European
Microsoft
Windows NT
Academic
Centre

WAIS Server Manual
Version 0.3

COPYRIGHT NOTICE

© 1994 Computing Services, The University of Edinburgh.

Permission to use, copy, and distribute this software and its documentation, in whole or in part, for any purpose (except as detailed hereunder) is hereby granted without fee, provided that the above copyright notice and this permission notice appear in all copies of the software and related documentation. Notices of copyright and/or attribution which appear in any file included in this distribution must remain intact.

You may not disassemble, decompose, reverse engineer, or alter this file or any of the other files in the package.

This software is provided as FREEWARE, and cannot be sold. This restriction does not apply to connect time charges, or flat rate connection/download fees for electronic bulletin board services. This software can not be bundled with any commercial package without express written permission from Edinburgh University Computing Service.

Source code for this software is proprietary information of Edinburgh University Computing Service. A source-code license is available.

THE SOFTWARE IS PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EXPRESS, IMPLIED OR OTHERWISE, INCLUDING WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL THE UNIVERSITY OF EDINBURGH BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND, OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER OR NOT ADVISED OF THE POSSIBILITY OF DAMAGE, AND ON ANY THEORY OF LIABILITY, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

European
Microsoft
Windows NT
Academic
Centre

WAIS Server Manual
Version 0.3

Chris Adie
6 September, 1994

European Microsoft
Windows NT Academic Centre
Computing Services
30-38 George Square
Edinburgh EH8 9LJ

TABLE OF CONTENTS

1. Introduction 1
2. Installation 2
    2.1. Requirements 2
    2.2. Installing 2
    2.3. Installation Problems 4
    2.4. Deinstalling 4
3. Configuration 5
    3.1 The WAIS Server Control Panel Applet 5
    3.2 Putting the Data Directory on a Fileserver 6
4. Operation 7
    4.1. Using the Services Dialog 7
    4.2 The WAISSERV Program 7
    4.3. Error Logging 8
    4.4 WAIS Transaction Logging 8
5. WAIS Databases and the Data Directory 9
    5.1 The WAIS Data Directory 9
    5.2 Creating WAIS Databases 9
6. Troubleshooting 12
    6.1 Errors Starting the WAIS Server 12
    6.2 Errors Recorded in the Event Log 12
Appendix I - Registry Entries 14
Appendix II - Formal Command Syntax 15

1. INTRODUCTION

This manual describes the Wide Area Information Server (WAIS) software for computers running the Windows NT operating system. You should read it if you plan to install, operate, manage or deinstall the WAIS Server software. This manual assumes you have a reasonable degree of competence in the use of Windows NT, and a reasonable knowledge of WAIS.

The WAIS Server for Windows NT implements a subset of the Z39.50-88 protocol, with WAIS-specific extensions. It runs as a Windows NT "service", just like the FTP Server which comes with Windows NT.

This manual covers the beta test version of the WAIS Server. Please direct bug reports about this version to `C.J.Adie@ed.ac.uk`.

This manual does not cover the WAIS indexing program `waisindex`, which is used to build databases for use by the WAIS Server and by other information servers such as the Gopher Server and the HTTP Server for Windows NT. Neither does it cover the `waisserv` program, which is essential for the use of the WAIS Server. See the WAIS Toolkit manual for details of these programs.

The European Microsoft Windows NT Academic Centre (EMWAC) has been set up to support and act as a focus for Windows NT within academia. It is sponsored by Datalink Computers, Digital, Microsoft, Research Machines, Sequent and the University of Edinburgh. This manual forms part of the programme of EMWAC.

2. INSTALLATION

2.1. Requirements

To use the Windows NT WAIS Server, you need to have a computer with the following characteristics:

- Intel or Digital Alpha or MIPS processor.
- Windows NT 3.1 final release, with TCP/IP software installed.
- At least 16Mb of memory.
- Network connection - typically Ethernet.

You also need to install the WAIS Toolkit files `WAISINDEX.EXE` and `WAISSERV.EXE`. See the WAIS Toolkit manual for details.

2.2. Installing

1. Log into your Windows NT system as a user with administrative privileges.
2. The WAIS Server is distributed in two versions, for the Intel and DEC Alpha architectures. Select the appropriate ZIP file for your processor.
3. Unzip the file. You should have the following files:

`WAISS.EXE`	The WAIS Server service.
`WAISS.CPL`	The Control Panel applet.
`WAISS.DOC`	This manual in Word for Windows format.
`WAISS.WRI`	This manual in Windows Write format.
`WAISS.PS`	This manual, in postscript ready for printing.
`COPYRITE.TXT`	The copyright statement for this product.
`READ.ME`	Summary of new features, etc.

4. Decide which directory you are going to put the `WAISS.EXE` file in, and move it there. A good choice is the `\WINNT\SYSTEM32` directory, which is where many other services live. Using the Security/Permissions menu option in the File Manager, ensure that the SYSTEM user has read permission for the file.
5. Move the `WAISS.CPL` file to the `\WINNT\SYSTEM32` directory. Start the Control Panel from the Program Manager to verify that the WAIS Server applet is represented as an icon in the Control Panel.
6. Determine which version of the WAIS Server you have. To do this, at the Windows NT Command Prompt, type:

```
waiss -version
```

and the version number of the program will be displayed. This manual covers Version 0.3. (If the program reports a later version number, you will find a corresponding later manual in the files you unpacked

from the ZIP archive.) You should also check the IP address of your machine using the command:

```
waiss -ipaddress
```

This will display the IP address as reported by the Windows Sockets API. If it is incorrect, you need to reconfigure the TCP/IP software on your machine. The WAIS Server will not work if this address is wrong.

7. If you have installed a previous version of the WAIS Server, remove it by typing:

   ```
   waiss -remove
   ```

   See section 2.4 for further information. You can use either the old or the new version of `WAISS.EXE` to perform this remove operation. Note that this will delete your existing WAIS Server configuration information from the Registry. IF YOU ARE REPLACING VERSION 0.1 WITH VERSION 0.2 OR LATER, READ THE NOTE AT THE END OF THIS SECTION!

8. Install `waiss` into the table of Windows NT Services (and simultaneously register it with the Event Logger) by running the program from the Windows NT command line, specifying the `-install` flag. (NOTE - it is vital that you execute this command using the copy of `WAISS.EXE` which you placed in the `\WINNT\SYSTEM32` directory, and not using some other copy which you plan subsequently to delete.) For instance:

   ```
   waiss -install
   ```

   The program will register itself and its location with the Service Manager and with the Event Logger, and will report success or failure. In the case of failure, see the section on Installation Problems below.

9. To verify that the installation has succeeded, start the Windows NT Control Panel and double-click on the Services icon. The resulting dialog should list WAIS Server as one of the installed services. If so, see the Configuration chapter for further instructions.

NOTE - UPGRADING FROM VERSION 0.1 TO VERSION 0.2 OR LATER. With version 0.2, the "short name" by which the WAIS Service is known to the operating system changed from "WAIS Server" to "WAISS". This means that the Windows NT registry stores information about the service in a different place from earlier versions. If you are upgrading from version 0.1 of the WAIS Server, this has two consequences:

- The information stored in the registry by the earlier version of WAISS must be deleted. This can be done by running the earlier version of WAISS from the command line with the `-remove` flag. Alternatively, version 0.2 or later (when you run it with the `-remove` option) will detect whether information relating to version 0.1 is present in the registry, and if so it will delete it. However, both methods have occasionally been observed to cause the EventLog Service to terminate with an access violation. This is harmless - just restart the EventLog Service from the services dialog in the control panel.

- When you replace version 0.1 with 0.2 or later, any events recorded in the Event Log by the earlier version will be unintelligible. This is because the Event Viewer program cannot find the information in the registry which tells it where the `WAISS.EXE` file is located.

2.3. Installation Problems

The system says that WAISS.EXE is not a Windows NT program

This is probably because you are trying to run an executable for the wrong sort of processor. Check you have unpacked the correct ZIP file for your processor type.

WAISS waits for a while, then terminates with a usage message

You must not run `waiss` from the command line or from the File Manager, except with the `-install` or `-remove` or `-version` or `-ipaddress` options. The `waiss` program is a Windows NT "Service", and must be started through the Services dialog in the Control Panel.

The system says that the WAIS Service won't install because of a "duplicate service name"

You must remove a previous version of the Gopher Service using the `waiss -remove` command before installing with `waiss -install`.

"CreateService Failed with error: service already installed".

This error message occurs if you type `waiss -install` when the WAIS Server is already installed. You cannot install two WAIS Servers.

2.4. Deinstalling

This section describes what to do if you want to remove the WAIS Server from your computer, or if you want to move the program to a new location.

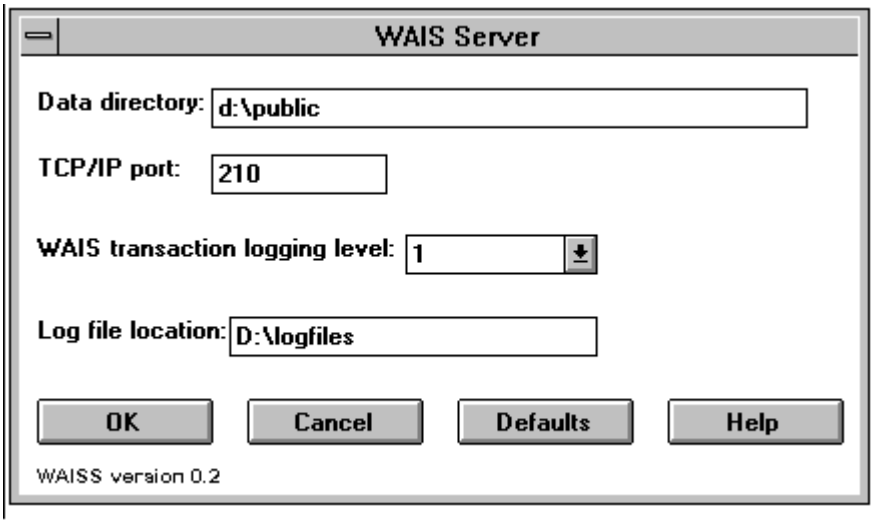
1. If necessary, stop the WAIS Server using the Stop button in the Services dialog in the Control Panel.
2. At the Windows NT command line, run `waiss` with the `-remove` option:
   ```
   waiss -remove
   ```
   This will remove the WAIS Server from the Service Manager's list of services. NOTE - this also deletes the WAIS Server's configuration information from the Registry.
3. If you are deinstalling the WAIS Server, simply delete the `WAISS.EXE` program, the `WAISS.CPL` Control Panel applet, and the `WAISS.HLP` help file.
4. If you want to move `WAISS.EXE` to a new location, you must move the file, then type `waiss -install`. This informs the Service Manager and Event Logger of the new location of the program. You will need to configure the WAIS Server and start it running again from the Control Panel.

3. CONFIGURATION

3.1 The WAIS Server Control Panel Applet

The WAIS Server is configured using the WAIS Server applet in the Control Panel.

The WAIS Server applet looks like this:



Note that the version number of the applet is displayed in the lower left-hand corner of the dialog. The version number reported by the command

```
waiss -version
```

must be the same as the version number of the applet.

You can use this dialog to:

- Set the root of the directory tree containing the files you wish to make available using WAIS. Use the **Data directory:** field for this. Full details of how WAIS treats the files and directories in this directory tree are given later in this manual. Default: `D:\WAIS`.
- Specify the TCP/IP port on which the WAIS Server listens for incoming connections. Use the **TCP/IP port:** field for this. The value must be a positive integer representing a legal and otherwise unused port. Default: 210.
- Control the amount of information which is logged for every WAIS transaction. The WAIS Server records information about each WAIS request it receives in a text file. The list box in the control panel lets you select either no logging, or a varying amount of logging information up to "full logging" which records everything. See section 4.4 for further information. Default: None.

- Specify the directory in which the log files will be located. This entry field is disabled if no logging is requested.
- Restore the default values of all the configuration settings. Click on the **Defaults** button to do this.

When you have finished making changes to the configuration, click on the **OK** button. In order for the configuration to take effect, you will need to stop and restart the WAIS Server using the Services dialog in the Control Panel - see section 4.1.

3.2 Putting the Data Directory on a Fileserver

If the directory tree which you wish to make available to WAIS clients is located on a fileserver instead of on the local Windows NT machine, you will need to take special action.

Normally, directories on the fileserver are mapped to a drive letter on the local system. You might expect that simply using the mapped drive letter in the WAIS Server configuration dialog would have the desired effect, and indeed it does - until you log off the local machine.

Drive mappings are established only when someone logs on to the Windows NT machine. They are specific to a user, not to the machine. The WAIS Server is normally kept running, independently of whether someone is logged onto the machine or not. Often, the WAIS Server will be set to start up automatically when the operating system loads, when no-one is logged in and there are therefore no drive mappings in effect.

To overcome this, you can specify the WAIS Data Directory in the WAIS Configuration dialog using a UNC form of directory name - for instance:

```
\\CLYDE\INFOSERVER
```

Here, `CLYDE` is the name of the server, and `INFOSERVER` is the sharename of the directory which is to be served using WAIS.

4. OPERATION

4.1. Using the Services Dialog

You use the Services dialog in the Windows NT Control Panel for managing the WAIS Server operation.

After you install the WAIS Server, you can start it running by selecting it from the list of services in the dialog and clicking the Start button. If all goes well, a message box containing a rotating timer will appear while the service starts up, and will then disappear. The WAIS Server will then appear in the list of services with status "Started", and will be able to respond to WAIS clients.

If the service fails to start, it can be for one of several reasons. You may get a message box indicating the source of the problem. See the chapter on Troubleshooting for further information.

You may want to arrange for the WAIS Server to start automatically when the system is started. You can do this using the **Startup** button in the Services dialog. You can also use this button to specify a different user ID for `waiss` to run under. See your Windows NT documentation for details.

Note that you cannot start up the WAIS Server automatically if the WAIS data is located on a network volume. This is because the network connection is not yet established when the WAIS Server starts.

Pausing the WAIS Server (using the **Pause** button in the Services dialog) causes the following behaviour:

- Any WAIS transactions currently underway will be unaffected. They will run to completion.
- Any new WAIS connections will be queued. When the service is Resumed, they will be accepted and processed.
- If more than five incoming connections are received while the service is paused, the extra connections will be rejected.

4.2 The WAISSERV Program

When an incoming TCP/IP connection from a WAIS client is received by the WAIS Server, `WAISS.EXE` will execute the `WAISSERV.EXE` program. This program reads and writes information from and to the connection, and handles all the Z39.50 protocol encoding and decoding and the database searching.

`WAISSERV.EXE` is a Windows NT "console" application, meaning that it can be executed from the command line. However, it is not useful to do so,

except if using the -v flag to determine the version of the program. WAISSERV.EXE is documented in the WAIS Toolkit manual.

In order for WAISS.EXE to find and execute the WAISSERV.EXE program, it is essential that the latter is placed in a suitable location such as \WINNT\SYSTEM32.

4.3. Error Logging

If an error in the operation of the server occurs, the error will be logged in the Application Event Log. This log may be viewed with the Event Viewer, which you will find in the Administrative Tools program group in the Program Manager. See your Windows NT documentation for details of how to use the Event Viewer.

The errors logged in the Application Event Log are usually associated with a system call failure caused by lack of resources, or a problem with the configuration information).

When the WAIS Server is started or stopped, Information events are recorded in the Application Event Log.

Problems detected by the WAISSERV.EXE program are recorded in the log file file rather than in the Event Log..

Note that the Event Viewer uses the WAISS.EXE program to interpret messages associated with events. Therefore, if you delete the WAISS.EXE file, the WAIS Server events in your Application Event Log will be unintelligible.

4.4 WAIS Transaction Logging

If you select anything other than "None" for the WAIS transaction logging level in the WAIS Server configuration dialog, then for every WAIS request which the server receives, it will record certain information in the log file.

A new log file is created every day. The file name is of the form WSyymmdd.LOG - so that for instance the file corresponding to 4 July 1994 would be WS940704.LOG.

You will need to clear out the log directory periodically.

5. WAIS DATABASES AND THE DATA DIRECTORY

5.1 The WAIS Data Directory

The WAIS Data Directory is the root of a directory tree within which you must locate files and databases you want to make available to WAIS clients. Points in the file system above the Data Directory, or on other disks, are not accessible to WAIS clients. The Data Directory must be located on a disk which uses the HPFS or NTFS file systems, because the indexing process requires long filename support.

The Data Directory tree must be accessible by the user ID under which `waiss` runs. Normally, this is the SYSTEM user ID.

5.2 Creating WAIS Databases

WAIS databases are created using the `WAISINDEX.EXE` program, from the WAIS Toolkit for Windows NT. Before reading this section, you should read the WAIS Toolkit manual. (The WAIS Toolkit for Windows NT is available from the same place you obtained this WAIS Server software.)

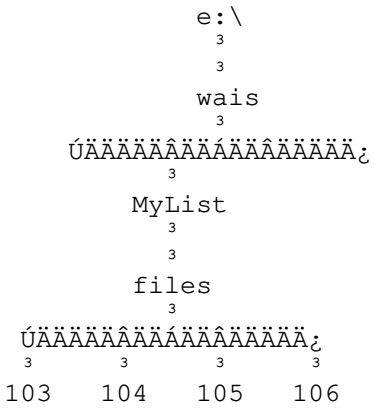
When the `WAISSERV.EXE` program runs, its current directory is the WAIS Data Directory, and all file references are relative to that directory. Therefore, when you index a set of files and create a WAIS database, the WAIS Data Directory must be the current directory when you run the `WAISINDEX` program.

Let's look at how to create a simple WAIS database of mail messages.

Prepare the directory structure

Let's assume that the WAIS data directory is `e:\wais`, where drive `e:` is on an NTFS partition. Within that directory, you've created a subdirectory `MyList` to hold the database of mail messages from a mailing list. Now, create a directory `files` under `MyList`, which is to hold the actual mail messages, one to each file.

Here is the directory tree in graphical form:



The mail messages in this example have filenames which do not include extensions, like `103`.

Index the messages

Using a Windows NT command prompt, change to the WAIS data directory (`e:\wais`). This is so that the filenames in the filename table which will be created by the indexing program are relative to the WAIS data directory.

Run the indexing command:

```
waisindex -d MyList\index -export -t netnews MyList\files\*
```

This will create files called `index.src`, `index.inv`, etc, in the `e:\wais\MyList` directory.

Test the database

To verify that the index functions correctly, use the WAISLOOK program (from the WAIS Toolkit for Windows NT) to examine it:

```
waislook -d MyList\index foobar
```

This should return a list of files and headlines which contain the word "foobar".

You should also test the operation of the database with a remote WAIS client, by copying the `index.src` file to the client machine and selecting that database to make a query.

Register the database

If your database is for public use, you may wish to register it with the database of databases. To do this, first check the information in index.src, making sure it contains an IP address and a DNS name, as well as the TCP/IP port you are using for the WAIS server. Then mail the file to the following addresses:

```
wais-directory-of-servers@cnidr.org
```

```
wais-directory-of-servers@quake.think.com
```

Updating the database

When a new message (say `107`) arrives in the `e:\wais\MyList\files` directory, you should run the WAISINDEX command to update the index. Change to the `e:\wais` directory, and issue the command:

```
waisindex -d MyList\index -t netnews -a MyList\files\107
```

This will add the new file to the directory. Normally, of course, you would arrange for this command to be executed automatically in a batch file.

Note that the `WAISSERV` program will NOT automatically re-index the database if a new file is added to the directory. You must do that yourself.

6. TROUBLESHOOTING

This chapter lists some of the problems which you may have in running the WAIS Server, and describes how to overcome them.

6.1 Errors Starting the WAIS Server

When starting the WAIS Server, you may see one of the following error messages.

Could not start the WAIS Server service on \\yourmachine. Error 0002: The system cannot find the file specified.

The Service Manager could not locate `WAISS.EXE`. This probably means it has been moved, or has not been installed correctly. Remove and reinstall the WAIS Server - see section 2.4 for details.

Could not start the WAIS Server service on \\yourmachine. Error 0005: Access is denied.

`WAISS.EXE` is inaccessible to the SYSTEM user. By default, the Service Manager starts the WAIS Server process running under a user ID of SYSTEM. The executable file for the service must be readable by this user.

Could not start the WAIS Server service on \\yourmachine. Error 2140: An internal Windows NT error occurred.

This usually means a problem with the configuration of the WAIS Server. Further information detailing the precise problem will be recorded in the Application Event Log - see the section on Error Logging elsewhere in this manual for details on how to view this information. A description of some of the most common errors is given below.

6.2 Errors Recorded in the Event Log

This section records some of the error messages which may appear in the Application Event Log. Many of these are self-explanatory.

Windows Sockets library function "bind" failed. The address or port is already in use.

One of the following situations may give rise to this error:

The TCP/IP port you have specified in the WAIS Server configuration dialog is conflicting with another application. Choose a different port number.

The IP address which the WAIS Server is using is incorrect. Start the Network Control Panel applet, and configure the TCP/IP software to use the correct IP address.

Windows Sockets library function "accept" failed. The call was cancelled.

This indicates that the WAIS Server terminated abnormally for some reason. Restart the service.

APPENDIX I - REGISTRY ENTRIES

This appendix lists entries added *explicitly* to the Windows NT Registry by the WAIS Server. A number of other entries are added to the Registry implicitly by the Service Control Manager. The information in this appendix is not guaranteed to remain unchanged between releases of the WAIS Server. The information is intended for advanced users of Windows NT who understand the function and structure of the Registry.

The Service Control Manager creates the following entry in the `HKEY_LOCAL_MACHINE` database:

`SYSTEM\CurrentControlSet\Services\WAISS\Parameters`

Under this entry, the WAIS Server itself creates the following entries, which are used to hold the configuration information.

Entry name	**Entry type**	**Description**
`Directory`	`REG_SZ`	WAIS Data Directory name
`PortNo`	`REG_DWORD`	TCP/IP port number
`LogDirectory`	`REG_SZ`	Directory where log files are created.
`LogLevel`	`REG_DWORD`	Volume of log information: 0 means none, 10 is the maximum.

APPENDIX II - FORMAL COMMAND SYNTAX

The formal description of the `waiss` command options is as follows.

Syntax

```
waiss [-remove | -install] [-version] [-ipaddress]
```

Description

The `waiss` command installs or removes the WAIS Server.

Options

`-install`	Add the WAIS Server to the list of installed services. Make sure you are executing a copy of `WAISS.EXE` which you aren't planning to delete later.
`-remove`	Remove the WAIS Server from the list of installed services. This will also delete the WAIS Server configuration information from the Registry.
`-version`	Report the version number of the WAIS Server.
`-ipaddress`	Report the IP addresses on which the WAIS Server is listening.