

File Number 1410/7010 - 07

Re: Form No. A22-6704

This Newsletter No. N22-0154

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Previous Newsletter Nos. N22-0074,
N22-0077,
N22-0118

IBM 1311 DISK STORAGE DRIVE FOR IBM 1410 AND 7010 SYSTEMS CHANGES AND ADDITIONS TO FORM A22-6704

Change in Disk Drive Numbering

Page 4, Figure 2:

Change disk drive numbers from 0, 1, 2, 3, and 4 to 0, 2, 4, 6, and 8.

Page 5, upper right column:

Change disk drive number relationship to Sector Addresses as follows:

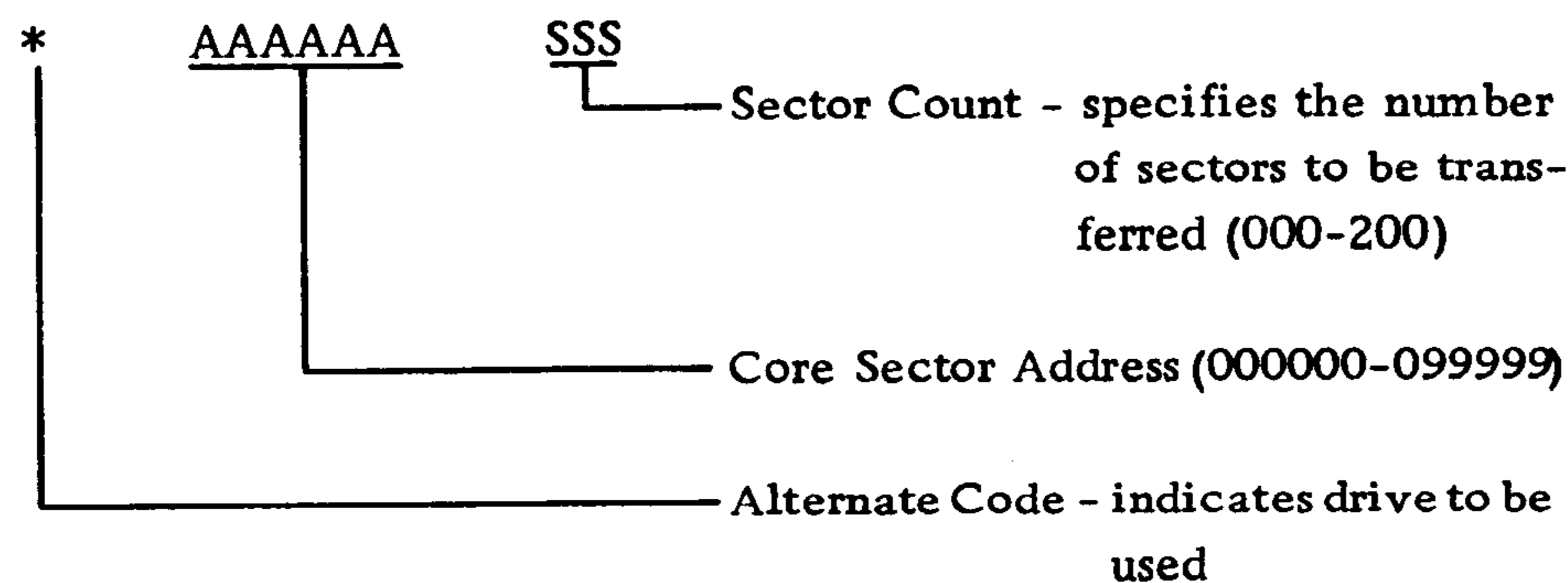
<u>Sector Addresses</u>	<u>Disk Drive Number</u>
000000 - 019999	0
020000 - 039999	2
040000 - 059999	4
060000 - 079999	6
080000 - 099999	8

Pages 5 and 6

Delete the section "Disk Control Fields" and insert:

Disk Control Fields

A 1311 disk control field is used by the program to specify the 1311 drive to be used, the sector to be read or written, and the number of sectors to be moved. It has the following format:



The alternate code permits reading or writing a disk pack with recorded sector addresses that do not coincide with the sector addresses associated with the number of the disk drive on which the disk pack is mounted:

<u>Alternate Code</u>	*	<u>Selects Disk Drive:</u>
		As specified by core sector address
These numeric alternate codes take precedence over first digit of core sector address	0	0
	2	2
	4	4
	6	6
	8	8

When the disk control field has an asterisk in its high-order position, the core sector address automatically selects the appropriate 1311 disk drive. For example, disk control field *021700 selects disk drive 2. A digit in place of the asterisk can specify an alternate drive; for example, disk control field 4021700 selects disk drive 4.

A disk pack with sector addresses ranging from 080,000 to 099,999 may be mounted on drive 0 and read or written with the disk control field 0080000xxx. The core sector addresses in core storage must compare equal with the sector addresses on the disk pack. More than one on-line disk pack could have sector addresses in the 080,000 to 099,999 range; the alternate code specifies the desired disk drive. Writing destroys previously written information.

Page 6

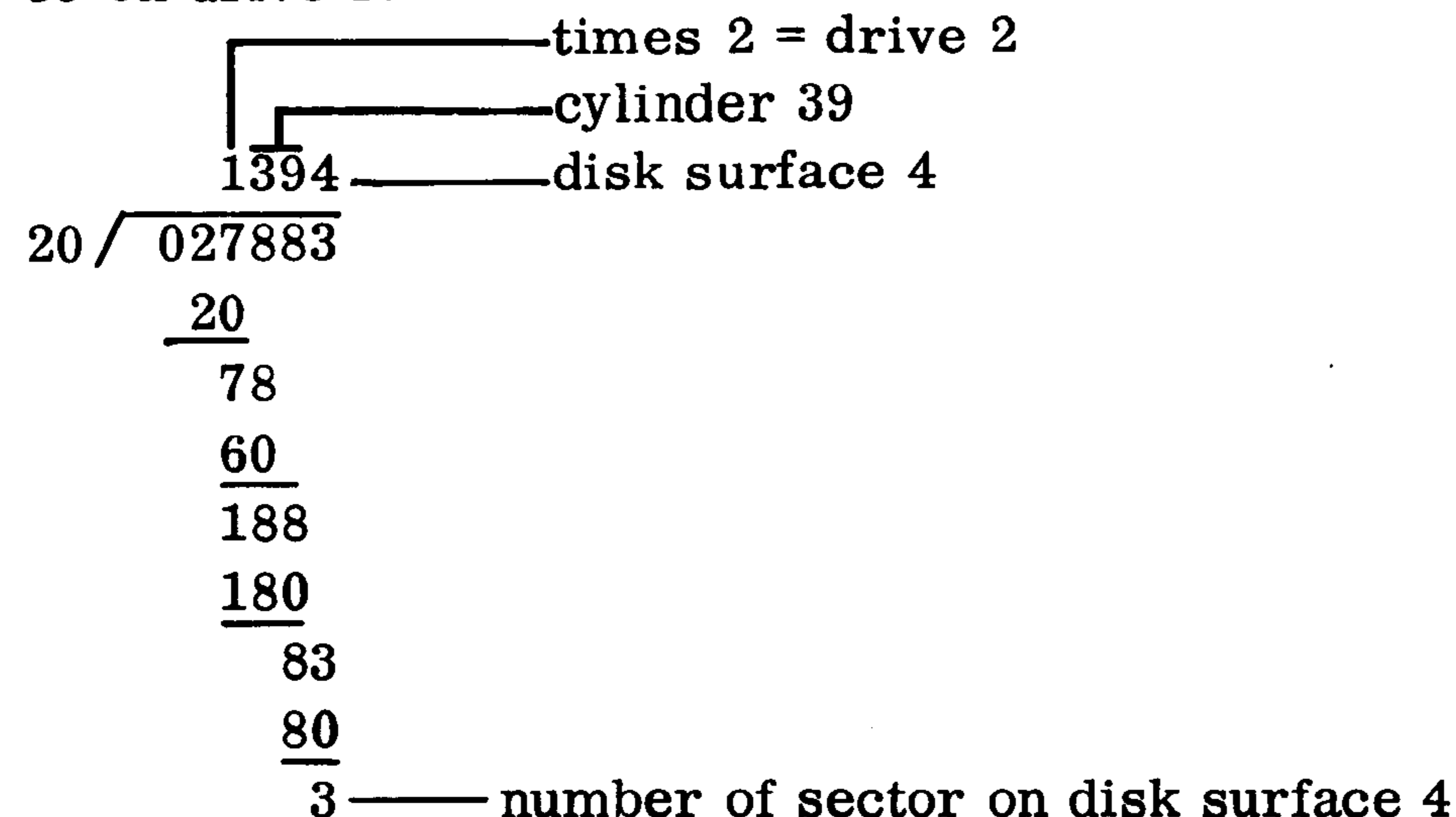
Delete the section "Cylinder Numbers" and insert:

Cylinder Numbers

Drive, cylinder, disk surface, and track sector numbers may be extracted from a disk control field as follows:

Divide the sector address by 20. Double the first digit of the quotient to obtain the drive number. The next two digits of the quotient are the cylinder number. The next digit is the disk surface number. The remainder is the sector number (00-19) on the track.

For example, sector address *027883 specifies sector 3 of disk surface 4 in cylinder 39 on drive 2:



A disk control field specifying an alternate drive overrides the drive number obtained with this procedure.

Add to end of manual:

ERROR RECOVERY PROCEDURES

The following procedures form the basis of the error recovery routines used in input-output programming for IBM Programming Systems packages. For efficient use of data processing systems, these procedures are recommended wherever possible in writing input-output routines.

Four status indications and two error indications sent to the 1411/7114 provide the information used to choose an appropriate action.

Status Indications

The four status indications sent to the 1411/7114 are listed in Figure 19 with the appropriate minimum action required:

Status Sent to 1411/7114	Error Condition	When Encountered During a Read Operation	When Encountered During a Write or Write Check Operation
Not Ready	The address mode switch is set to wrong position for a write operation. File unsafe. Control unit power off. Control unit disconnected. Disk Storage disconnected. Drive motor off.	Action 1	Action 1
Busy	Any access in motion (Basic). Addressed access in motion (Seek Overlap Option).	Action 3	Action 3
Data Check	Parity check. Write disk check.	Action 2	Action 2
External Condition	No record found. Absence of sector address compare subsequent to valid sector address compare.	Action 2	Action 2

Action 1

Notify the operator.

Action 2

1. Repeat the operation as necessary, up to four times.
2. If the error condition persists, issue a return to home seek to the desired cylinder.
3. Repeat the operation as necessary, up to four times.
4. If the error condition persists, use the message 2 format to notify the operator of the error. The application will determine further action.

Note: When a write check operation encounters a data check, the write operation immediately preceding the write check operation should also be repeated.

Action 3

Loop until Not Busy occurs; then resume program.

Figure 19. Status Indications and Error Recovery Actions

Error Indications

Wrong Length Record

A wrong length record indication unaccompanied by a status indication points to the need for a message print-out and an exit to the user's program for a routine suitable to the application. Use Message 2 format.

No transfer

When unaccompanied by a status indication, No Transfer is caused by the "Disk Write Switch" on the 1415 console not being set in the write position for a write operation. The following steps should be taken:

1. Direct the operator to check the position of the disk write switch on the 1415.
2. Enter a waiting loop.
3. Correction of the disk write switch enables the program to be restarted.

Statistics

Information about program/machine performance is maintained by the program for a print-out at the end of a program segment or other convenient interval, depending on the application. Message 1 format is used for statistics.

Diagnostic Aid

The program has two provisions for aiding the Customer Engineer in diagnosis of machine malfunction:

1. Each entry into an error routine is indicated by Message 2 format, or Customer Engineer is provided guidance in modifying program to obtain this print-out.
2. The Customer Engineer may obtain a statistical print-out at other than normal intervals.

Message 1

1. Message code (see below)
2. Module Number, Sector Count
3. Number of error routine entries
4. Number of errors that error routine could not correct

Message 2

Minimum: 1 through 4

Recommended where available core storage permits: 1 through 5

Maximum: 1 through 7

1. Message code (see below)
2. Type of error--Read, Write, or Write Check, plus 1311 mode of operation (Sector, Track Record, etc.)
3. Contents of sector count register and sector address register at completion of operation
4. Status indication(s) in 1411 or 7114
5. Mode--move or load.

- 6. Address of disk control field in core storage
- 7. Module, track number, and sector count

MESSAGE CODE

Message codes consist of five digits:

