

TECHNICAL DATA APRIL 1973



The Peripheral Control II Block provides for control of most 9800 family peripherals, with the exception of the 9865A Cassette Memory. It differs from 11220A Peripheral Control I Block in that general interface capabilities have been significantly enhanced at the expense of the high level plotter control. Unique new features include the ability to do tape translation, control the new Hewlett-Packard ASCII Bus for instrumentation systems, formatted read and write capability, and a key to call special internal code programs.

must be scaled between 0 and +1; this may be accomplished by the equations

$$\frac{X_c - x_{\min}}{x_{\max} - x_{\min}} \quad \text{and} \quad \frac{Y_c - y_{\min}}{y_{\max} - y_{\min}}$$

where min and max denote the minimum and maximum values. The scale, axes, and lettering functions must be done by programming.

DESCRIPTION



N, PLT works in either of two ways. PLT; - with no parameters PLT gives pen up. PLT Xc, Yc; - with X coordinate and Y coordinate specified, PLT causes the pen to move to those coordinates and drop if up. X and Y coordinates



0, FMT - all of the format conversion and edit specifications in Peripheral Control I remain in Peripheral Control II.

PCI Conversion specifications are:

- FMT r FLT W.d (Floating)
- FMT r FXD W.d (Fixed)
- FMT r FXD W.0 (Integer)

PCI Edit specifications are:

- FMT r X r Spaces
- FMT r / CR-LF sent r times
- FMT r "... " quote field (alpha numeric message)
- Z Suppress CR-LF

Additional specifications in Peripheral Control II are:

FMT*;- specifies free field input format for Read statement; this makes the read statement the same as it is in Peripheral Control I Block.

The following specifications are used primarily for the HP ASCII Bus:

FMT YN - N is a number between 0 and 15 decimal. This specification causes the four I/O status output bits to be set to N.

FMT r FXD * . D or

FMT r FLT * . D - cause the number to be sent with all leading spaces suppressed.

There is an additional new tabular format capability:

FMT N,; - labels the format statement so that it may be called by any Read or Write statement written as

RED N, M, or

WRT N, M; - N is the integer part and specifies select code, M is the fractional part (must be $0 \leq M \leq 9$) and specifies the Format label number. For example:

RED 3.2, A; will call FMT 2, and address select Code 3, putting the contents into A.



, WRT - operation and syntax are much like Peripheral Control I. The exceptions are:

- Quote fields must be in the Format statement.
- There is no default format; each RED or WRT must have a FMT statement.
- WRT 15, replaces the Type key on PCI.
- All 128 (2^7) seven bit codes in the ASCII field may now be sent.



, RED - Syntax and operation of the RED key are upward compatible from Peripheral

Control I. Significant new features are:

- RED statement may be executed from the keyboard.
- RED may be formatted in the same manner as WRT. In addition the select code may be an arithmetic expression.
- RED is approximately ten times faster than Peripheral Control I Block. When external peripheral delays are not limiting, PCII can handle data at up to 600 characters per second.



, TFR is the same as with Peripheral Control I except that the entire eight bits are now transferred instead of seven bits in PCI.



, CMD is a key which is used by the new HP ASCII Bus for instrumentation control. It has the syntax CMD "Address", "Instruction" The address is sent in multiple or address mode and the instruction is sent in single or instruction mode; modes alternate for longer control statements. The statement CMD "ABC", "XYZ" is equivalent to the longer statement FMT Y1, "ABC", Y2, "XYZ", Z; WRT13; Select Code 13 has been assigned to the HP ASCII Bus.



, RDS is a function key which returns the four status input lines as a decimal number in the range 0 to 15. Syntax is RDS SC. This key is used with the HP ASCII Bus and may have other uses.



, WTB takes a decimal number between 0 and 255 ($2^8 - 1$), computes the binary equivalent and outputs it to the specified select code. Syntax is WTB SC, DATA. For Data or arithmetic expressions with values larger than 255, the output is modulo 256.



, RDB is the input dual to Write Byte. The syntax is: RDB SC. For a specified select code, the eight data bits are converted to a decimal number.

RDB is a function and may be tested, stored or manipulated. Using Read Byte, the user also has the ability to sense an event along with passing status information about those events, and to construct a primitive interrupt control.



, CSP is a unique key which allows the user to execute stored internal code programs. These special programs make the 9820A truly

anti-obsolete. The syntax is:

CSP "NAME", P₁, P₂,

where "NAME" is the label of a special program that has been stored in the read/write memory of the 9820A; P₁, P₂,, are the parameters of the special program.

Special programs may be written only by Hewlett-Packard; a list of these programs will be available at your nearest HP sales and service office.

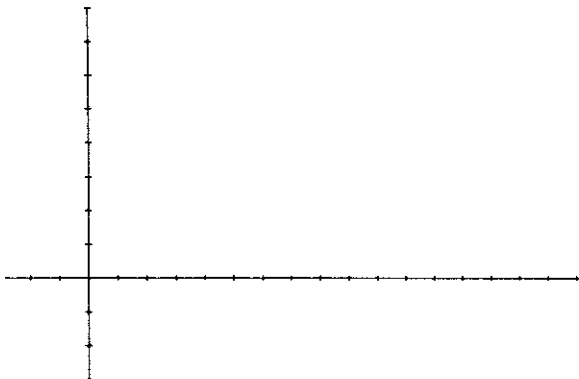
EXAMPLE NO. 1

Plotter program to plot axes and tic marks in keyboard language. This program demonstrates use of the scale factors.

```

0:
ENT "X MIN",R0,"
X MAX",R1,"Y MIN
",R2,"Y MAX",R3,
"X AXIS",X,"Y AX
IS",YF
1:
(X-R2)/(R3-R2)+B
;0+A;PLT A,B;1+A
;PLT A,B;PLT ;B+
R4F
2:
(Y-R0)/(R1-R0)+A
;0+B;PLT A,B;1+B
;PLT A,B;PLT ;A+
R5F
3:
ENT "X TIC",X,"Y
TIC",Y;R5+A;R4+
B;Y/(R3-R2)+CF
4:
IF 0<B;B-C+B;
JMP 0F
5:
PLT A,B;PLT A+.0
05,B;PLT A-.005,
B;PLT A,B;PLT F
6:
IF B<1;C+B+B;
JMP -1F
7:
X/(R1-R0)+CF
8:
R4+B;IF 0<A;A-C+
A;JMP 0F
9:
PLT A,B;PLT A,B+
.005;PLT A,B-.00
5;PLT A,B;PLT F
10:
IF A<1;C+A+A;
JMP -1F
11:
END F

```



EXAMPLE NO. 2

Code conversion using Read Byte and Write Byte keys. Tape one is an ASCII coded data tape; tape two is the same data converted to EIA 227 code, which is widely used for numerical control purposes.

Tape 1 - ASCII

Tape 2 - EIA 227

```
0:
RDB 1+Z;IF Z=0;
WTB 2,0;JMP 0F
1:
IF Z<31;JMP -1F
2:
IF Z>57;JMP -2F
3:
IF Z=32;WTB 2,16
F
4:
IF Z<43;JMP -4F
5:
Z-44+Z;GSB +2F
6:
JMP -6F
7:
JMP 1+ZF
8:
WTB 2,59;RET F
9:
WTB 2,64;RET F
10:
WTB 2,107;RET F
11:
WTB 2,49;RET F
12:
WTB 2,32;RET F
13:
WTB 2,1;RET F
14:
WTB 2,2;RET F
15:
WTB 2,19;RET F
16:
WTB 2,4;RET F
17:
WTB 2,21;RET F
18:
WTB 2,22;RET F
19:
WTB 2,7;RET F
20:
WTB 2,8;RET F
21:
WTB 2,25;RET F
22:
END F
R139
```

