

RECOMP II USERS' PROGRAM NO. 1129

PROGRAM TITLE: SUBROUTINES FOR USING MAGNETIC  
TAPE UNITS WITH RECOMP II (PART A)

PROGRAM CLASSIFICATION: General

AUTHOR: S. M. Chamberlain  
Autonetics

PURPOSE: The purpose of these subroutines is  
to provide a simple and reliable  
method for utilizing the magnetic tape  
units with the RECOMP II computer. The  
subroutines simplify the programming  
for the magnetic tape units and correct  
for machine errors made by the magnetic  
tape units. They enable the programmer  
to write on tape, read from tape, and  
rewind tape. All reading and writing on  
tape is verified to insure against errors.

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GENERAL METHOD OF USE

Information is written on tape or read from tape in 1- channel blocks. A program is used, first of all, to put 1- channel numbered blocks on the entire length of a new magnetic tape. The tape is also checked for bad spots at the same time. Then, the subroutines can be used to read or write on the tape. To read or write the programmer specifies 3 things: the channel in main memory, the block on magnetic tape, and the tape unit to be used. The subroutines take care of moving to the correct block and verifying that information is read or written correctly. If reading or writing cannot be accomplished because of bad magnetic tape, the computer will stop and display an error flag.

RESTRICTIONS

Information can only be read or written on tape in blocks of 1 main memory channel.

The last 2 words of a channel to be read or written on tape cannot be used.

The magnetic tape subroutines cannot be written on tape.

The subroutines occupy the following areas in memory:

7355 - 7357  
7400 - 7577  
7700 - 7757

They also use: 7600 - 7677 and the high-speed loops.

The program for using the subroutines occupies: 7360 - 7377

Sense Switch B is used by the subroutines, and therefore should not be used in a tape program.

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The first 100 octal blocks and the last 100 octal blocks on the tape should not be used.

ON-OFF PROCEDURE FOR TAPE UNITS

To avoid line transients from ruining tapes, the following ON-OFF procedure should be followed. All tape units should be turned on or off together.

- ON: Turn on computer.  
Set unit numbers.  
Push "STOP" buttons.  
Turn on circuit breakers.  
Push "ON" buttons.  
Turn on "ERASE" switch (if erasing is to be done).  
Turn on "R + W" or "R" switches (as desired).  
Push "FWD" buttons.  
Push "STOP" buttons.  
Push "AUTO" buttons.  
Turn on Sense Switch B on the console.
- OFF: Push "STOP" buttons.  
Push "REV" buttons. Wait for "LOAD POINT" lights to come on, and then:  
Push "STOP" buttons.  
Turn off "R + W" or "R" switches.  
Turn off "ERASE" switches (if on).  
Turn off circuit breakers.  
Turn off computer (if desired).

In order to use any tape unit, all tape units must be turned on. Do not turn tape units on or off while computer is computing. Do not try to use a unit which is set to the same unit number as another unit.

CALLING SEQUENCES

The following symbols are used below:

- U - Tape Unit Number (0, 1, 2, or 3)  
BBBBB - Block Number on Tape  
MM - Memory Channel in Main Memory

Rewind:

SLL  
TRA 7551.1  
PZE 000U.0  
Normal Return

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Rewind Check:

SLL  
TRA 7560.0  
PZE 000U.0  
Normal Return

Read:

SIR  
TRA 7710.0  
+OB BBBB.0  
+OO MMOU.0  
Normal Return

Write:

SLL  
TRA 7500.0  
Error Return  
+OB BBBB.0  
+OO MMOU.0  
Normal Return

PROGRAM PART

Rewind and Check:

L 7360.0  
C +OO 0000.0 - OO 000U.0 , ENTER  
START

Read:

L 7366.0  
C +OB BBBB.0 - OO MMOU.0 , ENTER  
START

Write:

L 7373.0  
C +OB BBBB.0 - OO MMOU.0 , ENTER  
START

PROGRAMMING NOTES

All tape programs must start by first rewinding all tapes to be used.

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The rewind check must be given just before each tape is read or written on for the first time in a program. It is not used thereafter in the program. It has the same key word in its calling sequence as the corresponding key word in the rewind calling sequence for the same tape.

The normal order of operations for a tape program is as follows:

- Rewind all tapes to be used.
- Do computing not involving tapes.
- Give Rewind check for all tapes to be used.
- Do computing using tapes.
- Rewind all tapes used.
- Stop.

The computer stops when it finds a bad block. A record should be kept of the bad blocks. This block and the following block should not be used again in a program. A tape which has many bad blocks should be discarded.

ERROR FLAGS

The computer will stop and display an error flag in the nixies if it finds something wrong with the magnetic tapes.

EXAMPLE: - OB BBBB.0 - 77 NOOU.0

WHERE: BBBB - Bad Block Number ,

N - Error Flag Number

U - Tape Unit Number

They are given as follows:

Cannot write in this block after 3 tries. Pushing "START" will transfer control to the Error Return in the Write Calling Sequence.

Cannot move to this block after 20 tries. Pushing "START" will cause computer to try to move to this block 20 more times. If it finds it, computation will continue.

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Block on tape will not read into memory after 20 tries. Pushing "START" will cause computer to read next block and continue computation. To find out the block number of the bad block, set the pre-set stop to L 7416 before pushing "START" and when it stops look in L 7677. The next block number will be at a binary 39. Push "START" to continue.

Block read from tape has wrong information on it. Pushing "START" will cause block to be read again. If it is correct, computation will continue.

STARTING PROCEDURE

When using a new tape, the following procedure should be used, before the subroutines can be used:

Make sure tape has a load point sticker.

Load tape onto unit so that the load point sticker is well before the read-write head.

Set unit number to 0, and the other units to any other numbers.

Erase the tape forward to the end.

Make sure tape has an end of tape sticker.

Erase the tape in the reverse direction to the end.

Enter program for establishing blocks.

Push Start #1. This will put 1-channel blocks on the whole tape. Weak blocks will be typed out on the typewriter. When tape reaches the end, push Error Reset.

Push Start #2. This will check all the blocks on the tape. Weak blocks will be typed out. When tape reaches the end, push Error Reset.

Push Start #3. This will move the tape and then stop at L 5005. Enter a weak block number at a binary 18 and push start. The subroutines are now used to try to write in this weak block. If writing fails, then this block and the following block should be declared bad and never used again. Each weak block should be tested in this fashion.

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Using this procedure we can be sure that all the blocks, except the blocks which were declared bad, are all good at the start. Tapes wear out in time, however, but the subroutines will detect blocks which have gone bad. When many blocks are bad, the tape should be discarded.