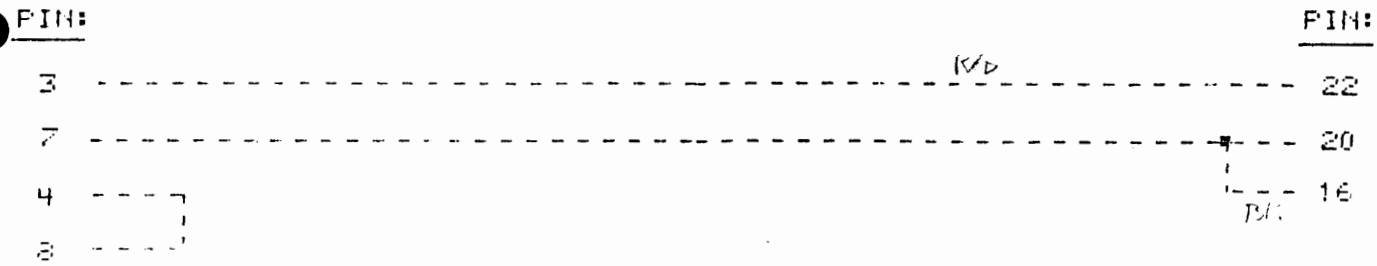
COMET - SERIEL STIK

25 POLET CANON STIK (HAN)

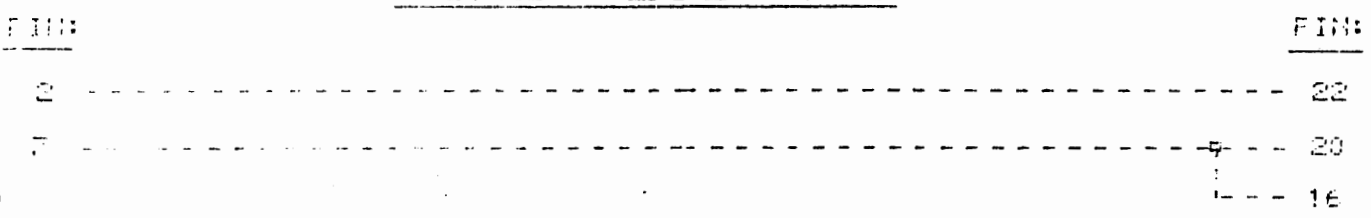
HIPPO DIGITIZER

25 POLET CANON STIK (HUN)

COMET 4 MHz



COMET 2.5 MHz



KABEL FOR TILSLUTNING AF HIPPO DIGITIZER TIL COMET (4 & 2.5 MHz)

INTERNATIONAL COMPUTERS LIMITED A/S	83-08-06		ULJ

HIPAD OUTPUT SELECTION

The HIPAD digitizer has available, in the standard basic unit, four user formats. These formats are DISPLAY FORMAT, SERIAL ASCII, PARALLEL BINARY, PARALLEL BCD.

The display output, which is used to drive the optional digitizer display, is not intended for user application.

The other output formats may be SINGLY or COLLECTIVELY selected. The digitizing rate, or the number of coordinate pairs per second, is controlled and/or limited by the selection of output formats.

The HIPAD digitizer is shipped with all output formats enabled. Associated with each format is a pin in the interface connector which when tied to circuit common, will disable one of the formats.

The HIPAD's output may be scaled in either English or Metric units. As shipped, the output will be in English but may be changed to Metric units by connecting pins in the interface connector.

The HIPAD digitizer's output rate or number of coordinate pairs/second is determined by the types of output selected by the user.

BCD FORMAT

The BCD (binary coded decimal) format consists of seven bytes, one byte with control information, three bytes with X-Axis information and three bytes with Y-Axis information.

	MSB						LSB	
CONTROL BYTE	1	1	X	X	X	X	X	1st byte
X AXIS	0	0	SIGN	MSD				2nd byte
X AXIS	2nd SD			3rd SD				3rd byte
X AXIS	4th SD			LSD				4th byte
Y AXIS	0	0	SIGN	MSD				5th byte
Y AXIS	2nd SD			3rd SD				6th byte
Y AXIS	4th SD			LSD				7th byte

The upper 2 bits of the control byte are coded logical one's, a combination which cannot occur in any of the other bytes, and therefore, may be used for sync in the data stream. The control byte is coded exactly as in the binary format. The sign of each axis is coded as follows:

01 — for positive 11 — for negative

The individual digits of coordinate information are all coded in binary with a range of 0-9.

SERIAL FORMAT

The serial format consists of 15 ASCII coded characters as follows:

C_B	±	X	X	X	X	X	±	Y	Y	Y	Y	Y	C_R	L_F

The control byte (CB) is used to display the different modes of operation which the HIPAD is capable.

Where C_B for Button Red, (DT-114 DT-114A)

= @(64), indicates the first coordinate of a switched stream.

= A(65), indicates successive coordinates of a switched stream.

= B(66), indicates a coordinate of point mode.

= 3(51), indicates a coordinate of stream mode with the cursor button released.

= D(68), indicates a coordinate of stream mode with the cursor button depressed.

Where C_B for Button White, (DT-114 and DT-114A), for Single Button Cursor and Stylus (DT-11 and DT-11A)

= 0(48), indicates the first coordinate of a switched stream.

= 1(49), indicates successive coordinates of a switched stream.

= 2(50), indicates a coordinate of point mode.

= 3(51), indicates a coordinate of stream mode with the cursor button released.

= 4(52), indicates a coordinate of stream mode with the cursor button depressed.

Where C_B for Button Yellow, (DT-114 and DT-114A)

= (96), indicates the first coordinate of a switched stream.

= a(97), indicates successive coordinates of a switched stream.

= b(98), indicates a coordinate of point mode.

= 3(51), indicates a coordinate of stream mode with the cursor button released.

= d(100), indicates a coordinate of stream mode with the cursor button depressed.

Where C_B for Button Green, (DT-114 and DT-114A)

= P(80), indicates the first coordinate of a switched stream.

= Q(81), indicates successive coordinates of a switched stream.

= R(82), indicates a coordinate of point mode.

= 3(51), indicates a coordinate of stream mode with the cursor button released.

= T(84), indicates a coordinate of stream mode with the cursor button depressed.

Where ± = an ASCII coded + or −.

Where X or Y = ASCII coded digits 0-9.

Where C_R = ASCII coded carriage return.

Where L_F ( ) = ASCII coded line feed.

BINARY FORMAT

The binary format consists of five bytes; one byte with control information, two bytes with X-Axis information, and two bytes with Y-Axis information.

	MSB							LSB	
CONTROL BYTE	1	X	X	X	X	X	X	X	1st byte
MSB X AXIS	0	SIGN	X_{12}	X_{11}	X_{10}	X_9	X_8	X_7	2nd byte
LSB X AXIS	0	X_6	X_5	X_4	X_3	X_2	X_1	X_0	3rd byte
MSB Y AXIS	0	SIGN	Y_{12}	Y_{11}	Y_{10}	Y_9	Y_8	Y_7	4th byte
Y AXIS	0	Y_6	Y_5	Y_4	Y_3	Y_2	Y_1	Y_0	5th byte

The most significant bit is always a logical one for the control byte and is always a logic zero for data bytes containing axis information. Therefore, this bit can be used for sync in the data stream.

The four high order bits of the control byte are used to determine the button which is being used. These high order bits are coded as follows:

1100 = -- Button 1.
1111 = -- Button 2, single Button cursor, or stylus.
1110 = -- Button 3.
1101 = -- Button 4.

The four low order bits of the control byte are coded as follows:

0000 — -- indicates the first coordinate of a switched stream.
0001 — -- indicates successive coordinates of a switched stream.
0010 — -- indicates a coordinate of point mode.
0011 — -- indicates a coordinate of stream mode with the cursor button released.
0100 — -- indicates a coordinate of stream mode with the cursor button depressed.

The coordinate information is coded with the most significant bit of each byte a logical zero. The remaining seven bits of the most significant byte along with the remaining seven bits of the least significant byte express a 14 bit two's complement binary number.

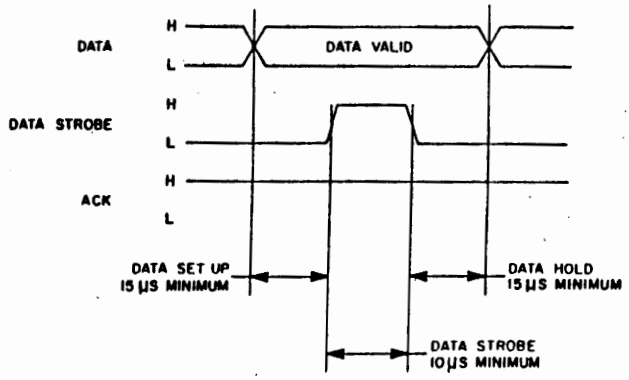
HIPAD INTERFACING

The interface connections to the HIPAD digitizer are made through a DB-25P connector directly from an Intel 8048/8748 microcomputer integrated circuit. Input and output signals are TTL compatible at one standard load unit., i.e., 1.6 mA. In addition, a serial output which is of RS-232-C level compatibility is also supplied.

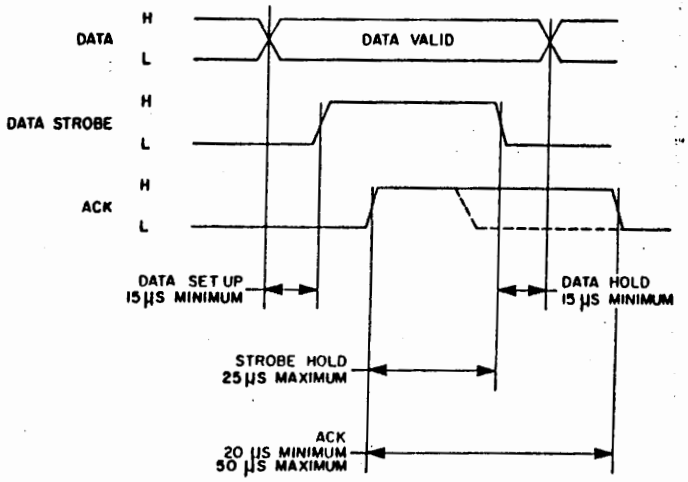
PARALLEL DATA INTERFACE

Parallel data is provided on an eight bit wide data path with a data strobe. In addition, an input is provided which can be used to control output timing.

OUTPUT TIMING WITHOUT ACKNOWLEDGE FUNCTION



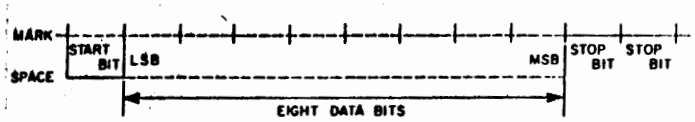
OUTPUT TIMING WITH ACKNOWLEDGE FUNCTION



SERIAL DATA INTERFACE

Serial data is provided either as TTL compatible levels or as RS-232-C compatible levels. The serial stream is asynchronous with one start bit, eight data bits, and two stop bits.

The serial stream can be stopped by pulling ACK line low.



The following baud rates are selectable in the interface connector, 300 BAUD, 1200 BAUD, 2400 BAUD, 4800 BAUD.

In addition to the normal output functions of the HIPAD, additional features have been provided in the interface connector.

Power for the HIPAD may be supplied in the data cable, thus eliminating the need for the power pak which is supplied with the unit. External power requirements are +12VDC ±10% @250 mA.

Provision has also been made to provide a remote RESET and/or CURSOR switch.

An additional status line PROX has also been provided which can be used to indicate that the cursor is in the position for digitizing.

SPECIFICATIONS . . .

DIGITIZING AREA — 11 x 11 inches (27.94 x 27.94 cm).

OVERALL SIZE — Height—1 inch (2.54 cm), Width—17 inches (43.18 cm), Depth—14 inches (35.56 cm).

RESOLUTION — 0.005 inches or 0.01 inches. Selectable at interface connector.

ACCURACY — ±0.015 inches (at 0.005 resolution) in relationship to user defined origin.

DATA RATE — Up to 100 coordinate pairs per second.

COORDINATE SYSTEM — Absolute Cartesian with choice of relocatable or fixed origin. Selectable at interface connector.

OUTPUT FORMATS — Binary, BCD, and Serial ASCII.

INTERFACE LEVELS — RS-232-C serial and/or TTL 8-bit parallel, selectable at interface connector (See Fig. 1).

SCALING English or Metric Units — Selectable at interface connector.

OPERATING MODES —

RESET: Resets origin and all functions of the digitizer.
POINT: Selects digitizing function for point to point.
SWITCH STREAM: Selects digitizing function for continuous digitizing whenever signalled by the switch.
STREAM: Selects digitizing function for continuous digitizing.

POWER REQUIREMENTS —

STANDARD — 110-125 VAC, 50/60 Hz, 5 watts
OPTIONAL — 250-250 VAC, 50/60 Hz, 5 watts
SPECIAL DC — +12 VDC @ 250 mA Max
SPECIAL AC — 9-10 VAC, 50/60 Hz, 3 Watts Max

SHIPPING WEIGHT — 8 lbs. (3.6k)

NET WEIGHT — 5 lbs. (2.25k)

INTERFACE CONNECTOR DB-25P

PIN 1 — Data Bit 0.
PIN 2 — Data Bit 1.
PIN 3 — Data Bit 2.
PIN 4 — Data Bit 3.
PIN 5 — Data Bit 4.
PIN 6 — Data Bit 5.
PIN 7 — Data Bit 6.
PIN 8 — Data Bit 7.

Used for parallel data formats in conjunction with one or more data strobes.

PIN 9 — Display STRB.
PIN 10 — BDC STRB.
PIN 11 — Binary STRB.
PIN 12 — TTL Serial Output.
PIN 13 — ACK - Used for output handshaking with BCD or Binary Format.
PIN 14 — +12VDC External Power.
PIN 15 — BAUD Rate Selection.
PIN 16 — BAUD Rate Selection.
PIN 17 — IN/MM Selection.
PIN 18 — .01/.005 inch resolution select.
PIN 19 — Floating or fixed origin select (except 4 button).
PIN 20 — Ground or Circuit Common.
PIN 21 — RESET - A contact closure to GND will reset the digitizer.
PIN 22 — RS-232-C Compatible Serial Output.
PIN 23 — Cursor SW - A contact closure to GND will duplicate the cursor sw function.
PIN 24 — PROX - Indicates the cursor is in digitizing position.
PIN 25 — +5VDC - Used to power the optional DISPLAY only.

Figure 1: Interface Connector Pin Assignments

OPTIONS:

DISPLAY — 5 digits (½ inch high, 1.3 cm) plus sign per axis.
Part No. DT11-91

STYLUS — Marking or non-marking pen-type device.
Part No. DT11-109

HISTORY OF HOUSTON INSTRUMENT

Houston Instrument has been designing and manufacturing recorders since 1959. Today we are the industry's leading manufacturer of recorders with models available in a wide variety of pen speeds, paper sizes and capabilities for on-line, off-line, remote batch and time share plotting applications.

A world wide operation, with sales and services in all major countries of the world, Houston Instrument is headquartered on 22 acres of land in Austin, Texas. Manufacturing is conducted at both our Austin, Texas and Bistel, Belgium plants.

In addition to digital plotters, we make strip chart recorders, X—Y recorders, electrostatic plotters and line printers. All products meet our stringent quality control standards and enjoy an outstanding reputation.

Houston Instrument is a division of Bausch and Lomb, a growing "Fortune 500" company listed on the New York Stock Exchange, and known throughout the world for their fine optical products and analytical instrumentation.