TYMSHARE, INC.

OPERATIONS MANUAL

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GENERAL: The timesharing system program is now stored on the disc as well as tape. There can be several versions (as well as several copies) on the disc at the same time. It is the Operator's responsibility to see that the correct version is loaded.

The new load procedure will dump as well as load; i.e., if a crash occurs, DSWAP3 will dump the crashed system on the disc and load the new system into core. (The dump can be bypassed by placing BP Switch 1 down.) The selection of the system to be loaded is controlled by break point switches 2, 3, and 4 on the console. The switches are tested octally per example 1:

EXAMPLE 1:

BP	BP	BP	BP
1	2	3	4

If the system to be loaded is on Disc 3, place BP #3 and BP 4 down. This is interpreted as an octal 3 and will load the system from Disc 3.

LOAD PROCEDURE:

1. Place DSWAP3 in the paper tape reader

2. Set BP switches to correspond to the system to be loaded. If a crashed system is not to be saved, put BP switch 1 down also.

3. Standard fill from paper tape. This consists of the following steps:

    a) IDLE The Run-Idle-Step switch is put in IDLE
    b) START Depress the Start button. This clears the P and C registers
    c) RUN The Run-Idle-Step switch is put in RUN
    d) FILL The paper tape switch is toggled. This reads in the paper tape. The HALT light will come on when the paper tape is completely· read in, but if the ERROR light comes on, the paper tape must be reloaded. If the ERROR light comes on, let the loading go on to completion, for if the Run-Idle-Step switch is taken out of RUN and put into IDLE, the paper tape will run away. If this happens, press START (this stops the paper tape) and re-position the paper tape and then go back to Step 3a.

    This will execute the dump of the crashed system (if BP switch 1 is up) and load the new system into core. As stated in the beginning of the section, if the crashed system is not to be saved, BP switch 1 must be down.

NOTE: There are two phases to DSWAP3; the WRITE and READ phases. Which phase DSWAP3 is in is indicated by a <u>66</u> in the W buffer for a WRITE and a <u>26</u> for a READ. If a crashed system is to be saved, obviously the WRITE phase (writing the crashed system onto the disc) would occur first (a 66 in the W buffer), for if the new system was read into core first (a 26 in the W buffer), it would read in over the crashed system and destroy it.

If, for any reason DSWAP3 is aborted while saving a crash before it is fully executed, be careful to observe which phase, the WRITE (66), or the READ (26) the DSWAP3 is in. If it is in the WRITE phase at the time of the abortion, precede as before, but if DSWAP3 is in the READ phase, that means that the crashed system has been written on the disc and and the new system is partially read into core and therefore, the crashed system that was in core is now destroyed. In order not to write the new system that was partially read into core onto the disc and wipe out the crashed system already there, BP switch 1 must be put down when going through the preceding steps.

4. Prog. will stop at P=25

5. IDLE The Run-Idle-Step switch is put in IDLE. The BP switches are reset.

6. RUN The Run-Idle-Step switch is put in RUN

After the above 6 steps have been completed, the system will respond on Teletype 1 with the following:

1. <u>81-nE (mo-day-time)</u>:

This is a request to have the month, day, and time entered after the colon as per the example that follows: 11-17-1530 Cr<u>Lf</u>

2. <u>LAST START UP n/n n:nm</u> Cr<u>Lf</u>

Nothing is required of the Operator at this point

3. <u>NO. OF USER</u>:

This is a request to have a number entered after the colon. The number should correspond with the number of channels to be answered, as per the following example: 15 Cr<u>Lf</u>

4. PAGES:nn Cr<u>Lf</u>

n=The number of pages available to the individual users (n varies depending on the number of users). A page equals 2048 words. Nothing is required of the operator at this point.

5. **PLEASE LOG IN!**

   This response will occur after the system searches the disc and builds
   a bit map. The time it takes to build a bit map is a function of the
   size of the disc, the number of users, and the number of files.

   The response of the Operator to the "PLEASE LOG IN!" command
   depends upon one thing; is the crashed system that was dumped on the
   disc to be saved or not?

   a) @1;Operator CrLf

      The Operator logs in under this account number and user name
      if the crashed system is not to be saved.

   b) @1; CRASH CrLf

      The Operator logs in under this account number and user name
      if the crashed system is to be saved. The reason for this is to
      save all crashes under an identifying user name.

      All the procedures that are done under @1;OPERATOR can be
      done under @1;CRASH.

      NOTE: (a) and/or (b) mentioned above may be done between
      Steps 4 and 5 to speed things up.

6. **READY (date) (time) CrLf**

   This is a response giving the date and time that the Operator got on
   the system. Nothing is required of the Operator at this point.

7. The system will reply with an Executive Dash (-) indicating that the
    computer is in the Executive mode and that it is ready to accept any
    command from the Operator.

8. Answer the Channels (See "Answer" Section).

CRASH SAVE

This is a procedure used to save the crashed system on the disc. The Operator is logged in under @1;CRASH.

1.   ST^{C}S^{C}EX$_A$-1 CrL̲f̲

    This command, known as Exec Status, is needed in order to do the following steps.

2.   ST^{C}S^{C}LD$_A$0 CrL̲f̲

    The computer responds with:

    T̲O̲ The Operator types: 7 CrL̲f̲
    The computer responds with:
    L̲O̲C̲ The Operator types: 0 CrL̲f̲

    The computer will effectively place the crashed system into core.

3.   SAVE$_A$0$_A$37777$_A$ON$_A$ /FILE NAME/ CrL̲f̲

    The crashed system is put on a file. The file name should be in the form of /day-time-P reg./

4.   LOG OUT CrL̲f̲ or DELETE$_A$/FILE NAME/ CrL̲f̲

    The Operator types one of these two commands, in order to write the file directory of the crashed file on the disc. The reason for this is that if the system should crash again before the operator logs out or deletes a file in the normal run of things, the saved crash file would be lost.

5.   ST^{C}S^{C}EX$_A$-1 CrL̲f̲

    This step has to be done if the Operator logged out in the previous step. The Exec Status is needed to do the remaining steps.

6.   RESET CrL̲f̲

    This command clears all programs out of memory

7.   RECOVER$_A$/JST/ CrLf

    The file JST, system J symbol table, is recovered from the disc and put into core.

8. $ST^CS^CLD,0$ CrLf

    The computer responds with:
    TO The Operator types: 1 CrLf
    The computer responds with:
    LOC The Operator types: 0 CrLf

    The crashed system is loaded into core

9. CONTINUE CrLf

    This command will put the DDT Program into the operating system

10. WERIS[

    This command is followed by 18 linefeeds. It gives the location of
    each user number in reference to each channel at the time of the crash.
    The 1 in the WERIS + 1 is the channel number.

    AUNN[

    This command is given after the WERIS[is finished and while still
    in DDT. It may be given on the same line as the last WERIS[. The
    AUNN[gives the account number and user number in reference to the
    job number. The 1 in the AUNN + 1 is the job number.

    There is no relationship between the 1 in the WERIS+1 and the 1 in
    the AUNN+1

    If only a certain section is wanted, the command is typed with the first
    channel number of that section; i.e, WERIS + 17

    Two Altmodes will put you back in the Exec

11. Go to the "SPS" Section

DISC LOAD

1. Mount the disc dump/load program on Unit 0

2. Mount the tape to be dumped on the disc on Unit 3

3. Set BP Switch 1

4. Standard FILL

    a) IDLE Put the Idle-Run-Step switch in IDLE
    b) START Depress Start button to clear P and C registers
    c) RUN Put the Idle-Run-Step switch in RUN
    d) TOGGLE MAG TAPE SWITCH This reads the disc/dump load
        program into core. The HALT light will come on when it is
        completely read into core. If the W buffer ERROR light comes
        on while the program is being read in, rewind tape and START
        over.

5. IDLE

6. START

7. BRU 207 - Enter 100207 in C Register

8. Computer will halt with 2010101 in C. Register

9. IDLE

10. RUN

11. Toggle BP switches 3, 4, 3

     The BP switches are programmed to act as a combination lock, to
     prevent the accidental loading of the disc. They must be used exactly
     as described or a HALT will occur. To recover from the error HALT
     go to Step 6.

                    See List of ERROR HALTS for
                    Disc Dump/Load

DISC DUMP

1. Mount the disc dump/load program on Unit 0

2. Mount scratch tape on Unit 3

3. Standard FILL

   a) IDLE
   b) START
   c) RUN
   d) TOGGLE MAG TAPE SWITCH. This reads in the disc dump/load program into core. The HALT light will come on when program is completely read into core. If the W buffer error light comes on, rewind tape and start over.

4. IDLE

5. START

6. BRU 207 - enter 100207 in the C register

7. Computer will halt with 2010101 in the C register

8. IDLE

9. RUN

10. Toggle BP switch 4, 3, 2

    The BP switches are programmed to act as a combination lock. They must be used exactly as described or an error halt will occur. To recover from the error, go to Step 5

              See List of ERROR HALTS for
              Disc Dump/Load

DISC DUMP/LOAD

ERROR LIST

P = 512   Tape not ready
P = 515   W buffer not ready
P = 531   W buffer staying busy

For any of the above errors, start load or
dump again.

C = 2000001   Tape read errors
C = 2000002   Tape read errors
C = 2000003   The 1, 2, or 3 indicates the logical record within
                 the physical record on which the error occurred.

When any one of these errors occur, it indicates that
ten read errors have occurred on a logical record. The
physical record on which the tenth error occured is
designated by 1, 2, 3, corresponding to the three physical
records on a logical record. If this happens, clean tape
head and start again. Should this fail, clean tape head
on other drive and try again on that drive. If still no
success, PUNT.

C = 2000005   Seek time or search time error on disc controller
C = 2000006   Disc controller error
C = 2000007   W buffer error

For any of the above 3 errors, the following action is
to be taken:

1. Go to IDLE
2. Press Controller Clear
3. Go to RUN

If a read error occurs, indicate in Log Book on what disc,
track, and sector it occurred. Contact Center Manager.

CARD TO TAPE

1. Mount card to tape (CTT) program on Unit 0 and set density

2. Ready punched cards in card reader

3. IDLE

4. START

5. RUN

6. TOGGLE MAG TAPE SWITCH This loads the CTT program. The HALT light will come on when the program is loaded successfully. If an error occurs (W buffer error light) while loading the program, rewind the tape and load again

7. Take tape drive out of AUTO

8. Mount scratch tape an Unit 0 and set density

9. IDLE

10. START

11. BRU 200 - enter 100200 in the C register

12. RUN

13. E.O.F. When last card has been read, depress E.O.F. When the E.O.F. is depressed, the number of words copied to the tape will be typed out on the maintenance teletype

    NOTE 1: The system requires that a dummy deck be placed on the tape as the last file. The dummy deck need consist of 1 card only. It must be added or the system will crash when an attempt is made to copy the tape to disc.

    NOTE 2: Decks may be stacked. The only limit on the number of decks which can be stacked is the amount of tape.

    NOTE 3: When any Reader error occurs, the READY light will go out. Until further notice, take the following action on any error condition:

        1. Reset (clear) error condition
        2. Terminate processing of that deck, i.e., depress E.O.F.
        3. Restart that deck

TAPE TO CARD

1. Mount tape to card (TTC) program on Unit 0 and set density

2. Place blank cards in card punch

3. IDLE - Idle-Run-Step switch is put in IDLE

4. START - Press START button to clear P and C registers

5. RUN - Idle-Run-Step switch is put in RUN

6. TOGGLE MAG TAPE SWITCH This loads the TTC program. The HALT light will come on when the program is loaded successfully. If an error occurs (W buffer error light) while loading the program, rewind tape and load again

7. Take tape drive out of AUTO

8. Mount File Tape on Unit 0 and set density

9. IDLE

10. START

11. BRU 200 - Enter 100200 in the C register. The card punch will Cycle 1 card

12. RUN

13. FILE NUMBER - When the TTC program is ready to accept input of a file number from the maintenance teletype, the input light will come on. The number must be inputted as a two-digit octal number, i.e., 05 = 5th file on tape. The files must be inputted in ascending order, though they do not have to be in sequence.

SYSTEM TAPE COPY

1. Place "32k DUMP" paper tape program in paper tape reader

2. Mount system tape (Disc Dump) on Unit 0

3. IDLE

4. START

5. RUN

6. TOGGLE MAG TAPE SWITCH

7. When computer halts, take system tape out of AUTO

8. Mount scratch tape on Unit 0, set density and put in AUTO

9. IDLE

10. START

11. RUN

12. TOGGLE PAPER TAPE SWITCH

13. Watch W buffer for error

14. When copy is finished, load disc with copy and bring system up.
    If you can LOG IN, tape copy is good.

SAM OUTLINE

I   SAM SYMBOL CHANGE

    A. Print CST Table

        -RECOVER∧/NRECSAM/ CrLfLf

        -CONTINUE CrLf

        DDT Lf
        CST" . LfCr
        CST+1":LfCr
        CST+2"! LfCr

            .
            .
            .

        CST+11" 7 CrLf
        CST+12" 8 LfCr
        CST+13" 9 LfCr

            .
            .
            .

        CST+76" $ CrCrLf

    B. Changing User Symbols (Still in DDT)

        CHANGE;G LfCr
        2:1, 3:2-57, 3:60, 12:100-111 LfCr
        56:112-157, 33:160-177, 76:300-700 CrLf

        240;G LfCr (This will run the program)
        1830..:$$ 5 (2 Altmodes)

        -DUMP∧/NEWRECSAM/ CrLfLf

        -SAVE∧0∧TO∧3777∧ON∧/SAM/ CrLf
        NEW FILE or OLD FILE LfLf

        STARTING LOCATION 240 CrLfLf

        -ST^C S^C E X∧-1 CrLfLf

        -GO∧/SAM/ CrLf
        1840 ..::$$$!   8

II   CHANGE INCTIK

-RECOVERʌ/NRECSAM/ CrLfLf

-CONTINUE CrLf
DDT CrLf
INCTIK/   *3120   16040   CrLf

INCTIK/   16040   CrLf
(2 Altmodes)

-DUMPʌ/NRECSAM/ CrLfLf

-SAVEʌ0ʌTOʌ3777ʌONʌ/SAM/ CrLf
OLD FILE or NEW FILE LfLf

STARTING LOCATION 240 CrLf

-ST^{c}S^{c}EX -1 CrLfLf

-GOʌ/SAM/ CrLf
1840 ABV↑:...   8

SAM DESCRIPTION

SAM is a GO TO Program which periodically prints out the number of users on the system. The users on the system are represented by symbols. These symbols are the letters of the alphabet, numbers 1 through 9, and special characters such as *, ., $, etc. The procedure to change the symbols that represent a user is discussed in Section I.

As stated above, SAM prints out periodically. The time increment can be changed. This is discussed in Section II.

I   SAM SYMBOL CHANGE

As stated above, symbols such as A, 9, $, etc., represent a user on the system. Each symbol in the SAM program is represented by an octal number. For example, 1B (B indicates that the number is octal) is equated to the character:, 44B is equated to the letter Y., etc. The octal number and what it is equated it is found in the CST Table. These octal numbers in the CST Table, along with the user numbers, are used by the SAM Program to print out a symbol for a particular user.

A.   LISTING THE CST TABLE

-RECOVER /NRECSAM/ Cr<u>LfLf</u>

This loads the recover file (24 type file) into core. In this case, the file name is NRECSAM, but this is not always so. As long as the recover file is the version you want to use, the name makes no difference.

-CONTINUE
<u>DDT</u>

You are now in DDT. This is the only language that can be used with a recover or 24 type file.

<u>CST: . Lf</u>
<u>CST+1": Lf</u>
<u>CST+2"! Lf</u>

   .

   .

   .

<u>CST+76"$</u>

To list the CST Table the user types CST" and the computer will type a period (.) The octal number representinga period is 0. A Lf after the period will cause CST+1": to be printed out by the computer. 76 linefeeds will print out the complete CST TABLE.

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-CONTINUE
DDT

You are now in DDT. This is the only language that can be used with a recover or 24 type file.

CST: . Lf
CST+1": Lf
CST+2"! Lf

.
.
.

CST+76"$

To list the CST Table the user types CST" and the computer will type a period (.) The octal number representinga period is 0. A Lf after the period will cause CST+1": to be printed out by the computer. 76 linefeeds will print out the complete CST TABLE.

NOTE: There must always be a comma (,) after the user
number. Except at end of a line where a line feed serves
the same purpose. Also, if a mistake is made, this is
remedied by typing a ? immediately after the mistake. This
would delete the entry with the mistake in it and give a
carriage return and linefeed and put DDT in the command mode
(again. To precede with the changes, type CHANGE;G.

After the changes and new additions have been made, one of two
things may be done after the carriage return: 1) The changes
may be checked against the users on the air at the time by typing
240;G. This will cause SAM to run with the new changes. To
get out of the running program, hit altmode once. This will
put you back into the command mode. Hitting altmode twice
will put in in the Exec. 2) Hit altmode twice and get back to
the Exec.

Once back in the Exec, you are ready to dump the corrected
recover file onto a new recover file.

-DUMP$_\wedge$/NEWRECSAM/ CrLfLf

This dumps the recover file that you have made changes to
in core to a new file called NEWRECSAM.

-SAVE$_\wedge$0$_\wedge$TO$_\wedge$3777$_\wedge$ON$_\wedge$/SAM/ CrLf
NEW FILE LfLf

STARTING LOCATION 240 CrLfLf

-ST^{C}S^{C}EX -1 CrLfLf

-GO$_\wedge$/SAM/ CrLf

The SAVE Command stores the core image of the recover
file on a file called SAM. Two linefeeds after the NEW FILE
(or OLD FILE) print out will cause STARTING LOCATION to
be typed out. This is a command for the user to type in at
what location he wants the GO TO program to begin. In this
particular case, and in most others, the starting location is 240.

To run SAM Exec Status (ST^{C}S^{C}EX 1)must be set.

A.   Description of SAM INCTIK

The SAM INCTIK is the time interval for the SAM type out. The INCTIK can be set from one second on up. (The usual time interval is 2 or 5 minutes). Since the timing of SAM is dependent on the real time clock, and the real time clock is dependent on the AC current, 60 cycles would equal one second. So 60 times the number of seconds and the result converted to octal would be the value entered fo the INCTIK. To convert to octal, do the following:

$$5 \times 60 \times 60 = 18,000$$

$$
\begin{array}{ll}
8\lfloor 18000 & = 0 \\
\quad 8\lfloor 2250 & = 2 \\
\qquad 8\lfloor 281 & = 1 \quad = \quad 43120B \\
\qquad\quad 8\lfloor 35 & = 3 \\
\qquad\qquad 4 & = 4
\end{array}
$$

The 4, 3, 1, 2, and 0 are the remainders of the divisions. This is the octal number entered for the INCTIK to cause SAM to print out every five minutes.

To change the INCTIK the recover file or 24 type file that is to be changed must be loaded into core and the change made under DDT. This is done per the following example:

-RECOVER∧/NRECSAM/ Cr<u>LfLf</u>

-CONTINUE Cr<u>Lf</u>
<u>DDT</u> <u>Cr</u>Lf
INCTIK/   *3120   16040 Cr<u>Lf</u>
INCTIK/   <u>16040</u>

Typing INCTIK/ will cause the computer to print out the current value of the INCTIK, which in this case, is *3120. (Due to the configuration of the hardware, a 4 (four) will print out as an asterik (*)). The carriage will space over to the next tab stop. If the INCTIK is to be changed, the new value is entered here, which in this case, is 16040 on two minutes. To see if the new value of the INCTIK has been accepted, again type INCTIK/, as per above example, and the new value will be typed out.

If, while typing in a new value of the INCTIK, a mistake is made, type a question mark (?) and the computer will delete the value entered with the mistake and space forward to the next tab stop. You can now enter the new value.

After changing the INCTIK, you can either make further changes or go back to the Exec. To go back to the Exec, hit the altmode 2 or 3 times.

Once back in Exec, dump the file and create a GO TO file per the following example:

    -DUMPʌ/NRECSAM/ CrLfLf

    -SAVEʌ0ʌTOʌ3777 ONʌ/SAM/ CrLf
    NEW FILE or OLD FILE LfLf

    STARTING LOCATION 240 CrLfLf

OPER

DESCRIPTION

OPER is a utility program that contains 24 commands for the upkeep of the system. To use OPER, Exec Status must be set. OPER is a 21 type file or a GO TO program. To access the commands in OPER, the following must be done:

-ST^{c}S^{c}EX -1 Cr

-GO$_\wedge$OPER Cr

*

The asterik indicates that OPER is ready to accept any of the 24 valid commands. These commands, what they do, and how to use them, are described in the following sections.

*UAD Cr

OUTPUT TO: PR Cr

3/24   22:15

*1 ᴧYᴧEᴧT		0 77777777
UTILITIESᴧS	77770001	
OPERATORᴧP	77770025	
SYS81ᴧT	77770037	
*2 ᴧTᴧAᴧB		0 77777777
BᴧILL	77	
JACK	156	
AᴧND	20000036	
JILLᴧF	200536	

*3

.

.

.

TOTAL: 0:00. 00 0:00

. . . . END OF JOB. . . . .

The command UAD Cr will print out all of the active accounts. In the above example, the output was to the printer (PR) So all the information from "3/24 22:15" to "...END OF JOB..." will be printed out on the printer. When it is through printing the computer will output to the teletype "END JOB" and return an Executive Dash (-).

If one wishes to only print out one account, such as A5, then a linefeed after *UAD instead of a carriage return will allow one to do this. Instead of out-putting to the printer, output to the teletype.

Example:
*UAD Lf

OUTPUT TO: T Cr

A5 Cr

A5& NU &T		0 77777777
JAMES &W	201	
BILL&R	202	

TOTAL: 0:00.00 0:00

END JOB

-

After the carriage return (Cr) in the "OUTPUT TO:" request, the computer
waits for an input of an account number, such as the A5 in the preceding
example.

The printer designates a control letter with a delta before the letter, i.e,
$_{A}$N. The teletype designates a control letter with an ampersand before the
letter, i.e., &N. For the atsign (@) accounts the printer will print out an
asterik for the @.

As can be seen from the above examples, the operating system returns an
Exec Dash after printing the UAD. To give anymore OPER commands, one
must get back into OPER.

NOTE: See Appendix A for description of the UAD output.

*FILES Cr

OUTPUT TO: PR Cr

3/19 12:13

1   0:00.00 0:00   77777777
     101122 22000000 31656 /$/
     177012 21000000 10316 /ʀGOP/
     102110 22000000 14100 /8SSY/
OVERFLOW: 1350
2   0:00.00 0:00   77777777
              .

              .

              .

1350 o:00.00 0:00
     701105 22000000 32631 /ʌGT8/
OVERFLOW: 1
              .

              .

              .

TOTAL: 0:00.00

...................END OF JOB..........

The Operation of the FILES command is the same as for UAD; that is, a
carriage return after FILES will print all of the files or a linefeed will only
print out the ones selected.

With a linefeed (Lf) after FILES, one may select more than one file to print.

Example:
*FILES Lf

OUTPUT TO: T Cr

3/19 12:30

77
77 0:00.00 0:00 77777777
     631101 23000000 12343 /MUD/
     612066 23000000 36477 /QUI/

102
102 0:00.00 0:00   77777777
     605115 24000000 25776 /$/

To get out of the FILES command, hit almode a few times

*CLEAR FILE Lf

3/24 8:30

105
107
300

Altmode

-

The CLEAR FILE command deletes all files under a user number.
After the date and time is printed out, the computer waits for the user
number or numbers whose files are to be deleted.

*ACCOUNT Cr
LNP₁ --- P₁₂ Cr
TTTTTTTT∧AAAAAAAA Cr
Alter Switch 1

NEW or OLD

*
‾

The ACCOUNT command is used to enter new accounts, change account
time parameters, change account parameters, or change account passwords.
The ACCOUNT command requires four arguments:

Where   L = Account Letter
         N = Account Number
         P = Password
         T = Time Parameter

There must be a space between the Time parameter and the Account parameter.

Altering switch 1 enters the account into the system. Up to this point, one
may altmode out of the ACCOUNT command. This is the only way to correct
a mistake in input.

Whenever an account is entered or changed, it must be checked to see if
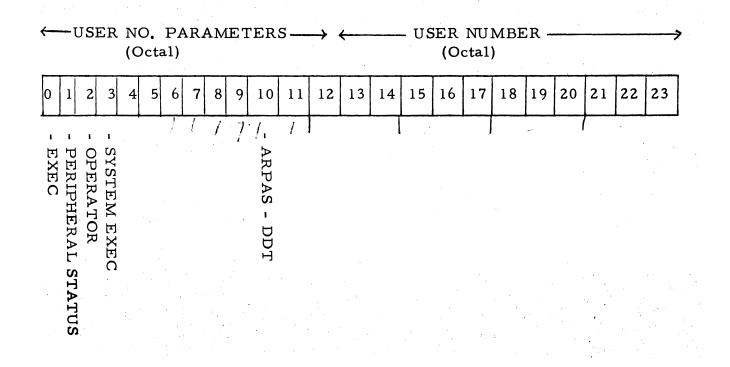entered correctly by doing a UAD for that account.

*

The Account Letter, L, can be any letter from A through Z and the special
character @. The @ is restricted to internal Tymshare usage only.

The Account Number, N, can be any number from 1 through 8.

The Password, P, can consist of any combination of numbers, letters, and
control characters (up to 12 characters)

The Time Parameter, T, controls the access time of the user. It is usually
24 hour access. Sometimes, parameters are as follows:

77777777 or -1	=	24 hour access
37700	=	10AM to 6 PM
37774	=	10 AM to 10 PM
1400	=	2 PM to 4 PM
77600377	=	4 PM to 8 AM
77600077	=	6 PM to 8 AM
1477	=	2 PM to 4 PM, 6 PM to 12 PM

6074	=	12 AM to 2 PM, 6 PM to 10 PM
300	=	4PM to 6 PM
1700	=	2 PM to 6 PM
377	=	4 PM to 12 PM

The time parameter is right justified

The Account parameter, A, is not used at the present time, but a zero (0) must be entered in order for the Account command to be executed

```
*NAME Cr
LNU, --- U,,Cr
PPPPDDDD Cr
Alter Switch 1
```

NEW or OLD

*

The NAME command is used to enter a new user name into an account or to
change the user parameter. The NAME command requires the following
arguments:

Where L = Account Letter
    N = Account Number
    U = User Name
    P = User Parameter
    D = User Number

The user parameter must be typed only if it is other than zero (0). The
user parameter/user number is right justified.

NOTE:D(user number) should be unique for each user. If it is not, both
users will share the same file directory.

Altering Switch 1 enteres the user name, etc., into the system. To correct
any mistakes an input, altmode out of the NAME command before altering
Switch 1.

Whenever a user name is entered or changed, it must be checked to see if
entered correctly by doing a UAD for that user name's account.

*

The Account letter, L, and the Account Number, N, must have been entered
previously by the use of the ACCOUNT command.

The User Name, U, can consist of any combination (up to 12 characters) of
numbers, letters, or control characters.

The User Parameter, P, will not be used in the majority of cases for outside
users. It is generally restricted to internal use. The user parameters allow
a person to have Exec, Operator, Peripherial, System Exec, or ARPAS-DDT
status, all five, or any combination of the five.

The User Number, D, is necessary for all users. At the present time, it is
an octal number from 1 to 777. Under this number is all the user's files. The
number is different for every user.

←——USER NO. PARAMETERS——→ ←——— USER NUMBER ———→
              (Octal)   (Octal)

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

- EXEC
- PERIPHERAL STATUS
- OPERATOR
- SYSTEM EXEC
- ARPAS - DDT

*CANCEL ACCOU Cr
LN Cr
Alter Switch 1

OLD

*

Where   L = Account Letter
             N = Account Number

Confusion may arise with this command, in that cancelling an account does
not cancel the users in that account. If the account is to be cancelled
completely, the user names should be cancelled first by using the CANCEL
NAME command (See following section).

As in the other commands, one may altmode out of the CANCEL ACCOU
command before altering Switch 1.

*CANCEL NAME Cr
LNU, --- $U_{,2}$ Cr
Alter Switch 1

OLD

*

Where   L = Account Letter
             N = Account Number
             U = User Name

This command cancels the user name. But cancelling a user name does not
eliminate the files that the user may have amassed. There are two ways to
eliminate these files:

1. By using the DELETE command in Exec before cancelling
    the User Name.

2. By using the CLEAR FILE command in OPER, which is much
    quicker and which does not require logging in under the user
    nameand therefore, does not require that the user name still
    be in existence.

Whenever a cancellation is made, do a UAD for that particular user account
to see if it is cancelled.

OVERFLOW

The OVERFLOW command is used to assign an overflow number to a user having used up all of his file space under his initial user number. The initial user number is still the identifying number for a user. The block of user numbers from 1237 to 1377 is to be used for overflows.

The system will not allow more than one overflow to be assigned to a user number. An overflow can not be assigned while the user who has that user number is logged in. Also, the system will not allow an overflow to be cancelled if there are any files under that overflow number.

The procedure for setting up an overflow is as follows:

* OVERFLOW Cr
DDDD, FFFF Cr
Alter Switch 1

*

Where   D = User Number
         F = Overflow Number

The procedure for cancelling an overflow is as follows:

*OVERFLOW Cr
DDDD, Cr
Alter Switch 1

*

If the information is not entered in the correct format, or a user is logged in to whom the overflow is to be assigned, or the files are not deleted from the overflow before cancellation, the system will come back with a ? .

USERS

This command lists and sorts all of the users by either User Number, Account Number, or User Name, depending on which column; 1, 2, or 3, respectively, it is sorted in.

*USERS Cr

OUTPUT TO: PR Cr

SORT ON COL. (1, 2, or 3): 1 Cr

3/25 17:48

1 *1 UTILITIES
2 *1 CRASH   ⎤
3 *1 RAY   ⎥
    .   ⎥ — PRINTER
    .   ⎥
    .   ⎥
TOTAL: 0:00.00 0:00 ⎦

.................END OF JOB..............

END JOB

POINTER

This command will indicate the last overflow number assigned, minus one. At this time, the validity of the pointer over 1000 octal is doubtful. So use the results of this command with caution.

*POINTER Cr

OVERFLOW POINTER at 1355

END JOB

FILES FROM TAPE TO DISC

To copy files from Tape to Disc, or from Disc to Tape, is known as sys-defining.
To sys-define one must have peripheral and exec status; peripheral status in
order to use the Tape drive, and exec status in order to use the "SDF..."
command.

Files on a Tape have three (3) parameters:

1.   File Number
2.   File Type
3.   File Length

The File Number is a number that designates the location of the file on the tape.
These numbers are octal numbers, i.e., 1, 2, ...7, 10, ... There is no zero (0)
File Number. The number of files on a Tape is only limited by the amount of
Tape.

The File Type is a number that indicates what type of file:

1.   1 is a "go to" file
2.   2 is a binary file
3.   3 is a symbolic file
4.   4 is a recover file

The File Length is a number that indicates the length of the file in words., i.e.,
44477, 25003, etc.

With every Tape that has files on it, there should be a file directory with it.
This file directory should list all of the files and their parameters. The file
directory is vital to the sys-defining.

MOUNT FILE TAPE on Unit 0, set density and put in Auto.

-ST^{c}S^{c}EX$_\wedge$-1 Cr

- POSITION Cr
  3

This command is used to position the Tape. It is always positioned at File 3.
Though the tape is usually at file 1 when it is at the load point, sometimes this
is not the case. This command is not used if there are only two files on the Tape.
As stated above, the POSITION command positions the Tape at file 3. If there
is no file 3, the Tape will run away and probably crash the system.

If while trying to position the tape, you get a tape wind error, TW□ , it indicates
that the tape is not on unit zero. The tape units are now hung up. They can not
be used until the following steps are gone through:

Put Tape drive Unit 0.
        and
-ST^{C}S^{C}REW Cr
        This command will clear the system of the hang up, and position the
        tape at file 2.

-ST^{C}S^{C}DF$_\wedge$' <Tape file-name> '$_{,\wedge}$AS $_\wedge$<File-number>   , <File-Type> , <File-length> **Cr**

This command defines the tape file-name with the parameters after the **AS.**
The same < Tape file-name> may be used over and over again, if it is copied to
the disc before it is defined again with different parameters. If the <Tape file-
name> is defined again with different parameters, the computer will type back
"(ALREADY DEFINED)" after the Cr on the ST^{C}S^{C}DF command.

-COPY$_\wedge$ '<Tape file-name> '$_\wedge$TO $_\wedge$ /<File-name>/ Cr <u>Lf</u>
  <u>NEW FILE</u> or <u>OLD FILE</u> <u>Cr</u> Lf

This command will copy the tape file, which has been defined with parameters
of a file on the the tape, to a disc file.

After the second Cr the system will search the tape for the file number stipulated
in the ST^{C}S^{C}DF command. When it has found the file, the system will give a
carriage return and start writing the tape file to the disc file. When it is
finished the system returns an executive dash.

If the file cannot be found on the tape, this will be indicated by the tape unwinding
and rewinding.   To stop this, altmode out of the COPY command.

If the file is found, but it can't be read, (PE), position error, will be typed
out on the TTY.   (PE) will continue to be typed out until the file is read or
until the COPY command is altmoded out of.   If more than 5 or 6 (PE) occur,
altmode out of the COPY command anyway.   Try again.   If (PE)'s still occur,
try another tape drive.   If it still doesn't work, the tape is bad or the tape
units are in bad condition.

FILES FROM DISC TO TAPE

System - defining files from disc to tape is basically the same as from tape to disc, except for the copy command;

-COPY∧ / ‹File-name› /∧ To∧' ‹Tape file-name› ' Cr

In the SDF command, the parameters of a file on the tape to which a disc file is to be copied to is defined, and the copy command copies the disc file to that tape file.

In copying files to tape, two of the three tape file parameters must always agree with the file directory of the tape. These are the file number and the file length. The file type may change depending on the type of file to be copied to the tape.

To copy files to tape, there must always be at least two files. To create more files on a tape, do the following:

-COPY∧ / ‹file-name›/ ∧TO ' Tape file-name› ' Cr
NEW FILE Cr

NOTE: The tape file-name has not been defined by a SDF command.
            The disc file is copied to the tape and a new tape file is created.

-FD: '‹Tape file-name› 'Cr
      43, 3, 13171

   This command will give the parameters of the new tape file. Enter this
   onto the tape file directory.

NOTE: Never use the same ' ‹ Tape file-name›' over again until the
            parameters of a particular file copied to tape has been determined
            by FD:.

SHUT

The shut command does the opposite of the answer command, though it does not selectively shut channels, but instead shuts all unused channels. If a user logs out after a shut command has been given, the channel he was using is shut.

-ST^{c}S^{c}EX$_\wedge$ -1 Cr

-SHUT Cr
  alter B. P. switch 1

HANG

This command will cause the indicated channels to be disconnected from the computer. It has the same affect as if the dataphone was hung up or a log out occurred, except if a user has a $ file, his core at the time of the hang is dumped on to the $ file.

-ST^{C}S^{C}EX -1   Cr

-HANG N (or) N, N (or) N-N Cr
    alter B. P. Switch 1

-

NOTE: This command only causes a Temporary Disconnect. It does not
               prevent the effected line (s) from being re-activated immediately.

GARBAGE FILES

Garbage files are files in a user's file directory that have gotten clobbed, or have been added to the user's file directory. A file with garbage files might look like the following:

-FI Cr

```
/DATA/        23, 512
/AC/          22, 1047
/PRT/         23, 512
              %@      23, 23156
/SI/          22, 2456
/NUT/         22, 1056
<'A           330, 2, 703635
/QUS/         23, 3675
```

-

The fourth and the seventh files are garbage files. To remove these files, determine the location of the file, i.e., the first garbage is the fourth file. Then do the following:

-ST^{C}S^{C}CL$_\wedge$4 Cr

-

This command will remove the garbage file that is the fourth one in the file directory. Take another files

-FI Cr

```
/DATA/        23, 512
/AC/          22, 1047
/PRT/         23, 512
/SI/          22, 2456
/NUT/         22, 1056
<'A           330, 2, 703635
/QUS/         23, 3675
```

-

The other garbage file is now sixth in the file directory. To remove it, do the same as with the previous one.

PROGRAM TITLE: ___DISC LOAD 40___

ACC./USER NAME: _____

RESPONSIBLE PROGRAMMER: ___V. VAN ULEAR___

STATUS REQUIRED

OPER.	EXEC1	EXEC2	PERH.	SUBSYS	ARPAS-DDT

PURPOSE: TO LOAD THE DISC FROM A PREVIOUS DISC DUMP

SET UP INSTRUCTIONS: MOUNT DISC LOAD/DUMP PROGRAM ON UNIT 0. CLEAR REGISTERS AND GO TO RUN. PLACE B.P. SW 1 down and MAG FILL. MOUNT THE TWO TAPES TO LOADED FROM ON THE UNIT THAT IS WRITTEN ON THE TAPE LABEL. PLACE BOTH TAPES IN AUTO.

OPERATING INSTRUCTIONS:

1. GO TO IDLE
2. CLEAR REGISTERS
3. LRA 5040
4. GO TO RUN (COMPUTER will HALT AT 2010101 in C)
5. CLEAR HALT (toggle run)
6. TOGGLE B.P. SW 2, 3, 4

ERROR RESTART PROCEDURE: TO STEP 1

REVISION DATE: _____ REVISED BY: _____

PROGRAM TITLE: _Disc Dump # 2_

ACC./USER NAME: _____

RESPONSIBLE PROGRAMMER: _V. Von Vlear_

STATUS REQUIRED

OPER.	EXEC1	EXEC2	PERH.	SUBSYS	ARPAS-DDT

PURPOSE: TO TAKE A DISC DUMP TO KEEP A BACKUP OF THE FILES CURRENTLY ON THE DISC.

SET UP INSTRUCTIONS: MOUNT DISC LOAD/DUMP PROGRAM ON UNIT 0. CLEAR REGISTERS AND GO TO RUN. PLACE B.P.SW 1 UP. AND MAG FILL. MOUNT THE TWO TAPES TO BE DUMPED ON UNIT 0 AND UNIT 1 and PLACE THEM BOTH OF THEM IN AUTO. THE FIRST 8 DISCS WILL GO ON TAPE, UNIT 0. THE SECOND 8 DISCS ON TAPE, UNIT 1.

OPERATING INSTRUCTIONS:

1. GO TO IDLE AND CLEAR REGISTERS
2. B.M. =040
3. GOTO RUN (COMPUTER WILL HALT AT 010101 in C)
4. CLEAR HALT (Toggle RUN)
5. TOGGLE B.P. SW. 2, 4, 2 (IN THAT ORDER)

ERROR RESTART PROCEDURE: TO STEP 1

REVISION DATE: _____ REVISED BY: _____

ERROR HALTS AND CORRECTIVE ACTION

DISC DUMP/LOAD #2

C Reg. Flag	Description	Corrective Action
2010101	Dump or Load ready to start	
2000001	LOAD only: Tape Read Retried 10 times	(a) Toggle Run Sw., tries 10 more times. (b) Set Console Sw.#4, Toggle Run Sw. Accepts tape record as read.
2000003	LOAD only; Disc Address read from tape is not valid for tape number.	If first read on tape then tape might be on wrong handler number, otherwise bad read. (c) Toggle Run Sw., Rereads tape. (d) Set Console Sw.#4, toggle Run Sw. Record not written on disc, next tape record read.

WONT WORK WRONG UNIT SET

C Reg. Flag	Description	Corrective Action
2000004	SKS 14000 error on disc (W Buffer not going ready)	(e) Toggle Run Sw., Tries disc instructions again. (f) Set Console Sw.#4, toggle run. DUMP: Accepts disc record (1 page) as read and writes on tape whatever is currently in disc buffer. (Probably lost 1 page of data) LOAD: Record is left on disc as written, probably with errors. (Depending upon type of disc failure.
2000005	SKS 10026 error on Disc (Seek or Search Time Error)	Take actions (e) or (f) above.
2000006	SKS 11026 error on disc (Disc Controller Error)	Take actions (e) or (f) above.
2000007	SKS 11000 error on disc (W Buffer Error, includes Disc Read Errors)	Take actions (e) or (f) above.
2077777	DUMP or LOAD complete on two tapes if 16 disc dump, on 1 tape if 8 disc dump. (Ready to proceed with 2nd two tapes if 32 disc dump)	

WIM error (P reg. at 455) (LOAD ONLY) can be bypassed by placing run switch in halt, pressing START and branching to 446.

P REGISTER LOOPS

626/627	Error in erasing tape.
644/646	Error in backing up tape on a retry.
656/660	Tape not ready.
661/662	W Buffer not ready on tape instruction.

PROGRAM TITLE: TAPE COPY
ACC./USER NAME: OP: OPERATOR
RESPONSIBLE PROGRAMMER: LMM

STATUS REQUIRED

(OPER.)   EXEC1   EXEC2   PERH.   SUBSYS   ARPAS-DDT

PURPOSE: COPY FROM OR TO TAPE FILES.

SET UP INSTRUCTIONS: MOUNT TAPE

OPERATING INSTRUCTIONS:

1. POS
      nn

2. OF 'x' AS xx, n, nnnn *

3. COPY /x/ TO 'x' OR COR 'x' TO /x/
      NEW FILE OR OLD FILE

* THIS IS IF YOU ARE USING A TAPE WITH DEFINED FILES

ERROR RESTART PROCEDURE: ALT MODE

REVISION DATE:_____ REVISED BY:_____

1 page of 1

PROGRAM TITLE: _RELEASE OF ARPAS & DDT_

ACC./USER NAME: _@1: OPERATOR OR @3: TSCSL_

RESPONSIBLE PROGRAMMER: _____

STATUS REQUIRED

(OPER.)	EXEC1	EXEC2	PERH.	SUBSYS	ARPAS-DDT

PURPOSE: RELEASE ARPAS & DDT FOR ALL USERS ON THE SYSTEM.

SET UP INSTRUCTIONS: —

OPERATING INSTRUCTIONS:

1. ENABLE, ARPAS C.R.
   SYSTEM RESPOND WITH EXGC MODE.
   AFTER TYPING: <u>ARPAS DDT</u>

ERROR RESTART PROCEDURE:

REVISION DATE: _____ REVISED BY: _____

PROGRAM TITLE: _LETTER_
ACC./USER NAME: _@L/OPERATOR OR @S:TCCSC._
RESPONSIBLE PROGRAMMER: _VERNE_

STATUS REQUIRED

OPER.	~~EXEC~~	EXEC2	PERH.	SUBSYS	ARPAS-DDT

PURPOSE: _TO PUT A LETTER INTO THE SYSTEM FOR ALL USERS._

SET UP INSTRUCTIONS: _GO /OPER/ PREVIOUS TO THIS_
IN EXEC MODE TYPE: LETTER CR. IF IT RESPONDS WITH
LETTER OFF. GO OPER, IF IT RESPONDS WITH: LETTER
ON. TYPE LETTER C.R. AGAIN AND YOU GET: LETTER OFF

OPERATING INSTRUCTIONS:

1. _COUNT LETTER_
   1 NUMBER
   2 NUMBER
   _3 0_
   _4 0_
   _5 0_
   _6 0_

2. _LETTER C.R._
   LETTER NR. 1-6 : N C.R

ERROR RESTART PROCEDURE: _ALT MODE   GO OPER_

REVISION DATE:_____ REVISED BY:_____

PROGRAM TITLE: LETTER

CONT. OPERATING INST:
TYPE TEXT OF LETTER. D^C *

3. IN EXEC TYPE: LETTER$_\wedge$ N (FOR LETTER NR)
   TEXT OFF LETTER (ERROR CHECK)

4. LETTER C.R.
   LETTER ON

* WHEN TYPING TEXT OF LETTER, A
SHIFT B WILL DELETE PRECEDING
CHARACTER.   A D^C WITHOUT ANY TEXT
AFTER TYPING LETTER NR. WILL REMOVE
A LETTER.

IF, WHEN SYSTEM RESPONDS WITH LETTER
OFF$_\wedge$ THE SYSTEM DOES NOT RETURN
AND
TO EXEC. TYPE ALT MODE KEY. THIS
IS A BUG IN THE PROGRAM YET. ALSO
PUT IN AN EXTRA$_\wedge$ AFTER TYPING
CR
NR.

REVISION DATE_____   REVISED BY_____

EXEC COMMANDS (System 1.86)

All Users

LOGOUT	Allows user to logout
WRITE FD	Writes File Dir. on disc
RENAME	Renames a file
DATE	Types date and time
KILL PROGRAM	Kills program relabelling only
RESET	Returns all of user's memory
COPY	Copies file to file
FILES	Types file directory
FD FOR	Types selected file dir. entry
GO TO	Goes to a "GO TO" (type 1) file
PLACE	Places a "SAVE" type program (type 1) in core
SAVE	Saves program, creates GO TO or type 1 file
BRANCH	Branches into a program
DELETE	Deletes a file
TIME	Types real time used (and computer time*)
STATUS	Types user's relabelling status
MEMORY	Types unused user's memory
"	Causes typing to be ignored by EXEC
DUMP	Dumps all program, saves status
RECOVER	Recovers from a DUMP file (type 4)
CONTINUE	Continues running a Sub-system
RELEASE	Releases a subsystem
PMT	Prints a users Program Memory Table
EXIT	Allows a user to LOGOUT without writing File Dir.
SIZE	Sets Users Machine size
MAIL	Types all Mail in user's mail box.
SEND TO	Allows user to put letter in Mail box

Users with Sub-System Status and above.

USERS	Types number of users on system
WHERE IS	Gives teletype number for a user
WHO IS ON	Types users on system by Account and name
REWIND	Rewinds tape, resets tape logic
RLT	Releases tape
STN	Sets tape no.
PTN	Types tape no.
SETEXEC	Sets user·status
POSITION TAPE	Positions tape
TAPE POSITION	Types current tape position
DF	Allows a file directory entry to be set up.
REMOVE FILE	Removes file from directory (without deleting)
PSP	Types error counters, etc.
CREATION	Types file directory with Creation Date & Access Count
LFCRE	Types Creation Date & access count of selected file
STORE	Stores a file to on Mag. Tape (in backup format)
RETREIVE	Retrieves a file from mag. tape
DIRECTORY	Types File Directory for files in Backup Format

OPERATOR PROGRAM COMMANDS

Command	Description
HELP	Types list of commands
MAIL COUNT	Provides a list of Mail originators and total number of addressees.
COPY MAIL	Allows operator to copy selected mail to a file.
CANCEL MAIL	Allows operator to cancel mail by number
MAIL GARBAGE	Removes holes and null entries from Mail List
UAD	Ouputs User/Account Directory
LENGTH	Computes length of files by acoount
TIME	Provides time used by user number
SET DAY	Validates a user for a whole day
RESET TIME	Same as TIME but also clears time.
SET HOUR	Validates a user for selected hours
FILES	Outputs complete or selected File Directories
CLEAR FILE	Clears a file directory
SIZE ACCOUNT	Computes and provides maximum size of files by account.
ACCOUNT	Sets up or changes Account parameters
NAME	Sets up or changes a user's parameters
CANCEL ACCOUNT	Cancels an account directory
CANCEL NAME	Cancels a user entry in the A.U.D.
*OVERFLOW	Allows assignment of an overflow directory
*MAP	Builds system bit-map
GARBAGE	Removes garbage from erflow file directory
POINTER	Indicates current location for a new overflow file directory.
USERS	Provides a sorted list bf users on the system
COUNT LETTERS	Counts the number of users YET to receive x all broadcast letters
REMOVE LETTER	Removes a broadcast letter from the system
LETTER	Allows a broadcast letter to be created.
COPY RECORDS	Allows the accounting records to be copied to a file.
CLEAR RECORDS	Same as COPY RECORDS but also clears records.

Users with Operator or System status

SHUT DOWN	Starts system shut down
UP	Cancels shut down
HANG UP	"Hangs up" selected teletype phone lines (DSS)
ANSWER	Ansers (or enables) Data subset
ACCOUNTING	Controls accounting to paper tape
LETTER	Types broadcast letters
ABT	Aborts tape operation (halts runaway)
GFD	Gets another user's file directory
ENABLE	Enables a subsystem group
DISABLE	Disables a subsystem group
LOOK	Looks at real core locations
SYSLD	Allows load from disc directly into user's core

System commands

RSMT	Reads in from RAD a SMT Page
SYSDP	Allows core to be dumped directly on disc.

FILE DIRECTORY FORMAT ON DISC

1 Entry (Disc File)

0	0 1 8 9 14 15 23	
	0 Account No. No. of Accesses | Creation Date	
1	11 12	
	C Change if File Size | File Length (FL)	
2	2 3 6 11 12	
	CB FT LTP | Future Controls	
3	Index Block Pointer	
4	1 7 8 9 15 16 17	
	D Char. of 0 0	
	Name	
N	1 7 8 15 16	
	F Char. of Char. or 136 (fill) Char. or 136	
	Name (fill)	

FT = File Type
LTP = Low Order Tape position
HTP = High Order Tape position
FS = Tape File Size
FL = File Length for disc Files
C   = Change in file length (file length no longer
        valid)
CB = File Control Bits, 0=Tape file *4 = IGNORE FILE*
                      2=Disc file
F   = End of Entry Flag (1)

If Tape File, word #3 =

3	0 5 6 8 9		23
	HTP 0	FS	

DISC MAP

Arm Positions

	0	1	2	~	31	32	33	34	~	61	62	63	
1 page 0	User 400	Date user1											
40	FD	FD								LOC 0	LOC 0		Disc 0
100													(0XXXX)
140		user 77											
0	User 500	User 100											
40	FD	FD								LOC 1	LOC 1		Disc 1
100													(2XXXX)
140													
0	User 600	User 200											
40	FD	FD								LOC 2	LOC 2		Disc 2
100													(4XXXX)
140													
0	User 700	User 300											
40	FD	FD								LOC 3	LOC 3		Disc 3
100													(6XXXX)
140													
0	User 1000	Acct 1											
40	FD	UAD								LOC 4	LOC 4		Disc 4
100		Acct											(10XXXX)
140		127											
0	User 1100												
40	FD									LOC 5	LOC5		Disc 5
100													(12XXXX)
140													
0	User 1200												
40	FD	Acc't								LOC 6	LOC 6		Disc 6
100													(14XXXX)
140													
0	User 1300												
40	FD	Letter								LOC 7	LOC 7		Disc 7
100													(160000-
140													177740)

8K

00XX 02XX 04XX   76XX 100XX 102XX 104XX   172XX 174XX 176XX

After a crash is paved + the lines answered –

- RES
- REC /MONST/
- PL /CRASH/
- CON

PDT

MONCR/   =   NOT MON
                   0

CLINT/   =
MCRA/   =
MCRB/   =
MCRX/   =
MCR∅/   =
MCRC/

BSX/   32∂ (EXEC CRASH)
SS01/   =
SS02/   =
SS03/   =

JOB [X   0   IF PHANTOM CRASH
TTY [Y
AUXO .   [
MFRUST/   [
RRL1 [
RRL2 [
RRL3 [
PWFL [

NB112 [
error addresses [
BLK31/   =   0
IOCL1/   -1
NRCL/   -1
PUCTR/   SHOULD BE < 5
PWFI/   0

To look at the bad address in the running system follow this procedure:

- REE /MONST/

- .CON
   DDT

   IDER2 = W
   RD2 = X
   TNI2L = Y
   TFI2L = Z

- LOOK W 10

- LOOK X 10

- LOOK Y 6

- LOOK Z 6

All crashes on this system 1.85 V10 should stop with P=21176. If this is not the case, record the P counter & the name of the crash and call me.

Error counters and error addresses

For rad errors and disc errors we have a table of the addresses at which the hardware failed. For unexpected ON and OFF teletype interrupts we have a table of the channel that failed. If any of the counters indicate an error, type to the appropriate table to find out where the hardware failed.

Rad errors: RD2 (10 words)

Disc errors: IDSC2 (10 words)

TTY ON interrupts: TNI2L (6 words)

TTY OFF interrupts: TFI2L (6 words)

There are extra ON interrupts if
TNICTR > TNIAC   (TN > TNA)

There are extra OFF interrupts if
TFICTR > TFIAC   (TF > TFA)

These errors may be checked in the running system by typing -PSP.

APPENDIX A

GENERAL DESCRIPTION OF THE COMBINED FILE DIRECTORY

1. A user may have one or two file directory blocks
    on the disc; the second block is an overflow block.
    Each block consists of 128 words containing a vari-
    able number of file directory entries. Each entry
    is in the format pictured in (d).

2. If the first word of the block is zero, the block
    considered to be empty. The last entry is followed
    by a -1 or -2 word where the -2 indicates that there
    are additional entries in the overflow block.

3. The last four words of the file directory block
    contain the following information:

Last Word	Valid on-time for this user (1 bit per hour of the day).
Last Word -1	Accumulated computer time used.
Last Word -2	Accumulated real time used.
Last word -3	Overflow block pointer.

4. In the case of an overflow block, the last three
    words are zero, and the overflow block pointer is
    a backward pointer to the first file directory block.

FILE DIRECTORY BLOCK

```
           ┌────────────────────────────────┐
      ↑    │      4 Control Words           │        ↑
      |    ├ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┤        |    Up to 24
      |    │     Variable length name        │        |    Entries
      |    ├ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┤        ↓
      |    │                                │
      |    ├────────────────────────────────┤
      |    │   End Dir. Flag -1 or -2        │
    128    ├────────────────────────────────┤
   words   │                                │
      |    │           Garbage              │
      |    │                                │
      |    ├────────────────────────────────┤
      |    │    Overflow block pointer       │   Last -3
      |    ├────────────────────────────────┤
      |    │    Accumulated Real Time        │   Last -2
      |    ├────────────────────────────────┤
      |    │  Accumulated Computer Time       │   Last -1
      ↓    ├────────────────────────────────┤
           │       Valid On Time            │   Last Word.
           └────────────────────────────────┘
```

LOCATION OF FILE DIRECTORIES
(on 16 DISC system)

(All numbers in Octal)

A File Directory occupies two sectors or 200_8 words on the disc.

The Disc Location or address is composed of two parts; the first

part is made from the low order two digits of the User no.

DOUBLE THE TWO LEAST SIGNIFICANT DIGITS TO OBTAIN PART 1 of the address.

OBTAIN PART TWO OF THE ADDRESS FROM THE FOLLOWING TABLE, USING THE
REMAINING MOST SIGNIFICANT DIGITS:

0	200	(disc 0, arm position 1)
100	20200	(disc 1, arm position 1)
200	40200	(disc 2, arm position 1)
300	60200	(disc 3, arm position 1)
400	0	(disc 0, arm position 0)
500	20000	(disc 1, arm position 0)
600	40000	2
700	60000	3
1000	100000	4
1100	120000	5
1200	140000	6
1300	160000	7
1400	200000	10
1500	220000	11
1600	240000	12
1700	260000	13
2000	300000	14
2100	320000	15
2200	340000	16
2300	360000	17

(overflow user numbers,
not to be assigned)

EXAMPLES:

```
        User number:     243
        Double 43              += 106
        from table, 200       = 40200
                               _____
        Disc address =          40306

        User number: 2367
        Double 67             = 156
        from table, 2300      = 360000
                               _____
        Disc address +          360156
```

IMPORTANT DISC ADDRESSES
(16 Disc system)

Last user number: 2377   Disc adr.: 360176

Overflow user numbers start at 2100
Lowest overflow pointer without garbage collection: 2140

Accounting records: 140200
Account/User directory: 100200   (Disc 4, arm pos 1)
Broadcast Letter bit map: 160200   (allows 2048_{10} users,last=3777)
Broadcast Letters: #1   160210
                    #2   160212
                    #3   160214
                    #4   160216
                    #5   160220
                    #6   160222
(Maximum size of letter,383 characters)
Note: current letter bit map programs setup for maximum number
of users of 1023_{10} which allows a LAST POSSIBLE USER NO. of 1777.)

Mail Box List: 120200
Mail Box mails: 120240
Maximum size of mail: 240 chars
  (packed 3 chars. per word,fits into 64 words)

Future Expansion:

Account/User Directory for Accounts from P through Z and
overflow goes at location: 200200
Mail box List moves to 160240 and additional mail at 160300.