

**Lucas Control Systems Products
Deeco™ Systems**

Touch Assist II

USER MANUAL

Lucas Control Systems Products

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1.0 Installation

Touch Assist II is supplied on a single floppy disk and is comprised of three files:

- 1) TOUCH.EXE
- 2) TOUCH.HLP
- 3) TOUCH.INI

To install Touch Assist II, copy the files TOUCH.EXE and TOUCH.HLP into the same directory. This may be any directory (e.g. C:\TAII). The file TOUCH.INI should be copied into the directory where Windows is installed (e.g. C:\WINDOWS).

2.0 Overview

Touch Assist II (TAII) is the second generation of Lucas Control Systems Products' application generating tool for its touch/graphic products. These products are intelligent flat panel controllers married with infrared touch sensing arrays. TAII allows users to generate graphic screen images and construct touch menu systems for use in LCSP products.

TAII is intended to aid the application and OEM designer in incorporating LCSP products into their systems. It provides an easy-to-use graphical interface to the features and functions of the LCSP product family. It is a screen generator, CAD tool, and paint program whose output is easily incorporated into software systems, or embedded within the LCSP product.

2.1 *LCSP Touch/Graphic Products*

LCSP products are intelligent controllers for flat panel touch systems. The system of flat panel, infrared touch, and controller is designed as a stand-alone ASCII/graphics terminal.

2.2 Text and Graphics Capability

The terminal functionality is based on Digital Equipment Corporation's popular VT series (VT100, VT220, VT320, etc.). The VT series is the originator and prime user of the ANSI 3.64 standard command language for text terminals. The text terminal emulation is accurate and reliable for these products. Some offer more complete emulations but all offer accuracy in the subset of the VTxxx commands that they support. They support multiple visual pages, multiple character sets, user-definable characters, editing functions, and extensive cursor control.

The graphics functions in LCSP products are accessed through an extension of the VTxxx command structure. Basic graphic objects such as vector, circle, arc, and graphic text are supported as well as advanced functions controlling coordinate transformation, clipping, and windowing.

2.3 Touch Capability

The touch system, offered on all LCSP products, extends the terminal functionality and creates a simple, powerful man-machine interface. Touch input can be as simple as X, Y coordinate pair reporting. When the user touches the screen, the coordinates describing the position of the touch are reported to the host over the communication link. LCSP products offer this and more. The interface designer may define regions on the screen which represent actuators (buttons). When a button is touched, the terminal may be programmed to take action independent of the host. That is, the designer may embed commands in the definition of the button freeing the host of wasteful overhead.

2.3.1 Buttons and Menus

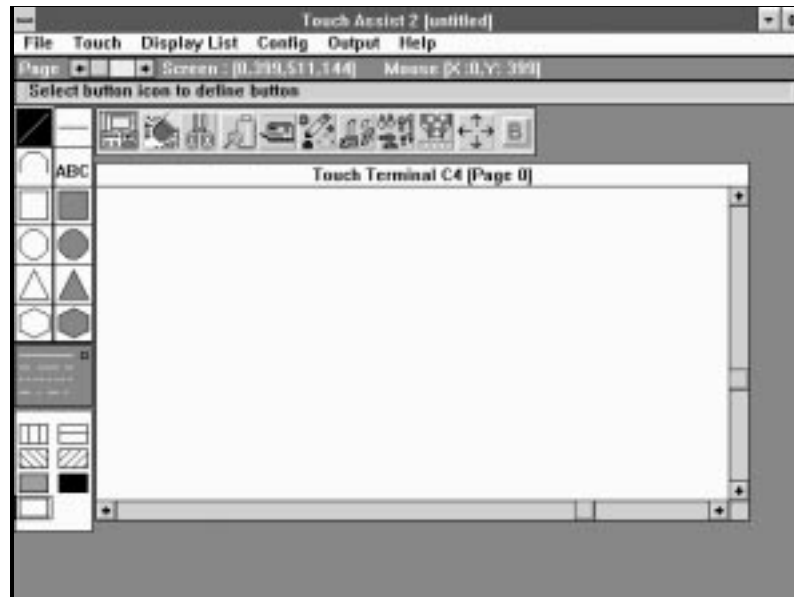
The "button" is the basic touch unit in the intelligent touch system. A button is defined by its position and size on the screen, its visual appearance, and its response. Many buttons may be grouped together to form a page (menu).

The button response, which is activated by touching the button, is divided into two parts, the local response and the host message. The host message is an ASCII string which is sent to the host over the communication link. The local response is an ASCII string which is treated like a host command stream: it may contain any command which the host itself could send to the terminal. It is the local response which represents the embedded intelligence of the touch system.

A menu, or page, is a group of buttons. A menu may be identified by a single number (the page number). When activated by a command, a menu is automatically drawn on the screen. Menus may be linked in a hierarchical structure by embedding the command to activate another menu in the local response of a button on the currently active menu.

3.0 Touch Assist II Design Tools

TAII is a Microsoft® Windows™ 3.1 compatible application. Much of the "look and feel" of TAI is standard Windows giving the designer a head start in understanding how it works. Some Windows techniques used in TAI and described in this manual such as "clicking", "double clicking", and "dragging" are essential in the use and understanding of TAI. Descriptions of these techniques and others may be found in the Windows manual.



TAII offers the interface designer a variety of tools to build the visual and tactile interface. The designer may build button menus, link them, and design associated graphic images. TAII uses palettes of design tools, on-line help, and download functions to aid the design process. The final output of TAII can be transferred directly to a LCSP device or the output can be incorporated into the program of the host system either as a data file or as compiled C code.

The TAII is composed primarily of four tool types:

- 1) System configuration and control
- 2) Target configuration and control
- 3) Graphics generation
- 4) Touch menu generation.

The access to these tools is from the main menu bar, the function palette, and the graphics palette.

The TAI layout consists of the following major components on the PC monitor:

- Title Bar** a standard Windows item that displays the file name of the last TAI file opened or accessed. It also has the standard Windows control bar and min/max controls.
- Menu Bar** a standard Windows item which gives access to pull down menus that control the configuration of the system, the target, and other TAI features and functions.
- Status Line** this is where target and system information is displayed.
- Design Window** this is where the visual touch/graphics design is displayed as it is built.
- Function Palette** an icon based front end to TAI design tools.
- Graphics Palette** this is where the user may access all graphics and text drawing functions.
- Help Line** provides context sensitive help.

3.1 The Title Bar



The title bar, a standard Windows characteristic, displays the program title (Touch Assist II) and more importantly the name of the active session, (the file name selected). The active session is named after the file used for default file operations. If there is no default file, the session is named "untitled".

The default file name is set whenever a file is opened or saved. These operations are accessed through the "File" menu selection. Specifying "new" from the file menu resets the default file to none.

3.2 The Menu Bar

File	Touch	DisplayList	Config	Output	Help
------	-------	-------------	--------	--------	------

The menu bar consists of six pull down menus: File, Touch, Display List, Config, Output, and Help. Standard Windows keyboard accelerator techniques allow the menus to be activated by typing a letter as well as by mouse activation.

3.2.1 File



TAII files are used to save and retrieve sessions. A session is an instance of running TAI and designing touch menus and graphics. Sessions may be saved, retrieved, and combined.

Many of the file operations available on the File menu conform to standard Window 3.1. Beyond the obvious file operation some file menu items impact modes or other functions in TAI, or provide additional capabilities.

New clears all defined objects from the session. All graphics, buttons, menus, and list references are erased. Many modes are reset to default values.

Example: Creating a File

Step 1. Select the **File function** from the **Menu Bar**.

Step 2. Select **New...** from the choices presented.

Note: If you currently have information on the screen (i.e. Graphics or Buttons), a dialog box will prompt the user to save this information.

- Step 3. At this point the user may create Graphics or Buttons on the Touch Assist II **Design Window**. (Refer to the examples in the sections on Graphics and Buttons for details.)
- Step 4. After creating graphics or buttons on the **Design Window**, select the **Save As...** option from the File menu.
- Step 5. Type the desired file name. (Standard DOS filename rules apply.)
- Step 6. Click the **Save** button. The user can verify that the file has been saved by using techniques discussed in the following example.

Open is used to retrieve an existing session file. File names are prompted for in dialog boxes associated with these functions. The names supplied become the session name appearing in the TAI title.

Example: Opening an Existing File

- Step 1. Select the **Open...** function from the **File** menu.

Note: If you currently have information on the screen (i.e. Graphics or Buttons), a dialog box will prompt the user to save this information.

- Step 2. Select the desired file from the choices presented in the dialog box.
- Step 3. Click the **Open** box.

Copy allows user to copy an existing TAI file to any desired directory. Dialogue windows are provided to enter file name and destination.

Example: Copying a File

- Step 1. Select the **Copy** function from the **File** menu.
- Step 2. Select the file to be opened from the choices provided within the **Open File Name** box.
- Step 3. Position the mouse inside the **Copy to Dir.** box and click the left button on the mouse.
- Step 4. Type the path of the desired file to be copied.
- Step 5. Click the **Open** button. This will activate the desired file.

Append is used to combine sessions. The file specified in the append operation is combined with the current session. Appending does not change the session name. When appending files, buttons on pages are combined and care must be taken if buttons overlap. Another possible problem encountered in append operations is references to files as display lists. When the current session and the appended session both name a file as a particular display list, the appended files reference stands as the one used from then on.

Example: Using the Append Function to Combine a File

- Step 1. Open the desired file to be appended using techniques discussed in the Opening a File example.

- Step 2. Select the **Append** option from the **File** menu.
- Step 3. Select the target file from the choices provided.
- Step 4. Click the **Execute** button. A dialog box will prompt the user to cancel or proceed.
- Step 5. Click the **OK** button.
- Step 6. The first file will now be combined under the heading of the target file that was selected.

Save/Save As are used to store session information.

Example: Saving a File

- Step 1. Select the **File** function from the **Menu Bar**.
- Step 2. Select the **Save** option from the choices provided.

Note: A file may be saved at any time after it is created or opened.

Example: Using the Save As... Function

- Step 1. Follow steps 1-4 from the Example: Opening an Existing File.
- Step 2. Select the **Save As...** option from the **File** menu.
- Step 3. Type the new file name in the **File Name** dialog box.

Step 4. Click the **Save** button.

Note: The original file will still exist under the original file name. This is a useful tool that will allow the user to test different modifications of a program while leaving the original intact.

View is used to examine the text information in any given file created during a session. The desired file must be converted to an ASCII file before it can be viewed. See Output mode.

Example: Viewing a File

Step 1. Select the **View** option from the **File** menu.

Step 2. Select the desired file to be viewed from the choices provided.

Step 3. Click the **Open** box. At this time the file will be display in ASCII form.

Step 4. To return to the Touch Assist II **Design Window**, select the **Exit** button from the **File** menu.

Note: All files must be compiled into ASCII form before they can be viewed. Refer to the **Example: Creating an ASCII File in the Output Menu section.**

Delete is used to delete any given file found under the TAI directory. All information associated to the file will be lost.

Example: Deleting a File

Step 1. Select the **Delete** option from the **File** menu.

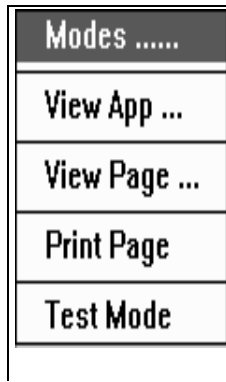
- Step 2. Select the desired file to be deleted from the choices provided.
- Step 3. Click the **Execute** button. At this point a dialog box will prompt the user to cancel or proceed.
- Step 4. Click the **OK** button to proceed with the file deletion or click the **Cancel** button to cancel.

Exit terminates the program session.

Example: Exiting Touch Assist II.

- Step 1. Select the **Exit** option from the **File** menu.
- Step 2. At this point a dialog box will prompt the user to Save file or Cancel
- Step 3. Clicking the **Yes** button will save the file prior to exiting TAI. Clicking the **No** button will exit TAI without saving the changes made to the current file.

3.2.2 Touch



Parameters which control touch application generation are accessed through this menu. LCSP products support many modes of operation which change the look and feel of touch buttons and menus as well as more rudimentary touch functionality. These modes are accessible from the "Modes" item of the Touch menu. For detailed descriptions of these modes, refer to the product manual of the device. Typically, the default values used by TAI are sufficient.

The Touch menu also allows the designer to view the current application in different ways. A hierarchical view is supported by the "View App" item. In this view, all pages are shown in a simple list structure. Individual elements of the page, buttons and graphic objects, are described. The list can be scrolled to view all pages and their elements. The detailed specifications of individual buttons on a page can be viewed by clicking on button item (buttons are identified by their label).

Another view supported is the "whole page" view selected by the "View Page" item of the Touch menu. This view shows the entire page in a single window. The page elements, buttons and graphic objects, are shown exactly as they are in the **Design Window**. Unlike the **Design Window** however, a simulation of the entire screen of the target device is shown.

The "Print Page" item of the Touch menu prints the view offered by "View Page". The printing is done through the standard windows printer driver.

Example: Configuring Touch Button Report Modes

- Step 1. Select the **Modes** option from the **Touch** menu.
- Step 2. Select the desired button report mode(s) from the choices provided. An "X" in the box of any given mode will enable that mode.
- Step 3. Click the **Set** button.

Note: Clicking the Reset button will return all settings back to factory default settings. Clicking the Exit button will return the user back to the Design Window causing all changes to be deleted.

Example: Viewing a Page Summary

- Step 1. Select the **View App...** option from the **Touch** menu. At this point the user will be able to view a summary of the button pages which have been defined by the current program.

- Step 2. The user may view the attributes and responses of any particular button by double clicking the icon representing the desired button with the mouse. Clicking the **Exit** button will return the user to the **Page Summary** screen.
- Step 3. To exit the **Page Summary** screen, click the **Control Menu** box at the upper left hand corner of the screen. Select **Close Alt + F4** from the options listed. An alternative method of closing the **Page Summary** screen would be to double click the **Control Menu** box.

Example: Viewing a Page

- Step 1. Select **View Page** from the **Touch** menu. At this time the **Design Window** will be maximized.
- Step 2. To exit the full page screen, click the **Control Menu** box at the upper left hand corner of the screen. Select **Close Alt + F4** from the options listed. An alternative method of closing the full page screen would be to double click the **Control Menu** box.

Example: Printing a Page

- Step 1. Open an existing file or created a new file using techniques discussed in the File Menu section.
- Step 2. Select **Print Page** from the **Touch** menu. At this time the page will be printed.

Example: Using Test Mode

- Step 1. Open an existing file or created a new file using techniques discussed in the File Menu section.
- Step 2. Select the **Test Mode** option from the **Touch** menu. To disengage the **Test Mode** option, simply click the option a second time with the mouse pointer.

- Note:**
- 1) All TAII Menu functions, Function Palette Icon, and Graphics Palette functions are disabled while in Test Mode.
 - 2) Positioning the mouse onto a button and clicking the left button once emulates activating the button.
 - 3) Pop-up menus will appear at the upper left hand corner of the Design Window regardless of the coordinates specified by the button parameters. However, they will be positioned correctly upon download to the target unit.

- 4) **Test Mode will not emulate a Button Capture response as described in the Button section.**
- 5) **Host mode may be enabled prior to activating Test Mode. Host mode will allow the user to view the host responses of any button activated while in Test Mode.**

3.2.3 Display Lists



Display lists are a feature in LCSP products. A display list is a sequence of commands which are grouped together and may be referred to by a single numeric ID. They are used as macro commands. In the product, these commands

can be stored locally, often in non-volatile memory, so that the host system can execute the entire command macro by issuing a single simple instruction to the unit. This saves on communication overhead and helps embed local intelligence and flexibility in the target unit. TAIL provides a means to define and use display lists when designing applications.

In TAIL, display lists can be used to couple graphics and touch menus. The action (local response) of a button may be to invoke a display list. The list contents, graphic commands, are executed resulting in graphic images on the screen. A local response may also contain a command to change button pages. By doing both in a local response a button may change button pages and efficiently draw its associated graphics. Buttons on many different pages may use the same local response combination of page change and display list. See examples section to learn how to create and use a display list.

Display lists are referenced as separate files in a TAIL design. These files typically will contain frequently used graphics. In fact, a file referenced as a display list may contain graphics, or graphics generated text. Attempting to reference a file which contains touch menu definitions as well will result in an error. To reference a file as a display list in a TAIL session, use the "Define List" item in the Display List menu. The dialog box invoked by this item asks for the

numeric ID of the list and the file to be referenced. The ID is then used throughout TAI to reference the display list.

The Display List menu allows lists to be deleted. Deleted lists will not be downloaded or otherwise specified in output file. References to deleted lists, such as in the local responses of buttons, are not deleted. LCSP products will correctly ignore references to non-existent lists.

The "View List" item of the Display List menu displays a graphical directory of all defined lists and the logical contents of the lists.

Example: Creating a Display List

- Step 1. Select the **Define Lists...** option from the **Display List** menu.
- Step 2. Input any desired number from 1 to 4000 into the **Display List I.D.** dialog box. For this example, input a value of 1.
- Step 3. Click the **Open** button within the **Display List** dialog box.
- Step 4. Enter the name of a new (previously unused) file in the **Open File Name** dialog box. For this example, input the word:
Circle
- Step 5. Click the **Open** button within the **Open File Name** dialog box.
- Step 6. At this point the user is ready to input data to the display list. Draw a circle with no fill on the **Design Window** using techniques described in the Graphics Examples section.
- Step 7. After defining all the graphics to be entered into the display list, click the **Exit** button within the **Exit Capture** dialog box.
- Step 8. At this point, the user has created a display list that can be accessed as part of a button response whenever necessary. Refer to the section on Button Responses for further details.

Example: Deleting a Display List

- Step 1. Select the **Delete List** option from the **Display List** menu.
- Step 2. Enter the number of the display list to be deleted into the **Display List I.D.** box.
- Step 3. Click the **OK** button. This will cause the specified display list to be deleted.

Example: Viewing Display List Summaries

- Step 1. Select the **New** option from the **File** menu in order to create a new file.
- Step 2. Select the **View List** option from the **Display List** menu. The user will be presented with a visual representation of the display list.
- Step 3. Double clicking any given box representing a display list allows the user to view the ASCII information contained within the list. Click the **Exit** button to return to the **Display List Summary**.
- Step 4. The vertical scroll bar located at the right hand side of the screen allows the user to advance the summary towards additional lists as necessary.
- Step 5. To exit the **Display List Summary** click the **Control Menu Bar** and select **Close Alt + 4** from the available options.

3.2.4 Config



Configuration refers to both the development system (the PC running TAI under Windows) and the target LCSP product.

The LCSP product to be used as the target of a TAI design is selected from the "Module" item. The LCSP products are identified by their controller model number (C3, C4, C320, etc.). To select one, click the selection box near the name. The selection of the target implicitly selects the screen dimension and insures proper translation of the TAI design to output format.

To download and test a TAI design, the target product must be connected to the PC serially. The serial link and data transfer formatting between the PC COM port and the target must be defined correctly. The serial link, and data transfer formatting are defined using the "Communication" item on the "Config" menu. (Recommend using 9600 Baud, 8 Data Bits, 1 Stop Bit and No Parity for all LCSP products.)

Example: Sending a Reset to the Target Terminal

- Step 1. Select the **Reset** option from the **Config** menu. At this point the user will be prompted to save the current file or cancel.
- Step 2. Click the **Yes** button to reset the target terminal after saving changes to the current file. Click the **NO** button to reset the target terminal without saving changes to the current file

Example: Configuring Touch Assist II for a Specific Module

- Step 1. Select the **Module** option from the **Config** menu.
- Step 2. Point and click the mouse in the circle beside the appropriate terminal. Refer to the following list of compatible terminals by category. Each selection can be toggled on and off by rechecking the same selection.

C320 (640x200/640x400):

M320ST/M320ST-AC
 ST2200
 ST2200XT
 ST2205
 ST2400

C4 (640x400):

M4ST
 ST3220
 ST3225
 ST3420

C3 (512x256):

M3
 M3-15

C6 (640x480):

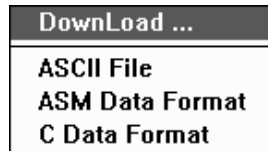
M6ST
 ST4230

Step 3. Click the **OK** button to activated the configuration. Click the **Cancel** button to cancel the selection.

Example: Setting Communication Port Settings

- Step 1. Select the **Communication** option from the **Config** menu.
- Step 2. Point and click the mouse in the circle beside the appropriate configuration selection. For details regarding communication requirements, refer to the Applications manual for the specific unit.
- Step 3. Click the **OK** button to activate the selected communications settings. Click the **Cancel** button to cancel the settings.

3.2.5 Output



Output allows the user to convert files into various forms such as, ASCII, COBAL, and ASSEMBLY.

Download is used to transfer files to an attached LCSP target unit. TAIL translates the files into appropriate command sequences as it downloads over the serial link.

Example: Downloading a File to a Target Terminal

- Step 1. Select the **Download** option from the **Output** menu. At this time the user will be prompted to save any active file. Click the **YES** button to save any changes made to the current file.
- Step 2. Select the file to be downloaded from the options available.
- Step 3. Click the **Execute** button. At this time, the user will be prompted with a list of conditions to be activated during download. Select the appropriate conditions for the download.
- Step 4. Click the **OK** button to proceed with the download.

Example: Outputting Files for use in Alternate Programming Modes (ASCII, Cobal, ASM)

- Step 1. Select **New** from the **File** menu to create a new file.
- Step 2. Select the **C Format** option from the **Output** menu.

Note: The procedure is identical for all three options.

- Step 3. Clicking on the C Data format will create a file in the Touch Assist II sub-directory with the appropriate extension. (For this example it would be XXXX.C) This will not be a compiled file, it is a co-generated file with a format change. This will allow the user to call up the file as a routine within a program.
- Step 4. The ASCII formatted file is viewable using the View option from the File menu. Cobal and Assembly formatted files are viewable outside the Touch Assist II environment only. The user will have to use standard DOS commands or a file management program.

3.2.6 Help

Content
Using Help
About Touch Assist ...

TAII utilizes a standard Windows help facility. An index is provided for common TAII procedures and concepts. The index is accessed via the "Index" item. To get help on Windows help facility, use the "Using Help" item.

Example: Using Help

- Step 1. Select the **Content** option from the **Help** menu.
- Step 2. Position the mouse pointer on the desired subject of inquiry.
- Step 3. Click the left button on the mouse.
- Step 4. Follow instructions on the screen.

3.3 The Design Window

The **Design Window** is where graphics images and touch menus are drawn and laid out. It represents a portion or all of the physical screen of the LCSP touch/graphic product, depending upon which terminal mode has been selected.



The portion of the physical screen which is viewed may be changed (if necessary) by the scroll bars on the bottom and side of the **Design Window**. The physical coordinates of the viewed portion are

displayed in the Status Line "Screen" field. The four numbers of the Screen field denote the left, top, right, and bottom coordinates, respectively, of the viewed screen portion. These coordinates are physical screen coordinates and assume that the origin is at the top left of the physical screen.

The target LCSP product and the current touch page are identified in the title of the **Design Window**. The page number is selected from the slide switch in the Status Line. The product type is selected from the "Module" item of the "Config" menu. The product type defines the screen size and the number of available pages.

The Status Line also displays the coordinates of the mouse cursor when it is active in the **Design Window**. This is helpful for precision placement of objects in the Window. The coordinates are terminal dependent and will vary accordingly with the terminal selected under the "Config" set-up menu.

3.4 The Function Palette



The tools represented by the Function Palette icons allow the creation and manipulation of touch buttons and pages, and the manipulation of graphics and text. This palette holds all the graphic edit functionality such as cut and paste, move, re-size, and delete as well as the button definition functionality.

Items on the palette are selected by moving the cursor to them and clicking. Some functions, such as the edit functions are modal; that is, they are a mode of operation and the mode continues until another function is selected. Functions such as button creation are not modal; they cause an immediate action. The significance of modal functions is that they inhibit non-modal functions and graphic draw operations. It is not possible to draw graphics in the **Design Window** during a modal operation. The meaning and function of the mouse cursor in the **Design Window** is tied to the modal operation in effect. Modal functions are

terminated by selection of another function or by selecting an object from the graphic palette. The current mode may be identified by the appearance of the corresponding function palette button to the right of the function palette. The absence of any identifier means that non-modal operation are allowed.

3.4.1 Host

The Host function refers to an additional window, the Host Window, which can be displayed on the screen. The Host window displays information which is transmitted from the LCSP product connected to the COM port of the PC. The Host function toggles the displays of the Host Window and current screen.

The COM port and its configuration is specified from the Communication item of the Config menu.

Example: Using the Host Function

- Step 1. Select the **New** option from the **File** menu.
- Step 2. Select the **Host** function from the **Function Palette**. A blue dialog strip will appear at the bottom of the screen.
- Step 3. Create a button as described in Button Example 1.
- Step 4. Select **Test Mode** from the **Touch** menu.
- Step 5. Click the button located within the **Design Window** with the mouse pointer. The user will notice the host response within the blue dialog box at the bottom of the screen.

3.4.2 Cut, Copy and Paste

Cut and Copy work together with paste to allow the movement of graphic items from one page to another. They are modal operations and will be in affect until another function is selected. Typically this other function will be Paste. Cut and Copy only differ in how the source objects are treated in the ensuing Paste operation. If the objects are Cut, they will be deleted when the paste happens, if they are Copied, they will remain unaffected by the paste. The following description of the cut operation pertains to copy as well, except for the behavior noted.

An item or group of items is selected during a cut operation by creating a cut area. The cut area is a rectangular region encompassing all the desired items. An item must be fully contained within the cut area to be affected. The cut area is created by moving the mouse cursor to the top left of the desired region, pressing the left mouse button, and dragging the mouse (moving it with the button depressed) diagonally to the lower right corner of the desired region. The cut area will be identified by a dotted rectangle which rubber-bands as the mouse is dragged.

The cut area will be removed from the screen (cut) when the paste operation has been selected and performed. To paste, select the page where the item is to be pasted using the page slide switch in the Status Line; then select the Paste function from the function palette. The cut area will be positioned on the new page at the same relative coordinates it held on the original page. It can then be moved, if desired, to a new relative position by using the move function (icon).

Example: Cut and Paste Function

- Step 1. Select the **New** option from the **File** menu.
- Step 2. Define a circle on the **Design Window** as described in the Graphics examples.
- Step 3. Select the **Cut** function from the **Function Palette**.

Step 4. Place the mouse pointer at a point above and to the left of the circle. Click and drag the mouse until a dotted box fully encloses the graphic.

Note: The cut function can only be used to transfer items to other pages. It cannot be used to move and object around on the same page.

Step 5. Click the right arrow on the page change slide switch located on the status line just below the menu bar. This will change the **Design Window** to a new page. The current page number is displayed in the title bar of the **Design Window**.

Step 6. Select the **Paste** function from the **Function Palette**.

Step 7. Place the mouse pointer at the desired location of the object to be pasted and click the left button on the mouse. Upon releasing the button the object will appear at the new location.

Example: Copy and Paste Function

Step 1. Select the **New** option from the **File** menu.

Step 2. Define a circle on the **Design Window** as described in the Graphics examples.

Step 3. Select the **Copy** function from the **Function Palette**.

Step 4. Place the mouse pointer at a point above and to the left of the circle. Click and drag the mouse until a dotted box fully encloses the graphic.

Step 5. Click the right arrow on the page change slide switch.

Step 6. Select the **Paste** function from the **Function Palette**.

Step 7. Place the mouse pointer at the desired location of the object to be pasted and click the left button on the mouse. Upon releasing the button the object will appear at the new location.

Note: Unlike the Cut function, the copy function will leave the original object intact. Be careful when copying buttons. Some button responses such as pop-ups might require modification to be compatible with their new location.

3.4.3 Erase

The Erase is a modal function that operates on graphic objects and buttons. Objects and buttons are deleted and cease to be displayed when erased.

CAUTION: THERE IS NO UNDO!

To erase an object, select the erase function and move the mouse cursor to the object to be erased. Clicking the left mouse button will erase the object. Care must be taken when erasing an object which overlaps or is overlapped by another object. The mouse cursor should be in a non overlapped region of the desired object before it can be clearly identified. If this is not possible, such as in the case of completely overlapped objects, it is suggested that the items be moved to isolate the desired object of erasure.

Example: Erase Function

Step 1. Select the **New** option from the **File** menu.

Step 2. Select the circle option from the **Graphics Palette**.

Step 3. Define a circle as described in the Graphics examples.

Step 4. Select the **Erase** function from the **Function Palette**.

Note: When any function from the function palette is selected, the icon for that function will appear at the upper right hand corner of the screen.

Step 5. Place the mouse pointer within the area of the circle and click the left button on the mouse. This will cause the graphic to be erased from the **Design Window**.

Step 6. Choosing any other function or menu item will deactivate the **Erase** function.

3.4.4 Edit

The edit modal function is used to resize graphic objects and buttons.

To resize an object select the edit function and move the mouse cursor on or near the desired object and click the left mouse button. Edit markers will appear at various points on the object. The number of points depends on the type of object selected. When the mouse cursor is placed on any of these edit markers and the left button is pressed, dragging the mouse will resize the object. Polygon objects can be reshaped as well as resized in the edit mode.

Example: Edit Function

Step 1. Select the **New** option from the **File** menu.

Step 2. Define a rectangle as described in the Graphic examples.

Step 3. Select the **Edit** function from the **Function Palette**.

Step 4. Place the mouse pointer within the area of the rectangle and click the left button. Dark boxes will appear on each corner of the rectangle.

- Step 5. Click and drag one of the corner squares to modify the size of the rectangle. Once the left button of the mouse is released, the rectangle will be positioned at that coordinate.

3.4.5 Single Move and Group Move

Single and Group Move modal operations are used to move objects, graphic and touch, on a given page.

Moving objects starts with identifying them. For single object moves the object is selected by moving the mouse cursor onto the object and pressing the left button. The object will be identified by a surrounding dashed box and the move icon will appear. Groups of objects are selected by moving the cursor to a point above and to the left of the items and pressing the left mouse button. By then dragging the mouse a dashed box is created which can be used to encompass the desired objects. The mouse cursor can be moved into the box and the left mouse button pressed to obtain the move cursor. Once the move cursor is obtained, in either case, it will remain until the left mouse button is released. By dragging the mouse with the left button pressed, the object or objects can be repositioned to any desired location. Releasing the left mouse button will leave the moved objects permanently in their new position. When moving a group of objects, only those contained entirely inside the box will be moved. All other objects will be left unchanged.

Example: Single Move Function

- Step 1. Select the **New** option from the **File** menu.
- Step 2. Create a rectangle as described in the Graphics examples.
- Step 3. Select the **Single Move** from the **Function Palette**.
- Step 4. Place the mouse pointer within the area of the rectangle and click the left button. A dotted line representation of the object will appear and a hand will replace the mouse cross-hairs.

- Step 5. Click and drag the object with the mouse to the desired location.
- Step 6. Once the mouse button is released, the object will be positioned and the mouse pointer will resume a cross-hair configuration.

Example: Group Move Function

- Step 1. Select the **New** option from the **File** menu.
- Step 2. Create a rectangle as described in the Graphics examples.
- Step 3. Select the **Group Move** function from the **Function Palette**.
- Step 4. Place the mouse above and to the left of the region to be moved.
- Step 5. Click and drag the mouse until a dotted rectangle encompasses the objects to be moved. At this time, release the mouse button to define the region.
- Step 6. Place the mouse pointer within the area of the rectangle and click the left button. A hand will replace the mouse cross-hairs.
- Step 7. Click and drag the object with the mouse to the desired location.
- Step 8. Once the mouse button is released, the object will be positioned and the mouse pointer will resume a cross-hair configuration.

3.4.6  Fine Move

The Fine Move function can be used to accurately place an object to the pixel level. The object is selected by clicking it. The four arrow keys of the keyboard may then be used to move the object up, down, left, or right. The cursor moves with the object and the mouse position reported in the status line is maintained so the position can be monitored during the move.

Example: Fine Move Function

- Step 1. Select the **New** option from the **File** menu.
- Step 2. Create a rectangle as described in the Graphics examples.
- Step 3. Select the **Fine Move** function from the **Function Palette**.

3.4.7 **Auto-Arrange**

This modal function is useful in formatting various touch and graphic objects in the Display Window. A group of items may be arranged within a rectangular region with constant inter-object spacing.

First a group of objects is selected for arrangement. This is done by drawing a dashed selection box around the object. Move the mouse cursor to a point above and to the left of the desired group of objects. Press the left mouse button and drag the mouse to a point below and to the right of the objects. The resulting dashed box will contain all the objects to be included in the auto-arrangement function. The next step is to define a region where the arrangement is to be placed. This may be anywhere on the current page and is created in a similar fashion to that of the selection area. The size of the arrangement determines the order and spacing of the final arrangement.

Example: Auto Arrange Function

- Step 1. Select the **New** option from the **File** menu.
- Step 2. Create four rectangle at various positions on the **Design Window**. Use techniques described in the Graphics examples.
- Step 3. Select the **Auto Arrange** function from the **Function Palette**.
- Step 4. Place the mouse pointer above and to the left of the region to be arranged.

- Step 5. Click and drag the mouse until the dotted rectangle encompasses the region to be moved. Release the left button on the mouse to define the region.
- Step 6. Click and drag the mouse to define a rectangular region starting at the following coordinates: X=50, Y=200 and ending at the following coordinates: X=400, Y=150.
- Step 7. Release the left button on the mouse to define the region. The objects are automatically aligned according to the defined region.



3.4.8 Place Button

Place Button creates a button on the current page and allows the placement (positioning) of the button of the current **Design Window** page.

When actuated, Place Button invokes a dialog box. Within the dialog box is the rough placement grid. This grid represents the **Design Window** and its cells are possible button locations. The number of cells is a function of the default button size. Button size is determined by the template function. Clicking a grid cell places a button of the current default size at a corresponding location in the **Design Window**. (Clicking again at the same location will erase the button.) The button may be moved or resized later with the edit and move functions.

The button placement dialog box gives access to another dialog box, the template editor. The template, as mentioned above, is the default button size. It is characterized by the rectangle of the resulting button and by the inter-button spacing. The template editor allows the rectangle and spacing to be specified.

The button placement dialog box also displays button resource information. Many LCSP touch products allow only a fixed number of button regions. A button region is defined by position as well as shape. Button regions may be used on multiple pages, and always have the same position and shape.

Once a button has been placed on the page its function and appearance may be defined. The design and development of touch menu systems is discussed in greater detail in the examples section.

Example: Create a Button with Default Dimensions

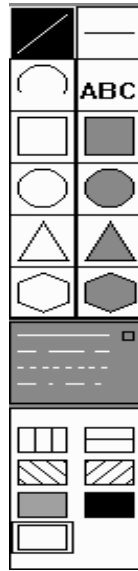
- Step 1. Select the **New** option from the **File** menu to create a new file.
- Step 2. Select the **Place Button** icon on the **Function Palette**.
- Step 3. Click one square from the grid located within the **Assign Button Location** dialog box.
- Step 4. Click the **Exit** button. At this point a single button box will be created on the **Design Window**. Double click the button with the mouse.
- Step 5. Select the **Button Label** dialog box and enter: *BI*.
- Step 6. Select the **Host Response** dialog box and enter: *Button 1*.

Note: This response will be the response received by the host system and can be seen while in Touch Assist test mode when the Host mode is activated from the **Function Palette**.

- Step 7. Click the **Exit** button with the mouse. At this point a functioning button will be created on the **Design Window**.
- Step 8. To test this buttons function, select **Test Mode** from the **Touch** menu and click the button with the mouse pointer.

Note: All other Touch Assist functions are disabled while in **Test Mode**.

3.5 The Graphics Palette



The graphics palette can be thought of as an extension to the function palette. In the absence of any modal function, the graphics palette selection becomes active. Graphics drawing is, in effect, the default mode. The active graphic shape is identified by highlight.

Two attributes control the appearance of lines and region and are selectable from the graphics palette. The line style controls the appearance of vectors and polygon and circle borders. These can be solid, dashed, or dotted. The current selected is indicated by a small square marker to the right of the active attribute. To change the line style, move the mouse to the desired style and click the left button. Fill style controls the appearance of filled regions. The active fill style is indicated by highlight. It can be changed by moving the mouse to the desired style and clicking the left mouse button.

Example: Shaded Shape Options

- Step 1. Select the **New** option from the **File** menu to create a new file.
- Step 2. Select the shaded square option from the **Graphics Palette** located at the left side of the screen.
- Step 3. Observe the shading style options at the bottom of the **Graphics Palette**. Select the **Vertical Hatch** option.
- Step 4. Place the mouse pointer on the **Design Window**. Click and drag the mouse to create a rectangle 50 pixels high by 100 pixels long. Mouse coordinates are reported on the status line just below the Menu bar.

Note: In order for the Shading option to function, the solid line style option must be active.

- Step 5. Select the shaded triangle option from the **Graphics Palette**.
- Step 6. Select the left diagonal shading option.
- Step 7. Place the mouse pointer on the **Design Window** and click the left mouse button at the desired location for the first vertice of the triangle. Repeat this procedure for each of the three vertices of the triangle.

Note: The mouse pointer cannot leave the Design Window until all three of the triangle's vertices are defined.

Example 2: Non-Shaded Shapes Options

- Step 1. Select the **New** option from the **File Menu** to create a new file.
- Step 2. Select the circle option from the **Graphics Palette** located at the left side of the screen.
- Step 3. Observe the line style options located just below the shape options in the **Graphics Palette**. The solid line is the default option and is identified as being active by a small square to the right of the line.
- Step 4. Select the dotted line option just below the solid line option by clicking the mouse directly over the image of the line.
- Step 5. Place the mouse pointer on the **Design Window**. Click and drag the mouse until a circle with a diameter of 250 pixels is created.
- Step 6. Select the polygon option from the **Graphics Palette**.
- Step 7. Place the mouse pointer on the **Design Window** and click the mouse at the desired location for the first vertice of the polygon.
- Step 8. Reposition the mouse and click the left button for each vertice of the polygon.

Step 9. Click the right button on the mouse to close the polygonal shape.

Note: The mouse cannot exit the Design Window until the right button on the mouse is pressed.

3.5.1 Vectors

Two types of vectors are supported: random and orthogonal. Random vectors can be any orientation. Orthogonal vectors are always parallel the X and Y axes. The methods for drawing either vector type are the same, though the results will be different.

Example: Drawing a Vector

Step 1. Move the mouse cursor in the **Design Window** to the desired start point, and click the left mouse button

Step 2. Move the mouse to the desired end point and click the left button again.

Note: The vector will appear when the endpoint has been defined.

Example: Drawing a Vector (rubber band method)

Step 1. Move the mouse to the desired start position, press and hold the left mouse button; move the mouse to the desired stop location and release the left button to complete the vector.

Note: In the rubber band method you will observe a dashed vector starting at the selected start point and terminating at the mouse cursor. This dashed vector moves as the mouse is moved and represents the final vector if the mouse button were to be released.

3.5.2 Arcs

Arcs are sections of circles and are defined by three points.

Example: Drawing an Arc

Step 1. Select the Arc option from the **Graphics Palette**.

Step 2. Move the mouse cursor to the desired positions and click the left mouse button.

Note: The first position will define one end point of the arc.

Step 3. Repeat Step 1 for points 2 and 3 of the Arc.

Note: The second position will define the opposite end point of the arc. The last position will define any given point on the curve of the arc itself. The arc will be drawn upon the specification of the third point.

3.5.3 Circles

Circles may be filled or unfilled. Unfilled circles will use the current line style for the border but filled circles will always use a solid border.

Example: Drawing a Circle

Step 1. Select the circle option from the **Graphics Palette**.

Step 2. Move the mouse to the center of the desired circle, press and hold down the left mouse button.

Step 3. Drag the mouse with the left button held down.

Note: An ellipse with a dashed border will appear and will move as the mouse is moved.

Step 4 Release the mouse button.

Note: The dashed ellipse will become a circle with the selected attributes. The radius of the resulting circle is always the minor (smaller) axis of the ellipse.

3.5.4 Rectangles

Rectangles may be filled or unfilled. Unfilled rectangles will use the current line style for the border but filled rectangles will always use a solid border.

Example: Drawing a Rectangle (2 Point Definition)

Step 1. Select the Rectangle option from the **Graphics Palette**.

Step 2. Click the left button at the coordinates that make up the opposite vertices of the rectangle.

Example: Drawing a Rectangle (rubber rand method)

Step 1. Select the Rectangle option from the **Graphics Palette**.

Step 2. Move the mouse to the corner of the desired rectangle. Press and hold the left button of the mouse while dragging the mouse. An outline of the desired rectangle will be displayed.

Step 3. Release the left button of the mouse to define the rectangle.

3.5.5 Triangles

Triangles may be filled or unfilled. Unfilled triangles will use the current line style for the border but filled triangles will always use a solid border. Triangles are specified by three points.

Example: Drawing a Triangle (Three Point Method)

- Step 1. Select the Triangle option from the **Graphics Palette**.
- Step 2. Three points should be identified by moving the mouse to each point and clicking the left mouse button. The triangle will be drawn upon specification of the third point.

Example: Drawing a Triangle (rubber band method)

- Step 1. Select the Triangle option from the **Graphics Palette**.
- Step 2. Move the mouse to the coordinate of the first vertex of the desired triangle, press and hold the left mouse button while dragging the mouse to the location of the second vertex of the triangle.
- Step 3. Release the left button of the mouse. The base line for the triangle will be defined.
- Step 4. Move the mouse to the coordinate of the third vertex of the desired triangle and click the left button. The entire triangle will be displayed.

3.5.6 Polygons

Polygons may be filled or unfilled. Unfilled polygons will use the current line style for the border but filled polygons will always use a solid border.

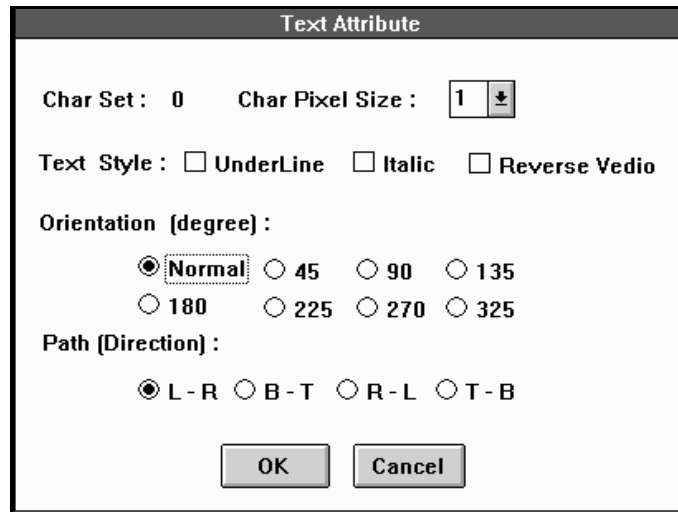
Example: Drawing a Complex Polygon

- Step 1. Select the Polygon option from the **Graphics Palette**.
- Step 2. Polygons are specified by their vertices. To specify a vertex move the mouse to the desired location and click the left mouse button.
- Step 3. Starting with the second vertex, edges joining the two last vertices will appear as new vertices are specified.
- Step 4. To complete the polygon click the right mouse button. This will draw an edge from the last vertex to the first vertex.

Note: The user may define up to 32 vertices. After 32 vertices are selected, the polygon will automatically close itself.

3.5.7 Text

It is possible to alter the visual appearance of text. Font, size, rotation, as well as such attributes as underline, italics, and reverse video may be changed. String path, how successive characters are placed relative to one another, may also be changed. The Text Attribute dialog box, which allows changes to these attributes, is accessed by double clicking the text icon on the graphics panel.



The image shows a dialog box titled "Text Attribute". It contains the following controls:

- Char Set :** 0
- Char Pixel Size :** 1 (with a dropdown arrow)
- Text Style :** UnderLine Italic Reverse Video
- Orientation [degree] :**
 - Normal
 - 45
 - 90
 - 135
 - 180
 - 225
 - 270
 - 325
- Path [Direction] :**
 - L - R
 - B - T
 - R - L
 - T - B

At the bottom are two buttons: **OK** and **Cancel**.

Fonts are referred to by the Char Set number. The number of sets available depends on the target. A character is scaled in LCSP products by pixel replication. The size of the pixel is selectable as an integral multiplier of the base pixel size. Orientation refers to character and string rotation, which is in multiples of 45 degrees. Path refers to successive character placement and may be left-to-right, bottom-to-top, right-to-left, or top-to-bottom.

Example: Drawing Graphical Text

- Step 1. Select the Text option from the **Graphics Palette**.
- Step 2. Move the mouse to the start position (lower left) of the desired text string and click the left mouse button. A dialog box will appear where the ASCII text may be typed.
- Step 3. Type the following text string: "This is an example of the text function."
- Step 4. Select the OK button to draw the text in the **Design Window**. Selecting the Cancel button will cancel the operation without displaying any text.

3.6 *Status Line*



Page ◀ ▶ Screen : [0,399,511,144] Mouse [X:499,Y:320]

The Status Line displays information about the **Design Window**. The screen extent represented by the design window, the mouse position within the design window, and the status of the communication link to the LCSP product connected to the COM port are shown.

The button page (menu) currently displayed in the **Design Window** is selectable from the Status Line. The slide switch controls which page is displayed within the **Design Window**. The page number identifying the current page is displayed within the title of the **Design Window**.

3.7 *The Help Line*

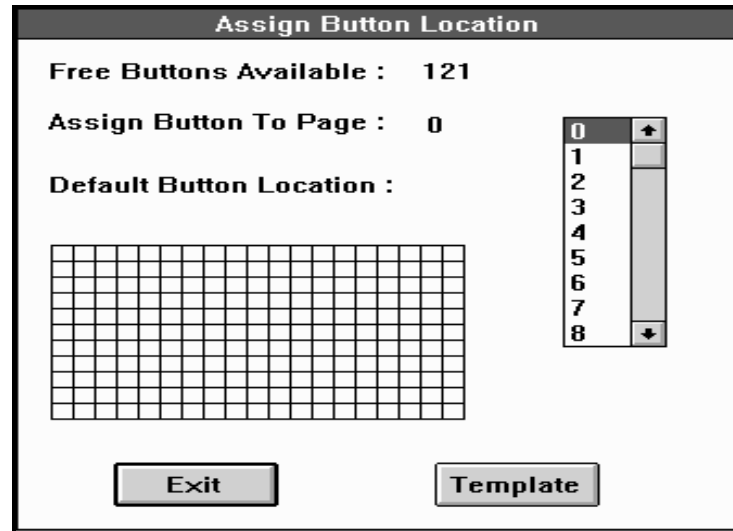
Context sensitive help appears on the Help Line. As functions from the Function Palette or objects from the **Graphics Palette** are selected, messages are displayed on the Help Line describing options or required actions to complete or modify the function.

4.0 **Application Development**

The application generation process centers around the creation of touch menus, or pages. A page is a group of buttons collectively displayed on the target module screen and referred to by a single numeric ID, the page number. The page number is selected by moving the page slide bar, (or clicking on the advance bar arrows), on the Status Line. The page number is visible in the **Design Window** header.

Graphics screens may be generated and saved independent of touch constructs, however the graphics designed on a page with buttons becomes part of that page. This coupling of graphics and touch menu is done automatically by TAIL and it is done in the local response of buttons which change pages. When the change page is specified as part of the response TAIL adds the graphics commands required to draw the images associated with that page.

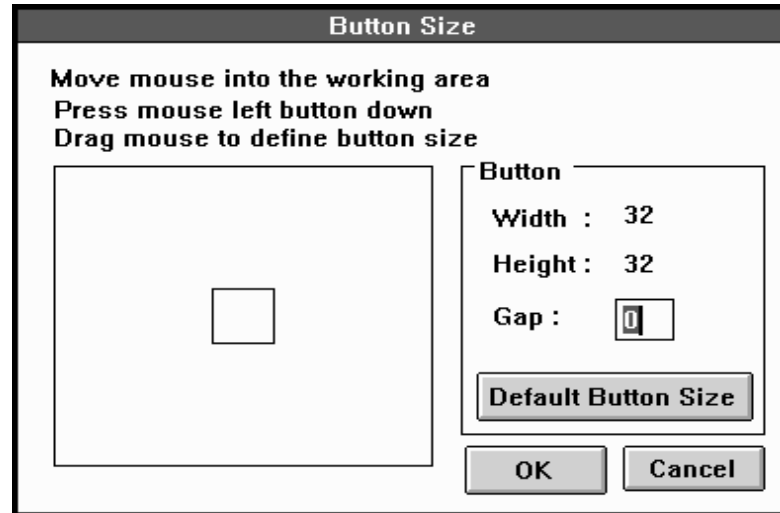
the button to be re-sized. Move the mouse to any of the markers, click and drag the marker to re-size.



Example: Create a Button using Template Dimensioning

- Step 1. Select the **New** option from the **File** menu.
- Step 2. Select the **Place Button** icon as in Example 1A.
- Step 3. Click the **Template** button in the **Assign Button Location** window.
- Step 4. Move the mouse into the work area to the left of the **Button Size** window.
- Step 5. Click and drag the mouse until you create a button with a width and a Height of 100 pixels. Button dimensions can be observed in the **Button** box to the right of the work area.
- Step 6. Select the **Gap** dialog box and enter a value of 5.
- Step 7. Click the **OK** button with the mouse.

- Step 8. Select two adjacent boxes from the grid located in the **Assign Button Location** window.
- Step 9. Repeat Steps 3-7 of the example in section 3.4.8 for each of the two buttons created.
- Step 10. To test each button, refer to Step 8 of the example in section 3.4.8.



If a new default size is desired, the template defining the default may be changed. The Template editor is entered through the "Template" button in the placement dialog box. The size of the default may be defined by creating a box in the edit area of the desired size. The box is drawn by moving the mouse to a convenient point representing the upper left corner, pressing the left mouse button and dragging the mouse to the lower right corner. The height and width is shown in pixel size and updated as the box is defined. Release the mouse button when the desired size is obtained.

The inter-button space may be entered explicitly by editing the spacing number. The inter-button spacing refers to how close buttons will appear when placed using the placement grid. The placement grid will adjust according to the defined default size and inner button space.

Once placed, use the single or fine move function to position the button. Select the function and the button to be moved. The appearance of the move cursor (a small hand) enables the button to be moved and placed anywhere in the **Design Window**.

Example: Changing the Size of an Existing Button

Step 1. Select **New** from the **File** menu.

Step 2. Select the **Edit** function from the **Function Palette**.

Step 3. Click the target button with the mouse

Note: The button will be highlighted with blocks at each corner.

Step 4. Click and drag one of the corner blocks until the button is of the desired dimension.

SHIFT-6 then SHIFT-M. Labels are automatically centered, left to right and top to bottom by the target device as well as TAIL.

The host message is entered similar to the label. Click on the host edit box to move the text cursor to that box. Enter the text of the message from the keyboard. Control codes may be embedded by the appropriate Control-< key > combination.

A local response is a sequence of target compatible commands which are replayed through the device's command parser as if the commands had come from the host. Any command which can be sent from the host is possible to embed in a local response. The local response may be entered in the same fashion as the label or host message. To embed complex command sequences five pre-defined options are offered:

Capture Button embeds a command in the response which couples the current button to another button, perhaps on another page. When the current button is pressed in the target, the coupled button will also appear to be pressed. This has the effect of changing the coupled button's state. If the coupled button is on the current page, its label will be updated but the host message will not be sent and its local response will not be executed.

Capture Page allows the designer to couple the current button to another page of buttons. Pressing the button on the target will cause the current button page to be erased and the new page to appear. The graphics associated with the new page will also be embedded in the button.

Capture Graphics embeds a sequence of graphic commands in the response. It does this by displaying the current page in the **Design Window** and allowing graphics to be drawn using Graphic Palette functions. A small window appears on the screen containing instructions on how to exit the capture mode. An Exit button is offered within this small window which when clicked will exit and return to the Button Response Dialog box.

Capture Display List embeds a display list into the local response of the button. The list is specified by its numeric ID. A small dialog box will appear as part of the capture process so that the ID may be entered.

These options cover most response requirements. Except for the Pop-up option, all options may be embedded in the same response. (If the Pop-up button is chosen no other function (local response) may be selected.) To embed options in a response, click on the selection box of the options desired and then click on the "Capture" button. The defining dialog boxes or procedures for each option will then appear. The following examples will detail how to define buttons with the above functions:

Example: Creating a Button with Button Capture

- Step 1. Select **New** from the **File** menu.
- Step 2. Define two buttons using the procedure outlined in Button Example 1.
- Step 3. Double click the first button with the mouse.
- Step 4. Select **Button Label** and enter the word: *One*
- Step 5. Select the **Button** box from the **Local Response Capture List**.

- Step 6. Click the **Capture** button.
- Step 7. Click the second button with the mouse.
- Step 8. Click the **Exit** button in the **Define Button Response** window.
- Step 9. Double click the second button on the **Design Window**.
- Step 10. Select **Button Label** and enter the word: *Two*
- Step 11. Select the **Graphic** box from the **Local Response Capture List** and click the **Capture** button.
- Step 12. Select the rectangle icon from the **Graphics Palette**.
- Step 13. Define a rectangle on the **Design Window** as described in the Graphics examples.
- Step 14. Click the **Exit** button from the **Exit Capture** window.
- Step 15. Click the **Exit** button within the **Define Button Response** window.

Note: **Button Capture does not function within the Test Mode of Touch Assist II. To observe the button capture, the file must be downloaded to the target unit.**

Example: Create Buttons with a Page Change

- Step 1. Select **New** from the **File** menu.
- Step 2. Define a basic button as in Example 1.
- Step 3. Select the **Page** option box from the **Local Response Capture List** for the local response.
- Step 4. Click the **Capture** button located at the bottom right of the **Define Button Response** dialog box.

Step 5. Select the **Page Number** box and enter a value of 1.

Note: Any value from 1 to 199 can be selected.

Step 6. Click the **OK** button with the mouse.

Note: The Sealtouch command for the page change is automatically entered into the local response box. This code can be edited by the user at any time.

Step 7. Click the **Exit** box to the right of the **Define Button Response** dialog box.

Step 8. Go to the **Page Change Slide Switch** located within the **Status Line** just under the **Menu Bar**. Click the right arrow or slide the scroll bar until you reach the desired page number. The current page number will be displayed in the **Title Bar** of the **Design Window**. For this example, select Page 1.

Step 9. Repeat Steps 1-6 to create a return button. For Step 4 enter a value of 0.

Step 10. To test the buttons, select **Test Mode** from the **Touch** menu and click the button with the mouse.

Example: Create a Multistate Button with Attribute Changes

Step 1. Select **New** from the **File** menu.

Step 2. Define a button using the procedure outlined in the example in section 3.4.8.

Step 3. Select **Normal** as the button attribute.

Step 4. Select **Button Label** and enter: 1

Step 5. Select **Host Response** and enter: 1

Step 6. Select the **Graphic** box from the **Local Response Capture List**.

- Step 7. Click the **Capture** button.
- Step 8. Select the **Circle** graphic from the **Graphics Palette** and define a circle on the **Design Window** by clicking the mouse pointer at the intended center of the circle and drag the mouse until the desired size is achieved.
- Note: We recommend that display lists be used to call up graphics. If the target unit does not possess an EPROM feature, you can imbed graphics within button responses as in this example.**
- Step 9. Click the **Exit** button in the **Exit Capture** window.
- Step 10. Click the **Next** button at the top of the **Define Button Response** window. Note that the button state has changed from 0 to 1 and all labels and responses have been cleared.
- Step 11. Click the down arrow for **Button Attribute** and select **Highlight**.
- Step 12. Select **Button Label** and enter: 2
- Step 13. Select **Host Response** and enter: 2
- Step 14. Select the **Pop-up Menu** box from the **Local Response Capture List**.
- Step 15. Click the **Capture** button.
- Step 16. Enter a value of 1 for the **Page Number** and click the **OK** button.
- Step 17. Select the **Pop-up Menu Item** and enter the word: *Popup1*. Click the **Add** button.
- Step 18. Select the **Pop-up Menu Item** and enter the word: *Popup2*. Click the **Add** button.
- Step 19. Select the **x position** dialog box and enter a value of 10

- Step 20. Select the **y position** dialog box and enter a value of 10.
- Step 21. Select the **Space** box and enter a value of 1.
- Step 22. Double click the word *Popup1* within the main dialog box.
- Step 23. Select **Host Response** and enter: *Popup1*. Click the **OK** button.
- Step 24. Double click the word *Popup2* within the main dialog box.
- Step 25. Select **Host Response** and enter: *Popup2*. Click the **OK** button.
- Step 26. Click the **OK** button within the **Create Pop-up Menu** window.
- Step 27. Click the **Next** button at the top of the **Define Button Response** window.
- Step 28. Click the **Button Attribute** down arrow and select: **Vertical Hatch**.
- Step 29. Select **Button Label** and enter: 3
- Step 30. Select **Host Response** and enter: 3
- Step 31. Select the **Page** box from the **Local Response Capture List**.
- Step 32. Click the **Capture** button.
- Step 33. Enter a value of 4 for the **Page Number** and click the **OK** button.
- Step 34. Click the **Exit** button in the **Define Button Response** window.
- Step 35. Click the **Page Change** slide switch found on the **Status Line** until Page 4 is displayed in the **Design Window** title bar.

- Step 36. Select the **Place Button** icon from the **Function Palette** and double click the button with the mouse.
- Step 37. Select **Template** and define a button with a dimension of 50 pixels by 50 pixels. Click the **OK** button.
- Step 38. Click one square from the grid located within the **Assign Button Location** dialog box. Click the **Exit** button.
- Step 39. Double click the button image.
- Step 40. Select **Button Label** and enter: Return
- Step 41. Select the **Page** box from the **Local Response Capture List**.
- Step 42. Click the **Capture** button.
- Step 43. Enter a value of 0 for the **Page Number** and click the **OK** button.
- Step 44. Click the **Exit** button in the **Define Button Response** window.
- Step 45. To test the buttons, select **Test Mode** from the **Button** menu and click the button with the mouse.

Note: When in Test Mode, the pop-up will be located at the upper left hand corner of the Design Window. Upon downloading this file to the target unit, the pop-up will be positioned correctly according to their defined positions.

Create Popup Menu

Popup Menu Item :

[Point & double click to define response]

Menu Item

Position

x : **y :**

Space :

Add

OK

Delete

Cancel

Change

4.1.3 Pop-Up Menus

Pop-up menus are touch elements which mimic the Windows style pull down menus. Capture Pop-up embeds the necessary command to initiate a Pop-up. The Pop-up itself is defined by a user selected page number and a sequence of pop-up elements (the items of the pop-up). To conserve memory and avoid terminal operational difficulties; ALWAYS SELECT THE LOWEST UNUSED PAGE TO DISPLAY THE POP-UP MENU. See examples section for a more detailed explanation. Capture will invoke a dialog box to specify the page number and then a dialog box to define the pop-up elements.

A pop-up item is added to the list of items by entering the text of the item as it will appear on the target screen and clicking the Add button. The host message and local response of each pop-up item are specified in an abbreviated response dialog box entered by double clicking an item. The pop-up response box is similar to the button response box without the label field edit feature.


Assign Popup Page

Page Number :


*** Caution : Read "How To Assign Popup Page"
in the help file.**

Popup Menu Button Response

Menu Item Label : asdf

 Host Response :

Local Response



Capture :

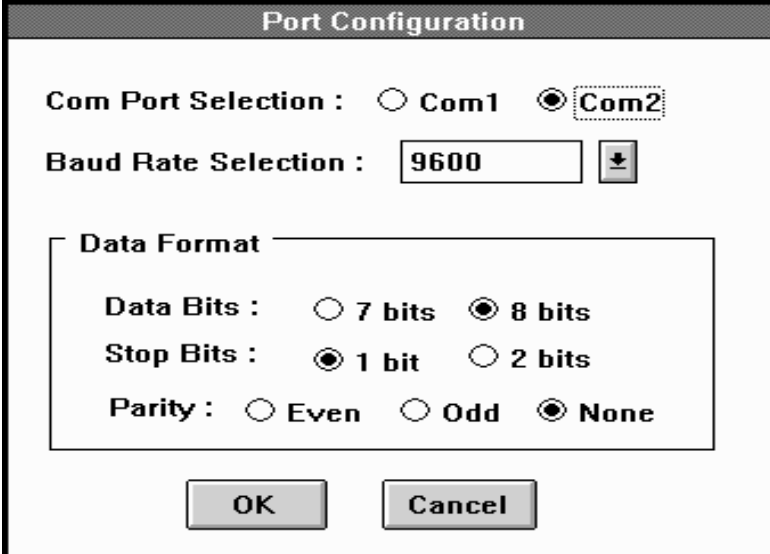
Button Page Graphic Display List

5.0 Test Mode

The application generated in a TAI session may be tested by downloading it to the target unit. The communication link is specified from the "Communication" item of the "Config" menu. Once communication has been established, the application may be downloaded to the target unit. This is done through the "download" item of the Output menu. The TAI application is translated into the

proper command sequence for the target and the download is initiated. The actual downloaded command stream may be inspected using the "View" item of the File menu. When the download is complete testing of the application may occur.

To download and test a TAI design, the target product must be connected to the PC serially. The serial link between the PC COM port and the target must be defined correctly. The serial link is defined using the "Communication" item on the "Config" menu. The necessary specifications include which COM port (1 or 2), the baud rate, the data format, and the parity selection. LCSP products generally use a default communication standard of 9600 baud, 8 data bits, 1 stop bit, and no parity.



The image shows a dialog box titled "Port Configuration". It contains the following settings:

- Com Port Selection :** Radio buttons for "Com1" and "Com2". "Com2" is selected and has a dashed border around it.
- Baud Rate Selection :** A text box containing "9600" and a dropdown arrow button.
- Data Format** (enclosed in a box):
 - Data Bits :** Radio buttons for "7 bits" and "8 bits". "8 bits" is selected.
 - Stop Bits :** Radio buttons for "1 bit" and "2 bits". "1 bit" is selected.
 - Parity :** Radio buttons for "Even", "Odd", and "None". "None" is selected.
- Buttons for "OK" and "Cancel" at the bottom.

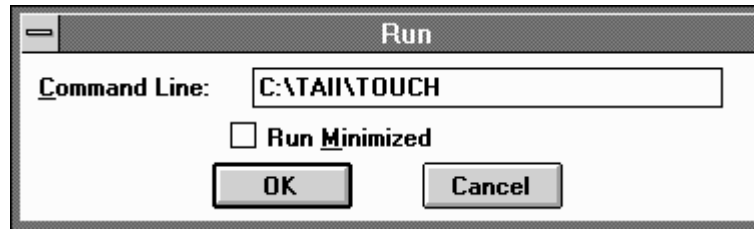
The level of testing which is achievable depends on how the target is to be used in a larger system and how much of that system is available during the test. At a minimum, the local responses of the button menus and button menu coupling can be tested. Using the Host Window of TAI, the host messages may also be verified during testing. Only the target and the PC are needed for this level of test.

6.0 Application Integration

Once the application has been found to meet certain minimum functionality goals, it may be incorporated into the host system. The menus, graphics, and display lists resulting from the design may be included in the software of the host, or if the application has been carefully designed to make full use of display lists, it may be downloaded into the non-volatile memory option of the target. Regardless of where the application physically resides, it must be invoked at system initialization. System initialization is typically a power-up of all system components. If the application information is resident in the host, it may be downloaded from the host to the target at the host's convenience. If the application is pre-loaded into the target's non-volatile memory in the form of a display list, the unit can be configured to automatically invoke the lists and self-initialize.

Most LCSP products which offer display lists also offer the ability to automatically execute a list upon power-up. This auto-configure feature is usually accessible from the set-up function of the device. List ID 0 is usually reserved for auto-configure. If an application is structured so that it is partitioned into lists, and list 0 is dedicated to controlling an initialization then the application may be embedded within the non-volatile memory option of the LCSP product and auto-configure may be used to invoke the application. See examples section of manual.

Two other means of generating a usable form of a TAI design exist. The "Output" menu allows a TAI design to be translated into a command stream and placed in a file. The file can be unformatted and can be used at run-time as input to a host software system and downloaded to the target by the host when appropriate. The Output menu can also produce a file encoded in a computer language. This form allows the file to be added to the host system software at compile-time. The user may choose from ASCII, COBAL, or ASSEMBLY language. To run Touch Assist II, select **Run...** from the **File** menu of the Program Manager. Enter the complete path for the file TOUCH.EXE. Choose OK to start the application.



You will see the Touch Assist II opening screen. At this point Touch Assist attempts to use the COM 2 serial port for communication with a LCSP target product. If this port is currently used for another function or is otherwise unavailable an error message will be displayed. Choose OK to continue Touch Assist II and select **Communications** on the **Config** menu to select the proper COM port for the target. If no target will be used the error may be ignored.

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