Operation of the HP 16500C Logic Analyzer
Rev. A

Introduction
The HP 16500C is a mainframe logic analyzer system. It utilizes plug-in cards to allow customized functionality. Each HP 16500C in the CHD lab contains among its cards an HP 16550A 100/500MHz Logic Analyzer, which will be used for debugging CHD labs.

Physical characteristics of the Logic Analyzer
The display of the logic analyzer is a 9” CRT with a touch sensitive surface. There is also a control to disable the touch-sensitivity. The front of the analyzer also features a jog wheel for input, and a mouse connects to the rear.

The plug-in cards slide in from the rear of the mainframe. I/O signals connect to the plug-in cards by means of pods. Large, multi-conductor cables attach directly to the cards and extend to breakout pods where the individual connections are separately available. The pods may be attached directly to header pins or used with probe tips with optional spring-loaded clips.

Graphical interface to the mainframe
The HP 16500C is controlled via a graphical menu system that takes input from the touch-screen or mouse. The two fields in the upper left of the screen select menus. The left field selects the module being used, and the right field identifies the module-specific menu displayed. Near the upper right on most menus is a “Print” button, which prints screen captures or saves them to disk.

System Module

System Configuration Menu
After booting, the HP 16500C starts the user at the System Screen shown in Figure 1. As the name suggests, this menu is mainly used to configure system-wide options.
**System Disk Menus**

Changing the Menu field to “Hard Disk” or “Flexible Disk” allows saving the configuration of any or all modules, instead of having to re-enter all label and trigger settings each time.

**100/500 MHz Logic Analyzer Module**

**Format Menu**

On the “Format1” menu of the “100/500 MHz LA E” module, labels can be entered for signals and pins assigned to those labels. Selecting a label brings up a small menu allowing the label top be turned on or off and editing the label’s text. Clicking under a pod on the row corresponding to each label allows selecting pins from that pod to be assigned to the label. An asterisk represents a selected pin; a dot represents an unselected pin.

**Trigger Menu**
The “trigger” menu defines the conditions under which the logic analyzer initiates display of waveforms. Conditions can be built from patterns of either levels or edges of signals built up from smaller patterns for each label. The patterns for the pins of each label can be entered in a number of radices, including ASCII. Once these patterns are defined, the relations between them can be defined, such as the times each must be present and the order in which they must occur. The default trigger condition is for the presence of a single pattern for a certain amount of time will suffice in many cases.

![Figure 4: Defining trigger conditions](image)

**Waveform Menu**

Once the trigger conditions have been defined, proceeding to the “Waveform1” menu allows the signals to be displayed. Pressing the “Run” button in the top right starts the analyzer, which then waits for the trigger condition to be met. The “Marker” button turns on vertical markers that can be used to measure time intervals or to show the signal pattern at particular times. Selecting the “sec/div” allows adjustment of the time scale so that long intervals or small detail can be shown.

![Figure 5: The Waveform Menu](image)

**Listing Menu**

As an alternative to the waveform display, selecting the “Listing1” menu will display the signals in a tabular form, which may be more appropriate for some data.
### Figure 6: Signals displayed in list format

<table>
<thead>
<tr>
<th>Label</th>
<th>TESTI</th>
<th>Time</th>
<th>STATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hex</td>
<td>Absolute</td>
<td>Hex</td>
</tr>
<tr>
<td>-7</td>
<td>0</td>
<td>-28 ns</td>
<td>0</td>
</tr>
<tr>
<td>-6</td>
<td>0</td>
<td>-24 ns</td>
<td>0</td>
</tr>
<tr>
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<td>0</td>
<td>-20 ns</td>
<td>0</td>
</tr>
<tr>
<td>-4</td>
<td>0</td>
<td>-16 ns</td>
<td>0</td>
</tr>
<tr>
<td>-3</td>
<td>0</td>
<td>-12 ns</td>
<td>0</td>
</tr>
<tr>
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<td>0</td>
<td>-8 ns</td>
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</tr>
<tr>
<td>-1</td>
<td>0</td>
<td>-4 ns</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0 s</td>
<td>0</td>
</tr>
</tbody>
</table>