HONEYWELL EDP

SERIES 200

Visual Information Projection

INTRODUCTION

Honeywell's Series 200/Visual Information Projection capabilities have evolved as a new concept in man/machine communication, providing a family of message generation and display, control, and communication equipment. Used as the primary terminal device, Display Stations can either replace or supplement other types of input/output terminals such as page printers and paper-tape devices. Designed to operate with any Series 200 processor, practically any number of Display Stations may be used to form an integrated processing/communication network.

The Visual Information Projection facilities include three different models of Display Stations. All incorporate a wide range of display capabilities and keyboard arrangements in order to provide functional adaptability to any application. Options, such as designation and usage of function keys and editing capabilities, are available with all models.

The Display Stations permit operators at many locations to key-in inquiry or input messages completely independently of each other. Each character — alphabetic, numeric, or symbolic — is instantly displayed on the viewing screen and is simultaneously stored within a Universal Control Unit. A composed message may then be visually verified, modified if necessary, and transmitted at a high transfer rate to the central processor. A subsequent input acknowledgment or reply message will then be received from the central processor and displayed in addition to, or in place of, the input message ...all in a matter of seconds.

Specifications remain subject to change in order to allow the introduction of design improvements.

OUTSTANDING FEATURES

The Series 200 Visual Information Projection devices feature advanced but proven techniques of solid-state circuitry, cathode-ray tube displays, data multiplexing, and communication. Several of the outstanding and unique features are summarized below:

□

Keyboards are available in numeric, numeric/block-alpha, and typewriter-like configurations.

□

Message lengths, both input and output, of up to 32, 64, 128, 256, 384, or 768 characters can be presented.

□

Keyboard-entry data is presented instantly on the viewing screen for pretransmission verification or editing.

□

Function keys are available for labeling and utilization with specific applications.

□

Individual local buffering provides isolation from the communication network and central processor during message preparation and after the receipt of a reply message.

□

Universal Control Units provide the input/output message buffering, message generation, and control for a number of local Display Stations or other terminal devices.

□

Provision for error checking of all communication traffic is incorporated within the system.

□

Automatic generation of station identification permits positive computer control over input data.

□

Terminals may share a single communication channel, thereby reducing communication costs.

VIP COMPONENTS

Three Display Stations are offered in order to serve a wide range of requirements and applications. All stations are operationally similar, so that the selection of a par-

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ticular station model may be made on the basis of keyboard requirements and message characteristics.

Display Stations operate in conjunction with a Universal Control Unit. The maximum number of Display Stations per Universal Control Unit is determined primarily by the message length selected by the user. Typically, the number of Display Stations may be from one to several dozen. Each Display Station is operated independently of the others. Each operator may compose messages or inquiries at his own pace, verify or edit, and receive responses or replies as if his Display Station were the only one in the system.

Each Display Station is connected to the Universal Control Unit by an individual cable; nominal cable length for each Display Station may be up to 1000 feet. Greater lengths may be used, as required, subject to an analysis of the system configuration. Each Display Station is also provided with a six-foot cable for connection to a standard, three-prong, 115 VAC power outlet.
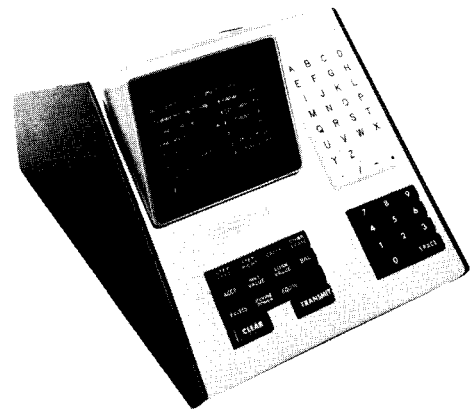
Display Stations

MODEL 303 DISPLAY STATION — Keyboard — Separate from viewing unit — 4-Row Typewriter-like Alphanumeric — 15 Function Keys — Clear — Transmit — Editing/ Special Keys — Viewing Area — 7¾" w x 5½" h — Display Capacity — 32, 64, 128, 256, 384, or 768 characters — Display Arrangement — Refer to Table — Size (Display Unit) — 14 1/16" w x 14¼" d x 16¼" h — Size (Keyboard Unit) — 17 13/16" w x 8⅞" d x 6⅛" h (includes 2" bottom projection) — Keyboard Stand — Optional.
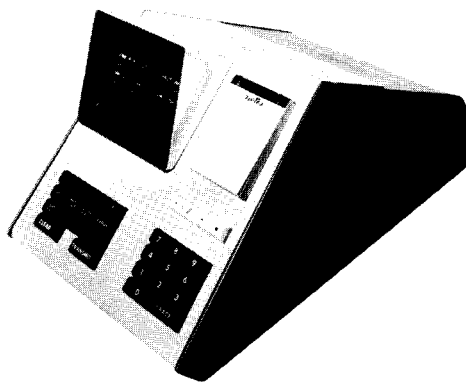
MODEL 311 DISPLAY STATION — Keyboard — 15-Key Block Numeric — 12 Function/Editing Keys — Clear — Transmit — Viewing Area — 4¾" w x 3¾" h — Display Capacity — 32, 64, 128, 256, or 384 characters — Display Arrangement — Refer to Table — Size — Approximately 11" w x 22½" d x 11⅛" h.

MODEL 312 DISPLAY STATION — Keyboard — 43-Key Numeric/ Block Alpha — 12 Function/Editing Keys — Clear — Transmit — Viewing Area — 4¾" w x 3¾" h — Display Capacity — 32, 64, 128, 256, or 384 characters — Display Arrangement — Refer to Table — Size — Approximately 11" w x 22½" d x 11⅛" h.

The viewing screen is a cathode-ray tube utilizing a high contrast, low persistence, emerald green phosphor. Each displayed character is composed from a 7 x 5 dot-pattern and registers clearly and sharply against a dark background. An ON-OFF/BRIGHTNESS control is provided for the operator, with other adjustments, such as FOCUS and CHARACTER HEIGHT, available for maintenance personnel. The character size may be adjusted from approximately typewriter size up to ¼-inch depending upon the number of characters to be displayed.

The displayed information is regenerated over forty times per second, resulting in a "steady" display without any trace of flicker.

To indicate the writing position on the viewing screen, an entry marker is provided. The entry marker steps to the next position as each character is entered; with edit features such as STEP RIGHT, SCAN RIGHT and HOME, the entry marker may be readily moved about the screen to facilitate erasure or overwriting.

The depression of each data or function key generates a seven-bit code which is stored within the Universal Control Unit. This code is compatible with the ASCII code set, so that the corresponding character is displayed on the viewing screen. The labeling, usage, and symbolic representation of the function keys may be assigned as desired for a particular application. A CR/LF key provides carriage return and line feed functions, and ERASE keys enable a character or line to be erased. The CLEAR key erases information from both the display and buffer storage, while the TRANSMIT key releases a message to the communication/processing network.

Display Stations associated with a Universal Control Unit may be a mixture of model types. The only requirement is that each have the same display capacity or "frame size."

In addition to, or in place of the Display Stations, a variety of other input/output terminals may be utilized such as receive-only page printers and paper-tape readers and punches. A complete mix of equipment may be provided to satisfy the requirements of practically any system application.

Universal Control Units
(Storage and Control)

Two Universal Control Units, Models 322 and 323, are available. Each is provided with power supply, control, message generation and buffer storage capable of servicing one or more Display Stations. The basic storage capability of 768 characters may be utilized in any of the following ways:

- One Display Station of 768 characters (Type 303 only).
- Two Display Stations of 384 characters.
- Three Display Stations of 256 characters.
- Six Display Stations of 128 characters.
- Twelve Display Stations of 64 characters.
- Eighteen Display Stations of 32 characters.

TABLE OF DISPLAY ARRANGEMENTS					
Display Capacity (Characters)	Display Station Model 311	312	303	Number of Lines	Number of Characters/line
32	x	x	x	2	16
32	x	x	x	4	8
64	x	x	x	2	32
64	x	x	x	4	16
128	x	x	x	4	32
256	x	x	x	8	32
*378	x	x	x	9	42
384	x	x	x	12	32
768			x	12	64

*Considered as 384 insofar as control unit storage requirements.

Expansion Modules to increase the capacity or number of display devices can be supplied with either Model 322 or 323. Each Expansion Module offers 768 storage locations. The Model 322 can be equipped with either one or two Expansion Modules to provide a total of 2,304 characters of storage.

Model 323 can be provided with up to eight Expansion Modules for a total of 6,912 characters of storage. The Model 341 Expansion Module is utilized for the 1st, 2nd, 4th, 5th, 7th and 8th addition to the Universal Control Unit, with the Model 342 Expansion Module being used for the 3rd and 6th additions.

Display Stations supplied with optional edit features (STEP LEFT, SCAN LEFT) utilize a Message Editing Logic Module with the basic Universal Control Unit and with each Expansion Module.

When terminal devices such as receive-only printers and paper-tape or card readers and punches are utilized, storage is allotted for each device equal to the amount established for each Display Station. Each device requires an additional Control Module; as an example, a system using a receive-only printer must have a Printer Control Module.

The basic mode of operation permits more than one input and response message to "build up" on the viewing screen. The operator also has access to any portion of the displayed data for purposes of editing or correction. However, each time the TRANSMIT key is pressed, all data appearing on the screen is transmitted. For applications where it is desirable to "build up" inputs and responses, but only transmit the most recent input data, the Multi-Message Transaction Module is provided. The operator then has access to only the most recent input data for purposes of alteration.

Universal Control Units
(Interfacing)

The Universal Control Units can be provided with an interface for connection to a communication network or directly to a Series 200 central processor.

Either Model 322 or Model 323 can be provided with a 1200-baud, half-duplex, interface (Model 331 Communications Interface) or a 2400-baud, half-duplex, interface (Model 332 Communications Interface) as an integral component.

Each of the interface configurations is compatible with the EIA Standard RS232-A and may operate directly with an appropriate modulator-demodulator (modem) or suitable processor interface. Data is transferred asynchronously serially-by-bit, using a 10-bit character composed of 1 start bit, 7 data bits (ASCII), 1 parity bit, and 1 stop bit, or synchronously serially-by-bit using an 8-bit character composed of 7 data bits and 1 parity bit.

For direct data transfers to or from the central processor at higher data rates, a High-Speed Interface is available as an integral part of the Universal Control Unit. In general, this configuration requires additional components external to the Universal Control Unit. These interfaces are available as required.

The optional Polling Module can be supplied where a half-duplex polling network is desired.

The Universal Control Unit is cable-connected to a suitable modulator-demodulator (cable not to exceed 50 feet) or directly to the processor interface with a cable length not greater than 50 feet.

UNIVERSAL CONTROL UNITS		
	Physical and Electrical Characteristics	
	Model 322	Model 323
Height	59″	59″
Width	30″	59″
Depth	20″	20″
Weight	200-260 lbs.*	350-425 lbs.*
Line Voltage	115	115
Power Phases	Single	Single
Input Power	1000 Watts**	1800 Watts

*Dependent on quantity of modules
**Maximum Power Requirements

OPERATION

The preparation of input messages or inquiries at a Display Station is accomplished "off-line," to the extent that data is not transmitted to the central processor until a message has been completely composed, verified by the operator, and corrected if necessary. Any number of operators may prepare messages and then communicate with the processor, with each appearing to have exclusive use of the system.

The data received by the processor may initiate a file search for the retrieval of information or may result in a series of computations. The reply message received by the originating Display Station may be a simple "acknowledge" or a complete response; the reply message is received and normally displayed within a matter of seconds.

Before the operator uses the Display Station, the CLEAR key may be pressed to remove any previous information from both the display and local storage. The message is then initiated by keying-in the desired information, which is simultaneously displayed and stored.

An "entry marker" character is always visible to indicate the writing position. As each data character is entered, it appears in the entry marker location and the entry marker steps to the right. When the end of a line is reached, the entry marker automatically performs the CR/LF function (advances to the left margin of the next line).

The displayed data may be composed of alphabetic, numeric, symbolic, space, or function characters. The function characters may serve as field identifiers or separators in any particular format or message type as required by the application.

After verifying the composed data, the operator then presses the TRANSMIT key. During the transmission interval a "T" appears in the lower right-hand display position and the keyboard is electronically "locked out."

Should there be a communication malfunction, no reply message is received and an "E" replaces the "T." The operator need only press the TRANSMIT key again to re-attempt transmission, as the original input message remains intact.

The reply message may be preceded by a "CLEAR" code — the usage of which is under processor control — in which event the original input data is instantly erased and the reply written in that position. Otherwise, the reply message is written beginning on the first line below the operator-composed message. Detection of an error in the reply message causes the displayed reply to be erased and an "E" to appear in the lower right-hand display position.

If subsequent information is added to the original input and response data, or any displayed information is altered, all information appearing on the viewing screen is transmitted to the processor when the TRANSMIT key is pressed.

Another operational mode may be facilitated by the use of the optional Multi-Message Transaction logic module, which permits a series of input/response messages to be "built up" on the viewing screen. When the TRANSMIT key is pressed, only the last input message is transmitted to the processor. This feature is particularly useful when it is necessary to retain previous information for reference but not desirable to return it to the processor.

Another optional feature is the Message Editing Module which provides additional control for the manipulation of the entry marker such as STEP LEFT and SCAN LEFT. Prior to the transmission of an input message, the operator may readily reposition the entry marker at a character location so that the character (or segment) may be written over, erased, or replaced by a space. When the Multi-Message Transaction Option is utilized, only the newly entered data is accessible for editing or correction. The ERASE keys cause a character or a line to be blanked, and "no data" is stored. The SPACE key also blanks display positions, but it enters a "space" code into storage. The CR/LF, STEP, SCAN, and HOME keys manipulate the entry marker but do not affect the displayed or stored information.

UNIVERSAL CONTROL UNIT
Modularity Configurator