

RECOMP II USERS' PROGRAM NO. 1130

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

PROGRAM CLASSIFICATION: General

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PURPOSE: The purpose of these subroutines is  
to provide a simple and reliable  
method for utilizing the magnetic  
tape units with the RECOMP II com-  
puter. 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  
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TAPE UNITS WITH RECOMP II (PART B)

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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.

GENERAL METHOD USED

1-channel RECOMP blocks are put on the entire length of a new tape using a separate program for establishing blocks. The last word of each channel is used for a tag number. This tag number is used to verify that the machine is reading, writing, and moving to the correct blocks. It is also used to test if the machine is reading a full block into memory. The second to the last word is used for a check sum. This is used to insure that blocks are written and read correctly. It makes sure that what is read from tape is exactly the same as what was written on tape.

The subroutines take into account the following errors (or combinations of errors) due to machine trouble in the tape units or bad magnetic tape:

Ref

is parity error.

Reads nothing into memory (parity error or not).

Reads wrong information into memory (parity error or not).

Will not read last 8 words of block into memory (parity error or not).

Reads block which was written differently on the tape (parity error or not).

Cannot read a block due to bad tape.

Reads wrong block.

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Write Errors

Makes parity error.

Does not write a full block (parity error or not).

Writes wrong information (parity error or not).

Tries to write on bad tape.

Writes wrong information in full block (parity error or not).

Move Errors

Moves to wrong block (by miscounting blocks).

Tries to move off either end of tape.

Cannot find a specified block.

Rewind Error

Tries to rewind when already rewound.

Therefore, if you try to write on tape, either the information will be written on tape correctly or the computer will stop on an error flag. Similarly, if you try to read from tape, either the information will read correctly from tape or the computer will stop on an error flag. In other words, the computer will not go on computing with false information from tape.

The subroutine also guards against some programming errors. Extract commands are used when looking at the key words in the calling sequences. This prevents the programmer from accidentally giving a wrong command (such as erase) and thereby ruining a tape.

All tape commands in the subroutines are followed by TOV's to take care of all possibilities.

The programmer uses only 4 calling sequences for the following operations: Rewind, Rewind Check, Read, and Write. A move routine is not used by the programmer but is contained in the Read and Write routines. The erase command is never used, since new information is written over old information on tape. Bad spots on tape are not erased; they are just not used. A record is kept of bad spots on each tape.

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DESCRIPTIONS OF ROUTINES

Rewind

The programmer specifies one thing; the tape unit number. A rewind command is constructed and executed. If an overflow occurs (tape already rewound) then control is transferred out.

Rewind Check

The programmer specifies one thing; the tape unit number. This is the same as the corresponding number used in rewind. The subroutine checks for rewinding tapes by using Sense Switch B and then moves the tape 100 octal blocks in the forward direction in order to avoid bad tape at the ends.

If it miscounts blocks in moving, this will not matter.

Move

This routine is contained within the read and write routines. The tape unit is given 20 tries to move to a specified block. If it fails to find the block, then an error flag is displayed in the nixies and the computer stops. The computer first reads a block to find out where it is. It then figures out how many blocks it needs to move to get to the desired block. It then moves, and then stops and reads a block again. If this is not the correct block, then it moves again. It keeps reading, computing and moving until it hits the correct block.

Every time that it should read a block, it is given 20 chances to read it correctly. If it fails to read it, then the computer stops on an error flag. When reading a block, it checks parity error and the last word in the block.

If the tape tries to move off the end, then the computer is told to back up 100 octal blocks, read a block, and continue. Provisions were made for moving more than 1000 octal blocks by using a counter.

The move routine is so set up that the tape will either move to the correct block or the computer will stop on an error flag. The read and move commands are looped together so that the routine will work even if neither of the commands work correctly.

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Read

The programmer specifies three things: tape unit to be used, block number on tape to read from, and channel number in memory to read into.

This routine uses the move routine to read the correct block into a buffer channel in memory. It then computes a check sum to insure that the information is correct. If not, an error flag is displayed in the nixies and computation stops. If the check sum is correct, then the high speed loops are used to transfer the block of information from the buffer channel to the given channel.

Write

The programmer specifies three things: tape unit to be used, channel number in memory to be written from, and block number on tape to be written on.

This routine first finds a check sum for the channel and stores it in the channel. It then puts a tag number in the channel. The tape unit is given three chances to write the information correctly. If not, the computer halts on an error flag and transfers control to the error return in the write calling sequence. The move routine is used to move to the correct block for writing and reading back. The block is then read back into a buffer channel in memory after it is written on tape. The last two words are checked against the channel in memory that was written. If they check, then a check sum is computed. If this checks, then it transfers out.

LOCATIONS IN MEMORY

7360	-	7377	:	Program for using subroutines
7400	-	7453	:	Move
7454	-	7477	:	Constants
7500	-	7536.0:		Write
7536.1	-	7540	:	Move
7541	-	7544.0:		Write
7544.1	-	7551.0:		Binary count
7551.1	-	7557	:	Rewind
7560	-	7566	:	Rewind Check
7567	-	7575	:	Constants
7576			:	Binary Count

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7577		:	Move
7600	-	7677	: (Buffer channel)
7700	-	7707	: Binary Count
7710	-	7737	: Read
7740	-	7745	: Constants
7746	-	7757	: Write

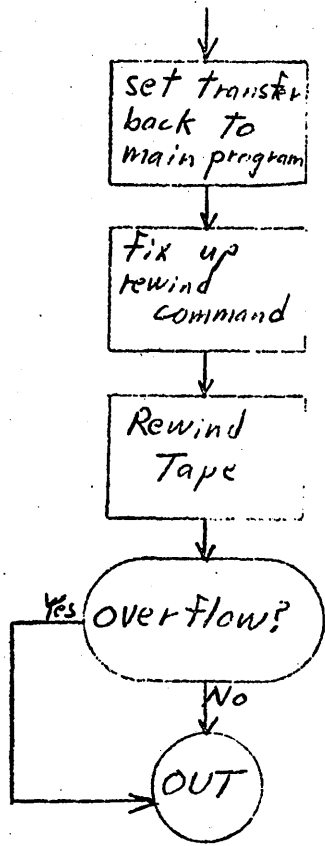
These routines are not independent of one another, and therefore should not be tried to be used by themselves. The program for using the subroutines in L 7360 - 7377 can be deleted without affecting the subroutines.

PROGRAM FOR ESTABLISHING BLOCKS

There are three parts to this program. The tape is tested at the same time.

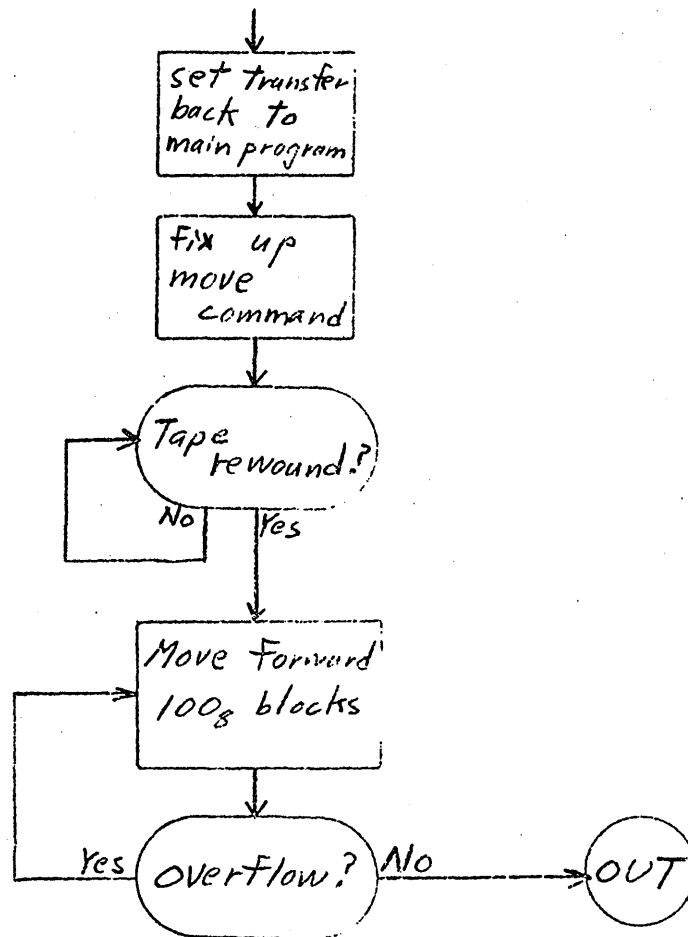
- Part #1: This writes 1-channel numbered RECOMP blocks on the entire length of a newly erased tape. If a parity error occurs, the tag number in that block is typed out.
- Part #2: This reads and checks every block on the tape. If a parity error occurs or if the tag number is not correct, then the correct tag number is typed out.
- Part #3: This uses the subroutines and tries to write on all the blocks whose tag numbers were typed out. If it cannot write in a block, then this block is declared bad. A record should be kept of bad blocks.

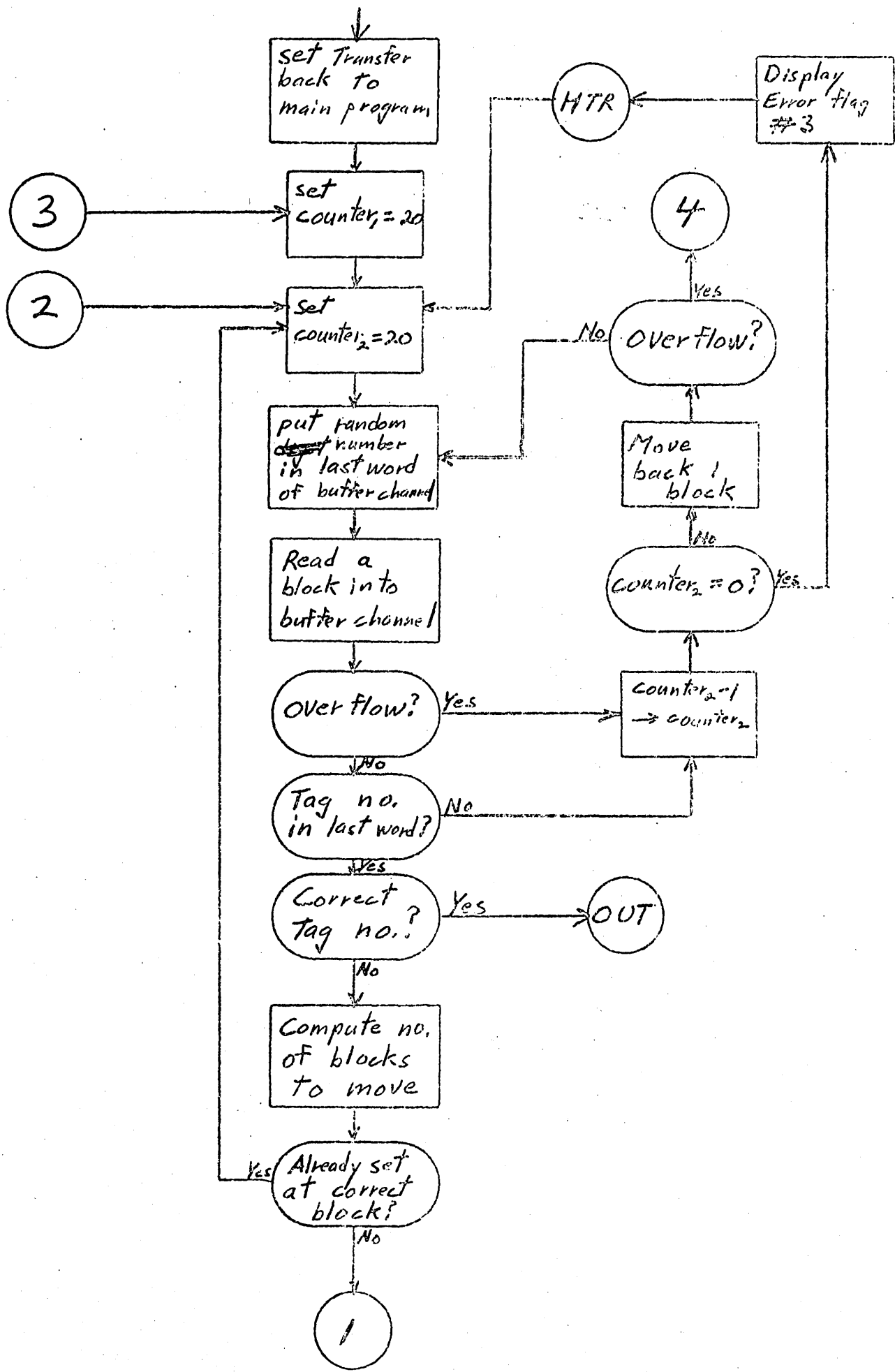
D = 1/11



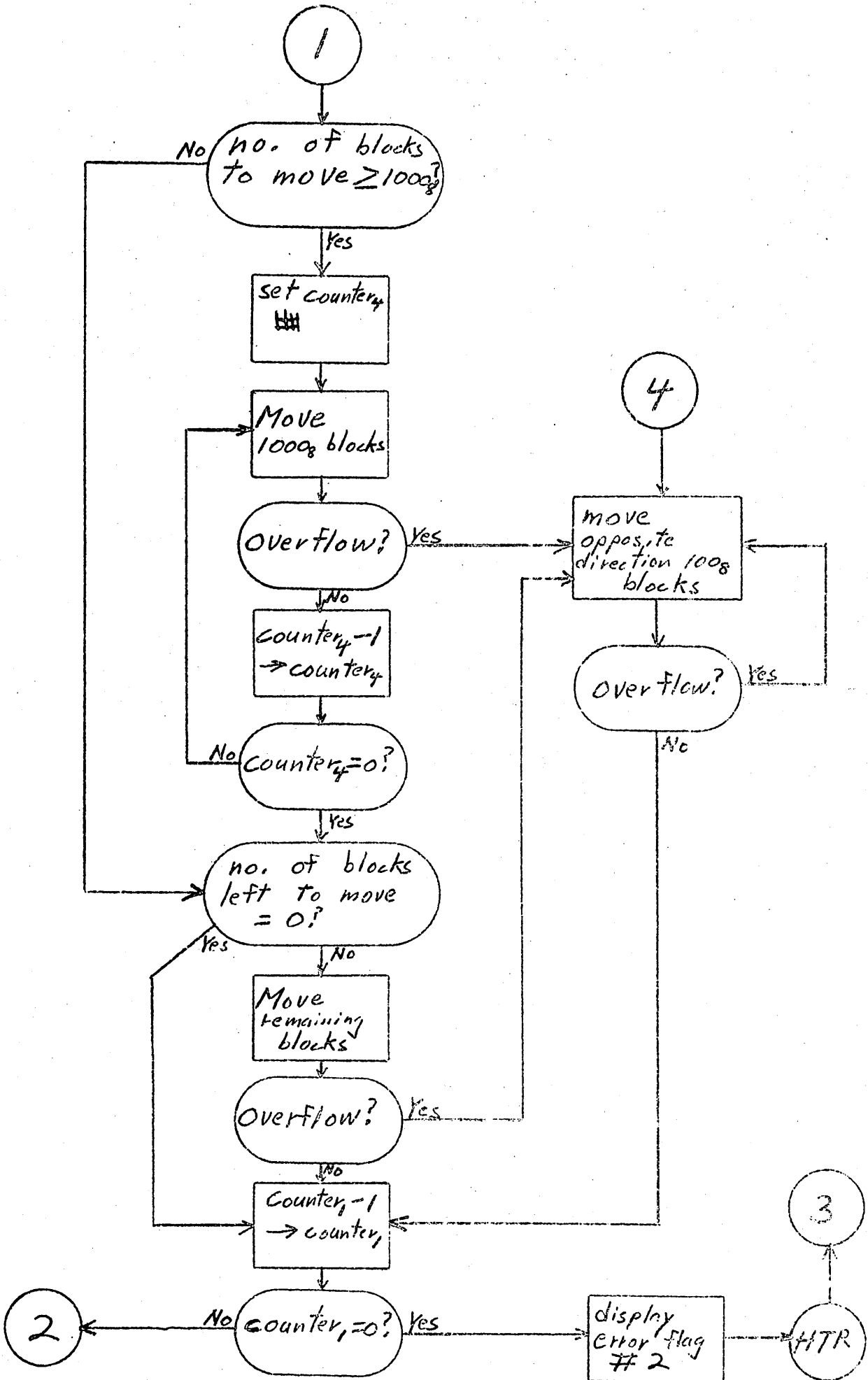
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## REWIND CHECK

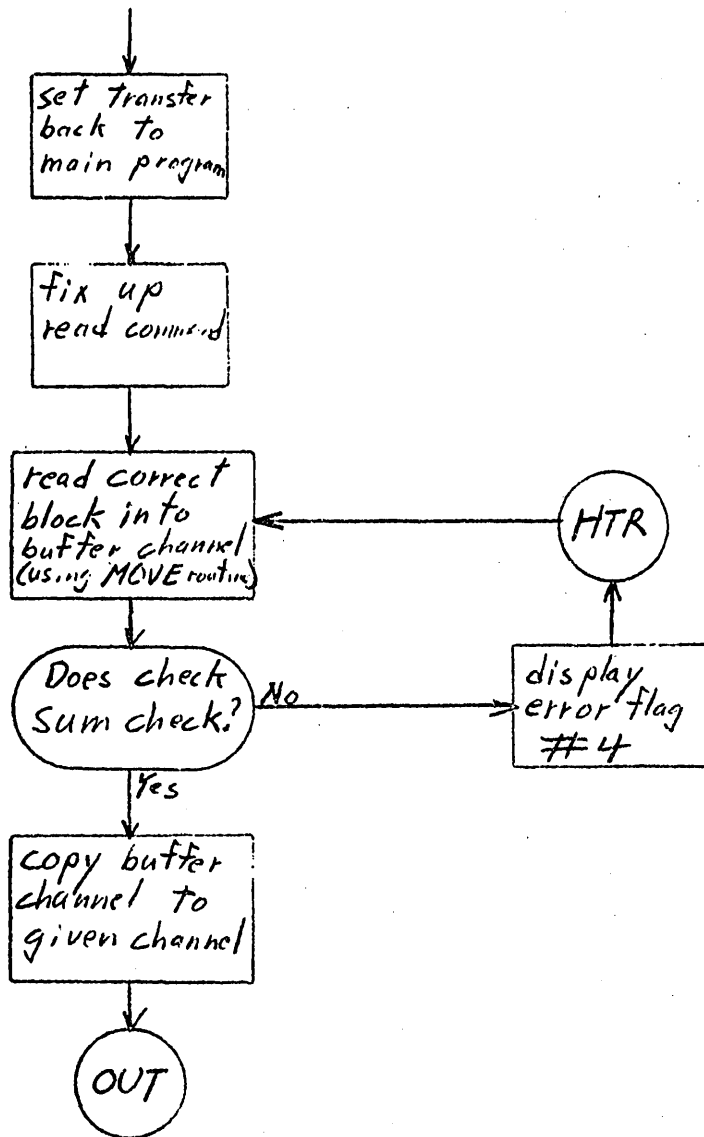




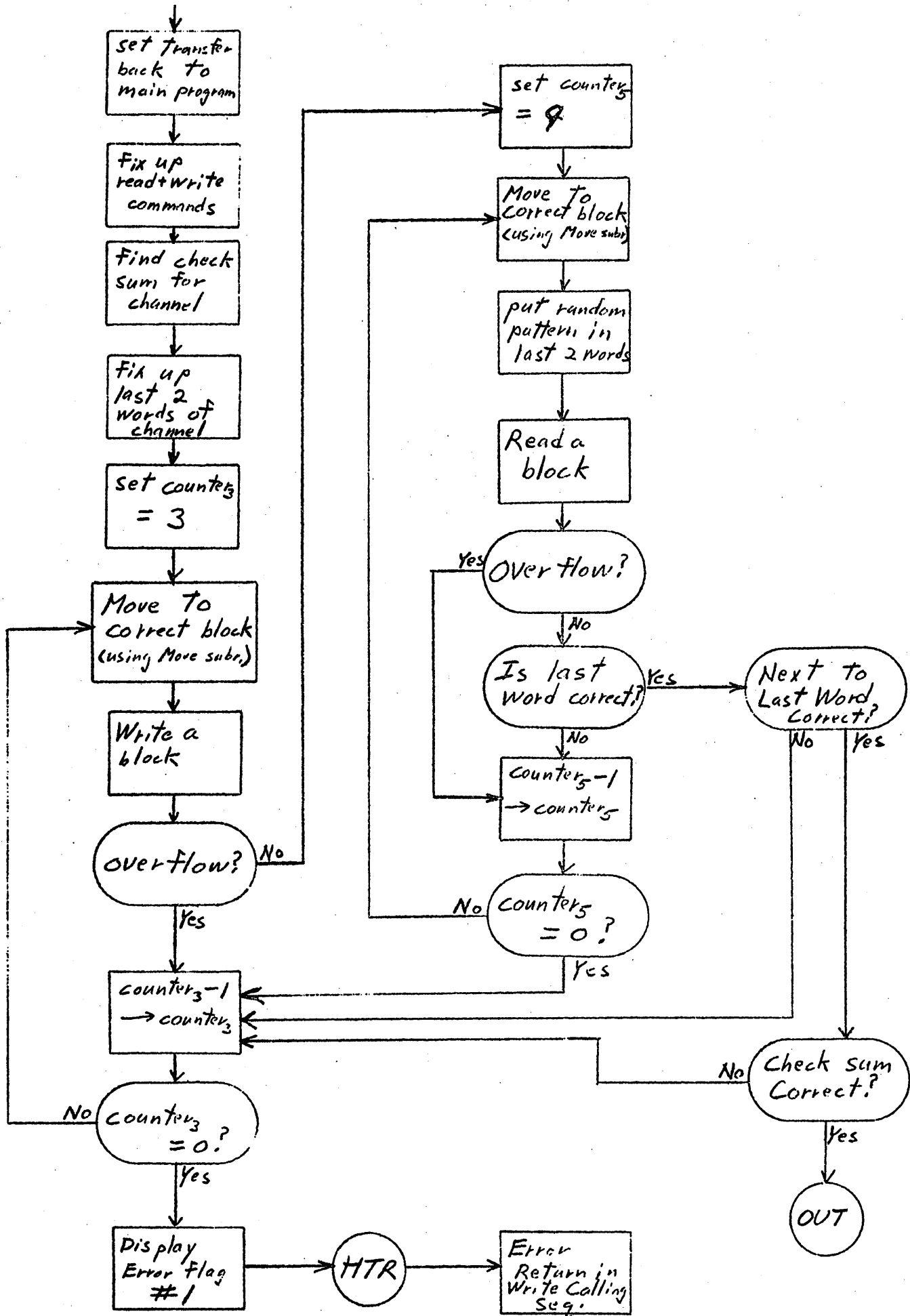




# READ

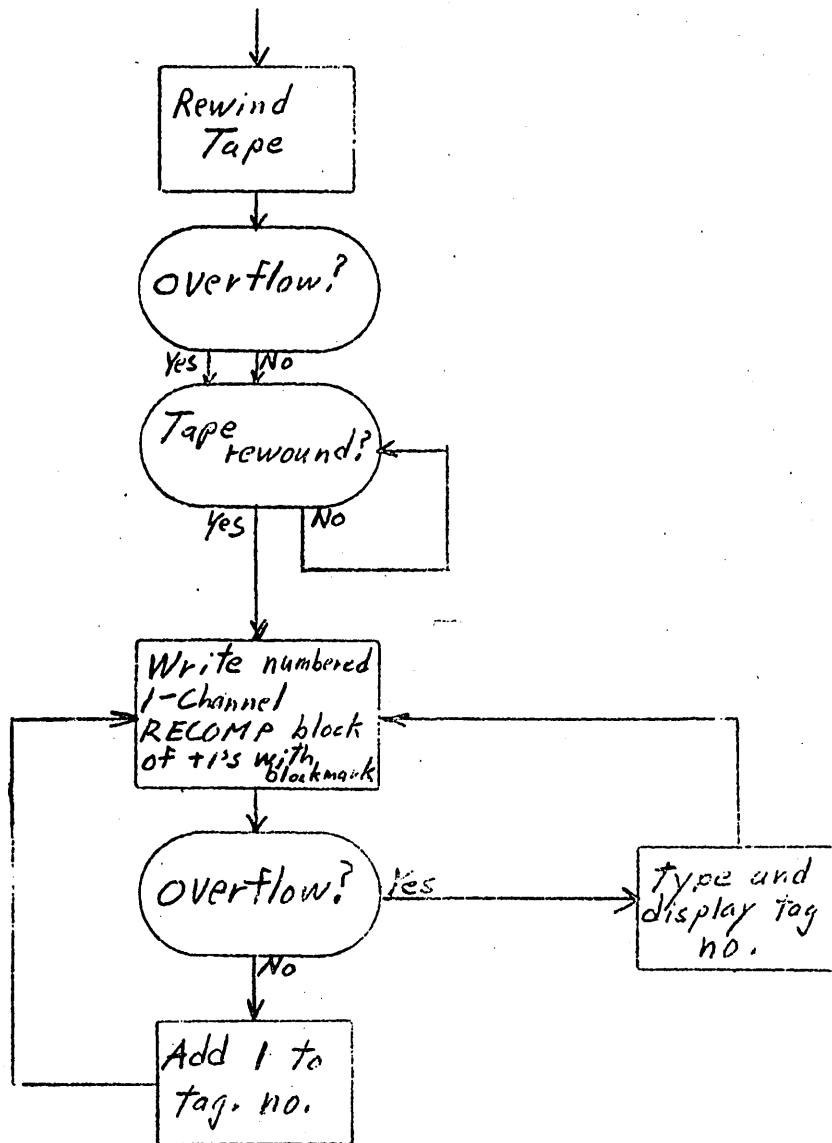


# WRITE

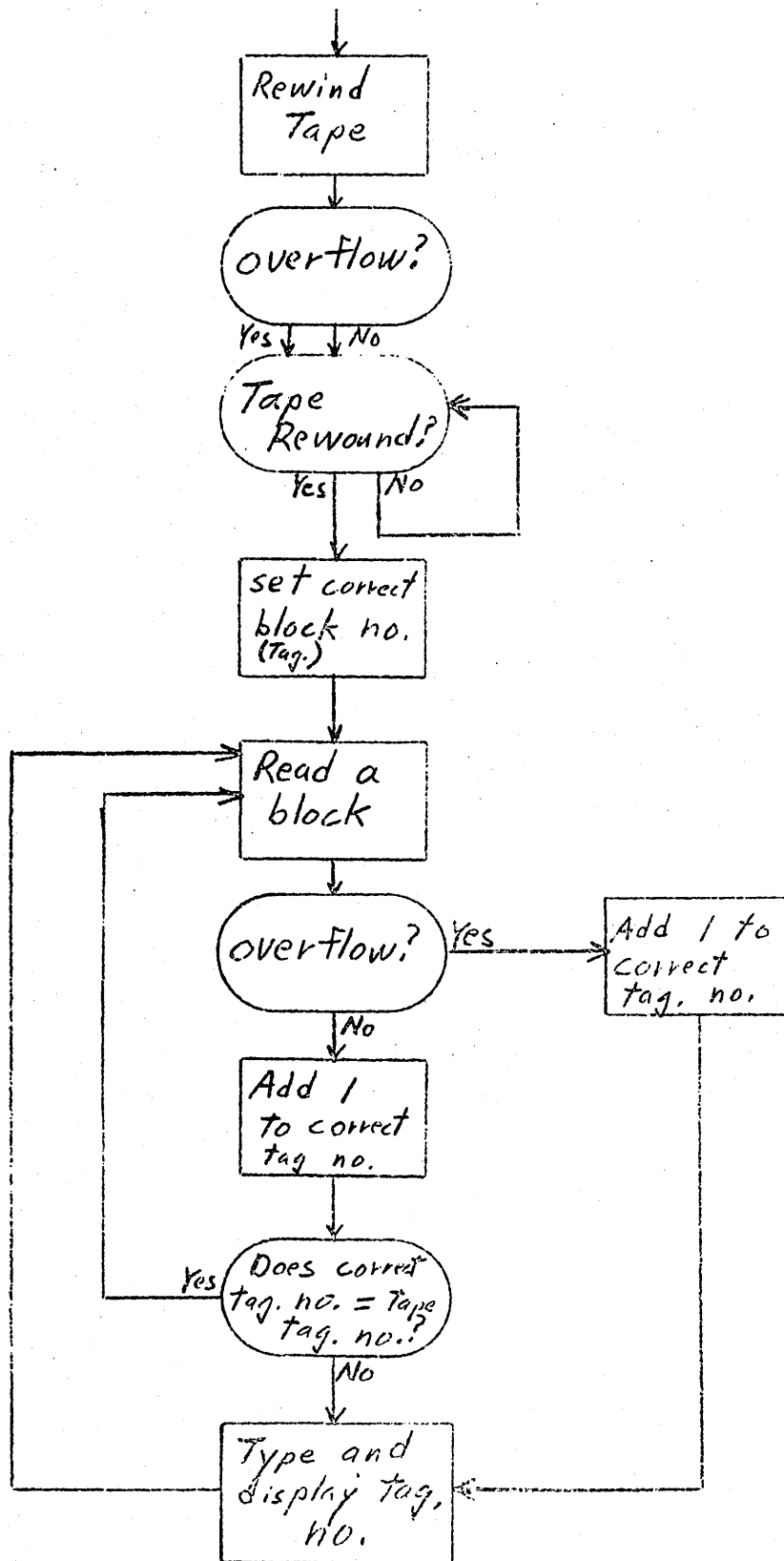


# ESTABLISH BLOCKS PROGRAM

Part #1



Part #2



Part #3

