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TO: Limited Distribution

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TITLE: Conventions for Information Transfer over the High Speed
         Channels on the IBM 7750, within the Compatible Time-Sharing System

Within the Compatible Time-Sharing system it is possible to include remote I/Ø units which communicate with the 7090 via Data-Phone (DP) lines. These remote I/Ø units appear as such to the Time-Sharing System but in reality may be other high-speed computers.

The bit configuration of a character transmitted over the DP full duplex lines is as follows.

a. Bit 1 - timing bit. This bit is always a logical one.

b. Bit 2 - Control bit.

    A logical 0 indicates control information.
    A logical 1 indicates normal information.

c. Bits 3-8-information character of 6 bits.

d. Bit 9-parity bit. This bit is set to insure that an odd number of logical ones is present in the 10 bit character.

e. Bit 10 - Stop bit. This bit is always a logical zero.

Bit configurations of the 6 bit control information necessary for communication via the DP lines are as follows:

A. 00 Idle control character. In order to satisfy certain hardware requirements, characters must be transmitted continuously over both sides of the full-duplex DP lines. This character is to be ignored. The complete 10 bit character is the following 1000000000_2

B. 01 Receipt of this character indicates that the previous message transmitted was found to be in error. Retransmission of the message should occur.

C. 02 Receipt of this character indicates that the previous message transmitted was not in error.

D. 03 Confirmation control character. Receipt of this character indicates that the last control character transmitted, exclusive of the control character 03, was received.

E. 04 Buffer control character. This character is transmitted by a unit when it is ready to receive a new message.

F. 05 This character is used in a physical message to indicate that this message is being transmitted for the first time.

G. 06 This character is used in a physical message to indicate this message is a repeat.

H. 07 End of Message Character. This character is used to flag the end of a physical message.

The format of a message to be transmitted over the DP line is as follows:

a. Character 1 - Message headers. This control character indicates the status of a message:

1. The character is 05, the message is being transmitted for the first time.

2. The character is 06, the message is being retransmitted.

b. Character 2 - Count. This number is the count of all non-control characters.

c. Character 3 - Logical Unit Number. This number is used to dispatch messages to sub-units operating under control of the unit attached to the DP lines.

d. Characters 4-n - These characters are the body of the message.

e. Last character - End of Message Character. This control character signals the end of a physical message.

In order to insure that transmission of information over the DP lines is reliable, the following conventions apply:

1. The 7750 will be in charge of all information flow.

2. The 7750 will count character times when a response is expected. If the response is not received in this time, dependent on the particular I/O unit attached, the 7750 will assume an error and retransmit the previous message or a "message in error" control character.

Six cases of information flow are listed on the following page. Note that in cases where large amounts of information are to be transmitted, fewer control characters are needed to establish continuous communication.

Examples of Message Transmission Between the 7750 and a Unit via the Data-Phone (DP) full-duplex lines

CASE I	CASE II
(7750 → DP)	(7750 ← DP)
MESSAGE →	← MESSAGE
← 02	02 →
	← 03

CASE III	CASE IV
(7750 → DP)	(7750 ← DP)
MESSAGE →	← MESSAGE
← 01	01 →
Repeat of CASE I or	Repeat of CASE II or
CASE III	CASE IV

CASE V	CASE VI
(7750 → DP)	(7750 ← DP)
04 →	← 04
Follow by	Follow by
A. ← 03	A. 03 →
or	or
B. CASE II or CASE IV	B. CASE I or CASE III