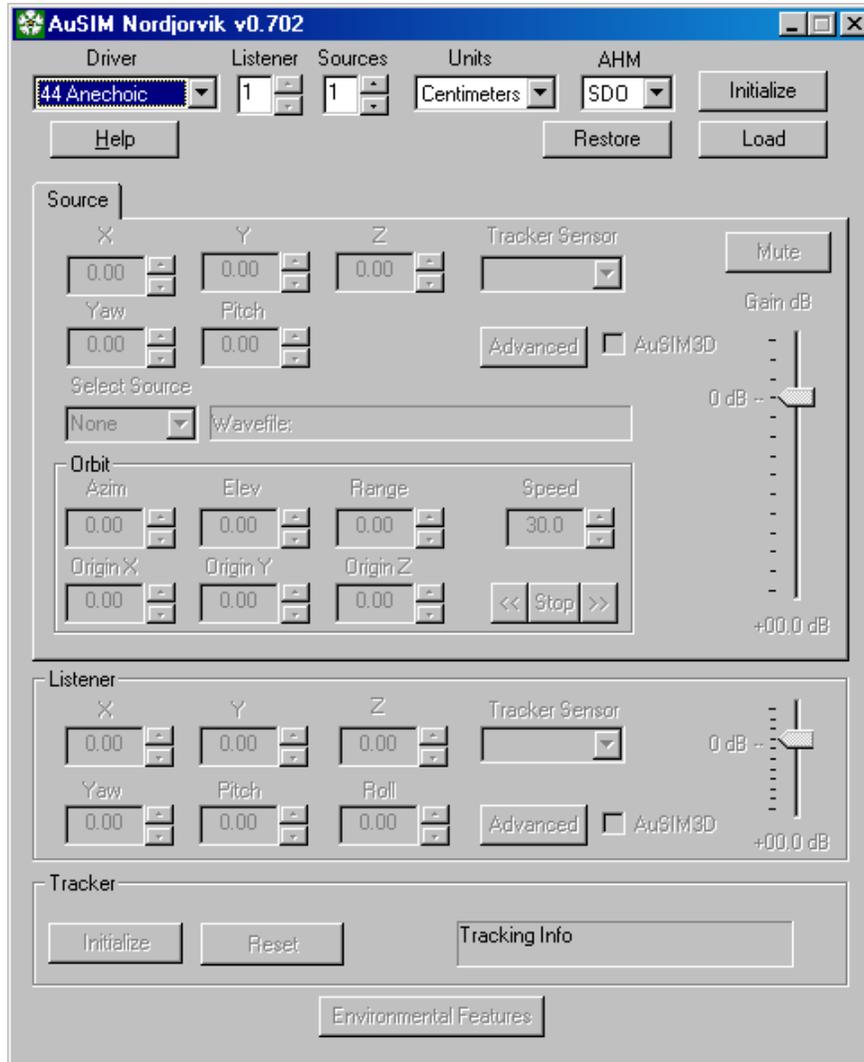


AuSIM Nordjorvik v0.7x

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Nordjorvik is a sample application for the AuSIM API. The user interface was created using Microsoft Foundation Classes. Nordjorvik can do almost everything that the current version of the GoldServe allows, making it an excellent tool for exploring the abilities of the AuSIM API. Many sources can be initialized; both pre-recorded and live input and the sounds can be orbited and tracked with just a few mouse clicks. Nordjorvik is constantly being updated to reflect the latest features that have been added to the GoldServe.



Initialization

AuSIM Nordjorvik is initialized using the controls on the top row of the user interface.



A new feature of AuSIM Nordjorvik is the ability to restore previously stored Nordjorvik data from a file. To initialize Nordjorvik in this way, please see the “Restore from File” section below

Driver

The current release of Nordjorvik requires that the default driver “44 Anechoic” be used to initialize the GoldServe . The Driver drop-down list will allow you to select 48 or 96 kHz rendering or more sophisticated models in future Nordjorvik releases.

Listener

Each specific listener of AuSIM Nordjorvik requires it’s own version of the GoldServe . Currently, Nordjorvik only supports one listener and so the listener ID at the top of Nordjorvik should always be set to 1.

Source

To select the number of sound sources to run on the server, adjust the control labeled “Sources”. The maximum number of sources that can be used in this application is 16. Once the server is running, it is not possible to add sources without an “Audio Close”. You should initialize all of the sound sources that you could possibly want to be playing simultaneously, but be aware that a large number of sources (>12) may lead to some degradation of sound quality depending on the version of the GoldServe you are using.

Units

The default units for AuSIM Nordjorvik are centimeters. This release of Nordjorvik has been optimized for this default. If you need very small or large distance ranges, or if you are not familiar with the metric system, you can change the units by selecting from the drop-down list labeled “Units”. You may choose from the following units: meters, centimeters, millimeters, feet, inches. The locations of all the sound sources and the listener can be set to two decimal places.

AHM

The default Acoustic Head Map is “SDO”. AuSIM Nordjorvik allows you to choose from a small selection of different AHM’s. You may want to spend some time trying the different options to find the AHM that gives you the most realistic aural images.

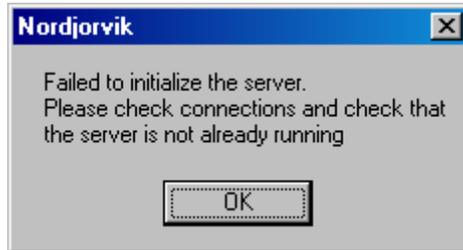
- SDO = small-headed female
- TWS = large and round headed male
- SLV = medium-sized headed male
- WLC = large, medium-shaped headed male

The AHM can only be changed prior to initialization. AHM's may be quickly compared by setting up a listening experience with one AHM, storing the setting with Nordjorvik's store and restore feature, closing the server, selecting a different AHM, and then restoring the setup. Change the current AHM by selecting from the drop-down list labeled “AHM”.

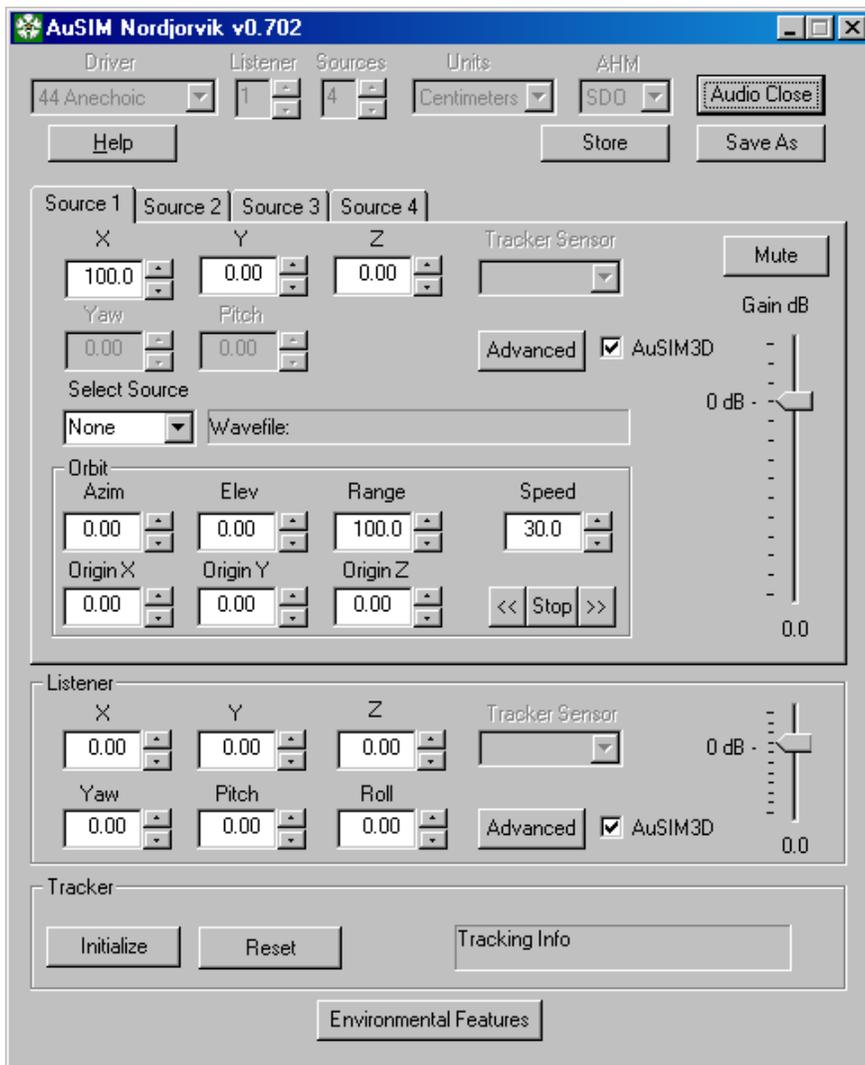
Initialize Button

Before selecting the “Initialize” button, be sure that you have the server running and correctly connected to your client. The best way to test this is to run the ConnectTest GUI from Start->AuSIM->Client or the location to which you copied the client software.

If the connection to the GoldServe fails, either because the GoldServe is not running or because it has already been initialized by another application, a message will appear suggesting that you check the GoldServe .



After Nordjorvik has been initialized, the controls to position the sound sources and the listener are enabled.

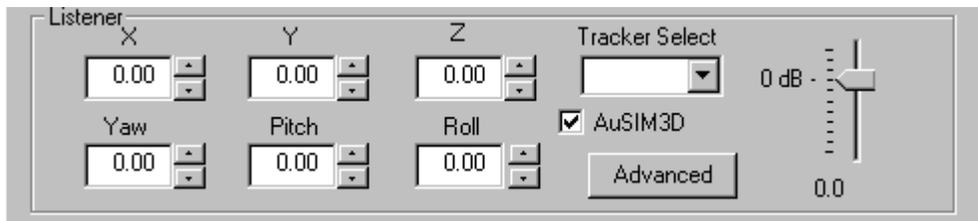
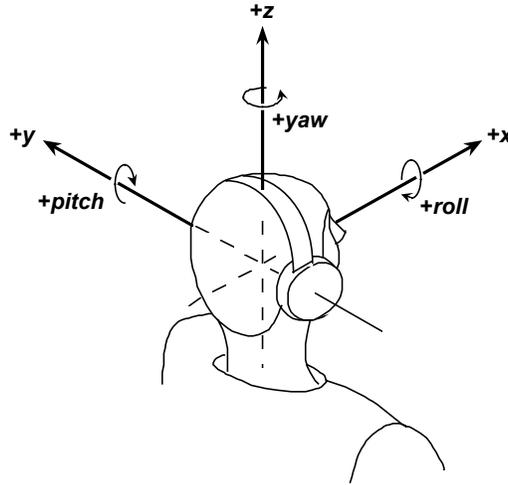


The GoldServe will also be updated to show the correct number of sound sources at their default locations.

Listener Control

Position and Orientation

The variables for the listener are set in the Listener panel. The position is set, in the units selected before initialization, by adjusting the values of the spinners labeled “X, Y, Z, Yaw, Pitch, and Roll”. These variables are explained in detail in the GoldServe manual.



Each value can either be adjusted by increasing or decreasing the spinner, or by typing a value into the edit box.

Gain

The gain control found in the Listener panel is used to change the overall volume of the audio. The relative levels of the sound sources are preserved when this slider is changed. The number underneath the slider gives the current setting in decibels. The default value for the Listener panel slider is 0dB.

AuSIM3D

The AuSIM3D checkbox toggles the AuSIM3D positional audio on or off. As with the level control slider, this checkbox affects all the audio (everything that the listener hears) so will turn off AuSIM3D for all sound sources. If AuSIM3D has been turned off for only some sound sources (as explained in the section of this document labeled “Source Control”) then the check in this box will be under-intensified.

Tracker

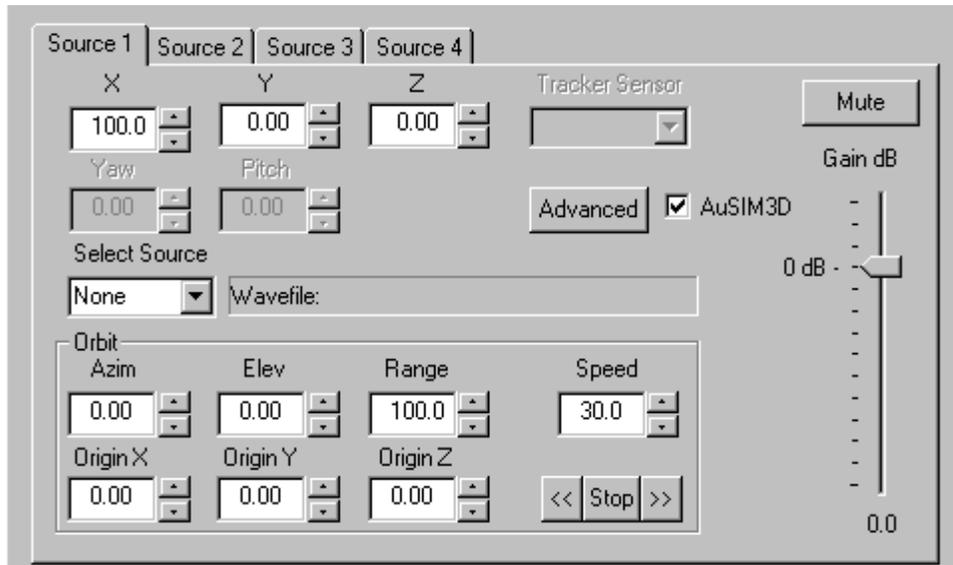
If you have a tracking system connected then you may want to track the position of the listener. This is usually done by attaching the sensor to the top of the listener’s headphones. If the tracker has been initialized (see the section of this document labeled Tracker Initialization), then the drop-down list labeled “Tracker Sensor” will be enabled. Any available tracker sensors will be listed automatically. Select the correct sensor, or select “none” if you do not wish to track the position of the listener.

Advanced

The button labeled “Advanced” opens a new window containing the advanced features relating to the listener.

Source Control

Once AuSIM Nordjorvik has been initialized successfully, the Source panel is enabled. The panel takes the form of a tab control, with a labeled tab for each of the successfully initialized sound sources. The panel shown here has 4 successfully created sound sources.



Clicking on one of the tabs shows the information for that sound source.

Position

The position of the currently selected sound source can be set in the same way as for the listener position: The position is set, in the units selected before initialization, by adjusting the values of the spinners labeled “X, Y, Z, Yaw, Pitch, and Roll”. These variables are explained in detail in the GoldServe manual. Each value can either be adjusted by increasing or decreasing the spinner or by typing a value into the edit box. In the current version of Nordjorvik, orientation of sound sources is not enabled.

Audio Source

To select an audio input channel for the currently selected source, choose from the drop-down list box labeled “Select Source”. The Channels refer to live audio input channels numbered as explained in the GoldServe manual. Selecting “Wavefile” creates a new window where you can choose from a list of wave files or type in the location of a wave file that can be found on the machine running the GoldServe . When no explicit absolute path is given, the wave file is found in a relative path from the wave file repository on the GoldServer. If the wave file opens successfully, its name should appear next to the “Select Source” list and should also replace the source number on the currently selected tab. The display of the GoldServe will also tell you if the wave file opened or not.

Gain

The volume control found in the Source panel is used to change the relative level of the currently selected sound source. If the level is set very low in the Listener panel, then the sound source level will sound much softer at 0dB than if the value in the Listener panel were unchanged from the default. The number underneath the slider gives the current setting in decibels. The default value for the Source panel slider is 0dB.

Each sound source has a button labeled either “Mute” or “UnMute”. This is used to instantly reduce the level of the sound source to be inaudible or to restore the level to the value it held before being muted.

AuSIM3D

The AuSIM3D checkbox toggles the AuSIM3D positional audio on or off. As with the level control slider, this checkbox affects only the currently selected sound source. This check box has two states - on or off. If AuSIM3D has been turned off for only some sound sources, then the Listener panel check will be under intensified.

Tracker

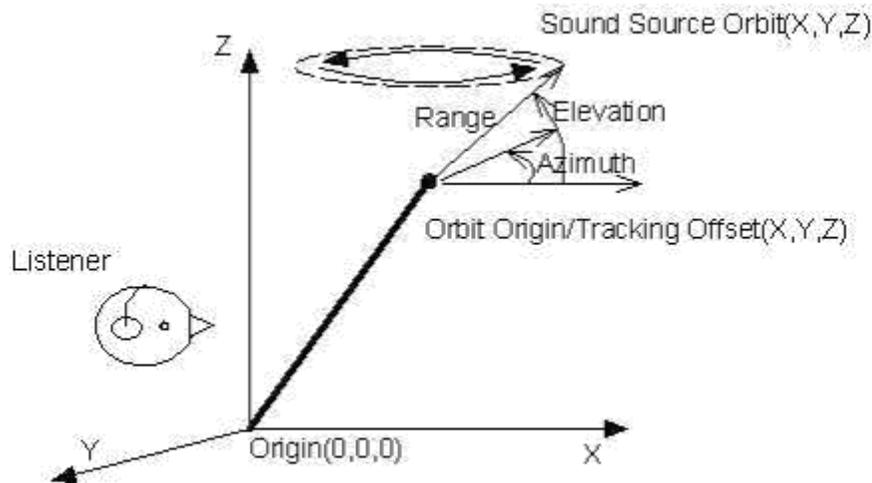
If you have a tracking system connected then you may want to track the position of some of the sources. Moving the selected sensor around will change the apparent position of the sound source with which it is associated. If the tracker has been initialized (see the section of this document labeled Tracker Initialization), then the drop-down list labeled “Tracker Sensor” will be enabled. Any available tracker sensors will be listed automatically. Select the correct sensor, or select “none” if you do not wish to track the position of the current sound source.

Advanced

The button labeled “Advanced” opens a new window containing the advanced features relating to the sound source.

Orbit Origin Points and Orbiting

- For each sound source you have the option of setting an orbit or offset origin. The orbit origins can be used when tracking a sound source to create the impression that the sound source is at the end of a stick that you are holding in front of you when you are holding the sensor. If “OriginX” is set to be 10cm, for example, then the location of the sound source will always appear to be 10cm away in the positive X direction from the position of the tracker sensor.



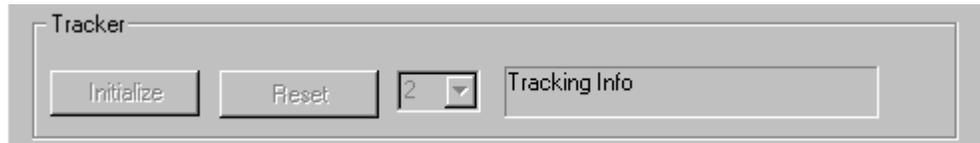
- The “Azim”, “Elev” and “Range” controls show the position, in polar coordinates, of the source relative to the orbit origins. Updating these values will adjust the “X”, “Y”, and “Z” fields and vice versa.
- AuSIM Nordjorvik allows you to make a source orbit around a specified orbit origin point. If the source is not being tracked then the center position around which the orbit is centered would be the position of the orbit origin. If your listener is positioned at X, Y, Z = 0, 0, 0 and you want the source to orbit around the listener, set the orbit origin to 0, 0, 0. In the above diagram the orbit origin has been set to X, Y, Z. The listener position has also moved away from his original 0, 0, 0 position. The listener would hear the sound source making small circles in the air slightly in front and to the left of him, at a slightly higher elevation than his head. If the source is being tracked, then the source will orbit around the current location of its sensor. The radius of the orbit is defined by the “Range” value. To start an

orbit, first set the “Speed” of the orbit to be a non-zero value of degrees-per-second. To orbit clockwise, click on “>>”; to orbit counter-clockwise click on “<<”. To stop a source from orbiting, click “Stop”. When a source stops orbiting, it remains in the position that it had reached when “Stop” was pressed until its location is changed either by entering new coordinates, from tracking information, or by restarting the orbiting.

Tracker Initialization

Please note: The tracking feature on Nordjorvik requires AuSIM's AuTrak Asynchronous Tracker server, sold separately, or bundled with any tracker sold by AuSIM.

If you have a tracker system, then you can choose to track the position of the listener and/or some of the sound sources depending on the number of sensors that you have connected. The Nordjorvik can support many sensors, but is usually run with four or fewer sensors. To initialize the tracking, click on the button labeled "Initialize" in the Tracker panel.



The button is only available after initialization of the application. This enables the "Tracker Sensor" drop-down lists in the Listener and Source panels. If no tracking is available, then these lists will be empty. The default sensor is "none". It is not possible to assign more than one source, or the listener and a source to the same sensor. The "Reset" button will set all of the sound source tracker sensors and listener tracker sensor back to "none".

Restore From File

Once you have all the parameters set up you may save them for future use. Clicking on the "Store" button in the top panel will write the data to a file named NDVKdata.tcd in the current directory. To recover the last set of data that you have stored, close the server by pressing "Audio Close" and then click the "Restore" button. Only the last set of data is saved. Each time the "Store" button is pressed, the previous data is over-written. Alternatively, save the data to a file with your choice of filename use the button labeled "Save As" and use the .tcd file extension. Retrieve this file when Nordjorvik is not initialized by using the "Load" button. There is an example of a .tcd file at the end of this document. The following data from Nordjorvik is saved in a .tcd file:

Number of sources

Listener X, Y, Z, Yaw, Pitch, Roll

Listener level (gain)

Listener tracker index

For each source:

Source Orbit Origin X, Y, Z

Source level (gain)

Source tracker index

Source Azim, Elev, Range

Source Direction of orbit (0 = none, 1 = clockwise, -1 = counter-clockwise)

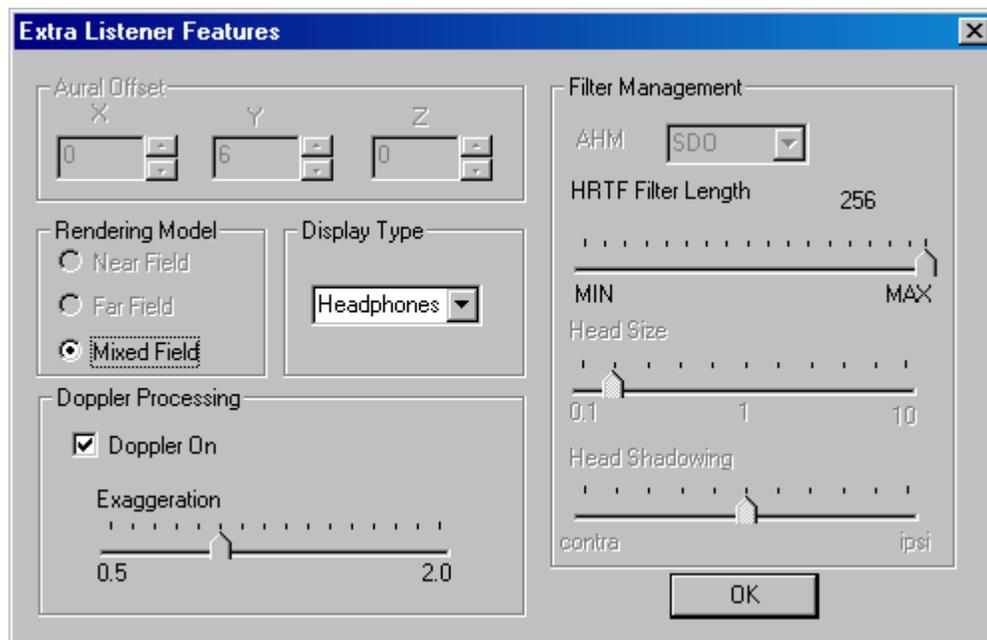
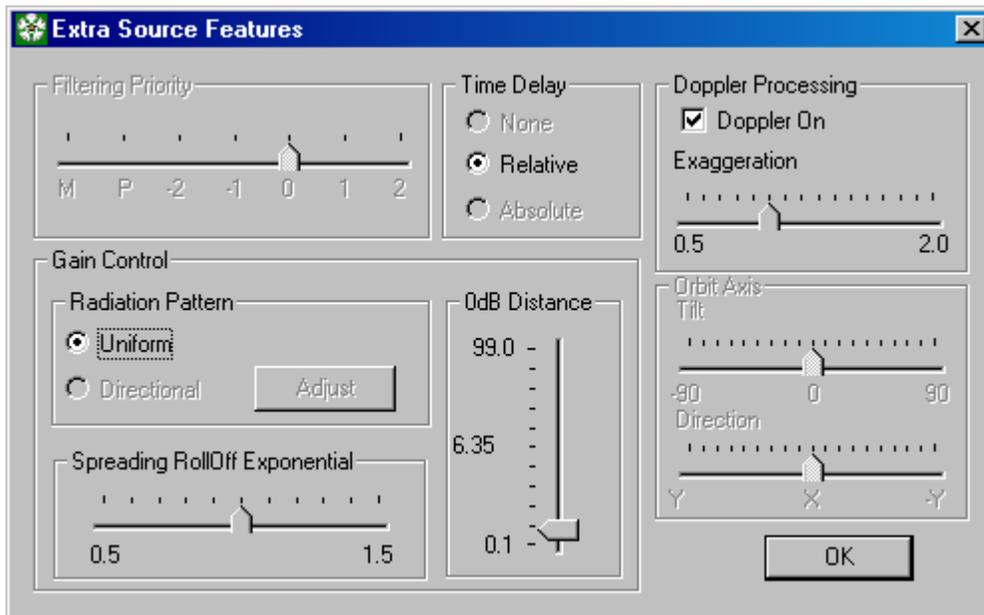
Source Speed of orbit

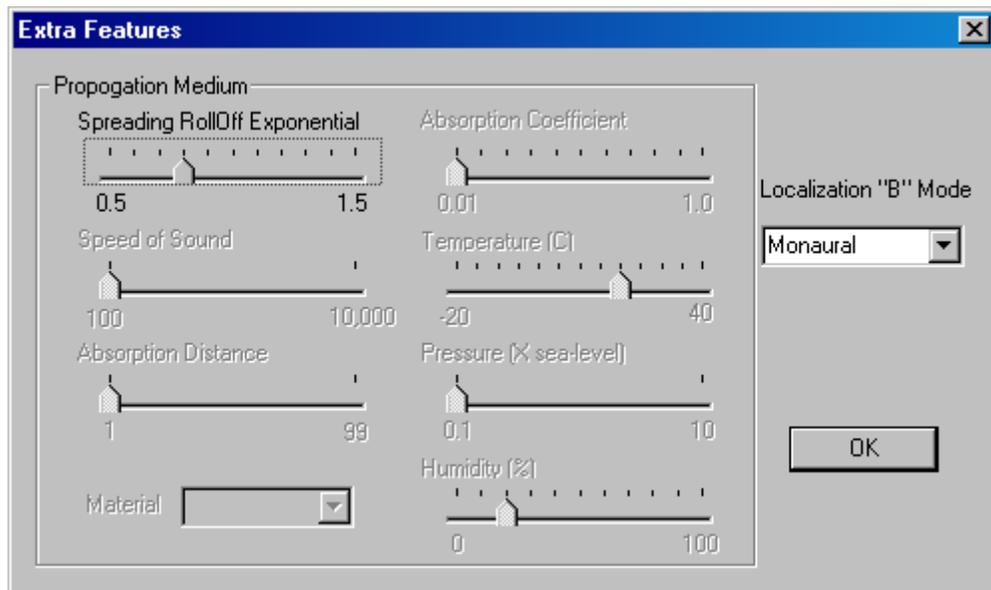
Source input

Source wave file (if any)

Advanced Features

There are three different advanced features windows. The window for the listener is opened from the button labeled “Advanced” in the Listener panel. The window for the global variables is opened from the button labeled “Environmental Features” at the bottom of the main application window. The window for the currently selected source is opened from the button labeled “Advanced” in the Source panel. Check with AuSIM, Inc. for the current implementation state of these features. The terms used may all be found in the GoldServe manual.





Example NJVKdata.tcd file:

TCG 0.1!Nordjorvik quick store/restore data file.

NUMSOURCES 3
TRACKING 0

!Angles are in degrees.

LISTENER XYZ 0.000000 0.000000 0.000000
LISTENER YPR 0.000000 0.000000 0.000000
LISTENER GAIN 0.000000
LISTENER TRACK 0

SOURCE 0 XYZ 13.000000 -9.000000 0.000000
SOURCE 0 GAIN 0.000000
SOURCE 0 TRACK 4
SOURCE 0 AER 4.499540 0.000000 100.002525
SOURCE 0 DIRECTION 1
SOURCE 0 SPEED 30.000000
SOURCE 0 SELECT 2

SOURCE 1 XYZ 0.000000 0.000000 0.000000
SOURCE 1 GAIN 0.000000
SOURCE 1 TRACK 4
SOURCE 1 AER 0.000000 0.000000 100.000000
SOURCE 1 DIRECTION 0
SOURCE 1 SPEED 30.000000
SOURCE 1 SELECT 0 bob

SOURCE 2 XYZ 0.000000 0.000000 0.000000
SOURCE 2 GAIN 0.000000
SOURCE 2 TRACK 4
SOURCE 2 AER 90.000046 0.000000 100.000000
SOURCE 2 DIRECTION 1
SOURCE 2 SPEED 40.000000
SOURCE 2 SELECT 5