While the HP 82143A Printer is plugged into the HP-41C, these operations become active in the system. These operations and programs containing these operations are only executable while the printer is plugged in and turned on. You can print these functions as well as functions in other plug-in accessories by executing \texttt{CATALOG} 2 while the printer is set to TRACE, or only view them in the display by executing \texttt{CATALOG} 2 while the printer is set to MAN or NORM.

### Function Index

- **ACA**
  Accumulates ALPHA register into print buffer.

- **ACCHR**
  Accumulates character into print buffer. Place character number (1-127) into X and execute \texttt{ACCHR}.

- **ACCOL**
  Accumulates column into print buffer. Place column print number (0-127) into X and execute \texttt{ACCOL}.

- **ACSPEC**
  Accumulates special character built in X using \texttt{BLDSPEC} into print buffer.

- **ACX**
  Accumulate X-register into print buffer.

- **ADV**
  Advances paper and prints buffer right justified.

- **BLDSPEC**
  Builds special character. Place column print number (0-127) into X and execute \texttt{BLDSPEC}. Repeat up to seven times. Accumulate into print buffer using \texttt{ACSPEC} or store in a register.

- **LIST**
  Lists program lines. Place number to list in X and execute \texttt{LIST}. Not programmable.

- **PRA**
  Prints ALPHA register.

- **PRAXIS**
  Prints axis using these inputs: $R_{00} = \text{YMIN}$, $R_{01} = \text{YMAX}$, $R_{02} = \text{nnn}$, $R_{04} = \text{AXIS}$. 
Prints print buffer left justified.
Prints flags and other status information.
Prints key reassignments.
Prints named program. Execute \texttt{PRP} and key in name. If name not specified, prints current program (not programmable).
Prints plot of named function. Prompts for these inputs: NAME, YMIN, YMAX, AXIS, XMIN, XMAX, XINC. Positive XINC specifies increment between values, negative XINC specifies number of increments. Store optional special plotting character in \texttt{R}_{03}.
Prints plot of function. Inputs must be stored in these registers: \texttt{R}_{00}=YMIN, \texttt{R}_{01}=YMAX, \texttt{R}_{03}=optional plot character, \texttt{R}_{04}=AXIS, \texttt{R}_{08}=XMIN, \texttt{R}_{09}=XMAX, \texttt{R}_{10}=XINC, \texttt{R}_{11}=NAME.
Prints all registers beginning with \texttt{R}_{00}.
Prints registers as directed by \texttt{X}. Format of \texttt{X}-number is \texttt{bbb.eee} where \texttt{bbb} is beginning register and \texttt{eee} is ending register.
Prints statistics registers.
Prints stack.
Prints \texttt{X}-register.
Plots single line using data in these registers: \texttt{X}=plot value, \texttt{R}_{00}=YMIN, \texttt{R}_{01}=YMAX, \texttt{R}_{02}=nnn.aaa where \texttt{nnn} is width of plot in columns and \texttt{aaa} is column location of axis. \texttt{PRAXIS} automatically supplies \texttt{nnn.aaa} to \texttt{R}_{02}.
Skips characters, accumulates in print buffer. Place number of characters to skip in \texttt{X} and execute \texttt{SKPCHR}.
Skips columns, accumulates in print buffer. Place number of columns to skip in \texttt{X} and execute \texttt{SKPCOL}.
Plots single line using data in stack registers: $T = \text{plot value}, Z = \text{YMIN}, Y = \text{YMAX}, X = \text{nnn.aaa}$ where nnn is width of plot in columns and aaa is column location of axis.

**Print Mode Switch**

In MAN printer is idle unless you or a program executes a print function. In NORM printer prints numbers and ALPHAs that are keyed in, function names as they are executed from the keyboard, and output from print functions. In TRACE printer prints numbers and ALPHAs that are keyed in, function names, intermediate and final answers, and output from print functions.

**Print Key**

In HP-41C normal mode, press $\text{PRINT}$ to print the contents of X-register. In ALPHA mode, press $\text{PRINT}$ to print the contents of the ALPHA-register. In PRGM mode, pressing $\text{PRINT}$ inserts a $\text{PRX}$ as a line in program memory, or while the HP-41C is also in ALPHA mode, inserts a $\text{PRA}$ into the program.

**Paper Advance Key**

Advances printer paper; prints print buffer right justified. In PRGM mode, inserts $\text{ADV}$ into program.

**Standard HP-41C Printing Functions**

$\text{VIEW}$ prints and displays the contents of specified register. $\text{AVIEW}$ prints and displays ALPHA register. $\text{PROMPT}$ prints and displays ALPHA register and halts program execution.

**XROM Functions**

Programs that contain printer functions will show an XROM function number while printer is not plugged into the HP-41C. Refer to the *HP 82143A Owner's Handbook* for XROM numbers and details.
Flags and the Printer

Flag 12: Double Wide Flag. When set, printing is double wide.

Flag 13: Lower Case Flag. When set, letters are printed lower case.

Flag 25: Error Ignor Flag. When set, ignores the first error encountered. Automatically cleared by error.


Flag 55: Printer Existence Flag. Determines if printer is connected or not. See table 1.

Table 1
Here is a table that shows how flags 55 and 21 work together to control printing in executing programs.

**Flag 55 Printer Existence Flag**

<table>
<thead>
<tr>
<th>Flag 21 Printer Enable Flag</th>
<th>SET</th>
<th>CLEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SET</strong></td>
<td>Initial condition when printer is connected.</td>
<td>Printer is not connected but flag 21 has been set.</td>
</tr>
<tr>
<td>1. If printer is ON, print functions print normally.</td>
<td>1. No printing occurs.</td>
<td></td>
</tr>
<tr>
<td>2. If printer is OFF, print functions result in <strong>PRINTER OFF</strong> display.</td>
<td>2. <strong>VIEW</strong> and <strong>AVIEW</strong> perform normal functions and halt execution. <strong>ADV</strong> is ignored.</td>
<td></td>
</tr>
<tr>
<td><strong>CONTINUED</strong></td>
<td>3. Execution of printer functions result in <strong>NON-EXISTENT</strong> display.</td>
<td></td>
</tr>
</tbody>
</table>
Flag 55 Printer Existence Flag

<table>
<thead>
<tr>
<th>SET</th>
<th>CLEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printer is connected but flag 21 has been cleared.</td>
<td>Initial condition when printer is not connected.</td>
</tr>
<tr>
<td>1. Running programs do not print output from print functions, even if printer is connected and ON. <strong>VIEW</strong> and <strong>AVIEW</strong> operate normally in programs but do not print.</td>
<td>1. <strong>VIEW</strong> and <strong>AVIEW</strong> perform normal functions and do not halt execution. <strong>ADV</strong> is ignored.</td>
</tr>
<tr>
<td>2. Printer ON: print functions executed from keyboard print normally.</td>
<td>2. Print functions displayed as XROM nn,nn in programs and result in <strong>NON-EXISTENT</strong> when executed in running program.</td>
</tr>
<tr>
<td>3. Printer OFF: print functions executed from keyboard result in <strong>PRINTER OFF</strong>.</td>
<td>3. Print functions executed from keyboard are <strong>NON-EXISTENT</strong>.</td>
</tr>
</tbody>
</table>