User Guide for

WB v1.59

Version 1 (DRAFT)

September 1998

Acknowledgements

This user guide is based on the UKERNA SHRIMP User Guide which will be available from http://www.ja.net/service_development/video/service_developments/shrimp/index.html.

Currently this document is nearly identical to the chapter on WB in the UKERNA guide, but as opposed to the UKERNA guide, this document will be updated as WB gets updated insofar as is possible.

Disclaimer

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1 Introduction

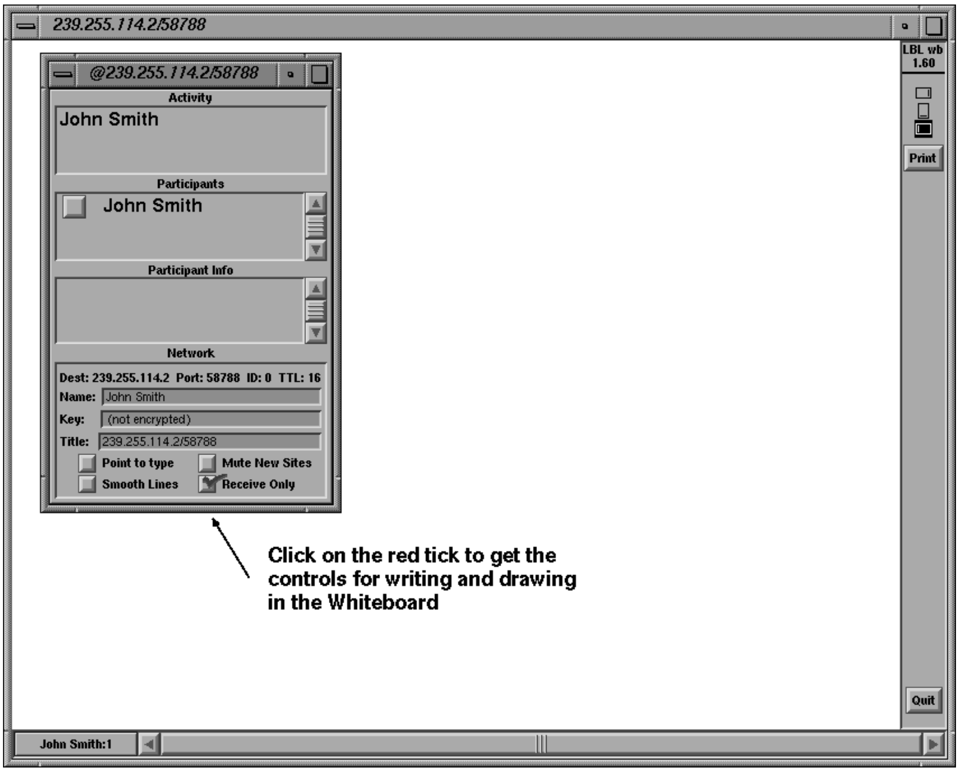


Figure 1: Main Whiteboard Window and Control Panel - Receive Only Mode

WB - unicast and multicast shared workspace. WB can be used for either point-to-point videoconferencing involving a direct link between two hosts or for multiparty conferencing with many participants via the Internet Mbone (see Box 1). WB is only available for Unix. Windows95/NT4.0 users are referred to WBD.

Unicast and Multicast

A *unicast* connection is like a telephone call which has one connection between two telephones for the duration of the call. You should use unicast if there are only two people in the conference and if one of you does not have access to multicasting. In order to set up a unicast connection, you must know the name of the computer that the person you want to have a conference with is going to use.

A *multicast* connection can, in principle, have an unlimited number of participants. You should use multicast if it is likely that there will be more than two participants in the conference. Tools like RAT, VIC, NTE, WB and SDR have been specially developed for multicasting.

Box 1: Unicast and Multicast

WB is first and foremost a conferencing tool - not a drawing tool. You can think of it as a drawing tool with limited functionality.

1.1 Getting started

There are two ways of starting up WB: from the command line and from SDR.

1.1.1 Starting up WB from SDR

When joining a conference with whiteboard from SDR, WB will start up automatically.

1.1.2 Starting up WB from the command line for a multicast conference

As with the other Mbone tools the format for setting up WB from the command line is as follows:

```
Prompt> wb [options] <address/port>
```

The multicast address should be in the range 224.2.0.0 - 224.2.255.255 (except when using admin scope – see Box 2). The port number should be at least 5002.

So, as an example, this line would start WB with a TTL of 48 (See Box 2 for an explanation of TTL) on the multicast address 224.2.4.70 and port number 5004:

```
Prompt> wb –t 48 224.2.4.70/5004
```

TTL

TTL stands for Time To Live and determines how far the audio that you transmit will travel. A TTL of 15 will reach other parts of your campus, a TTL of 47 will reach all parts of the JANET Mbone, a TTL of 63 reaches Europe, and 127 worldwide.

The default for all the Mbone tools is a TTL of 16.

Admin scope

There is currently a move away from using TTL for scoping conferences to using admin scopes. Using admin scope will limit conferences more accurately and is more sophisticated than specifying a TTL.

Like TTL scopes, admin scopes need to be set up by the network administrator. When the scopes have been configured, you will get a range of addresses for each of the scopes defined. Using an address in the range provided will limit your conference to that scope.

Example: If local scope is defined as addresses in the range of 239.0.0.0 - 239.100.255.255, any conference on addresses in this range will be restricted to the local area as defined by the network administrator.

The most widely used method for scoping is still TTL, so you should contact your local systems administrator to see if admin scopes have been set up. If not, you should ask them to do it.

Box 2: TTL and Admin scope

In the example above the user has used the option '-t' to specify the TTL. TTL determines how far the audio packets will go, i.e. how far away you can talk to people. A TTL of 48 is generally large enough for communication within the UK.

All participants must use the same multicast address and port number in order to "see" one another in WB.

1.1.3 Starting up WB from the command line for a unicast conference

As with the other Mbone tools the command format is:

```
Prompt> wb [options] < remote_hostname/port>
```

So, as an example, this line would start WB for a unicast conference with someone on the computer called myhost.example.ac.uk on port 5004:

```
Prompt> wb myhost.example.ac.uk/5004
```

The person at the other end, in this case the person who is working on myhost.example.ac.uk will have to do the same command but with the name of your computer instead of myhost.example.ac.uk.

🔔 TTL is not applicable in unicast sessions.

1.1.4 Quick guide to using WB

WB consists of two windows, the Main WB Window and a Control Panel Window (see Figure 1). They both appear on the screen when starting up WB.

Contributions made by other participants will automatically appear in the Main WB Window. The default start-up mode for WB is "receive only". To write and draw in the WB yourself, you must deselect the *Receive Only* button in the bottom right hand corner of the Control Panel Window (see Figure 1). This will cause a series of controls to appear in the right hand side of the WB, enabling you to write and draw (see Figure 2).

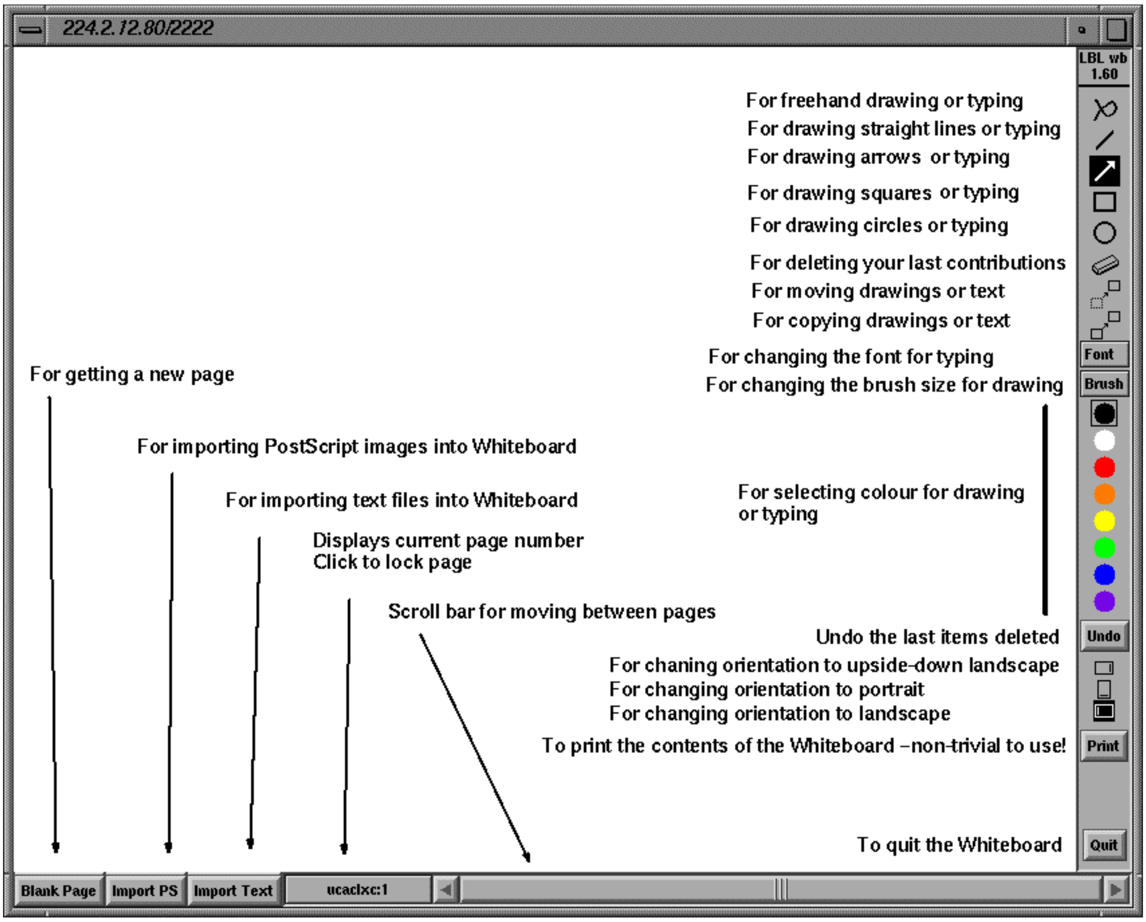


Figure 2: Main Whiteboard Window

To *write* on the WB, click where you would like your text to appear, and type using the keyboard. A dot will appear when you click on the whiteboard which will disappear again as soon as you start typing - but only if you do not move the mouse in between actions.

To *draw* on the WB, hold down the left mouse button and draw.

🔔 If nothing appears on the screen when you try to write or draw, check that one of the top five icons in the right hand side of the WB have been selected ( ) and check that the colour you are writing with is different from the background colour.

With WB, various following functions are possible. The controls on the right hand side of the WB enable:

- The drawing of various shapes - straight lines, arrows, squares and circles.
- Options to delete what you have drawn or written - the delete option will always erase the last text or drawing that you have made, regardless of what you click on. For how to delete selected items, see the section below.
- Moving and copying text or drawings.
- Changing the font of writing.
- Changing the thickness of the brush for drawing.
- Changing the colour that you use for drawing and writing.
- Undoing your last deletion.
- Changing the orientation of the whiteboard.

The controls at the bottom of the whiteboard can be used to:

- Select a blank page.
- Import PostScript and text files.
- *Lock* a page.
- Browse through the pages if there is more than one page to the document.

Unless you "lock" a page, WB will always switch to the page where someone is writing or drawing. So if you select a *Blank Page* and start typing on it, all of the other session participants will automatically switch to the page you are now typing on - unless they have locked their WB's on another page.

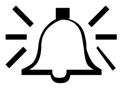
1.1.5 WB user guide

In this section we shall go through the options in more detail.

1.1.5.1 Main WB window

To type: Select one of the top five icons in the right hand side of the Main WB Window ( ). Click on the WB where you would like your text to appear and type using the keyboard.

Alternatively, check the *Point to type* box in the Whiteboard Control Panel, and the text will appear at the current mouse pointer position. If you move the mouse while typing, the letters will still appear wherever the mouse pointer is!



Useful Whiteboard Control Characters:

- ^H (backspace) / DELETE will delete the last typed character
- Carriage return will start a new line under the start of the previous line
- ^C and ^Q will exit WB.
- ^L will redraw the screen

Box 3: Whiteboard Control Characters

To draw: Select one of the following icons depending on which shape you want to draw.

 Freehand drawing.
 Straight line.
 Arrow
 Square
 Circle

Using any of these tools is essentially the same as using any basic drawing program.

To delete: There are several ways of deleting items on the WB.

- Selecting the icon  and clicking anywhere on the whiteboard will delete your last contribution. If you click again, your second-to-last contribution will be deleted. This can continue until you have deleted everything that you ever added.
- Right-clicking with the mouse anywhere in the whiteboard will also delete your last contributions in the same way as selecting the eraser does.
- Holding the right mouse button down and moving the pointer over an item of text or drawing will delete it.

Using the eraser icon or the right mouse button will only delete your own contributions.

- If you want to delete other participants' text or drawing, you have to "paint over" them. If the background colour of the whiteboard is white, you can select one of the drawing icons and the colour white, and use the mouse to paint on top of the text or drawing that you want to delete. (Remember to switch to another colour again for writing and drawing.)

- You cannot edit text once you have finished writing it, i.e. moved your mouse elsewhere.

- You cannot edit other participant's text.

To undo delete: Click on the *Undo* button under the colour palette on the right hand side of the Main WB Window.

- The *Undo* button can only undo delete operations. It cannot undo additions you have made to the whiteboard, menu selections, etc.

To change the text font: Click on the *Font* button on the right hand side of the Main WB Window and select a font from the menu.

To change brush size (for drawing): Click on the *Brush* button on the right hand side of the Main WB Window and select a brush size from the menu.

Your cursor

Only you can see your mouse cursor. To point to something you must make a mark on the page - underline, circle or draw an arrow pointing to it. You can erase this pointer by clicking the right mouse button, which will remove the last object drawn.

Box 4: Whiteboard Cursor

To change the colour (for text and drawing): Click on the colour you want on the colour palette (this is found on the right hand side of the Main WB Window). It is normally a good idea for each participant to use a different colour so that it is easy to see who is writing or drawing what.

- You cannot change the colour of text or drawings already in the WB, only text or drawings that you are about to make.

To change the orientation of the whiteboard: Click on one of the three buttons just below the *Undo* button on the right hand side of the Main WB Window, depending on which orientation you want.

Upside-down landscape (this is useful when imported PostScript images appear upside down in the WB)

Portrait

Landscape (default)

To print a WB page: Click on the *Print* button on the right hand side of the whiteboard. This will bring up a small dialogue window. Select *Print current page* or *Print all pages*, and click the *Print* ↵ button.

To save the contents of WB: Click on the *Print* button on the right hand side of the whiteboard. This will bring up a small dialogue window. Delete the *|lpr* and type in the file name you would like the whiteboard to be saved as. Then select whether you want all the pages saved (*Print all pages)* or just the current page (*Print current page*). Then click the *Print* ↵ button. The page or pages will be saved as a PostScript file.

To get a new blank page: Each page in the whiteboard is a set size - it does not have scroll bars. So if you run out of space, you can get a new page by clicking the *Blank Page* in the bottom left hand corner of the Main WB Window. Wherever you are when you create a new page WB will automatically move you on to the new page. If you are on page 2 of 10 pages currently created, the new page will be page 11 and you will be moved to it.

Hints on use

- It is a good idea to begin by typing your name. It is also helpful if all participants choose a unique font/colour combination. This makes it easier to distinguish individual's contributions and reduces the need to sign or initial each contribution.
- WB is a shared whiteboard, and does not provide the functionality of a general purpose drawing tool. If you need quality slides or diagrams, it is best to prepare them beforehand in minimal PostScript format (for example using "idraw") and import them into WB using the Import PostScript function provided.
- Creating new pages by clicking the *Blank Page* button is faster than erasing the current page. And it has the additional benefit of maintaining the previous pages for future reference.
- If you are watching a lecture you might want to start WB with the -S flag then unmute the lecturer's site. This will save your view of the lecture from being interrupted by random scribbling or page changes.

Box 5: Whiteboard Hint for Use

To import a PostScript file into WB: You can import small PostScript files into WB by clicking the *Import PS* button in the bottom left hand corner of the whiteboard. This brings up a dialogue window allowing you to select which file to import. The default maximum size is 32000 bytes. You can override this to allow up to 1000000 bytes by using the -P flag on the command line when starting up the WB. The file will be imported into a new page following the last current WB page. If you import a multiple page document, the input pages are displayed on new WB pages following the last current WB page. Files containing multiple pages MUST conform to the Adobe Document Structuring Conventions.

If nothing happens when you try to import a PostScript file, it is probably because the file is too big. WB does not notify you when PostScript files are too big, it simply does not do anything. Try setting the -P 1000000 flag, which will allow you to import PostScript files up to 1MB. If your PostScript file is larger than 1MB, you can try to compress it.

! PostScript files which can be displayed on some machines, may not be displayed on other machines. In particular, PostScript files which have been produced from Microsoft Office applications by printing to a file (.prn files) will not be displayed correctly in WB.

To import a text file into WB: You can import text files into WB by clicking the *Import Text* button in the bottom left hand corner of the whiteboard. This brings up a dialogue window allowing you to select which file to import. There is no line wrapping in WB, so only the first 80 characters of each line will be displayed. If you import a large file, the input is displayed on a series of new WB pages following the last current WB page.

To see which page number you are looking at, who created a page, and whether a page is complete: The box immediately to the right of the *Import Text* button contains various information. It will have the name of the participant who created the page followed by a colon and then the page number. The page in Figure 2 is page 1, and was created by ucaclxc. The name will be preceded by an asterisk if the page is not complete, i.e. if not all text or drawings are displayed on your screen.

Whiteboard Mouse Bindings

	Left	Middle*	Right
Normal	*Draw*	*Move*	*Delete*
Shift	*Straight Line*	*Duplicate*	*Undelete*
Control	*Paste Text*	*Paste Text*	*Paste Text*

*or both mouse buttons at the same time on a two-button mouse if using Linux.

Box 6: Whiteboard Mouse Bindings

To lock a page: When someone puts a mark on a new page all other participants are, by default, switched to viewing that page. To maintain your view of a particular page in this event, click on the button containing the information about who created the page and page number. The button then appears depressed with a cross over it. To release the view, click again.

1.1.5.2 WB control window

Figure 3: Whiteboard Control Panel

The WB Control Window consists of 4 sections, *Activity, Participants, Participant Info* and *Network*.

Activity contains a list of participants who have recently written or drawn on the WB.

Participants contains a list of participants who are running the WB.

It is possible to “mute” the contributions of individual participants, so you cannot see their contributions by clicking on the box to the left of their names (a red tick will appear in the box). This is useful in order to avoid graffiti type contributions. To restore contributions from these participants, deselect the box.

The names of participants who are currently active will be highlighted.

If the # sign appears between the checkbox and the participant's name, that person does not have all the data for the current page.

Participant Info gives reception and sending statistics for the participant selected in the *Participants* section. Click on the name of a participant in the *Participants* section for information about that particular person.

Network gives the IP address, port number, ID and TTL for this particular whiteboard session.

Also displayed is the *Name* that you will appear with in the *Activity* and *Particpants* sections. By default it will give your login name followed by the hostname of the computer you are running whiteboard on. You can change your name by clicking in the name field, editing the field and pressing the return key on the keyboard. You can also set your name by using the command line option -N followed by you name when you start up WB.

You can type in an encryption key in the *Key* field if the session is encrypted. If the session is not encrypted a *not encrypted* message will be displayed in the *Key* field. You can also set the key by using the command line option -K. NB: Not all versions of WB support encryption.

The *Title* field allows you to change the title of the session as it appears in the top left hand corner of the Whiteboard Control Window and the Main Whiteboard Window. The default title is the address/port number of the session. You can change the title by clicking in the *Title* field, editing the field and pressing the return key on the keyboard. You can also set the title by using the command line option -C followed by the title when starting up the whiteboard.

Point to type: Check this box to allow you to type at the current mouse pointer position. If this is not checked, you must click the left mouse button to make a dot on the board from which to type.

Smooth Lines: Check this box if you want WB to smooth the lines of your freehand drawing.

Mute New Sites: With this box checked, contributions from any sites that join the session after the box is checked will not appear on the whiteboard. This is equivalent to muting each individual new site by clicking on its checkbox in the *Participants* section of the window. You can also implement this option by using the -S command line option at startup.

Receive Only: This box is checked as default when whiteboard is started up. When this box is checked you cannot write or draw on the whiteboard. Use the command line option -r to override the default.

WB Command Line Options

-N *username*

username is the name shown for the participant in the Whiteboard Control Panel Window.

-C *confname*

confname is the name which will appear as the title in the Whiteboard Control Panel Window and in the top left hand corner of the Main Whiteboard Window.

-K *key*

key is an encryption key which may be specified to provide confidentiality. Since there is no way of preventing access to the WB, this allows a degree of privacy.

-r

By default, WB starts up in receive-only mode. Set this flag to override this.

-t *TTL*

Specifies the TTL (Time To Live) value set in the packet headers. This limits the scope of the packets. The following values are generally considered appropriate:

16 campus/organisation
47 country
64 continent
127 world

-p or **-l** or **+l**

use these to set the initial orientation of the whiteboard:

-p for portrait
-l for landscape
+l upside-down landscape

The default value is landscape.

-S *address/port*

To suppress/mute new sites. It means that new sites will come up muted and none of their input will show up on your display.

-P *size_in_bytes*

WB will not send a PostScript page bigger than MaxPostScriptSize. MaxPostScriptSize defaults to 32Kb but can be changed (up to a max of 1MB) by setting the X resource or by using this parameter.

Box 7: Whiteboard Command Line Options

Example

```
Wb +r –C 'Research Meeting' –P 1000000 –t 47 224.2.3.4/60600
```

This will start up whiteboard not in the receive only mode (-r), with the title 'Research Meeting' (-C 'Research Meeting'), allowing you to import PostScript images up to 1 MB (-P 1000000), a TTL of 47 which should suffice for anywhere in the UK (-t 47), on the address 224.2.3.4, and port number 60600.

Box 8: Whiteboard Example

1.2 Known bugs

There are currently no known bugs in WB.

Further Reading

WB

Floyd, S., Jacobson, V., Liu, C., McCanne, S., and Zhang, L. 1997. A Reliable Multicast Framework for Light-weight Sessions and Application Level Framing. *IEEE/ACM Transactions on Networking*, 5, 6, 784-803.

See also: http://www-nrg.ee.lbl.gov/wb/

Mbone

For further information about the JANET Mbone service, see the JANET Mbone Service Technical Guide. The guide is available from: http://www.ja.net/documents/mbone3.4.ps

Glossary

IP address

IP (Internet Protocol) addresses are unique numerical identifiers for each networked host computer. The IP address is used in conferencing when the conference is point-to-point rather than multiparty.

LBL

Lawrence Berkeley Laboratories, University of California, Berkerley, USA.

Mbone

The multicast capable backbone of the Internet. It currently consists of a network of tunnels linking the islands of multicast capable sub-networks around the world.

Multicasting

Multicasting is sending audio, video etc. on the Internet in way which ensures that anybody who is interested in receiving the information, *can* receive it, but only people who *are* interested will receive it. Think of it as being in between unicast (like most telephone calls - between two telephones only) and broadcast (TV - the signals are sent to you whether you want to watch or not).

Multicast address

Addresses used for multicast conferencing should be in the range 224.2.0.0 - 224.2.255.255
Note: Multicast addresses must be agreed upon in advance of the multicast session, either through e-mail or phone or assigned using SDR.

Network congestion

A condition in an IP network where the amount of traffic injected into the network is too great for the routers to handle and some packets are discarded.

Port

A UDP (User Datagram Protocol) number unique to the broadcast session, and should be over 5000.
Note: The port number must be agreed upon in advance, either through e-mail or phone or assigned using SDR.

Protocol

A set of standards that govern the transfer of information between computers over a network or via telecommunications systems. To reduce errors, the computers at both ends of a communications link must follow the same protocol.

Receive-only

A condition where a tool is used to receive information, but cannot transmit.

SDR

Multicast Session Directory.

TTL

TTL stands for time to live, and determines how far multicast packages can travel over the Internet. The standard values are:
16 - Site
47 - UK
63 - Europe
127 - World

Unicasting

A unicast connection is a point to point connection between two specific machines.

WB

Whiteboard.