD      DSN=NOT.USED,UNIT=TAPE,VOL=SER=222222,
//               DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE       CAT=RECAT
```

EXAMPLE 5: COPY ANY TAPE TO AN SL TAPE

Tape 999999 will be copied to a scratch standard label volume. All files will be copied. FATAR will determine the label type of the input tape (STANDARD, ANSI, or UNLABELED) and process it appropriately. If the input labels are ANSI, all data files will be translated from ASCII to EBCDIC (if the records are ANSI variable length, RECFM=D, they will be converted to IBM RECFM=V). The data set names from the input tape will be copied to the output (if TAPEIN is unlabeled, the DSN= value from the TAPEIN DD statement is used to name all output files); if the FATAR tape management interface is enabled, it will be used to get the full 44-character data set name of every input file. The volume serial of the output tape will be preserved. If the output tape is filled before the input data is exhausted another volume will be requested. If any blocks on the input have unrecoverable data checks, they will be identified and printed, but the KEEP parameter will cause them to be written to the output tape anyway (using whatever data the input tape was able to transfer). The DROP statements will prevent the indicated input blocks from being written to the output tape. The VERIFY parameter will cause the output tapes to be analyzed after the copy is complete to verify readability.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=FIRSTDS,UNIT=TAPE,VOL=SER=999999,
//               LABEL=(,BLP),DISP=OLD
//TAPEOUT         DD      DSN=NOT.USED,UNIT=TAPE,DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE KEEP,VERIFY
   DROP LF=3,B=2
   DROP LF=3,B=10-12
```

CONTINUED . . .

26.2 CONTINUED . . .

EXAMPLE 6: PARTIAL COPY OF AN SL TAPE

Files 3 and 4 will be copied from labeled tape 111111 and written to a scratch Magstar (3590) tape. The LABEL=3 parameter on the TAPEIN DD Statement causes FATAR to start the copy with file 3 of the tape; the data set name of that file must be properly specified. The NUMFILES=2 parameter tells FATAR to copy two logical files, namely files 3 and 4. The files will become files 1 and 2 on the output tape, with the data set names of the original files. COMPACTION=COMP will cause the output tape to be written using IDRC hardware compaction. REBLOCK=16000 will cause each copied file to be reblocked to as close to a blocksize of 16000 bytes as possible. The RENAME statement is used to specify new names for the 2 output files, and CAT=YES will cause FATAR to catalog those names to the output tape.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=THIRDDS,UNIT=TAPE,VOL=SER=111111,
//               LABEL=3,DISP=OLD
//TAPEOUT         DD      DSN=NOT.USED,UNIT=3590,DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE NUMFILES=2,REBLOCK=16000,COMPACTION=COMP,CAT=YES
   RENAME LF=3,NEWN=TECHSERV.FILE3
   RENAME LF=4,NEWN=TECHSERV.FILE4
```

EXAMPLE 7: PARTIAL COPY OF AN SL TAPE

All files on labeled tape 111111 from file 4 through the end of the tape are copied to labeled output tape 222222, starting at file 2. In other words, file 4 will be copied to file 2, file 5 will be copied to file 3, etc. Data set names from the input tape will be retained; if the FATAR tape management interface is enabled, it will be used to get the full 44-character data set name of every input file. DCB=RECFM=U on the input tape will cause FATAR to treat the blocks as unblocked for printing/modification purposes but will not affect the DCB which will be written in the output tape's labels (which will be copied from the input tape's labels). LABEL=(10,BLP) is required on TAPEIN since we do not know its data set name and since FATAR must be positioned to the header labels of the first file. The rule is "SL file number, times 3, minus 2", in this case 4*3-2=10.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=UNKNOWN,UNIT=TAPE,VOL=SER=111111,
//               LABEL=(10,BLP),DISP=OLD,DCB=RECFM=U
//TAPEOUT         DD      DSN=NOT.USED,UNIT=TAPE,VOL=SER=222222,
//               LABEL=2,DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE
   PRINT ALL
```

CONTINUED . . .

26.2 CONTINUED . . .

EXAMPLE 8: ANALYZE A MULTI-VOLUME TAPE SET

Analyze multi-volume labeled tape set 333333, 444444, and 555555, which contain more than one data set. FATAR will properly read all three volumes, giving total block counts for each data set even when it crosses volumes (an intermediate block count is given each time an end-of-volume is reached). The tape summary (DD statement TAPESUMM) will contain one page for each tape, detailing the files and block counts on it. File numbers will be logical files since the beginning of the first tape, counting files which cross multiple volumes as one file. The PRINT control statements instruct FATAR to PRINT block 7 of file 1 in hexadecimal, blocks 22 and 23 of file 2 in dump format (HEX and EBCDIC) printing 96 bytes, and block 125 of file 4 in EBCDIC printing 250 bytes. The SCAN control statement requests FATAR to verify that the first 4 bytes of every record in file 2 contains a valid zoned decimal number.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=UNKNOWN,UNIT=TAPE,
//               VOL=SER=(333333,444444,555555),
//               LABEL=(,BLP,EXPDT=98000),DISP=OLD
//SYSIN           DD      *
  ANALYZE
  PRINT LF=1,B=7,HEX
  PRINT LF=2,B=22-23,L=96,DUMP
  PRINT LF=4,B=125,L=250
  SCAN LF=2,B=ALL,L=4,P=1,T=Z
```

EXAMPLE 9: ANALYZE AN SL TAPE WITH NO LABEL PROCESSING

Analyze SL tape 111111 without label processing, so that labels will be processed as data (however, labels will still be formatted and printed). Processing will continue until two consecutive tape marks are read or until EOV labels are read (tapes containing data sets which overflowed to another tape and end with EOV labels will not end with two tape marks, so FATAR has a special SCAN for the EOV labels). Since labels are not processed and no DCB information appears in the JCL, FATAR will process all tape blocks as RECFM=U (unblocked). Since FATAR is not processing labels, logical file numbers refer to the physical file number relative to the beginning of the tape, and the header and trailer label files are counted.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=FIRSTDS,UNIT=TAPE,VOL=SER=111111,
//               DISP=OLD
//SYSIN           DD      *
  ANALYZE LABELS=NO
```

CONTINUED . . .

26.2 CONTINUED . . .

EXAMPLE 10: ANALYZE AN NL TAPE

Analyze unlabeled tape 666666 with deblocking. The NF=3 parameter limits FATAR to reading three physical files. Since DCB information is supplied on the TAPEIN DD statement, FATAR will attempt to deblock every file processed. On the PRINT and SCAN statements, the LF= parameter refers to the physical file number since the beginning of the tape. The SCAN statement is used to VERIFY that bytes 4 to 6 of all records from record 5 in block 3 to record 2 in block 5 contain only characters A, B, or C (as defined in the TABLE statement). The PRTLEN=5000 will ensure that any blocks printed (due to the PRINT statement or failure of the SCAN statement) will print the entire block (up to 5000 bytes), deblocked into records.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=NOLABEL,UNIT=TAPE,VOL=SER=666666,
//               DCB=(RECFM=FB,LRECL=120),
//               LABEL=(,NL),DISP=OLD
//SYSIN           DD      *
   ANALYZE NF=3,PRTLEN=5000
   PRINT LF=1,B=1-20
   TABLE T=A,D=C'ABC'
   SCAN LF=2,B=3.5-5.2,L=3,P=4,T=A
```

EXAMPLE 11: SEARCH A PARTIAL FILE

Analyze a partial file on SL tape 111111 and print blocks containing a certain string. Since only the first 20 blocks are to be scanned, there is no need to read the rest of the tape; the ENDAFTER parameter causes FATAR to terminate immediately after processing block 20 in file 1 (since labels are being processed, this is the first data file). The REPLACE statement tells FATAR to print any block containing the string "EQUIPMENT" in any position, and the PRTLEN=32767 parameter causes the entire data block to be printed. The LBLPRT=HEX parameter causes the header labels of the file to be printed in hexadecimal.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=UNKNOWN,UNIT=TAPE,VOL=SER=111111,
//               LABEL=(,BLP,EXPDT=98000),DISP=OLD
//SYSIN           DD      *
   ANALYZE ENDAFTER=(LF=1,B=20),PRTLEN=32767,
   LBLPRT=HEX
   REPLACE LF=1,B=1-20,S=C'EQUIPMENT'
```

EXAMPLE 12: COPY AN ANSI TAPE

ANSI labeled tape 333333 is to be copied to a scratch tape with ANSI labels. The TAPEIN DD statement specifies LABEL=(,AL), but it could also specify LABEL=(,BLP) if the true volume serial or first data set name were not known; FATAR works correctly in either case. The TAPEOUT DD statement must specify LABEL=(,AL) for the labels to be written in ANSI format and the data in ASCII character set. All other processing is just the same as for standard label tapes (see example 4).

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=FIRSTDS,UNIT=TAPE,VOL=SER=333333,
//               LABEL=(,AL),DISP=OLD
//TAPEOUT         DD      DSN=NOT.USED,UNIT=TAPE,
//               LABEL=(,AL),DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE
```

CONTINUED . . .

26.2 CONTINUED . . .

EXAMPLE 13: COPY AN NL TAPE

7 files from unlabeled tape 222222 are to be copied to a scratch unlabeled tape. NUMFILES=7 tells FATAR to copy 7 files (7 tape marks and all data preceding them). Note that NUMFILES=0 could have been specified or defaulted to cause FATAR to copy all files until two consecutive tape marks were read. If the FATAR tape management interface is enabled, it will be used to get the true data set name of every input file and use it to name the equivalent output file. The first KEEP statement causes block 7 of file 2 to be written to the output tape even though it is known to cause a data check. The second KEEP statement causes block 12 of file 3 to be increased in length to 1400 bytes, with the original data block positioned at byte 51 (50 bytes of spaces will be added to the start of the block; if the original block is less than 1350 bytes long, additional spaces will be added to the end). The VERIFY parameter will cause the output tape to be analyzed for readability; however, if the output tape requires multiple volumes, the verify will be suppressed (multi-volume NL tapes cannot be verified).

```
//FATAR         EXEC     PGM=FATAR
//SYSPRINT       DD      SYSOUT=*
//TAPESUMM       DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPEIN         DD      DSN=FIRSTDS,UNIT=TAPE,VOL=SER=222222,
//              LABEL=(,NL),DISP=OLD
//TAPEOUT        DD      DSN=NOT.USED,UNIT=TAPE,
//              LABEL=(,NL),DISP=(NEW,KEEP)
//SYSIN          DD      *
  ANALYZE NUMFILES=7,VERIFY
  KEEP DCK,LF=2,B=7
  KEEP LF=3,B=12,L=1400,P=51
```

CONTINUED . . .

26.2 CONTINUED . . .

EXAMPLE 14: COPY AN SL FILE TO AN NL TAPE

File 3 from standard label tape 111111 is to be copied to an unlabeled scratch tape. LABEL=3 on the TAPEIN DD statement positions FATAR to the proper file; LABEL=(,NL) on the TAPEOUT DD statement requests an unlabeled scratch and causes FATAR to copy the TAPEIN data without labels. The NUMFILES=1 parameter restricts FATAR to copying one file. The input data set name (from the TAPEIN DD statement) is used to name the output file.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=THIRDDS,UNIT=TAPE,VOL=SER=111111,
//               LABEL=3,DISP=OLD
//TAPEOUT         DD      DSN=NOT.USED,UNIT=TAPE,
//               LABEL=(,NL),DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE NUMFILES=1
```

EXAMPLE 15: IMAGE COPY A TAPE

When a tape is damaged (but readable) or suspect (prone to failure) you can copy the tape to another output volume with an "image copy" of the tape. This involves copying all data from the input to the output tape including all labels and the volume serial, creating an exact bit-for-bit copy. Since the output tape will have the same volume serial as the original, tape management systems and system catalogs will usually not have to be modified or updated. LABEL=(,BLP) is shown on the TAPEOUT DD statement in this example, but even if omitted the OUTBLP option is forced by LABELS=IMAGE so that all labels and data can be copied to the output tape. LABEL=(,BLP) is optional on TAPEIN.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=ANYDSN,UNIT=3490,VOL=SER=111111,
//               LABEL=(,BLP),DISP=OLD
//TAPEOUT         DD      DSN=NOT.USED,UNIT=3490,
//               LABEL=(,BLP),DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE LABELS=IMAGE
```

EXAMPLE 16: COPY A MULTI-FILE MULTI-VOLUME TAPE TO A 3590 CARTRIDGE

Standard labeled tapes 333333, 444444, and 555555 comprise a multi-volume, multi-file tape set on 3480 cartridges, containing 17 files, and are to be copied to a 3590 Magstar cartridge. The VERIFY parameter causes the resulting 3590 volume to be analyzed for readability. If the FATAR tape management interface is enabled, it is used to get the full data set name of every input file; the RENAME statement with NEWI=.ABC will cause the second level index of every input data set name to be replaced with "ABC" when the files are opened on the output tape and CAT=YES causes those output files to be cataloged if they are not already cataloged. For example, if an input data set name was "PAYROLL.PROD.MASTER", the output data set becomes "PAYROLL.ABC.MASTER".

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPESUMM        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=FIRSTDS,UNIT=3480,
//               VOL=SER=(333333,444444,555555),
//               DISP=OLD
//TAPEOUT         DD      DSN=NOT.USED,UNIT=3590,
//               DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE VERIFY,CAT=YES
   RENAME  LF=ALL,NEWI=.ABC
```

CONTINUED . . .

26.2 CONTINUED . . .

EXAMPLE 17: COPY AND MODIFY A FILE

A mailing list file on tape has a company name misspelled in many places; we want to copy the file and change the name wherever it appears. The REPLACE statement causes all occurrences of "INVENTION DATA PROCESSING" to be changed to "INNOVATION DATA PROCESSING" whenever it appears in column 17 of any record. Note the way that the character strings are continued; multiple C' or X ' strings following a V=, S= or D= will simply be concatenated (up to 256 bytes). The MSGLEVEL=0 parameter suppresses the printing of the data portion of the modified blocks. CAT=RECAT will cause the file to be recataloged to the output tape.

```
//FATAR         EXEC     PGM=FATAR
//SYSPRINT       DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPEIN         DD      DSN=COMPANY.MAIL.MASTER,
//              DISP=(OLD,KEEP)
//TAPEOUT        DD      DSN=COMPANY.MAIL.MASTER,UNIT=CART,
//              DISP=(NEW,KEEP)
//SYSIN          DD      *
  ANALYZE MSGLEVEL=0,CAT=RECAT
  REPLACE LF=1,B=ALL,P=17,V=C'INVENTION DATA',
  C'PROCESSING',D=C'INNOVATION DA',
  C'TA PROC',C'ESSING'
```

EXAMPLE 18: COPY AND MODIFY A FILE

Tape master file "MASTER" on labeled tape 111111 causes a run-time data exception when it is read by its processing program. A previous FATAR run has revealed that record 3 of block 27 contains "00735B4A" in hexadecimal, which is an invalid packed decimal number. It should contain "0073534C". The REPLACE statement causes this substitution to be made. CAT=RECAT will recatalog the data set to the output tape.

```
//FATAR         EXEC     PGM=FATAR
//SYSPRINT       DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPEIN         DD      DSN=MASTER,UNIT=TAPE,VOL=SER=111111,
//              DISP=OLD
//TAPEOUT        DD      DSN=MASTER,UNIT=TAPE,
//              DISP=(NEW,KEEP)
//SYSIN          DD      *
  ANALYZE CAT=RECAT
  REPLACE LF=1,B=27.3,S=X '00735B4A',
  D=X'0073534C'
```

EXAMPLE 19: RECOVER FROM DATA CHECKS

Unlabeled tape 222222 is known to have data checks in a number of blocks. Copy the tape to another unlabeled scratch, retrying all data checks 256 times in each direction to insure that all possible attempts have been made to recover the data. If any block still cannot be read, the KEEP parameter will cause it to be written to the output tape anyway, but the REPLACE DCK statement will cause the first four bytes of those records to be set to hexadecimal "FFFFFFFF" (high values) which will signal the application program to perform special validation. The DCB parameters are provided on the TAPEIN DD statement so that the input records can be deblocked.

```
//FATAR         EXEC     PGM=FATAR
//SYSPRINT       DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPEIN         DD      DSN=NLINPUT,UNIT=TAPE,VOL=SER=222222,
//              LABEL=(,NL),DISP=OLD,DCB=(RECFM=FB,LRECL=240)
//TAPEOUT        DD      DSN=NLOUTPUT,UNIT=TAPE,
//              LABEL=(,NL),DISP=(NEW,KEEP)
//SYSIN          DD      *
  ANALYZE RETRY=256,KEEP
  REPLACE DCK,F=1,B=ALL,P=1,D=X'FFFFFFFF'
```

CONTINUED . . .

26.2 CONTINUED . . .

EXAMPLE 20: RECOVER FROM DATA CHECKS ON MULTI-VOLUME TAPE

Data set "LARGEDS" occupies three tape volumes "AAAAAA", "BBBBBB", and "CCCCCC". Volume "BBBBBB" has developed read data checks, so we want to create a valid copy, dropping the data check blocks. With FATAR, it is not necessary to read the volumes preceding the first data check (in this case "AAAAAA"). The JCL below will produce output volumes which can be used to REPLACE "BBBBBB" and "CCCCCC". However, it is up to the user to update the system catalog to reflect the new volume serials. If you have a tape management system, you must also do whatever manual updating is necessary to cause its records to properly reflect the new volume relationships. Note that this tape management update will be unnecessary if you copy the entire tape set (as in Example 16) or if you copy only the problem tape (as in Example 21).

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=LARGEDS,UNIT=TAPE,
//               VOL=SER=(BBBBBB,CCCCCC),DISP=OLD
//TAPEOUT         DD      DSN=LARGEDS,UNIT=TAPE,DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE
```

EXAMPLE 21: RECOVER FROM DATA CHECKS

This is another way to recover from the data checks in example 20 above. It does not require any catalog or tape management updates since it creates an exact copy ("image copy") of the bad tape, including its volume serial; in other words, the output of this run is a tape with the same volume serial as the original tape, so it should be externally re-labeled and the original tape discarded. Since tape "BBBBBB" is the middle tape of a multi-volume set, we know that it is completely filled with data; the output tape must be as large or larger than the original so that FATAR can WRITE all of the data and labels before the end-of-tape is detected, or the copy will be invalid. FATAR will correct the trailer label block counts if blocks are dropped because of data checks.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=LARGEDS,UNIT=TAPE,
//               VOL=SER=BBBBBB,DISP=OLD
//TAPEOUT         DD      DSN=LARGEDS,UNIT=TAPE,DISP=(NEW,KEEP),
//               LABEL=(,BLP,EXPDT=98000)
//SYSIN           DD      *
   ANALYZE LABELS=IMAGE
```

CONTINUED . . .

26.2 CONTINUED . . .

EXAMPLE 22: RECOVER DATA FROM AN OVERWRITTEN TAPE

A tape with valid data on it was accidentally used for output, but the new file is smaller than the original file; it is desired to recover as much of the original data file as possible. The new file will occupy four physical files on the tape (header labels, data, trailer labels, and extra tape mark), so the LABEL=(5,BLP) will position FATAR immediately beyond the extra tape mark, at the beginning of the remaining original data. FATAR will process this as unlabeled data since it is not positioned to label records. Since labels are not available, the DCB characteristics of the original data should be provided on TAPEIN, if known. The TAPEOUT DD statement specifies a labeled scratch tape with the data set name of the original data set. The first data block is likely to cause a permanent data check if it is partially overwritten; if this is the only error it can be ignored. NF=1 causes FATAR to read only the original data file. CAT=RECAT will cause the data set to be recataloged to the output tape (be sure to specify the correct data set name on the TAPEIN DD statement). See Section 24.2 RECOVERING DATA FROM OVERWRITTEN TAPES for additional details on overwritten tapes.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=ORIGINAL,UNIT=TAPE,
//               VOL=SER=BBBBBB,LABEL=(5,BLP),DISP=OLD,
//               DCB=(RECFM=FB,LRECL=125,BLKSIZE=32750)
//TAPEOUT         DD      DSN=ORIGINAL,UNIT=TAPE,DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE NF=1,CAT=RECAT
```

EXAMPLE 23: COPY FILES FROM AN OVERWRITTEN TAPE

A tape with multiple files on it was accidentally used for output, but the new file is smaller than the original first file; it is desired to copy the original files beyond the first. The new file will occupy four physical files on the tape (header labels, data, trailer labels, and extra tape mark) and the original first file will occupy two more (data file and trailer labels) so the LABEL=(7,BLP) will position FATAR to the header labels of the original second file. FATAR will process this as a labeled tape; DCB information will be copied from the labels of the copied files. FATAR can copy data set names from the original tape labels, but these data sets will no longer be recorded in your tape management system so FATAR will not be able to get the full original data set names; if the original names are longer than 16 characters, the RENAME statements can be used to specify the correct names; CAT=RECAT will cause them to be recataloged to the new output tape. See Section 24.2 RECOVERING DATA FROM OVERWRITTEN TAPES for additional details on overwritten tapes.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=ORIGINAL,UNIT=TAPE,
//               VOL=SER=BBBBBB,LABEL=(7,BLP),DISP=OLD
//TAPEOUT         DD      DSN=NOTUSED,UNIT=TAPE,DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE CAT=RECAT
   RENAME  LF=3,NEWN=ORIGINAL3
   RENAME  LF=4,NEWN=ORIGINAL4
```

CONTINUED . . .

26.2 CONTINUED . . .

EXAMPLE 24: COPY AN IMPROPERLY CLOSED TAPE

Due to a system crash or power failure, tape 333333 was not properly closed and has no trailing tape mark or labels; it cannot be read with standard access methods. A previous FATAR analyze job shows that block 742 is the last good block of the proper length; a data check occurs immediately after it. The job below will copy the tape up to and including block 742 onto a scratch tape with proper labels.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=A.NAME,UNIT=TAPE,
//               VOL=SER=333333,DISP=OLD
//TAPEOUT         DD      DSN=NOT.USED,UNIT=TAPE,DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE ENDAFTER=(LF=1,B=742)
```

EXAMPLE 25: EXCLUDE FILES FROM A MULTI-FILE COPY

Multi-file tape 444444 is to be copied to a scratch tape, but files 3 and 5 are not to be copied. The DROP statements with B=ALL will cause those files, including all of their labels and tape marks to be entirely omitted from the output tape. This means that file 4 from the input tape becomes file 3 on the output, file 6 from the input becomes file 4, file 7 comes file 5, etc. The VERIFY parameter causes the output tape to be read back to verify readability, number of files, labels, etc.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=FIRSTDS,UNIT=TAPE,
//               VOL=SER=444444,DISP=OLD
//TAPEOUT         DD      DSN=NOT.USED,UNIT=TAPE,DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE VERIFY
   DROP LF=3,B=ALL
   DROP LF=5,B=ALL
```

EXAMPLE 26: COPY USER LABELS

Labeled tape "SSSSSS" contains user labels, and we wish to copy it to another labeled scratch tape preserving the labels. Note that the LABEL= parameter on the TAPEIN DD statement may specify BLP, SL, SUL, or (if appropriate) AL or AUL; FATAR will recognize the user labels regardless of the JCL label type. Although the output tape specifies LABEL=(,SL), FATAR will change it to SUL when it detects the user labels on TAPEIN. The output tape may not exceed one volume since FATAR has no way to generate appropriate user labels at volume switch.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//SYSUDUMP        DD      SYSOUT=*
//TAPEIN          DD      DSN=ULABDS,UNIT=TAPE,
//               VOL=SER=SSSSSS,DISP=OLD
//TAPEOUT         DD      DSN=NOT.USED,UNIT=TAPE,
//               LABEL=(,SL),DISP=(,KEEP)
//SYSIN           DD      *
   ANALYZE
```

26.2 CONTINUED . . .

EXAMPLE 27: DROP AN EXTRA TAPE MARK

Because of a malfunctioning tape drive, labeled tape 555555 has an extra tape mark following the trailer labels for file 3. This makes all files past 3 unusable since data management expects an exact sequence of labels and tape marks; FATAR also cannot process the whole tape as labeled, but is capable of processing part of it. Two techniques are shown for recovering from this error:

The first technique causes an exact copy of the tape to be created, but without the extra tape mark. Since the tape mark looks like a file with no data blocks, the DROP statement shown will omit that file and therefore drop the tape mark (it is file 10 since the three standard label files preceding it appear to be three files each in LABELS=NO mode). The output tape will have the serial number of the original tape and should be externally re-labeled.

```
//FATAR          EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPEIN          DD      DSN=FIRSTDS,UNIT=TAPE,
//               VOL=SER=555555,DISP=OLD
//TAPEOUT         DD      DSN=NOT.USED,UNIT=TAPE,
//               LABEL=(,BLP),DISP=(NEW,KEEP)
//SYSIN           DD      *
   ANALYZE LABELS=IMAGE
   DROP LF=10,B=ALL
```

The second technique involves copying the data up to and beyond the extra tape mark in two separate FATAR steps, but processing in label mode. The first step copies the first three good files. LABEL=(11,BLP) in the second step positions the input tape to the header labels of the file beyond the tape mark, and LABEL=4 on the output tape causes FATAR to start the copy in the right place. The second step then continues to the end of the tape. The output tape will retain its original serial number, and labels will be properly updated if needed. If the FATAR tape management interface is enabled, it will be used to get the full data set name of each input data set; CAT=RECAT will cause them to be cataloged to the output tape.

```
//FATAR1         EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPEIN          DD      DSN=FIRSTDS,UNIT=TAPE,VOL=SER=555555,
//               LABEL=(1,BLP),DISP=(OLD,PASS)
//TAPEOUT         DD      DSN=NOT.USED,UNIT=TAPE,DISP=(NEW,PASS)
//SYSIN           DD      *
   ANALYZE NUMFILES=3,CAT=RECAT
//FATAR2         EXEC     PGM=FATAR
//SYSPRINT        DD      SYSOUT=*
//TAPEIN          DD      DSN=FIRSTDS,UNIT=TAPE,VOL=SER=555555,
//               LABEL=(11,BLP),DISP=(OLD,KEEP)
//TAPEOUT         DD      DSN=NOT.USED,DISP=(NEW,KEEP),
//               VOL=REF=*.FATAR1.TAPEOUT,LABEL=4
//SYSIN           DD      *
   ANALYZE CAT=RECAT
```

26.2 CONTINUED . . .

EXAMPLE 28: FATAR AS A FATS SUB-TASK COPY TO 3480

FATAR may be run as a sub-task of FATS, and FATS parameters may be used to call for multiple tape volumes9898 on the same drive. However, each tape is treated as a single volume, not as a multi-volume set. FATAR will be re-initialized for each tape processed. LABEL=(,BLP) is used on the TAPE1 DD statement since the tapes will probably have different data set names, and "DDDDDD" is a dummy volume serial which will not be used. The VOL= parameter will causes tapes 111111, 222222, 333333, and 444444 to be copied. A console mount message will be issued for each tape requested. A 3480 scratch output tape will be mounted for each input tape, and all files copied to it. A full FATAR printout will be printed for each tape, and the FATS summary will show the results for all tapes. If the FATAR tape management interface is enabled, it will be used to get the full data set name of each input data set; CAT=RECAT will cause them to be cataloged to the output tape.

```
//FATFTR        EXEC     PGM=FATS
//SYSPRINT       DD      SYSOUT=*
//SYSPRIN1       DD      SYSOUT=*
//SUMMPRT        DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE1          DD      DSN=ANYDSN,UNIT=(TAPE,,DEFER),
//              VOL=SER=DDDDDD,DISP=OLD,LABEL=(,BLP,EXPDT=98000)
//TAPE1OUT       DD      DSN=ANYDSN,UNIT=(3480,,DEFER),
//              DISP=(,KEEP)
//SYSIN          DD      *
   ANALYZE(1) VOL=(111111,222222,333333,444444),CAT=RECAT
```

EXAMPLE 29: FATAR AS A FATS SUB-TASK MULTIPLE TAPES AND DRIVES

When FATAR is run as a sub-task of FATS, FATS may invoke multiple copies of FATAR to perform operations on separate tape drives. Each FATAR execution will produce a separate report on its own SYSPRINx DD statement. Multiple volumes may be requested on each drive. The example below will request volumes ABC101, ABC102, and ABC103 on TAPE1, and volumes 000123 and 000125 on TAPE2 (copying the files on them to a scratch tape on TAPE2OUT).

```
//FATFTR        EXEC     PGM=FATS
//SYSPRINT       DD      SYSOUT=*
//SYSPRIN1       DD      SYSOUT=*
//SYSPRIN2       DD      SYSOUT=*
//SUMMPRT        DD      SYSOUT=*
//SYSUDUMP       DD      SYSOUT=*
//TAPE1          DD      DSN=ANYDSN1,UNIT=(TAPE,,DEFER),
//              VOL=SER=DDDDDD,DISP=OLD,LABEL=(,BLP)
//TAPE2          DD      DSN=ANYDSN2,UNIT=(TAPE,,DEFER),
//              VOL=SER=EEEEEE,DISP=OLD,LABEL=(,BLP)
//TAPE2OUT       DD      DSN=NOT.USED,UNIT=TAPE,DISP=(,KEEP)
//SYSIN          DD      *
   ANALYZE(1) VOL=ABC101,VOLINCR=1,MAXVOLN=3
   ANALYZE(2) VOL=(000123,000125),VERIFY
```

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FATS® & FATAR™

USER DOCUMENTATION

MESSAGES & CODES

INNOVATION® DATA PROCESSING

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30.0 FATS AND FATAR MESSAGES AND CODES

30.1 RETURN CODES

RETURN CODES

Both FATS and FATAR use the following completion or return codes:

0 Normal completion. No serious errors

4 A trial version of the product is being executed and the trial period has expired (contact INNOVATION if you wish to continue your testing or install the production version).

12 Serious errors have occurred and the RETCODE option has been specified (user abend U0200 or U0888 is issued otherwise).

30.2 ABEND CODES

ABEND CODES

Both FATS and FATAR may issue the following user abend codes (most abends will be accompanied by an explanatory message):

U0100 (FATAR only) TAPEIN DD statement missing, TAPEIN or TAPEOUT is not assigned to a tape unit, or an open failure on TAPEIN or TAPEOUT

U0200 (FATAR only) unrecoverable I/O error on TAPEOUT. If the RETCODE parameter is specified, a return code of 12 is issued instead of this abend.

U0401 Open error or I/O error on SYSIN

U0402 Open error or I/O error on a PRINT data set

U0502 Error in FATS or FATAR control statements

U0888 Major errors on tape. For FATS, any condition causing abnormal completion of a FATS function (indicated by "ABNORM" in the FATS summary report). For FATAR, unrecoverable I/O errors on TAPEIN other than data checks, or MAXERR=/ MAXTERR= values exceeded. If the RETCODE parameter is specified, a return code of 12 is issued instead of this abend.

CONTINUED . . .

30.3 CONSOLE MESSAGES

CONSOLE MESSAGES

The following write-to-operator (WTO) and write-to-operator-with-reply (WTOR) messages may be issued by FATS or FATAR. They will be written to route code 3 (tape pool console).

FATSW01 **REQUEST TO LABEL TAPE ON UNIT uuuu REPLY WITH SERIAL NUMBER**

Reason: The OPERATOR parameter has been specified or the SAVLAB function found that the tape was not a labeled tape

Action: Respond with a 1-to-6 character volume serial. FATS will left justify it, blank fill it, and label the tape on tape unit "uuuu".

FATSW02 **REPLY EOJ/KEOJ/Kuuuu TO TERMINATE**

Reason: FATS will always issue this WTOR at the start of every FATS run to allow the operator to control and terminate FATS

Action: It will not be necessary to reply to this message unless:1) MULT was specified without MAXVOLN=2) It is desired to terminate FATS before its normal termination, or3) A particular tape must be halted. Valid responses are:

EOJ – FATS will terminate after all tapes which are currently in progress have completed. Any pending tape mounts must be satisfied.

KEOJ – FATS will halt all tapes in progress, cancel any pending mounts, and terminate with a U0888 abend or return code 12.

Kuuuu – Where "uuuu" is the 3 or 4-digit address of a tape drive allocated to FATS. Any mount or tape in progress on that drive will be halted. If appropriate, another tape may be requested on the drive. Other drives allocated to FATS will not be affected. If "uuuu" is not a drive in use by FATS, it will be ignored. The FATSW02 message will be reissued.

FATSW03 **FATS ANALYSIS OF TAPE ON UNIT=uuuu VOL=vvvvvv**

PERM ERRORS=ppppp TEMP ERRORS=ttttt

Reason: The WTO parameter has been specified. This message will be issued at the end of processing for each tape, giving unit "uuuu", volume serial "vvvvvv", and the total number of permanent and temporary errors ("ppppp" and "ttttt"). If a tape has major errors causing it to be halted prematurely, "ppppp" will be "MAJOR".

FATSW04 **MOUNT NEXT REEL ON UNIT=uuuu VOL=vvvvvv**

Reason: Issued by FATS to request mounting of another tape on tape unit "uuuu". The volume serial "vvvvvv" may be an explicit serial or "SCRTCH" as appropriate.

Action: Mount the requested tape on unit "uuuu".

CONTINUED . . .

30.3 CONTINUED . . .

FATSW05 FATS HAS STOPPED ON DATA CHECK ON UNIT=uuuu REPLY CONT, TERM, NOSTOP

Reason: The STOP or STOPNUM= parameters have been specified and a permanent data check has occurred. FATS stops to allow visual inspection of the tape at the point of the error.

Action: Inspect the tape on tape unit "uuuu", if desired, re-ready the tape, and reply:

CONT – To continue certifying/verifying, stopping again on the next data check

TERM – To terminate processing of the tape

NOSTOP – To continue certifying/verifying without stopping on further data checks

Note that if you remove the tape from the "READY" state to inspect it, you will probably be unable to re-ready it at the same spot and be forced to reply "TERM".

FATSW06 PLEASE CLEAN UNIT=uuuu THEN (RE)MOUNT VOL=vvvvvv

Reason: The MAXCLEAN= or ERRCLEAN= parameters were specified. If MAXCLEAN=n then "n" tapes have been processed on unit "uuuu" since the last cleaning. If ERRCLEAN=n then more than "n" errors have occurred on unit "uuuu" (the message will say RE-MOUNT).

Action: Clean tape unit "uuuu" and mount or remount the specified volume "vvvvvv"

FATSW07 NVALID RESPONSE TO TERMINATE MESSAGE -- RE-ENTER

Reason: The response to message FATSW02 was not "EOJ", "KEOJ", or "Kuuuu". FATSW02 will be reissued.

Action: Reply with a valid response for message FATSW02

FATSW08 VOL=vvvvvv MOUNTED,DSN=d...d,EXPDT=yyddd

FATSW08 UNIT=uuuu REQUIRES VOL=xxxxxx-REPLY IGNORE, UNLOAD, TERM, SKIP

FATSW08 UNIT=uuuu DSN NOT EXPIRED -- REPLY IGNORE, UNLOAD, TERM, SKIP

Reason: The VALIDATE= parameter was specified to validate input and/or output labeled tapes with LABEL=(,BLP). Either the wrong volume was mounted or the expiration date on an output volume was not reached. In the first line of the message, "uuuu" is the tape unit, "vvvvvv" is the actual volume mounted, "d...d" is the data set name read from the tape, and "yyddd" is the expiration date. One of the next two formats of the message will be issued ("xxxxxx" is the volume expected).

Action: Reply with:

IGNORE – To ignore the error and accept the volume mounted.

UNLOAD – To unload the volume and request mounting of another tape

TERM – To terminate FATS or FATAR

SKIP – To terminate this volume and go on to the next (FATS only)

CONTINUED . . .

30.3 CONTINUED . . .

FATSW11 FATAR FILE ffff OPERATION UNIT=uuuu,VOL=vvvvvv,BLOCKS=bbbbbb,PERM ERRS=ppppp,TEMP ERRS=ttttt

Reason: The WTO parameter has been specified. The message will be issued at the end of processing each input file, giving file number "ffff", unit "uuuu", volume serial "vvvvvv", input block count "bbbbbb", and the total number of permanent and temporary errors ("ppppp" and "ttttt") in that file. "Operation" will be "ANALYZED ON" (if TAPEOUT absent), "COPIED FROM" (if TAPEOUT present), or "VERIFIED ON" (if verifying TAPEOUT)

Action: None

FATSW12 FATAR FILE ffff OPERATION UNIT=uuuu,VOL=vvvvvv REPLY CONT, TERM, OR NOSTOP

Reason: The STOP parameter has been specified. The message will be issued at the end of processing each input file, giving file number "ffff", unit "uuuu", and volume serial "vvvvvv". "Operation" will be "ANALYZED ON" (if TAPEOUT is absent), or "COPIED FROM" (if TAPEOUT present).

Action: Reply with:

CONT – To continue with the next input file, stopping again at the end of that file

TERM – To terminate processing of TAPEIN

NOSTOP – To continue with the next file without stopping at the end of further files

FATSW13 REPLY IS: TEXT

Reason: Automatic reply to tape management message.

FATSW14 INVALID MODIFY COMMAND GIVEN: text....

Reason: "text" was specified in MODIFY (F) id,text operator command. "id" is the FATS jobname for which the MODIFY command was intended. "text" is not either "QUIT" or "Kuuuu" to terminate FATS when current tapes are done or to immediately terminate processing for tape unit "uuuu".

Action: None. Command is ignored.

FATSW89- - xxxx -- TRIAL VERSION FROM INNOVATION DATA PROCESSING EXPIRES IN nnn DAYS.

FATSW89- - xxxx -- TRIAL VERSION FROM INNOVATION DATA PROCESSING EXPIRED ---------- PLEASE CONTACT INNOVATION.

Reason: "xxxx" (FATS or FATAR) trial will expire in "nnn" days or "xxxx" trial has expired. The version of FATS or FATAR that you are running is a trial version and has expired or will expire shortly.

Action: If you have purchased FATS/FATAR and have received the tape, make sure that it was properly installed and the trial version has been deleted. Then rerun the job. If you have not yet purchased FATS/FATAR, call INNOVATION DATA PROCESSING.

CONTINUED . . .

30.4 PRINT MESSAGES

PRINT MESSAGES

FATS and FATAR may issue the following messages to their data sets (SYSPRINT or SYSPRINx).

FATS001 TAPEIN DD STATEMENT MISSING

Reason: The DD statement for TAPEIN is missing from the job step JCL.

Action: FATAR is terminated with a U0100 abend. Correct the JCL and resubmit the job.

FATS002 TAPEIN DEVICE IS NOT A TAPE UNIT

Reason: The DD statement for TAPEIN does not reference a supported tape unit type.

Action: FATAR is terminated with a U0100 abend. Correct the JCL and resubmit the job.

FATS003 TAPEIN COULD NOT BE OPENED

Reason: The open of the input tape on TAPEIN failed.

Action: FATAR is terminated with a U0100 abend. Check the printout for operating system messages indicating the cause.

FATS005 TAPEOUT DEVICE IS NOT A TAPE UNIT

Reason: The DD statement for TAPEOUT does not reference a supported tape unit type.

Action: FATAR is terminated with a U0100 abend. Correct the JCL and resubmit the job.

FATS006 TAPEOUT COULD NOT BE OPENED

Reason: The open of the output tape on TAPEOUT failed.

Action: FATAR is terminated with a U0100 abend. Check the printout for operating system messages indicating the cause.

FATS010 CONTROL CARD ERROR -- REASON X

Reason: A syntax or usage error has been detected in the control statement printed immediately preceding the message. Only one FATS010 message will be printed for each input statement (multiple errors will not be diagnosed). "x" is a letter or number indicating the type of error detected:

1 – Open failed for the control statement data set (SYSIN or SYSINx)

2 – Control statement is completely blank

3 – An invalid operation keyword was found on the control statement

4 – More than one ANALYZE control statement was found.

5 – The control statement required at least one keyword parameter but did not contain one (for all statements except ANALYZE).

6 – A specific keyword parameter was required on the control statement but was not found or a required parentheses was missing or a keyword was misspelled.

7 – An ANALYZE control statement was required but not found.

8 – T= on TABLE statement in error. Letter previously used.

9 – A numeric value for a keyword parameter exceeds the allowed maximum for that keyword

A – A value for a keyword parameter was zero or non-numeric

B – Continuation card required but not found

C – B= keyword in error. Block range specified but not in ascending order

CONTINUED . . .

30.4 CONTINUED . . .

D – D=, V=, or S= keyword in error. Length of data is more than 256 bytes or characters.

E – D=, V=, or S= keyword in error. Data field must contain at least 1 byte or character.

F – ENDAFTER= keyword error.

G – Control statement table is too small to contain all information from the control statements present. Increase the table size via the EXEC JCL statement PARM field.

H – Error in X ' or C' data: no closing apostrophe, invalid HEX digits, or odd number of HEX digits.

J – Invalid data string. Must start with X ' or C'

K – Error in T= keyword. On SCAN statement, must be A-Z and defined in a previous table statement (except for P and Z). On table statement, must be A-O or Q-Y and not previously used.

L – EXITNAME was not found or length of EXITNAME is zero.

M – Data set name specified by NEWN= on a RENAME statement is invalid.

N – Data set name mask specified by NEWI= on a RENAME statement is invalid.

Action: FATAR will abend with a U0502 abend code after all control statements have been scanned.

FATS013 ONE OR MORE ERRORS DETECTED -- FATAR TERMINATED

Reason: Message FATS010 was issued for one or more control statement errors.

Action: FATAR will abend with a U0502 abend code. Correct the errors and re-execute.

FATS014 NO CONTROL CARD DATASET. DEFAULTS ASSUMED

Reason: No SYSIN DD statement for control statement input was present in the job step JCL (if FATAR was invoked by FATS, no SYSINx DD was present).

Action: All defaults are assumed for all ANALYZE statement parameters. If FATAR was invoked by FATS, any FATAR parameters specified in FATS statements will override these defaults.

FATS016 ANALYSIS TERMINATED DUE TO MAJOR ERROR

Reason: An unrecoverable hardware error has occurred on the input tape drive or channel. Preceding messages will give details of the error.

Action: FATAR is terminated with a U0888 abend or return code of 12. Contact INNOVATION if you need assistance in determining the cause.

FATS017 MAXIMUM ERRORS EXCEEDED -- FATAR TERMINATED

Reason: The number of unrecoverable data checks exceeded the MAXERR= parameter, or the number of recoverable data checks exceeded the MAXTERR= parameter.

Action: FATAR is terminated with a U0888 abend or return code of 12.

FATS019 FATAR MUST BE IN AN AUTHORIZED LIBRARY. PROGRAM TERMINATED

Reason: FATAR must be executed as an APF authorized program. Either the program library containing FATAR was not marked as an APF authorized library on your MVS system, or your STEPLIB or JOBLIB DD statement has nonauthorized libraries concatinated to the FATAR program library, or FATAR has been relinked as nonauthorized (AC=0),.

Action: FATAR will terminate with a U0047 ABEND.

CONTINUED . . .

30.4 CONTINUED . . .

FATS020 ANALYSIS TERMINATED AT TAPEMARK SEQUENCE

Reason: If labels are being processed, two consecutive tape marks were read after a label file. If labels are not processed and NUMFILES=0 was specified or defaulted, two consecutive tape marks were read.

Action: Processing of the input tape is completed.

FATS021 ANALYSIS TERMINATED BY EOV LABELS DETECTED IN LABELS=NO MODE

Reason: If labels are not being processed and NUMFILES=0 was specified or defaulted, FATAR has detected what appears to be IBM or ANSI EOV labels.

Action: Processing of the input tape is completed.

FATS022 ANALYSIS TERMINATED AFTER SPECIFIED NUMBER OF FILES

Reason: NUMFILES=n was specified, and "n" logical files have been read.

Action: Processing of the input tape is completed.

FATS023 ANALYSIS TERMINATED BY ENDAFTER OPTION

Reason: The file and block specified by the ENDAFTER= parameter was read.

Action: Processing of the input tape is completed.

FATS024 ANALYSIS TERMINATED BY LOGICAL END OF FILE

Reason: FATAR attempted to switch to a new input tape volume (due to EOV labels read, or end-of-file in LABELS=OS mode), but no more volumes were given.

Action: Processing of the input tape is completed.

FATS025 ANALYSIS TERMINATED BY OPERATOR REQUEST

Reason: The operator replied "TERM" to the FATSW12 message or FATSW08 message.

Action: Processing of the input tape is halted.

FATS026 TAPEIN DATA SUCCESSFULLY COPIED TO TAPEOUT VOLUME VVVVVV

Reason: The TAPEOUT DD statement was present, and reading of TAPEIN data completed successfully. All input data not "DROPPED" has been written to TAPEOUT. The last or only volume of TAPEOUT was "vvvvvv".

Action: None

FATS027 UNLABELED TAPEOUT REQUIRED MORE THAN ONE VOLUME -- VERIFY CANCELLED

Reason: TAPEOUT is an unlabeled tape (LABEL=(,NL) or (,BLP)), the VERIFY parameter was specified, and TAPEOUT overflowed to more than one volume

Action: FATAR cannot verify multi-volume unlabeled tapes. The VERIFY will not be performed.

FATS028 ANALYSIS TERMINATED DUE TO INVALID LABEL

Reason: Labels were being processed on TAPEIN, but a valid IBM standard or ISO/ANSI or user label was not read when one was expected.

Action: The invalid data will be printed, and FATAR will be terminated with a U0888 abend or return code 12

CONTINUED . . .

30.4 CONTINUED . . .

FATS030 EOT ON TAPEOUT BUT VOLUME SWITCH NOT ALLOWED -- FATAR TERMINATED

Reason: Labels are being processed on TAPEIN, the current file being copied contains user labels, and the SUPULAB parameter (suppress user labels) was not specified. User labels may be required with the EOV (end-of-volume) and header labels written when the file crosses volumes, but FATAR has no way to generate user labels acceptable to the user application.

Action: FATAR is terminated with a U0888 abend or return code 12

FATS033 PERMANENT I/O ERROR ON TAPEOUT -- FATAR TERMINATED

Reason: FATAR uses standard system error recovery on TAPEOUT. An uncorrectable I/O error occurred (messages will follow to detail the error which occurred).

Action: FATAR will be terminated with a U0200 abend or return code 12. Consult the FATAR messages and operating system messages for details of the error. Errors may be avoided by cleaning the TAPEOUT tape drive, and using an output tape certified by FATS or other means.

FATS034 NOISE BLOCK HAS BEEN READ

Reason: A data check block too small to be considered a valid data block has been read (will not occur on tape cartridge drives).

Action: No recovery attempts will be made. The block will be immediately flagged as a permanent data check.

FATS035 TAPE DRIVE NOT CAPABLE OF REQUIRED DENSITY/MODE

Reason: The tape drive has reported that it is not capable of reading the input tape. This may occur when a tape written at a certain density (such as 6250 BPI for round tapes) or format (such as 3490E format) is mounted on a drive that is not capable of reading that density or format. This error may also be caused by an uninitialized tape.

Action: FATAR is terminated with a U0888 abend. Determine the actual density of the tape, and change the TAPEIN DD statement to allocate an appropriate tape drive.

FATS036 BLOCK GREATER THAN NNNNN BYTES READ -- FATAR TERMINATED

Reason: A tape block longer than "nnnnn" bytes (as specified by the BLKSIZE= parameter, DEFAULT 65534) has been read.

Action: The excess data is discarded, and FATAR is terminated with a U0888 abend.

FATS037 TAPE LABELS IN ISO/ANSI FORMAT -- TRANSLATED TO EBCDIC

Reason: FATAR has detected that the labels on TAPEIN are in ISO/ANSI format ("ANSI labels").

Action: The labels will be translated to EBCDIC for printing or processing. Also, the associated data file is assumed to be in ISCII/ASCII and will be translated to EBCDIC.

FATS038 DATA FILE IN ISCII/ASCII -- TRANSLATED TO EBCDIC

Reason: The current data file is assumed to be in ISCII or ASCII code. This occurs when DCB=OPTCD=Q is specified on the TAPEIN DD card, or when ISO/ANSI labels were detected on TAPEIN by FATAR.

Action: All data blocks in the file will be translated to EBCDIC for printing and processing.

CONTINUED . . .

30.4 CONTINUED . . .

FATS039 **WARNING** BLOCK LENGTH GREATER THAN BLOCKSIZE OF bbbbb

Reason: A block was read whose length is greater than the blocksize "bbbbb" of the current file (extracted from the header labels of the file, or given on the TAPEIN DD statement if labels are not processed).

Action: None. Unless dropped or modified, the block will be written to TAPEOUT as read.

FATS040 TAPEIN IS NOT LABELED -- LABELS=NO ASSUMED

Reason: The LABELS=YES parameter was specified or defaulted, but FATAR did not find valid IBM or ISO/ANSI labels in the first file read.

Action: FATAR will proceed as if LABELS=NO were specified.

FATS042 TAPEIN TRAILER BLOCK COUNT OF bbbbbb IS INCORRECT

Reason: The EOF1 or EOV1 trailer label on a labeled TAPEIN file contained a block count "bbbbbb" which did not match the number of blocks actually read in the file by FATAR. The actual block count is found in the "end of file" message preceding this message.

Action: None

FATS044 END OF OUTPUT TAPE vvvvvv -- NEW VOLUME REQUESTED

Reason: The end-of-tape reflector (tape indicate) was detected on TAPEOUT volume "vvvvvv".

Action: EOV labels are written on "vvvvvv" (if labeled), and a new output volume is requested.

FATS046 * * I/O ERROR--> ECB=eeeeeeeeECB rc description

Reason: This is the first of several messages issued as the result of a non-data check error on TAPEIN or any error on TAPEOUT. For diagnostic purposes it includes the event control block (ECB, 4 bytes) in hexadecimal along with the description associated with the ECB reason code (1st byte of ECB).

Action: Other messages will indicate whether FATAR can continue or must terminate, depending on the nature of the error. Appropriate manufacturer's manuals should be consulted to determine the cause of the error. Contact INNOVATION if you need assistance.

FATS047 * * I/O ERROR--> CSW=wwwwwwww wwwwwwwwcsw status desc

Reason: This is one of several messages issued as the result of a non-data check error on TAPEIN or any error on TAPEOUT. For diagnostic purposes it includes the channel-status word. (CSW, 8 bytes) in hexadecimal along with the description associated with the unit and channel status bytes of the CSW (bytes 4 and 5).

Action: See message FATS046

FATS048 * * I/O ERROR--> CCW=cccccccc cccccccccccw channel cmd

Reason: This is one of several messages issued as the result of a non-data check error on TAPEIN or any error on TAPEOUT. For diagnostic purposes it includes the channel-command word. (CCW, 8 bytes) in hexadecimal along with the channel command associated with the command code byte of the CCW (byte 0).

Action: See message FATS046

FATS049 * * I/O ERROR--> SENSE ssss EXTENDED SENSE ee...ee error description

Reason: This is one of several messages issued as the result of a non-data check error on TAPEIN or any error on TAPEOUT. For diagnostic purposes it includes the sense bytes (ssss, 2 bytes) in hexadecimal. If available, the extended sense (up to 32 bytes) is displayed. If FATAR can determine the cause from the sense and extended sense, a text description of the error is displayed.

Action: See message FATS046

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30.4 CONTINUED . . .

FATS051 RECORD rr BYTE bb LENGTH ll INVALID xxxx DATA FIELD

Reason: A SCAN statement has detected data which does not meet the user-specified criteria. "rr" is the record number within the current block ("RECORD rr" will not appear if deblocking is not being done). "bb" is the location of the invalid field within the indicated record or block (relative to 1). "ll" is the length of the field. "xxxx" will be "ZONED", "PACKED" or "TYPE t" (where "t" is a table ID).

Action: None

FATS052 SCAN FIELD NOT IN RECORD -- SCAN TERMINATED FOR THIS RECORD

Reason: A SCAN statement applied to a block or record, but the location to be scanned (P= parameter) was beyond the end of the block/record.

Action: SCAN not performed. Check the SCAN parameters.

FATS053 BLOCK LENGTH ZERO -- BLOCK NOT KEPT

Reason: A KEEP statement applied to an input block, but the length of the data read was zero (probably due to a data check).

Action: The block will not be written to TAPEOUT.

FATS054 BLOCK LENGTH CHANGED WHILE IN LOGICAL RECORD MODE --DEBLOCKING TERMINATED

Reason: FATAR was deblocking input blocks into individual records, but a KEEP statement changed the length of a block.

Action: The block will not be deblocked

FATS056 RECORD TOO SHORT--NO DATA REPLACED

Reason: A record or block is too short to contain the data specified on a REPLACE statement

Action: REPLACE not performed. Check the REPLACE parameters.

FATS057 DATA RECOVERED -- BLOCK NOT MODIFIED

Reason: A MODIFICATION/SCAN statement with the DCK parameter applied to a data block, but the block did not have a permanent data check.

Action: The MODIFICATION or SCAN will not be performed.

FATS058 RECORD nnnnn HAS BEEN DROPPED

Reason: In response to a DROP statement with a record number indicated, record "nnnnn" has been deleted from the current block.

Action: The block will be "compressed" to eliminate the deleted record. If the record format is variable, the block length will be updated.

FATS061 RECFM/LRECL NOT GIVEN -- FILE ASSUMED UNBLOCKED

Reason: The record format (RECFM) and logical record length (LRECL) for the current file are not available from either the TAPEIN DD statement or TAPEIN header labels.

Action: FATAR is unable to deblock the current file into logical records and will treat each block as a single record. If deblocking is desired, specify RECFM and LRECL on TAPEIN and re-execute FATAR.

CONTINUED . . .

30.4 CONTINUED . . .

FATS062 DEBLOCKING ANSI SPANNED RECORDS NOT SUPPORTED -- UNBLOCKED ASSUMED FORTHIS FILE

Reason: The TAPEIN DD statement or TAPEIN header labels specifies ANSI variable-length spanned records (record format DS or DBS). FATAR does not support deblocking of ANSI spanned records.

Action: Unblocked (record format U) assumed.

FATS063 BLOCK INVALID FOR RECFM/LRECL IN USE--DEBLOCKING TERMINATED

Reason: Blocks in the current file were being deblocked into logical records, but the current block cannot be deblocked using the record format and logical record length provided (via the TAPEIN DD statement or TAPEIN header labels). For fixed length records, the block is not an exact multiple of the record length. For variable length records, the record descriptor words (RDW) may be invalid or indicate a length greater than the block size.

Action: The current block will be treated as unblocked. If the record format and length given are correct, the block is invalidly formatted; if not, specify the correct RECFM and LRECL on TAPEIN and re-execute FATAR.

FATS064 FILE NOT ELIGIBLE FOR REBLOCKING--REBLOCKING SUPPRESSED FOR THIS FILE

Reason: REBLOCK= was specified, but the current file cannot be reblocked for one of the following:

1) The record format is not fixed or variable

2) The record format is variable spanned

3) The blocksize is zero

4) The logical record length is zero (if the record format is FB or VB)

5) The blocksize is greater than the MAXRBLK= parameter, if specified.

Action: The file will be copied without reblocking.

FATS065 RECORD LENGTH TOO LARGE FOR REBLOCKING -- REBLOCKING SUPPRESSED FOR THIS FILE

Reason: REBLOCK= was specified, but the logical record length of the current file is larger than the specified reblocking block size.

Action: The file will be copied without reblocking.

FATS066 THIS FILE WILL BE REBLOCKED TO A BLOCKSIZE OF nnnnn

Reason: REBLOCK= was specified, and the current file can be reblocked. The new block size "nnnnn" will be equal to the reblocking block size for variable length files, or the next lower multiple of the record length for fixed length files

Action: The file will be copied and reblocked.

FATS067 INPUT DEBLOCKING ERROR WHILE REBLOCKING -- FATAR TERMINATED

Reason: REBLOCK= was specified, and the current file was being reblocked, but an error occurred extracting logical records from the current input block (message FATS063 will precede this message).

Action: Since the labels on the output tape reflect the new blocksize, FATAR will be terminated with a U0888 abend or return code of 12. Specify the correct RECFM and LRECL on TAPEIN and re-execute FATAR.

CONTINUED . . .

30.4 CONTINUED . . .

FATS068 INPUT RECORD TOO LARGE WHILE REBLOCKING -- FATAR TERMINATED

Reason: REBLOCK= was specified, and the current file was being reblocked, but an input logical record was larger than the output reblocking blocksize.

Action: Since the labels on the output tape reflect the new blocksize, FATAR will be terminated with a U0888 abend or return code of 12. Specify a larger value for REBLOCK= and re-execute FATAR.

FATS069 RECORD nnnnn SPANNING ERROR -- xxxxx OF SEGMENT MISSING

Reason: The TAPEIN JCL or tape labels specifies variable spanned records for the current file, and FATAR has detected an incomplete spanned record. "xxxxx" will be "START" if the end of a record was found without a corresponding beginning, or "END" if a new record was found before a previous spanned record was complete. "nnnnn" is the record number within the current block where the error was detected (if "xxxxx" is "END", the error is probably actually in the preceding block(s)).

Action: An additional FATAR run may be required to print the appropriate blocks and determine which records are truly in error. Another run using either FATAR REPLACE statements to fix the spanning flags, or DROP statements to delete the partial records may be used to fix the tape.

FATS070 CONTROL CARD TABLE SIZE IS n BYTES

Reason: This message is always printed to document "n", the size of the FATAR control statement storage table. This size defaults to 4096 but can be increased by the SIZE= parameter in the FATAR EXEC JCL statement PARM=.

Action: If this FATAR execution receives message FATS010 reason G, increase the table size.

FATS071 TAPE BUFFER SIZE IS n BYTES

Reason: This message is always printed to document "n", the size of the FATAR TAPEIN read buffer. The default size is 65535 bytes but can be reduced by use of the BLKSIZE= parameter.

Action: Any blocks on TAPEIN exceeding "n"-1 in length will cause FATAR to terminate (see message FATS036).

FATS072 TAPEIN DATA WILL BE COPIED TO TAPEOUT

Reason: The TAPEOUT DD statement is present.

Action: All files and data on TAPEIN will be copied to TAPEOUT unless "DROPPED" by data checks or FATAR control statements.

FATS074 ** WARNING ** CONTROL CARD NUMBER N WAS NEVER REFERENCED OR REPLACE-VERIFY NEVER SATISFIED

Reason: This message is issued at FATAR termination to warn of control statements which have never been acted upon (possibly due to user error). Either the file $NL or block $NL on the statement was never encountered on TAPEIN, or, for a REPLACE statement with a V= or S= parameter, the VERIFY or SCAN never caused any data to be replaced.

Action: Review the control statements to be sure that they were coded correctly. Review the FATAR output to be sure that the desired files and blocks were processed.

FATS075 SPECIAL EXPIRATION OF yydd1 DETECTED, TAPEOUT EXPDT=yydd2

Reason: FATAR read labels containing an expiration date "yydd1" recognized as having a special purpose, i.e., 98000 or 99000.

Action: If copying to TAPEOUT, the output file will have expiration "yydd2" (98000 is changed to 00000 but some tape management systems will change this to a default retention).

CONTINUED . . .

30.4 CONTINUED . . .

FATS076 TAPE MANAGEMENT text

Reason: Displays information about the FATAR Tape Management interface. If no supported tape management system was detected or an interface error occured, this is indicated. Otherwise it will identify the type and level of the tape management system, and information about the input tape extracted from that TMS

Action: None, unless an error occurs. If necessary, contact Innovation Technical Support.

FATS077 EOT ON TAPEOUT BUT FATAR WILL ATTEMPT TO WRITE nnn MORE BLOCKS

Reason: During an image copy (LABELS=NO), FATAR detected the logical End-of-Tape (EOT) on the output tape, and EOTBLOCKS= was specified or defaulted.

Action: Since an image copy must put all the input data on a single output volume, FATAR will attempt to write "nnn" additional blocks beyond logical EOT.

FATS078 EOT ON TAPEOUT, FATAR WROTE nnn MORE BLOCKS BUT COPY NOT COMPLETE

Reason: During an image copy (LABELS=NO), FATAR wrote extra blocks beyond logical EOT, but the allowable block count was reached before all input data was copied.

Action: Since an image copy must put all the input data on a single output volume, this copy is not complete. If "nnn" is less than 999, you can attempt to complete it by increasing the EOTBLOCKS= value, or using a longer output tape.

FATS079 PHYSICAL EOT ON TAPEOUT AFTER nnn EXTRA BLOCKS WRITTEN, COPY INCOMPLETE

Reason: During an image copy (LABELS=IMAGE), FATAR wrote extra blocks beyond logical EOT, but physical EOT was detected (on a cartridge drive) before all input data was copied.

Action: Since an image copy must put all the input data on a single output volume, this copy is not complete. You can attempt to complete it by using a longer output tape.

FATS080 UNABLE TO LOAD CHARTAB=table PRINT TRANSLATE TABLE. DEFAULT "FATCHRTB" WILL BE USED.

Reason: CHARTAB= was specified with the name of a load module containing an alternate print table, but FATAR was unable to successfully LOAD that module.

Action: Check the job log for IBM messages indicating why the module could not be loaded. For this run the standard FATAR translate table is used.

FATS081 TAPE LABELS IN ISO/ANSI FORMAT - TRANSLATED TO EBCDIC FOR PRINTING ONLY

Reason: ANSI labels were detected on the input tape. They are translated to EBCDIC for printing purposes only.

FATS083 **WARNING TAPE REWOUND TO LOAD POINT FOR IMAGE COPY**

Reason: An image copy was requested (LABELS=IMAGE) but the TAPEIN JCL specified a file number (LABEL=n) greater than 1.

Action: Since OPEN positioned the tape to the specified file, FATAR rewound the tape to the beginning (load point) in preparation for copying the entire tape.

FATS084 **WARNING MORE THAN ONE INPUT VOLUME FOUND DURING IMAGE COPY. COPY STOPPED AT END OF FIRST VOLUME**

Reason: An image copy was requested (LABELS=IMAGE) but the TAPEIN JCL specified more than one volume serial. Image copy can process only one volume at a time.

Action: The additional volume serials were ignored. If they must also be copied, you must submit separate LABELS=IMAGE steps for each one.

CONTINUED . . .

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30.4 CONTINUED . . .

FATS085 **WARNING** NUMFILES SET TO 0 FOR IMAGE COPY

Reason: An image copy was requested (LABELS=IMAGE) but NUMFILES= (NF=) was specified with a value other than 0.

Action: Since image copy must copy the entire tape, NUMFILES=0 was forced.

FATS086 **WARNING** NO TAPEOUT DD FOUND WHEN LABELS=IMAGE SPECIFIED

Reason: An image copy was requested (LABELS=IMAGE) but no TAPEOUT DD was provided to specify the output tape.

Action: Processing will continue, allowing you to “dry run” the image copy, but the step must be rerun with a TAPEOUT DD statement to actually copy the tape.

FATS087 **WARNING** CATALOG OF OUTPUT TAPE FAILED. COMP=comp DSN=dsn

Reason: Cataloging of the indicated output data set was requested by the CAT=YES or CAT=RECAT parameters, but the attempt to catalog the indicated data set failed. “comp” is the return code from CAMLST CATALOG, which will usually be 0008. For CAT=YES this may indicate that the output data set name is already cataloged. Another common cause is attempting to catalog into the master catalog, usually because you have used an output data set name which is not assigned to a user catalog. FATAR will complete processing but the indicated output data set names will not be cataloged.

Action: You can catalog the output data set name manually without rerunning FATAR, using the IDCAMS statement DEFINE NONVSAM. If you want to recatalog the output name to the output tape, rerun the step using CAT=RECAT instead of CAT=YES. If the output name is not valid, use the RENAME statement to change the name to one that can be cataloged.

FATS088 **WARNING** CATALOGING REQUESTED BUT FULL NAME NOT AVAILABLE. DSN=dsn

Reason: Cataloging of the indicated output data set was requested by the CAT=YES or CAT=RECAT parameters, but was not attempted because FATAR does not know the full 44-character name of the data set. IBM records only the last 17 characters of the original data set name in the tape labels, which is not valid for cataloging. FATAR can attempt cataloging if:

- the FATAR tape management interface is enabled and has provided the full data set name from tape management records
- the name in the labels is 16 characters or less
- you have provided the output data set name on a RENAME statement with the NEWN= paramenter

FATAR will complete processing but the indicate output data set names will not be cataloged.

Action: You can rerun the FATAR step providing RENAME statements with NEWN= to provide the output data set name. If the tape is recorded in your tape management system but you have not enabled the FATAR tape management interface, you can do so (See Section 90.3 IMPLEMENTING THE TAPE MANAGEMENT INTERFACE).

FATS089 **WARNING** NEWI= SPECIFIED BUT FULL NAME NOT AVAILABLE. NEWI=mask

Reason: A RENAME statement with the NEWI operand applies to this file, but the full data set name of the input data set was not available. The full name is available if the original name is 16 characters long or less, if the full name was provided on the TAPEIN DD statement, or if you have enabled the FATAR tape management interface.

Action: The output file will be created with the truncated name derived from the input tape labels. You may want to rerun the copy specifying a full output data set name with NEWN= instead of NEWI=.

CONTINUED . . .

30.4 CONTINUED . . .

FATS090 **WARNING** NEWI= RESULTED IN INVALID OUTPUT DATA SET NAME. NEWI=mask

Reason: A RENAME statement with the NEWI= operand applies to this file, but when the mask was applied to the input data set name, it resulted in an output data set name which does not meet IBM standards.

Action: The output data set will be created with the input data set name, ignoring the RENAME statement. You may want to rerun the copy specifying a NEWI= which results in a valid name, or specify a NEWN= to provide a complete output name.

FATS091 **WARNING** NEXTVOL=TMS SPECIFIED BUT TMS INFORMATION NOT AVAILABLE

Reason: NEXTVOL=TMS was specified, requesting that FATAR get information about the additional input tape volumes related to the first input tape from the FATAR tape management interface, but no tape management information was available for this tape. Either the tape management interface is not enabled (See Section 90.3) or the input tape is not recorded in the tape management data base.

Action: If additional volume serials were specified on the TAPEIN DD statement, they will be mounted. Otherwise, FATAR will terminate normally at the end of the input tape.

FATS092 OUTPUT DATA SET RENAMED TO DSN=dsname

Reason: A RENAME statement was supplied which applies to this tape file. The actual name of the output data set is displayed.

FATS093 OUTPUT DATA SET RENAMED AND CATALOGED. DSN=dsname

Reason: A RENAME statement was supplied which applies to this tape file and CAT= was also specified. The actual name of the output data set is displayed; this data set was cataloged.

FATS094 **WARNING** CATALOGING REQUESTED BUT NEW NAME WAS NOT SPECIFIED

Reason: CAT= was specified, requesting that this output data set be cataloged, but the full name of the input data set was not available and no RENAME NEWN= was provided with an output data set name. The full name is available if the original name is 16 characters long or less, if the full name was provided on the TAPEIN DD statement, or if you have enabled the FATAR tape management interface.

Action: The output file will be created with the truncated name derived from the input tape labels but this name was not cataloged.

CONTINUED . . .

30.4 CONTINUED . . .

FATS100 (INSTRUCTION LINE)

Reason: If PARM=I is present on the FATS EXEC JCL statement, this message will be printed repeatedly on SYSPRINT with the internal FATS instructions.

FATS102 CONTROL CARD ERROR -- REASON=x

Reason: A syntax or usage error has been detected in the control statement printed immediately preceding the message. Only one FATS102 message will be printed for each input statement (multiple errors on a statement will not be diagnosed). "x" is a letter or number indicating the type of error detected:

1 – An option parameter is not followed by a blank or comma.

2 – Operation keyword is invalid or the tape number in parentheses is not 1 through 9.

3 – Tape number has been previously used on another operation statement.

4 – An option parameter is invalid.

5 – Error in the MODE= parameter. Value is not 2 hexadecimal digits or is not one of the valid values.

6 – Error in the RETRY= parameter. Must be RETRY=h or RETRY=(l,h). "h" must be 1 to 99. "l" must be 0 to "h".

7 – Error in the numeric value of a keyword parameter. Invalid numeric digits.

8 – Error in the BPI= parameter, BPI=0.

9 – Error in the LABEL= parameter, invalid characters in the label value.

A – Expected continuation statement not received (previous statement ended in a comma).

B – No ending apostrophe in OWNERID= parameter.

C – Error in the THRESHOLD= parameter, greater than 32767.

D – Label operation statement missing LABEL= or VOL= parameter.

E – Error in BLKSIZE= parameter, must be less than 65536 and more than twice the tape density (BPI), except for cartridges.

F – Error in VOL= parameter. Volume serial longer than 6 characters.

G – Error in VOL= parameter. More than 682 volume serials specified.

H – VOL= parameter specified on a default statement.

I – VOLINCR= parameter specified without VOL= parameter.

J – Blank control statement.

K – Error in VOLINCR= parameter. The last volume serial in the VOL= parameter could not be incremented due to insufficient trailing numeric digits.

L – Error in ENDAFTER= parameter (for FATAR execution).

M – Invalid numeric value for keyword. Value was zero or greater than 32767.

N – An option parameter was specified which is invalid for the control statement on which it was found. For instance, MODIFY=YES was specified on a read statement, but it is only valid on a DEFAULT statement.

Action: FATS will abend with a U0502 abend code after all control statements have been scanned.

CONTINUED . . .

30.4 CONTINUED . . .

FATS104 ONE OR MORE ERRORS DETECTED -- FATS TERMINATED

Reason: Message FATS102 was issued for one or more control statement errors.

Action: FATS will abend with a U0502 abend code. Correct the errors and re-execute.

FATS105 NO INPUT CARDS -- FATS TERMINATED

Reason: No control statements other than DEFAULT and comments were present in the input. At least one operation statement must be present.

Action: FATS will abend with a U0502 abend code.

FATS106 DD=SYSPRINx MISSING -- REQUIRED FOR ANALYZE

Reason: An ANALYZE(x) control statement was present but no corresponding SYSPRINx DD card was found. FATAR cannot write its messages to SYSPRINT when invoked from FATS.

Action: FATS will abend with a U0502 abend code.

FATS107 A line of the detail report indicating label status

FATS108 NO SUMMPRT DD PROVIDED-SUMMARY REPORT WILL GO TO SYSPRINT

Reason: The SUMMPRT DD card is not present.

Action: FATS will write summary report data to SYSPRINx if present for TAPEx or to SYSPRINT

FATS109 FATS BYPASSED DD=TAPEx REASON=MISSING DD STATEMENTDEVICE NOT A TAPE

Reason: FATS was unable to process an operation statement because the associated DD card TAPEx was not provided or did not allocate a tape device.

Action: Other operation statements (if present) will be processed. Check the TAPEx DD statement.

FATS110 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Reason: FATS has read the control card printed as part of this message.

Action: FATS will parse the control statement.

FATS111 xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Reason: FATS has parsed all of the control statements and merged the information for each with the defaults. This table represents the processing to be done for each of the 1 to 9 functions specified.

Action: FATS will not perform the requested functions.

FATS112 FATS MUST BE IN AN AUTHORIZED LIBRARY. PROGRAM TERMINATED

Reason: FATS must be executed as an APF authorized program. Either the program library containing FATS was not marked as an APF authorized library on your MVS system, or your STEPLIB or JOBLIB DD statement has nonauthorized libraries concatinated to the FATS program library, or FATS has been relinked as nonauthorized (AC=0),.

Action: FATS will terminate with a U0047 ABEND.

30.4 CONTINUED . . .

FATS201 TAPEx MAJOR ERROR ON TAPE

FATS201 ANALYZE TERMINATED FOR VOL=vvvvvv

Reason: The first format of the message will be issued whenever unrecoverable I/O errors (other than data checks) occur on the indicated tape drive; it will be followed by message FATS202. The second format of the message appears when a threshold of major errors is exceeded or when the error is too severe to continue (such as equipment check or intervention required).

Action: If the second form of the message is issued, further processing of the tape volume "vvvvvv" is halted, and FATS will eventually abend with a U0888 abend code to indicate that major errors occurred.

FATS202 IOB SENSE ECB CSW CCW ADDRESS DCB FAILING CCW

FATS202 data corresponding to the above labels

FATS202 FULL SENSE=ff....ff

Reason: This message is issued after message FATS201 when major I/O errors occur. At least the first two lines will be printed, the first containing the titles shown and the second the corresponding diagnostic data in hexadecimal. If the complete sense data produced by the device is available, it will be printed in the third line.

Action: Major errors may indicate severe problems with the tape being processed or problems with the tape unit being used. Appropriate manufacturer's manuals should be consulted to determine the cause of the error. Contact INNOVATION if you need assistance.

FATS203 A line of the detail report indicating a tape mark read.

FATS204 A line of the detail report indicating a data check.

FATS205 A line of the detail report indicating PRINT threshold met.

FATS206 A line of the detail report showing the compaction achieved for the current line.

FATS207 A line of the detail report indicating operator cancelled, maximum errors exceeded, or end-of-tape (tape indicate).

FATS208 A line of the detail report indicating cleaning action.

FATS209 A line of the detail report indicating that an IDRC compacted file was sensed.

FATS210 FATS OPEN/CLOSE SUBTASK ABEND ON DD=TAPEx COMP CODE = Ssss Uuuuu

Reason: FATS sub-task which handles OPEN, CLOSE, and FATAR has abended with a system (sss) or user (uuuu) abend.

Action: Use of the tape drive on TAPEx will be terminated. If no other TAPEx DD statements are active, FATS will terminate.

FATS211 OPERATOR CANCELLED ANALYSIS ON DD=TAPEn

Processing of this tape was cancelled by the operator by a reply of "KEOJ" or "Kuuu" to the FATSW02 console message, or "TERM" or "SKIP" to the FATSW08 console message.

CONTINUED . . .

30.4 CONTINUED . . .

FATS300 A line of the summary report giving DD name, tape unit address, volume serial, operation performed, termination status, tape length, and data check summary by retry count.

FATS301 **END OF REPORT**

Reason: Printed at the end of all detail and summary reports.

FATS990 **INSTALLED INNOVATION TRIAL WILL EXPIRE ON YY.DDD**

Reason: Product extension has completed successfully.

Required JCL:

```
//EXTEND        EXEC     PGM=FATEXTND,PARM=xxxx
//STEPLIB        DD      DISP=SHR,DSN=fats.loadlib
//SYSLIB         DD      DISP=SHR,DSN=fats.loadlib
//SYSDIAG        DD      SYSOUT=*
```

PARM will be supplied by INNOVATION.

CONTINUED . . .

30.5 FATS ACTION MESSAGES

ACTION MESSAGES

The "ACTION" column of the FATS detail report will contain one of the following messages:

3480 FORMAT FILE SENSED

The current file is a normal 3480 file.

3480XF FORMAT FILE SENSED

The current file is an IDRC compacted 3480 file.

3490E FORMAT FILE SENSED

The current file is a 3490E format file which may or may not be IDRC compacted.

3490E WRAP 2 REVERSAL SENSED

The current file is a 3490E file which has reached logical EOT and is recorded in the reverse direction.

3590 FORMAT FILE SENSED

The current file is a 3590 (Magstar) format file which may or may not be IDRC compacted.

DATA COMPACTED BY xx%

The current file was IDRC compacted by the indicated amount.

TAPE INDICATE

The logical end of tape (end-of-tape reflector or cartridge logical end-of-tape) has been detected by a FATS WRITE operation.

PERM DATA CHECK

An error has been retried until the retry level defining a permanent error (RETRY= parameter) has been reached.

PERM DATA CHECK CNTL

An error was encountered while repositioning the tape for data check retry. No further retries are done. This may indicate serious problems with the tape or drive.

TEMP DATA CHECK

An error has been retried and was successful before the permanent error retry level was reached.

TAPE MARK

A tape mark (end of file) was read during a FATS read operation.

LABEL SAVED

The volume serial was read from the tape and labels were successfully rewritten (the SAVLAB function).

LABEL NOT SAVED

The SAVLAB function was attempted, but labels did not exist or could not be read.

LABEL WRITTEN

Labels with the specified volume serial number have been written to the tape.

LABEL NOT WRITTEN

Labels could not be written due to I/O errors.

CONTINUED . . .

30.5 CONTINUED . . .

TEMP DATA CHK LABEL

Temporary I/O errors were encountered when writing labels but the labels were written successfully.

PERM DATA CHK LABEL

Permanent I/O errors were encountered when writing or saving labels. The labels were not written.

MAX ERROR EXCEEDED

The length in inches of a contiguous data check has exceeded the MAXCERR= parameter specified. Processing of this tape will be terminated.

PRINT THRESHOLD MET

The number of errors printed for this tape exceeds the THRESHOLD= parameter specified. No more errors will be printed in the detail report, but processing will continue.

OPERATOR CANCELLED

Processing of this tape was cancelled by the operator by a reply of "KEOJ" or "Kuuu" to the FATSW02 console message or "TERM" or "SKIP" to the FATSW08 console message.

OPEN ERROR OR NO DD

Errors occurred opening this tape. Processing of all tapes on this tape unit will be halted.

CLEAN ACTION REQUEST

The number of errors on this tape exceeds the ERRCLEAN= parameter. The operator is requested to clean the tape drive and remount the same tape.

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FATS® & FATAR™

USER DOCUMENTATION

INNOVATION® DATA PROCESSING

INSTALLATION

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90.0 FATS AND FATAR INSTALLATION

DISTRIBUTION TAPE FORMAT

FATS and FATAR are distributed on standard label (SL) magnetic tape volume. The volume serial of the distribution tape will be:

FAT45P - a production (licensed) version of FATS alone or FATS/FATAR.

FAT45T - a trial (evaluation) version of FATS/FATAR (always contains both products).

The volume serial and status will be clearly marked on the external tape label. The trial programs will expire (i.e., stop functioning) on the expiration date indicated on the external label.

The files on the tape are:

File 1: DSN=FAT.INSTALL
an executable program which is used to load the files on the tape to disk.

File 2: DSN=LOAD
IEBCOPY unloaded copy of programs.

File 3: DSN=DOC
IEBCOPY unloaded copy of this user manual in IBM BOOKMANAGER format.

File 4: DSN=ICL
IEBCOPY unloaded copy of installation jobstreams and supplementary documentation.

File 5: DSN=CLIST
IEBUPDTE-format file of ISPF dialog CLISTs.

File 6: DSN=PANELS
IEBCOPY unloaded copy of dialog PANELs.

File 7: DSN=MESSAGES
IEBCOPY unloaded copy of dialog MESSAGEs.

File 8: DSN=SKELETON
IEBCOPY unloaded copy of dialog SKELETONs.

File 9: DSN=TABLES
IEBCOPY unloaded copy of dialog TABLEs.

File 10: DSN=JCL
IEBCOPY unloaded copy of all example JCL from this user manual.

CONTINUED . . .

90.1 LOADING THE FATS/FATAR LIBRARIES FROM THE DISTRIBUTION TAPE

The FATS/FATAR Tape Install Program, FATLOAD, makes the installation of an FATS/FATAR distribution tape very easy. You can execute FATLOAD directly from tape if you have access to a TSO userid that has the MOUNT attribute, or if you are able to issue or request a command on a system console to have a tape mounted. Otherwise, you must copy the Tape Install Program to disk using the JCL shown in Step 3.

If you have access to a TSO userid with the MOUNT attribute, logon to that id and proceed to Step 2. If you don't know if your userid has the MOUNT attribute, you probably don't, so proceed to Step 1.

Step 1 Use this step if your TSO userid does not have MOUNT privileges and you are able to issue (or request to be issued) a command on a MVS system console to have a tape mounted. If your userid has MOUNT privileges, proceed to Step 2; otherwise proceed to Step 3.

If your TSO userid does not have the MOUNT attribute, you can still access a tape from TSO by having the operator issue a MOUNT command. You or the operator must mount and ready the tape on a free tape drive BEFORE issuing the following command on a MVS system console:

MOUNT uuu,VOL=(SL,FAT45T) Change "uuu" to the actual tape unit address.

Change FAT45T to FAT45P if this is a production tape.

Now go to Step 2, but remember that when you are done with the tape, it must be unloaded by the MVS system command:

UNLOAD uuu

Note: if the tape unit has a 4-digit address, you must precede it with a slash, e.g.,

MOUNT /1234,VOL=(SL,FAT45T) and UNLOAD /1234

Step 2 Use this step if your TSO userid has the MOUNT attribute, or if you have completed Step 1.

If you are using ISPF, issue the following TSO commands from ISPF Option 6 (TSO COMMANDS). You can also exit ISPF and issue them from the TSO "READY" prompt.

Enter this TSO command to allocate the FATS/FATAR distribution tape:

ALLOC DA('FAT.INSTALL') VOL(FAT45T) UNIT(TAPE) SHR Change FAT45T to FAT45P if you are loading from a production tape.
Change the UNIT parameter to the appropriate tape unit name.

If you get the message "IKJ56221I DATA SET FAT.INSTALL NOT ALLOCATED, VOLUME NOT AVAILABLE", it may be because your userid does not have the MOUNT attribute; go back to Step 1. If you have already done Step 1, then the problem is that the tape was mounted AFTER the MOUNT command was issued. Issue an UNLOAD console command and go back to step 1.

Now issue this TSO command to invoke the Tape Install Program:

LOADGO 'FAT.INSTALL'

The Tape Install program (FATLOAD) will be loaded from the tape and begin execution. Proceed to Step 4.

CONTINUED . . .

90. 1 CONTINUED . . .

Step 3 Use this step to submit a batch job to copy the Tape Install Program to a disk file, from which it can be executed under TSO.

Submit this jobstream:

```
//IEBGENER     EXEC     PGM=IEBGENER
//SYSPRINT      DD      SYSOUT=*
//SYSIN         DD      DUMMY
//SYSUT2        DD      DISP=(,CATLG),SPACE=(3200,10),
//             DSN=user-specified-name.       <=== specify a dataset name
//             UNIT=SYSALLDA,VOL=SER=vvvvvv  <=== specify a disk volume
//SYSUT1        DD      DISP=OLD,DSN=FAT.INSTALL,LABEL=(1,EXPDT=98000),
//             UNIT=TAPE,                          <=== change if required
//              VOL=SER=FAT45T      <=== change to FAT45P if production tape
```

After the successful completion of the IEBGENER job, issue this TSO command from ISPF Option 6 (TSO COMMANDS) or the TSO READY prompt:

LOADGO 'user-specified-name' Specify the same data set name given in the JCL, in quotes.

The Tape Install program will be loaded from disk and begin execution. Proceed to Step 4.

Step 4 The tape install program will prompt you for information on what, where and how to load the FATS/FATAR tape files, in a series of four user-friendly screens. No action will take place until you give the final confirmation on the fourth screen. Only then are the output data sets allocated and cataloged with the names you specified, and the loading of those data sets begins (either in the foreground or via a batch jobstream).

Note: all dataset names and index name references are specified and displayed as fully-qualified names: a TSO userid will not be prefixed to the names unless you key it in.

Screen 1 - Data Set Selection

```
WELCOME TO INNOVATION DATA PROCESSING FATS/FATAR INSTALLATION    SCREEN 1
PLEASE REPLY TO THE FOLLOWING PROMPTS.
YOU WILL BE ABLE TO REVIEW AND CHANGE YOUR
SPECIFICATIONS PRIOR TO THE ACTUAL LOADING OF THE TAPE.

THE FOLLOWING DATA SETS MAY BE LOADED FROM THE INSTALLATION TAPE:

1 - FATS/FATAR INSTALLATION CONTROL LIBRARY
2 - FATS/FATAR DOCUMENTATION LIBRARY
3 - FATS/FATAR LOAD MODULE LIBRARY
4 - FATS/FATAR ISPF DIALOG CLIST LIBRARY
5 - FATS/FATAR ISPF DIALOG PANEL LIBRARY
6 - FATS/FATAR ISPF DIALOG MESSAGES LIBRARY
7 - FATS/FATAR ISPF DIALOG SKELETON LIBRARY
8 - FATS/FATAR ISPF DIALOG TABLE LIBRARY
9 - FATS/FATAR JCL LIBRARY
 ------------------------------------------------------------------------------
<PRESS>  "ENTER"    -  SELECT ALL OF THE ABOVE DATA SETS AND CONTINUE
<TYPE>   "N,N,.."   -  SELECT THE SPECIFIED DATA SETS
<TYPE>   "END"      -  EXIT IMMEDIATELY
 ------------------------------------------------------------------------------
              PLEASE SELECT ONE OF THE OPTIONS LISTE ABOVE
SELECT ===>
```

This screen allows you to select which of the data sets are to be loaded from the FATS/FATAR distribution tape. Normally, all data sets should be selected. When you are satisfied with the selection, press ENTER to continue to Screen 2.

CONTINUED . . .

90. 1 CONTINUED . . .

Screen 2 - Data Set Name Selection

```
------------------------- DATA SET NAME SELECTION SCREEN -------------- SCREEN 2

PLEASE REVIEW THE SELECTED DATA SET NAMES AND MAKE THE DESIRED MODIFICATIONS.

  1 - INSTALL CONTROL..... FATS.ICL45
  2 - DOCUMENTATION....... FATS.DOC45
  3 - LOAD LIBRARY........ FATS.LOAD45
  4 - ISPF CLISTS......... FATS.CLIST45
  5 - ISPF PANELS......... FATS.PANELS45
  6 - ISPF MESSAGES....... FATS.MSGS45
  7 - ISPF SKELETON....... FATS.SKELS45
  8 - ISPF TABLES......... FATS.TABLES45
  9 - JCL................. FATS.JCL45

-------------------------------------------------------------------------------
<PRESS>  "ENTER"      -  USE THE ABOVE SPECIFICATIONS AND CONTINUE
<TYPE>   "ALL,INDEX"  -  ASSIGN NEW INDEX(ES) TO ALL DATA SET NAMES
<TYPE>   "N,NEWNAME"  -  ASSIGN A NEWNAME TO THE DATA SET DESIGNATED BY "N"
<TYPE>   "BACK"       -  GO BACK TO THE DATA SET SELECTION SCREEN 1
<TYPE>   "END"        -  EXIT IMMEDIATELY
-------------------------------------------------------------------------------
            PLEASE SELECT ONE OF THE OPTIONS LISTED ABOVE
SELECT ===>
```

This screen allows you to specify the data set names which will be used for the data sets you have selected to load from the tape. These may be existing data sets to be updated, or they may be new datasets which will be allocated and cataloged.

The names shown above are the default names provided with the Tape Install program. You may change these names in one of 2 ways:

1) to change the current high-level index of all of the data sets to a different index (or indexes), enter "ALL,newindex(s)". For example, ALL,FAT45 will change the names to FAT45.ICL45, etc. ALL,SYS3.FAT45 will change the names to SYS3.FAT45.ICL45, etc.

2) to completely change the name of any one data set, enter that data set's number followed by the replacement name. For example, 3,SYS2.FATS.LOAD will change the name of the load library.

You can use either or both of these techniques repeatedly until you are satisfied with the names.

If you intend to update an existing library, be sure that library name is correctly specified. However, we recommend that you always install into newly created libraries to avoid X37 abends due to insufficient space in existing libraries. For new data sets, the install program will allocate them with sufficient space.

The FATS/FATAR load library must be defined to MVS as an authorized library. If it is not already defined as authorized, you (or your MVS system programmer) must do so by:

- For MVS releases prior to ESA V4, update the IEAAPFxx member in PARMLIB. An IPL will be required to activate the updated authorized library list.

- For ESA V4 and V5 and OS/390, if your installation has converted to the use of the PROGxx member in PARMLIB to define authorized libraries, you can update the PROGxx member and activate the updated list with the MVS console command:

  SET PROG=xx

  If your installation has specified that the authorized program list is in dynamic format, you can also temporarily authorize the FATS/FATAR library with the MVS console command:

  SETPROG APF,ADD,DSNAME=*fats.load.library*,VOL=*volser*

- You may also have another means of temporarily authorizing the FATS/FATAR load library for testing. Remember that temporary authorization will vanish after the next IPL unless the appropriate PARMLIB member is updated.

CONTINUED . . .

90. 1 CONTINUED . . .

SCREEN 3 VOLUME SERIAL SELECTION SCREEN

```
                          Screen 3 - Volume Serial Selection

----------------------VOLUMESERIALSELECTIONSCREEN-----------------------SCREEN3
THE FOLLOWING NEW DATA SETS WILL BE ALLOCATED AND CATALOGED:

                      DISP  VOLUME  DATA SET NAME
  1 - INSTALL CONTROL. NEW          FATS.ICL45
  2 - DOCUMENTATION... NEW          FATS.DOC45
  3 - LOAD LIBRARY.... NEW          FATS.LOAD45
  4 - ISPF CLISTS..... NEW          FATS.CLIST45
  5 - ISPF PANELS..... NEW          FATS.PANELS45
  6 - ISPF MESSAGES... NEW          FATS.MSGS45
  7 - ISPF SKELETON... NEW          FATS.SKELS45
  8 - ISPF TABLES..... NEW          FATS.TABLES45
  9 - JCL............. NEW          FATS.JCL45
 ------------------------------------------------------------------------------
 <PRESS>  "ENTER"      -  USE THE ABOVE SPECIFICATIONS AND CONTINUE
 <TYPE>   "ALL,VOLUME" -  ASSIGN A VOLUME TO ALL NEWLY ALLOCATED DATA SETS
 <TYPE>   "N,VOLUME"   -  ASSIGN A VOLUME TO THE DATA SET DESIGNATED BY "N"
 <TYPE>   "SMS"        -  DISPLAY SMS SPECIFICATIONS
 <TYPE>   "BACK"       -  GO BACK TO THE DATA SET NAME SELECTION SCREEN 2
 <TYPE>   "END"        -  EXIT IMMEDIATELY
 ------------------------------------------------------------------------------
             PLEASE SELECT ONE OF THE OPTIONS LISTED ABOVE
 SELECT ===>
```

On this screen, the DISP column shows whether the install program found that the indicated data set already exists (OLD) or does not exist (NEW). For NEW data sets, you can specify volume and/or SMS information to be used for the allocation of the data sets. For OLD datasets, the VOLUME column shows the volume serial of the existing data set.

Similar to Screen 2, you can specify the target disk volume serial for all or any one of the data sets to be allocated. For example,ALL,SYSLB2 will change the target volume serial for all the data sets. 2,BOOKM2 will change the target volume serial for the documentation library.You can use either or both of these techniques repeatedly until you are satisfied with the names. The volume serial can be omitted if the data set will be SMS-managed or if your system will allocate such data sets on non-specific storage volumes.

If SMS is active on your system, you may enter "SMS" which will take you to variations of Screen 3 which will allow you to specify the SMS storage class, management class, and/or data class to be assigned to each data set. However, this is not necessary if your installation's SMS ACS routines will assign proper classes to these data sets.

90. 1 CONTINUED . . .

Screen 4 - Installation Processing Option

```
-------------------- INSTALLATION PROCESSING OPTION SCREEN ----------- SCREEN 4

PLEASE VERIFY THE FOLLOWING SPECIFICATIONS AND SELECT THE PROCESSING OPTION:

                     DISP  VOLUME  DATA SET NAME
 1 - INSTALL CONTROL. NEW          FATS.ICL45
 2 - DOCUMENTATION... NEW          FATS.DOC45
 3 - LOAD LIBRARY.... NEW          FATS.LOAD45
 4 - ISPF CLISTS..... NEW          FATS.CLIST45
 5 - ISPF PANELS..... NEW          FATS.PANELS45
 6 - ISPF MESSAGES... NEW          FATS.MSGS45
 7 - ISPF SKELETON... NEW          FATS.SKELS45
 8 - ISPF TABLES..... NEW          FATS.TABLES45
 9  - JCL............. NEW          FATS.JCL45
-------------------------------------------------------------------------------
<TYPE>   "FG"       -  START LOADING THE ABOVE DATA SETS IMMEDIATELY
<TYPE>   "BG"       -  CREATE THE JCL TO LOAD THE ABOVE DATA SETS
<TYPE>   "BACK"     -  GO BACK TO THE DATA SET SELECTION SCREEN 1
<TYPE>   "END"      -  EXIT IMMEDIATELY
-------------------------------------------------------------------------------
             PLEASE SELECT ONE OF THE OPTIONS LISTED ABOVE
SELECT ===>
```

On this screen, you can review all of the decisions you have made before starting the actual loading of the libraries from the distribution tape. Entering "BACK" on this screen (or any of the others) will allow you to go back and change options before installation.

If **FG** (foreground) installation is chosen, all the data sets indicated as NEW will be allocated, then IEBCOPY or other utilities are invoked under TSO to load each of the selected libraries from tape. This option appears only if you loaded the Tape Install program directly from tape (Step 2). FG is recommended since the tape is already mounted.

If **BG** (background) installation is chosen, the NEW data sets will be allocated under TSO (same as FG) but then batch JCL will be created to actually load the libraries from the tape. This JCL will be stored as member FATLOAD in the ICL (Installation Control Library) you specified, or, if you did not select the ICL, in a dataset named "userid.FATSTEMP.JCL". You must review this jobstream, make any changes necessary for your installation, and submit it for execution.

CONTINUED . . .

90.2 ALTERNATE MANUAL INSTALLATION

If you prefer not to use the recommended interactive install program, you can load the libraries to disk manually.

First, copy the install jobstream from the ICL (Installation Control Library) on tape to disk, using JCL similar to:

JCL FOR LOADING INSTALL JOBSTREAM

```
//INSTALL        JOB     ...
//COPY          EXEC     PGM=IEBCOPY
//SYSPRINT       DD      SYSOUT=*
//TAPEIN         DD      DSN=ICL,DISP=OLD,LABEL=4,UNIT=tape,
//              VOL=SER=FAT45T
//LIBRARY        DD      DSN=your.library.here,
//              DISP=SHR
//SYSIN          DD      *
   COPY INDD=((TAPEIN,R)),OUTDD=LIBRARY
   SELECT MEMBER=INSTALL
//*
```

You will need to specify an appropriate unit name for the tape; if your tape is a production tape, be sure and change the tape volume serial to FAT45P. The LIBRARY DD statement should point to a control card library (RECFM=FB and LRECL=80); this can be an existing library or you can allocate a new one. The jobstream above will load only the single member INSTALL.

If you want to only install the FATS/FATAR Load Library use the member INSTMIN.

INSTALLATION JCL

The JCL member loaded by the preceding job provides you with procedures for the installation of the FATS/FATAR:

– Product load library.

– User documentation file.

– Installation Control library

– JCL (example) library

– ISPF dialog libraries

The JCL stream consists of three in-stream procedures and the necessary steps to execute those procedures to install the FATS/FATAR libraries. One procedure allocates the target libraries and contain the recommended size of each library; the other two execute IEBCOPY or IEBUPDTE to load the library from tape to disk. The jobstream contains comments which will guide you through modifying the jobstream to substitute data set names and target disk volumes of your choice. Once modifications are complete, submit the jobstream to allocate and load the libraries.

Note: The FATS/FATAR load library must be an authorized program library as shown in Section 90.1 LOADING THE FATS/FATAR LIBRARIES FROM THE DISTRIBUTION TAPE.

CONTINUED . . .

90.3 IMPLEMENTING THE TAPE MANAGEMENT INTERFACE

FATAR includes an interface to tape management systems to get complete information about the volumes and data sets being read by FATAR. It is also used by the FATS/FATAR ISPF dialogs to query tapes to be processed. Details on this interface are in Section 21.5 TAPE MANAGEMENT SYSTEM SUPPORT.

Currently, CA-1 (TMS) and CA-DYNAM/TLMS, both from Computer Associates, are supported. Other tape management systems may be supported in the future.

ASSEMBLING THE INTERFACE

However, to implement this interface you must assemble a piece of the interface code using the macro library supplied with your current tape management system. These macros include the necessary code to retrieve information from the tape management data base and the layouts of the tape management records.

Members in the FATS/FATAR ICL (Installation Control Library) contain the assembly jobstreams and instructions for doing the assembly. Depending on the type of your tape management system, please edit and submit one of the following ICLmembers, following the instructions in the member:

ASMCA1 - for CA-1 (TMS)

ASMTLMS - for CA-DYNAM/TLMS

TESTING THE INTERFACE

You can quickly test the tape management interface using a test program, FATTMTST. The JCL is simple:

```
//TESTTMS      EXEC    PGM=FATTMTST,PARM=volser
//STEPLIB       DD     DISP=SHR,DSN=fatsfatr.load.library
//SYSPRINT      DD     SYSOUT=*
```

The parameter (PARM=volser) is a tape volume serial. FATTMTST will use the tape management interface to query that volume and will print out the data set name on the volume. If the tape has multiple files on it, all tape files are listed. If the tape is part of a multi-volume tape set, all volumes in the set (and all data sets on the set) are listed. If the volume serial is not recorded in your tape management data base, you will get a return code of 12, and if your tape management system is not active, it sets return code 28. If you get other return codes, abends, or unexpected results, please contact Innovation for assistance.

NEW RELEASES OF TAPE MANAGE-MENT

As shown in the instructions in those members, you will create a load module whose name contains the actual release number of your tape management system (e.g., FATTMS52 for CA-1 R5.2). FATAR will automatically determine the release level of your current tape management system and invoke the proper module.

So, when you are installing a new release of your tape management system, you can assemble a new version of the interface module (e.g., FATTMS53) with the macro library from the new release. When you put the new release in production, FATAR will automatically begin using the new interface module.

CONTINUED . . .

90.4 CUSTOMIZING FATS AND FATAR

At this time there are no customizable options or settings in FATS and FATAR. All options are set via control statement operands.

However, the ICL (Installation Control Library) contains two source modules which you may wish to modify and assemble.

Member **OPENEXIT** is a sample FATAR Open exit. Use of the Open exit is documented in Section 21.4 OUTPUT TAPE PROCESSING and is controlled by operand EXIT= documented in Section 23.2.5.

Member **FATCHTAB** is a sample FATAR printer translate table. Use of the translate table is documented under the CHARTAB= operand in Section 23.2.4.

CONTINUED . . .

90.5 INSTALLING THE ISPF DIALOG

The FATS/FATAR ISPF dialog can be invoked at any time, from any TSO userid that is authorized to read the FATS/FATAR dialog libraries, by going to ISPF option 6 (TSO COMMAND) and entering:

EXEC 'fats.clist.library(FATALLOC)'

However, this is awkward, so two shortcuts are available:

ADDING FATS/FATAR TO A MENU

You may add FATS/FATAR as an option on the ISPF main menu or any menu of your choice. In the FATS/FATAR panel data set, there are two example panels showing how to add FATS/FATAR to the ISPF main menu:

ISR@V3X - for ISPF V3.x and V2.x

ISR@V4X -127127 for ISPF V4.x

You can make similar modifications to your ISPF main menu (panel ISR@PRIM) or to any other ISPF menu.

ADDING FATS/FATAR AS A COMMAND

You can add a FATS/FATAR command to the ISPF command table (ISPCMDS) by going to ISPF option 6 (TSO COMMAND) and entering:

EXEC 'fats.clist.library(FATCMDS)'

The modified command table will be stored in the first library in the ISPTLIB concatenation for this TSO userid. If the user has a private table library, it will normally be the first one in that concatenation, so the updated command table will be available only to this user. If the user does not have a private library, but has update authority to the first public library in ISPTLIB, it will be updated, and will be available to any userid using that library. However, you will have an option to specify a different table library before it is actually stored. If you do choose a different table library, that library will have to be in the ISPTLIB concatenation, prior to any other library containing a table called ISPCMDS.The FATS/FATAR dialog can now be entered from almost any ISPF panel by entering "FATS" on the command line.

CHANGING THE DIALOG LIBRARY NAMES

During the installation with the FATLOAD program, the names of the FATS/FATAR dialog libraries are automatically changed in the CLIST library to the names you specified on the installation screens. If you later change those names, or if you manually loaded the dialog librarires, you can correct the dialog to use the proper names by editing member FDRALLOC in the FATS/FATAR CLIST library. Change the appropriate CLIST lines to specify the new data set name(s):

CLIST	FATS/FATAR ISPF Dialog CLIST Library
LLIB	FATS/FATAR Load Module Library
PLIB	FATS/FATAR ISPF Dialog Panel Library
MLIB	FATS/FATAR ISPF Dialog Message Library
SLIB	FATS/FATAR ISPF Dialog Skeleton Library
TLIB	FATS/FATAR ISPF Dialog Table Library

90.6 VIEWING/PRINTING THE SOFTCOPY DOCUMENTATION

VIEWING/ PRINTING THE SOFTCOPY DOCUMENT-ATION

A copy of this FATS/FATAR user manual is provided in softcopy format for use with IBM BOOKMANAGER products, including

- Bookmanager READ/MVS (a standard component of OS/390)
- Bookmanager READ/DOS
- Bookmanager READ/2 (for OS/2)
- Bookmanager READ for Windows
- Bookmanager READ/6000 for AIX/6000

The documentation library PDS which was loaded from the FATS/FATAR distribution tape contains the softcopy as member FAT, but it must be copied in order to be used.

To use the softcopy book on MVS, the softcopy must be copied to a sequential file with DCB characteristics RECFM=FB, LRECL=4096, and any blocksize which is a multiple of 4096. Member BLDBOOKS in the FATS/FATAR ICL library contains sample JCL to copy the softcopy book to a sequential file with a data set name of your choosing. You can then read and search the book with Bookmanager READ/MVS.

To use the softcopy book on a PC, download the MVS member in the documentation library to the PC or server using any available file transfer software, using binary format. You can then read and search the book with the appropriate Bookmanager READ product.

If you like, the BOOKS menu option of Bookmanager READ can be used to create a new bookshelf for FATS/FATAR, or to add the book to an existing bookshelf.

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93.0 ISPF INTERFACE INTRODUCTION

FATS/FATAR ISPF panels are available to perform many of the FATS and FATAR functions like labeling, certifying and copying tapes. These panels create FATS or FATAR JCL and control statements as jobstreams which can be submitted, edited before submission, or saved for reuse.

The panels will simplify the use of FATS/FATAR for common tasks. Extensive validation of the input is done to eliminate errors at execution time. More complicated tasks such as dropping blocks or replacing data on a tape will be easier to perform.

Options for installing and invoking the FATS/FATAR dialogs are shown in Section 90.4 CUSTOMIZING FATS AND FATAR.

Every panel has detailed HELP information which can be displayed by pressing the HELP key (usually PF1). If your level of ISPF supports it, field level help is available by placing the cursor in the input field in question and pressing HELP. The descriptions of the fields and functions on the panels in the following sections are brief because the detailed, current descriptions are in the HELP.

MAIN MENU

```
 (V4.5.0) ----------------- FATS/FATAR  MAIN  MENU ---------------------------
OPTION ===>
       A. CERTIFY new tapes
       B. CERTIFY existing labeled tapes whose data sets have expired

       C. LABEL   new tapes
       E. ERASE   old data on tapes for security

       F. VERIFY  whether tapes are still readable              (FATS READ)
       G. VERIFY  whether tapes are still readable              (FATS ANALYZE)
       H. EXAMINE contents and layout (map) of foreign or unknown tapes

       J. COPY    a tape volume     - (make exact image)
       K. COPY    multiple volumes  - (make exact image)        (FATS ANALYZE)
       L. COPY    one or more files - (make a logical copy)

       M. FATAR   extended functions

       O. RECOVER data from overwritten (damaged) tape

       Q. QUERY   Tape Management System - CA-1/TMS (V5.1)
       S. SETUP   JCL and FATS/FATAR defaults for user          (Profiles)
```

This is the FATS/FATAR Main Menu. On your first use of this dialog, you should select the SETUP (S) option first, to set up the Job Profile and the FATS/FATAR defaults for your TSO USERID. Once that has been done, you may select other options from the menu to generate and submit jobstreams for common FATS and FATAR options. Note that options G through O will work only if you are licensed for FATAR.

TAPE MANAGEMENT SUPPORT

If you have installed the FATS/FATAR Tape Management Interface (See Section 90.3 IMPLEMENTING THE TAPE MANAGEMENT INTERFACE), option Q will appear on this menu. As shown above, it identifies the type and version of tape management which FATAR has identified as being active on your system. Option Q allows you to query your tape management data base through facilities provided by FATS/FATAR.

For a given tape volume serial, option Q will display all the data sets recorded as being on that tape. If the tape is part of a multi-volume tape set, all volumes and all data sets in the set are displayed, also showing which volumes each data set resides on.

Also, when the tape management interface is installed, you may also use a Q on the COMMAND line of many of the panels for the various FATS and FATAR functions (a prompt will appear on the panel when the function is available). This allows you to query your tape management system and automatically copy data set name, label type, and file number information into the appropriate fields for the input or output tapes.

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93.0 CONTINUED . . .

FATS/FATAR SETUP/ PROFILE PANELS

The following series of panels is invoked by option S (SETUP) on the FATS/FATAR main menu. They set defaults that will be used during the generation of jobstreams by other options on the menu. There are 3 kinds of defaults:

– JCL options, for generation of JOB statement and other JCL parameters

– FATS and FATAR "Profile" options, giving values for operands, such as lines/page, which cannot be overridden on other panels. The defaults provided by Innovation for these values will rarely need to be overridden, but if necessary you can set them to the values you need here.

– FATS and FATAR "Control" options, giving values for operands which can be overridden on other panels. However, setting these to the values you most commonly use will save time and typing later.

You can return to these panels at any time to change your saved options. These options are saved in your ISPF PROFILE data set, so they affect only your TSO userid.

On the FATS and FATAR function panels, an option will always appear asking if you want to see more FATS or FATAR operands. If you reply YES, you will see a panel similar to the "Control" panels shown below. If you change values on those panels, they are not saved in your profile and will need to be reentered every time you need them.

JOB PROFILE

```
------------------------ FATS/FATAR JCL PROFILE ----------------------------
COMMAND ===>

JOB STATEMENT:
  ===> //userid      JOB (ACCOUNT),'NAME'
  ===> //*
  ===> //*
  ===> //*

LOAD LIBRARIES:
  ===> ______________________________________________ <
  ===> ______________________________________________ <

SYSOUT CLASS:
  ===> *

VOLSER DEFAULT:
  ===> 99999 (default for Input DD Statement; 6th digit is system generated)

ADD Job Id Character: YES (yes/no)    SAVE DSN changes in Profile: NO  (yes/no)

  Press DOWN for FATS Profile
```

This panel allows you to enter any JOB statement parameters required by your installation and other defaults to be used when generating JCL for FATS/FATAR. If FATS/FATAR is in the system link list, no LOAD LIBRARY is required; if not, provide the name of the FATS/FATAR load library and STEPLIB DD statements will be generated. When done, press the DOWN key (usually PF8 or PF20) to see the next panel or the END key (usually PF3 or PF15) to save the profile.

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93.0 CONTINUED . . .

FATS DEFAULT PROFILE OPERANDS

```
(V4.5.0) ----------- FATS DEFAULT "PROFILE" OPERANDS --------------------------
COMMAND ===>

MODIFY    - Respond to operator's MODIFY(F) and STOP(P) commands : YES (yes/no)
WTOR      - Issue WTOR message for operator control of processing: NO  (yes/no)
MAXCLEAN  - Clean tape drive after ___   tapes are processed on drive
LINECNT   - Number of lines per page to be printed on FATS reports    : 56
MAXDETCNT - Number of detail lines to be printed before double spacing: 4
NEWPAGE   - Skip to new page when a new volume is processed  : NO  (yes/no)
METRIC    - List tape lengths/error positions in metric units: NO  (yes/no)
RETCODE   - Terminate with return code 12 due to major error : YES (yes/no)
WTO       - Report result of each operation on system console: NO  (yes/no)
REWIND    - Rewind tapes to load point at start of operation : ___ (yes/no)

    Press DOWN for FATS Control Operands            Press UP for JOB Profile
```

This panel modifies the default options that will be used for many FATS operations. These operands are not overridable from the function panels. Most users will require no changes except for those users who would prefer the lengths be shown in metric (the METRIC option). When done, press the DOWN key (usually PF8 or PF20) to see the next panel or the END key (usually PF3 or PF15) to save the profile.

FATS DEFAULT CONTROL OPERANDS

```
(V4.5.0)----------- FATS DEFAULT "CONTROL" OPERANDS --------------------------
COMMAND ===>

BLKSIZE  - Size of block written to new tape during Certification    : _____
NUMWRITES- Nbr of writes that FATS will do in one I/O when Certifying: 20
PASS     - Number of times to write over a tape during Certification : 1
RETRY(H) - Number of retries before error is considered permanent    : 10
RETRY(I) - Number of retries before error is printed in detail report: 1
ERRCLEAN - Clean tape drive after 32767 temporary or permanent errors
MAXERR   - Stop processing  after 200   permanent errors encountered
MAXCERR  - Stop processing  after 200   inches of contiguous permanent errors
TRESHHOLD- Stop printing error messages after 1000  permanent/temporary errors
STOPNUM  - Invoke STOP option after _ permanent errors have been encountered
STOP     - Stop/Issue FATSW05 message for each permanent error: NO  (yes/no)
DDLABEL  - Label tape with volume serial in TAPE1 DD statement: NO  (yes/no)
LABEL    - Label tape with volume serial nbr: ______
OPERATOR - Invoke OPERator/NOOPerator option: ____  (oper/noop)
OWNERID  - Contents of owner ID field in output volume label: ____________

    Press DOWN for FATAR Operands                   Press UP for FATS Operands
```

This panel modifies the default options that will be used for many FATS operations. These operands are overridable from the function panels. A subset of this panel is displayed whenever you answer YES to the question "Display More FATS Operands?" on the function panels. When done, press the DOWN key (usually PF8 or PF20) to see the next panel or the END key (usually PF3 or PF15) to save the profile.

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93.0 CONTINUED . . .

FATAR DEFAULT PROFILE OPERANDS

```
(V4.5.0) ----------- FATAR DEFAULT "PROFILE" OPERANDS -------------------------
COMMAND ===>

MAJERR   - Stop processing after 01   major errors are encountered
MAXERR   - Stop processing after 20    permanent data checks are detected
MAXTERR  - Stop processing after 100   temporary data checks are detected
LINECNT  - Number of lines per page to be printed on FATAR reports: 60
BYTEFACTOR - Specify divisor to calculate byte count values for reports: 1000
METRIC   - List tape lengths/error positions in metric units: NO  (yes/no)
RETCODE  - Terminate with return code 12 due to major error : YES (yes/no)
WTO      - Report result of each operation on system console: NO  (yes/no)
ROR      - Attempt "Read-Opposite-Recovery" on round reels  : YES (yes/no)
MSGLEVEL - Print contents of modified blocks?               : YES (yes/no)
EXITNAME - Name of load module to be executed at open time  : ________
CHARTAB  - Name of load ;module containing translation table: ________

Press DOWN for FATAR Control Operands           Press UP for FATS Operands
```

This panel modifies the default options that will be used for many FATAR operations. These operands are not overridable from the function panels. Most users will require no changes except for those users who would prefer the lengths be shown in metric (the METRIC option). When done, press the DOWN key (usually PF8 or PF20) to see the next panel or the END key (usually PF3 or PF15) to save the profile.

FATAR DEFAULT CONTROL OPERANDS

```
(V4.5.0) ----------- FATAR DEFAULT "CONTROL" OPERANDS -------------------------
COMMAND ===>

RETRY     - Number of retries before error will be considered permanent: 40
PRTLEN    - Number of bytes/characters of input tape data to be printed: 80
DATAFMT   - Print format of blocks/records: DUMP   (char/hex/dump)
LBLPRT    - Print format of input labels  : FORMAT (char/hex/dump/format/none)
LENCHK    - Print contents of different block lengths: NO  (yes/no)
STOP      - Provide operator control at End-of-File  : NO  (yes/no)
CHANEXTEND- Channel extender to be used              : NO  (yes/no)
NEXTVOL   - Multi-volume input tape processing method: TMS (jcl/tms)
PRINTTMS  - Print TMS list for selected Volume Serial: NO  (yes/no)
KEEP      - Copy block even on a permanent data check: NO  (yes/no)
EOV       - Check for EOV labels/update block counts : YES (yes/no)
EOTBLOCKS - Number of blocks to write after EOT for Image copy: __
CREATEDATE- Copy creation date from input tape labels: NO  (yes/no)
USERLABELS- Copy user labels to output tape labels   : YES (yes/no)
MAXRBLK   - Largest current blocksize for reblocking : _____
REBLOCK   - Target blocksize for data reblocking     : _____

    Press UP for FATAR Operands
```

This panel modifies the default options that will be used for many FATAR operations. These operands are overridable from the function panels. A subset of this panel is displayed whenever you answer YES to the question "Display More FATAR Operands?" on the function panels. When done, the END key (usually PF3 or PF15) to save the profile.

CONTINUED . . .

93.1 FATS ISPF INTERFACE

FATS OPERATIONS

Options A through G on the FATS/FATAR main menu will generate jobstreams for FATS operations (option G will work only if you are also licensed for FATAR).

Once you enter all necessary options on a given panel, press ENTER to complete generation of the FATS batch jobstream. You will be given the option of submitting the jobstream immediately or entering ISPF EDIT to view and modify the jobstream; you can submit it directly from edit, or save it in a JCL library

All the panels contain a data set name, unit name, and label parameter. A unique default data set name may be generated but you may overtype it with another name (this may be required to meet security restrictions); the name must be present to meet JCL requirements, but is usually not actually used by FATS. The unit name should be overridden with a generic name (such as 3490) or esoteric name (such as CART) which will allocate a tape drive of the appropriate type; a specific unit name (such as 3A0) may also be used. The label type presented by the panel is usually appropriate for the function requested but you may overtype it if required.

All panels contain those FATS options which are commonly used with the function on that panel; you can override the defaults displayed as necessary. They also contain a question "Display more FATS Operands?". If you enter YES, the FATS DEFAULT CONTROL OPERANDS panel shown in Section 93.0 ISPF INTERFACE INTRODUCTION is displayed, where you can override less commonly used parameters. The overrides are effective for this function only; the values are not saved.

FATS CERTIFY NEW TAPES

```
 (V4.5.0) ---------------- FATS CERTIFY NEW TAPES ------------------------------
COMMAND ===>                                          Enter Q for TMS51 Query

TAPE1  DD Dsname=  BAB.FATSOUT.JOBT                                <
          Unit  =( TAPE     )
          Label =( ,BLP,EXPDT=98000                       )

VOL     - Volume serial number(s)  1: ______  2: ______  3: ______  4: ______
                                   5: ______  6: ______  7: ______  8: ______
                                   9: ______ 10: ______ 11: ______ 12: ______
                                  13: ______ 14: ______ 15: ______ 16: ______
                                  17: ______ 18: ______ 19: ______ 20: ______

MAXVOLN  - Maximum number of volumes : ___
NOLABEL  - Create no label (NL) tapes: NO    (yes/no)
ANSI     - Create ANSI labeled tapes : NO    (yes/no)


Display more FATS Operands?: NO  (yes/no)
```

Option A (CERTIFY new tapes) on the FATS/FATAR Main Menu brings you to this panel, to certify and label new tapes (or relabel existing tapes). Normally it creates IBM standard labeled tapes, but you can create ANSI (AL) tapes or unlabeled tapes by specifying YES to the proper option. Since these are usually virgin (never used) tapes, the BLP option must be used to mount them without trying to read existing labels.

Tape volume serials can be specified in two ways:

– specify up to 20 specific volume serials

– specify the first volume serial after "1:" and specify the number of volumes after "MAXVOLN". A range of sequentially number volumes will be initialized.

CONTINUED . . .

93.1 CONTINUED . . .

FATS CERTIFY EXISTING TAPES

```
 (V4.5.0) ---------------- FATS CERTIFY EXISTING TAPES -------------------------
COMMAND ===>                                            Enter Q for TMS51 Query

TAPE1  DD Dsname=  BAB.FATSOUT.JOBT                                <
          Unit  =( TAPE     )
          Label =( ,SL                                    )

VOL     - Volume serial number(s)  1: ______  2: ______  3: ______  4: ______
                                   5: ______  6: ______  7: ______  8: ______
                                   9: ______ 10: ______ 11: ______ 12: ______
                                  13: ______ 14: ______ 15: ______ 16: ______
                                  17: ______ 18: ______ 19: ______ 20: ______

MAXVOLN - Maximum number of volumes : ___
NOLABEL - Create no label (NL) tapes: NO  (yes/no)
ANSI    - Create ANSI labeled tapes : NO  (yes/no)


Display more FATS Operands?: NO  (yes/no)
```

Option B (CERTIFY existing labeled tapes) on the FATS/FATAR Main Menu brings you to this panel, to certify existing labeled tapes. This might be used to periodically recertify tapes while they are in scratch status. Since these are existing labeled tapes, SL allows MVS to verify that the proper tapes is mounted and in scratch status before beginning the certification.

If you have a range of tapes to recertify, you can specify a starting serial number and the maximum number of volumes. It is more likely that you will have a list of random serials to process, simply enter up to 20 such serials.

FATS LABELING OF NEW TAPES

```
 (V4.5.0) ---------------- FATS LABEL NEW TAPES -------------------------------
COMMAND ===>                                            Enter Q for TMS51 Query

TAPE1  DD Dsname=  BAB.FATSOUT.JOBT                                <
          Unit  =( TAPE     )
          Label =( ,BLP,EXPDT=98000                       )

VOL     - Volume serial number(s)  1: ______  2: ______  3: ______  4: ______
                                   5: ______  6: ______  7: ______  8: ______
                                   9: ______ 10: ______ 11: ______ 12: ______
                                  13: ______ 14: ______ 15: ______ 16: ______
                                  17: ______ 18: ______ 19: ______ 20: ______

MAXVOLN - Maximum number of volumes : ___
NOLABEL - Create no label (NL) tapes: NO  (yes/no)
ANSI    - Create ANSI labeled tapes : NO  (yes/no)


Display more FATS Operands?: NO  (yes/no)
```

Option C (LABEL new tapes) on the FATS/FATAR Main Menu brings you to this panel, which labels (but does not certify) new tapes or relabels existing tapes. The parameters are the same as for Option A (Certify New Tapes)

CONTINUED . . .

93.1 CONTINUED . . .

FATS ERASE TAPE

```
 (V4.5.0) ---------------- FATS ERASE OLD DATA ---------------------------------
COMMAND ===>                                          Enter Q for TMS51 Query

TAPE1  DD Dsname=  BAB.FATSOUT.JOBT                                <
          Unit  =( TAPE     )
          Label =( ,SL                                   )

VOL     - Volume serial number(s)  1: ______  2: ______  3: ______  4: ______
                                   5: ______  6: ______  7: ______  8: ______
                                   9: ______ 10: ______ 11: ______ 12: ______
                                  13: ______ 14: ______ 15: ______ 16: ______
                                  17: ______ 18: ______ 19: ______ 20: ______

MAXVOLN - Maximum number of volumes : ___
SAVLAB  - Preserve volume serial?   : YES (yes/no)
NOLABEL - Create no label (NL) tapes: NO  (yes/no)
ANSI    - Create ANSI labeled tapes : NO  (yes/no)


Display more FATS Operands?: NO  (yes/no)
```

Option E (ERASE) on the FATS/FATAR Main Menu brings you to this panel, which allows you to erase all data from one or more tapes. This might be used before selling old tape volumes or before writing a volume with data to be sent offsite, to ensure that all previous corporate data is removed. The parameters are the same as for Option B (Certify Existing Tapes), except for the SAVLAB option which allows you to preserve the existing volume serial.

WARNING: This option will erase all data on a tape volume. Use caution when using this option.

FATS VERIFY OF EXISTING DATA ON TAPE

```
 (V4.5.0) ---------------- FATS VERIFY (READ) TAPES ----------------------------
COMMAND ===>                                          Enter Q for TMS51 Query


TAPE1  DD Dsname=  BAB.FATSIN.JOBT                                 <
          Unit  =( TAPE     )
          Label =( ,BLP,EXPDT=98000                      )

VOL     - Volume serial number(s)  1: ______  2: ______  3: ______  4: ______
                                   5: ______  6: ______  7: ______  8: ______
                                   9: ______ 10: ______ 11: ______ 12: ______
                                  13: ______ 14: ______ 15: ______ 16: ______
                                  17: ______ 18: ______ 19: ______ 20: ______

MAXVOLN - Maximum number of volumes : ___
FILES   - Number of Physical files to be read: 3


Display more FATS Operands?: NO  (yes/no)
```

Option F (VERIFY READ) on the FATS/FATAR Main Menu brings you to this panel, which uses the FATS READ function to verify the readability of data on the specified tape volumes. The volumes to be processed are specified as described for Option A (Certify New Tapes). The default of reading 3 physical files will read one data file on a labeled tape.

Note: if you are licensed for FATAR, options G and H provide more information about the content of the tape than option F.

CONTINUED . . .

93.1 CONTINUED . . .

FATS VERIFY (ANALYZE) OF TAPES

```
 (V4.5.0) ---------------- FATS VERIFY (ANALYZE) TAPES -------------------------
COMMAND ===>                                            Enter Q for TMS51 Query


TAPE1  DD Dsname=  BAB.FATSIN.JOBT                                <
          Unit  =( TAPE     )
          Label =( ,BLP,EXPDT=98000                     )

VOL     - Volume serial number(s)  1: ______  2: ______  3: ______  4: ______
                                   5: ______  6: ______  7: ______  8: ______
                                   9: ______ 10: ______ 11: ______ 12: ______
                                  13: ______ 14: ______ 15: ______ 16: ______
                                  17: ______ 18: ______ 19: ______ 20: ______

MAXVOLN - Maximum number of volumes : ___
NUMFILES- Number of Logical files to be read: 0     (zero = all files)
PRINTOPT(L)- Read and Print tape labels ONLY: NO    (yes/no)
        (A)- Print ALL blocks in ALL files  : NO    (yes/no)
        (B)- Number of blocks to print for each file processed: ________


Display more ANALYZE Operands?: NO  (yes/no)
```

Option G (VERIFY ANALYZE) on the FATS/FATAR Main Menu brings you to this panel, which uses the FATS ANALYZE function to invoke FATAR to analyze the specified tape volumes. The volumes to be processed are specified as described for Option A (Certify New Tapes). The PRINTOPT options allow you to print data from the tapes, or to print only the labels from the first file on the tape (to quickly identify the contents of tapes).

Option G will function only if you are licensed for FATAR.

Note: Option H (EXAMINE) can be used for the same function. Option H must be used if you want to analyze a multi-volume tape set and get a combined report on the entire set. Option G treats each tape volume as an independent tape and produces a separate report for each. For a single tape volume, use option H.

CONTINUED . . .

93.2 FATAR ISPF INTERFACE

FATAR OPERATIONS

Options H through O on the FATS/FATAR main menu will generate jobstreams for FATAR operations and will work only if you are also licensed for FATAR.

Once you enter all necessary options on a given panel (except for option M which is described later), press ENTER to complete generation of the FATAR batch jobstream. You will be given the option of submitting the jobstream immediately or entering ISPF EDIT to view and modify the jobstream; you can submit it directly from edit, or save it in a JCL library for future use.

All the panels contain a data set name, unit name, and label parameter. A unique default data set name may be generated but you may overtype it with another name (this may be required to meet security restrictions). If you are reading labeled tapes (LABEL=SL or AL) you must enter the actual data set name recorded on the tape label, but if you are bypassing labels (LABEL=BLP) any valid name may be used. For output tapes, the data set name you specify may be overridden by FATAR. The unit name should be overridden with a generic name (such as 3490) or esoteric name (such as CART) which will allocate a tape drive of the appropriate type; a specific unit name (such as 3A0) may also be used.

All panels contain those FATAR options which are commonly used with the function on that panel; you can override the defaults displayed as necessary. They also contain a question "Display more FATAR Operands?". If you enter YES, the FATAR DEFAULT CONTROL OPERANDS panel shown in Section 93.0 ISPF INTERFACE INTRODUCTION is displayed, where you can override less commonly used parameters. The overrides are effective for this function only; the values are not saved.

EXAMINE CONTENTS AND LAYOUT (MAP) OF TAPES

```
 (V4.5.0) ---------------- FATAR EXAMINE (MAP) TAPES ---------------------------
COMMAND ===>                                            Enter Q for TMS51 Query

TAPEIN  DD Dsname=  BAB.FATARIN.JOBT                                <
           Unit  =( TAPE     )
           Label =( ,BLP,EXPDT=98000                     )
           VolSer=( 99999T                                                    )

NUMFILES   - Number of Logical files to be read  : 0     (zero = all files)
BLP        - By-pass tape label processing       : YES   (yes/no)
PRINTOPT(L)- Read and Print tape labels ONLY     : NO    (yes/no)
        (A)- Print ALL blocks in ALL files       : NO    (yes/no)
        (B)- Number of blocks to print for each file processed: _______


Display more FATAR Operands?: NO  (yes/no)
```

Option H (EXAMINE) on the FATS/FATAR Main Menu brings you to this panel, which invokes FATAR to analyze a tape. If you use the default of BLP, the data set name and volume serial (volser) are not actually verified against the tape, so any values required to get the proper tape mounted and opened can be used; this allows any tape, including tapes with unknown contents and tapes from outside your installation to be mounted. If you change the label type to SL or AL, the actual data set name and volume serial must be entered. Multiple volume serials may be entered if they are part of a multi-volume tape set. FATAR will report on the actual volume serial, label type, data set names, and contents of every file on the tape. The PRINTOPT options allow you to print data from the tapes, or to print only the labels from the first file on the tape (to quickly identify the contents of tapes).

Note: Option G (Figure 10) can be used for the same function. However, when multiple tape serials are entered on Option G, they are treated as individual tapes, not as part of a tape set, and each tape receives a separate FATAR report. Option H requires that multiple serials be part of a multi-volume tape set. Option H should be used for a single tape volume.

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93.2 CONTINUED . . .

MAKE AN EXACT IMAGE OF A TAPE VOLUME

```
 (V4.5.0) ---------------- FATAR IMAGE COPY -----------------------------------
COMMAND ===>                                  Enter Q, QI or QO for TMS51 Query

TAPEIN  DD  Dsname=  BAB.FATARIN.JOBT                                  <
            Unit  =( TAPE     ),Label=( ,BLP,EXPDT=98000     )
            VolSer=( 99999T         )
TAPEOUT DD  Dsname=  BAB.FATAROUT.JOBT                                 <
            Unit  =( TAPE     ),Label=( ,BLP,EXPDT=98000     )
            VolSer=( _____________ )

NUMFILES  - Number of Logical files to be read   : 0      (zero = all files)
VALIDATE  - Verify Volume Serial/Expiration Date : ALL    (no/input/output/all)
VERIFY    - Verify readability of Output tape    : YES    (yes/no)
OUTDSN    - Check for initialized Output Dsname  : NO     (yes/no)
OUTVOL    - Use Input Volser for Mount/Validation: NO     (yes/no)
OUTSER    - Retain Output Volume Serial Number   : NO     (yes/no)
COMPACTION- Data compression requested for Output: SYSTEM (system/copy/yes/no)


Display more FATAR Operands?: NO  (yes/no)
```

Option J (COPY a tape volume) on the FATS/FATAR Main Menu brings you to this panel, which generates a FATAR job to make an image copy (an exact bit-for-bit copy) of a single tape volume. The submitted job must be authorized to use BLP (Bypass Label Processing) since this function is required for image copy. Since BLP is used on TAPEIN, any dsname and volser can be specified, whatever is sufficient to mount the proper input tape. However, if INPUT or ALL is specified for VALIDATE, the volume serial of the input tape will be checked against the serial you provided. The dsname of TAPEOUT will not be used, and the TAPEOUT volume serial is whatever you require to get the proper output tape mounted. The output tape will have the actual volume serial of the input tape after the copy is complete, unless you specify YES for OUTSER.

IMAGE COPY OF MULTIPLE TAPES

```
 (V4.5.0) ------------- FATS MULTIPLE VOLUMES IMAGE COPY -----------------------
COMMAND ===>                                            Enter Q for TMS99 Query

TAPEIN  DD  Dsname=  BAB.FATSIN.JOBT                                   <
            Unit  =( TAPE     ),Label=( ,BLP,EXPDT=98000     )
TAPEOUT DD  Dsname=  BAB.FATSOUT.JOBT                                  <
            Unit  =( TAPE     ),Label=( ,BLP,EXPDT=98000     )
VOL       - Volume serial number(s) 1: ______  2: ______  3: ______  4: ______
                                    5: ______  6: ______  7: ______  8: ______
                                    9: ______ 10: ______ 11: ______ 12: ______
                                   13: ______ 14: ______ 15: ______ 16: ______
                                   17: ______ 18: ______ 19: ______ 20: ______
MAXVOLN   - Maximum number of volumes: ___
VALIDATE  - Verify Volume Serial/Expiration Date : ALL    (no/input/output/all)
VERIFY    - Verify readability of Output tape    : YES    (yes/no)
OUTDSN    - Check for initialized Output Dsname  : NO     (yes/no)
OUTVOL    - Use Input Volser for Mount/Validation: NO     (yes/no)
OUTSER    - Retain Output Volume Serial Number   : NO     (yes/no)
COMPACTION- Data compression requested for Output: SYSTEM (system/copy/yes/no)


Display more ANALYZE Operands?: NO  (yes/no)
```

Option K (COPY multiple volumes) on the FATS/FATAR Main Menu brings you to this panel, which uses the ANALYZE option of FATS to invoke FATAR to perform an image copy of multiple input tapes to multiple output tapes. The input tapes might comprise a multi-volume tape set, or might be unrelated; since image copy completely copies one input tape to one output tape, the relation of the input tapes is immaterial. The considerations for the TAPEIN and TAPEOUT data set names are the same as for Option J (Copy a tape volume) and the rules for specifying the input volume serials are the same as for Option A (CERTIFY new tapes). However, the job will call for scratch (PRIVAT) mounts for each output tape; your operator must be prepared to mount the proper output tape for each input tape requested.

CONTINUED . . .

93.2 CONTINUED . . .

MAKE A LOGICAL COPY OF ONE OR MORE FILES

```
 (V4.5.0) ---------------- FATAR LOGICAL COPY ----------------------------------
COMMAND ===>                                   Enter Q, QI or QO for TMS51 Query

TAPEIN  DD  Dsname=  BAB.FATARIN.JOBT                                <
            Unit  =( TAPE     )
            Label =( ,BLP,EXPDT=98000                     )
            VolSer=( 99999T                                                     )
            Dcb   =( ___________________________________________________________ )
TAPEOUT DD  Dsname=  BAB.FATAROUT.JOBT                               <
            Unit  =( TAPE     )
            Label =( ,SL                                  )
            VolSer=( ___________________________________________________________ )
            Dcb   =( ___________________________________________________________ )

NUMFILES  - Number of Logical files to be read : 0      (zero = all files)
BLP/OUTBLP- By-pass label processing on - Input: YES -- on Output: NO  (yes/no)
VERIFY    - Verify readability of Output tape  : YES    (yes/no)
LABELS    - Label checking to be done by FATAR : YES    (yes/os)
COMPACTION- Data compression request for Output: SYSTEM (system/copy/yes/no)
CAT       - Catalogue Output tape              : NO     (yes/no/recat)

Display more FATAR Operands?: NO  (yes/no)
```

Option L (COPY one or more files) on the FATS/FATAR Main Menu brings you to this panel, which uses FATAR to logically copy files from an input tape (or multi-volume tape set) to an output tape (or tape set). If you use the default of LABEL=SL (or AL) on TAPEIN, the actual volume serials of the input tape(s) and the actual data set name of the first data set on the first volume must be provided. If you change the TAPEIN to LABEL=BLP, any dsname and volume serial(s) can be used; FATAR will recognize the label type of the input tape automatically even with BLP. For TAPEOUT, the LABEL parameter determines the format of the output tape (SL for IBM standard labels, AL for ANSI labels, NL or BLP for unlabeled tape); if the output tape is labeled, FATAR will extract the data set names of the files on the input tape and change the name of the output files to be the same; the data set name of TAPEOUT is not used. DCB information can be omitted if the input tape has labels; FATAR will get the file characteristics from those labels. If the full data set name is available (See Section 21.0 FATAR TECHNICAL SUMMARY), you can specify YES or RECAT for CAT to catalog the data set to the output tape (use RECAT if the input data sets are already cataloged).

CONTINUED . . .

93.2 CONTINUED . . .

RECOVER DATA FROM AN OVERWRITTEN TAPE

```
 (V4.5.0) ------------ FATAR OVER-WRITTEN TAPE RECOVERY ------------------------
COMMAND ===>                                  Enter Q, QI or QO for TMS99 Query


TAPEIN  DD  Dsname=  BAB.FATARIN.JOBT                                <
            Unit  =( TAPE     )
            Label =( ____ ,BLP,EXPDT=98000 )
            VolSer=( 99999T         )
            Dcb   =( ___________________________________________________________ )
TAPEOUT DD  Dsname=  BAB.FATAROUT.JOBT                               <
            Unit  =( TAPE     )
            Label =( ,SL                                  )
            VolSer=( _______________ )
            Dcb   =( ___________________________________________________________ )

NUMFILES  - Number of Logical files to be read  : 0      (zero = all files)
OUTBLP    - By-pass label processing on Output  : NO     (yes/no)
VERIFY    - Verify readability of Output tape   : YES    (yes/no)
EODRETRY  - Nbr of attempts to position past EOD: 0
COMPACTION- Data compression request for Output : SYSTEM (system/copy/yes/no)


Display more FATAR Operands?: NO  (yes/no)
```

Option O (COPY one or more files) on the FATS/FATAR Main Menu brings you to this panel, which uses FATAR to recover data from a tape which has been overwritten with a smaller amount of data; the data beyond the overwrite can be recovered. The parameters are similar to Option L (COPY). However, BLP is required to position the tape to the beginning of the overwritten data so the submitted job must be authorized to use BLP. A label number must be specified, pointing immediately after the overwriting data; since a single labeled data set uses 4 physical files, LABEL=5 is usually appropriate (See Section 24.2 RECOVERING DATA FROM OVERWRITTEN TAPES for more guidance on recovering overwritten data).

CONTINUED . . .

93.3 FATAR EXTENDED FUNCTIONS ISPF INTERFACE

FATAR EXTENDED FACILITIES

Option M (FATAR extended functions) on the FATS/FATAR Main Menu brings you to this panel, which is a starting menu for an interactive dialog which can build a FATAR jobstream using the many powerful features of FATAR. You should familiarize yourself with the FATAR modification/scan control statements and their functions (Section 23.3 MODIFICATION/SCAN STATEMENTS) before attempting to use these panels.

Option 1 can be invoked one time to specify the input and optional output tapes and generate the JCL (actually, if you invoke any of the other options before Option 1, it will take you through Option 1 first). The other options, 2-6, can be invoked repeatedly to generate whatever set of FATAR functions are required in that FATAR step.

```
(V4.5.0) ---------------- FATAR EXTENDED FUNCTIONS ----------------------------
OPTION ===>


       1. - to ANALYZE data on tape

       2. - to DROP (Delete) selected blocks or records

       3. - to KEEP selected blocks or change block length

       4. - to PRINT selected blocks

       5. - to REPLACE (Search for) data in selected blocks or records

       6. - to SCAN data fields in selected blocks or records

       7. - to RENAME file(s) copied to the output tape
```

As you invoke the various options, this menu will change format to show you how many statements of each kind have been generated. When complete, you can submit the generated job directly, or enter ISPF EDIT to review and submit or save it.

```
(V4.5.0) ---------------- FATAR EXTENDED FUNCTIONS ---------------------------
OPTION ===>

                                                                        COUNT
       1. - to ANALYZE data on tape                                       1

       2. - to DROP (Delete) selected blocks or records                   2

       3. - to KEEP selected blocks or change block length

       4. - to PRINT selected blocks                                      1

       5. - to REPLACE (Search for) data in selected blocks or records

       6. - to SCAN data fields in selected blocks or records

       7. - to RENAME file(s) copied to the output tape

Enter END to Review generated JCL         Enter SUBMIT to Submit Job
```

CONTINUED . . .

93.3 CONTINUED . . .

TAPEIN AND TAPEOUT SPECIFICATIONS

```
 (V4.5.0) --------- FATAR INPUT FILE DEFINITION for ANALYZE OPERATION ----------
COMMAND ===>                                          Enter Q for TMS99 Query

TAPEIN  DD Dsname=  BAB.FATARIN.JOBB                              <
           Unit  =( TAPE     )
           Label =( ,BLP,EXPDT=98000                    )
           VolSer=( 99999B                                                    )
           Dcb   =( ___________________________________________________________ )

COPYFILE - Do you wish to create an Output Tape?: ___ (yes/no)

NUMFILES- Number of Logical files to be read: 0      (zero = all files)
BLP     - By-pass labels processing on Input: YES    (yes/no)
LABELS  - Label checking to be done by FATAR: YES    (yes/no/os/image/req)
VALIDATE- Verify VolSer and Expiration Date : NO     (no/input/output/all)
EODRETRY- Attempts to position past EOD     : 0
ENDAFTER(LF)- Stop FATAR after logical file : _____
        (B) - Stop FATAR after block number : ______

Display more FATAR Operands?: NO  (yes/no)
```

Option 1 will take you to this screen to specify the input tape (you also come here if you enter another option without using Option 1 first). Refer to Option L (COPY one or more files) for considerations for the input (and output) tape specification.

If you specify YES for COPYFILE, the next panel allows you to specify the output tape, including the ability to optionally catalog the output files..

```
(V4.5.0) --------- FATAR OUTPUT FILE DEFINITION for ANALYZE OPERATION ---------
COMMAND ===>                                          Enter Q for TMS51 Query

TAPEOUT DD  Dsname=  BAB.FATAROUT.JOBB                              <
            Unit  =( TAPE     )
            Label =( ,SL                                    )
            VolSer=( ___________________________________________________________ )
            Dcb   =( ___________________________________________________________ )

OUTBLP    - By-pass label processing on Output   : NO     (yes/no)
COMPACTION- Data compression request for Output  : SYSTEM (system/copy/yes/no)
COMBFILES - Combine all Input into 1 Output file : NO     (yes/no)
VERIFY    - Verify readability of Output tape    : YES    (yes/no)
CAT       - Catalogue Output tape                : NO     (yes/no/recat)


Display more FATAR Operands?: NO  (yes/no)
```

FATAR DROP OPERATION

```
--------------------------- FATAR DROP OPERATION #2 ----------------------------
COMMAND ===> _

Drop Data Check Block ONLY: N (Y/N)

Logical File.......... ALL: N (Y/N)     -OR-     File: _______ Hdr/Trl: __ (H/T)

Blocks/Records........ ALL: N (Y/N)     -OR-     Blk1: _______  .  Rcd1: _______
                                                 Blk2: _______  .  Rcd2: _______
```

This is Option 2 on the FATAR Extended Functions Panel, which allows you to drop whole blocks or logical records from the output tape. See Section 23.3.2 DROP STATEMENT for guidance on the DROP statement.

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93.3 CONTINUED . . .

FATAR KEEP OPERATION

```
--------------------------- FATAR KEEP OPERATION #1 ---------------------------
COMMAND ===> _

Keep Data Check Block ONLY: N (Y/N)

Logical File.......... ALL: N (Y/N)     -OR-     File: _______ Hdr/Trl: _ (H/T)

Blocks................ ALL: N (Y/N)     -OR-     Blk1: _______  -  Blk2: _______

New Block Length......... : _______

Starting Location........ : _______

Reposition Data.......... : L (L -- Justify Left)
                            (R -- Justify Right)
```

This is Option 3 on the FATAR Extended Functions Panel, which allows you to copy whole blocks or logical records to the output tape when they would otherwise be dropped. It can also modify the length of copied blocks. See Section 23.3.3 KEEP STATEMENT for guidance on the KEEP statement.

FATAR PRINT OPERATION

```
--------------------------- FATAR PRINT OPERATION #1 --------------------------
COMMAND ===> _

  Print ALL Blocks: N (Y/N)
  ------ OR ------
  Logical File.......... ALL: N (Y/N)  -OR-     File: _______ Hdr/Trl: _ (H/T)
  Blocks................ ALL: N (Y/N)  -OR-     Blk1: _______ --  Blk2: _______
  Data Print Length........ : _______
  Data Print Format........ : ____ (Char/Hex/Dump)
```

This is Option 4 on the FATAR Extended Function Panel, which allows you to print blocks or records from the input tape. See Section 23.3.1 PRINT STATEMENT for guidance on the PRINT statement.

FATAR REPLACE OPERATION

```
--------------------- FATAR REPLACE OPERATION #1 (Panel 1 of 2) -------------------
COMMAND ===> _

Replace Data Check Block ONLY: N (Y/N)
  Logical File............. ALL: _ (Y/N)    -OR-    File: _______  Hdr/Trl: _ (H/T)
  Blocks/Record............ ALL: _ (Y/N)    -OR-    Blk1: _______  .  Rcd1:_______
                                                    Blk2: _______  .  Rcd2: _______

  Starting Location........... : _______

  Scan until End of Rcd/Blk... : N (Y/N)

  Scan Option................. : _ (S -- for Search)
                                  (V-- for Verify)

  Replace Data Option......... : N (Y/N)
```

This is Option 5 on the FATAR Extended Function Panel, which allows you to scan for data in blocks or records on the input tape and optionally replace data in blocks or records written to the input tape. See Section 23.3.4 REPLACE STATEMENT for guidance on the REPLACE statement..

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93.3 CONTINUED . . .

```
---------------------- FATAR REPLACE OPERATION #1 (Panel 2 of 2) -----------------
COMMAND ===> _

SEARCH STRING -      (* Note: Character Type: C for Ebcdic, X for Hexadecimal )
 Type: _ >                                                                     <
       _ >                                                                     <
       _ >                                                                     <
       _ >                                                                     <
       _ >                                                                     <
       _ >                                                                     <
       _ >                                                                     <
       _ >                                                                     <
REPLACEMENT DATA --
 Type:
       _ >                                                                     <
       _ >                                                                     <
       _ >                                                                     <
       _ >                                                                     <
       _ >                                                                     <
       _ >                                                                     <
       _ >                                                                     <
       _ >                                                                     <
         >>>>>  Enclose your character string(s) in Quotes (ex: 'xx...xx')    <<<<<
```

This is the second panel for the REPLACE function, where the data to be located and the replacement data are entered as either character or hexadecimal strings. The panel may contain either the SEARCH STRING field, the REPLACEMENT DATA field, or both, depending on options entered on the first panel.

FATAR SCAN OPERATION

```
------------------------- FATAR SCAN OPERATION #1 ------------------------
COMMAND ===> _

Scan Data Check Block ONLY: N (Y/N)
  Logical File........ALL : _ (Y/N)  -OR-     File: _____ Hdr/Trl: _ (H/T)

Blocks/Record.........ALL : _ (Y/N)  -OR-     Blk1: _____ Rcd1: ______
                                               Blk2: _____.Rcd2: ______
  Length of Field........ : _______
  Starting Location...... : _______
  Table Name............. : _ (P -- scan for Packed decimals)
                              (Z -- scan for Zoned  decimals)
                              (t -- scan according to Table <t>:
                                    where <t> = 'A' to 'Y' <excl. 'P'>)
```

This is Option 6 on the FATAR Extended Function Panel, which allows you to validate data on the input tape; you can check for valid packed or zoned decimal fields, or validate against a table of valid bytes you provide. See Section 23.3.5 SCAN STATEMENT for guidance on the SCAN statement.

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93.3 CONTINUED . . .

FATAR TABLE DEFINITION

```
---------------------------- FATAR TABLE -A- DEFINITION --------------------------
COMMAND ===> _

SCAN OPERATION: #1

Report/Print only if Character FOUND: N (Y/N)

Table String--    (* Note: Character Type: C for Ebcdic, X for Hexadecimal )

 Type: _ >                                                                    <
       _ >                                                                    <
       _ >                                                                    <
       _ >                                                                    <
       _ >                                                                    <
       _ >                                                                    <
       _ >                                                                    <
       _ >                                                                    <
         >>>>>  Enclose your character string(s) in Quotes (ex: 'xx...xx')  <<<<<
```

If you specify a Table Name other than P or Z on the previous panel, this panel allows you to specify the characters that are valid (or invalid) for the field to be validated. See Section 23.3.6 TABLE STATEMENT for guidance on the TABLE statement

FATAR RENAME STATEMENT

```
---------------------------- FATAR RENAME OPERATION #1 ------------
COMMAND ===>



Display TMS list...: _ (Y/N) for Volume 99999B


Logical File... ALL: N (Y/N)    -OR-    File: _____

Rename Type........: _ ( N = dataset name, I = index mask)

Rename Output to...:                                          <
                     (enter new dataset name -or- index mask)
```

This is Option 7 on the FATAR Extended Function Panel, which allows you to rename output data sets (if you specified an output tape); you can check for valid packed or zoned decimal fields, or validate against a table of valid bytes you provide. See Section 23.3.7 RENAME STATEMENT for guidance on the RENAME statement.

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READER'S COMMENT FORM

FATS/FATAR USERS MANUAL V4.5

INNOVATION DATA PROCESSING

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- errors in the text or typographical errors
- clarity
- suggestions for improvement in the manual
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