

July 10, 1957

FILE MEMO

SUBJECT: Review of Exchange

BY: W. Buchholz

References: 1. Meeting report of July 3, 1957.
2. Memo on Exchange Busy Indicator, of July 9, 1957.

Of the 9 points listed in Reference 1, 6 questions affecting the Exchange were tabled. This is a progress report on these 6 questions.

1. Storage of instructions in the Exchange.

Reference 2 deals with this point, which has thus been resolved.

2. Reading multiple blocks with single control word.

It appears desirable to detail this feature since there is no reason apparent why it would not be practical. If during the detailing the Exchange design group encounters undue complexity, the feature will be questioned again. Meanwhile, we will assume this feature to work as follows.

Two additional instructions will be needed:

READ MULTIPLE BLOCKS
WRITE MULTIPLE BLOCKS

These instructions continue reading and writing operations until the control word (or control words if scatter-read, scatter-write are provided) indicates the end, even if this covers more than one block.

If the last word of a block being read is not complete, the Exchange will fill it with zeros before proceeding to the next block. Thus, each block starts at the beginning of a word, in the same manner as if a new READ instruction had been given for each.

At the beginning of each block, as defined by a start-stop gap on tape, a card cycle, a line print cycle, etc., the Exchange stores the current value of the control word in an auxiliary location in the Exchange memory for safe-keeping in case of an error within

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the block. This permits programmed re-reading or re-writing for units which can be backspaced one block, thus starting new operation at the block in error even if the instruction covered multiple blocks. A control word address of zero in an instruction is decoded by the computer to energise a special line to the Exchange which then refers to the auxiliary Exchange memory location for the initial control word. This feature will not be provided for low-speed units.

3. Storage of control words to indicate data word in error.

This feature was found impractical because many errors cannot be localized to the exact word and will be discovered only at the end of the block. On reading, an erroneous block will usually appear in memory for what use can be made of the information.

4. Automatic backup of tape for error correction.

With the error correction feature described under 2, programmed backup will be relatively easy. Not much more would be needed in the Exchange to provide automatic backup, but it becomes an elaborate tape control problem. It is suggested that we not provide this extra feature unless we find more evidence that it will pay its way.

5. Storage of interrupt signals.

This is still to be reviewed.

6. Scatter-read and scatter-write.

One suggestion has been made to make this feature available for high-speed units by writing a dummy word between records. This would permit separating data word and control word cycles so that they can use the same time slots in two successive word cycles. This is still being reviewed.