



7740

**Communication
Control
System**

IBM

Customer Engineering Announcement

Customer Engineering Features

The 7741 compensates for as much as a 40% variation from the standard pulse length of the pulses received from a terminal on a low-speed line. The clock of the receiving terminal on a high-speed line is continually adjusted to keep it synchronized to the clock of the sending terminal.

Data and machine functions are continually checked in the 7741 Processing Unit:

1. A parity check is made every time data are read from memory.

2. Each group of low-speed channels has two channels permanently wired so that data transmitted on one channel return on the other as received data. This feature makes it possible to check by programming the 7741 circuits common to all channels without requiring use of a remote terminal. The connected channels can be programmed to check the circuits during system operation.

3. Telegraph line relays in the 7741 are duplexed to facilitate isolating current loop troubles. A check is made of unused relays to be sure they are in an inactive status.

4. There are three check points in the path of data being transmitted over low-speed lines.

5. Data received over low-speed lines are checked for an adequate number of bits. An error is indicated if the communication line is open.

6. An error is indicated if the processor attempts to use an inoperable line.

7. An error is indicated if a set time limit between characters received is exceeded.

The CE/operator panels have indicators and switches for monitoring and manually controlling machine functions:

1. Instructions can be single-cycled.

2. A program can be stopped at a predetermined address, or stopped if a parity error occurs.

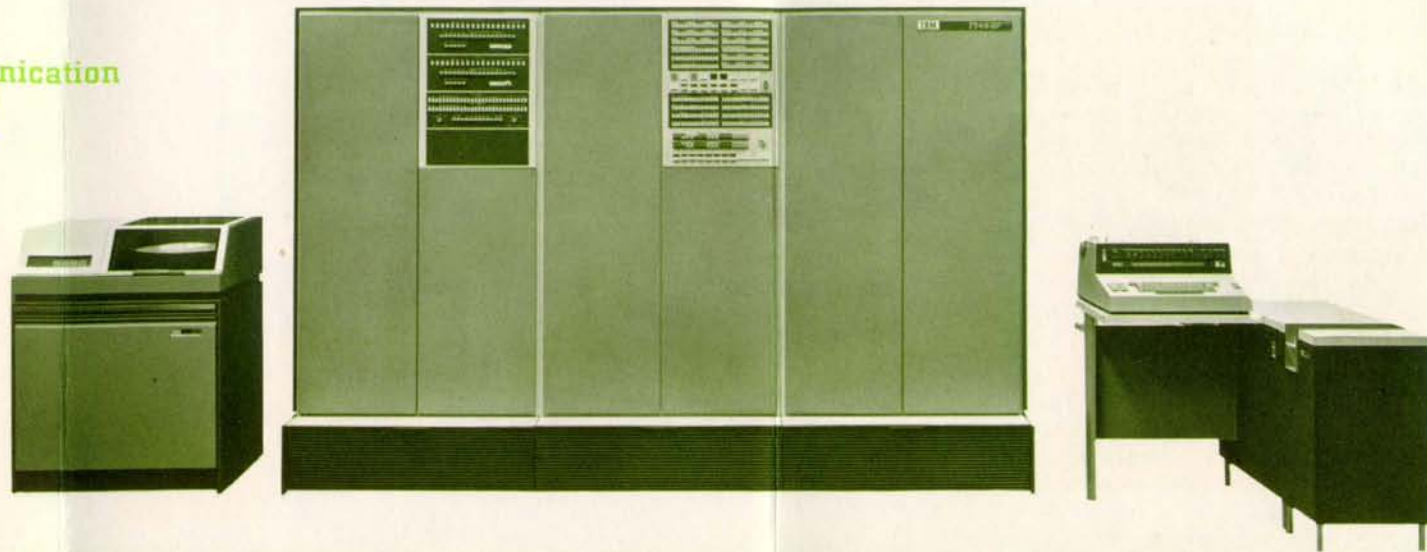
3. The program can be locked in a particular cycle or function to facilitate scoping or checking.

4. Parity errors can be forced to check error-detecting circuits.

5. The contents of an individual register can be observed, reset, or set to any bit pattern desired.

6. Switches allow operation of the 7740 independently of the computer or I-O units.

IBM 7740 | Communication Control System



The IBM 7740 Communication Control System is the central processor for a Tele-Processing® system. A network of communication lines links the processor to remote terminals. The 7740 system receives and transmits data and messages between various terminals, and has computer type instructions and capabilities. A communication channel can be a telephone line, telegraph line, or a radio circuit. Types of terminals are: the IBM 1009 Data Transmission Unit, IBM 1013 Card Transmission Terminal, IBM 7701/7702 Magnetic Tape Transmission Terminals, IBM 7710 Data Communication Unit, IBM 1050 and 1060 Data Communication Systems, telegraph terminals, IBM 66 and 65 Data Transceivers, IBM 7750 Programmed Transmission Control, and another 7740 system. Each terminal can have its own communication line, or several terminals can share one line. The transmitting unit disassembles characters into bits and sends the bits serially. The receiving device receives the bits serially and assembles them into characters.

The IBM 7740 can process different codes and speeds required by different types of terminals. A maximum of 84 low-speed lines (up to 200 bits per second) and 2 high-speed lines (up to 2,400 bits per second), or 56 low-speed and four high-speed lines, can be attached to a 7740 system. The system can send or receive data simultaneously over all the communication lines. The data received can be proc-

essed as received, on a real-time basis, or stored for batch processing later.

The basic unit of the IBM 7740 Communication Control System is the IBM 7741 Processing Unit, which is designed primarily for communication applications. Three models of the 7741 provide memory capacities of 16,384, 32,768, and 65,536 eight-bit characters for storage of programs and data. The 7740 system operates independently of a computer with an IBM 1050 and an IBM 1311 attached locally to the 7741. The 1050 provides a control console, punched card input, and printer output; the 1311 provides bulk storage for data and programs.

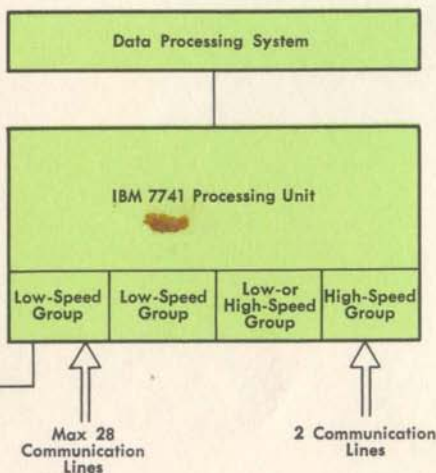
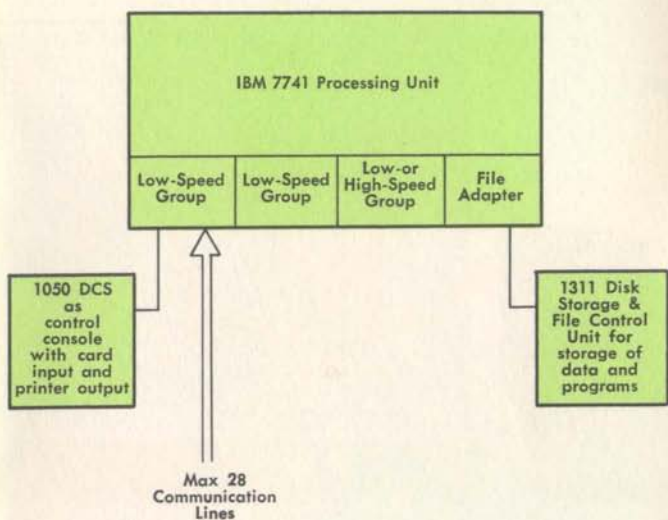
The minimum 7740 System, a 7741 with a 1050 as a console, can be used to link a communication network to an IBM 1410 or to any IBM 7000 series computer. In such a capacity, the 7741 is programmed to control the communication network and to exchange data with the computer. The computer processes the data; the 7740 acts as an I-O device.

A typical message sent over a communication line includes header, data, and end-of-message signals. When receiving, the 7741 assembles the message, interprets the header to determine the disposition of the data, removes control information from the data, and converts the data to the code required for processing or retransmission to another terminal. If the data are to be sent to a computer, the computer is

notified that there is a message. The computer accepts the data and sends a reply to the 7741. When sending a message, the 7741 adds header and control information, and converts the data to the coding required by the receiving terminal.

TYPICAL OPERATIONS performed by the 7741 Processing Unit are:

1. Allocate memory storage space to messages being received. Make the memory space available to other channels after the message has been processed.
2. Generate check characters for messages being sent to magnetic tape terminals.
3. Line up, or stack, messages to be transmitted over a communication line and, if necessary, arrange the messages on a priority basis.
4. Poll terminals; that is, control data transmission between the 7741 and multiple terminals sharing a single communication line.
5. Record and monitor traffic. Process some messages as received, others later. Take corrective action if an error is indicated: retransmit the record, keep a count of the number of errors made by any channel, and make the channel inactive if too many errors occur.
6. Establish time intervals to recognize inoperative terminals and switch a line from sending to receiving.



Computer-Oriented Tele-Processing System

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