

Libraries

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Chapter 1

Libraries

1.1 Amiga® RKM Libraries: 13 Preferences

To make the Amiga operating system easily configurable by the user, the OS comes with a family of editors and associated data files known collectively as Preferences. Preferences allows the user to set system-wide configuration options such as the printer driver to use, serial port baud rate and other items. To make an application appealing to the user, the system-wide Preferences settings should be respected as much as possible by applications. This chapter describes how to use the Preferences system in your programs.

In Release 2 the number of Preference items and the way they are handled is very different from 1.3 and earlier versions, though there is backward compatibility with old Preferences items. This chapter describes both the old 1.3 and the new Release 2 Preferences.

Preferences in 1.3 and Older Versions of the OS
Preferences in Release 2
Function Reference

1.2 13 Preferences / Preferences in 1.3 and Older Versions of the OS

In 1.3, the Preferences program allows the user to see and change many system wide parameters, like the Workbench colors, pointer image, printer settings etc. When a Preferences item is changed, the new setting can be used temporarily (until a reset occurs) or stored permanently in the `devs:system-configuration` file. Under 1.3, all Preferences items are stored in this file which the system reads at boot time to find out how to set various system-wide options.

The 1.3 Preferences system allows the user to change the following items:

- * Date and time of day. These are automatically saved in the battery-backed clock, if one is present.
- * Key repeat speed - the speed at which a key repeats when held down.

- * Key repeat delay - the amount of delay before a key begins repeating.
- * Mouse speed - how fast the pointer moves when the user moves the mouse.
- * Double-click delay - maximum time allowed between the two clicks of a mouse double click. For information about how to test for double-click timeout, see the description of the `DoubleClick()` function in the Amiga ROM Kernel Reference Manual: Includes and Autodocs.
- * Text size - size of the default font characters. The user can choose 64-column mode (64 characters on a line in high-resolution and 32 characters in low-resolution mode) or 80 column mode (80 characters on a line in high-resolution and 40 characters in low-resolution mode). The first variable in the Preferences structure is `FontHeight`, which is the height of the characters in display lines. If this is equal to the constant `TOPAZ_EIGHTY`, the user has chosen the 80-column mode. If it is equal to `TOPAZ_SIXTY`, the user has chosen the 64-column mode. Note that certain utility programs allow the user to change the default font under 1.3, so you cannot rely on the default font being Topaz 8 or 9.
- * Display centering - allows the user to center the image on the video display.
- * Serial port - the user can change the baud rate and other serial port parameters to accommodate whatever device is attached to the serial connector. Normally you use these values as defaults when you open the serial device. If you change the baud rate or other serial port options locally, it is good practice to reset them to the values specified in Preferences before quitting.
- * Workbench colors - the user can change any of the four colors in the 1.3 Workbench screen by adjusting the amounts of red, green and blue in each color.
- * Printer - the user can select from a number of printers supported by the Amiga and also indicate whether the printer is connected to the serial connector or the parallel connector.
- * Print characteristics - the user can select paper size, right and left margin, continuous feed or single sheets, draft or letter quality, pitch and line spacing. For graphic printing, the user can specify the density, scaling method, select a vertical or horizontal dump, etc.

Reading 1.3 Preferences

Setting 1.3 Preferences

Preferences Structure in 1.3

Alternatives to `SetPrefs`

1.3 13 / Preferences in 1.3 and Older Versions / Reading 1.3 Preferences

Applications can obtain a copy of Preferences by calling the Intuition function `GetPrefs()`. In a system in which there is no `devs:system-configuration` file, `GetDefPrefs()` can be used to obtain the

Intuition default Preference settings.

```
struct Preferences *GetPrefs(struct Preferences *preferences,
                             LONG size);
struct Preferences *GetDefPrefs(struct Preferences *preferences,
                                LONG size);
```

GetPrefs() and GetDefPrefs() have two arguments, a pointer to a buffer to receive the copy of the user Preferences and the size of this buffer. The most commonly used data is grouped near the beginning of the Preferences structure and you are free to read only as much as you need. So, if you are only interested in the first part of the Preferences structure, you do not need to allocate a buffer large enough to hold the entire structure. These functions return a pointer to your buffer if successful, NULL otherwise.

If you are using Intuition IDCMP for input, you can set the IDCMP flag IDCMP_NEWPREFS (formerly the NEWPREFS flag under V34 and earlier versions of the OS). With this flag set, your program will receive an IntuiMessage informing you changes have been made to Preferences. To get the latest settings, you would again call GetPrefs().

1.4 13 / Preferences 1.3 & Older Versions / Preferences Structure in 1.3

The Preferences structure in 1.3 and earlier versions of the OS is a static 232 byte data structure defined in <intuition/preferences.h> as follows:

```
struct Preferences
{
    /* the default font height */
    BYTE FontHeight;                /* height for system default font */

    /* constant describing what's hooked up to the port */
    UBYTE PrinterPort;              /* printer port connection */

    /* the baud rate of the port */
    UWORD BaudRate;                 /* baud rate for the serial port */

    /* various timing rates */
    struct timeval KeyRptSpeed;      /* repeat speed for keyboard */
    struct timeval KeyRptDelay;      /* Delay before keys repeat */
    struct timeval DoubleClick;      /* Interval allowed between clicks */

    /* Intuition Pointer data */
    UWORD PointerMatrix[POINTERSIZE]; /* Definition of pointer sprite */
    BYTE XOffset;                   /* X-Offset for active 'bit' */
    BYTE YOffset;                   /* Y-Offset for active 'bit' */
    UWORD color17;                   /****** */
    UWORD color18;                   /* Colours for sprite pointer */
    UWORD color19;                   /****** */
    UWORD PointerTicks;              /* Sensitivity of the pointer */

    /* Workbench Screen colors */
```

```

UWORD color0;                /*******/
UWORD color1;                /* Standard default colours */
UWORD color2;                /* Used in the Workbench */
UWORD color3;                /*******/

/* positioning data for the Intuition View */
BYTE ViewXOffset;           /* Offset for top lefthand corner */
BYTE ViewYOffset;           /* X and Y dimensions */
WORD ViewInitX, ViewInitY;  /* View initial offset values */

BOOL EnableCLI;             /* CLI availability switch (OBSOLETE)*/

/* printer configurations */
UWORD PrinterType;          /* printer type */
UBYTE PrinterFilename[FILENAME_SIZE]; /* file for printer */

/* print format and quality configurations */
UWORD PrintPitch;           /* print pitch */
UWORD PrintQuality;         /* print quality */
UWORD PrintSpacing;         /* number of lines per inch */
UWORD PrintLeftMargin;     /* left margin in characters */
UWORD PrintRightMargin;    /* right margin in characters */
UWORD PrintImage;          /* positive or negative */
UWORD PrintAspect;         /* horizontal or vertical */
UWORD PrintShade;          /* b&w, half-tone, or color */
WORD PrintThreshold;        /* darkness ctrl for b/w dumps */

/* print paper descriptors */
UWORD PaperSize;            /* paper size */
UWORD PaperLength;         /* paper length in number of lines */
UWORD PaperType;           /* continuous or single sheet */

/* Serial device settings: These are 6 nibble-fields in 3 bytes */
/* (these look a little strange so the defaults will map out to 0) */
UBYTE SerRWBits;           /* upper nibble = (8-number of read bits) */
/* lower nibble = (8-number of write bits) */
UBYTE SerStopBuf;          /* upper nibble = (number of stop bits - 1) */
/* lower nibble = (table value for BufSize) */
UBYTE SerParShk;           /* upper nibble = (value for Parity setting) */
/* lower nibble = (value for Handshake mode) */
UBYTE LaceWB;              /* if workbench is to be interlaced */

UBYTE WorkName[FILENAME_SIZE]; /* temp file for printer */

BYTE RowSizeChange;        /* affect NormalDisplayRows/Columns */
BYTE ColumnSizeChange;

UWORD PrintFlags;          /* user preference flags */
UWORD PrintMaxWidth;       /* max width of printed picture in 10ths/in */
UWORD PrintMaxHeight;      /* max height of printed picture in 10ths/in */
UBYTE PrintDensity;        /* print density */
UBYTE PrintXOffset;        /* offset of printed picture in 10ths/inch */

UWORD wb_Width;            /* override default workbench width */
UWORD wb_Height;           /* override default workbench height */
UBYTE wb_Depth;            /* override default workbench depth */

```

```
    UBYTE    ext_size;        /* extension information -- do not touch! */
                                /* extension size in blocks of 64 bytes */
};
```

1.5 13 / Preferences in 1.3 and Older Versions / Setting 1.3 Preferences

The instance of the Preferences structure in memory can be changed with the Intuition SetPrefs() function:

```
struct Preferences *SetPrefs(struct Preferences *preferences,
                             LONG size, BOOL inform);
```

In addition to a buffer holding the Preferences structure, and the buffer size, this function takes an argument which indicates whether an IDCMP_NEWPREFS message should be broadcast to windows which have this flag set in the Window.IDCMPFlags field of their window.

Avoid Using SetPrefs().

This function is normally only used by Preferences-like utilities. There should be no need for a normal application to set the system Preferences with SetPrefs().

1.6 13 / Preferences in 1.3 and Older Versions / Alternatives to SetPrefs

Since the Amiga is a multitasking system, it is rarely correct for a single Amiga application to modify the user's system-wide Preferences. Instead, use methods such as the following to modify only your own application's appearance or behavior.

- * Custom screen applications can control their own display mode, resolution, palette, and fonts. Use functions such as LoadRGB4() to change your own screen's palette, and SetFont() to change your own screen and window fonts. Workbench applications should never change the attributes of the user's Workbench.
- * The mouse pointer for a window may be changed with SetPointer().
- * Serial device settings can be changed with the command SDCMD_SETPARAMS.
- * Printer device settings may be changed by altering the printer's copy of the Preferences structure when you have the printer open. Note that Amiga applications should only keep the printer open while they are printing. This allows other applications to print, and also allows user changes to Printer Preferences to take effect.

See the Intuition and graphics chapters of this manual, and the "Printer Device" and "Serial Device" chapters of the Amiga ROM Kernel Reference Manual: Devices for more information.

1.7 13 Preferences / Preferences in Release 2

Under Release 2 (V36), the way Preferences are handled is significantly different. No longer is there one Preferences program with one configuration file. Instead there can be any number of Preferences editors (there are currently 13), each with its own separate configuration file covering a specific area. All these Preferences editors have the same look and feel. Using separate Preferences editors and configuration files allows for adding new Preferences items (and editors) in future versions of the OS.

Preferences Editors and Storage
The ENV: Directory and Notification
Preference File Format In Release 2

FONT	INPT	PGFX	SCRM
ICTL	OSCN	PTXT	SERL

Other Preferences File Formats in Release 2
Reading a Preferences File

1.8 13 / Preferences in Release 2 / Preferences Editors and Storage

In Release 2, the `devs:system-configuration` file has been replaced by various `.prefs` files, located in the `ENV:sys` and `ENVARC:sys` directories. System Preferences options currently in use are located in `ENV:sys`. Permanent, saved copies of system Preferences files are stored in `ENVARC:sys`. The contents of `ENVARC:` is copied at boot time to `ENV:.` Applications may also store their own preference files in `ENV:` but should use a subdirectory for that purpose.

Currently the following Preferences editors and files are available:

Table 13-1: Preferences Editors in Release 2

Preferences Editor	Preferences Configuration File
-----	-----
IControl	icontrol.prefs
Input	input.prefs
Palette	palette.ilbm
Pointer	pointer.ilbm
Printer	printer.prefs
PrinterGfx	printergfx.prefs
Overscan	overscan.prefs
ScreenMode	screenmode.prefs
Serial	serial.prefs
---	wbconfig.prefs
Font	wbfont.prefs, sysfont.prefs and screenfont.prefs
Time	---
WBPattern	wb.pat and win.pat

Each .prefs file is managed by editor with the same name, except for `wbconfig.prefs`, which is written directly by Workbench and has no editor. One Preferences editor has no .prefs file, Time. That Preferences editor writes directly to the battery backed clock.

When the user makes a change to a Preferences item with one of the editors, the changes will be saved in either `ENV:sys` or both `ENV:sys` and `ENVARC:sys` depending on whether the user saves the changes with the "Use" gadget or "Save" gadget of the Preferences editor.

The "Use" gadget is for making temporary changes and the new preferences will be stored only in `ENV:sys`. If the user reboots, the old preferences will be restored from the permanent copy in `ENVARC:sys`.

The "Save" gadget is for making permanent changes and the new preferences will be stored in both `ENV:sys` and `ENVARC:sys`. That way, if the user reboots, the new preferences will still be in effect since the system looks in `ENVARC:sys` to find out what preferences should be set to at boot time.

1.9 13 / Preferences in Release 2 / The ENV: Directory and Notification

One advantage of the new Preferences system in Release 2 is file notification. File notification is a form of interprocess communication available in Release 2 that allows an application to be automatically notified if a change is made to a specific file or directory. This makes it easy for the application to react to changes the user makes to Preferences files.

File notification is also used by the system itself. The Release 2 Preferences control program, `IPrefs`, sets up notification on most of the Preferences files in `ENV:sys`. If the user alters a Preferences item (normally this is done with a Preferences editor), the system will notify `IPrefs` about the change and `IPrefs` will attempt to alter the user's environment to reflect the change.

For example, if the user opens the ScreenMode Preferences editor and changes the Workbench screen mode to high-resolution, the new settings are saved in `Screenmode.prefs` in the `ENV:sys` directory. `IPrefs` sets up notification on this file at boot time, so the file system will notify `IPrefs` of the change. `IPrefs` will read in the `Screenmode.prefs` file and reset the Workbench screen to high resolution mode.

Here's a short example showing how to set up notification on the `serial.prefs` file in `ENV:sys`. The program displays a message in a window whenever this file is changed (e.g., when the user selects the "Use" or "Save" gadget in the Serial Preferences editor).

```
prefnotify.c
```

1.10 13 / Preferences in Release 2 / Preference File Format in Release 2

To understand the format of Preferences files, you must be familiar with IFF file standard (see the Amiga ROM Kernel Reference Manual: Devices for the complete specification).

In general all Preferences files are stored in the IFF format with a type of PREF (see the exceptions noted below). Each file contains at least two Chunks, a header Chunk and a data Chunk.

The Header Chunk The Data Chunk

1.11 13 // Preference File Format in Release 2 / The Header Chunk

The PRHD header chunk, contains a PrefHeader structure:

```
struct PrefHeader
{
    UBYTE ph_Version;
    UBYTE ph_Type;
    ULONG ph_Flags;
};
```

Currently all the fields are set to NULL. In future revisions these fields may be used to indicate a particular version and contents of a PREF chunk.

1.12 13 // Preference File Format in Release 2 / The Data Chunk

The data Chunk that follows the header Chunk depends on the kind of Preferences data the file contains. The types of Preferences data Chunks that are currently part of the system are:

Table 13-2: IFF Chunk Types in Release 2 Preferences Data Files

Chunk Name	Used With
-----	-----
FONT	Fonts, used for all font Preferences files. In future the PrefHeader may indicate what the font is used for.
ICTL	IControl
INPT	Input
OSCN	Overscan
PGFX	PrinterGfx
PTXT	PrinterText
SCRM	ScreenMode
SERL	Serial

Each chunk contains a structure applicable to the type.

1.13 13 / Preferences in Release 2 / FONT

```

struct FontPrefs
{
    LONG          fp_Reserved[4];
    UBYTE         fp_FrontPen;      /* Textcolor */
    UBYTE         fp_BackPen;      /* Character background color */
    UBYTE         fp_DrawMode;
    struct TextAttr fp_TextAttr;
    BYTE          fp_Name[FONTNAMESIZE]; /* Font name */
};

```

1.14 13 / Preferences in Release 2 / ICTL

```

struct IControlPrefs
{
    LONG  ic_Reserved[4];          /* System reserved          */
    WORD  ic_TimeOut;              /* Verify timeout          */
    WORD  ic_MetaDrag;            /* Meta drag mouse event   */
    ULONG ic_Flags;               /* IControl flags (see below) */
    UBYTE ic_WBtoFront;           /* CKey: WB to front       */
    UBYTE ic_FrontToBack;        /* CKey: front screen to back */
    UBYTE ic_ReqTrue;            /* CKey: Requester TRUE    */
    UBYTE ic_ReqFalse;           /* CKey: Requester FALSE   */
};

```

The `ic_Flags` field can have the following values:

ICF_COERCE_COLORS

This indicates that a displaymode with a matching number of colors has preference over a correct aspect ration when screen coercing takes place.

ICF_COERCE_LACE

This indicates that chosing an interlaced display mode is allowed when coercing screens. Otherwise a non-interlaced display mode will be selected.

ICF_STRGAD_FILTER

This indicates that control characters should be filtered out of string gadget user input.

ICF_MENUSNAP

This indicates that an autoscroll screen should be snapped back to origin when the mouse menu-button is selected.

Note that the command key values in the last four fields of the `IControlPrefs` structure are ANSI codes, not RAWKEY codes.

1.15 13 / Preferences in Release 2 / INPT

```

struct InputPrefs
{
    LONG          ip_Reserved[4];
    UWORD         ip_PointerTicks; /* Sensitivity of the pointer */
    struct timeval ip_DoubleClick; /* Interval between clicks */
    struct timeval ip_KeyRptDelay; /* keyboard repeat delay */
    struct timeval ip_KeyRptSpeed; /* Keyboard repeat speed */
    WORD          ip_MouseAccel; /* Mouse acceleration */
};

```

1.16 13 / Preferences in Release 2 / OSCN

```

struct OverscanPrefs
{
    ULONG         os_Reserved[4];
    ULONG         os_DisplayID; /* Displaymode ID */
    Point         os_ViewPos; /* View X/Y Offset */
    Point         os_Text; /* TEXT overscan dimension */
    struct Rectangle os_Standard; /* STANDARD overscan dimension */
};

```

1.17 13 / Preferences in Release 2 / PGFX

```

struct PrinterGfxPrefs
{
    LONG pg_Reserved[4];
    UWORD pg_Aspect; /* Horizontal or vertical */
    UWORD pg_Shade; /* B&W, Greyscale, Color */
    UWORD pg_Image; /* Positive or negative image */
    WORD pg_Threshold; /* Black threshold */
    UBYTE pg_ColorCorrect; /* RGB color correction */
    UBYTE pg_Dimensions; /* Dimension type */
    UBYTE pg_Dithering; /* Type of dithering */
    UWORD pg_GraphicFlags; /* Rastport dump flags */
    UBYTE pg_PrintDensity; /* Print density 1 - 7 */
    UWORD pg_PrintMaxWidth; /* Maximum width */
    UWORD pg_PrintMaxHeight; /* Maximum height */
    UBYTE pg_PrintXOffset; /* X Offset */
    UBYTE pg_PrintYOffset; /* Y Offset */
};

```

The possible values of each field are defined in <prefs/printergfx.h>. Note that your application is responsible for checking if the supplied values are valid.

1.18 13 / Preferences in Release 2 / PTXT

```

struct PrinterTxtPrefs
{

```

```

LONG   pt_Reserved[4];           /* System reserved          */
UBYTE  pt_Driver[DRIVERNAME_SIZE]; /* printer driver filename  */
UBYTE  pt_Port;                 /* printer port connection  */

WORD   pt_PaperType;            /* Fanfold or single        */
WORD   pt_PaperSize;           /* Standard, Legal, A4, A3 etc. */
WORD   pt_PaperLength;         /* Paper length in # of lines */

WORD   pt_Pitch;               /* Pica or Elite            */
WORD   pt_Spacing;             /* 6 or 8 LPI               */
WORD   pt_LeftMargin;          /* Left margin              */
WORD   pt_RightMargin;         /* Right margin             */
WORD   pt_Quality;             /* Draft or Letter          */
};

```

1.19 13 / Preferences in Release 2 / SCRM

```

struct ScreenModePrefs
{
    ULONG sm_Reserved[4];
    ULONG sm_DisplayID;          /* Displaymode ID          */
    WORD  sm_Width;             /* Screen width            */
    WORD  sm_Height;           /* Screen height           */
    WORD  sm_Depth;            /* Screen depth            */
    WORD  sm_Control;          /* BIT 0, Autoscroll yes/no */
};

```

1.20 13 / Preferences in Release 2 / SERL

```

struct SerialPrefs
{
    LONG   sp_Reserved[4];       /* System reserved          */
    ULONG  sp_BaudRate;         /* Baud rate                */

    ULONG  sp_InputBuffer;      /* Input buffer: 0 - 64K    */
    ULONG  sp_OutputBuffer;     /* Future: Output: 0 - 64K, def 0 */

    UBYTE  sp_InputHandshake;   /* Input handshaking        */
    UBYTE  sp_OutputHandshake;  /* Future: Output handshaking */

    UBYTE  sp_Parity;           /* Parity                   */
    UBYTE  sp_BitsPerChar;      /* I/O bits per character   */
    UBYTE  sp_StopBits;         /* Stop bits                 */
};

```

1.21 13 / Preferences in Release 2 / Other File Formats in Release 2

Not every Preferences file is stored as an IFF file of type PREF. The palette.ilbm and pointer.ilbm files contain a regular ILBM FORM to store their imagery. The win.pat and wb.pat files use a raw format with 16

bytes reserved, followed by a WORD giving the total size of the pattern, a WORD giving the bitplane count, and byte arrays (currently 32 bytes) for each bitplane. The format of the `wbconfig.prefs` file is private.

1.22 13 Preferences / Function Reference

The following are brief descriptions of the system functions that relate to the use of Preferences. See the Amiga ROM Kernel Reference Manual: Includes and Autodocs for details on each function call.

Table 13-3: Functions Used with Preferences

Function	Description
<code>GetPrefs()</code>	Old 1.3 (V34) function for making a copy of the Preferences structure
<code>SetPrefs()</code>	Old 1.3 (V34) function for overwriting Preferences with new data
<code>GetDefPrefs()</code>	Old 1.3 (V34) function for copying default Preferences from ROM
<code>StartNotify()</code>	Release 2 DOS library function for monitoring a <code>.prefs</code> file for changes
<code>EndNotify()</code>	Ends notification started with <code>StartNotify()</code>
<code>AllocIFF()</code>	IFFParse library function that creates an IFFHandle for parsing
<code>InitIFFasDOS()</code>	Initialize the IFFHandle as a DOS stream
<code>OpenIFF()</code>	Initialize an IFFHandle for reading or writing a new stream
<code>PropChunk()</code>	Specify a property chunk to store
<code>ParseIFF()</code>	Parse an IFF file from the IFFHandle stream
<code>CurrentChunk()</code>	Returns the top level context of an IFF stream
<code>FindProp()</code>	Search for a property chunk previously declared with <code>PropChunk()</code>
<code>CloseIFF()</code>	Closes an IFF context opened with <code>OpenIFF()</code>
<code>FreeIFF()</code>	Frees the IFFHandle created with <code>AllocIFF()</code>