October 1, 1958

FILE MEMORANDUM

SUBJECT: Identification of Unit Signals from 729 Tape Units

1. 729 Tape Units, develop a READY status under two conditions.
   (a) Depression of START button following a loading operation.
   (b) Completion of a REWIND.

   As presently defined, this status is not recognized by the data processing system until a Tape Unit is selected for some particular operation.

2. This method of operation is excessively restrictive when used in connection with systems having interruption facilities. Programs concerned with supervisory operation of the system and multiprogramming techniques require that the individual units attached be capable of informing the system when they are readied.

3. The following, indicates a method for correcting the deficiency indicated above. It is believed that this will allow a minimum of change to existing 729 tape units designs.
   (a) Each tape unit, connected to the adapter unit, on the vise of a READY condition, will turn on a binary trigger in the adapter unit. A trigger must be supplied in the adapter, for each tape unit attached. Numbering the triggers from right to left each tape unit should turn on the trigger corresponding to its logical unit number, as determined by the selector switch on the tape unit. After the vise of Ready the signal should be disconnected from the trigger input.

   (b) If not tape unit connected to the adapter are in use when a READY signal is received, the adapter trigger should be set on. For the first such signal received when the adapter triggers have all been reset, the signal should be passed on to the unit signal status bit in the Exchange control word. Subsequent READY signals would then only turn on the associated adapter trigger until the set has been reset.

(c) If another tape unit connected to the adapter is in use when a READY signal is received the same procedure can be followed. (Provided the Exchange needs no extra cycles).

(d) To supplement this determination in hardware requires the ability to LOCATE to the adapter unit. After selection of the adapter unit a READ command will send the current contents of the Adapter triggers over the data channels to the Exchange. The adapter should then signal the end of message and reset the triggers. Any operation other than READ, sent following the LOCATE to the adapter should reset the triggers and send end of message to the Exchange, and an Exchange Program Check.

4. One program for handling this scheme in the program is given for illustration.

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        STIC    L(IC)          Store Instruction Ctr
        BDS     α1             Branch Disabled
         ⋮

α1      LOC     1000             (1000= Address of Adapter Unit).
        BIN(UB) α1             (Bran. if ON)
α2      RD                     (Associated CW specified 1 WD = α2)
        BIN (UB α2             (Branch if ON)(Set to OFF)
        CNT (0011)
        BIN (Z)                (TEST word received
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Following this we may reenable the system or set up the information as desired.

5. In addition to the requirement for signaling READY to the system it is extremely important and desirable that the system, through programming, be allowed to perform the operation Rewind-Unload.

This command would cause a tape unit to rewind as usual. Upon completion of Rewind the READY signal would be suppressed and the Unit would automatically Unload.

Suppression of READY signal, while apparently equivalent is not sufficient. It increases the probability of operator error to a near certainly, since simply pressing the START button would READY the unit.

REWIND-UNLOAD requires positive action on the part of the operator and minimizes the possibility of confusion.

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