COMMUNICATIONS DISPLAY INTERFACE

MODULE CDIF810

DESCRIPTION AND PRINCIPLES OF OPERATION

CONTENTS PAGE

1. GENERAL

1.01 This section provides the description and principles of operation for the communication display interface module CDIF810, Figure 1. Field change notice information (TCN 1516 and 1518) was reviewed and did not affect the content of this section.

1.02 Information in this section was formerly contained in Section 578-110-100, Issue 1 dated November 1970 which was a Limited Printing BSP. Limited printing practices were formerly printed and distributed by Teletype Corporation on a need-to-know basis. The limited printing practice for the CDIF810 module is canceled and replaced by this practice which includes the latest information available at this time.

1.03 Issue 1 of this practice represents the first standard printing available for general distribution in the Bell System.

2. DESCRIPTION

2.01 Installing the module on a send/receive device such as the 2511 CDT or the DATASPEED* 40 provides the set with a receive interface that permits interfacing with a Series 2550 Cluster Controller and a magnetic tape terminal, such as TELETYPE® 4210 Magnetic Tape Terminal (MTT). Figure 2 depicts a block diagram showing equipment interconnection to the CDIF810 module.

2.02 Module operation is best explained by stating that the output interface is that end of the module that connects to the receive port of the CDT or DATASPEED 40 send/receive device, Figure 3. This interface uses an MC976 driver circuit card that operates according to TELETYPE Parallel Terminal Interface (PTI). For additional information, refer to 1976CD provided in the module wiring diagram package.

2.03 The input portion of the module has two MC969 PTI signaling terminator circuits wired to dual connectors to provide an interface for connection of customer cabling linking the devices to the module.

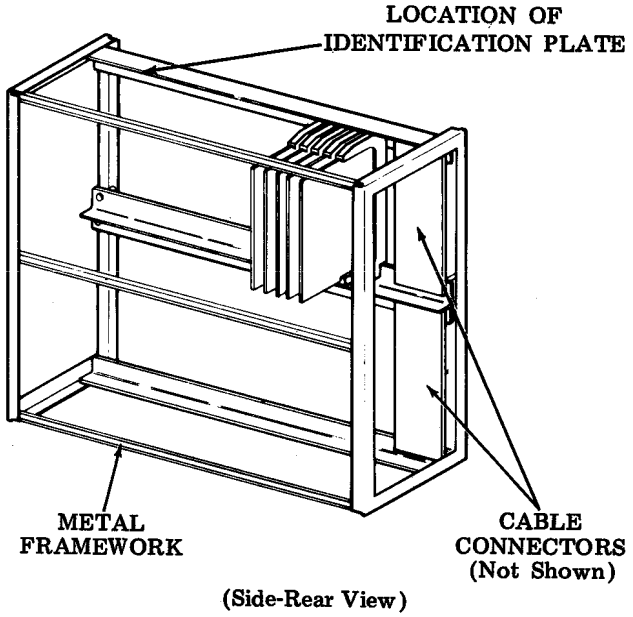

Figure 1 - CDIF810 Module

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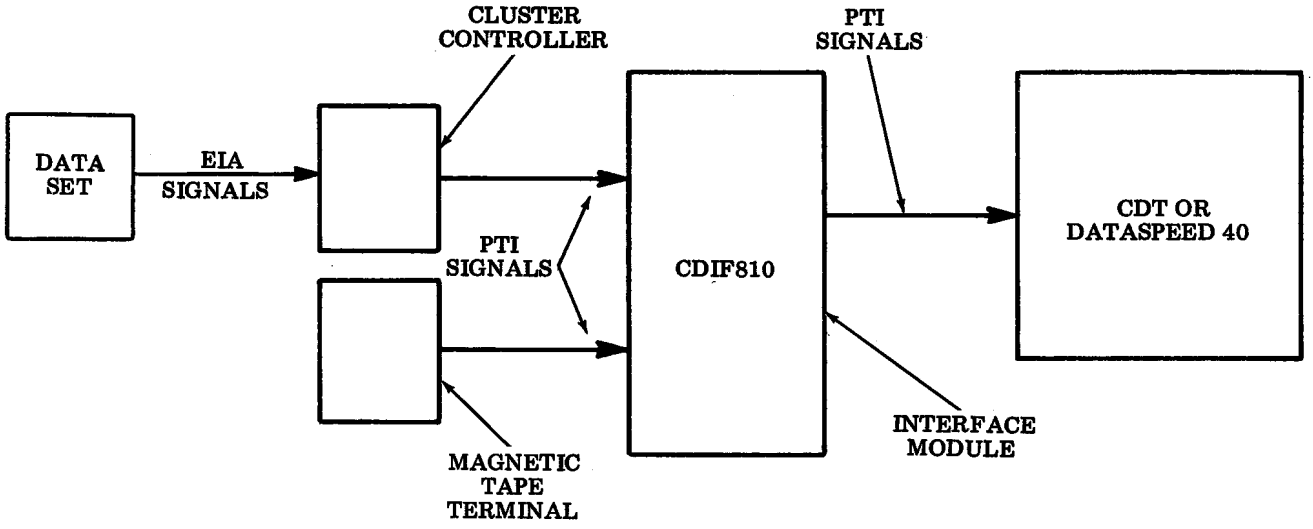

Figure 2 - Block Diagram of Equipment Interconnected to CDIF810 Module

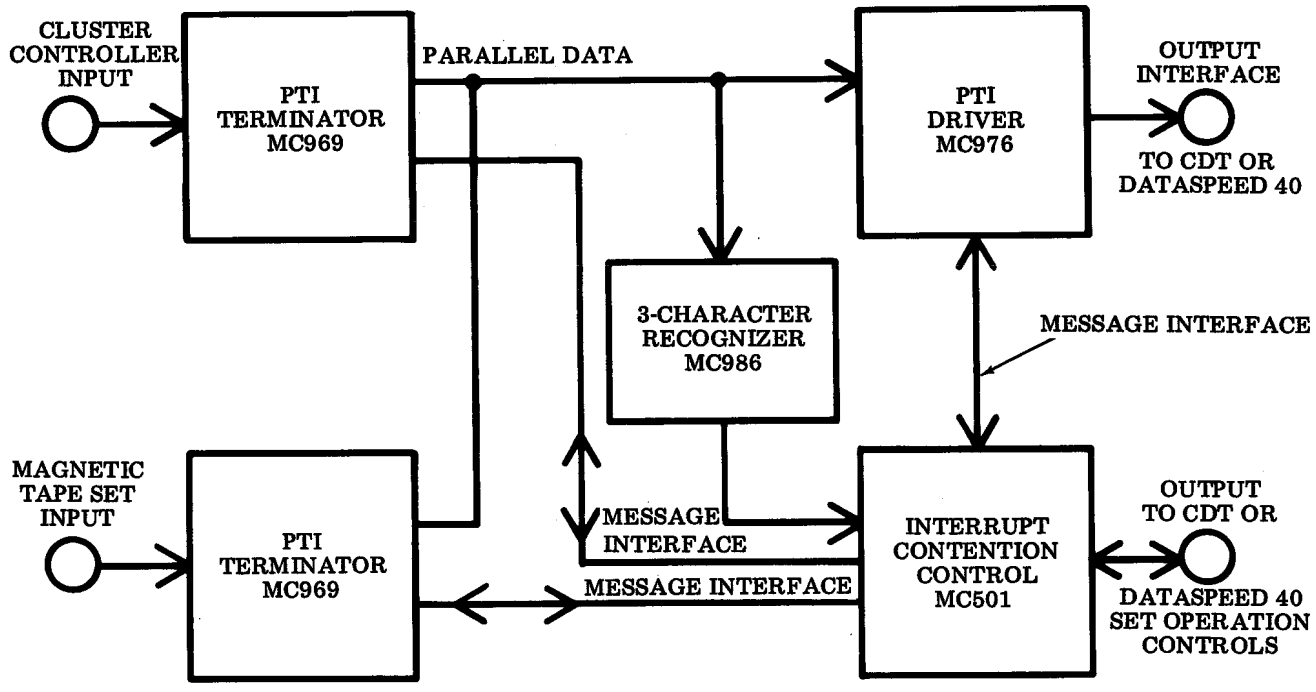

Figure 3 - Diagram of CDIF810 Circuitry

2.04 Between the module input and output interfaces are the control electronics. The control electronics respond to signals generated by the set attendant operating certain operational controls on the set.

2.05 If an attendant desires to receive data from a local device, such as the 4210 Magnetic Tape Terminal, depressing the appropriate set operational control (usually a REC MAG TAPE or EXT RELS button) conditions the CDIF810 electronics for interrupt operation. Interrupt operation allows the data to flow from the modules magnetic tape input to the receive port of the set. During this time the other receive interface is held inactive. The other interface connects to the station 2550 Cluster Controller. While the MTT interface is on, the interface to the cluster controller is signaled that the main edit set is not selectable for receiving incoming data.

2.06 A CDT or DATASPEED 40 send/receive device equipped with the CDIF810 module is normally used to provide a main edit facility for a cluster controller station. If the cluster controller should experience operation difficulties with its remote computer station due to a line problem or other circumstance, it can be operated in standby. Standby allows the peripheral CDT or DATASPEED 40 sets of the cluster controller station to continue their normal work assignments. All sent data is received by and stored on magnetic tape in the 4210 Magnetic Tape Terminal.

2.07 When standby operation is turned off to restore normal operation, the attendant at the main edit send/receive device retrieves the stored data. Stored data is received from the MTT set when the attendant conditions it for sending and depresses either the EXT RELS or REC MAG TAPE button on the main edit set. This action automatically places the main edit set into receive and lights both set buttons to indicate the action. When the ETX message ending character is detected, the set is removed from receive and returned to local operation. In local, the message can be checked for errors, corrected if necessary, and then transmitted from the main edit terminal to the remote computer station using normal line procedures.

BASIC UNIT

2.08 The CDIF810 interface module accepts and transfers parallel form data signals using PTI signaling. Eight information or data bit levels are used in the interface in addition to message and character control signaling.

2.09 The module is of an open metal frame type of construction which houses circuit card receptacles and connectors for connection of cabling to the interfaces and power cables.

2.10 When used with a CDT set, the module is installed in the lower half of the CDT cabinet on a pull-out type module shelf. In this arrangement, electrical power to operate the module is supplied by a low voltage power supply located in the set cabinet.

2.11 In operating arrangements with a DATASPEED 40, the module is usually located in a TELETYPE Series 2541 Buffer/Interface Set. Electrical power to operate the module is supplied by the 2541 Buffer/Interface Set power supply.

TECHNICAL DATA

A. Physical Characteristics

Dimensions and Weight (approximate):

Height	14 inches
Width	6 inches
Depth	15 inches
Weight	15 pounds

B. Electrical Characteristics

2.12 The input voltages to the module are as follows:

+ 5 volts dc	+10% at 70°F (ambient)
+12 volts dc	+10% at 70°F (ambient)
-20 volts dc	+10% at 70°F (ambient)

2.13 The module may be operated in an environment of 0 to 90 percent relative humidity, and at an ambient temperature of +40° to +110°F. Storage temperature is -40° to +110°F.

3. PRINCIPLES OF OPERATION

Data Input Interface

3.01 Incoming data to the interface module is sent from either the cluster controller or the magnetic tape terminal. The data bit signaling is in parallel form and conforms to the 7-level ASCII (American National Standard Code for Information Interchange); the 8th-bit level is used for parity. PTI signaling is a current sensitive interface that is insensitive to the voltage on the signal line.

3.02 In PTI signaling, the presence of current (typically 20 mA) indicates a space on the data lines or an on condition on the control signal lines. The absence of current (typically 3 µA) indicates a mark on the data lines or an off condition on the control signal lines. (Refer to 1969CD for a more detailed description of the PTI input signaling requirements.)

3.03 The interconnecting cabling from the cluster controller and the magnetic tape set must not exceed a maximum of 1000 feet for each cable. The cable length is restricted to the requirements of the PTI signaling.

Data Output Interface

3.04 The output interface from the module to the main edit send/receive device receive port also operates using parallel data bit signaling as described in 3.01. The data signaling and message control interface signals conform to the PTI signal characteristics described in 3.02. For more information concerning the module output signals, refer to the PTI driver circuit card description provided in 1976CD that is included in the set wiring diagram package.

Normal Operation

3.05 The TP322501 (MC501) interrupt-contention control circuit card in receptacle position ZB113 performs the central functions of the module. This circuit card in the normal operating state inhibits all interface control signals between the send/receive set and the magnetic tape set while passing all interface signals between the send/receive set and the cluster controller. See 3.11 for a description of interrupt operation.

Receive

3.06 When the main edit set is in receive, Figure 4, it presents a receiver selectable signal to the module at JB201 connector. From the connector the signal is passed to the MC976 card located in module position ZB115. From the driver circuit card it is then applied to the MC969 PTI terminator card located in position ZB117. The signal then passes through the MC969 and is applied to the cluster controller through the output at connector JB101. Selectable signal informs the cluster controller that the main edit device can receive an incoming message.

3.07 If the cluster controller has an incoming message, it responds to the selectable signal by returning a message (M) signal. This signal is received from the cluster controller at JB101 connector, passed through to the MC969 circuit card, MC501 card, and MC976 card to the main edit set connected at JB201 connector output.

3.08 When the main edit set senses the message signal it responds by sending the ready (R) signal and next character (NC) signal. The R signal is passed in a manner similar to the S signal, while the NC signal is applied directly from the MC976 circuit card to the MC969. When the cluster controller receives the R and NC signals, it presents the first character on the signal lines and activates the character available (CA) signal. The CA signal passes directly through the MC969 and MC976 circuit cards.

3.09 After CA signal is activated, the set accepts the data character and responds by turning off the next character signal. The cluster controller acknowledges that the set has received the data by turning off the CA signal

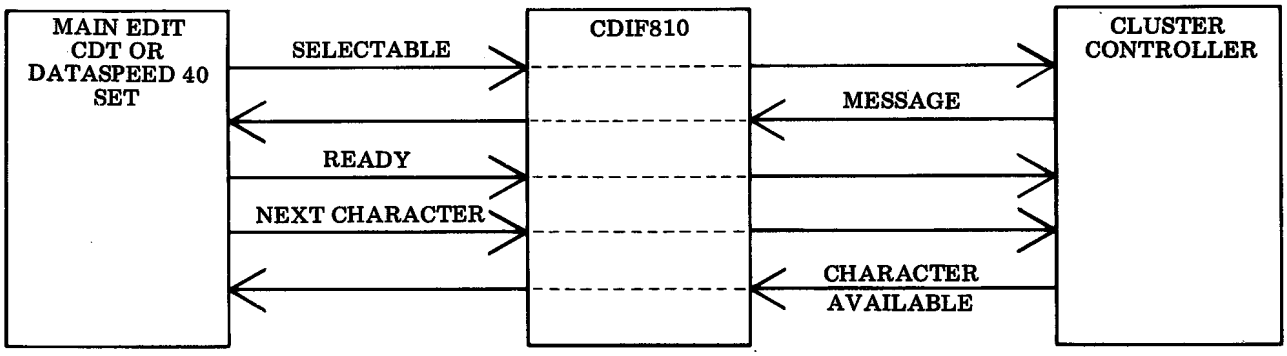

Figure 4 - Receive Message Interface

(detected NC off). The set logic detects that CA is off and it then requests the next message character by activating the next character signal. The NC-CA sequence is continued until the entire message is transmitted to the main edit set.

3.10 Normal operation with the cluster controller ends as described in the following.

(a) The cluster controller environment dictates that a data message always ends with an end-of-text (ETX) delimiter character.

(b) After a NC-CA sequence places ETX character on the data lines, the main edit set will activate NC again.

(c) The cluster controller ignores the NC signal and performs the error control sequence. At this time the CC has the capability of forcing the main edit set into local. If the set is forced into local, the S, R, and NC signals deactivate the M signal and the interface that was established is destroyed.

(d) To reestablish the interface, the main edit set must be placed into receive and the interface signaling described in 3.06 through 3.09 must be performed.

Interrupt Operation

3.11 In the interrupt operation (described in 2.05), the MC501 circuit card described in 3.05 inhibits all interface control signals between the main edit set and the cluster controller while passing the interface control signals between the set and magnetic tape terminal. (Refer to 1501CD for a more detailed description of operation.)

3.12 The establishment of the data channel from the magnetic tape to the main edit set, Figure 5, is as follows.

(a) When the attendant operates the EXT RELS or REC MAG TAPE button on the main edit set, the signal is applied from JB401 (input from set) to the MC501 circuit card. This input activates the receive and associated set control button (EXT RELS on CDT; REC MAG TAPE on DATASPEED 40) lamp signals which are applied to the main edit set controller module through B module connector JB402. The set, upon receipt of this signal, should go into receive and cause both the REC and EXT RELS or REC MAG TAPE indicator lamps on the set control panel to light. Lighting of these two lamps is visual indication to the attendant that interrupt operation has been established.

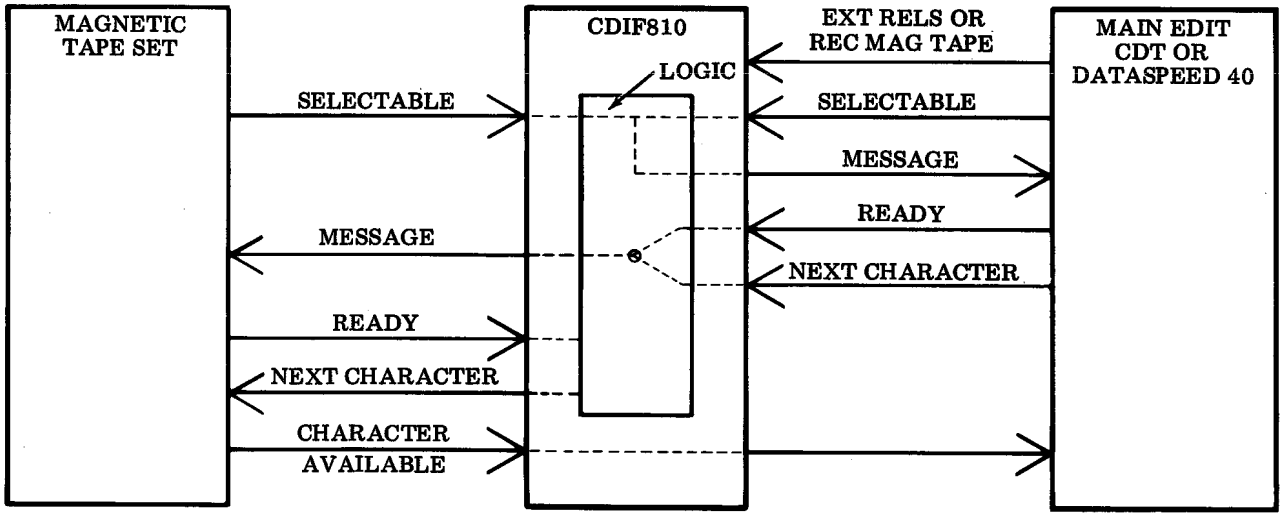

Figure 5 - Interrupt Operation Message Interface

(b) When the magnetic tape is ready to transmit data, it will turn on its selectable (S) signal to the module connector JB103. The module passes this signal through the MC969 card in ZB116 to the MC501 circuit card. Concurrently, the main edit set has its selectable on to the module at JB201 which passes through the MC976 circuit card to the MC501 circuit card.

3.13 Receipt of the magnetic tape set selectable signal at the module MC501 card causes the card to generate a message (M) signal to module output connector JB201. This signal causes the main edit set connected to JB201 to activate the R and NC signals. The R and S signals from the main edit set are received by the MC501 card and combined into a message signal that is sent to the magnetic tape set via connector JB103. The NC signal to the magnetic tape set is inhibited on the MC501 during this time.

3.14 In response to the M signal from the main edit set, the magnetic tape set turns on its ready (R) signal. When the module receives the ready signal, it releases the inhibit placed on the sets NC signal (3.13). With the transfer of signals just described, the interface is established. When the magnetic tape set responds to the next character request with a data character and an active CA signal, the message transfer sequence of CA and NC signals begins as described in 3.06 through 3.09.

3.15 The data ending sequence for interrupt operation is as follows.

(a) When the ETX message delimiter is detected at the MC986 3-character recognizer circuit card located in module position ZB114, a negative pulse is generated to the MC501 circuit card.

(b) This signal causes two functions to be performed simultaneously. First, the NC signal request from the send/receive set is inhibited. This insures that no character after the ETX will be requested. Second, the receive data acknowledge (RDA) (MTT) output is activated. This signal simulates the operation of the cluster controller, forcing the set into local, and performs a clear from cursor function.

(c) The local operation condition forces the set to deactivate its S, R, and NC signals. This in turn causes the MC501 to deactivate the M signal to the MTT.

(d) When this M signal is deactivated, the MTT deactivates its R signal.

(e) Since the set is in local, the local lamp signal at JB401 is on. This signal is used by the MC501 to reset the interrupt mode of operation.

(f) Once the local lamp signal is on, the interface module restores direct access to the cluster controller.

(g) To reinstate the interrupt mode, operator intervention and signaling is again necessary (3.11 through 3.15).