June 13, 1958

MEMO TO: Mr. D. W. Sweeney

SUBJECT: RELEASE instruction and EOS mode

A meeting on this subject was held today and Messrs. Buchholz, Gibson, Coffin, Podegs, and myself attended.

Facts

The following facts were brought to light:

1. With RELEASE defined as in the latest manual it is impossible to clear a control word in the Exchange of I/O status bits when operating with the interrupt system disabled. It is then impossible to issue any new instruction for this channel keeping the interrupt system disabled.

   This is a particular disadvantage when bringing a program to a halt in order to carry out some unpreplanned console activity.

2. When an I/O operation is carried out in the EOS mode and a unit check occurs, it is not possible to distinguish the two cases: the interrupt UK alone on one hand and the interrupts UK and EOP together on the other hand.

   The implication is that, if a repeat is to be attempted, the control word chain must be inspected even if the operation was actually completed.

3. With RELEASE defined as in the latest manual it is necessary to wait for the EOP for the RELEASE instruction itself before one may switch to using another tape unit on the same channel of the basic exchange.

   Project Rancho claims to have an application in which the data read from tape may indicate that no more information is required from the current tape block and that a fast switch should be made to another tape unit.

4. In order to program the EOS mode for a particular READ or WRITE instruction (instead of assuming the EOS function to be built in), the following situation must be considered:

1. Interrupt system enabled.
2. Issue READ for channel X.
3. Set "programmed suppress bit" for X on.

Between steps 2 and 3 an IQS/US interrupt occurs. Control does not return to step 3 before the channel X operation is completed. Hence, its EOP is not suppressed.

To remedy this one may operate as follows:

1. Disable interrupt system.
2. Issue READ
3. Test for EKR, UNR and UB.
4. Set "programmed suppress bit" on.
5. Enable interrupt system.

5. One of the uses of RELEASE is so that an I/O operation which is stuck in a control word loop can be terminated without waiting for the end of I/O medium.

Conclusions:

1. The EOS type I/O operations presently defined should not be eliminated.

2. The most desirable type of RELEASE is that which wipes out the I/O status bits (other than the READY bit) and does not hold up the CPU. This type of RELEASE should either be added to or substituted for the one defined in the latest manual. Addition is preferred to substitution. Dr. Buchholz agreed to investigate with the Exchange engineering group the possibility of implementing these choices.

P.S. It has now been agreed that both RELEASE and RELEASE EOS will be defined for the high, medium and low speed exchanges.

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