

POUGHKEEPSIE
Department 539
South Road Laboratory
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FILE MEMO

SUBJECT: Printed Documents with Microcode
BY: W. Buchholz
Reference: Memo on "Microcode" by S. W. Dunwell, of November 5.

(The following is an amplification of the microcode system described in the above memo.)

1. Document Reader

The serial document reader is assumed to be equipped with twelve stations for optically reading ordinary mark sensing with reflected light. For microcode reading, one of these stations will be equipped with two photo-cells to read double-track recording.

2. Double-Track Recording

The microcode characters will be printed on a chain printer, 10 to the inch on a single line. Each character consists of three vertical bars in either an upper (1) or lower (0) position. There are 8 such characters:

111	11 ¹	1 ¹ 1	1 ¹¹	1 ¹¹	1 ¹ 1	11 ₁	111	Bar pattern
0	1	2	3	4	5	6	7	

The double-track recording is self-synchronizing and, by taking the difference between the two outputs as the bit, relatively insensitive to background noise.

3. Reading

The bits will be entered serially into the Channel Adapter. 8 successive bits (2-2/3 microcode characters) make up a byte without gaps. Thus any binary information may be read. A 7-inch printing line (about 1 card) contains about 35 alphanumeric characters or a little over 3 words.

For initial synchronization it may be necessary to print a vertical line covering both tracks, such as an "absolute value" symbol, in a separate character position. A second such character may be used to terminate reading for that card, so that descriptive information may be placed to the right on the same line, if the entire line is not used for microcode.

H. G. Koloky

4. Checking

Check bits will not be printed since the double-track recording provides a check on each bit. Further checking or error correction will be done by programming in the computer.

5. Printing

The following character codes will be set aside in the extended-character version of the chain printer for printing the 8 microcode characters. These are the 8 positions for which there is no corresponding character on the typewriter.

<u>Octal</u>	<u>Bit</u>							
	0	1	2	3	4	5	6	7
0	0	0	0	0	0	1	0	0
1	0	0	0	0	0	1	0	1
2	0	0	0	0	0	1	1	0
3	0	0	0	0	0	1	1	1
4	0	1	0	0	0	1	0	0
5	0	1	0	0	0	1	0	1
6	0	1	0	0	0	1	1	0
7	0	1	0	0	0	1	1	1

Programming Note:

Bits 1, 6, and 7, in that order, contain the necessary binary information; the remaining bits are the same for all 8 codes. The expansion is readily obtained by an unsigned decimal LOAD (byte size 3 and offset 2), followed by an unsigned decimal STORE (byte size 8) provided the zone bits of the accumulator sign register have been loaded with 0001 beforehand. Two guard bits must be available to the right of the final memory field because zeros will be stored there.

WB/pkb

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