Release C, March 15, 2000

Technical Data and Instructions

DataPlot Printer Control Board
Model CB-420

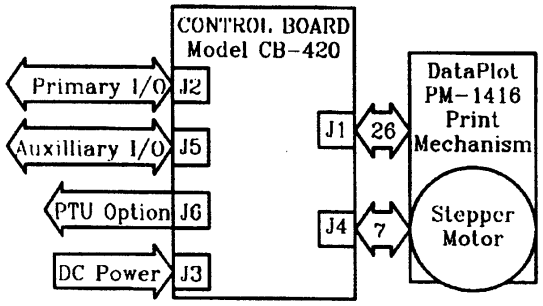
GENERAL DESCRIPTION

This is an 8039 microprocessor-based logic/control board for operating B-G Instruments' model PM-1416 print mechanism. It's user functions are determined by the program contained in an onboard EPROM (27C64). The standard program for the CB-420 supports parallel and limited serial ASCII data input, printing in the X and Y directions and versatile graphic plotting. Custom programs may also take advantage of an auxiliary keypad input on this board. For detailed information on these features, refer to the "Standard DataPlot Commands" sheet or your custom program specification. Please note that this board does not support all the features that are available on the model 1XXX series control boards.

SELF TEST

With proper power applied, connecting pins 1 and 2 of connector J5 together produces a print/plot test pattern that demonstrates proper operation of the print mechanism and drive circuitry. Connecting pins 4 and 2 together will cause paper to advance without printing.

ELECTRICAL INTERFACE DIAGRAM



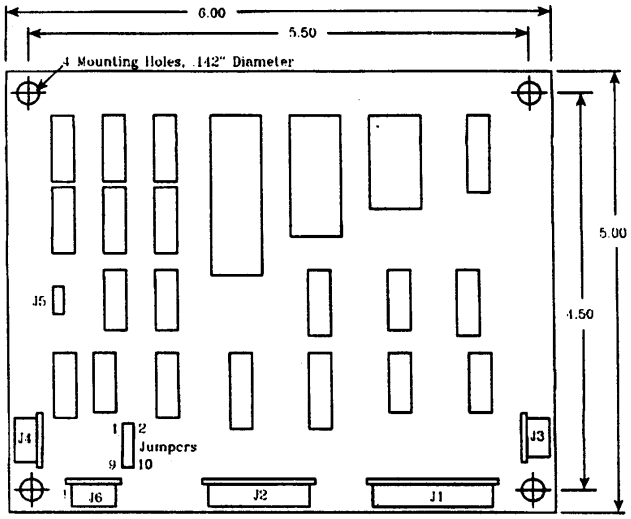
MATING CONNECTORS

for J2, T&B Ansley 609-2000M or equivalent
for J3, Molex 22-01-3067 shell, 08-50-0114 terminals
for J5, T&B Ansley 609-1000M or equivalent
for J6, Molex 22-01-3047 shell, 08-50-0114 terminals

PAPER ADVANCE

The PAPER ADVANCE signal is a single line available on connectors J2 and J5. It is internally pulled-up on the board. To advance paper, ground this line or drive it to a low state by a TTL driver (1.4 mA to ground).

LAYOUT AND DIMENSIONS



PRINT MECHANISM CONNECTIONS

As shown at the left, the CB-420 control board is connected to the printhead and stepper motor of the PM-1416 print mechanism through connectors J1 and J4. The circuit board is marked with the pin 1 location of J1. Pin 1 of each mating cable socket is marked by colored insulated conductor at one edge of the ribbon cable. The Molex connector at J4 should be inserted with the latch protrusion facing the retaining clip. These connections must not be made or broken while power is applied to the board.

JUMPER OPTIONS

A 10-pin jumper terminal is located on the CB-420 control board for selecting among various options, as follows:

OPTION:	CONNECT:
Parallel Input	3 to 4 and 6 to 8
Positive True Busy	7 to 9
Negative True Busy	9 to 10
Serial RS232C Levels	5 to 6
Serial TTL Levels	2 to 4
Non-Strobed Input	1 to 3

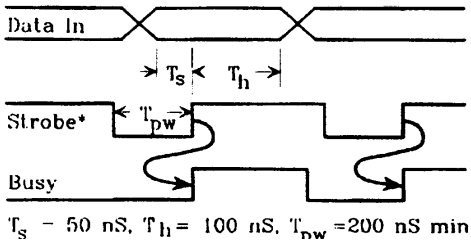
HEX DUMP MODE

With pin 5 of J5 grounded, the printer will not interpret commands, but will instead print all characters received, as hexadecimal values, up to 16 bytes per line. This mode is primarily useful for trouble shooting the system.

PARALLEL INPUT - Connector J2

The parallel input interface consists of 10 LSTTL lines, including 8 DATA lines, 1 STROBE* line to the printer and one BUSY line from the printer. The DATA lines are positive true logic while the STROBE* line is normally high with a low-going pulse whose rising edge causes the data to be read and BUSY to be set high (see timing diagram below). After the BUSY line returns low, the printer can accept more data. Select parallel input by connecting pin 3 to pin 4 and pin 6 to pin 8 at the jumper terminals. The CB420 board is normally delivered with these jumpers in place.

TIMING DIAGRAM



T_s – 50 nS, T_h = 100 nS, T_{pw} =200 nS min

SERIAL INPUT

This board is difficult to use for serial input because it provides no handshake BUSY signal in that mode. We recommend using the parallel input, or the CB-1416 control board if a complete serial interface is needed. With that caveat, this board provides an RS232 format input with 1 START bit, 8 DATA bits and 2 STOP bits at 300 baud. For RS232C levels, connect jumper pins 5 and 6. For TTL levels, connect pins 2 and 4. only one of these jumpers should be present. For the TTL input, the idle state is logic high, START bit is low, DATA true is logic high and the STOP bits are logic high. The RS232C input levels are the EIA Standard voltages:

NEGATIVE = 1= marking = OFF
POSITIVE= 0 = spacing= ON

WARRANTY

B-G Instruments will repair or replace, at its option, any model CB-420 control board that malfunctions within one year after its original date of sale, provided that it is used only for control of a PM-1416 print mechanism and:

1. neither the control board nor attached print mechanism have been modified in any way not specifically authorized by B-G Instruments, and
2. electrical power supplied to the control board has always been as specified in this document, and
3. the control board shows no evidence of electrical, thermal or mechanical damage.

INTERFACE PIN ASSIGNMENTS

The pins listed below are the only pins assigned for use by the standard CB-420 program. Pins not listed here may be assigned I/O functions in special application programs but should be left unconnected for the standard program.

J2 - Primary I/O
pin 1:BUSY
pin 2: 5V for pullup only
pin 3: Parallel Data, bit 0
pin 4: Parallel Data, bit 1
pin 5: Parallel Data, bit 2
pin 6: Parallel Data, bit 3
pin 7: Parallel Data, bit 4
pin 8: Parallel Data, bit 5
pin 9: Parallel Data, bit 6
pin 10: Parallel Data, bit 7
pin 11: STROBE* or TTL serial
pin 12: PAPER ADVANCE
pin 16: Serial Input
pins 19 and 20: GROUND

J3 - Power
pin 1: + 5V
pin 2: SV return
pins 3&4: + 16V
pins 5&6: 16V return

J6 - PTU Drive
pin 1: GROUND
pin 2: + 16V
pin 4: Drive Pulse

J5 - Auxiliary Keypad
pin 1: Self Test
pin 2: GROUND
pin 3: Serial Input Select
pin 4: Paper Advance
pin 5: Hex Dump pin
pin 6: Invert Print

Note for J5: Connect GROUND (pin 2) to pin 1, 3, 4, 5 or 6 to select the listed mode. The other pins (7, 8, 9 and 10) are for use only for keypad input in specially programmed printers. Grounding or otherwise connecting to pins 7, 8, 9 or 10 may cause system failure and possible damage.

POWER REQUIREMENTS

The CB-420 control board requires + 5V + /-5% logic power @ 300 mA and + 16Vdc for the printhead and stepper motor. The 16V current requirement is quite variable, from 3.8 amperes peak for 2 milliseconds while printing a maximum line of dots to a much lower average of a few hundred mA during printing of columnar data. The 16V should also be adjustable over + /-10% to compensate for differences in printhead resistances.

The 16V must not be applied before applying the 5V logic power or when the 5V is outside its tolerance limits. Internal logic reset circuitry is provided to prevent damage when the two supplies are energized at once. The 5V supply must be free of spikes that might cause the microprocessor to partially reset and thereafter run improperly.

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