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Operation:

Hex Calculator

Reference:

Product Overview

Hex Workshop, is a set of hexadecimal development tools for Windows 3.1, 95, and NT, combining advanced binary editing with the ease and flexibility of a word processor.   With Hex Workshop you can edit, insert, delete, cut, copy, and paste hex, print high quality customizable hex dumps, and export to RTF or HTML for publishing.   Additionally you can goto, find, replace, compare, and calculate checksums within a file.

Hex Workshop is integrated with the Windows Explorer, the File Manager, and Microsoft Visual C++ so you can quickly hex edit files from your most frequently used workspaces. Hex Workshop also includes a Base Converter for converting between hex, decimal, and binary, and a Hex Calculator supporting arithmatic and logical operations.

Hex Workshop was recognized in "The 47 Best from the Net" by Windows Sources and as the Windows Tech Journal Download of the Month.   Hex Workshop is available at retail price of $20 (with volume discounts and site licenses also available).   For more information, visit the BreakPoint Software Home Page at www.bpsoft.com or e-mail inquiries to sales@bpsoft.com.
.
With Hex Workshop you can:

- Edit multiple files of unlimited size.
- Hex edit files directly from the Windows Explorer and File Manager.
- Customize your editing environment, with a multitude of user preferences.
- Print high quality hex dumps with customized headers, footers, fonts, etc..
- Cut, Copy, Paste, Insert, Delete, and Undo.
- View and Edit raw binary data as decimal values with a Data Viewer.
- Export and Copy hex as RTF and HTML for publishing or C source for inserting into source code.
- Find and Replace hex, decimal, or ASCII (incl. Unicode) values.
- Goto from the start, end, or cursor position within a file or disk.
- Use a Compare Tool to find differences in files.
- Calculate Checksums for all or part of a file.
- Edit Floppy and Hard Disks on Windows 3.1, 95, and NT.
- Search across multiple sectors on a Disk.
- Get File/Disk properties with the click of the mouse.
- View File/Disk attributes in the Status Bar.
- Use Keycuts to access most features with function keys.
- Use Online help including multiple character tables and list of data types and ranges.
- And you get two additional applets:
     1. A Base Converter to convert between hex/decimal/binary.
     2. A Hex/Decimal Calculator (supporting +, -, *, /, &, ^, >>, <<, ~).

* - Version 2.50 and later run on Windows 95 and Windows NT 4.0 only (support for Windows 3.1 and Windows NT 3.5x apply to Hex Workshop version 2.20 and earlier.

How To Order

Hex Workshop can be purchased for $20.   For this you will receive a Serial Number valid for both the 16 bit and 32 bit versions of Hex Workshop, as well as free minor upgrades, and first notice of and discounts on major upgrades. For your convenience, you may order Hex Workshop from a number of sources using a variety of payment methods. To determine the easiest way for you order Hex Workshop select your desired method of payment below.

Payment Method:

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Ordering From Europe

Click here for multi-user prices and an order form.

Or for the latest information on Hex Workshop, check out our web page:

www.bpsoft.com

Credit Card Ordering

You may order Hex Workshop (item # 11823) from the Public Software Library (PsL) using MasterCard, Visa, American Express, or Discover Card by:

Phone at 1-800-2424-PSL or 713-524-6394.

FAX at 1-713-524-6398.

CompuServe Mail at 71355,470.

E-Mail at 71355.470@compuserve.com.

U.S. Mail at: Public Software Library
                 P.O. Box 35705
                 Houston, TX 77235-5705.

Internet: To place a credit card order for Hex Workshop over the Internet, go to the BreakPoint Software Home Page (www.bpsoft.com) and follow the directions for placing a credit card order.

Hex Workshop Pricing:

Single Copy: $20 each

Site License:
    2 to 9 machines: $17 each
    10 to 24 machines: $14 each
    25 to 49 machines: $10 each
    50 to 99 machines: $8 each
    over 100 machines: please Contact the Authors.

Prices guaranteed through 1997 and apply to Hex Workshop version 2.5 or lower.

After you register, you will receive an acknowledgment by U.S. Mail in approximately 1 week with your Serial Number.

THE ABOVE NUMBERS ARE FOR ORDERS ONLY.

BreakPoint Software cannot be reached at the numbers above.   These numbers are for PsL, a credit card order taking service only.

Please be sure to include your credit card number and expiration date on all credit card orders.   Any questions about the status of the shipment of an order, refunds, registration options, product details, technical support, volume discounts, dealer pricing, site licenses, etc., must be directed to BreakPoint Software (see Contacting the Authors).

Purchase Orders

You may order Hex Workshop directly from BreakPoint Software Inc. with a Purchase Order by:

U.S. Mail at: BreakPoint Software, Inc.
                P.O. Box 4629
                Stamford, CT 06907-4629.

E-Mail at sales@bpsoft.com.

Internet: To submit a purchase order for Hex Workshop over the Internet, go to the BreakPoint Software Home Page (www.bpsoft.com)) and follow the directions for submitting a purchase order.

Purchase Orders are only accepted for orders of $50 or more and must include a purchase order #, billing address, and shipping address (if different from the billing address).

Payment Terms are Net 30 days

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Site License:
        2 to 9 machines: $17 each
        10 to 24 machines: $14 each
        25 to 49 machines: $10 each
        50 to 99 machines: $8 each
        over 100 machines: please Contact the Authors.

Prices guaranteed through 1997 and apply to Hex Workshop version 2.5 or lower.

After you register, you will receive an acknowledgment by U.S. Mail in approximately 1 week with your Serial Number.

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Number of Copies: _____

Total Cost: _____

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Account #:   _____
Name: _____
Organization: _____
Address: _____
Address: _____

City, State, Zip: _____

Country: _____

Phone(s):   _____

E-Mail Address: _____

SHIP TO ADDRESS (if different):

Name: _____

Organization: _____

Address: _____

Address: _____

City, State, Zip: _____

Country: _____

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You may order Hex Workshop directly from BreakPoint Software Inc. with a check by:

U.S. Mail at: BreakPoint Software, Inc.
P.O. Box 4629
Stamford, CT 06907-4629.

Payments must be in U.S. dollars drawn on a U.S. bank, or with an international postal money orders in U.S. dollars

After you register, you will receive an acknowledgment by U.S. Mail in approximately 1 week with your Serial Number.

Please fill in the information below:

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Site License:
    2 to 9 machines: $17 each
    10 to 24 machines: $14 each
    25 to 49 machines: $10 each
    50 to 99 machines: $8 each
    over 100 machines: please Contact the Authors.

Connecticut residents add 6% sales tax   _____

Total payment   _____

Prices guaranteed through 1997 and apply to Hex Workshop version 2.5 or lower.

Name: _____
Organization: _____
Address: _____
Address: _____
City, State, Zip: _____
Country: _____

Phone(s):   _____

E-Mail Address: _____

Where did you hear about Hex Workshop? _____

Comments:

CompuServe Software Registration Service

To order from CompuServe follow the steps below and CompuServe will automatically add the Hex Workshop registration fee to your next bill.

1. Connect to CompuServe.
2. Go to the Shareware Registration Service (GO SWREG).
3. Choose "Register Shareware".
4. Enter the appropriate responses.
5. When prompted with the search window, use the keyword: HEXWORKS.
6. Select the appropriate product/license and choose "Register".

Hex Workshop products/licenses offered include:

Hex Workshop Single User License	$ 20	Registration ID: #7813
Hex Workshop (2 pack)	$ 34	Registration ID: #14201
Hex Workshop (5 pack)	$ 85	Registration ID: #14202
Hex Workshop (10 pack)	$140	Registration ID: #14203
Hex Workshop (25 pack)	$250	Registration ID: #14204

After you register, you will receive an acknowledgment by U.S. Mail in approximately 1 week with your Serial Number.

Any questions about the status of the shipment of an order, refunds, registration options, product details, technical support, volume discounts, dealer pricing, site licenses, etc., must be directed to BreakPoint Software (see Contacting the Authors).

Internet Ordering (Internet)

Hex Workshop can be ordered using a variety of payment methods over the Internet.

To order over the Internet, first go to the go to the [BreakPoint Software Home Page (www.bpsoft.com)](www.bpsoft.com) and follow the directions for submitting an order over the Internet.

Hex Workshop Pricing:

Single Copy: $20 each

Site License:
      2 to 9 machines: $17 each
      10 to 24 machines: $14 each
      25 to 49 machines: $10 each
      50 to 99 machines: $8 each
      over 100 machines: please Contact the Authors.

After you register, you will receive an acknowledgment by U.S. Mail in approximately 1 week with your Serial Number.

Any questions about the status of the shipment of an order, refunds, registration options, product details, technical support, volume discounts, dealer pricing, site licenses, etc., must be directed to BreakPoint Software (see Contacting the Authors)

Ordering From Europe

You may order Hex Workshop (program #100130) from ShareIt, an order taking service in Europe, using EuroCheque, Eurocard/Mastercard, American Express, or Diners Club by:

Phone at 49-221-2407279 or 49-172-7229837.

FAX at 49-221-2407278.

E-Mail at register@shareit.com.

Internet: To place an order for Hex Workshop over the Internet, go to the BreakPoint Software Home Page (www.bpsoft.com) and follow the directions for placing an order.

Hex Workshop Pricing:

Single Copy: $20 each

Prices guaranteed through 1997 and apply to Hex Workshop version 2.5 or lower.

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WWW Page - Latest Downloads Available

The BreakPoint Software home page is:

www.bpsoft.com

From our home page you can download commercial demos of the latest 16 and 32 bit versions of Hex Workshop, download betas of upcoming versions, and find out the latest information on improvements and plans for future releases.   We also have links to other development resources, software development companies, and download sites on our web site.

From our web site you can find the most up to date information on ordering Hex Workshop over the Internet (Ordering over the Internet)

Note: The WWW home page is subject to change.   If possible we will provide the new URL if this one changes for any reason.

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You should carefully read the following terms and conditions before using this software.

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Commercial Demo Policy

Beginning with version 2.50, the trial policy for Hex Workshop was changed from a shareware version (unlimited) to a commercial demo version (limited time).   Hex Workshop (version 2.50 and later) is offered for a 90 day trial period with unlimited functionality.   After the end of the trial period the user is granted an additional 14 days to order and receive delivery of the full version of the product.   The full version of Hex Workshop costs $20, and is available from a number of sources for your convenience (Ordering Hex Workshop).

If a longer trial period is required, you may download version 2.20 from the BreakPoint Software Web Site www.bpsoft.com.   This version has an unlimited trial period (shareware style).

If you have any questions regarding this policy or on purchasing the full version of Hex Workshop, contact the authors.

Technical Support and Questions

Technical Support for Hex Workshop will be provided to registered users only.   If you require technical support or have found a problem with Hex Workshop please submit it as an e-mail to support@bpsoft.com.   Please be as descriptive as possible and title the message "Hex Workshop: Tech Support" or "Hex Workshop: Problem Reported" as applicable.   We will make every effort possible to answer all inquiries (problems reported) in a timely manner.

In either case please specify the version information located in the About Box (i.e.: ver 2.50, 32 bit) and the operating system (Win 3.1, 95, or NT) you are using.

For additional information, see Contacting the Authors.

Comments and Suggestions

We are continually planning our next versions, in which we will be adding features to the Hex Editor as well as additional hex-related mini-applications.

If you have any comments or suggestions for the current version or future versions of Hex Workshop please do not hesitate to contact us via e-mail at support@bpsoft.com.   Please title the message "Hex Workshop: Comments (or Suggestions)".

For additional information, see Contacting the Authors.

How To Contact the Authors

The Authors can be contacted via online services or directly by mail.

E-Mail Address: Internet at sales@bpsoft.com or support@bpsoft.com
CompuServe at 75554,377

U.S. Mail: BreakPoint Software, Inc.
P.O. Box 4629
Stamford, CT 06907-0629

Version History

Hex Workshop v 2.50 (32 bit only) - Jan 1997 (current version):

NEW FEATURES

Installer is now a self extracting archive.

Added Data Watch to display and edit decimal values.

New Preferences
- Added user defined bytes/row and Fit to Window.
- Added new character filters (DOS and Macintosh).

Redesigned Preferences tabs.

Redesigned Document Properties (offset, insert/overwrite, etc.).

Added Shift-PgUp and Shift-PgDn Accelerators.

Find Improvements
- ASCII search by Unicode.
- Ability to pad replacement ASCII strings with nulls.
- Ability to search by decimal value (byte, long, float, etc.).

Added Copy As and Export capabilities (Text, HTML, RTF, and C Source).

BUG FIXES

Inserting bytes would occasionally cause crashes

Miscellaneous display problems

Did not handle read only files properly

Did not save checksum dialog states

Canceling a "Save As" caused Altered bytes to be reset

Hex Workshop v 2.20 - July 1996:

NEW FEATURES

Added Installer.
Creates Hex Workshop Program Group.
Installs the Hex Workshop File Manager Extension.
Installs the Hex Workshop Windows 95 Shell Extension.
Adds Hex Workshop to Microsoft Visual C++ "Tools" Menu.

Added Uninstall capability to 32 bit version to remove product.

New Preferences
- Default path to open files from.
- Can set to open documents maximized.
- Can choose to highlight altered bytes with a different color.
- Added new character filters (EBCDIC/ASCII/none).

Added new keycuts for selecting bytes.

Added Command Line options.

BUG FIXES

Right Aligned Footer not working properly.

16-bit Checksum sign extension bug.

Able to handle unlimited size files although performance on very large files is poor.

Preferences were not being saved in some cases.

Base Converter always pasted into one window.

Hex Workshop v 2.10 - Feb 1996:

NEW FEATURES

Page Setup
    - Margins, Headers, Footers, Printer Font.

Enhanced Disk Editing
    - Support more drive types.
    - Edit in drive or raw disk mode.

Context Menu Extension [Win 95]
    - Can hex edit a file from the right mouse context menu.

Drag and Drop
    - from shell/explorer [Win 95].
    - from File Manager.

File Manager Extension
    - Allows user to add a "hex edit" menu to file manager.

Checksum
    - Added 16 bit checksum.
    - Added one's and two's complement modifiers.

Enable paste into Find/Replace, Goto dialogs.

Added Tool Help Bubbles.

Added Dockable Toolbars (32 bit version).

Combined Hex Calculator and Bit Calculator into one.

BUG FIXES

Printing continued for infinite number of pages .

Editing disks with over 255 tracks didn't work.

Sector find wasn't working properly.

Compare failed when file comparing two files with the same file name.

Never performed input range checking for the compare and sector dialogs.

Dialog background colors where not being set correctly in Win 95.

Goto dialog was not always setting the initial focus properly.

Hex Workshop v 2.01 -   Dec 1995

BUG FIXES

Signed short was not working properly in the 32-bit version.

Launching the calculators failed because of new naming convention.

Hex Workshop v 2.00 - Oct 1995

NEW FEATURES

32 bit version for Windows 95 and NT.

Sector Editor
- Supports BIOS floppy and hard disks.

Checksum calculations
- Checksum, CRC-16, CRC-16/CCITT, CRC-32 are calculated selection.

Right-Click menus
- Cut, Copy, Paste, Goto, Checksum, Insert for Files
- Copy, Next Sector, Previous Sector, Goto, Checksum for Disks.

Paste Special Command
- Allows you to paste any format on the clipboard into Hex Workshop.

New File Command
- Allows you to open a blank file (useful with paste special).

Copy Special Command
- Places the selected text on the Windows clipboard in a text format.

Select Block
- Allows you to select large amounts of data easily (by block size or ending offset).

BUG FIXES

Improved display
- Optimized the selection drawing routines.

Fixed crash when trying to open a help component that didn't exist.

Print/Print Preview was calculating the number of lines per page incorrectly.

Could not add (append) to the end of a file.

Find Again failed, when changing the cursor position between finds.

When saving documents, was not clearing undo stack.

Copy/Pasting selection over 32K causes random results.

Hex Workshop v 1.0 - May 1995

ORIGINAL VERSION

General Hex Editing
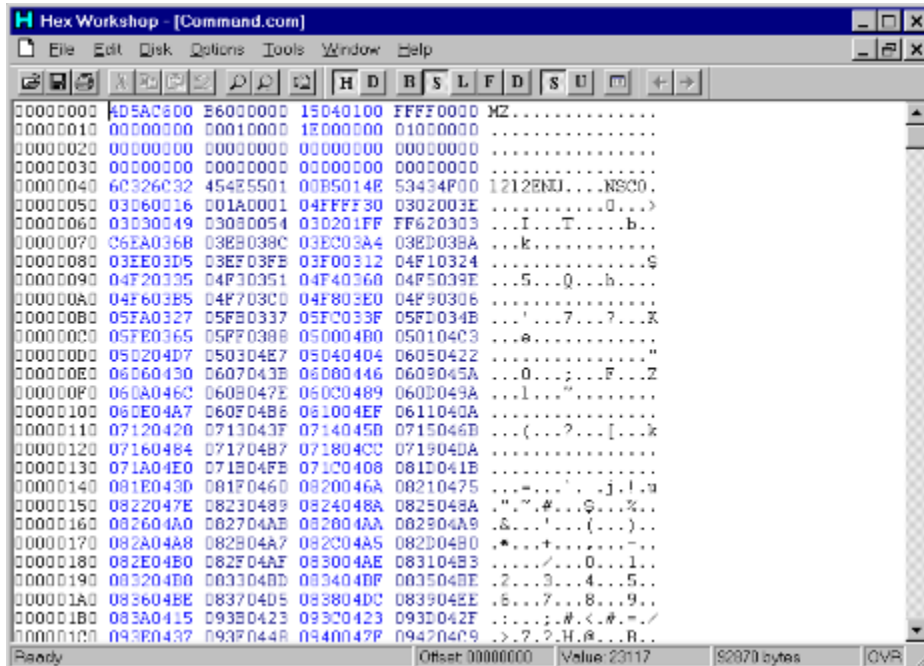
Hex Workshop includes a professional hex editor with the power and ease of a Word Processor allowing cut, copy, paste, insert, delete, undo, and more.

Hex/ASCII Editing:

A file can be edited from either the hex or ASCII display.   The cursor can be toggled between hex and ASCII with the tab key or hex/ASCII can be chosen by clicking the mouse in the particular region.

Clipboard Functionality:

Cut (Ctrl+X), Copy (Ctrl+C), and Paste (Ctrl+V) operate in a similar manner to other editors.   Paste Special allows you choose from and paste any of the standard Windows Clipboard formats currently available into a file.

Undo:

Undo (Ctrl+Z) allows you to reverse the most recent editing operation(s).   The size of the undo buffer (which determines how many operations are saved) can be set in the General Preferences.

Inserting/Deleting:

Automated Inserting (Ctrl+Ins) allows a specified number of bytes to be inserted at the cursor position with any hex value. Deleting (Del) simply deletes the highlighted bytes.   Normal editing can be done in either insert (INS) or overwrite (OVR) mode.   Insert mode with automatically insert hex values entered at the cursor position, while overwrite mode will overwrite existing bytes at the cursor position with hex values entered.   The current mode is shown in the far right pane of the status bar and is toggled with the insert (Ins) key.

Select Block/Select All:

A block of hex can be automatically selected at the cursor position using the Select Block feature and specifying either the size of the block or the ending position.   In either case the block starts at the cursor position.   Select All

(Ctrl+A) automatically selects the entire file.

File/Disk Properties:

File/Disk Properties (Alt+Enter or Right Mouse Button) display information on the current file or disk being edited.

Window Operations:

Open windows can be tiled Horizontally (F2), Vertically (Alt+F2), or Cascaded (Ctrl+F2) from the Window Menu or using keycuts.

The editing environment can be customized using <u>Layout</u> and <u>Display</u> preferences for font, colors, and hex display (bytes per column).

How To Hex Edit: An Example

This topic is designed as an example of how to hex edit (modify) a file.   It is intended for those who are not familiar with binary file editing and would like to make a specific change in a binary file.   An example of where this technique would apply is in game cheats.   To implement a game cheat, users are typically instructed to make a change in a saved game file in order to get loads of extra cash or a super weapon.

Making these changes is extremely easy with Hex Workshop.   Simply perform the following stpes:

1. Open the file you wish to modify

L:aunch Hex Workshop and from the file-open menu choose the specific file.

2. Finding what you need to change

This is the most difficult part when performing binary file editing.   You will be typically given instructions in one of two forms:

"Go to offset xxxx" or "Search for the value yyyy"

Going to a specific offset

In Hex Workshop, under the Edit menu, select Goto.
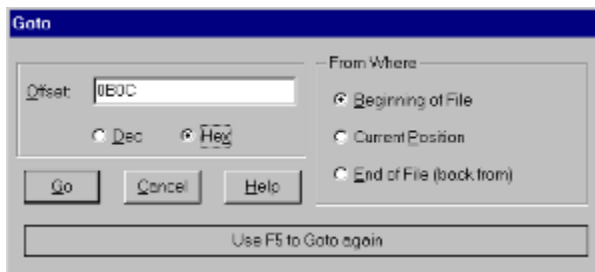
Fill in the offset given in the instructions.   Make sure that the "Beginning of File" and "Hex" radio buttons are checked.   Hit the "Go" button.   Hex Workshop will then move the cursor to (or goto) a certain hexadecimal address (offset) from the beginning of the file.

Although it is unlikely, you may be given a decimal offset.   If this is the case, the instructions will tell you this specifically.   In this case, make sure you check the "Dec" radio button for decimal.

Search for a Hex String

In Hex Workshop, under the Edit menu select Find.
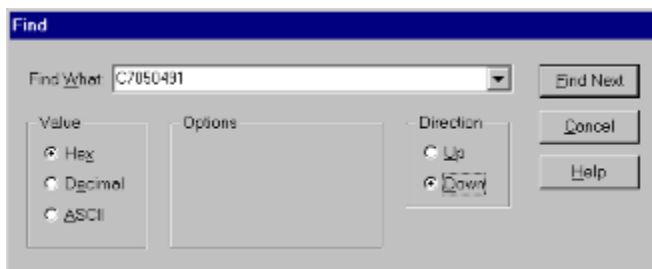
Fill in the search string given in the instructions.   Make sure that "Hex" and "Down" radio buttons are checked.   Hit the "Find Next" button.   Hex Workshop will then search for the hexadecimal string from the beginning of the file.

NOTE: Your data will be selected in Hex Workshop editor, please deselect it by clicking the mouse just to the left of the selection.

3.   Making the Change

Before you make any change, make sure you are in overwrite mode and not in insert mode.   You can tell what mode you are in by looking at   the indicator in the right side of the Status Bar, located at the bottom of the editor.   It is encircled in red in the graphic below for demonstration purposes.

If the indicator says "INS" instead of "OVR" hit the "Insert" key on your keyboard once to toggle Hex Workshop into overwrite mode.

Now, you are ready to change the value.   In most cases you will be instructed to change some hex string to another. For example, "Change C705 to FFFF".   If your instructions say to change 0xC607 to 0xFFFF, please ignore the 0x- this is a shorthand for saying hexadecimal.

You can see on the 2nd line (at offset C705) the text you would like to change.   You would now move the cursor to the "C" and type "FFFF".

You can see your changes in red.   (If they do not appear in red, go under the Options-Preferences menu, click on the "Display Tab" and select the "Highlight Modified Bytes" checkbox.

4.   Saving the File

The last step is to save the file.   You can do this by going under the "File" menu and selecting "Save".   You will be prompted with the following dialog (unless you specifically turned it off):
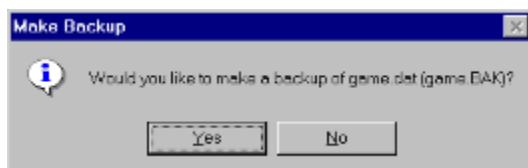
We recommend that you hit "Yes",   so if you made any mistakes, you can recover the original file.

Keycuts

Below is a list of Keycuts available:

F1	Help (Contents)
F2	Tile Windows Horizontally
Alt+F2	Tile Windows Vertically
Ctrl+F2	Cascade Windows
F3	Find Again
Alt+F3	Find
Alt+F4	Exit
F5	Goto Again
Alt+F5	Goto
F6	Compare Again
Alt+F6	Compare
F12	Generate Checksum
Alt+Enter	Properties of File/Sector
Tab	Toggles between Hex and ASCII in main edit window
Home	Beginning of File/Sector
End	End of File/Sector
Shift+Right Arrow	Selects +1 byte forward from cursor
Shift+Left Arrow	Selects -1 byte backward from cursor
Shift+Down Arrow	Selects 16 bytes forward from cursor
Shift+Up Arrow	Selects -16 bytes backward from cursor
Shift+PgDn	Selects 1 screen length forward from cursor
Shift+PgUp	Selects 1 screen length backward from cursor
Shift+Home	Selects from cursor position to begin of document
Shift+End	Selects from cursor position to end of document
Ctrl+Up	Previous Sector (Drive Editing Only)
Ctrl+Dn	Next Sector (Drive Editing Only)
Ctrl+PgUp	Back 10 Sectors (Drive Editing Only)
Ctrl+PgDn	Ahead 10 Sectors (Drive Editing Only)
Ctrl+Home	First Sector (Drive Editing Only)
Ctrl+End	Last Sector (Drive Editing Only)

Command Line Usage

Hex Workshop allows users the ability to open files, logical drives, and raw fixed disks via the command line

Usage:

```
hworks32 [files...] [drives...] [/F:fixeddisk]

    files    - Opens the listed file(s).
    drives   - Opens a Logical Drive.  In the form 'X:', where X is
               the drive letter.
                    A: for Drive A:
    fixeddisk - Open a "Raw Mode" Fixed Disk in the Form '/F:x',
               where x is the fixed disk number:
                    /F:80 for the first fixed disk
                    /F:81 for the second fixed disk
```

Examples:

```
c:\hexworks\hworks32 foobar1.bin foobar2.bin
```

This will start Hex Workshop with the files "foobar1.bin" and "foobar2.bin" loaded in the editor.

```
c:\hexworks\hworks32 C:
```

This will start Hex Workshop with the logical "C:" drive loaded in the sector editor.

```
c:\hexworks\hworks32 /F:80
```

This will start Hex Workshop with the physical first physical disk loaded in the sector editor.

Note: The above usage and examples are for the 32 bit version of Hex Workshop.   For the 16 bit version the program name is `hworks16` (not `hworks32`).

Layout Preferences
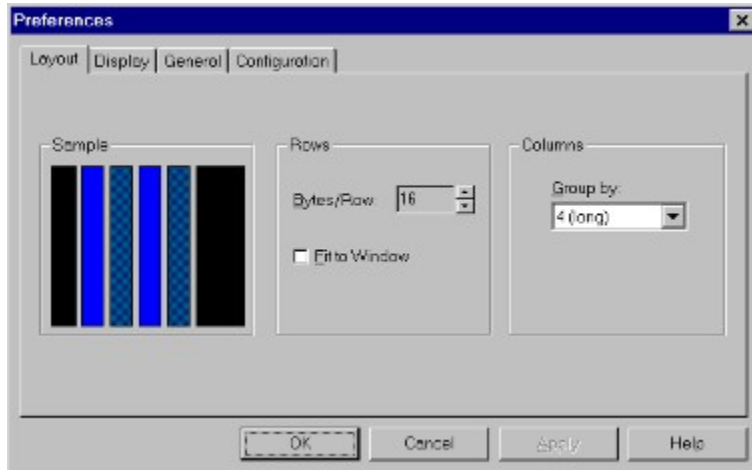
Hex Workshop provides the user with preferences to customize the appearance of their hex editing environment. Below are a list of these options:

Rows:

Hexadecimal data is displayed in rows.   The amount of bytes per row can be set to a specific value (8, 16, 24, or 32 bytes) or can be set to fit to the editor window width.   The default is 16 bytes per row.

Columns:

Within the rows, data is broken up into columns to make viewing the data easier.   The Column preference lets the user choose how this data is grouped.   For example, if data is grouped in 4 bytes (or longs), there would be four columns of 4 bytes in each row of hexadecimal data (assuming 16 bytes per row).   The default is 2 bytes (or shorts).

See also: Display Preferences, General Preferences, Configuration Preferences

Display Preferences
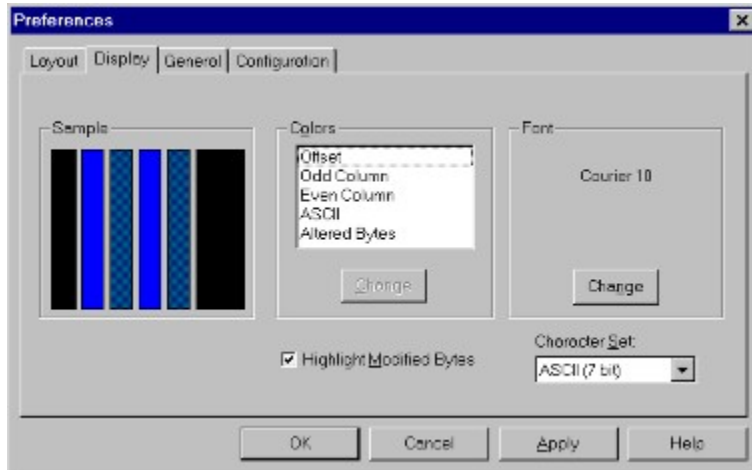
Hex Workshop provides the user with preferences to customize the appearance of their hex editing environment. Below are a list of these options:

Colors:

Different colors are used to display the File Offsets, Odd Columns (of data), Even Columns (of data), (ASCII) Characters, and Modified Bytes.   These colors can be customized by the user.   The defaults are black, light blue, dark blue, black, and red for the file offsets, odd columns, even columns, characters, and modified bytes, respectively.

Highlight Modified Bytes:

If this is set Hex Workshop will display modified bytes in the specific color selected (see Colors, above).   The default is off.

Font:

The font which is used to display all data in the main editing window.   This can be changed to any monospace font on the users system.   The default is Courier 12 point.

Character Set:

On the right side of the main editing window is the character equivalent of the hexadecimal data.   The characters are interpreted using a chosen character set.   The user can choose between ASCII (0x20-0x7F), Windows ANSI (no filtering), and EBCDIC.   The default is ASCII.

See also: Layout Preferences, General Preferences, Configuration Preferences

General Preferences
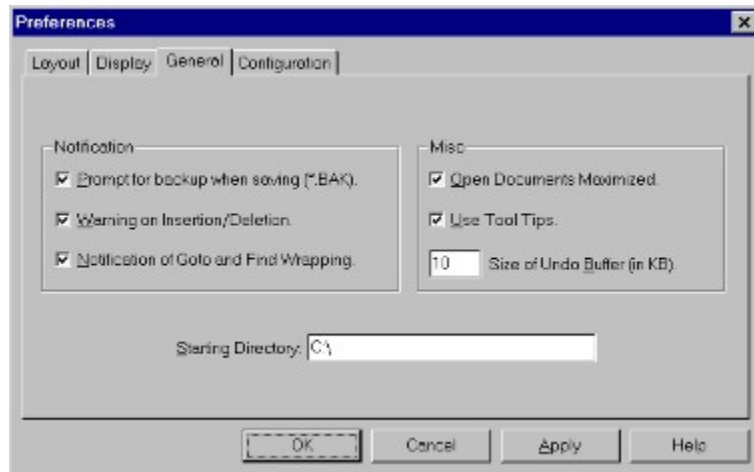
Prompt for Backup when Saving:

When set Hex Workshop will ask if a backup should be created whenever an altered file is being saved.   A backup file with the extension *.BAK will be created if requested.   Default is on.

Warning on Insertion/Deletion:

When set Hex Workshop will post a warning message (dialog box) before allowing an insert or delete of bytes in an open file.   Default is on.

Notification of Goto/Find/Compare Wrapping:

When set Hex Workshop will prompt the user whether or not to wrap the file (move from the end to the beginning or vice-versa) during the Goto, Find/Replace, or Compare Operations.   Default is on.

Open Documents Maximized:

When set Hex Workshop will always open files or disks with their editing Window maximized.   Default is off.

Use ToolTips:

When set Hex Workshop displays tool tips for the toolbar buttons when the cursor is positioned over the buttons. This helps define the function of each toolbar button.   Default is on.

Size of Undo Buffer:

Specifies the size of the buffer used by Hex Workshop for maintaining a list of previous editing operations.   This is used when the undo command is selected, the larger the buffer the more operations which can be saved and later undone if requested.   Default is 4K.

Starting Directory:

This is the directory which Hex Workshop will use as a default when opening files.   Default is none (the application directory).

See also: Layout Preferences, Display Preferences, Configuration Preferences

Configuration Preferences
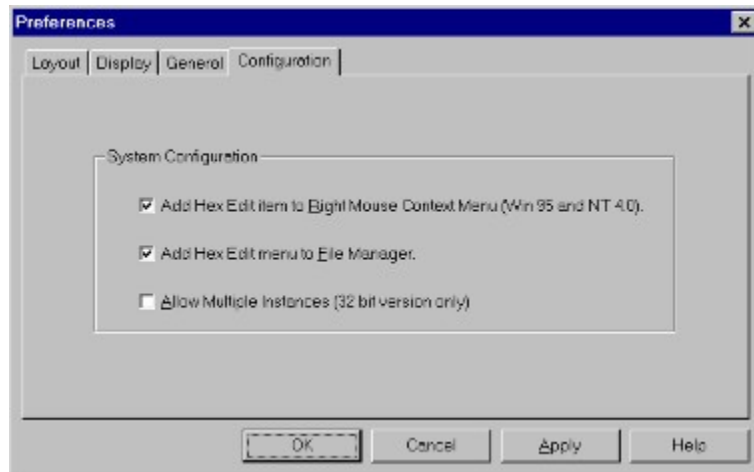
Hex Workshop provides the user with settings to integrate hex editing closely with the operating system to allow the quick and easy launching of Hex Workshop.   These setting can be customized from the Options-Preferences menu in the Configuration tab.   Below are a list of these options:

Add Hex Edit Item to Right Mouse Context Menu (Win 95 and NT 4.0 only):

When set Hex Workshop will install a Windows 95 Context Menu Shell Extension so whenever the right mouse button is clicked on a file, a Hex Edit menu item will be added.   Clicking on the Hex Edit menu item will automatically launch Hex Workshop with the selected file(s) open.   There is no default setting, the user is prompted for this option on first use of the product.

Add Hex Edit Menu to File Manager (Win 3.x, 95, NT):

When set Hex Workshop will install a File Manager Extension adding a Hex menu to the File Manager.   Clicking on the Edit File(s) menu item under the Hex Menu will automatically launch Hex Workshop with the selected file(s) open. There is no default setting, the user is prompted for this option on first use of the product.

Allow Multiple Instances (32 bit only):

When set Hex Workshop allow multiple instances to be running at once.   If this is not set, then launching Hex Workshop from anywhere will result in the maximizing of the previous running instance with the selected files open if appropriate.   Default is off.

See also: Layout Preferences, Display Preferences, General Preferences

Status Bar
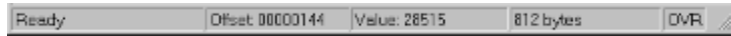
The Status Bar displays information on the current file (or disk sector) and editing environment.

The first pane of the status bar contains information on the current operation (or menu item).

The second pane of the status bar contains the cursor position, displayed in either hex or decimal (as selected in the Options-File Offset Menu).

The third pane contains information on the data at the cursor position or being highlighted.   If no data is highlighted, Hex Workshop interprets the data at the cursor in the data format selected in the Options-Status Bar Data Menu.   If hex data is highlighted, Hex Workshop will interpret the data appropriately depending on the amount of bytes highlighted (i.e. 2 bytes as a Short).   If an appropriate data type does not exist (an odd number of bytes is highlighted, i.e. 9), Hex Workshop will display the number of bytes being highlighted.

The contents of   the fourth pane depends on whether a file or disk is being edited.   If a file is being edited, the pane contains the file size in bytes, displayed in either hex or decimal.   If a disk is being edited, the pane contains the size in bytes of the sector being edited.

The last pane displays whether Hex Workshop is currently in overwrite mode (OVR) or insertion mode ("blank").

Export and Clipboard Formats

Hex Workshop includes the capability to both export and copy hex as formatted text (RTF), text, and HTML, for publishing, and C source for inserting into code for development.   Exporting is done using the File-Export Menu and copying to the Windows Clipboard is done using the Edit-Copy As Menu.   Below are samples of the different formats:

Formatted Text (RTF):

```
00000000 4D5AC600 B6000000 15040100 FFFF0000 MZ............
00000010 00000000 00010000 1E000000 01000000 ..............
00000020 00000000 00000000 00000000 00000000 ..............
00000030 00000000 00000000 00000000 00000000 ..............
```

Text:
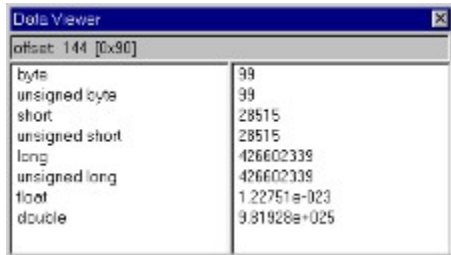
```
00000000 4D5AC600 B6000000 15040100 FFFF0000 MZ..............
00000010 00000000 00010000 1E000000 01000000 ................
00000020 00000000 00000000 00000000 00000000 ................
00000030 00000000 00000000 00000000 00000000 ................
```

HTML:

```
<html>

<head>
        <title>
                HWS5383
        </title>
</head>

<body bgcolor="#FFFFFF">
        <h1><center>HWS5383</center></h1>
        <meta name="GENERATOR" CONTENT="Hex Workshop">
        <hr>
<pre><code>
<font color="#000000">00000000 </font><font color="#0000FF">4D5AC600 </font><font
color="#004080">B6000000 </font><font color="#0000FF">15040100 </font><font color="#004080">FFFF0000
</font><font color="#000000">MZ..............
00000010 </font><font color="#0000FF">00000000 </font><font color="#004080">00010000 </font><font
color="#0000FF">1E000000 </font><font color="#004080">01000000 </font><font color="#000000">................
00000020 </font><font color="#0000FF">00000000 </font><font color="#004080">00000000 </font><font
color="#0000FF">00000000 </font><font color="#004080">00000000 </font><font color="#000000">................
00000030 </font><font color="#0000FF">00000000 </font><font color="#004080">00000000 </font><font
color="#0000FF">00000000 </font><font color="#004080">00000000 </font><font color="#000000">................
</font>
</code></pre>
        <hr>
        <font size="-3">
        Generated by <a href="http://www.bpsoft.com">Hex Workshop</a>
        </font>
        </body>
</html>
```

C Source:

```
// Generated by Hex Workshop
// HWS50A0 - Starting Offset: 0 (0x00000000) Length: 64 (0x00000040)

unsigned char rawData[64] = {
0x4D, 0x5A, 0xC6, 0x00, 0xB6, 0x00, 0x00, 0x00, 0x15, 0x04, 0x01, 0x00, 0xFF, 0xFF, 0x00, 0x00,
0x00, 0x00, 0x00, 0x00, 0x00, 0x01, 0x00, 0x00, 0x1E, 0x00, 0x00, 0x00, 0x01, 0x00, 0x00, 0x00,
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
} ;
```

Data Viewer

Hex Workshop includes a Data Viewer, which is a floating palette displaying the cursor data as decimal values. The Data Viewer interprets the hexadecimal data at the cursor position as a byte, unsigned byte, short, unsigned short, long, unsigned long, float, and double. From the Data Viewer, you can modify the data at the cursor position by highlighting the data type/value you wish to change and hitting F2 or clicking on it again with mouse (as you would in the Windows Explorer) and editing the value.

The Data Viewer can be toggled on/off (shown/hidden) from the Options Menu and the Toolbar.

Page Setup
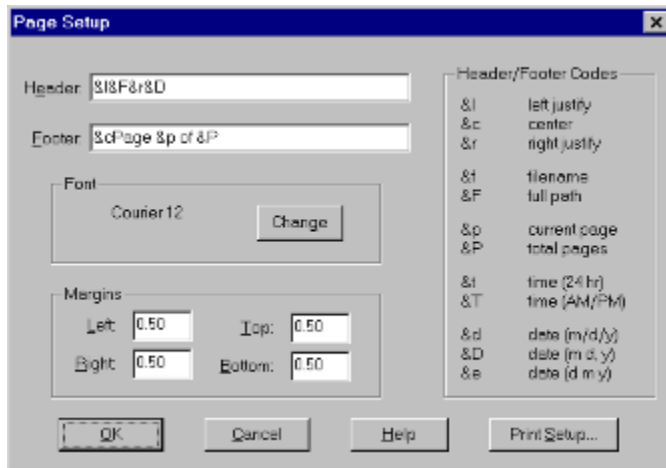
Hex Workshop provides the ability to print customized printouts (hex dumps) with a Page Setup feature. Using the Page Setup users can use a custom header and/or footer, printer font, and margins.

Header/Footer:

The header and footer can consist of any valid text. Using special codes (listed in the Page Setup dialog) users can print the filename or full path, current page number, total pages, and time and date in a number of different formats. In addition, any portion or all of the headers and footers can be left, center, or right justified using these special codes.

Font:

The font which is used to print all data. This can be changed to any monospace font on the users system. The default is Courier 12 point.

Margins:

The left, right, top, and bottom margin can be set for printouts. The default is 0.50 inches for all margins.

Find/Replace Utility
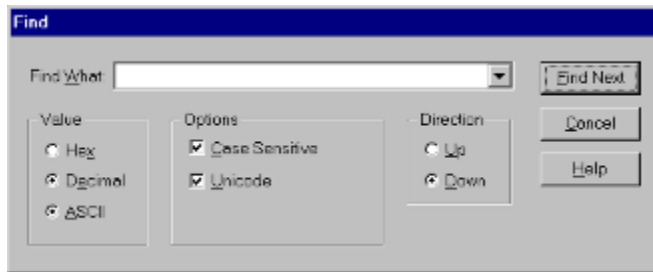
The Find Utility (Alt+F3), located under the Edit menu, allows the user to search for a hex, ASCII, or decimal value within the file.   The Find Utility searches from the cursor position either down (forward) or up (backward) throughout the file.   If a hex value is the search target, it is assumed to be raw hex (no options are offered).   If a decimal value is the search target, options are given for data type (byte, short, long, etc.) and byte ordering (Intel vs. Motorola).   If an ASCII value is the search target, the options given are for a case sensitive search and to search for a Unicode string.   There is a toolbar button which can be used as a shortcut for the Find Utility.

The Find Again (F3) command, located under the Edit menu, searches for the next occurrence of the target hex or ASCII value within the file.   This Find Again is in the same direction beginning at the (new) cursor position, having the same effect as setting up and executing another identical Find.   If there are no existing Find parameters, the Find Again brings up the original Find Dialog.   There is a toolbar button which can be used as a shortcut for Find Again.

The Replace Utility, located under the Edit menu, works in the same manner as the Find.   The Replace Utility allows for different sized search and replace strings, and has a Replace All option.   In addition, the Replace Utility offers an option to "Pad String with Nulls" when replacing ASCII.   This is useful if you are replacing a string with a shorter string and with to leave the file size intact.   The replace string will be padded with NULL chars until it is equal in size to the search string, before substituted.

Hex Workshop is set up to notify the user upon wrapping around the file during a Find, Find Again, or Replace execution (See General Preferences).

Goto Utility
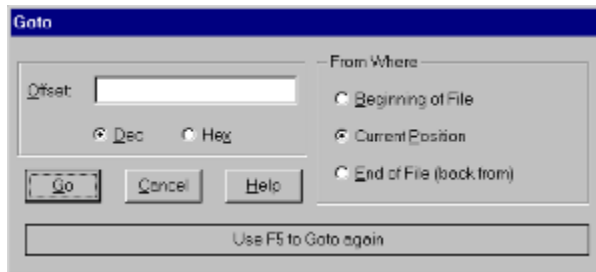
The Goto Utility (Alt+F5), located under the Edit menu, allows the user to logically move throughout the file.   The Goto Utility can be used to move from the beginning of the file, the cursor position, or the end of the file.   The number of bytes to move can be specified in either hex or decimal (with hex values always positive).   When moving from the cursor position a negative decimal value may be entered to move backwards (This is the only time a negative value is allowed.).   In moving back from the end of the file, a positive number moves back into the file. There is a toolbar button which can be used as a shortcut for Goto.

The Goto Again (F5) command, located under the Edit menu, is used to re-execute the last Goto command.   If the previous Goto was from the current position, then another Goto is executed moving the same amount of bytes in the same direction, having the same effect as setting up and executing another identical Goto.   If the previous Goto was from the beginning or end of file, then the dialog is brought up again with the previous values loaded.   If there are no existing Goto parameters, the Goto Again brings up the original Goto Dialog.

Hex Workshop is set up to notify the user upon wrapping around the file during a Goto or Goto Again execution (See General Preferences).

Compare Tool
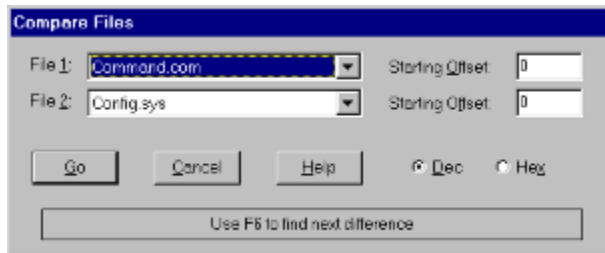
The Compare Tool (Alt+F7), located under the Tools menu, allows the user to compare two open files beginning at a specified location in both files.   The Compare Tool can be used to compare two different files or the same file beginning at different file offsets.

The Compare Again (F7) command, located under the Tools menu, is used to find the next difference in the two files being compared.   If there are no existing Compare parameters, the Compare Again brings up the original Compare Dialog.

Hex Workshop is set up to notify the user upon wrapping around the file during a Compare or Compare Again execution (See General Preferences).

Checksum Generator
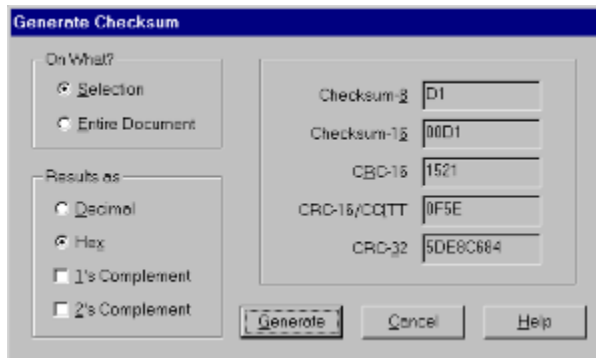
The Checksum Generator (F12), located under the Tools menu, allows the user to generate checksums for an entire file or a selection.   The Checksum Generator currently calculates five types of checksums:

CheckSum-8:   8 bit count, adds all the bytes, initial value = 0x00
CheckSum-16:   16 bit count, adds all the bytes, initial value = 0x00
CRC-16:   16 bit CRC, polynomial = 0x8005, initial value = 0x0000
CRC-16/CCITT: 16 bit CRC, polynomial = 0x1021, initial value = 0xFFFF
CRC-32:   32 bit CRC, polynomial = 0x04C11DB7, initial value = 0xFFFFFFFF

Hitting the generate button will perform these calculations, the user can then view the results in hex or decimal with the option for either 1's complement, 2's complement, or neither.

Drive (Sector) Editing

In addition to editing files, Hex Workshop can also edit Drive (Disk) Sectors.   By selecting "Open Drive" from under the Disk menu both mounted drives and BIOS disks (INT 13 floppy or fixed disk) can be edited.

Disk Editing Modes:

In drive mode (default), PC drives mounted by the operating system can be edited.   Drives of this type include, PC floppy disks, PC hard drives, or other external PC removable disks.   CD-ROM's cannot be edited (currently), because the operating system mounts these in a different manner than other disks (more like network drives).

In raw mode (or disk mode), BIOS disks can edited.   BIOS disks include floppy disks and fixed disks.   Floppy disks available are A: and B:, while fixed disks are listed as 0x80 (first fixed disk), 0x81 (second fixed disk), etc..

The difference between the two modes is drives are accessed as logical volumes through the operating system by letters assigned by the operating system, and can only be edited if the operating system understands the disk format (file system).   Disks are accessed as physical media through the BIOS.   Raw (disk) mode allows editing of disks not readable by the operating system as well as partition information stored on the disk but not residing in a logical volume.

Sector Editing:

Disk Editing information is supplied to the user including sector number currently being edited and total number of sectors on the disk in the title bar, and sector size, cursor position (within the sector), and hex data interpretation in the status bar.   From the toolbar the current sector and buttons to move forward or backward sectors are displayed.

Drive Editing is accomplished in the same manner as file editing, with a few exceptions.   Since the sector size is fixed, data cannot be inserted or deleted, only overwritten.   The Goto utility becomes a Goto Sector Utility allowing movement forward or backward in sectors from the beginning, end, or current sector of the drive/disk.   The Find Utility now operates on a range of sectors specified in the Find dialog, and Replace is disabled for sector editing. Finally the Compare Tool will compare (and wrap) within a sector not crossing sector boundaries.

Because of the slightly different nature of Drive Editing additional keycuts are available to help quickly move throughout the sectors of a disk.

Base Converter
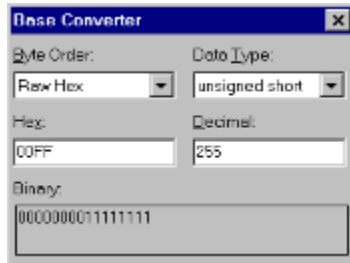
Hex Workshop includes a Base Converter (BCONV16.EXE or BCONV32.EXE, in the 16 or 32 bit version, respectively).   The Base Converter converts from hex to decimal and decimal to hex (while displaying binary).   For a conversion the user can specify byte order (Intel, Motorola, or Raw Hex) and Data Type (byte, unsigned byte, short, unsigned short, long, unsigned long, float, or double).

The Base Converter includes an Always on Top (Ctrl+A) option accessible from the system menu.

Note: When entering hex values with the Byte Order set on Intel or Motorola, the Base Converter will only convert and display a decimal value when the number of digits is exactly the number appropriate for the selected Data Type. For example, if the Byte Order is set to Intel and the Data Type is set to unsigned short a decimal value will only be displayed when 4 hex digits are entered.   This is necessary to avoid assumptions on zero padding (right or left) before byte flipping.   When the Byte Order is set to Raw Hex, then a decimal value will be displayed when the number of digits is less than or equal to that for the selected Data Type (left padding of zeros is assumed).

Hex Calculator

Hex Workshop includes a Hex Calculator (CALC16.EXE or CALC32.EXE, in the 16 or 32 bit version, respectively). The Hex Calculator operates in two modes; arithmetic mode and bit manipulation mode.   The arithmetic mode supports addition (+), subtraction (-), multiplication (*), and division (/)   and the bit manipulation mode supports logical or (|), logical and (&), exclusive or (^), negation (~), left shift (<<), and right shift (>>).   Both modes operate on hex or decimal unsigned long values and do not allow negative numbers or fractions.

The left shift (<<) and right shift (>>) operators require a second value specifying the amount of bytes to shift.   For example to left shift 0xFF by 1 bit, enter FF << 1 =., by 4 bits enter FF << 4 =.   Further it should be noted the left and right shift do not rotate the most significant and least significant bit (because that would be dependent on data type).

The mode can be toggled from the system menu or using the Ctrl+S keycut.   The calculator can be toggled between hex and decimal by clicking on the "HEX" or "DEC" in the display or using the spacebar, and the calculator can be switched into hex or decimal mode using the keycuts, Ctrl+H and Ctrl+D, respectively.

The Calculator includes an Always on Top (Ctrl+A) option accessible from the system menu.

Windows ANSI (ASCII) Character Set

Dec	Hex	Char	Code
0	00	€	NUL
1	01	€	SOH
2	02	€	STX
3	03	€	ETX
4	04	€	EOT
5	05	€	ENQ
6	06	€	ACK
7	07	€	BEL
8	08	€	BS
9	09	€	HT
10	0A	€	LF
11	0B	€	VT
12	0C	€	FF
13	0D	€	CR
14	0E	€	SO
15	0F	€	SI
16	10	€	SLE
17	11	€	CS1
18	12	€	DC2
19	13	€	DC3
20	14	€	DC4
21	15	€	NAK
22	16	€	SYN
23	17	€	ETB
24	18	€	CAN
25	19	€	EM
26	1A	€	SIB
27	1B	€	ESC
28	1C	€	FS
29	1D	€	GS
30	1E	€	RS
31	1F	€	US
32	20	(space)	
33	21	!	
34	22	"	
35	23	#	
36	24	$	
37	25	%	
38	26	&	
39	27	'	
40	28	(	
41	29	)	
42	2A	*	
43	2B	+	
44	2C	,	
45	2D	-	

46	2E	.
47	2F	/
48	30	0
49	31	1
50	32	2
51	33	3
52	34	4
53	35	5
54	36	6
55	37	7
56	38	8
57	39	9
58	3A	:
59	3B	;
60	3C	<
61	3D	=
62	3E	>
63	3F	?
64	40	@
65	41	A
66	42	B
67	43	C
68	44	D
69	45	E
70	46	F
71	47	G
72	48	H
73	49	I
74	4A	J
75	4B	K
76	4C	L
77	4D	M
78	4E	N
79	4F	O
80	50	P
81	51	Q
82	52	R
83	53	S
84	54	T
85	55	U
86	56	V
87	57	W
88	58	X
89	59	Y
90	5A	Z
91	5B	[
92	5C	\
93	5D	]
94	5E	^
95	5F	_
96	60	`
97	61	a
98	62	b
99	63	c
100	64	d
101	65	e

102	66	f
103	67	g
104	68	h
105	69	i
106	6A	j
107	6B	k
108	6C	l
109	6D	m
110	6E	n
111	6F	o
112	70	p
113	72	q
114	72	r
115	73	s
116	74	t
117	75	u
118	76	v
119	77	w
120	78	x
121	79	y
122	7A	z
123	7B	{
124	7C	|
125	7D	}
126	7E	~
127	7F	DEL
128	80	€
129	81	☐
130*	82	‚
131*	83	ƒ
132*	84	„
133*	85	…
134*	86	†
135*	87	‡
136*	88	ˆ
137*	89	‰
138*	8A	Š
139*	8B	‹
140*	8C	Œ
141	8D	☐
142	8E	Ž
143	8F	☐
144	90	☐
145	91	'
146	92	'
147*	93	"
148*	94	"
149*	95	•
150*	96	–
151*	97	—
152*	98	~
153*	99	™
154*	9A	š
155*	9B	›
156*	9C	œ
157	9D	☐

158	9E	ž
159*	9F	Ÿ
160	A0	
161	A1	¡
162	A2	¢
163	A3	£
164	A4	¤
165	A5	¥
166	A6	¦
167	A7	§
168	A8	¨
169	A9	©
170	AA	ª
171	AB	«
172	AC	¬
173	AD	
174	AE	®
175	AF	¯
176	B0	°
177	B1	±
178	B2	²
179	B3	³
180	B4	´
181	B5	µ
182	B6	¶
183	B7	·
184	B8	¸
185	B9	¹
186	BA	º
187	BB	»
188	BC	¼
189	BD	½
190	BE	¾
191	BF	¿
192	C0	À
193	C1	Á
194	C2	Â
195	C3	Ã
196	C4	Ä
197	C5	Å
198	C6	Æ
199	C7	Ç
200	C8	È
201	C9	É
202	CA	Ê
203	CB	Ë
204	CC	Ì
205	CD	Í
206	CE	Î
207	CF	Ï
208	D0	Ð
209	D1	Ñ
210	D2	Ò
211	D3	Ó
212	D4	Ô
213	D5	Õ

214	D6	Ö
215	D7	×
216	D8	Ø
217	D9	Ù
218	DA	Ú
219	DB	Û
220	DC	Ü
221	DD	Ý
222	DE	Þ
223	DF	ß
224	E0	à
225	E1	á
226	E2	â
227	E3	ã
228	E4	ä
229	E5	å
230	E6	æ
231	E7	ç
232	E8	è
233	E9	é
234	EA	ê
235	EB	ë
236	EC	ì
237	ED	í
238	EE	î
239	EF	ï
240	F0	ð
241	F1	ñ
242	F2	ò
243	F3	ó
244	F4	ô
245	F5	õ
246	F6	ö
247	F7	÷
248	F8	ø
249	F9	ù
250	FA	ú
251	FB	û
252	FC	ü
253	FD	ý
254	FE	þ
255	FF	ÿ

* Windows True Type Fonts Only

DOS Character Set

Dec	Hex	Char	Code
0	00	€	NUL
1	01	€	SOH
2	02	€	STX
3	03	€	ETX
4	04	€	EOT
5	05	€	ENQ
6	06	€	ACK
7	07	€	BEL
8	08	€	BS
9	09	€	HT
10	0A	€	LF
11	0B	€	VT
12	0C	€	FF
13	0D	€	CR
14	0E	€	SO
15	0F	€	SI
16	10	€	SLE
17	11	€	CS1
18	12	€	DC2
19	13	€	DC3
20	14	€	DC4
21	15	€	NAK
22	16	€	SYN
23	17	€	ETB
24	18	€	CAN
25	19	€	EM
26	1A	€	SIB
27	1B	€	ESC
28	1C	€	FS
29	1D	€	GS
30	1E	€	RS
31	1F	€	US
32	20	(space)	
33	21	!	
34	22	"	
35	23	#	
36	24	$	
37	25	%	
38	26	&	
39	27	'	
40	28	(	
41	29	)	
42	2A	*	
43	2B	+	
44	2C	,	
45	2D	-	

46	2E	.
47	2F	/
48	30	0
49	31	1
50	32	2
51	33	3
52	34	4
53	35	5
54	36	6
55	37	7
56	38	8
57	39	9
58	3A	:
59	3B	;
60	3C	<
61	3D	=
62	3E	>
63	3F	?
64	40	@
65	41	A
66	42	B
67	43	C
68	44	D
69	45	E
70	46	F
71	47	G
72	48	H
73	49	I
74	4A	J
75	4B	K
76	4C	L
77	4D	M
78	4E	N
79	4F	O
80	50	P
81	51	Q
82	52	R
83	53	S
84	54	T
85	55	U
86	56	V
87	57	W
88	58	X
89	59	Y
90	5A	Z
91	5B	[
92	5C	\
93	5D	]
94	5E	^
95	5F	_
96	60	`
97	61	a
98	62	b
99	63	c
100	64	d
101	65	e

102	66	f
103	67	g
104	68	h
105	69	i
106	6A	j
107	6B	k
108	6C	l
109	6D	m
110	6E	n
111	6F	o
112	70	p
113	72	q
114	72	r
115	73	s
116	74	t
117	75	u
118	76	v
119	77	w
120	78	x
121	79	y
122	7A	z
123	7B	{
124	7C	|
125	7D	}
126	7E	~
127	7F	DEL
128	80	Ç
129	81	ü
130	82	é
131	83	â
132	84	ä
133	85	à
134	86	å
135	87	ç
136	88	ê
137	89	ë
138	8A	è
139	8B	ï
140	8C	î
141	8D	ì
142	8E	Ä
143	8F	Å
144	90	É
145	91	œ
146	92	Æ
147	93	ô
148	94	ö
149	95	ò
150	96	û
151	97	ù
152	98	ÿ
153	99	Ö
154	9A	Ü
155	9B	¢
156	9C	£
157	9D	¥

158	9E	
159	9F	*ƒ*
160	A0	á
161	A1	í
162	A2	ó
163	A3	ú
164	A4	ñ
165	A5	Ñ
166	A6	ª
167	A7	º
168	A8	¿
169	A9	¬
170	AA	½
171	AB	¼
172	AC	¡
173	AD	«
174	AE	»
175	AF	
176	B0	
177	B1	
178	B2	
179	B3	
180	B4	
181	B5	
182	B6	
183	B7	
184	B8	
185	B9	
186	BA	
187	BB	
188	BC	
189	BD	
190	BE	
191	BF	
192	C0	
193	C1	
194	C2	
195	C3	
196	C4	—
197	C5	
198	C6	
199	C7	
200	C8	
201	C9	
202	CA	
203	CB	
204	CC	
205	CD	
206	CE	
207	CF	
208	D0	
209	D1	
210	D2	
211	D3	
212	D4	
213	D5	

214	D6	
215	D7	
216	D8	
217	D9	
218	DA	
219	DB	
220	DC	
221	DD	
222	DE	
223	DF	
224	E0	
225	E1	ß
226	E2	
227	E3	
228	E4	
229	E5	
230	E6	µ
231	E7	
232	E8	
233	E9	
234	EA	
235	EB	
236	EC	
237	ED	
238	EE	
239	EF	
240	F0	
241	F1	
242	F2	
243	F3	
244	F4	
245	F5	
246	F6	÷
247	F7	
248	F8	º
249	F9	•
250	FA	·
251	FB	
252	FC	
253	FD	²
254	FE	
255	FF	

EBCDIC Character Set

Dec	Hex	Char	Code
0	00	€	NUL
1	01	€	SOH
2	02	€	STX
3	03	€	ETX
4	04	€	PF
5	05	€	HT
6	06	€	LC
7	07	€	DEL
8	08		
9	09	€	RLF
10	0A	€	SMM
11	0B	€	VT
12	0C	€	FF
13	0D	€	CR
14	0E	€	S0
15	0F	€	S1
16	10	€	DLE
17	11	€	DC1
18	12	€	DC2
19	13	€	DC3
20	14	€	RES
21	15	€	NL
22	16	€	BS
23	17	€	IL
24	18	€	CAN
25	19	€	EM
26	1A	€	CC
27	1B		
28	1C	€	IFS
29	1D	€	IGS
30	1E	€	IRS
31	1F	€	IUS
32	20	€	DS
33	21	€	SOS
34	22	€	FS
35	23		
36	24	€	BYP
37	25	€	LF
38	26	€	ETB
39	27	€	ESC
40	28		
41	29		
42	2A	€	SM
43	2B		
44	2C		
45	2D	€	ENQ

46	2E	€	ACK
47	2F	€	BEL
48	30		
49	31		
50	32	€	SYN
51	33		
52	34	€	PN
53	35	€	RS
54	36	€	UC
55	37	€	EOT
56	38		
57	39		
58	3A		
59	3B		
60	3C	€	DC4
61	3D	€	NAK
62	3E		
63	3F	€	SUB
64	40	€	SP
65	41		
66	42		
67	43		
68	44		
69	45		
70	46		
71	47		
72	48		
73	49		
74	4A	¢	
75	4B	.	
76	4C	<	
77	4D	(	
78	4E	+	
79	4F	|	
80	50	&	
81	51		
82	52		
83	53		
84	54		
85	55		
86	56		
87	57		
88	58		
89	59		
90	5A	!	
91	5B	$	
92	5C	*	
93	5D	)	
94	5E	;	
95	5F	¬	
96	60	-	
97	61		
98	62		
99	63		
100	64		
101	65		

102	66	
103	67	
104	68	
105	69	
106	6A	|
107	6B	'
108	6C	%
109	6D	
110	6E	_ >
111	6F	?
112	70	
113	72	
114	72	
115	73	
116	74	
117	75	
118	76	
119	77	
120	78	
121	79	\
122	7A	:
123	7B	#
124	7C	@
125	7D	'
126	7E	=
127	7F	"
128	80	
129	81	a
130*	82	b
131*	83	c
132*	84	d
133*	85	e
134*	86	f
135*	87	g
136*	88	h
137*	89	i
138*	8A	
139*	8B	
140*	8C	
141	8D	
142	8E	
143	8F	
144	90	
145	91	j
146	92	k
147*	93	l
148*	94	m
149*	95	n
150*	96	o
151*	97	p
152*	98	q
153*	99	r
154*	9A	
155*	9B	
156*	9C	
157	9D	

158	9E	
159*	9F	
160	A0	
161	A1	~
162	A2	s
163	A3	t
164	A4	u
165	A5	v
166	A6	w
167	A7	x
168	A8	y
169	A9	z
170	AA	
171	AB	
172	AC	
173	AD	
174	AE	
175	AF	
176	B0	
177	B1	
178	B2	
179	B3	
180	B4	
181	B5	
182	B6	
183	B7	
184	B8	
185	B9	
186	BA	
187	BB	
188	BC	
189	BD	
190	BE	
191	BF	
192	C0	{
193	C1	A
194	C2	B
195	C3	C
196	C4	D
197	C5	E
198	C6	F
199	C7	G
200	C8	H
201	C9	I
202	CA	
203	CB	
204	CC	
205	CD	
206	CE	
207	CF	
208	D0	}
209	D1	J
210	D2	K
211	D3	L
212	D4	M
213	D5	N

214	D6	O
215	D7	P
216	D8	Q
217	D9	R
218	DA	
219	DB	
220	DC	
221	DD	
222	DE	
223	DF	
224	E0	\
225	E1	
226	E2	S
227	E3	T
228	E4	U
229	E5	V
230	E6	W
231	E7	X
232	E8	Y
233	E9	Z
234	EA	
235	EB	
236	EC	
237	ED	
238	EE	
239	EF	
240	F0	0
241	F1	1
242	F2	2
243	F3	3
244	F4	4
245	F5	5
246	F6	6
247	F7	7
248	F8	8
249	F9	9
250	FA	
251	FB	
252	FC	
253	FD	
254	FE	
255	FF	

Macintosh Character Set

Dec	Hex	Char	Code
0	00	€	NUL
1	01	€	SOH
2	02	€	STX
3	03	€	ETX
4	04	€	EOT
5	05	€	ENQ
6	06	€	ACK
7	07	€	BEL
8	08	€	BS
9	09	€	HT
10	0A	€	LF
11	0B	€	VT
12	0C	€	FF
13	0D	€	CR
14	0E	€	SO
15	0F	€	SI
16	10	€	SLE
17	11	€	CS1
18	12	€	DC2
19	13	€	DC3
20	14	€	DC4
21	15	€	NAK
22	16	€	SYN
23	17	€	ETB
24	18	€	CAN
25	19	€	EM
26	1A	€	SIB
27	1B	€	ESC
28	1C	€	FS
29	1D	€	GS
30	1E	€	RS
31	1F	€	US
32	20	(space)	
33	21	!	
34	22	"	
35	23	#	
36	24	$	
37	25	%	
38	26	&	
39	27	'	
40	28	(	
41	29	)	
42	2A	*	
43	2B	+	
44	2C	,	
45	2D	-	

46	2E	.
47	2F	/
48	30	0
49	31	1
50	32	2
51	33	3
52	34	4
53	35	5
54	36	6
55	37	7
56	38	8
57	39	9
58	3A	:
59	3B	;
60	3C	<
61	3D	=
62	3E	>
63	3F	?
64	40	@
65	41	A
66	42	B
67	43	C
68	44	D
69	45	E
70	46	F
71	47	G
72	48	H
73	49	I
74	4A	J
75	4B	K
76	4C	L
77	4D	M
78	4E	N
79	4F	O
80	50	P
81	51	Q
82	52	R
83	53	S
84	54	T
85	55	U
86	56	V
87	57	W
88	58	X
89	59	Y
90	5A	Z
91	5B	[
92	5C	\
93	5D	]
94	5E	^
95	5F	_
96	60	`
97	61	a
98	62	b
99	63	c
100	64	d
101	65	e

102	66	f
103	67	g
104	68	h
105	69	i
106	6A	j
107	6B	k
108	6C	l
109	6D	m
110	6E	n
111	6F	o
112	70	p
113	72	q
114	72	r
115	73	s
116	74	t
117	75	u
118	76	v
119	77	w
120	78	x
121	79	y
122	7A	z
123	7B	{
124	7C		
125	7D	}
126	7E	~
127	7F	DEL
128	80	Ä
129	81	Å
130	82	Ç
131	83	É
132	84	Ñ
133	85	Ö
134	86	Ü
135	87	á
136	88	à
137	89	â
138	8A	ä
139	8B	ã
140	8C	å
141	8D	ç
142	8E	é
143	8F	è
144	90	ê
145	91	ë
146	92	í
147	93	ì
148	94	î
149	95	ï
150	96	ñ
151	97	ó
152	98	ò
153	99	ô
154	9A	ö
155	9B	õ
156	9C	ú
157	9D	ù

158	9E	û
159	9F	ü
160	A0	†
161	A1	°
162	A2	¢
163	A3	£
164	A4	§
165	A5	•
166	A6	¶
167	A7	ß
168	A8	®
169	A9	©
170	AA	™
171	AB	´
172	AC	¨
173	AD	
174	AE	Æ
175	AF	Ø
176	B0	
177	B1	±
178	B2	
179	B3	
180	B4	¥
181	B5	µ
182	B6	
183	B7	
184	B8	
185	B9	
186	BA	
187	BB	ª
188	BC	º
189	BD	
190	BE	æ
191	BF	ø
192	C0	¿
193	C1	¡
194	C2	¬
195	C3	
196	C4	ƒ
197	C5	
198	C6	
199	C7	«
200	C8	»
201	C9	…
202	CA	
203	CB	À
204	CC	Ã
205	CD	Õ
206	CE	Œ
207	CF	œ
208	D0	–
209	D1	—
210	D2	"
211	D3	"
212	D4	'
213	D5	'

214	D6	÷
215	D7	
216	D8	ÿ
217	D9	Ÿ
218	DA	/
219	DB	¤
220	DC	‹
221	DD	›
222	DE	
223	DF	
224	E0	‡
225	E1	·
226	E2	‚
227	E3	„
228	E4	‰
229	E5	Â
230	E6	Ê
231	E7	Á
232	E8	Ë
233	E9	È
234	EA	Í
235	EB	Î
236	EC	Ï
237	ED	Ì
238	EE	Ó
239	EF	Ô
240	F0	
241	F1	Ò
242	F2	Ú
243	F3	Ü
244	F4	Ù
245	F5	
246	F6	ˆ
247	F7	
248	F8	¯
249	F9	
250	FA	·
251	FB	
252	FC	¸
253	FD	
254	FE	
255	FF	

Data Types

Type Name	Bytes	Range of Values
(signed) byte	1	-128 to 127
unsigned byte	1	0 to 255
(signed) short	2	-32,768 to 32,767
unsigned short	2	0 to 65,535
(signed) long	4	-2,147,483,648 to 2,147,483,647
unsigned long	4	0 to 4,294,967,295
float	4	3.4E +/- 38
double	8	1.7E +/- 308
long double	10	1.2E +/- 4932

Note: Integers are shorts with 16 bit processors and longs with 32 bit processors.