

CUSTOMER ENGINEERING ANNOUNCEMENT

IBM

7710 Data Communication Unit

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THE IBM 7710 DATA COMMUNICATION UNIT is a solid-state, high-speed TELE-PROCESSING® device that provides direct communication between remote IBM 1401 computers at speeds up to 48,000 bits per second. It also enables an IBM 1401 computer to communicate with the following IBM TELE-PROCESSING units at their respective line speeds.

7701 Magnetic Tape Transmission Terminal

7702 Magnetic Tape Transmission Terminal

1009 Data Transmission Unit

1013 Card Transmission Terminal

The 7710 transmits or receives serial data over the communications network, entirely under 1401 program control. Operation is completely automatic so that operator attention is required only in the event of a major communications failure. Data transfer between 7710 and the communications network occurs a bit at a time; between 7710 and the 1401, a character at a time. Records of variable length may be exchanged. Record length is limited only by the capacity of the equipment attached to the 7710. In case of error, records are automatically retransmitted. If the error persists, an audible alarm sounds. In the event of communications failures, the 1401 is automatically released to proceed with other programmed operations.

The 7710 uses serial transmission in order to operate with the most economical form of communications network presently available. Transmission takes place in IBM 4-of-8 line code for maximum reliability in detection of errors. The 7710 is compatible with all the latest communication services (telephone, microwave, cable, satellite, etc.). Data sets and communications facilities must be provided by the customer.

Operations

As a transmitter: The 7710 obtains a data character from the 1401, checks it, translates it to 4-of-8 code, then serializes it for transmission.

As a receiver: The 7710 assembles serial data bits into a character, checks it, translates the character to 7-bit 1401 code, then transfers it to the 1401.

Circuits

All 7710 logic circuits are DDTL (Diffused Diode Transistor Logic) type, which uses diode inputs to control NPN transistors. Servicing is simplified by the fact that only one signal voltage level ($\pm B$) is used. DDTL circuits are extremely fast and reliable, operating in the nanosecond (billionth of a second) range. Thus, the oper-

ating speed of the 7710 is limited by external factors:

- the communications network
- the 1401
- the remote system

Data Checking

Data sent to and from the 1401 are parity checked. Data sent to and from the communications network are character checked and record checked to detect errors caused by noise on the transmission lines. Record sequence is also checked to detect loss or duplication of data records. Errors are corrected automatically, by retransmission of the record.

Service Aids

The 7710 CE panel can be used, with the operator's panel, to isolate system failures as well as internal machine failures. Three test modes are provided:

Self Test: This test checks out both the transmit and receive sections of the 7710. Only a 7710 is required for this test, since the input from the 1401 is degated and the 7710's transmit output is looped back to its receive input, eliminating the communications network. Data characters are entered from the bit switches. These characters can be manually stepped through the 7710 and their progress observed on indicator lamps on registers in the data path.

Send Test: This test checks out the transmit section of the 7710. It requires a 7710, a 1401, and a send-test diagnostic program. The communications network is eliminated because the transmit output of the 7710 is tied back to its own receive input. Data characters originate in the 1401, flow through the transmit section of the 7710, and loop back to the receive section, where they are checked. This test is controlled by the 1401 program, and (under switch

control)) can be set to stop on error to display machine status at the time of failure. *Receive Test:* This test checks out the receive section of the 7710. It requires a 7710, a 1401, and a receive test diagnostic program. The communications network is not used since the transmit output of 7710 is looped back to its receive input. Data characters originate in the bit switches of 7710, flow through the transmit section, and loop back through the receive section to the 1401. This test is controlled by the 1401 program and (under switch control) can be set to stop on error.

Two additional diagnostic programs complete the system troubleshooting aids.

Line test diagnostic program: Checks out all interface lines between the 7710 and the 1401.

System test diagnostic program: Checks over-all system performance.

Optional Features

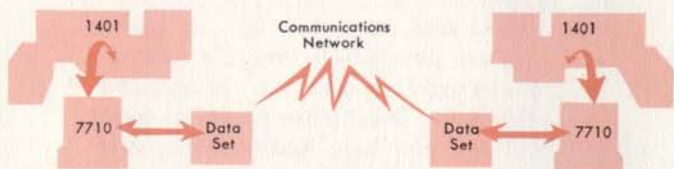
A clock is necessary to maintain synchronization between the 7710 and the remote communications terminal. A 7710 internal clock is offered as an optional feature for use with data sets that do not contain their own line clocking devices.

The 7710 is normally equipped with one of the two data set interfaces presently used by the communications companies. As an optional feature, both interfaces may be obtained on the same 7710.

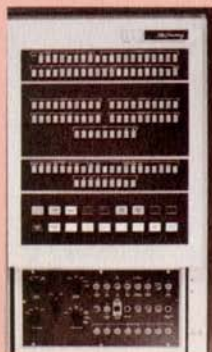
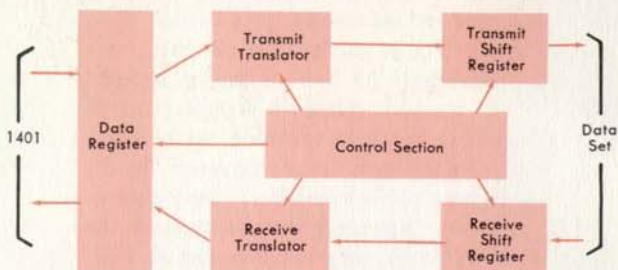
The IBM logo, consisting of the letters "IBM" in a bold, sans-serif font, with a small registered trademark symbol (®) to the right.

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NOTE: The 7710 connects to the 1401 through the 1401 Serial I/O Adapter.



The 7710 can also communicate with any of the following IBM equipment: 7701, 7702, 1009 (with an IBM CPU), 1013. Data sets and communications facilities must be provided by the customer.



IBM 7710 CE and Operator Panels