



8B1 DATA SELECTIVE CALLING  
(FULL DUPLEX)  
GENERAL DESCRIPTION AND OPERATION

1. GENERAL

1.001 This addendum, which supplements Section 581-120-101, Issue 1, is issued to add information pertaining to the reception and implementation of a group CDC. The group CDC is used to enable two or more data selective calling stations to receive a broadcast transmission.

1.002 Insert the attached pages in accordance with the filing instructions above. Arrows in the margins indicate changes and additions.

Attached:  
Page 5 dated August 1966, revised  
Page 6 dated August 1966, reissued

## CALL DIRECTING CODES (CDC) AND RESPONSES

2.05 When the data communications processor has a message available for transmission, it will transmit the CDCs on the receive leg, pausing after each CDC for an answer-back response on the send leg. The CDCs provide a means for selecting one or more receiving units on the receive leg.

2.06 A called receiving station, if capable of receiving message text, will respond with a \ ACK code sequence. If the receiving unit is in a low tape or low paper condition, the station will respond with a maintenance code sequence, BELL BELL, on the send leg. A BELL BELL response will occur only if the specific receiving unit is in a maintenance condition.

2.07 A Call Directing Code consists of any two alpha-block characters with code levels 6 spacing and 7 marking. If only alphas are permissible, then 26<sup>2</sup> or 676 combinations are possible. If a mixture of alphas and symbols are permissible, 32<sup>2</sup> or 1024 combinations are possible. A CDC is assigned to each receiving unit on the receive leg. A group CDC can be assigned to all receivers for receipt of a broadcast transmission.

Note: When a group CDC is assigned, only one station can be permitted to provide the answer-back response. Therefore, the answer-back response must be suppressed at all other stations encoded with the group CDC.

## NULL CODE

2.08 The NULL code is generated by the data communications processor. The station controller logic is designed to temporarily disconnect a sending tape reader or selected receiving unit(s) upon receipt of a NULL code. This renders both legs idle for subsequent polling or selective calling by the data communications processor. An EOA code reactivates the interrupted tape reader or selected receiving unit(s).

## END-OF-ADDRESS (EOA) CODE

2.09 An EOA code, transmitted by the data communications processor, will place all selected receiving units in the PRINT or PUNCH condition and all unselected receiving units in the NONPRINT or NONPUNCH conditions. An EOA code will also cancel a previously transmitted NULL code in order to re-

store activity on the send or receive leg. In this system an EOA code is followed by a DELETE (same as RUBOUT) character; the DELETE provides time for connecting a tape punch.

## XOFF CODE

2.10 When an outlying station's tape reader starts sending, it will continue to operate until the tape ends and the tape-out pin rises. The message preamble and text will be transmitted without interruption (except when temporarily interrupted by a NULL on the receive leg for a subsequent selective calling function). Should a tape reader tend to monopolize the send leg or send garbled information, the data communications processor can generate an XOFF code to disconnect the tape reader. A TSC would then be required to restart the disconnected reader.

## END-OF-TRANSMISSION (EOT) CODE

2.11 An EOT code when transmitted from an outlying station on the send leg, is received solely by the data communications processor; it cannot affect activity on the receive leg.

2.12 However, when an EOT code is transmitted by the data communications processor on the receive leg, it will disconnect the selected receiving devices and introduce the SELECT, NONPRINT mode to all receiving stations. It will not affect the activity on the send leg.

## FORMAT EFFECTOR CODES

2.13 ASCII control codes can be used with 8B1 station sets. When sending a horizontal tab, vertical tab, or form-out function from an outlying station, no special buffering character is required on the tape. However, the data communications processor must enter a multiple number of buffer (DELETE) codes after each tab or form-out function, or must pause for the duration of each form effector function. Horizontal tabulation requires one buffer character per three character spaces of tabulation; vertical tabulation requires one buffer character per six lines of tabulation.

## 3. OPERATION

### INTERRUPT SEQUENCES

3.01 Special control sequences must be generated by the data communications processor on the receive leg in order to stop a reader or interrupt a receiver. If selective calling is to be performed, the send leg must become idle to allow a called station to send an

answer-back response. If polling is to be performed, an outgoing message from the data communications processor must be interrupted to allow the processor to send TSCs on the receive leg.

#### A. Send Leg Busy; Receive Leg Idle

3.02 In order to stop a busy reader and start a receiver, the processor must generate a NULL DELETE sequence on the receive leg. The code following NULL may be a DELETE character or at least 70 milliseconds idle line pause so that the reader has time to stop. At the conclusion of processor generated CDCs and station generated answer-back responses, an EOA DELETE sequence will restart the reader and activate the receivers. NULL DELETE is a customer implemented option.

#### B. Send Leg Idle; Receive Leg Busy

3.03 In order to temporarily stop a busy receiver and start an idle reader, the processor must generate a NULL DELETE sequence on the receive leg. The DELETE may be a complete permutation or at least 70 milliseconds idle line pause to cause all receiving printers to enter the NONSELECT, NONPRINT mode and all receiving punches to turn off. The processor can then send a TSC for starting the reader followed by an EOA DELETE for reactivating the receivers. NULL DELETE is customer implemented.

#### C. Send and Receive Legs Busy

3.04 In cases where a reader is monopolizing the send leg with a long multiple message tape, it may be necessary to disconnect the reader and poll another station reader. The processor should not interrupt the reader during message transmission, but should wait until an EOM (End-Of-Message) or EOT is received before sending a NULL DELETE code sequence. Both the reader and the selected receivers will be temporarily deactivated with the NULL DELETE sequence. The processor can then send an XOFF to disconnect the reader.

Note: If the receive leg is idle when disconnecting a reader, the processor need not generate the NULL DELETE sequence.

A different TSC will start another reader; a subsequent EOA DELETE sequence will reac-

tivate the receivers. A disconnected reader must be repolled with a TSC in order to send again.

#### D. Send and Receive Legs Idle

3.05 The special interrupt sequence (NULL DELETE) is not required if both legs are idle when polling or calling. The processor, upon recognizing the idle legs, can poll the readers with TSCs or call the receivers with CDCs.

#### E. Operating Sequence

3.06 A sequence of events for full duplex operation is shown in Figure 2.

#### FUNCTIONS OF DATA COMMUNICATIONS PROCESSOR

3.07 The following functions must be performed by the data communications processor: (The processor sends on the receive leg and recognizes on the send leg.)

- (a) Send TSCs.
- (b) Send XOFF.
- (c) Send NULL DELETE sequence.
- (d) Send CDCs.
- (e) Send EOA DELETE sequence.
- (f) Send text.
- (g) Send EOT on the receive leg.
- (h) Recognize idle line, EOM and EOT on the send leg.
- (i) Recognize answer-back code sequence.
- (j) Recognize no-traffic response.
- (k) Recognize maintenance response.
- (l) Continually police the send and receive leg traffic.
- (m) Purge all NULL codes from send leg to prevent transmission on receive leg.
- (n) Add DELETE codes or equivalent pause after form effector codes (vertical tab, horizontal tab, and form out).