ICONW, used to build small windows that will appear as icons on the display, is a standard input/output feature. This feature was introduced in Lyric and has been enhanced in Medley. The following description of **ICONW** should be appended to Section 28.4, Windows, of the *Interlisp-D Reference Manual*. Medley changes are indicated with revision bars in the right margin.

28.4.16 Creating Icons with ICONW

ICONW is a group of functions available for building small windows of arbitrary shape. These windows are principally for use as icons for shrinking windows; i.e., these functions are likely to be invoked from within the **ICONFN** of a window. An icon is specified by supplying its image (a bitmap) and a mask that specifies its shape. The mask is a bitmap of the same dimensions as the image whose bits are on (black) in those positions considered to be in the image, and off (white) in those positions where the background should show through. By using the mask and appropriate window functions, **ICONW** maintains the illusion that the icon window is nonrectangular, even though the actual window itself is rectangular. The illusion is not complete, of course. For example, if you try to select what looks like the background (or an occluded window) around the icon but still within its rectangular perimeter, the icon window itself is selected. Also, if you move a window occluded by an icon, the icon never notices that the background changed behind it. Icons created with **ICONW** can also have titles; some part of the image can be filled with text computed at the time the icon is created, or text may be changed after creation.

28.4.16.1 Creating Icons

Two types of icons can be created with **ICONW**, a borderless window containing an image defined by a mask and a window with a title.

(ICONW *IMAGE MASK POSITION NOOPENFLG*) [Function]

Creates a window at *POSITION*, or prompts for a position if *POSITION* is **NIL**. The window is borderless, and filled with *IMAGE*, as cookie-cut by *MASK*. If *MASK* is **NIL**, the image is considered rectangular (i.e., *MASK* defaults to a black bitmap of the same dimensions as *IMAGE*). If *NOOPENFLG* is T, the window is returned unopened.

(TITLEDICONW *ICON TITLE FONT POSITION NOOPENFLG JUST BREAKCHARS OPERATION*) [Function]

Creates a titled icon at *POSITION*, or prompts for a position if *POSITION* is **NIL**. If *NOOPENFLG* is T, the window is returned unopened. The argument *ICON* is an instance of the record **TITLEDICON**, which specifies the icon image and mask, as with **ICONW**, and a region within the image to be used for displaying the title. Thus, the *ICON* argument is usually of the form

```
(create  TITLEDICON  ICON ← someIconImage
MASK ← iconMask  TITLEREG ←
someRegionWithinICON)
```

The title region is specified in coordinates relative to the icon, i.e., the lower-left corner of the image bitmap is (0, 0). The mask can be **NIL** if the icon is rectangular. The image should be white where it is covered by the title region. **TITLEDICONW** clears the region before printing on it. The title is printed into the specified region in the image, using *FONT*. If *FONT* is **NIL** it defaults to the value of **DEFAULTICONFONT**, initially Helvetica 10. The title is broken into multiple lines if necessary; **TITLEDICONW** attempts to place the breaks at characters that are in the list of character codes *BREAKCHARS*. *BREAKCHARS* defaults to **(CHARCODE (SPACE –))**. In addition, line breaks are forced by any carriage returns in *TITLE*, independent of *BREAKCHARS*. *BREAKCHARS* is ignored if a long title would not otherwise fit in the specified region. For convenience, *BREAKCHARS* = **FILE** means the title is a file name, so break at file name field delimiters. The argument *JUST* indicates how the text should be justified relative to the region. It is an atom or list of atoms chosen from **TOP**, **BOTTOM**, **LEFT**, or **RIGHT**, which indicate the vertical positioning (flush to top or bottom) and/or horizontal positioning (flush to left edge or right). If *JUST* = **NIL**, the text is centered. The argument *OPERATION* is a display stream operation indicating how the title should be printed. If *OPERATION* is **INVERT**, then the title is printed white-on-black. The default *OPERATION* is **REPLACE**, meaning black-on-white. **ERASE** is the same as **INVERT**; **PAINT** is the same as **REPLACE**.

For convenience, **TITLEDICONW** can also be used to create icons that consist solely of a title, with no special image. If the argument *ICON* is **NIL**, **TITLEDICONW** creates a rectangular icon large enough to contain *TITLE*, with a border the same width as that on a regular window. The remaining arguments are as described above, except that a *JUST* of **TOP** or **BOTTOM** is not meaningful.

In the Medley release, **TITLEDICONW** can create icons with white text on a black background. To get this effect, your icon image must be black in the correct area, and you must specify the *OPERATION* argument as INVERT.

In Medley, you can copy- select the title of an icon.

28.4.16.2 Modifying Icons

(ICONW.TITLE *ICON TITLE*) [Function]

Returns the current title of the window *ICON*, which must be a window returned by **TITLEDICONW**. In addition, if *TITLE* is non-**NIL**, makes *TITLE* the new title of the window and repaints it accordingly. To erase the current title, make *TITLE* a null string.

(ICONW.SHADE *WINDOW SHADE*) [Function]

Returns the current shading of the window **ICON**, which must be a window returned by **ICONW** or **TITLEDICONW**. In addition, if *SHADE* is non-**NIL**, paints the texture *SHADE* on *WINDOW*. A typical use for this function is to communicate a change of state in a window that is shrunken, without reopening the window. To remove any shading, make *SHADE* be **WHITESHADE**.

28.4.16.3 Default Icons

When you shrink a window that has no **ICONFN**, the system currently creates an icon that looks like the window's title bar. You can make the system instead create titled icons by setting the global variable **DEFAULTICONFN** to the value **TEXTICON**.

(TEXTICON *WINDOW TEXT*) [Function]

Creates a titled icon window for the main window *WINDOW* containing the text *TEXT*, or the window's title if *TEXT* is **NIL**.

DEFAULTTEXTICON [Variable]

The value that **TEXTICON** passes to **TITLEDICONW** as its *ICON* argument. Initially it is **NIL**, which creates an unadorned rectangular window. However, you can set it to a **TITLEDICON** record of your choosing if you would like default icons to have a different appearance.

28.4.16.4 Sample Icons

The LispUsers StockIcons module contains a collection of icons and their masks usable with **ICONW**, including:

- **FOLDER, FOLDERMASK** - a file folder

- **PAPERICON, PAPERICONMASK** - a sheet of paper with the top right corner turned

- **FILEDRAWER, FILEDRAWERMASK** - front of a file drawer

- **ENVELOPEICON, ENVELOPEMASK** - envelope

- **TITLED.FILEDRAWER** - TitledIcon of the filedrawer front (capacity, about three lines of 10-point text)

- **TITLED.FILEFOLDER** - TitledIcon of the file folder (capacity, about three lines of 10-point text)

- **TITLED.ENVELOPE** - TitledIcon of the envelope (capacity, one short line of 10-point text)