TOPS-10/TOPS-20
USAGE File Specification

AA-4181B-TK, AD-4181B-T1

July 1982

USAGE files contain data used to account for computer
resource utilization. The USAGE File Specification describes
the format and use of USAGE files. This document updates the
document of the same name, order number AA-4181B-TK.

OPERATING SYSTEM: TOPS-10 V7.01
                              TOPS-20 V4
                              TOPS-20 V5

SOFTWARE: GALAXY V4.1 (TOPS-10)
                       GALAXY V4 (TOPS-20'

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document requests the user's critical evaluation to assist us in preparing future
documentation.

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PREFACE

This document describes the format and use of USAGE files for TOPS-10 and TOPS-20 operating systems. Included is a brief discussion of downstream billing programs supplied with TOPS-20 systems.

The USAGE File Specification is written for the applications programmer who must write or modify a billing or accounting program that reads USAGE files as input. For additional information, refer to the following manuals for your TOPS-10 or TOPS-20 system:

TOPS-10 Operator's Guide (AA-H283A-TB)

TOPS-10 Operating System Commands Manual (AA-0916D-TB)

Introduction to DECsystem-10 Software (DEC-10-MZDC-D)

TOPS-10 Monitor Installation Guide (AA-5056B-TB)

TOPS-20 Operator's Guide (AA-4176D-TM)

TOPS-20 Commands Reference Manual (AA-5115B-TM)

TOPS-20 User's Guide (AA-4179C-TM)

TOPS-20 System Manager's Guide (AA-4169F-TM)

TOPS-20 Software Installation Guide (AA-4195G-TM)

Section 1 describes USAGE files and their purpose; Section 2 describes the entries that make up USAGE files; Section 3 describes how TOPS-10 and TOPS-20 create USAGE files; Section 4 defines data fields common to all USAGE file entries; Section 5 gives examples of USAGE files; Section 6 describes how to run the TOPS-20 downstream billing programs; Section 7 gives the rules for adding and defining data fields.

Appendix A contains the format of each USAGE file record. A glossary follows the appendix.

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1.0 GENERAL FILE DESCRIPTION

USAGE files contain data that account for system resource usage. When
someone uses a system resource, a record of that usage is made in the
USAGE file. The data recorded in the USAGE file forms the basis for
charges that a downstream billing program places on the user's bill.
The data in the USAGE file includes the user's console connect time,
the number of disk reads and writes caused by the user, the number of
seconds it took the central processing unit to process the user's job,
and the number of seconds the user had devices and file structures
mounted.

TOPS-10 and TOPS-20 differ in how they collect this system resource
usage data.   Section 3 explains how each system collects data, and
names the files used on each system in this process.   Section 3 also
explains when each USAGE file entry type is made.

The formats of USAGE files are the same on TOPS-10 and TOPS-20.
Briefly, a USAGE file consists of one or more USAGE file entries.
Each USAGE file entry consists of two or more records. A record is a
string of ASCII characters terminated by a carriage return/line feed.
Section 2 gives a brief description of the records that make up each
entry type, and what kind of data each entry type contains. This
information is printed in boldface for easy reference.   Refer to
Appendix A for a detailed description of each record.

2.0 ENTRY DESCRIPTIONS

Each USAGE file entry has two parts: an entry header record and one
or more data records. The header record of each entry has the same
format. The subsequent data records vary among entry types.   The
entry types defined are:

1. System restart entries

2. Session entries

3. Incomplete session entries

4. USAGE file header entry (TOPS-10 only)

5. Date/time change entries

6. Batch processor entries (not implemented)

7. Input spooler entries

8. Output spooler entries

9. Disk storage entries

10. Disk spindle usage entries (TOPS-10 only)

11. File structure mount entries

12. Magtape mount entries

13. DECtape mount entries (TOPS-10 only)

14. DECtape FILE command entries (TOPS-10 only--not implemented)

15. File retrieval entries (TOPS-20 only)

16. File archival entries (TOPS-20 only)

17. File migration entries (TOPS-20 only)

18. File collection entries (TOPS-20 only)

Sections 2.1 through 2.15 discuss these entry types.

2.1 System Restart Entry (Entry Type 0001)

The monitor (TOPS-20) or the ACTDAE program (TOPS-10) makes this entry every time the monitor restarts. If a USAGE file does not already exist when the monitor restarts, the system opens a new USAGE file before making this entry. In addition, the ACTDAE program makes a USAGE file header entry before it makes the restart entry. A restart entry consists of an entry header record and a system restart record.

2.2 Session Entry (Entry Type 0002)

The system writes a session entry whenever a user logs out a job or types a successful SET ACCOUNT or SET REMARK command on TOPS-20 or a SESSION command on TOPS-10. In addition, the system writes a session entry each time the operator changes the accounting shift. The data recorded in a session entry includes the console connect time and the run time used in that session. A session entry consists of an entry header record, session record #1, session record #2 (TOPS-10 only) and a user identification record.

2.3 Incomplete Session Entry (Entry Type 0003)

The system writes an incomplete session entry whenever the monitor restarts after a crash that occurs while users are logged in. An incomplete session entry contains a record of the user's console connect time and his/her runtime as of the time of the last checkpoint before the system went down. An incomplete session entry has the same format as a session entry.

2.4 USAGE File Header Entry (Entry Type 0004)

ACTDAE writes a USAGE file header entry at the beginning of every TOPS-10 USAGE file. It writes this entry whenever it starts a new usage file. This entry consists of an entry header record followed by a USAGE file header record. A USAGE file header entry has the same format as the system restart entry, and contains information identifying the system on which it was made.

This entry is not implemented in TOPS-20.

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2.5 Date/Time Change Entry (Entry Type 0005)

The system writes a date/time change entry every time the operator
types a successful SET DATE-AND-TIME command (TOPS-20) or SET DATE or
SET DAYTIME command (TOPS-10). A date/time change entry consists of
an entry header record and a date/time change record. The entry
header record contains the new date and time, and the date/time change
record contains the old date and time.

2.6 Batch Processor Entry (Entry Type 0006)

The system writes this entry when it finishes processing a batch job.
A batch processor entry consists of an entry header record, a batch
processor record, and a user identification record. The date/time
recorded in the entry header record is the time the batch job was
completed.

This entry is not implemented.

2.7 Input Spooler Entry (Entry Type 0007)

The system makes this entry when the input spooler completes
processing an input request. An input spooler entry consists of an
entry header record, an input spooler record, and the user
identification record. The entry header record contains the date and
time the spooler finished processing the item in the input queue. The
input spooler record contains the date and time the input spooler
began processing the input request. The user identification record
contains the user's name.

2.8 Output Spooler Entry (Entry Type 0008)

The system writes this entry when the output spooler completes
processing an output request. An output spooler entry consists of an
entry header record, an output spooler record, and a user
identification record. The entry header record contains the date and
time the spooler finished processing the item in the output queue.
The output spooler record contains the date and time the user gave the
command that placed the item in the output queue, the date and time
the request was placed in the queue, and the date and time the spooler
began to output the item. The user identification record contains the
user's name.

2.9 Disk Usage Entry (Entry Type 0009)

The system makes one disk storage entry for each directory on the
system. Each entry identifies a directory, then gives the amount of
storage space used by each account. A disk storage entry consists of
an entry header record, a disk usage directory record, and one account
string record for each account string associated with a file in that
directory.

The operator causes the system to make this entry by using the /USAGE
switch while running the BACKUP program on TOPS-10, or by giving the
command DISK-STATISTICS to the CHKPNT program on TOPS-20.

2.10 Disk Spindle Usage Entry (Entry Type 0010)

The disk spindle usage entry contains data on disk drive usage. One entry is made for each file structure. The ACTDAE program writes this entry for a given file structure when that file structure is removed from the system. A disk spindle usage entry consists of an entry header record, and one disk spindle usage record for each physical disk drive in the file structure. The disk spindle usage record tells which disk drive in the file structure that record describes. The entry header record contains the date and time the disk drive is dismounted. The disk spindle usage record contains the date and time the disk drive is first mounted.

This entry is not implemented in TOPS-20.

2.11 Device Mount Usage Entries

The device mount usage entries consist of an entry header record, a record that describes the device mounted, and a user identification record. These entries record the connect time and use time whenever a user uses a peripheral device. Sections 2.11.1 through 2.11.4 describe device mount usage entries.

2.11.1 File Structure Mount Entry (Entry Type 0011)

The system writes this entry for each file structure the user mounts. It also writes this entry when the structure is dismounted. A file structure mount entry consists of an entry header record, a file structure record, and a user identification record. The entry header record contains the user's connect time, and the date and time the user dismounts the file structure. The file structure record contains the date and time the user mounts the file structure. The user identification record contains the user's name.

2.11.2 Magtape Mount Entry (Entry Type 0012)

The system makes a user magtape mount entry for each magtape drive used. A magtape mount entry consists of an entry header record, a magtape record, and a user identification record. The entry header record contains the date and time the user dismounts the magtape. The user magtape record contains the date and time the user mounts the magtape. The user identification record contains the user's name.

2.11.3 DECtape Mount Entry (Entry Type 0013)

The ACTDAE program makes a DECtape mount entry when a user mounts a DECtape. (FILE commands are recorded in the DECtape FILE command entry.) A DECtape mount entry consists of an entry header record, a DECtape record, and a user identification record. The entry header record contains the date and time the user dismounts the DECtape. The DECtape record contains the date and time the user mounts the DECtape. The user identification record contains the user's name.

This entry is not implemented in TOPS-20.

2.11.4 DECtape FILE Command Entry (Entry Type 0014)

The ACTDAE program creates this entry for every DECtape FILE command.
A DECtape FILE command entry consists of an entry header record, a
DECtape FILE command record, and a user identification record.   The
entry header record contains the date and time the system makes the
entry in the USAGE file. The DECtape FILE command record contains the
date and time the user gave the DECtape FILE command and the date and
time that the system serviced the command.   The user identification
record contains the user's name.

This entry applies only to TOPS-10 but is not implemented. |

2.12 File Retrieval Entry (Entry type 0015)

TOPS-20 makes a file retrieval entry when the operator satisfies a
file retrieval request.   The operator does this by restoring a file
from system archive tapes to the directory of the user who made the
request. This entry identifies the user and the account, and contains
the size of the file, the name of the directory to which the file is
restored, and the identification numbers of the tapes on which the
file was archived. A file retrieval entry consists of an entry header
record, a file retrieval record, and a TOPS-20 user identification
record.

This entry is not implemented in TOPS-10.

2.13 File Archival Entry (Entry type 0016)

TOPS-20 makes a file archival entry for each file a user archives.
This entry identifies the user, the account, and the directory of the
file archived. This entry also identifies the tapes on which the file
is archived, and contains the size of the file archived. A file
archival entry consists of an entry header record, a file archival
record, and a user identification record.

This entry is not implemented in TOPS-10.

2.14 File Migration Entry (Entry type 0017)

TOPS-20 makes a file migration entry for each file the REAPER program
causes to be migrated by the DUMPER program. This entry identifies
the user, the account, and the directory of the migrated file.   This
entry contains the size of the migrated file and the identification
numbers of the tapes to which the file was migrated. A file migration
entry consists of an entry header record, a file migration record, and
a user identification entry.

This entry is not implemented in TOPS-10.

2.15 File Collection Entry (Entry type 0018)

TOPS-20 makes a file collection entry for each file that the DUMPER program collects due to a passed file expiration date. This entry identifies the user, the account and the directory of the file, and contains the same data as the file migration entry. A file collection entry consists of an entry header record, a file collection record, and a user identification record.

This entry is not implemented in TOPS-10.

3.0 DATA FLOW

The data collected in the USAGE file are a record of computer resource usage. The system starts to collect these data regarding a user's computer resource usage when that user logs in, and collects data until that user logs out. The system collects these data in two ways: by checkpointing and by an event-driven process.

Checkpointing is the periodic collection of data by the system. Checkpointing collects the data that appear in the session records of a USAGE file. Refer to the session record formats in Appendix A for a complete description of the data checkpointing collects.

When a user logs in, the system stores accounting data for that user in a checkpointing file. The data stored in this disk file includes the user's console connect time, run time, and the time and date the current session started. These accounting data become the USAGE file session entry.

The system updates all the user job slots in the checkpoint file at the end of each checkpoint interval. The default checkpoint interval is ten minutes. Refer to Section 3.1 for instructions on changing the TOPS-10 checkpoint interval. Refer to Section 3.2 for instructions on changing the TOPS-20 checkpoint interval.

Checkpointing allows the system to keep track of resource use even if the system crashes. After a crash, the checkpoint file on disk contains accounting data current at the last checkpoint before the crash. When the operator restarts the system, the system writes the data in the checkpoint file as incomplete session entries in a USAGE file. No job that causes accounting entries proceeds until the system writes incomplete session entries for each job that was running when the crash occurred.

Events also cause the system to collect accounting data. For example, when a user types the PRINT command, the system collects accounting data. These data include the time the user typed the command, the name of the output device, the time the request enters the printer queue, the time the spooler finishes the printing, and the time the output spooler uses in processing the request. The system writes these data into the USAGE file as an output spooler entry.

The flows of data in TOPS-10 and TOPS-20 differ, but each system produces USAGE files with the same format. The following section discusses the TOPS-10 data flow in detail. Section 3.2 discusses the TOPS-20 data flow in detail.

3.1 TOPS-10 Data Flow

TOPS-10 collects system resource usage data by checkpointing and by an event-driven process. Section 3.1.1 describes how a part of the monitor called the accounting daemon, or ACTDAE, uses checkpointing to collect data for USAGE file session entries, and how ACTDAE uses these data to produce a USAGE file session entry. Section 3.1.2 describes how ACTDAE collects data produced by an event the user causes, and how these data become a USAGE file entry. Section 3.1.3 describes how TOPS-10 keeps accounting data intact if the monitor stops, whether the stop is due to operator intervention or a system crash.

3.1.1 Checkpointing

ACTDAE maintains the file ACT:USEJOB.BIN on disk as an open file. When a user logs in, ACTDAE opens a job slot in USEJOB.BIN for that user. This job slot contains the data that will become a USAGE file session entry.

ACTDAE also maintains the file ACT:nnnDEV.BIN on disk, where 'nnn' is a user's job number. Each time a user mounts a device or a file structure, ACTDAE opens a device slot in this file for the user. This device slot contains checkpoint data concerning the use of devices and file structures by the user.

When a checkpoint interval ends, ACTDAE updates the USEJOB.BIN job slots for each active job and the nnnDEV.BIN file if the user mounted devices and/or file structures. ACTDAE updates the job slots in USEJOB.BIN by updating the fields that contain the console connect times and the run times of the users, and other fields that make up the data that form the session entry. ACTDAE updates nnnDEV.BIN by updating the fields that contain the number of disk reads and writes, the device connect time for each user, and other fields that make up the data that form the USAGE file device entries.

The default length of the checkpoint interval is ten minutes. For most systems this interval ensures accurate accounting. The length of the checkpoint interval can be changed, however, to accommodate the needs of your system. The TOPS-10 system programmer changes the default checkpoint interval by reassembling ACTDAE.MAC with new parameters.

When a logged-in user types the SESSION command, ACTDAE updates that user's USEJOB.BIN job slot and that user's nnnDEV.BIN device slots. ACTDAE then writes a session entry and appropriate device and file structure entries in the USAGE file. Next, ACTDAE copies the contents of that USEJOB.BIN job slot into the auxiliary checkpoint area for that job.

ACTDAE also copies the device slot from nnnDEV.BIN, the primary device checkpoint file, to the auxiliary checkpoint area. The auxiliary checkpoint areas now contain the checkpoint data current at the beginning of the second session.

The user's second session now starts, and the user can again use system resources. ACTDAE continues to update the job slots in USEJOB.BIN and nnnDEV.BIN at the end of every checkpoint interval. ACTDAE does not update the job slots in the auxiliary areas at the end of each checkpoint interval.

If the user types a second SESSION command, the user's second session ends. ACTDAE obtains the accounting data for this session by doing a checkpoint for that user and then subtracting the data in the auxiliary area from the data in USEJOB.BIN. For example, to find the connect time for the second session, ACTDAE obtains the difference between the connect time recorded in USEJOB.BIN and the accumulated connect time in the auxiliary area.

ACTDAE uses these data to write a session entry in the file ACT:USAGE.OUT. Then ACTDAE copies the contents of USEJOB.BIN into the auxiliary area. ACTDAE checkpoints the job slot in USEJOB.BIN as usual at the end of each succeeding checkpoint period.

ACTDAE obtains the data needed for the file structure and device usage entries by the same process as for session entries. ACTDAE obtains the difference between the current data in nnnDEV.BIN, and the data in the auxiliary area that was current at the beginning of the session. The difference between these two sets of data is the data on device and file structure use for the second session.

●

3.1.2 Event-Driven Data Collection

When a user requests some action, for example the printing of a file, the TOPS-10 monitor runs a program to service the request. The called program collects accounting data such as the time the user made the request, the time the request entered the queue, and the name and account number of the user. Then the called program services the request.

When the called program finishes processing the request, the called program sends ACTDAE an InterProcess Communication Facility, or IPCF, message. The IPCF message causes ACTDAE to write a USAGE entry in the file USAGE.OUT. ACTDAE processes the following USAGE file entry types in the foregoing manner:

- ● Session entries

- ● Date/time change entries

- ● Input spooler entries

- ● Output spooler entries

- ● Disk storage entries

- ● File structure mount entries

- ● User magtape mount entries

- ● DECtape mount entries

- ● DECtape FILE command entries - not implemented

TOPS-10 processes file structure and device mount requests by calling the MOUNT program. This program interprets the user MOUNT command, then calls upon the QUASAR and PULSAR programs to process the request as follows: they collect accounting data, and then assign the file structure or device to the requesting user. The accounting data that they collect includes data identifying the user's account and the name of the structure or device. QUASAR sends ACTDAE an IPCF message with these data, and ACTDAE opens a device slot in nnnDEV.BIN for this user and device.

QUASAR sends ACTDAE an IPCF message when the device or structure is removed from the system. When it receives the IPCF message, ACTDAE updates nnnDEV.BIN, and then writes a file structure or device mount entry in USAGE.OUT.

TOPS-10 processes all other requests in the list above in a similar way: the user makes a request, a called program collects some of the accounting data, and then the called program services the request. When the request servicing finishes, the called program sends ACTDAE an IPCF message. When ACTDAE receives the IPCF message, it collects the rest of the needed accounting data, updates the USEJOB.BIN and nnnDEV.BIN device slots for the user, and then writes the appropriate USAGE file entries.

When a user logs out, ACTDAE updates the USEJOB.BIN and nnnDEV.BIN job slots for that user. To obtain the data for that session, ACTDAE uses the primary and auxiliary checkpoint files in the same way as when the user types a SESSION command. Then ACTDAE writes a session entry and appropriate device and file structure entries into USAGE.OUT.

ACTDAE next sets all data fields in that user's job slots in USEJOB.BIN, nnnDEV.BIN, and the auxiliary areas to zero. The record of the user's completed session now resides in USAGE.OUT. USEJOB.BIN now contains job slots for logged-in jobs only.

The SESSION command affects only the job slot of the user giving the command. When a user types the SESSION command, ACTDAE updates the USEJOB.BIN and nnnDEV.BIN device slots for that user and writes a session entry and appropriate device and file structure entries in USAGE.OUT.

ACTDAE then updates the fields in each checkpoint file that contain the user's account string and/or remark string. ACTDAE continues to update the primary checkpoint file job slots for that user at the end of each checkpoint interval. Run time and console connect time for the new account accrue from the time the user gave the SESSION command.

3.1.3 System Crashes

If a system crash occurs, TOPS-10 has the most recent checkpoint data in the disk files USEJOB.BIN and nnnDEV.BIN, the primary checkpoint files. These files contain data that ordinarily become USAGE file session entries and device and file structure entries.

Whenever the operator restarts the monitor, ACTDAE writes a system restart entry in the file USAGE.OUT. If the operator restarts the

system after a crash, ACTDAE also uses the checkpoint data in the USEJOB.BIN file to write an incomplete session entry for each job that was logged in when the system crashed. The monitor will not process any job that uses accountable system resources until it writes these incomplete session entries in USAGE.OUT.

3.2 TOPS-20 Data Flow

TOPS-20 collects accounting data by checkpointing and by an event-driven process. Section 3.2.1 describes how the monitor uses checkpointing to collect data for USAGE file session entries, and how the monitor uses those data to produce a USAGE file session entry. Section 3.2.2 describes how the monitor collects data produced by an event the user causes, and how those data become a USAGE file entry. Section 3.2.3 describes how TOPS-20 keeps accounting data intact if the system crashes.

3.2.1 Checkpointing

TOPS-20 maintains the file PS:<ACCOUNTS>CHKPNT.BIN on disk as an open file. When a user logs in, the monitor opens a job slot in CHKPNT.BIN for that user. This job slot contains the data that will become a USAGE file session entry. Whenever a checkpoint interval ends, the monitor updates the job slot for each active job. The monitor updates the job slots by updating the fields that contain the console connect times and the run times of the users.

When a user logs out, the monitor updates the CHKPNT.BIN job slot for that user, writes a session entry into PS:<ACCOUNTS>SYSTEM-DATA.BIN, and then sets all data fields in that user's job slot in PS:<ACCOUNTS>CHKPNT.BIN to zero. The record of the user's completed session now resides in PS:<ACCOUNTS>SYSTEM-DATA.BIN, and PS:<ACCOUNTS>CHKPNT.BIN contains job slots for running jobs only.

The default length of the checkpoint interval is ten minutes. For most systems this interval ensures accurate accounting. The length of the checkpoint interval can be changed, however, to accommodate the needs of your system. The TOPS-20 operator changes the default checkpoint interval by inserting the following commands in PS:<SYSTEM>PTYCON.ATO:

```
CHKPNT
SET (CHECKPOINT INTERVAL TO) n (MINUTES)
EXIT
```

where n is the length of the interval in minutes.

TOPS-20 maintains PS:<ACCOUNTS>SYSTEM-DATA.BIN on disk as an open file. To process the accounting data contained in SYSTEM-DATA.BIN, create a USAGE file from the SYSTEM-DATA.BIN file by typing the COPY command to the CHKPNT program prompt. In the example that follows, you type the underlined portion:

```
@ENABLE
$CHKPNT
CHKPNT>COPY (SYSTEM DATA TO) filespec
CHKPNT>EXIT
$DISABLE
@
```

If you do not enter a file specification, the system gives the new
file the default name USAGE.OUT. USAGE.OUT resides in your connected
directory.

The COPY command to CHKPNT converts the mixed-mode data in
SYSTEM-DATA.BIN to ASCII mode and appends that data to USAGE.OUT in
the format specified in Appendix A. Any control characters in
SYSTEM-DATA.BIN become backslashes (\) in USAGE.OUT.

After CHKPNT copies the SYSTEM-DATA.BIN file into the file USAGE.OUT,
it closes the copied SYSTEM-DATA.BIN file and opens a new
SYSTEM-DATA.BIN file on disk. You should save the closed
SYSTEM-DATA.BIN file until after your billing program processes the
accounting data in USAGE.OUT. To avoid placing duplicate data in
USAGE.OUT, you should rename the closed SYSTEM-DATA.BIN file and save
it. If you do not want to save the data in the SYSTEM-DATA.BIN file,
give the EXPUNGE command to the CHKPNT program as follows:

    @CHKPNT
    CHKPNT>EXPUNGE (PROCESSED SYSTEM DATA)
    CHKPNT>EXIT

This procedure deletes and expunges all closed files named
SYSTEM-DATA.BIN.

3.2.2 Event-Driven Data Collection

In addition to a LOGOUT command from a user, other events cause the
TOPS-20 monitor to write session entries using the data in CHKPNT.BIN.
When the operator resets the accounting shift by giving the CHANGE
command to the CHKPNT program, or when the monitor changes the
accounting shift due to commands in the PS:<SYSTEM>4-CONFIG.CMD (Refer
to the TOPS-20 Software Installation Guide.), the monitor updates all
job slots in CHKPNT.BIN and writes a session entry in the file
SYSTEM-DATA.BIN for each job. Then the monitor sets the fields
containing the console connect time and the run time in all job slots
to zero.

When a logged-in user types the SET ACCOUNT command the system updates
that user's CHKPNT.BIN job slot and writes a session entry into
SYSTEM-DATA.BIN. Then the monitor sets to zero the fields in
CHKPNT.BIN containing the user's run time and console connect time.
The monitor enters the new session start time and date and the new
account string or remark, but leaves all other fields in the
CHKPNT.BIN job slot unchanged. The SET ACCOUNT command affects only
the job slot of the user giving the command. Checkpointing then
updates the CHKPNT.BIN job slot for that user at the end of each
checkpoint interval, and run time and console connect time accrue from
the time the user gave the SET ACCOUNT command.

When a user requests some action, for example the printing of a file,
the TOPS-20 monitor runs a program to service the request. The called
program collects accounting data such as the time the user made the
request, the time the request entered the queue, and the name and
account number of the user. Then the called program services the
request.

When the called program finishes processing the request, the called
program executes a USAGE monitor call. This monitor call causes the
monitor to write a USAGE entry in the file SYSTEM-DATA.BIN.

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This entry becomes part of a USAGE file when the program CHKPNT processes the SYSTEM-DATA.BIN file as described in Section 3.2.1. The monitor processes the following USAGE file entry types in this way:

- Date/time change entries

- Input spooler entries

- Output spooler entries

- File retrieval entries

- File archival entries

- File migration entries

- File collection entries

TOPS-20 processes file structure and device mount requests by calling the MOUNTR program. MOUNTR collects accounting data, and then mounts the file structure or device. The accounting data MOUNTR collects includes data that identify the user's account and the name of the structure or device.

MOUNTR executes a USAGE monitor call when the device or structure is removed from the system. The monitor then writes a file structure or device mount entry in SYSTEM-DATA.BIN. CHKPNT writes these mount entries in USAGE.OUT as described in Section 3.2.1.

For the following USAGE file entry types, DUMPER executes a USAGE monitor call:

- File retrieval entry

- File archival entry

- File migration entry

- File collection record

As with device or structure mount entries, the system makes these USAGE file entries only when the action has been accomplished.

Operator activity causes the monitor to write disk storage entries. Disk storage entries account for disk storage use by structure name and user account. The operator causes the CHKPNT program to collect disk usage statistics by giving the command DISK-STATISTICS to CHKPNT as follows:

```
@ENABLE (CAPABILITIES)
$CHKPNT
CHKPNT>DISK-STATISTICS (FOR STRUCTURE) str:
CHKPNT>EXIT
$DISABLE (CAPABILITIES)
@
```

This procedure causes CHKPNT to collect disk usage statistics only once, when the operator gives the command. The operator must give this command for each file structure for which he wants accounting data.

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CHKPNT writes the disk usage statistics it collects in the file PS:<ACCOUNTS>SYSTEM-DATA.BIN. CHKPNT copies the disk usage statistics into the file USAGE.OUT as disk storage entries. This occurs when the operator gives the COPY command to the CHKPNT program. For disk storage entries to be included in the USAGE file, the operator must give the DISK-STATISTICS command to CHKPNT for each file structure before giving the COPY command. Refer to the TOPS-20 Operator's Guide for an example of this and other CHKPNT procedures.

Operator activity also causes TOPS-20 to write system restart entries. The monitor writes a system restart entry every time the operator restarts the system. Section 3.2.3 discusses system restart entries.

3.2.3 System Crashes

If a system crash occurs, TOPS-20 has the most recent checkpoint data in the disk file PS:<SYSTEM>CHKPNT.BIN. This file contains data that ordinarily become USAGE file session entries. Whenever the operator restarts the system, the monitor writes a system restart entry in the file SYSTEM-DATA.BIN.

If the operator restarts the system after a crash, the system uses the checkpoint data in the CHKPNT.BIN file to write an incomplete session entry for each job that was logged in when the system crashed. The system writes these entries in the SYSTEM-DATA.BIN file immediately after it writes the restart entry. The monitor does not process any job that uses accountable system resources until it writes these incomplete session entries in SYSTEM-DATA.BIN.

4.0 DESCRIPTIONS OF DATA COMMON TO ALL ENTRIES

This section defines all common data descriptions used in the entry record descriptions in Appendix A.

4.1 Dates and Times

All dates are of the form:

    yyyymmddhhmmss

where yyyy is the year, mm is the month, dd is the day, hh is the hour, mm is the minute, and ss is the second. Dates contain no spaces. Since the date field in a USAGE file record is 14 ASCII characters long, and the dates are 14 ASCII characters long, dates are not justified.

The record descriptions in Appendix A refer to this format as sf, the standard ANSI format.

4.2 Program Versions

All program version numbers have the following format:

nnnaa(nnnnnn)-n

where n is a numeric character and a is an alphabetic character. The version number begins in the first column of the data field. No blanks should occur within the version numbers; blanks will fill the remainder of the data field to the right of the version number.

For example, if the version number data field occurs in columns 40-54, version 1(3)-1 is positioned in columns 40-45 and the remaining columns, 46-54, contain blanks.

4.3 Disposition Items

A disposition item communicates what happened during an event to the downstream processing. All disposition items contain a 6-character field provided by the calling program to indicate what happened. Each disposition item also provides a 39-character field for a comment made by the system, operator, or user. If the disposition of an event is abnormal, the comment explains why normal disposition did not take place.

Disposition items are implemented with GALAXY 4.1.

5.0 EXAMPLES OF USAGE FILES

This section gives examples of USAGE files. Single lines denote record boundaries; double lines denote entry boundaries.

5.1 Example of USAGE File on TOPS-10

This example illustrates a typical TOPS-10 USAGE file that contains no system restart entries.

ENTRY HEADER RECORD	USAGE HEADER ENTRY
USAGE HEADER RECORD	" " "
ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
SESSION RECORD #2	" "
USER IDENTIFICATION RECORD TOPS-10	" "
ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
SESSION RECORD #2	" "
USER IDENTIFICATION RECORD TOPS-10	" "
ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
SESSION RECORD #2	" "
USER IDENTIFICATION RECORD TOPS-10	" "
ENTRY HEADER RECORD	OUTPUT SPOOLER ENTRY
OUTPUT SPOOLER RECORD	" " "
USER IDENTIFICATION RECORD TOPS-10	" " "

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5.2 Example of a TOPS-10 USAGE File with a Restart

This example shows a typical TOPS-10 USAGE file with a system restart. Two user jobs were logged in when the crash occurred, so this example contains two incomplete session entries.

ENTRY HEADER RECORD	USAGE HEADER ENTRY
USAGE HEADER RECORD	" " "
ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
SESSION RECORD #2	" "
USER IDENTIFICATION RECORD TOPS-10	" "
* * * * * * C R A S H * * * * * *	
ENTRY HEADER RECORD	SYSTEM RESTART ENTRY
SYSTEM RESTART RECORD	" " "
ENTRY HEADER RECORD	INCOMPLETE SESSION ENTRY
SESSION RECORD #1	" " "
SESSION RECORD #2	" " "
USER IDENTIFICATION RECORD TOPS-10	" " "
ENTRY HEADER RECORD	INCOMPLETE SESSION ENTRY
SESSION RECORD #1	" " "
SESSION RECORD #2	" " "
USER IDENTIFICATION RECORD TOPS-10	" " "
ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
SESSION RECORD #2	" "
USER IDENTIFICATION RECORD TOPS-10	" "
ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
SESSION RECORD #2	" "
USER IDENTIFICATION RECORD TOPS-10	" "
ENTRY HEADER RECORD	OUTPUT SPOOLER ENTRY
OUTPUT SPOOLER RECORD	" " "
USER IDENTIFICATION RECORD TOPS-10	" " "

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5.3 Example of USAGE File on TOPS-20

This example illustrates a typical USAGE file on TOPS-20 that contains
no system restart entries.

ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
USER IDENTIFICATION RECORD TOPS-20	" "
ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
USER IDENTIFICATION RECORD TOPS-20	" "
ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
USER IDENTIFICATION RECORD TOPS-20	" "
ENTRY HEADER RECORD	OUTPUT SPOOLER ENTRY
OUTPUT SPOOLER RECORD	" " "
USER IDENTIFICATION RECORD TOPS-20	" " "

5.4 Example of a TOPS-20 USAGE File with a Restart

The next example shows a TOPS-20 USAGE file with a system restart.
Two user jobs were logged in when the crash occurred, so this
example contains two incomplete session entries.

ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
USER IDENTIFICATION RECORD TOPS-20	" "
ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
USER IDENTIFICATION RECORD TOPS-20	" "
ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
USER IDENTIFICATION RECORD TOPS-20	" "
ENTRY HEADER RECORD	OUTPUT SPOOLER ENTRY
OUTPUT SPOOLER RECORD	" " "
USER IDENTIFICATION RECORD TOPS-20	" " "
* * * * * * C R A S H * * * * * *	
ENTRY HEADER RECORD	SYSTEM RESTART ENTRY
SYSTEM RESTART RECORD	" " "
ENTRY HEADER RECORD	INCOMPLETE SESSION ENTRY
SESSION RECORD #1	" " "
USER IDENTIFICATION RECORD TOPS-20	" " "
ENTRY HEADER RECORD	INCOMPLETE SESSION ENTRY
SESSION RECORD #1	" " "
USER IDENTIFICATION RECORD TOPS-20	" " "
ENTRY HEADER RECORD	SESSION ENTRY
SESSION RECORD #1	" "
USER IDENTIFICATION RECORD TOPS-20	" "

6.0 DOWNSTREAM BILLING PROGRAMS

A downstream billing program uses the information stored in the USAGE file to generate a data summary, to calculate charges, and to produce a bill for each account. DIGITAL provides two general downstream billing programs with TOPS-20 operating system software: USAH20 is written in FORTRAN, and USAG20 is written in COBOL.

DIGITAL supports only the FORTRAN format statements for USAH20 and the LIBRARY file for USAG20. The source code for these programs is provided on the TOPS-20 distribution tapes in the files PS:<FIELD-IMAGE>USAG20.CBL and PS:<FIELD-IMAGE>USAH20.FOR. Section 7 discusses modifying these downstream billing programs.

Different installations have different downstream billing needs, all of which no single program can satisfy. These billing programs provide examples of typical functions of a downstream billing program.

NOTE

TOPS-10

Downstream billing programs are not provided with your system. However, USAGE accounting record descriptors have been provided to save you time in writing your own programs. There is a set of record descriptors for COBOL and FORTRAN programs in the respective files FD.USG and FORMAT.USG on the CUSP distribution tape.

6.1 Running a Downstream Billing Program

Table 1 contains the output and expected input of the example downstream billing programs that DIGITAL supplies. The underlined characters are the acceptable responses to the program prompts. The programs assume that a carriage-return/line-feed follows each response. USAG20 and USAH20 perform the same steps and appear identical to the operator running them.

Table 1
Running the Downstream Billing Program

Type USAG20 to run the COBOL program, or type USAH20 to run the FORTRAN program.

   @USAG20 or USAH20

Type the input file specification xxxxxx.yyy, where xxxxxx is a filename of six characters or less and yyy is a file type of three characters or less. The default file specification is USAGE.OUT.

   TOPS-20 ACCOUNTING SYSTEM
   READ USAGE FILE: xxxxxx.yyy

Choose the type of output report. A system usage report summarizes and bills user computer usage, such as console connect time, run time, input spooler usage, and output spooler usage. A disk usage report summarizes and bills for disk pages (permanent) used in directories. The default is system usage (S).

   INPUT FILENAME: XXXXXX.YYY
   REPORT BY [SYSTEM USAGE(S) OR DISK USAGE(D)]: S or D

If the report is to be either by system usage for each user name or by disk usage for each directory name, type N. If the report is to be either by system usage or disk usage for each account, type A. The default sort is by Name (N).

   SORT BY [NAME(N) OR ACCOUNT(A)]: N or A

Type the output file specification xxxxxx.zzz, where xxxxxx is a filename of six characters or less and zzz is a file type of three characters or less. The default file specification is USAGE.RPT.

   WRITE TO FILE: xxxxxx.zzz

The program now begins to process the USAGE data for the specified input file.

   OUTPUT FILENAME: XXXXXX.ZZZ or carriage-return/line-feed

The previous input file has been processed. Enter another input file specification and continue, or type EXIT to any prompt to return to the operating system.

   READ USAGE FILE: xxxxxx.yyy or EXIT

6.1.1 Printing Reports Made by USAG20

The following command prints the billing reports made by USAG20:

    @PRINT output filespec/REPORT:type

One of the following report types must be specified:

Type	Report
NAME	System usage sorted by user name
ACCOUNT	System usage sorted by account
DNAME	Disk usage sorted by directory name
DACCOUNT	Disk usage sorted by account

6.1.2 Printing Reports Made by USAH20

The following command prints the billing reports made by USAH20:

    @PRINT output filespec/FILE:FORTRAN

6.2 Setting Billing Rates

The file USAG20.CHG contains the rates for billing computer usage. The file format is:

    Charge-code unit-charge/unit-type

A space is required between the charge code and the unit charge, and a slash (with no spaces) is required between the unit charge and the unit type. Valid charge codes are as follows:

Charge Code	Charge Item
SESCON	Console connect time
SESRUN	Session run time
PAGPAG	Line printer pages printed
PAGRUN	Run time used to print pages
CRDCRD	Cards read
CRDRUN	Run time used to read cards
DSKPAG	Disk pages used for storage

The unit charge format is:

    $$$.$$

The maximum charge per unit type is $999.99 and the minimum charge per unit type is $0.01.

The unit type is not currently an option in USAG20 or USAH20; connect time is charged per hour, run time is charged per second, cards are charged per card, and line printer pages and disk pages are charged per page.

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An example of a rate file is:

```
SESRUN  000.01/SECOND
SESCON  001.50/HOUR
PAGPAG  000.05/PAGE
PAGRUN  000.00/SECOND
CRDCRD  000.00/CARD
CRDRUN  000.01/SECOND
DSKPAG  000.01/PAGE
```

The file USAG20.CHG must be in the user's connected directory.

6.3 Report Examples

Figures 1 through 4 show examples of billing reports.

TOPS-20 BIG SYSTEM, TOPS-20 MONITOR
TOPS-20 System USAGE Report
USAGE Entries From: 30-Sep-79 16:53 to: 03-Oct-79 17:14

Account	Total Charge	Connect Time (Hours)	Runtime (Sec.)	Input Spooler Cards	Output Spooler Pages	Remark
UNSPECIFIED ACCOUNT	$ 0.45		.7		9	OUTPUT SPOOLER CHARGES
* * * Account Subtotal * * *	$ 0.45		.7		9	
341	$ 0.00		.5	26		INPUT SPOOLER CHARGES
* * * Account Subtotal * * *	$ 0.00		.5	26		
390	$ 33.15	14.88	1107.7			
390	$ 14.60		12.4		292	OUTPUT SPOOLER CHARGES
* * * Account Subtotal * * *	$ 47.75	14.88	1120.1		292	
MONITOR	$ 0.29	.11	13.3			
* * * Account Subtotal * * *	$ 0.29	.11	13.3			
OPERATOR	$ 58.86	37.65	241.5			
* * * Account Subtotal * * *	$ 58.86	37.65	241.5			
* * * Totals * * *	$ 107.35	52.64	1376.1	26	301	

```
*******************************
* End of Report for User OPERATOR
*******************************
Rates:
    Session Connect Time = $ 1.50/Hour,  Session Runtime        = $ .01/Second
    Input Spooler Unit   = $  .00/Card,  Input Spooler Runtime  = $ .00/Second
    Output Spooler Unit  = $  .05/Page,  Output Spooler Runtime = $ .00/Second
```

Figure 1   USAG20 Billing Report for System Usage Sorted by User Name

TOPS-20 BIG SYSTEM, TOPS-20 MONITOR
TOPS-20 System USAGE Report
USAGE Entries From: 30-Sep-79 16:53 to: 03-Oct-79 17:14

Name	Total Charge	Connect Time (Hours)	Runtime (Sec.)	Input Spooler Units	Output Spooler Units	Remark
DRUEKE	$ 26.68	9.13	1303.7			
DRUEKE	$ 0.15		.2		3	OUTPUT SPOOLER CHARGES
* * * User Subtotal * * *	$ 26.83	9.13	1303.9		3	
EIBEN	$ 0.40	.20	12.4			
* * * User Subtotal * * *	$ 0.40	.20	12.4			
EIBEN,INFO	$ 2.62	1.40	52.0			
* * * User Subtotal * * *	$ 2.62	1.40	52.0			
F-S	$ 4.65	2.86	38.0			
* * * User Subtotal * * *	$ 4.65	2.86	38.0			
* * * Totals * * *	$ 34.50	13.59	1406.3		3	

```
******************************
* End of Report for Account F-S
******************************
Rates:
     Session Connect Time = $  1.50/Hour,  Session Runtime        = $  .01/Second
     Input Spooler Unit   = $   .00/Card,  Input Spooler Runtime  = $  .00/Second
     Output Spooler Unit  = $   .05/Page,  Output Spooler Runtime = $  .00/Second
```

Figure 2   USAG20 Billing Report for System Usage Sorted by Account

```
Run Date:    8-Nov-79 07:03                      TOPS-20 BIG SYSTEM, TOPS-20 MONITOR
Account ROOT.3-STUFF                                    TOPS-20 Directory USAGE Report
                                                    USAGE Entries on 02-Nov-79 21:01

                                        Total      Disk     Number    Avg. No.  Structure
                    Directory          Charge      Pages    of Files  of Pages  Name
                    ---------        -----------  --------- --------- --------- ---------

HURLEY                              $       0.12       12         4       6.0 PS
HURLEY                              $       0.04        4         4       1.0 SNARK
                                     -----------  --------- --------- ---------
* * * Directory Subtotal * * *      $       0.16       16         8       7.0


                                     ===========  ========= ========= =========
* * * Totals * * *                  $       0.16       16         8       7.0

******************************
* End of Report for Account    ROOT.3-STUFF
******************************
Rates:
   Disk Usage =    $.01/Page
```

Figure 4   USAG20 Billing Report for Disk Usage Sorted by Account

```
                              TOPS-20 BIG SYSTEM, TOPS-20 MONITOR
                                    TOPS-20 Directory USAGE Report
                              USAGE Entries on   02-Nov-79 21:01
```

Account		Total Charge	Disk Pages	Number of Files	Avg. No. of Pages	Structure Name
1	$	0.18	18	4	9.0	PS
* * * Account Subtotal * * *	$	0.18	18	4	9.0	
341	$	0.52	52	1	52.0	PS
* * * Account Subtotal * * *	$	0.52	52	1	52.0	
390	$	0.92	92	14	46.0	PS
390	$	0.04	4	4	1.0	SNARK
* * * Account Subtotal * * *	$	0.96	96	18	47.0	
OPERATOR	$	2.86	286	9	143.0	PS
* * * Account Subtotal * * *	$	2.86	286	9	143.0	
* * * Totals * * *	$	4.52	452	32	251.0	

```
******************************
* End of Report for Directory OPERATOR
******************************
Rates:
    Disk Usage =   $.01/Page
```

Figure 3 USAG20 Billing Report for Disk Usage Sorted by Directory Name

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6.4 Error Messages

USAG20 and USAH20 error messages are shown in Table 2. When appropriate, other error messages will come from the TOPS-10 or TOPS-20 operating systems, COBOL, or FORTRAN.

Table 2
Error Messages

Error	Explanation and Correction
Input file error: xxxxxx	The input file specification you typed could not be parsed. Check that you have the correct file specification, then reenter the file specification.
Output file error: xxxxxx	The output file specification you typed could not be parsed. Reenter the output file specification.
Incomplete session entry	All three records of the session entry were not read. The USAGE file being processed has been corrupted. Use another copy of the USAGE file.
Incomplete input spooler entry	All three records of the input spooler entry were not read. The USAGE file being processed has been corrupted. Use another copy of the USAGE file.
Incomplete output spooler entry	All three records of the output spooler entry were not read. The USAGE file being processed has been corrupted. Use another copy of the USAGE file.

7.0 CHANGING USAGE FILE ENTRY RECORDS

Changing the fields of a USAGE file entry record requires a system programmer to be familiar with the TOPS-10 or TOPS-20 operating system. To modify and rebuild USAG20 requires a COBOL/SORT license. To modify and rebuild USAH20 requires FORTRAN and SORT licenses.

The downstream billing program will continue to run only if the following rules for changing entry records are observed:

1. DIGITAL will increase by one the DIGITAL record revision number of any record that DIGITAL changes. This number appears in field 4 of USAGE file entry records. A customer must increase by one the customer revision number of any record that the customer changes. This number appears in field 5 of USAGE file entry records.

2. No field within a record can be deleted. If the datum in a field is no longer needed, the system must write blanks in the field. If this is done, the appropriate record revision number must also be increased by one.

3. New data fields must be added to the end of the existing record. If this change is made, the appropriate record revision number must increased by one.

4. No control characters can be entered in any field of a USAGE file entry record.

5. The entry type field changes only if records within that entry are redefined.

APPENDIX A

USAGE FILE RECORD FORMATS

This appendix describes the formats of USAGE files for TOPS-10 and TOPS-20. The data items having an asterisk in the first column are provided in TOPS-20 only. Those items having two asterisks are provided in TOPS-10 only.

The abbreviation sf stands for standard ANSI format, as described in Section 4.0.

RECORD DOCUMENTATION

				RECORD NAME Entry Header Record				PAGE 1	OF 37
SEQUENCE Always the First Record of an Entry								DATE July-82	REV 5
			RECORD SIZE 85			7-BIT			

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		Depends on Type of Following Record(s)
2	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3	6	6	Record Sequence Number	1	n		'1'
4	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	24	Job Number	4	n		Job Number of Calling Program or User
8	25	38	Local Date and Time	14	n		Date and Time Entry is Made (sf)
9	39	39	Terminal Designator	1	a		T=TTY C=CTY P=PTY D=DET U=Unknown
10	40	43	Line Number	4	n		Terminal Number
11	44	49	Program Name	6	a		Name of Calling Program
12	50	64	Program Version Number	15	a		Version of Calling Program (sf)
13	65	79	ACTDAE/MONITOR Version Number	15	a		(sf)
14	80	85	Node Name	6	a		Name of Caller's Location

RECORD DOCUMENTATION

									PAGE	OF
					RECORD NAME TOPS-10 User Identification Record				2	37

							DATE	REV
SEQUENCE Preceded by Entry Header Record and the Entry Data Record(s)							Aug-77	3

			RECORD SIZE 44			**7-BIT**		

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		Depends on Type of Preceding Record
2	5	5	Operating System Identifier	1	n		'1'
3	6	6	Record Sequence Number	1	n		Usually '3'
4	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	26	Project Number	6	n		(Octal digits)
8	27	32	Programmer Number	6	n		(Octal digits)
9	33	44	User Name	12	a		

RECORD DOCUMENTATION

RECORD NAME			PAGE 3	OF 37
TOPS-20 User Identification Record				

SEQUENCE	DATE	REV
Preceded by Entry Header Record and the Entry Data Record(s)	Aug-77	3

RECORD SIZE 59		7-BIT			

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1*	1	4	Entry Type	4	n		Depends on Type of Preceding Record
2*	5	5	Operating System Identifier	1	n		'2'
3*	6	6	Record Sequence Number	1	n		Usually '3'
4*	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5*	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6*	11	20	Filler	10	n		Reserved for DEC
7*	21	59	User Name	39	a		

RECORD DOCUMENTATION

RECORD NAME		PAGE	OF
ACTDAE/System Restart Record		4	37

	DATE	REV
	July-82	5

RECORD SIZE		7-BIT		
145				

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		'0001'
2	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3	6	6	Record Sequence Number	1	n		'2'
4	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	59	System Name	39	a		
8	60	74	Monitor Version Number	15	a		(sf)
9	75	88	Monitor Build Date/Time	14	n		(sf)
10	89	106	Monitor Uptime	18	n		Seconds Since Last Cold Start Reload of System
11	107	107	Number of CPU's	1	n		CPU's running when this entry was made
12	108	111	Serial Number of CPU0	4	n		
13	112	115	Serial Number of CPU1	4	n		
14	116	119	Serial Number of CPU2	4	n		
15	120	123	Serial Number of CPU3	4	n		
16	124	127	Serial Number of CPU4	4	n		

				RECORD NAME ACTDAE/System Restart Record (cont.)		PAGE 5	OF 37
SEQUENCE Preceded by Entry Header Record						DATE July-82	REV 5
			RECORD SIZE 145		7-BIT		
DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
17	128	131	Serial Number of CPUS	4	n		
18	132	145	Date/Time of Last Checkpoint	14	n	(sf)	

USAGE FILE RECORD FORMATS

				RECORD NAME USAGE File Header Record		**PAGE** 6	**OF** 37
SEQUENCE Preceded by Entry Header Record						**DATE** Aug-79	**REV** 4
			RECORD SIZE 145		**7-BIT**		

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		'0004'
2	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3	6	6	Record Sequence Number	1	n		'2'
4	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	59	System Name	39	a		
8	60	74	Monitor Version Number	15	a		(sf)
9	75	88	Monitor Build Date/Time	14	n		(sf)
10	89	106	Monitor Uptime	18	n		Seconds Since Last Cold Start Reload of System
11	107	107	Number of CPU's	1	n		CPU's running when this entry was made
12	108	111	Serial Number of CPU0	4	n		
13	112	115	Serial Number of CPU1	4	n		
14	116	119	Serial Number of CPU2	4	n		
15	120	123	Serial Number of CPU3	4	n		
16	124	127	Serial Number of CPU4	4	n		

USAGE FILE RECORD FORMATS

RECORD DOCUMENTATION

				RECORD NAME USAGE File Header Record (cont.)		PAGE 7	OF 37
SEQUENCE Preceded by Entry Header Record						DATE Aug-79	REV 4
			RECORD SIZE 145		7-BIT		

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
17	128	131	Serial Number of CPU5	4	n		
18	132	145	Date/Time of Last Checkpoint	14	n		(sf)

					RECORD NAME	PAGE	OF

					Session Record # 1 (TOPS-10 and TOPS-20)	8	37

SEQUENCE if TOPS-10, followed by Session Record # 2   **DATE** July-82   **REV** 5

Preceded by Entry Header Record; if TOPS-20, followed by TOPS-20 User Identification Record

RECORD SIZE 147   **7-BIT**

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		'0002'
2	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3	6	6	Record Sequence Number	1	n		'2'
4	7	8	Record Revision Number	2	n		'02' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	59	Account String	39	a		Supplied by User
8	60	68	User's Runtime	9	n		In Milliseconds
9	69	82	Session Start Date/Time	14	n		End Date/Time Found in Entry Header Record (sf)
10	83	83	Job Type	1	n		'1' = Timesharing, '2' = Batch
11	84	89	Batch Job Name	6	a		
12	90	95	Batch Sequence Number	6	n		
13	96	134	Session Remark	39	a		Supplied by User
14	135	141	Console Connect Time	7	n		Seconds
15	142	147	Batch Request ID	6	n		

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USAGE FILE RECORD FORMATS

								PAGE 9	OF 37

RECORD NAME
Session Record # 2 (TOPS-10 Only)

SEQUENCE
Preceded by Session Record # 1; followed by TOPS-10 User Identification Record

DATE Aug-79	REV 4

RECORD SIZE 120   **7-BIT**

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		'0002'
2	5	5	Operating System Identifier	1	n		'1'
3	6	6	Record Sequence Number	1	n		'3'
4	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	28	Disk Reads	8	n		Block
8	29	36	Disk Writes	8	n		Block
9	37	47	Core-Time Integral	11	n		100*Kilo-Core-Seconds
10	48	58	Virtual Core-Time Integral	11	n		100*Kilo-Core-Second
11	59	67	EBOX Megacounts	9	n		Cycles x 10^6
12	68	76	MBOX Megacounts	9	n		Cycles x 10^6
13	77	82	Monitor Calls	6	n		
14	83	88	Monitor Commands	6	n		
15	89	91	Scheduling Class	3	n		
16	92	97	TTY Input Characters	6	n		

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USAGE FILE RECORD FORMATS

								PAGE 10	OF 37

RECORD NAME
Session Record # 2 (TOPS-10 Only) (cont.)

SEQUENCE
Preceded by Session Record # 1; followed by TOPS-10 User Identification Record

DATE Aug-77   REV 3

RECORD SIZE 120   7-BIT

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
17	98	103	TTY Output Characters	6	n		
18	104	109	Wake Count	6	n		Number of Times Job was Wakened After Blocking For TTY Activity
19	110	120	Run Queue Quotient	11	n		Runtime/Time in Queue

				ITEM	ITEM			

SEQUENCE
Preceded by Entry Header Record   **DATE** July-82   **REV** 4

RECORD SIZE 48   **7-BIT**

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		'0005'
2	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3	6	6	Record Sequence Number	1	n		'2'
4	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	27	Offset in Days	7	n		
8	28	34	Offset in Seconds	7	n		
9	35	48	Old/Date Time	14	n		New Date/Time Found in Entry Header Record (sf)

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USAGE FILE RECORD FORMATS

RECORD DOCUMENTATION

Note: This record type is not implemented					**RECORD NAME** Batch Processor Record		**PAGE** 12	**OF** 37
SEQUENCE Preceded by Entry Header Record;		if TOPS-10, followed by TOPS-10 User Identification Record if TOPS-20, followed by TOPS-20 User Identification Record					**DATE** July-82	**REV** 5
			RECORD SIZE 222			**7-BIT**		

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		'0006'
2	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3	6	6	Record Sequence Number	1	n		'2'
4	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	59	Account String	39	a		Supplied by User
8	60	68	Batch Runtime	9	n		Milliseconds Used to Process User Request
9	69	79	Batch Core-Time Integral	11	n		100*Kilo-Core-Seconds Used to Process Request
10	80	87	Batch Disk Reads	8	n		Blocks (TOPS-10)/Pages (TOPS-20) Read to Process User Request
11	88	95	Batch Disk Writes	8	n		Blocks (TOPS-10)/Pages (TOPS-20) Written to Process User Request
12	96	101	Job Name	6	a		Usually File Name of Control File
13	102	107	Sequence Number	6	n		Spooling System Sequence Number
14	108	121	Creation Date/Time of Request	14	n		Date/Time User Submitted Job (sf)
15	122	135	Eligible Date/Time	14	n		Date/Time Job Could be Scheduled (sf)
16	136	149	Scheduled Date/Time	14	n		Date/Time Job Started Running (sf)

Note: This record type is not implemented	RECORD NAME Batch Processor Record (cont.)		PAGE 13	OF 37

SEQUENCE Preceded by Entry Header Record;	if TOPS-10, followed by TOPS-10 User Identification Record July-82 if TOPS-20, followed by TOPS-20 User Identification Record	DATE July 82	REV 5

	RECORD SIZE 222		7-BIT		

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
17	150	155	Disposition	6	a		NORMAL, KOPR, KUSER, ERROR, MODIFY
18	156	194	Operator, System or User Text	39	a		Supplied to Explain Reason of Disposition
19	195	196	Priority of Request	2	n		
20	197	202	User's Runtime Estimate	6	n		Seconds
21	203	208	User's Actual Runtime	6	n		Seconds
22	209	212	User's Core Estimate	4	n		Pages
23	213	216	User's Core Highwater Mark	4	n		Pages
24	217	222	Request ID Number	6	n		

RECORD NAME		PAGE	OF
Input Spooler Record		14	37

SEQUENCE		DATE	REV
Preceded by Entry Header Record; if TOPS-10, followed by TOPS-10 User Identification Record if TOPS-20, followed by TOPS-20 User Identification Record		July-82	5

RECORD SIZE		7-BIT	
196			

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		'0007'
2	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3	6	6	Record Sequence Number	1	n		'2'
4	7	8	Record Revision Number	2	n		'02' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	59	Account String	39	a		Supplied by User on $Job Card
8	60	68	Spooler Runtime	9	n		Milliseconds Used to Process User Request
9**	69	79	Spooler Core-Time Integral	11	n		100*Kilo-Core-Seconds Used to Process Request
10	80	87	Spooler Disk Reads	8	n		Blocks (TOPS-10)/Pages (TOPS-20) Read to Process User Request
11	88	95	Spooler Disk Writes	8	n		Blocks (TOPS-10)/Pages (TOPS-20) Written to Process User Request
12	96	101	Job Name	6	a		Supplied by User on $Job Card
13	102	104	Queue Name	3	a		'INP'
14	105	110	Processing Device	6	a		Actual Input Device Name
15	111	116	Sequence Number	6	n		Spooling System Sequence Number
16	117	122	Number of Cards Read	6	n		

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USAGE FILE RECORD FORMATS

							7-BIT			

RECORD NAME
Input Spooler Record (cont.)

SEQUENCE
Preceded by Entry Header Record; if TOPS-10, followed by TOPS-10 User Identification Record
if TOPS-20, followed by TOPS-20 User Identification Record

DATE July-82 REV 5

RECORD SIZE 196

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
17	123	136	Creation Date/Time of Request	14	n		Date/Time Cards are Read In (sf)
18	137	142	Disposition	6	a		BATCH, ERROR, NOBAT, KOPR
19	143	181	Operator or System Text	39	a		Supplied to Explain Reason of Disposition
20	182	183	Priority of Request	2	n		
21	184	189	Request ID Number	6	n		
22	190	196	Connect Time	7	n		Seconds

RECORD DOCUMENTATION

				RECORD NAME			PAGE	OF
				Output Spooler Record			16	37

SEQUENCE				if TOPS-10, followed by TOPS-10 User Identification Record			DATE	REV
Preceded by Entry Header Record; if TOPS-20, followed by TOPS-20 User Identification Record							July-82	5

			RECORD SIZE			7-BIT		
			221					

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		'0008'
2	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3	6	6	Record Sequence Number	1	n		'2'
4	7	8	Record Revision Number	2	n		'02' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	59	Account String	39	a		Supplied by User
8	60	68	Spooler Runtime	9	n		Milliseconds Used to Process User Request
9**	69	79	Spooler Core-Time Integral	11	n		100*Kilo-Core-Seconds Used to Process Request
10	80	87	Spooler Disk Reads	8	n		Blocks (TOPS-10)/Pages (TOPS-20) Read to Process User Request
11	88	95	Spooler Disk Writes	8	n		Blocks (TOPS-10)/Pages (TOPS-20) Written to Process User Request
12	96	101	Job Name	6	a		Usually Name of File
13	102	104	Queue Name	3	a		'LPT', 'PTP', 'CDP', 'PLT'
14	105	110	Output Device	6	a		Actual Processing Device (e.g., 'LPT270')
15	111	116	Sequence Number	6	n		Spooling System Sequence Number
16	117	122	Output Units Generated	6	n		Pages, Feet, Cards, Minutes

RECORD DOCUMENTATION

				RECORD NAME Output Spooler Record (cont.)			PAGE 17	OF 37

SEQUENCE		if TOPS-10, followed by TOPS-10 User Identification Record			DATE July-82	REV 5

Preceded by Entry Header Record; if TOPS-20, followed by TOPS-20 User Identification Record

RECORD SIZE 221		7-BIT	

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
17	123	127	Number of Files Processed	5	n		Files * Copies
18	128	141	Creation Date/Time of Request	14	n		Date/Time User Request (sf)
19	142	155	Scheduled Date/Time	14	n		Date/Time Request Started on Device (sf)
20	156	161	Forms Type	6	a		'NARROW', 'NORMAL'
21	162	167	Disposition	6	a		'REQUE', 'ABORT', 'NORMAL'
22	168	206	Operator, System, or User Text	39	a		Supplied to Explain Reason of Disposition
23	207	208	Priority of Request	2	n		
24	209	214	Request ID	6	n		
25	215	221	Connect Time	7	n		Seconds

RECORD DOCUMENTATION

SEQUENCE	DATE	REV
Preceded by Entry Header Record; followed by n (see Data Item #7) Disk Usage Account String Records	July-82	5

	RECORD SIZE 145		7-BIT		

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		'0009'
2	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3	6	6	Record Sequence Number	1	n		'2'
4	7	8	Record Revision Number	2	n		'02' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	23	Number of Disk Usage Account Records Following	3	n		Total Number of Account Strings to be Recorded
8	24	33	Total Allocated Disk Usage	10	n		Blocks on TOPS-10, Pages on TOPS-20
9	34	43	Total Actual Disk Usage	10	n		Blocks on TOPS-10, Pages on TOPS-20
10	44	48	Total Number of Files	5	n		
11	49	54	File Structure Name	6	a		'DSKB'
12	55	93	PPN/Directory	39	a		
13	94	94	Type of File Structure	1	n		'1' = Public, '2' = Private (TOPS-10) '3' = Domestic, '4' = Foreign (TOPS-20)
14	95	97	Controller Type	3	n		
15	98	100	Device Type	3	n		
16	101	106	Quota In	6	n		FCFS on TOPS-10, Working on TOPS-20

RECORD DOCUMENTATION

								RECORD NAME			PAGE	OF
								Disk Usage Directory Record (cont.)			19	37

SEQUENCE: Preceded by Entry Header Record; followed by n (see Data Item #7) Disk Usage Account String Records — DATE July-82 — REV 4

RECORD SIZE 145 — 7-BIT

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
17	107	112	Quota Out	6	n		LGO on TOPS-10, Permanent on TOPS-20
18	113	126	Last Logged in Date/Time	14	n		(sf)
19	127	140	Last Accounting Date/Time	14	n		(sf)
20	141	141	Expired PPN/Directory	1	a		'Y' = Yes, 'N' = No
21*	142	142	Files Only Directory	1	a		'Y' = Yes, 'N' = No
22**	143	143	UFD Protection	1	a		'Y' = UFD is Protected against BACKUP
23**	144	144	File Protection	1	a		'Y' = Some Files are Protected against BACKUP
24**	145	145	Account Buffer Overflow	1	a		'Y' = User has too many unique account strings for BACKUP to handle

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USAGE FILE RECORD FORMATS

		RECORD NAME	PAGE	OF
		Disk Usage Account String Record	20	37

SEQUENCE	DATE	REV
Preceded by Disk Usage Directory Record (For each account string, there is one record of this type.)	July-82	4

	RECORD SIZE		7-BIT		
	136				

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)	ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n	'0009'
2	5	5	Operating System Identifier	1	n	'1' = TOPS-10, '2' = TOPS-20
3	6	6	Record Sequence Number	1	n	'3' (N.B., always 3)
4	7	8	Record Revision Number	2	n	'01' DEC-Reserved
5	9	10	Record Revision Number	2	n	'01' Customer-Reserved
6	11	20	Filler	10	n	Reserved for DEC
7	21	59	Account String	39	a	Stored in File's RIB(TOPS-10)/FDB(TOPS-20)
8	60	98	PPN/Directory	39	a	TOPS-10: Characters 60 to 71 = PPN / Characters 72 to 98 = Spaces
9	99	108	Allocated Disk Usage	10	n	Block on TOPS-10, Pages on TOPS-20
10	109	118	Actual Disk Usage	10	n	Blocks on TOPS-10, Pages on TOPS-20
11	119	123	Number of Files	5	n	
12	124	129	File Structure Name	6	a	'DSKB', 'DSKC', 'KLAD', 'PS', etc.
13	130	130	Type of File Structure	1	n	'1' = Public, '2' = Private (TOPS-10) / '3' = Domestic, '4' = Foreign (TOPS-20)
14	131	133	Controller Type	3	n	
15	134	136	Device Type	3	n	

| RECORD NAME Disk Spindle Usage Record | | PAGE 21 | OF 37 |

| SEQUENCE Preceded by Entry Header Record | | | DATE Aug-79 | REV 4 |

| RECORD SIZE 67 | | 7-BIT | |

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)	ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n	'0010'
2	5	5	Operating System Identifier	1	n	'1' = TOPS-10, '2' = TOPS-20
3	6	6	Record Sequence Number	1	n	'2'
4	7	8	Record Revision Number	2	n	'01' DEC-Reserved
5	9	10	Record Revision Number	2	n	'01' Customer-Reserved
6	11	20	Filler	10	n	Reserved for DEC
7	21	26	File Structure Name	6	a	'DSKB', 'DSKC', 'KLAD', 'PS', etc.
8	27	27	Type of File Structure	1	n	'1' = Public, '2' = Private (TOPS-10) '3' = Domestic, '4' = Foreign (TOPS-20)
9	28	30	Controller Type	3	n	
10	31	33	Device Type	3	n	
11	34	45	Disk Pack Identifier	12	a	'2RP555'
12	46	49	Disk Unit Name	4	a	'DPA0', 'RPA1', 'RPB2'
13	50	51	Total Number of Packs	2	n	Count of Packs in File Structure
14	52	53	mth Pack in File Structure	2	n	m of n Count (see Data Item 13)
15	54	67	Date/Time of First Mount	14	n	Removal Date/Time Found in Entry Header Record (sf)
16	68	74	Connect Time	7	n	Seconds

RECORD NAME User File Structure Record						**PAGE** 22	**OF** 37

SEQUENCE Preceded by Entry Header Record;	if TOPS-10, followed by TOPS-10 User Identification Record if TOPS-20, followed by TOPS-20 User Identification Record		**DATE** July-82	**REV** 5

	RECORD SIZE 175		7-BIT		

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		'0011'
2	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3	6	6	Record Sequence Number	1	n		'2'
4	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	59	Account String	39	a		Account String of User
8	60	65	File Structure Name	6	a		'DSKB', 'PRIV', etc.
9	66	66	Type of File Structure	1	n		'1' = Public, '2' = Private (TOPS-10) '3' = Domestic, '4' = Foreign (TOPS-20)
10	67	68	Total Number of Packs	2	n		Count of Packs in File Structure
11	69	71	Controller Type	3	n		
12	72	74	Device Type	3	n		
13	75	80	Disposition	6	a		'NORMAL', 'CANCEL'
14	81	119	Operator or System Text	39	a		Supplied to Explain Reason of Disposition
15	120	133	Creation Date/Time of Request	14	n		Date/Time User Typed Request (sf)
16	134	147	Scheduled Date/Time of Request	14	n		Date/Time Operator was Notified (sf)

				RECORD NAME User File Structure Record (cont.)				**PAGE** 23	**OF** 37
SEQUENCE Preceded by Entry Header Record;			if TOPS-10, followed by TOPS-10 User Identification Record if TOPS-20, followed by TOPS-20 User Identification Record					**DATE** July-82	**REV** 5
			RECORD SIZE 175		**7-BIT**				

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
17	148	161	Serviced Date/Time of Request	14	n		Field 17 - Field 16 = Operator Wait (sf)
18	162	164	Mount Count Before Mount	3	n		
19	165	167	Mount Count After Dismount	3	n		
20	168	168	Access Type	1	n		'1' = Multiple Access, '2' = Single Access
21	169	175	Connect Time	7	n		Seconds

							RECORD NAME User Magtape Record		PAGE 24	OF 37

SEQUENCE Preceded by Entry Header Record; if TOPS-20, followed by			if TOPS-10, followed by TOPS-10 User Identification Record TOPS-20 User Identification Record						DATE July-82	REV 5
			RECORD SIZE 255			7-BIT				
DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)			
1	1	4	Entry Type	4	n		'0012'			
2	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20			
3	6	6	Record Sequence Number	1	n		'2'			
4	7	8	Record Revision Number	2	n		DEC-Reserved '03' = TOPS-10, '01' = TOPS-20			
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved			
6	11	20	Filler	10	n		Reserved for DEC			
7	21	59	Account String	39	a		Account String of User			
8	60	65	Magtape Volume Identifier	6	a		Recorded in VOL1 Label			
9	66	71	Magtape Reel Identifier	6	a		Visual Label of Magtape			
10	72	79	Magtape Reads	8	n		Thousands of Characters Read			
11	80	87	Magtape Writes	8	n		Thousands of Characters Written			
12	88	93	Disposition	6	a		'NORMAL', 'CANCEL'			
13	94	132	Operator or System Text	39	a		Supplied to Explain Reason of Disposition			
14	133	146	Creation Date/Time of Request	14	n		Date/Time User Typed Request (sf)			
15	147	160	Scheduled Date/Time of Request	14	n		Date/Time Operator was Notified (sf)			
16	161	174	Serviced Date/Time of Request	14	n		Field 16 - Field 15 = Operator Wait (sf)			

				RECORD NAME User Magtape Record (cont.)					**PAGE** 25	**OF** 37
SEQUENCE Preceded by Entry Header Record;				if TOPS-10, followed by TOPS-10 User Identification Record if TOPS-20, followed by TOPS-20 User Identification Record					**DATE** July-82	**REV** 5
			RECORD SIZE 255				**7-BIT**			
DATA ITEM (1)	**START POS'N** (2)	**END POS'N**	**CONTENTS**		**ITEM SIZE** (3)	**ITEM TYPE** (4)		**ITEM DESCRIPTION** (5)		
17	175	177	Type of Controller		3	n				
18	178	179	Label Type		2	n		'01' = Unabeled, '02' = ANSI, '03' = EBCDIC, '04' = DEC		
19	180	180	Volume Label State		1	n		'0' = Unlabeled Volume, '1' = Private Volume, '2' = Scratch Volume, '3' = User Scratch Volume		
20	181	188	Number of Physical Records Read		8	n				
21	189	196	Number of Physical Records Written		8	n				
22	197	202	File Set Identifier		6	a		Unlabeled tape contains blanks in this field		
23	203	212	Number of Soft Read Errors		10	n				
24	213	222	Number of Soft Write Errors		10	n				
25	223	232	Number of Hard Read Errors		10	n				
26	233	242	Number of Hard Write Errors		10	n				
27	243	249	Connect Time		7	n		Seconds		
28**	250	255	Device Name		6	a		'MTB263'		

									RECORD NAME User DECtape Record		PAGE 26	OF 37
SEQUENCE Preceded by Entry Header Record; followed by TOPS-10 User Identification Record											DATE July-82	REV 5
			RECORD SIZE 204				7-BIT					:
DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS			ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)			
1	1	4	Entry Type			4	n		'0013'			
2	5	5	Operating System Identifier			1	n		'1' = TOPS-10			
3	6	6	Record Sequence Number			1	n		'2'			
4	7	8	Record Revision Number			2	n		'02' DEC-Reserved			
5	9	10	Record Revision Number			2	n		'01' Customer-Reserved			
6	11	20	Filler			10	n		Reserved for DEC			
7	21	59	Account String			39	a		Account String of User			
8	60	65	DECtape Volume Identifier			6	a		Recorded in DECtape Label			
9	66	71	DECtape Reel Identifier			6	a		Visual Label of DECtape			
10	72	79	DECtape Reads			8	n		Blocks Read			
11	80	87	DECtape Writes			8	n		Blocks Written			
12	88	93	Disposition			6	a		'NORMAL', 'CANCEL'			
13	94	132	Operator or System Text			39	a		Supplied to Explain Reason of Disposition			
14	133	146	Creation Date/Time of Request			14	n		Date/Time User Typed Request (sf)			
15	147	160	Scheduled Date/Time of Request			14	n		Date/Time Operator was Notified (sf)			
16	161	174	Serviced Date/Time of Request			14	n		Field 16 - Field 15 = Operator Wait (sf)			

					RECORD NAME User DECtape Record		**PAGE** 27	**OF** 37
SEQUENCE Preceded by Entry Header Record; followed by TOPS-10 Identification Record							**DATE** July-82	**REV** 5
			RECORD SIZE 204			**7-BIT**		

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
17	175	198	Connect Time	7	n		Seconds
18	199	204	Device Name	6	a		'DTA140'

USAGE FILE RECORD FORMATS

Note: This record type is not implemented					RECORD NAME User DECtape File Command Record			PAGE 28	OF 37

SEQUENCE Preceded by Entry Header Record; followed by TOPS-10 User Identification Record								DATE July-82	REV 5

			RECORD SIZE 199			7-BIT			

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1	1	4	Entry Type	4	n		'0014'
2	5	5	Operating System Identifier	1	n		'1' = TOPS-10
3	6	6	Record Sequence Number	1	n		'2'
4	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6	11	20	Filler	10	n		Reserved for DEC
7	21	59	Account String	39	a		Account String of User
8	60	68	Mount Runtime	9	n		Milliseconds to Process User Request
9**	69	79	Mount Core-Time Integral	11	n		100*Kilo-Core-Seconds Used to Process Request
10	80	87	Mount Disk Reads	8	n		Blocks Read to Process User Request
11	88	95	Mount Disk Writes	8	n		Blocks Written to Process User Request
12	96	96	Type of File Command	1	a		D = Delete, F = Write to DECtape, etc.
13	97	98	Number of Files Transferred	2	n		
14	99	104	Disposition	6	a		'NORMAL', 'CANCEL'
15	105	143	Operator or System Text	39	a		Supplied to Explain Reason of Disposition
16	144	157	Creation Date/Time of Request	14	n		Date/Time User Typed Request (sf)

Note: This record type is not implemented	RECORD NAME User DECtape File Command Record		PAGE 29	OF 37
SEQUENCE Preceded by Entry Header Record; followed by TOPS-10 User Identification Record			DATE July-82	REV 5

			RECORD SIZE 199			7-BIT			

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
17	158	171	Scheduled Date/Time of Request	14	n		Date/Time Operator was Notified (sf)
18	172	185	Serviced Date/Time of Request	14	n		Field 18 - Field 17 = Operator Wait (sf)
19	186	199	Connect Time	7	n		Seconds

RECORD NAME File Retrieval Record						**PAGE** 30	**OF** 37
SEQUENCE Preceded by Entry Header Record; followed by TOPS-20 User Identification Record						**DATE** Aug-79	**REV** 4
			RECORD SIZE 147		**7-BIT**		

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1*	1	4	Entry Type	4	n		'0015'
2*	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3*	6	6	Record Sequence Number	1	n		'2'
4*	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5*	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6*	11	20	Filler	10	n		Reserved for DEC
7*	21	59	Account String	39	a		Account String for Retrieve Requestor
8*	60	65	File Structure Name	6	a		
9*	66	104	Directory of File	39	a		
10*	105	114	File Size	10	n		Number of Pages
11*	115	120	Tape #1 ID	6	a		ID of First Tape on which File Located
12*	121	124	Save Set Number of Tape #1	4	n		
13*	125	130	Tape File Number of Tape #1	6	n		
14*	131	136	Tape #2 ID	6	a		ID of Second Tape on which File Located
15*	137	140	Save Set Number of Tape #2	4	n		
16*	141	146	Tape File Number of Tape #2	6	n		

RECORD DOCUMENTATION

SEQUENCE Preceded by Entry Header Record; followed by TOPS-20 User Identification Record	DATE Aug-79	REV 4

| | RECORD SIZE
147 | | 7-BIT | | |

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
17*	147	147	Reason File was Moved Off-line	1	n		'1' = File Expired, '2' = Archive was Requested '3' = Migration was Requested

USAGE FILE RECORD FORMATS

RECORD DOCUMENTATION

RECORD NAME File Archival Record						**PAGE** 32 **OF** 37

SEQUENCE Preceded by Entry Header Record; followed by TOPS-20 User Identification Record	**DATE** Aug-79 **REV** 4

RECORD SIZE 147		**7-BIT**		

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1*	1	4	Entry Type	4	n		'0016'
2*	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3*	6	6	Record Sequence Number	1	n		'2'
4*	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5*	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6*	11	20	Filler	10	n		Reserved for DEC
7*	21	59	Account String	39	a		Account String for File
8*	60	65	File Structure Name	6	a		
9*	66	104	Directory of File	39	a		
10*	105	114	File Size	10	n		Number of Pages
11*	115	120	Tape #1 ID	6	a		ID of First Tape on which File Located
12*	121	124	Save Set Number of Tape #1	4	n		
13*	125	130	Tape File Number of Tape #1	6	n		
14*	131	136	Tape #2 ID	6	a		ID of Second Tape on which File Located
15*	137	140	Save Set Number of Tape #2	4	n		
16*	141	146	Tape File Number of Tape #2	6	n		

	RECORD NAME File Archival Record (cont.)		PAGE 33	OF 37

	RECORD SIZE		7-BIT		

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
17*	147	147	Reason File was Moved Off-line	1	n		'1' = File Expired, '2' = Archive was Requested '3' = Migration was Requested

USAGE FILE RECORD FORMATS

				RECORD NAME File Migration Record		**PAGE** 34	**OF** 37
SEQUENCE Preceded by Entry Header Record; followed by TOPS-20 User Identification Record						**DATE** Aug-79	**REV** 4
			RECORD SIZE 147		**7-BIT**		

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1*	1	4	Entry Type	4	n		'0017'
2*	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3*	6	6	Record Sequence Number	1	n		'2'
4*	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5*	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6*	11	20	Filler	10	n		Reserved for DEC
7*	21	59	Account String	39	a		Account String for File
8*	60	65	File Structure Name	6	a		
9*	66	104	Directory of File	39	a		
10*	105	114	File Size	10	n		Number of Pages
11*	115	120	Tape #1 ID	6	a		ID of First Tape on which File Located
12*	121	124	Save Set Number of Tape #1	4	n		
13*	125	130	Tape File Number of Tape #1	6	n		
14*	131	136	Tape #2 ID	6	a		ID of Second Tape on which File Located
15*	137	140	Save Set Number of Tape #2	4	n		
16*	141	146	Tape File Number of Tape #2	6	n		

USAGE FILE RECORD FORMATS

								PAGE	OF
				RECORD NAME					
				File Migration Record (cont.)				35	37
SEQUENCE								**DATE**	**REV**
Preceded by Entry Header Record; followed by TOPS-20 User Identification Record								Aug-79	4
			RECORD SIZE 147			**7-BIT**			
DATA ITEM (1)	**START POS'N (2)**	**END POS'N**	**CONTENTS**	**ITEM SIZE (3)**	**ITEM TYPE (4)**		**ITEM DESCRIPTION (5)**		
17*	147	147	Reason File was Moved Off-line	1	n		'1' = File Expired, '2' = Archive was Requested '3' = Migration was Requested		

RECORD NAME	PAGE	OF
File Collection Record	36	37

SEQUENCE	DATE	REV
Preceded by Entry Header Record; followed by TOPS-20 User Identification Record	Aug-79	4

RECORD SIZE		7-BIT		
147				

DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)
1*	1	4	Entry Type	4	n		'0018'
2*	5	5	Operating System Identifier	1	n		'1' = TOPS-10, '2' = TOPS-20
3*	6	6	Record Sequence Number	1	n		'2'
4*	7	8	Record Revision Number	2	n		'01' DEC-Reserved
5*	9	10	Record Revision Number	2	n		'01' Customer-Reserved
6*	11	20	Filler	10	n		Reserved for DEC
7*	21	59	Account String	39	a		Account String for File
8*	60	65	File Structure Name	6	a		
9*	66	104	Directory of File	39	a		
10*	105	114	File Size	10	a		Number of Pages
11*	115	120	Tape #1 ID	6	a		ID of First Tape on which File Located
12*	121	124	Save Set Number of Tape #1	4	n		
13*	125	130	Tape File Number of Tape #1	6	n		
14*	131	136	Tape #2 ID	6	a		ID of Second Tape on which File Located
15*	137	140	Save Set Number of Tape #2	4	n		
16*	141	146	Tape File Number of Tape #2	6	n		

					RECORD NAME File Collection Record (cont.)			PAGE 37	OF 37
SEQUENCE Preceded by Entry Header Record; followed by TOPS-20 User Identification Record								DATE Aug-79	REV 4
			RECORD SIZE 147			7-BIT			
DATA ITEM (1)	START POS'N (2)	END POS'N	CONTENTS	ITEM SIZE (3)	ITEM TYPE (4)		ITEM DESCRIPTION (5)		
17*	147	147	Reason File was Moved Off-line	1	n		'1' = File Expired, '2' = Archive was Requested '3' = Migration was Requested		

GLOSSARY

Account string

A string of ASCII characters that identifies an account and can be used by the installation for downstream billing, reporting, charging, and so forth. The string can be broken into small data fields or be used as one field, depending on the needs of the installation.

Calling program

A TOPS-20 program that executes a USAGE monitor call to make a USAGE file entry; or a TOPS-10 program that sends an IPCF message to ACTDAE to make a USAGE file entry.

Disposition and text

The contents of the disposition data field (6 characters) are some specified text to report success or failure of a particular task (for example, printing). The text data field (39 characters) contains a string of text provided by the user, system, or operator.

Entry

A USAGE file entry consists of two or more records. Each entry is self-contained and, therefore, easily billable.

Record

The basic unit of an entry. A record is a string of ASCII characters terminated with a carriage return/line feed. A record contains data fields as defined in Appendix A.

Record revision number

A version number of the record. This number will be increased by one every time data fields are made obsolete or appended to the record. Each record has two revision numbers. One revision number is reserved for Digital, which will increase this number when it revises the record. The other is the customer revision number, which the customer will increase by one each time he revises the record.

Session

A session is the time, usage, and events being recorded in a session entry. A session entry can begin on a LOGIN, SET ACCOUNT (TOPS-20) or a SESSION (TOPS-10) command, and can terminate with a LOGOUT, SET ACCOUNT (TOPS-20), SESSION, or KJOB (TOPS-10) command, or a monitor stop.

USAGE

The generic name of the file containing data in the format described in this document. This file is used for accounting data after TOPS-20 Version 4 with GALAXY Version 4, and TOPS-10 Version 7.01 with GALAXY Version 4.1.

INDEX

READER'S COMMENTS

NOTE: This form is for document comments only. DIGITAL will use comments submitted on this form at the company's discretion. If you require a written reply and are eligible to receive one under Software Performance Report (SPR) service, submit your comments on an SPR form.

Did you find this manual understandable, usable, and well-organized? Please make suggestions for improvement.

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Did you find errors in this manual? If so, specify the error and the page number.

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Please indicate the type of reader that you most nearly represent.

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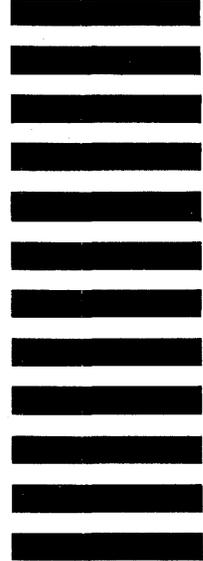
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UPDATE NOTICE

**TOPS–10/TOPS–20
USAGE File Specification
AD–4181B–T1**

July 1982

Insert this Update Notice in the *TOPS–10/TOPS–20 USAGE
File Specification* to maintain an up-to-date record of changes
to the manual.

Changed Information

The changed pages contained in this update package reflect
corrections or enhancements to the base manual and new
information for GALAXY 4.1.

The instructions for inserting this update start on the next page.

software **digital**

The following list of page numbers specifies which pages are to be placed in the *TOPS–10/TOPS–20 USAGE File Specification* as replacements for, or additions to, current pages.

⌈Title page ⌊Copyright page	⌈19 ⌊20	⌈A–5 ⌊A–6
⌈iii ⌊Blank	⌈27 ⌊28	⌈A–9 ⌊A–30
⌈1 ⌊10	⌈A–1 ⌊A–2	⌈Index–1 ⌊Index–2
⌈13 ⌊14		

KEEP THIS UPDATE NOTICE IN YOUR MANUAL TO MAINTAIN AN UP-TO-DATE RECORD OF CHANGES.

TYPE AND IDENTIFICATION OF DOCUMENTATION CHANGES.

Five types of changes are used to update documents contained in the TOPS–10 and TOPS–20 software manuals. Change symbols and notations are used to specify where, when, and why alterations were made to each update page. The five types of update changes and the manner in which each is identified are described in the following table.

The Following Symbols and/or Notations	Identify the Following Types of Update Changes
1. Change bar in outside margin; version number and change date printed at bottom of page.	1. Changes were required by a new version of the software being described.
2. Change bar in outside margin; change date printed at bottom of page.	2. Changes were required to either clarify or correct the existing material.
3. Change date printed at bottom of page.	3. Changes were made for editorial purposes but use of the software is not affected.
4. Bullet (●) in outside margin; version number and change date printed at bottom of page.	4. Data was deleted to comply with a new version of the software being described.
5. Bullet (●) in outside margin; change date printed at bottom of page.	5. Data was deleted to either clarify or correct the existing material.

July 1982