

Mr. Kalsky

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FILE MEMO

I. The following description is a proposal for a Binary Serial Disk File setting down the actual characteristics desired. Association of such files with Binary Data Processing Systems, indicates the fundamental characteristic of binary addressing. Since production requirements for Project Saber are too restrictive for development, it is proposed that this file be considered for 1961 or 1962 release.

II. Physical Characteristics

Rotation	1800 rpm
Time/revolution	33 1/3 ms.
Tracks/disk	256
Information bits/track	18,432
7030 (ECC mode) words/track	256
# Disk/module (information)	16
# Disks/file (information)	64
# modules/file	4
# tracks/module	4096

III. Addressing

The bit segments which must be combined to form an address can be identified as follows:

- 8 bits - vertical cylinder designation
- 2 bits - Module (set of 16 disks plates)
- 4 bits - specific arm within module
- 1 bit - head
- 3 bits - record or sector level

An additional 3 bits, enabling the specification of one file from a set of eight, might be desirable.

The sector (or record) length is assumed fixed length for simplicity. This restriction arises from the lack of available plates for record length specification and from the assumption that truly variable length records are not presently possible, merely sector lengths per cylinder.

IV. Modal Operation

Two forms of logical usage are desirable in using a disk file. They may be designated as "random" and "sequential" modes.

The random mode will use the four access mechanisms independently. By making the "seeking" operation free-running it should be possible to permit one or more access mechanisms to be in motion concurrently. The transmission of data to or from the file need only occur from a single arm, however. In the random mode, it would be very desirable to permit "seek" instructions to proceed without regard to the status of data transmission if the access mechanism

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addressed is not involved in the transmission. Record sequencing, where the message length exceeds a sector, will be handled within the control unit, with the system's control "word" logic. Similarly track to track accessing could be handled, if required.

The sequential mode will use the access mechanism in an interlocking fashion. Where a given access mechanism is set to a specified cylinder (of tracks) the access mechanisms for successively higher track addresses will be positioned to the same cylinder. When the next track required is on the next inner most cylinder the top access mechanism will have been positioned prior to the required access. Thus data can be transmitted continuously as a successive set of bits with no interruption due to "seeking".

V. Checking

Between the 1st and 2nd modules and the 3rd and 4th modules will be disks available for checking purposes. An access mechanism may use one surface and checking will be optional. The form of checking will be write followed by read.

Since alternate access mechanisms are offset, no interference will occur on the check disk. Figure 1 attached will provide an indication of the logical nature of the file.

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VI. The above represents a tentative discussion of a possible binary serial file. Additional characteristics which should be evaluated are the possibility of additional access mechanisms and additional modified controls for the added access mechanisms. . One form of the modified controls would permit decimal operation on say 250 cylinders, using blocks of 15 arms. In such a scheme coordinated programming would be imperative. The binary side of such a file system would be able to use the non-decimal tracks for its own purposes.

Comments on the above would be appreciated.

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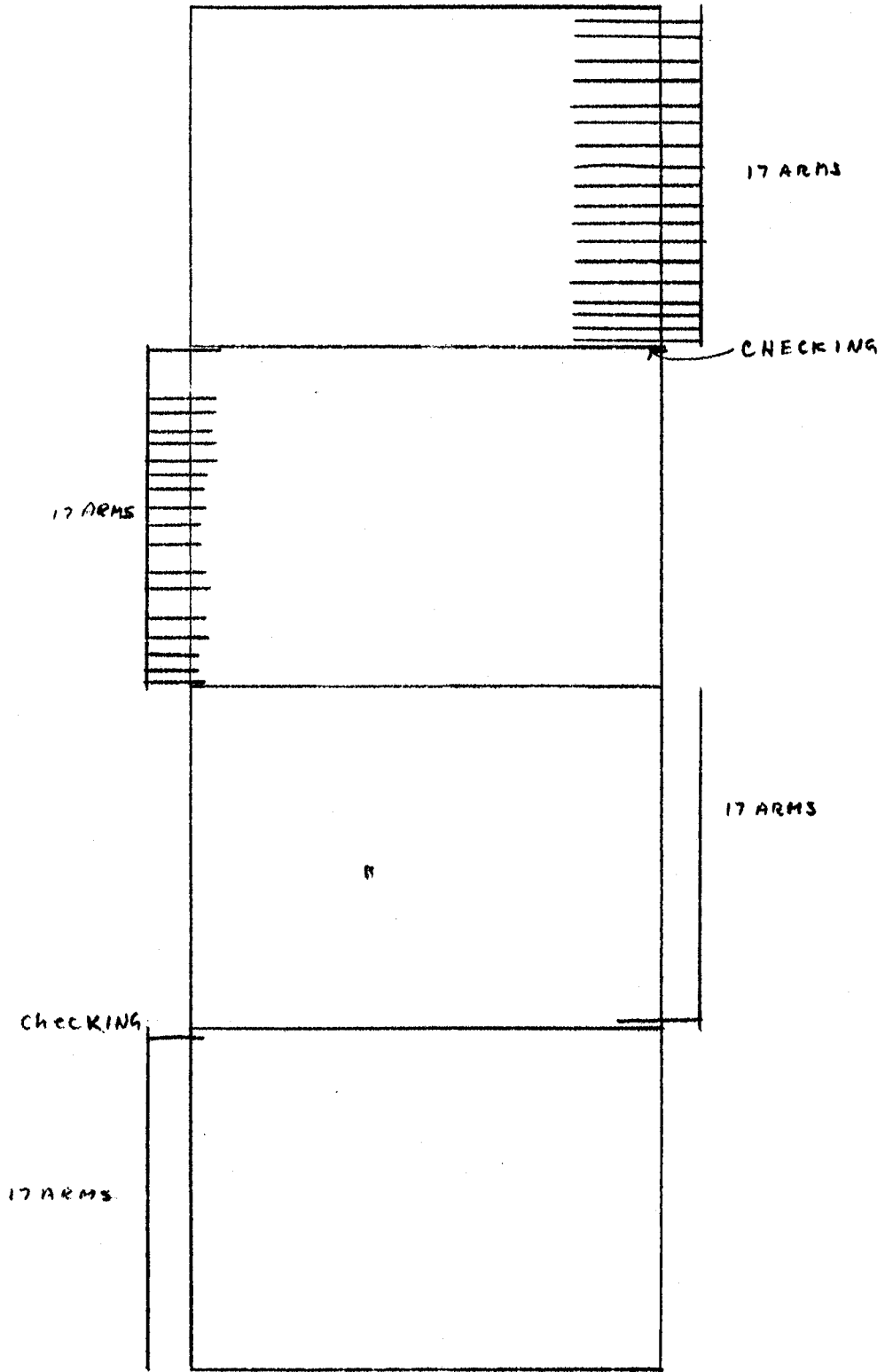


FIGURE 1