

## 2.9 Texas Instruments IBM 3780 Communications

### 2.9.1 Introduction

The Texas Instruments IBM 3780 Communications board assembles ASCII coded information from the system disk database. The information is converted into EBCDIC code format and using IBM 3780 Protocol is transmitted to the ~~MAP~~ System.

Data is received from the MAP System in the reverse fashion.

### 2.9.2 Description and Operation

See Texas Instruments data sheets (2-37 and 2-38).

### 2.9.3 Switches and Links

#### (1) Switches

One 8-way DIL switch is mounted on the board.

The function of the switch is as follows:

S1 Sets the card address.

Refer to Fig. 1 for location and setting of the switches.

NOTE: The normal setting of the switches are shown.

#### (2) Links

Link set E1 - E2 External clock.

Link set E0 - E2 Internal clock.

Refer to Fig. 1 for location and fitting of links.

N.B. On ~~MAP~~ systems link is set E0 - E2 (Internal Clock).

### 2.9.4 Input/Output Connections

Two input/output connectors are mounted on the board. Refer to Fig. 1 for location.

Plug PI 80-Way Edge Connector

1	0V VSS	41	-12V, R6, U71-5, U72-5, U73-5
2	0V VSS	42	
3	+5V VCC	43	
4	+5V VCC	44	
5		45	
6		46	
7		47	
8		48	
9		49	
10		50	
11		51	
12		52	
13		53	
14	U1-15	54	
15		55	
16		56	
17		57	
18	U6-1	58	
19		59	
20		60	U26-4
21		61	
22	U1-11	62	
23		63	
24	U2-7	64	
25		65	
26		66	U26-13
27		67	
28		68	
29		69	
30		70	
31		71	
32	U6-5	72	
33		73	
34	U6-15	74	
35		75	
36		76	
37		77	+5V VCC
38	U6-12	78	+5V VCC
39	+12V VDD	79	0V VSS
40	+12V VDD	80	0V VSS

Plug J1 25-Way Cannon D Connector  
 Ribbon Interconnection with MODEM to MAP Communications  
 Link

1		14	U73-6, P1-25
2	U72-7	15	U73-7
3	U74-1	16	
4	U72-6	17	U69-10
5	U74-4	18	
6	U74-10	19	U70-7
7	0V VSS	20	U71-7, P1-11
8	U74-13	21	U71-6
9		22	U69-4
10		23	
11	U71-7, P1-20	24	U69-1
12	U69-13	25	U73-6, P1-14
13	U73-6, P1-25		

2.9.5 RS232 Signals Reference

1	Protective Ground
2	Tx Transmitted Data
3	Rx Received Data
4	RTS Request to Send
5	CTS Clear to Send
6	DSR Data Set Ready
7	Signal Ground
8	RLSD Received Line Signal Detector
9	
10	
11	2nd RTS Secondary Request to Send
12	2nd RLSD Secondary Received Line Signal Detector
13	
14	
15	Tx Element Timing (DCE)
16	
17	Rx Element Timing (DCE)
18	
19	
20	DTR Data Terminal Ready
21	
22	Ring Indicator
23	Data Signal Rate Selector
24	
25	

# TEXAS INSTRUMENTS 3780/2780 EMULATOR COMMUNICATION

## Features

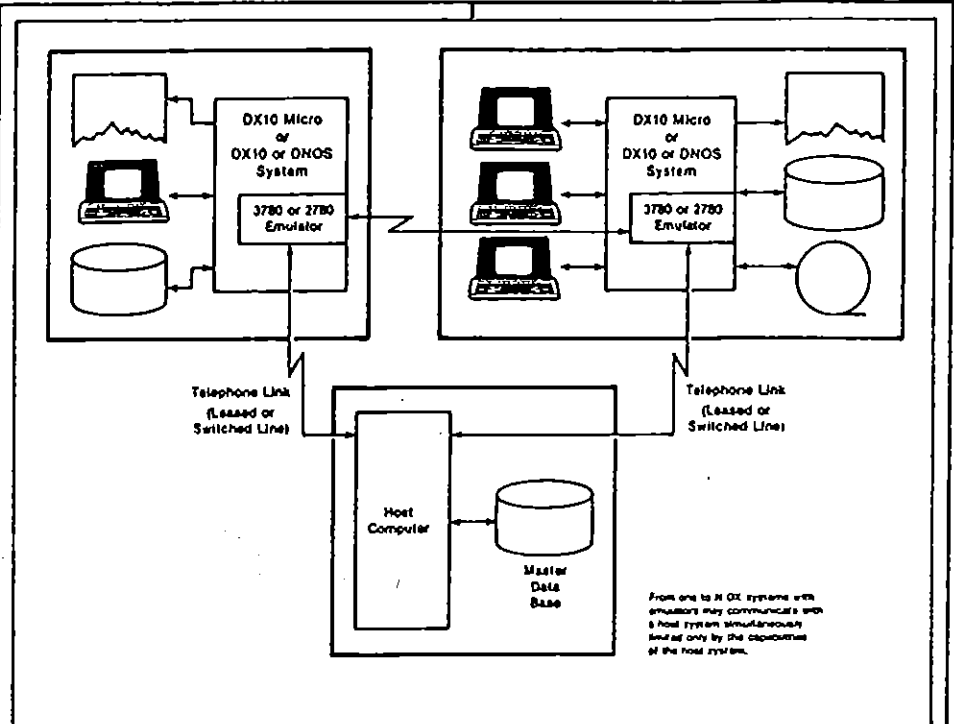
- Binary Synchronous Communications (BSC)
- Terminal identification
- Dial-up communications
- Device independence
- Horizontal and vertical format control
- 3780 Space compression/expansion
- EBCDIC data transmission
- Transparency and binary file transfer
- Component selection
- Unattended operational mode
- Bid task feature
- Partial file transmission
- Automatic Call Unit (ACU)

## Product Overview

The 3780/2780 Emulator Communications Software packages enable the Texas Instruments computer family to communicate with other computer systems using IBM 3780/2780 protocols. Communications consist of exchanging data files between master and slave stations over leased point-to-point or switched telephone lines. TI computer systems using 3780/2780 Emulators can be used as satellite and/or central stations in a distributed processing network. Remote stations can be dialed manually or automatically using an optional auto-call unit.

Unlike the IBM 3780/2780 Data Communications Terminal emulated, files transferred via the 3780/2780 Emulator are not restricted to the card reader/punch and line printer. Any file or TI I/O device available may be used for input or output.

3780/2780 Emulator Software packages operate under the DNOS, DX10 and DX10 Micro Operating Systems.



## Emulated Capabilities

Some of the major IBM 3780/2780 features emulated include terminal identification, dial-up switched network support, input/output devices, component selection, and 3780 space compression and expansion. Communications with an IBM host is accomplished with data link control using BSC procedures that control point-to-point data exchange. During each connection with a host or remote system, the emulator can opt to identify itself using and ID character sequence. This feature keeps the data base secure and helps the host quickly recognize the necessary data processing activities associated with an identified terminal. In addition, switched network control allows the emulator to automatically answer or disconnect a communications line.

Using the component selection feature,

a local station can select the output device at a remote station. Although card punch devices are not supported, the emulator can transmit and receive data formatted for a card punch and may direct received data to any available file or device.

The emulator can transmit and receive the entire 256 eight-bit EBCDIC character set by specifying it as binary data. This feature, along with the ability to transmit control characters as data characters, allows transmission of program files and directories.

Vertical forms control (VFC) permits vertical carriage control formatting of printer data by a transmitting station. This control includes single, double, and triple space, space suppression, top of form, and vertical tab.

The remaining VFC is emulated by fixed-line spacing.



Horizontal format control provides a horizontal tab function allowing deletion of spaces in formatted lines. Both of these features help to increase throughput.

In addition to the above features, the 3780 Emulator can replace strings of spaces with an information gap separator (IGS) character and a space-count character to reduce the number of spaces transmitted, thereby improving transmission efficiency.

### Limitations

3780/2780 does not emulate IBM 3780/2780 multipoint operation, dual communications interface, terminal testing, or synchronous clock. Auto-call is supported only on Business System 600 and 800 Series.

### Extensions

Major features supported by the 3780/2780 Emulator that are not contained in the IBM 3780/2780 include the bid task features, command file operation, receive pathname/send request features, automatic call unit (ACU), and partial file transmission.

### Bid Task

There are two bid task features that the emulator can request. A local station can request that a remote station execute a specified task and, under DX10 or DNOS, the local station can execute a task on the local system.

### Unattended Operation

The emulator can be operated by a sequential file or a relative-record file containing predefined emulator commands. It can also be operated by an interprocess communication channel that processes commands from tasks executing on DNOS and an intertask message queue that processes commands from tasks executing on DX10. These modes of operation alleviate the

need for the presence of an operator.

### Device Independence

Receive pathname and send request features allow the local station to specify the destination pathname for transmitted data or request that a remote station transmit a specified file or portion of a file to the local station. These features also support an unattended mode of operation.

### Error Recovery

An optional auto-call unit lets the emulator dial remote stations automatically. In addition, the emulator can begin transmission at specified intermediate points within a file. This feature allows efficient recovery from error situations.

### System Requirements

3780/2780 Emulator Software package can operate under DX10 Micro, DX10, and DNOS Operating System software. The memory required for 3780/2780 is 34K bytes. The interface hardware is as follows:

- Terminal-based Business System Computers (Note: These units do not support auto-call.)  
Communications option board 2532823-1  
2-meter cable to external modem 2532883-1  
5-meter cable to external modem 2532883-2  
10-meter cable to external modem 2532883-3  
15-meter cable to external modem 2532883-4
- 13-slot Chassis-based Business Systems Computers  
Communications Processor 501 2265184-1 or  
Communications Processor 503 2261954-1 or

Texas Instruments reserves the right to change its product and service offerings at any time without notice.



**TEXAS  
INSTRUMENTS**

Communications Interface Module  
946104-1

### Software Components

The S200 3780/2780 Emulators consist of two loadable tasks containing the communications device service routine (DSR), emulator functions, operator interface, and all tables and buffers. The 3780/2780 Emulator software license with DX10 Micro includes an executable object module, concatenated object modules for all but the configuration module, and source data for the user-defined, configuration table module. No operating system generation is required for installation of this emulator. In this environment, the communications interface may not operate at a shared interrupt level with any other system device.

The DX10 and DNOS 3780/2780 Emulators consist of a system-resident DSR including DSR tables, buffers and overlaid loadable tasks, which include emulator functions, operator interface, and the remaining tables and buffers. The DX10 and DNOS 3780/2780 Emulator software license includes object modules and source modules for configuration of the DSR and tasks. An operating system generation is necessary for installation of these emulators. DX10 and DNOS Operating Systems expand communication abilities by enabling more than one emulator to run at a time.

### Host Software

Data may be transmitted to and received from the RJE portion of an IBM 360/370 or other host systems using 3780/2780 BSC protocols. The IBM host RJE terminal control software supported includes HASP, ASP, and JES 3. The host may also be a 990 computer running under TI operating system software.

Sales and Service Office of Texas Instruments are located throughout the U.S. and in major countries overseas. Contact the Data Systems Group, Texas Instruments Incorporated, P.O. Box 202146, Dallas, Texas 75220, or call (512) 250-7305, for the location of the office nearest to you.

# SWITCHES AND CONNECTORS SETTINGS AND LOCATIONS

