Energy, Mines and
Resources Canada

Énergie, Mines et
Ressources Canada

CANMET

Canada Centre for
Mineral and Energy
Technology

Centre canadien de la
technologie des
minéraux et de l'énergie

Mining
Research
Laboratories

Laboratoires
de recherche
minière

USER'S GUIDE TO COMPUTER PROGRAM FOR
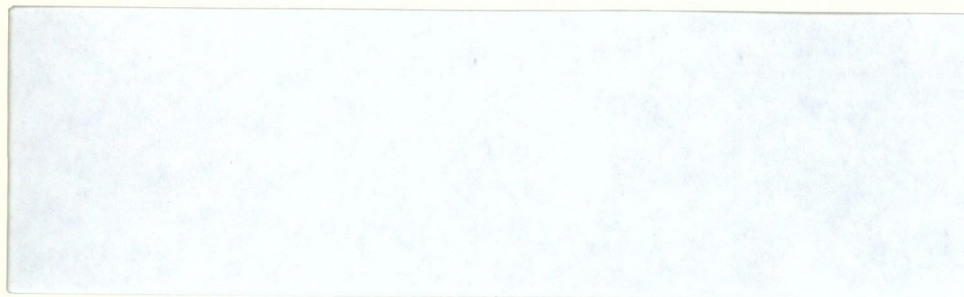# MAGNETIC TAPE EXCHANGE (MTEXCH)

R. BOYLE & N. TOEWS

Canada

USER'S GUIDE TO COMPUTER PROGRAM FOR
MAGNETIC TAPE EXCHANGE (MTEXCH)
R. BOYLE & N. TOEWS

MRL 89-25(TR)

February 1989

USER'S GUIDE TO COMPUTER PROGRAM FOR MAGNETIC TAPE EXCHANGE (MTEXCH)

by

R. Boyle * and N. Toews **

ABSTRACT

This user's guide was developed for the utilisation of the software MTEXCH. It is a computer program for Magnetic Tape EXCHanges written for the SUN OS 4 UNIX system. The menu driven, user friendly software is written in Fortran 77 and uses the SUN 4 Fortran Library Routines.

The computer program can read foreign (stranger) magnetic tapes which were created by various computers and software configurations. The program can also create a foreign magnetic tape to be read by an other computer. The software can only handle ACSII data files. Multiple files can be stored on one magnetic tape.

* Physical Scientist, Canadian Mine Technology Laboratory, Mining Research Laboratories, CANMET, Energy, Mines and Resources Canada, Ottawa, Ontario.
** Research Scientist, Canadian Mine Technology Laboratory, Mining Research Laboratories, CANMET, Energy, Mines and Resources Canada, Ottawa, Ontario.

MANUEL DE L'USAGER POUR LE LOGICIEL D'ÉCHANGE DE BANDES MAGNÉTIQUES (MTEXCH)

par

R. Boyle * and N. Teows **

RÉSUMÉ

Ce manuel de l'usager a été développé pour l'utilisation du logiciel MTEXCH. C'est un programme d'ordinateur écrit pour le système SUN OS 4 UNIX, servant à l'échange de bandes magnétiques. Ce logiciel, simple d'utilisation est écrit en Fortran 77 et utilise les routines de la librairie Fortran SUN 4.

Une des options du programme permet la lecture sur le SUN 4 de bandes magnétiques étrangères créées par différents ordinateurs et logiciels. Une autre option du logiciel permet d'écrire sur les bandes magnétiques pour être lues par un autre ordinateur. Le logiciel accommode seulement des fichiers ASCII. Plusieurs fichiers peuvent être écrits ou lus sur une bande magnétique.

MOT-CLÉS: Logiciel; manuel de l'usager; bande magnétique; SUN OS 4 UNIX, simple d'utilisation.

* Chercheur en sciences physiques, Laboratoire canadien de technologie minière, Laboratoires de recherche minière, CANMET, Énergie, Mines et Ressources Canada, Ottawa, Ontario.
** Chercheur scientifique, Laboratoire canadien de technologie minière, Laboratoires de recherche minière, CANMET, Énergie, Mines et Ressources Canada, Ottawa, Ontario.

TABLE OF CONTENTS

TABLES

No.

INTRODUCTION

The infrequent transfer of large volumes of ASCII data over long distances is done inexpensively by using magnetic tapes. High density magnetic tapes can store large amount of data and are accessible to any computer system having a magnetic tape drive unit and software to handle foreign (stranger) magnetic tapes.

A Fortran program was developed for the SUN OS 4 UNIX operating system to handle foreign magnetic tapes that were created for or by other hardware and software configurations.

This report is a user guide for the usage of mtexch, (magnetic tape exchange) computer program.

EXECUTION OF MTEXCH

The magnetic tape exchange program is a utility which enables the transfer of ASCII data files between various hardware and software configurations by using stranger magnetic tapes. The computer system must have a magnetic tape drive and a software program to read and create stranger magnetic tapes. Such a program was developed for the SUN OS 4 UNIX system. The software is user friendly, menu driven and was written in Fortran 77 using the Fortran library routines for magnetic tape manipulation. The software is capable of handling multi-files on one magnetic tape but cannot handle multi-volumes (multiple magnetic tapes).

The execution of the software is done by entering 'mtexch' followed by return. The software displays a menu on the user's terminal screen from which an option is selected. Users have the following options:

a) Reading an ACSII file from a magnetic tape
b) Writing an ASCII file to a new magnetic tape
c) Adding an ASCII file to a magnetic tape
d) Viewing contents of a magnetic tape
e) Exit from program mtexch

Table 1 shows the login, execution command for the program and displays the main menu on the terminal screen.

Table 1 - Execution of mtexch

```
                login username (return)
                password xxxxxxxxx (return)



% mtexch (return)

MOUNT MAG TAPE ON TAPE DRIVE
ENTER ONE OF THE FOLLOWING:
      READ MAG TAPE.........r
      WRITE NEW MAG TAPE.....w
      ADD TO A MAG TAPE......a
      DUMP MAG TAPE.........d
      STOP..................s
```

READING AN ACSII FILE FROM A MAGNETIC TAPE

The first option READ MAG TAPE is selected to copy one file from the magnetic tape to the computer hard disk. The user is prompted for the following: file position (SKIP), disk file name to store data, record length and number of records per block. The user also has the option to eliminate blank characters at end of records. The file name path is optional; when not specified the file will be copied to the directory from which the program is being executed. Table 2 shows an example of this option with a multi-file magnetic tape.

Table 2 - Reading an ASCII file from a magnetic tape

```
% mtexch (return)
MOUNT MAG TAPE ON TAPE DRIVE
ENTER ONE OF THE FOLLOWING:
    READ MAG TAPE..........r
    WRITE NEW MAG TAPE.....w
    ADD TO A MAG TAPE......a
    DUMP TAPE..............d
    STOP...................s
r (return)
  HOW MANY FILES DO WANT TO SKIP
      > 0 FORWARD
      = 0 NO SKIP
      < 0 BACKWARD
2 (return)
 FILE 1 BLOCK SIZE = 1600
 FILE 2 BLOCK SIZE = 2400
  2 FILES HAVE BEEN SKIPPED
   HOW MANY FILES DO WANT TO SKIP
      > 0 FORWARD
      = 0 NO SKIP
      < 0 BACKWARD
0 (return)
ENTER FILE NAME TO STORE DATA FROM MAG TAPE
dir1/sub-dir1/file-name.dat (return)
  BLANKS ELIMINATED AT END OF RECORDS.....y/n
n (return)
  BLOCK SIZE OF FILE = 800 BYTES
ENTER THE RECORD LENGTH (MAX 200)
80 (return)
ENTER NUMBER OF RECORDS PER BLOCK
10 (return)
   330 RECORDS WRITTEN TO dir1/sub-dir1/file-name.dat
  DO YOU WANT TO CONTINUE?..............c
  DO YOU WANT TO START NEW PROCESS?.....n
  DO YOU WANT TO STOP?..................s
s (return)
  EXIT FROM JOB
```

WRITING AN ASCII FILE TO A NEW MAGNETIC TAPE

The second option WRITE NEW MAG TAPE is used to create a new magnetic tape. When using this option existing data on the magnetic tape is over written. The user is prompted for the following: hard disk file name to be copied to the magnetic tape, record length and the number of records ber block. Table 3 is an example of creating a new magnetic tape.

Table 3 - Writing an ASCII file to a new magnetic tape

```
% mtexch (return)
MOUNT MAG TAPE ON TAPE DRIVE
ENTER ONE OF THE FOLLOWING:
    READ MAG TAPE..........r
    WRITE NEW MAG TAPE.....w
    ADD TO A MAG TAPE......a
    DUMP TAPE.............d
    STOP..................s
w (return)
ARE YOU CERTAIN? y/n
y (return)
ENTER FILE NAME TO COPY TO MAG TAPE
filan.dat (return)
  ERROR: FILE DOES NOT EXIST
ENTER FILE NAME TO COPY TO MAG TAPE
file-name.dat (return)
ENTER THE RECORD LENGTH (MAX 200)
80 (return)
ENTER NUMBER OF RECORDS PER BLOCK
10 (return)
   331 RECORDS WRITTEN TO MAG TAPE FROM FILE
file-name.dat
  DO YOU WANT TO CONTINUE?..............c
  DO YOU WANT TO START NEW PROCESS?.....n
  DO YOU WANT TO STOP?..................s
s (return)
  EXIT FROM JOB
```

ADDING AN ASCII FILE TO A MAGNETIC TAPE

The third option ADD TO MAG TAPE is used to copy a disk file after the last file on the magnetic tape. The program will automaticly the magnetic tape after the last file. The user is then prompted for a disk file name, record length and number of records per block. Table 4 is an example of the third option as displayed on the terminal screen.

Table 4 - Adding an ASCII file to a magnetic tape

```
% mtexch (return)
MOUNT MAG TAPE ON TAPE DRIVE
ENTER ONE OF THE FOLLOWING:
     READ MAG TAPE..........r
     WRITE NEW MAG TAPE.....w
     ADD TO A MAG TAPE......a
     DUMP TAPE..............d
     STOP...................s
a (return)
ARE YOU CERTAIN? y/n
y (return)
  YOU ARE AT THE END OF TAPE MARK
   9 FILES HAVE BEEN SKIPPED
ENTER FILE NAME TO COPY TO MAG TAPE
fima.dat (return)
  ERROR: FILE DOES NOT EXIST
ENTER FILE NAME TO COPY TO MAG TAPE
file-name.dat (return)
ENTER THE RECORD LENGTH (MAX 200)
80 (return)
ENTER NUMBER OF RECORDS PER BLOCK
20 (return)
   331 RECORDS WRITTEN TO MAG TAPE FROM FILE
file-name.dat
  DO YOU WANT TO CONTINUE?..............c
  DO YOU WANT TO START NEW PROCESS?.....n
  DO YOU WANT TO STOP?..................s
s (return)
  END EXECUTION
```

VIEWING CONTENTS OF A MAGNETIC TAPE

The forth option DUMP MAG TAPE enables the user to view the contents of a magnetic tape. The program position the magnetic tape at the beginning of the first file. The user is then prompted for: NEXT BLOCK, NEXT FILE or END. NEXT BLOCK displays on the terminal screen width the block size and contents of one block. The full 80 characters of the screen are used and may not correspond to the record length of the file as stored on the magnetic tape. NEXT FILE positions the magnetic tape at the beginning of the next file. The end of file of the last file stored on a magnetic tape is followed by an end of tape (EOT). The program indicates when the end of tape (EOT) has been reached. Table 5 is an example of the forth option.

Table 5 - Viewing contents of a magnetic tape

```
% mtexch (return)
ENTER ONE OF THE FOLLOWING:
     READ MAG TAPE.........r
     WRITE NEW MAG TAPE.....w
     ADD TO A MAG TAPE......a
     DUMP TAPE..............d
     STOP...................s
d (return)
  YOU ARE NOW AT THE BEGINNING OF FILE # 1

  NEXT BLOCK.......b
  NEXT FILE........f
  END..............e

b (return)
  FILE # 1 BLOCK SIZE = 1600
ZZX****
ZZX0009 1 X15 112 0507092527
ZZX0009 2 C 19720 2590 1152
ZZX0009 3 SURFACE HOLE
ZZX0009 5 500.0
ZZX0009 6 1000.0 -66.0 35.0
ZZX0009 7 1500.0 -45.0 44.0
ZZX0009 8 1740.0 -42.0 37.0
     ...
     ...
     ...
```

Table 5 cont.

```
 NEXT BLOCK.......b
 NEXT FILE........f
 END..............e

f (return)
 FILE # 1 BLOCK SIZE = 1600

 END OF FILE DETECTED
 FILE 1 HAS 16 BLOCKS

 YOU ARE NOW AT THE BEGINNING OF FILE # 2

 NEXT BLOCK.......b
 NEXT FILE........f
 END..............e

f (return)
 FILE # 2 BLOCK SIZE = 2400

 END OF FILE DETECTED
 FILE 2 HAS 10 BLOCKS

 YOU ARE NOW AT THE BEGINNING OF FILE # 3

 NEXT BLOCK.......b
 NEXT FILE........f
 END..............e

f (return)
 FILE # 3 BLOCK SIZE = 800

 END OF FILE DETECTED
 FILE 3 HAS 33 BLOCKS
```

Table 5 cont.

```
YOU ARE NOW AT THE BEGINNING OF FILE # 4

NEXT BLOCK.......b
NEXT FILE........f
END..............e

b (return)
 FILE # 4 BLOCK SIZE = 3200
 ZZX****
                    ZZX0009    X15    0    5
                      59    09    12    59    12
         1152.000 0.00000 0.00000BWG
            0.00000 SURFACE HOLE
            0.00000
                             0   -55   60   WW   X
         0.000 1152.00 20.000 20.000
                            0.000
                            0.000
                            0.000
                            0.000
        -20.000 1135.67 48.000 48.000
                            0.000
                            0.000
                            0.000
                            0.000
                             4   -54   57   WW   2
        -68.000 1096.74 48.000 48.000
                            0.000
                            0.000
                            0.000
                            0.000
         ...
         ...
         ...
         ...
```

Table 5 cont.

```
 NEXT BLOCK.......b
 NEXT FILE........f
 END..............e

e (return)
 DO YOU WANT TO CONTINUE?..............c
 DO YOU WANT TO START NEW PROCESS?.....n
 DO YOU WANT TO STOP?..................s
s (return)
 END EXECUTION
```

EXIT FROM PROGRAM MTEXCH

The final option STOP is used to exit the execution of the program. Table 6 is an example of this option.

Table 6 - Exit from program MTEXCH

```
ENTER ONE OF THE FOLLOWING:
    READ MAG TAPE..........r
    WRITE NEW MAG TAPE.....w
    ADD TO A MAG TAPE......a
    DUMP TAPE..............d
    STOP...................s
s (return)
 EXIT FROM JOB
```

CONCLUSION

The program can handle most of data input errors entered form the user's keyboard such as: nonexisting files names, wrong menu selections. The user at any time can abort the program by entering from the keyboard 'CRTL C'. CRTL C entered during writing a magnetic tape can cause unpredictable results. When the CRTL C is used the user must ensure the magnetic tape is at the load point (LP) on the magnetic tape drive before re-executing the program.

When using magnetic tapes we recommend the following precautions:
- properly label the magnetic tapes
        - owner, creation date, name, density etc...
- keep a directory of files with record lengths and block sizes,
- when reading magnetic tapes remove the write ring,
- store magnetic tapes in clean secure areas,
- consult with you system administrator or magnetic tape librarian.

REFERENCES

SUN Microsystems, (1988) SUN FORTRAN Programmer's Guide, 329 pp.