J. E. Griffith (signature)

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PROJECT STRETCH   COMPANY CONFIDENTIAL
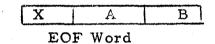FILE MEMO #13

Subject: Input/Output Operations Section II
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End of File Condition

1. The End of File condition will be operative only when the tape is
    in <u>Read</u> status.

    As soon as the End of File condition is detected, an immediate
    transfer of control is executed which uses another special
    location which is semi-permanently assigned to the tape unit.
    This special location is known as the End of File Word. The
    EOF word will normally succeed the Input/Output Control Word
    in memory. The EOF word will be made up as follows:

X	A	B

EOF Word

    where A = field in which the contents of the program counter
              are to be stored when EOF condition is detected.

          B = field whose contents are to be placed in the program
              counter when EOF condition is detected.

          X = field not used at present.

    Upon the detection of an EOF condition, the contents of the
    program counter are stored in field A of the EOF word
    associated with that tape unit, and the contents of the B
    field are transmitted to the program counter. Also, the
    selected tape will be disconnected from the buffer register.

    It will be necessary for the EOF routine to ascertain the
    exact conditions under which the EOF condition occurred.
    The EOF routine will also have to reload the program counter
    with the contents of field A in order to proceed with the main
    program.

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2. To write EOF, an instruction, write EOF m is given. This instruction causes an EOF mark to be written on tape m.

3. A backspace File command to allow backspacing over a group of files. The Backspace File command:

     Backspace   n   m

where n = number of files to be skipped over in backspacing
     m = address of tape unit

This command allows a tape to backspace over n successive records.

Section 3.

Stretch's input/output section is a modular system in both the vertical and horizontal direction. The number of buffer units may be increased, the amount and type of Input/Output units may be expanded, and the memory time required for servicing an Input/Output unit may be decreased.

One input/output control register and several buffer units will constitute a standard Stretch input/output system. If the user desires increased concurrent input/output operation, the number of buffer units may be increased without any change in the logical design of the system. Vertical expansion can continue until all of memory time is used for data transmission and the control of this transmission.

The number of input/output units attached to the several buffer units may be expanded until 99 units are connected. Units of different operating speeds may be attached without alteration of input/output routines. The buffer units and input/output control register will automatically adjust their operating speeds to the speeds of the various input/output units attached to the computer.

A horizontal improvment can be made by altering the components used to hold the input/output control words. When data transmission time is low relative to processing time input/output control words can be stored in standard core memory locations. Transmission of a word of data will require a maximum of 3 memory cycles. As the amount of time used for data transmission becomes higher, the control word locations can become high speed transistor registers. The minimum amount of time for data transmission can be achieved by attaching immediate access input/output control word registers.