Technical Manual

Browser Application Development Kit User Guide

Version 2.1

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Introduction

This document outlines the tools and processes a developer can use to create and test XHTML Basic, CHTML, and CSS content intended for deployment to mobile devices. The Motorola Browser Application Development Kit (ADK) is an Integrated Development Environment (IDE) built to develop and test wireless Internet applications.

The main features of the Browser Application Development Kit include

- Create web content using these markup languages:
    - CHTML
    - XHTML Basic
    - CSS
- Test output on the Phone Emulator
- Browsing functionality

This document assumes that the developer is familiar with the basic principles of wireless applications and the use of XHTML, CHTML, and CSS.

Document History

Version	Date	Author	Comments
Draft (2.1)	Oct 4, 2002	MW MDP	Initial Draft
Draft (2.1)	Oct 18, 2002	MW MDP	Second Draft
Draft (2.1)	Dec 11, 2002	MW MDP	Third Draft
Draft (2.1)	Feb 17, 2003	MW MDP	Fourth Draft
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Draft (2.1)	Apr 16, 2003	MW MDP	Sixth Draft
Release (2.1)		MW MDP	Final release

Features in this Release

The following new features are included with this release:

- Motorola A830 handset support
- Ability to upload images to default or specific folders of the phone file system for use by the ADK
- Ability to explicitly re-open the emulator
- Use Cross Wire to pinpoint the location and color of any pixel on the display
- Ability to set connection parameters and proxy information

System Requirements

The following describes the hardware and software requirements of the Browser ADK tools.

Hardware Requirements

- Windows PC with a 266 MHz Intel® Pentium® II or equivalent
- 64 MB of RAM recommended
- 80 MB of hard disk space

Software Requirements

- Windows NT® 4.0/Windows 2000/Windows XP
- Microsoft® Internet Explorer 4.0 or higher
- Microsoft® Data Access Objects (DAO) 3.5
- Microsoft® Data Access Components 2.7
- Java™ Runtime Environment (JRE), Standard Edition, 1.3.1 or later
- Adobe Acrobat® 4.0 or later to read the documentation. The free reader application can be downloaded from http://www.adobe.com/products/acrobat/readermain.html.
- Small Fonts must be selected in the Display Control panel.

NOTE: If the Microsoft Data Access Components or JRE is absent on your computer, the Browser ADK installation package installs them automatically.

Glossary

Here are definitions of common terms used in this manual:

Term	Definition
ADK	Application Development Kit
ASCII	American Standard Code for Information Interchange
CHTML	Compact Hypertext Markup Language
CSS	Cascading Style Sheets
DDE	Dynamic Data Exchange
IDE	Integrated Development Environment
ODBC	Open Data Base Connectivity
UI	User interface
WAP	Wireless Application Protocol
WML	Wireless Markup Language
WMLS	Wireless Markup Language Script
XHTML	Extensible Hypertext Markup Language

References

The following references provide additional information on the technologies and materials discussed in this manual:

Organization	URL
Motorola Developer Program	`www.motorola.com/developers/wireless`
O'Reilly & Associates	`www.oreilly.com`
Open Mobile Alliance, Ltd	`www.openmobilealliance.org`
World Wide Web Consortium	`www.w3.org`

The following specifications and books provide information on XHTML, WAP, and CSS:

- *HTML and XHTML: The Definitive Guide, 5th Ed.*, Musciano and Kennedy, O'Reilly and Associates, Inc.
- *Cascading Style Sheets: The Definitive Guide*, Eric Meyer, O'Reilly and Associates, Inc.
- *WAP-277-XHTMLMP-20011029-a*, Open Mobile Alliance, Ltd.

Browser ADK Overview

The Motorola Browser ADK enables you to develop and test web content on a PC. The main functionality in the Browser ADK includes:

- Writing XHTML, CHTML, and CSS content files using the Browser IDE
- Test content using a Phone Emulator

This chapter introduces you to the Motorola Browser ADK and describes its components and operation.

Browser ADK Components

The Motorola Browser ADK consists of two executable files:

- **Phone Emulator**— The Phone Emulator is a separate executable that emulates the behavior of Motorola handsets and works in conjunction with the Browser IDE. It provides the interface in the form of a skin, which displays a specific model of the Motorola handset.
- **Browser IDE**—The Browser IDE serves as a service to the Phone Emulator on which XHTML, CHTML, and CSS files can be tested for various phone types. The browser implemented in the IDE is the actual core browser code present in the mobile device. The Browser IDE us installed in the directory `C:\Program Files\Motorola\Browser ADK 2.1`.

The IDE manages and orchestrates the operation of many internal code modules. These code modules implement the development tools used to write, edit, and browse content. The code modules consist of the following:

- **Editor—**Use the editor module to write source code for XHTML, CHTML, and CSS source files. It recognizes any of the keywords in these page layout languages and displays them in a different color to assist code development. In addition, the editor also supports basic CSS editing with syntax coloring and file operations. The editor saves all source files as ASCII text.

  NOTE: The editor only recognizes language keywords; it doesn't perform syntax checks.

- **Browser**— Use the browser module to test the compliance of the XHTML, CHTML, and CSS files. This ensures that files created with the Editor module display properly on any target hardware using the same browser module.

Launching Browser ADK

The file `wapadk.exe` in the `Browser ADK 2.1` directory is the program that runs the integrated development tools. You can either make a shortcut to this file, or use the menu selection in the Start menu. Specifically, this is

To launch the Browser ADK:

- Choose the **Start > Programs > Motorola Browser ADK > Browser ADK v2.1 > Browser ADK v2.1** menu item

Important: The Browser ADK requires the use of the Java™ Runtime Environment (JRE) to operate. If you don't have a JRE on your system, the installer will prompt you to install JRE 1.3.1_01.

ADK Operation

All of the software development tools are part of the IDE. You launch the Browser ADK IDE application, then write and test wireless programs from within the IDE.

The IDE uses an Open Data Base Connectivity (ODBC) database to store configuration information.

The Phone Emulator simulates the UI for the program under development. For this release, only the Motorola A830 is supported. This can be used to test and correct problems with the program's user interface.

The Phone Emulator is a separate executable file that is launched automatically when you start the IDE. Both the IDE and Phone Emulator use Windows Dynamic Data Exchange (DDE) interprocess communications to relay information to each other.

Finally, the IDE is capable of connecting to a server via IP so that you can test the operation of wireless client software against server applications.

IDE Overview

This chapter provides an overview of the Motorola Browser IDE.

IDE Menus

When you launch the Browser ADK IDE, the IDE's main window appears, along with that of the Phone Emulator, as shown in Figure 1.

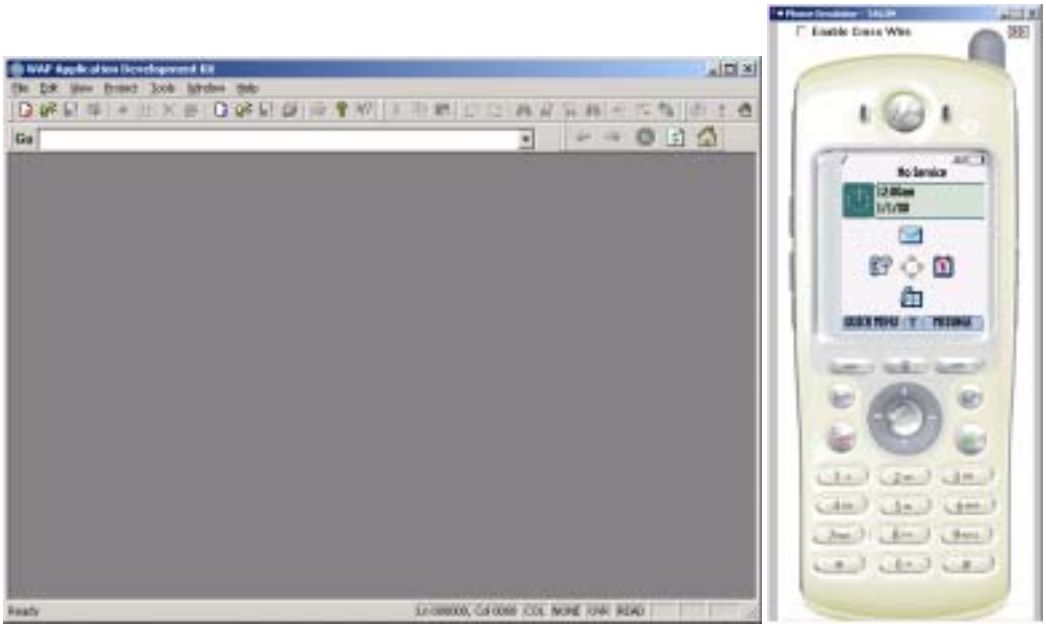


Figure 1. The Browser ADK in operation, showing the IDE and the Phone Emulator

The Browser IDE's window is on the left, and the Phone Emulator's window is on the right. You will spend most of your time during the initial stages of code development in the Browser IDE's window. Once the program's UI takes shape, and then you will make more use of the Phone Emulator. The Phone Emulator in the figure simulates the Motorola A830 handset. Other handset simulations are available. You can change the choice of handset display from a menu selection.

Browser IDE Menus

The Browser IDE provides a number of point-and-click menus that assist in program development. These are:

- **File** menu. This menu handles all file operations, such as opening or creating new source files, saving changes to a source file, and printing. The Recent Files… and Recent Projects… menu choices let you quickly open recently accessed source files or project files.
- **Edit** menu. This menu supports source-editing operations such as Cut, Copy, Paste and Delete, as well as setting and using bookmarks. It also has commands that conduct search and replace operations in a source file.
- **View** menu. This menu handles the display of specific windows such as the toolbars and Project window.
- **Tools** menu. This menu lets you configure and operate the IDE's tools. It is where you select the handset skin used by the Phone Emulator (Tools > Phone Settings), enter communications settings that allow the browser to interact with a remote server (Tools > Connection Settings), and upload images (Tools > Upload Images). Other menu choices start the encoder or compiler, set or clear breakpoints, and have the WAP browser execute a program under debugger control.

  NOTE: The menu items Enable Debugger, Set Breakpoint, and Breakpoints are not supported in Browser ADK 2.1.

- **Window** menu. This menu controls how the IDE presents specific windows, and to select or close active windows.
- **Help** menu. This menu is where you access the Browser ADK's help system.

Browser IDE Windows

Within the scope of the Browser ADK window, several different types of windows can appear. These different types of components and windows include:

- **Toolbar**–one-click access to most Browser IDE commands. See the section *Browser IDE Toolbars* for details.
- **Editor**– provides the basic framework to write and edit content files. Multiple editor windows are possible, one per open editable file.
- **Output**– displays information regarding the results of an encode/compile operation, and where code errors are reported. Two tabs enable you to switch between:
  - **Output Wnd**–select the Output window view to display the result of a WML and WMLScript compilation, whether successful or not.

    NOTE: Compilation is not supported in Browser ADK 2.1.

- **HTTP Headers**–select to view the list of URLs accessed through HTTP mode. Includes header information like request sent, response received, method used to fetch content, type of content received, file size, and HTTP status (Figure 2).

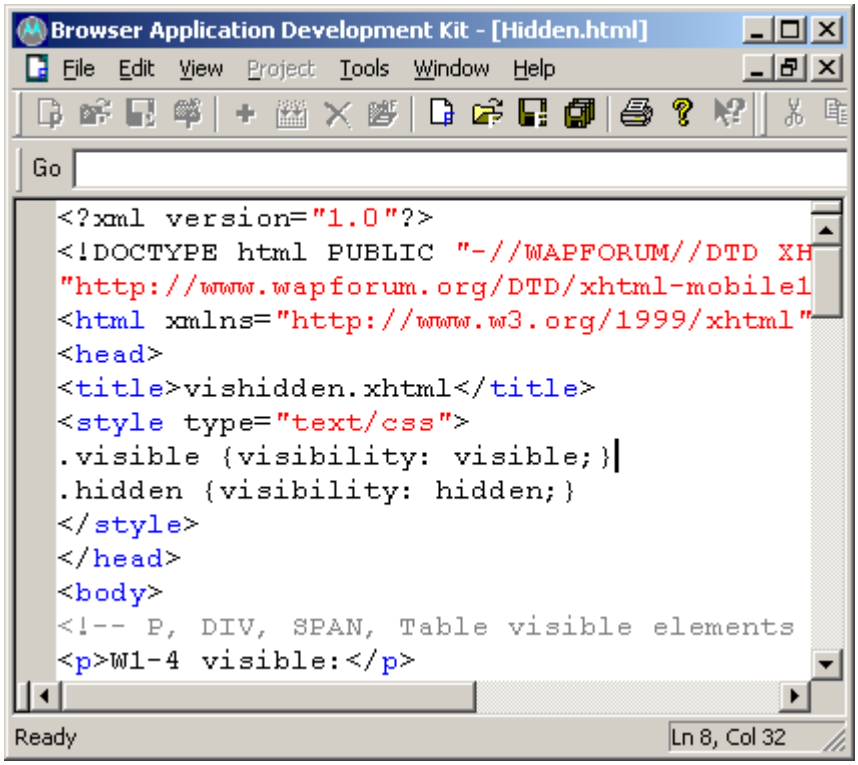
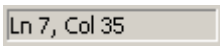


Figure 2. Examing an HTTP session using HTTP Headers.

At the very bottom of the IDE window is a status bar. It indicates what action the IDE is performing, where the editor's insertion point is poised in a source file, and other status information.

Browser IDE Toolbars

The IDE Window toolbars provide one-click access to many of the program-specific commands. Each toolbar can be individually viewed or hidden using the View menu. The commands specific to each toolbar include:

Toolbar	Icons	Actions
Standard Toolbar		Project commands–new, open, save, close
		Project File commands–add file(s) to project, build, remove file from project, open selected project file
		File commands–new text file, open file, save, save all modified files
		Program commands–print, about, help
Edit Bar		Editing commands–cut, copy, paste
		Undo commands–undo, redo
		Find commands–find, repeat, find previous, find & replace
		Source commands–go to line, tab stops, set font
Build Bar		Compile and Debug commands–compile, simulate, set breakpoint
Navigation Bar		Navigation commands–back, forward, stop, upload images, home
Bookmark Bar		Bookmark commands–toggle, next, previous, and clear all
Go Bar		Provides a text box to enter URL's and load web pages.
Status Bar		Displays the status of the Browser ADK application or the current action. Appears at the bottom of the window.

To view or hide a toolbar:

- Choose the **View > *Toolbar_Name*** menu item

- The selected toolbar is displayed and a checkmark appears before its name on the View menu if it was hidden, or hidden and the checkmark removed if already visible.

Mouse Shortcuts

The Browser IDE supports the following functions when right-clicking:

- **Within a window**–displays a popup menu with options relevant to that window. (Only the window level commands are shown).
- **Item**–displays a popup menu relevant to that item.
- **Between windowpanes or on a toolbar**–displays a popup menu with options for quicker access to the commonly used commands (Figure 3).

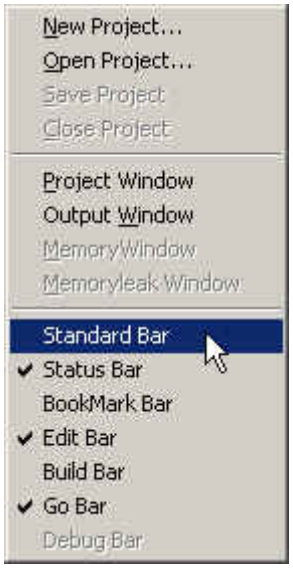


Figure 3. The list pop-up options that appear when you right-click inside the main Browser ADK window.

Setting the Phone Emulator

The Browser IDE can support multiple Motorola devices. If more than one phone emulator is available, you can select it in the Phone Settings window (Figure 4).

Figure 4. Use the Phone Settings window to select the emulator the Browser IDE uses.

To select a different phone emulator:

1. Choose the **Tools > Phone Settings...** menu item

   The **Phone Settings** window appears (Figure 4).
2. Select a phone in the **Select Phone Type** list
3. Click **OK**

The next time you run the Phone Emulator, the chosen phone emulation is used.

Setting Connection Settings

You can customize the Browser ADK to the connection available using the **Connection Settings** window (Figure 5).

To access the **Connection Settings** window:

- Choose the **Tools > Connection Settings** menu item

The HTTP connection simulates access to s network. It can be a direct connection to the Internet or an HTTP Proxy connection. If you are using a direct connection to the Internet, select the Direct Connection to Internet radio button and proceed. If you are using a proxy connection, select the Manual proxy configuration radio button, then enter the IP Address and Port number of the proxy server.

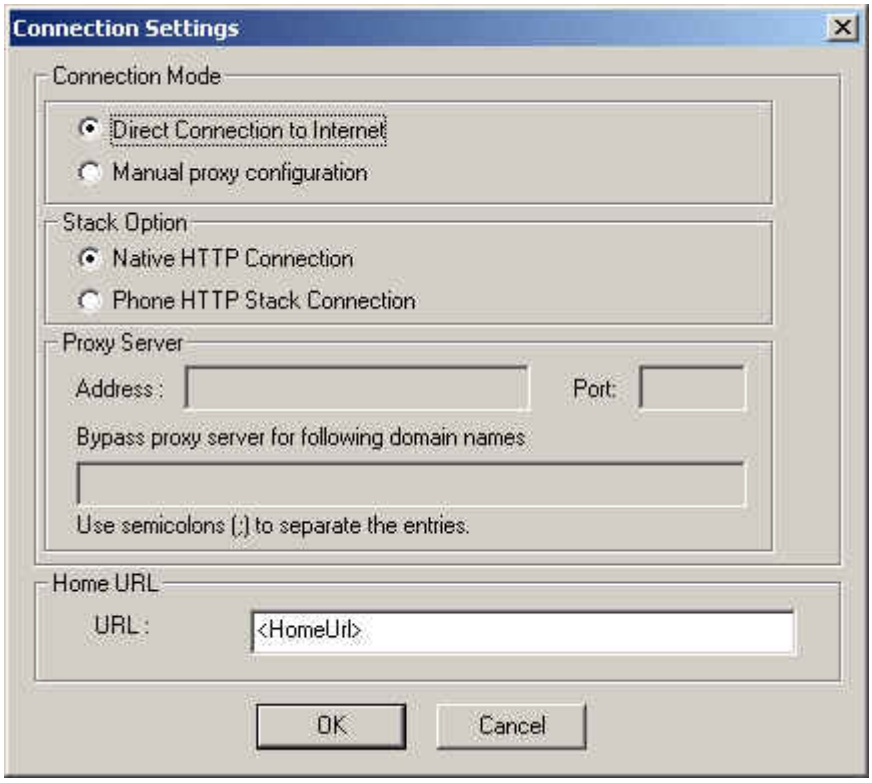


Figure 5. Use the Connection Settings window to configure the Internet connection.

The **Connection Settings** window options include:

Option	Description
Direct Connection to Internet	Select this option if working without a proxy.
Manual proxy configuration	Select this option if working with a proxy.
Native HTTP Connection	Select to use Native HTTP stack (based on Microsoft MFC APIs).
Phone HTTP Stack Connection	Select to use phone implementation stack.
Address	Enter the proxy server address.
Port	Enter the port ID used by the proxy server.
Bypass proxy server for the following domain names	Enter the domain names that the proxy should not use within the intranet.
URL	Enter the home page URL for the phone.

The Browser ADK supports two different stacks including: Windows native stack and phone stack. The Windows native stack uses Windows MFC (Microsoft Foundation Classes) APIs to fetch content using the HTTP protocol. The phone stack uses the actual code that resides in the phone.

NOTE: One stack type must be chosen for the IDE to operate.

Local Content Uploading

The Browser ADK cannot fetch images from local files that are specified using the `file://link` format. All local images are expected to be located in the phone file system which is located at `<ADK Installation directory>/dl_fs_root/a/`. Use the upload images feature to move local image files into the phone file system folder, which acts as the root directory for the phone in the NT environment.

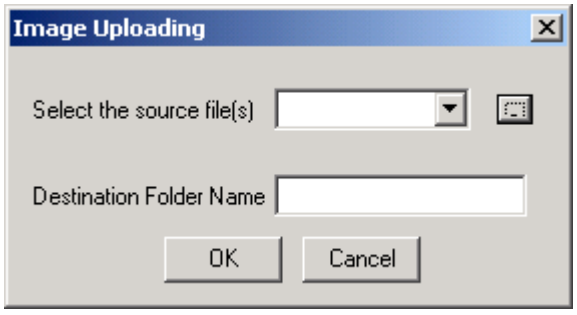


Figure 6. Image Uploading window.

To upload images:

1. Choose the Tools > Upload Images… menu item

   The **Image Uploading** window appears (Figure 6).

2. Click the "**…**" button to locate and select the image files to upload

   The **Upload Images from…** window appears. Use the controls in this window to locate and select one or more images to upload, and then click **Open**.

3. Enter the name of the destination folder in the **Destination Folder Name** text box

   If nothing is entered in the **Destination Folder Name** text box, the default destination folder `<ADK Installation directory>/dl_fs_root/a/` receives the uploaded images.

4. Click **OK**

   The selected images are uploaded to the destination folder.

Using Bookmarks

The IDE lets you bookmark locations in source files and jump directly to them at any time during a development session.

To toggle bookmarks on or off:

- Position the editing cursor in the line to bookmark
- Select the Edit > Bookmarks > Toggle Bookmark menu item

  A blue bookmark appears at the start of the line, or disappears if one already existed.

To navigate bookmarks:

- Select the **Edit > Bookmarks > Next Bookmark** menu item to jump to the next bookmark in the file

OR

- Select the **Edit > Bookmarks > Previous Bookmark** menu item to jump to the previous bookmark in the file

To clear all bookmarks in a file:

- Select the **Edit > Bookmarks > Clear All Bookmarks** menu item

  All bookmarks are removed from the source file.

Content Testing

One of the main features of the Browser ADK is the ability to develop and test Internet content on a PC using the Phone Simulator.

Testing Requirements

You must have the following items in order to properly test Internet content in the Phone Simulator:

- Internet content sources
- Content server containing Internet content
- Browser ADK to bring them together

Internet Content

The Internet content is stored in files that are generated from any of the languages supported by the Browser ADK. The content can be created by you or come from content readily available on the Internet. The languages supported include:

- XHTML
- CHTML
- CSS

In addition, you can create content files using the Browser ADK's editor and test them in the Simulator.

Content Server

A **Content Server** is a device that hosts content and sends it to either the Phone Simulator of the mobile device when requested. A content server can be:

- **Local server**–files are hosted on your PC for easy access
- **Remote server**–files are located at any URL reachable by the PC or mobile device

No matter where the content is located, the Browser ADK seeks it out, opens it into the Phone Simulator for viewing, and loads the source into a window for comparison. This enables you to verify that the source describes exactly what is shown on the Simulator screen.

Browsing Internet Content on the Emulator

Use the following to test Internet content files in the Simulator whether they are stored on a local or remote server.

To test Internet content:

1. Launch the Browser ADK

   The Browser ADK and Phone Simulator windows appear.

2. Configure connection settings (optional)

   If not already configured, or you need to change the settings, choose the **Tools > Connection Setting** menu item. Refer to the section Mouse Shortcuts for more information.

3. Open the Internet content

   To open a local Internet content file:

   a. Choose the **File > Open** menu item

   b. Click the **Browse** button to locate and select the file

   c. Click **OK**

   OR

   To open a remote Internet content file:

   a. Type the website's URL into the **Go** field in the Browser ADK window

   b. Press **Enter**

   The Browser ADK opens the file into a source window.

4. Choose the **Tools > Simulate** menu item

   The Phone Simulator displays the Internet content.

Troubleshooting

Most of this section deals primarily with subtle installation problems.

Problem: The Browser ADK IDE application dies on launch.

Solution: The application can't locate and utilize the database objects it needs to function. Try running the Data Access Components installer, `mdac_typ.exe`, which is located in the directory `..\Motorola\Browser ADK 2.1\Jre1.3`. This will install the Data Access Components and the DAO objects.

Problem: When you launch Browser ADK IDE, it reports "The procedural entry point HttpSendRequestExa could not be located in the dynamic link library WININET.dll" and quits.

Solution: You're running the Browser ADK on a vintage version of Windows NT 4.0 that has only Internet Explorer (IE) 3 installed. The IDE is looking for specific Internet protocol interfaces that are only available with IE4 or later. Download the latest version of the browser that is compatible with NT 4.0 and install it.

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