



Spatialisation-X-Series Card Version 1.1.4

X-Series Expansion Card for Apogee Rosetta 800/96

Reference manual
Version 1.1.4

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for

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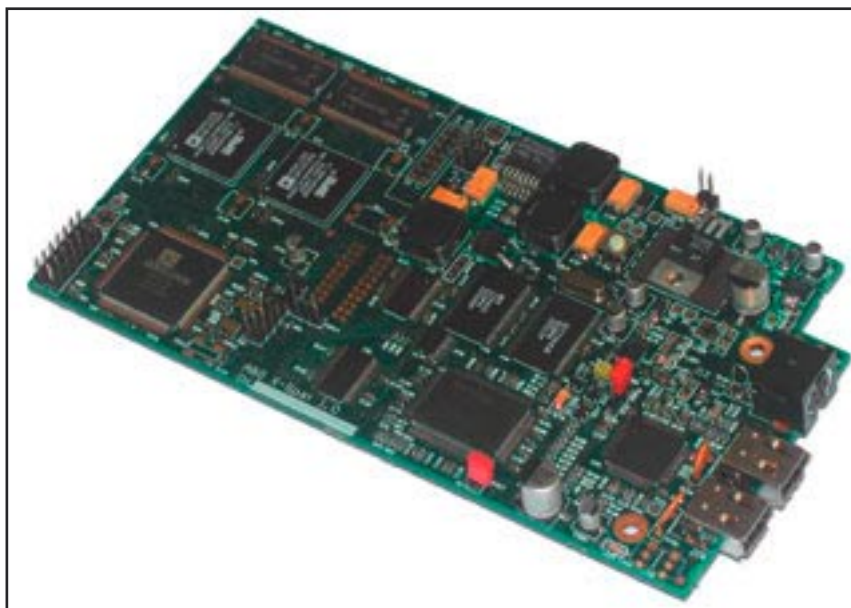
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Welcome!

Welcome to the world wide community of users of the system consisting of the Spatialisation™-X-Series Card and the Rosetta 800 converter, manufactured by Apogee Electronics of Santa Monica, California. With the invaluable help of the famous American company, we have designed another innovative product for 'A&G Soluzioni Digitali' and we are particularly proud that it has been created and continuously updated in Italy by a consortium of strictly Italian companies. It means a lot to everyone who has been involved from day to day in insuring high levels of professionalism and in keeping our products at the sharp edge of modern technology. So we would like to thank you for rewarding our efforts by adopting X-Spat (as we will call the system in brief) as your preferred solution for your productions or multi-channel audio installations.



X-Spat Bundle uses powerful DSP processors and a refined MIDI implementation to provide everything that is necessary to create and execute professional quality audio Spatialisation™ effects in real time.

By the term 'Spatialisation™' we define the combined space-temporal sensations determined by our system, a perfectly three-dimensional Soundscape in which you can immerse your audience. For further information on Spatialisation, and how to use it to achieve best results in terms of realism and impact on your audience, for any type of multi-channel project, we refer you to the chapter: "Suggestions for a correct usage of the X-Spat system".

Not to mention the powerful integrated digital Mixer/Patch bay, completely controllable via MIDI, which the card puts at your disposal utilizing the included Firewire ports. It is an option you can't refuse for all users of ProTools LE, Cubase SX, Digital Performer, Logic, Nuendo, Sonar or any other audio sequencer capable of assigning MIDI control change messages to its graphic elements of control. Using the 3D Spatialisation provided by the DSPs of X-Spat to support or replace normal 2D "panning" of the above items of software, the latter will have at their disposal increased computing power for the other effects that must use the host computer processor.

And there is more.

The complete package offered by A&G includes numerous items of software developed by the same Company from Livorno, i.e. IMEASY X and X-Spat Controller. You can also find some demo versions of software being developed for the hardware system X-Spat, by a growing number of designers from all over the world.

Conventions used in this manual

This manual uses the following terms to indicate elements, choices and key controls:

Term	Meaning
To click	Press the mouse key.
To select	Click once on an object or on its name. If a double click is necessary, it will be indicated in the explanation of the relative function. It may refer to the release of the button in case of pop-up menus.
Confirm	In the standard dialogue windows of the operative system, which are designated for the selection of the elements, click on the buttons 'Open' or 'OK '.
Tools >Time Editor Ctrl+T	Select 'Time Editor ' in the 'Tools' menu. The abbreviation Ctrl+T means that you can get the same result pressing 'Control ' and 'T' at the same time on your keyboard.
Option-click	Press 'Option ' and click at the same time.
Right-click	Press the right key of the mouse.
Ctrl+Left-click	Press the left key of the mouse and the Control key, at the same time.
Checkbox	Box to be selected. Selecting it enables a precisely defined function and the v sign appears inside.
Default	Value previously determined in the system at the time of programming.
Spatializer Inputs	The internal inputs are the 8 audio channels (for a single X-Spat card) used to 'spatialize' audio signals coming from the Rosetta.
Outputs	The channels used by the outgoing Spatializer. The number of outputs must always be the same as the number of speakers used to reproduce Spatialisation™ in the given environment.
Setup	All the settings necessary to achieve Spatialisation™ in a given environment.
X-Spat Base	The hardware system made up of the X-Series Spatialisation card and the Rosetta 800.

For other terms relating to your computer and to its operating system, please refer to its own manuals and instructions.

Compatibility

‘A&G Soluzioni Digitali’ assures compatibility and provides support only for equipment that has been tested and approved. For a list of computers approved by A&G, please refer to the latest information on compatibility available from the Internet site <http://xspat.aegweb.it>

A&G Registration

Make sure that you have filled and mailed or faxed the included registration card. Registered users are entitled to free technical assistance for a year. They will receive regular software updates and will be advised about promotions and special events.

For any question on the X-Spat system, you can contact A&G at the following e-mail address: info@aegweb.it

Connection and Configuration of X-Spat system

The X-Spat system consists of a preinstalled A&G -X-Series Spatialisation Card, and a AD/DA 8 channel Apogee Electronics Rosetta800/96 converter.



View of the Rosetta 800's back panel with an X-Spat card installed. To the left are LED 8 (above) and 9 (below). The LEDs have two colours: LED 8 (STATUS), if the green light is permanently on, indicates correct operation; if the green light is flashing, it indicates that there is no valid connection (i.e. interface is not configured, drivers are not installed, etc.); if the light is red, the card must be repaired.

LED 9 (ACTIVITY) a green light comes on for around 500 ms, if the system is back in sync or if a recognised MIDI has been received (see MIDI Implementation Chart). The same LED 9 (UNLOCK) comes on with a red light for around 500 ms if the system goes out of sync.

To the right are LED 10 (above) and 11 (below), also in two colours. LED 10 flashes a green light if the internal DSPs have booted up correctly and are therefore available. If one of the LEDs to the right, comes on with a red light, call technical support.

Use the adapter provided in the X-Spat package to connect the MIDI IN port to the right of the Firewire ports, to the MIDI interface of your computer. If you are using the Firewire audio connection, this will also provide a two way MIDI port, which can be selected directly from inside your MIDI compatible software. If you can choose between the ports, we advice you to always favour the MIDI IN port in the X-Spat panel. This has been tested and certified by A&G as perfectly compatible with any MIDI interface external to the system, whereas, especially in a Mac OS X environment, the Firewire MIDI port is subject to the modifications that Apple may make to its Firewire driver.

The number of real time parameters available varies according to the sampling frequency of the Rosetta 800. Contact your A&G dealer or visit the Website <http://xspat.aegweb.com> for updated information on the recommended system requirements.

The minimal system requirements to operate the X-Spat system differ according to the configuration of the system and of the platform. To install in Windows XP they are: a computer with a Pentium III processor and 800 Mhz or more with at least 256 MB RAM, a free 400 Firewire port and a CD-ROM reader; Windows XP Professional or Home Studio both exclusively with Service

Pack 1. With Mac OS X they are: a computer with an Apple Macintosh G4 processor at 800 MHz or more with at least 256 MB RAM, a free 400 Firewire port and a CD-ROM reader; version 10.3.5 Mac OS X or superior.

Connect and Set up X-Spat

The first step is to install the X-Spat drivers. *NB. Proceed to next step directly if you are installing X-Spat Controller for Mac OS X.*

To install the X-Spat drivers for Windows XP:

Switch your computer on. Introduce the A&G Software Collection CD-ROM. Identify the X-Spat Driver Installer application and double click on it. When the program opens, select Next to continue. Follow the instructions on the screen to complete the installation. The Installer will guide you through the installation procedure.

The second step is to install the software for the configuration and control of X-Spat. The software is not protected by a copy and an updated version is always available in the X-Spat site at this address:

http://www.aegweb.it/html/html_interne/downloadsD.html

At the same address you will also find various files for the configuration and control, which will allow you to use X-Spat with your favourite audio sequencer. In the following chapters you will find the necessary instructions for their correct utilization.

To install the X-Spat software for Windows XP:

Switch your computer on. Introduce the A&G Software Collection CD-ROM. Identify the X-Spat Installer application and double click on it. When the program opens, select OK to continue. In the Installer dialogue window, select Install. The installer will ask you to select the drive in which to install the X-Spat software. Select your Start-up drive. Follow the instructions on the screen to complete the installation. The Installer will guide you through the installation procedure and the X-Spat software will be installed in a folder called X-Spat in your hard disk.

Once the installation procedure is complete, the Installer will allow you to restart your computer.

To install the X-Spat software for Mac OS X:

Switch your computer on. Introduce the X-Spat installation CD-ROM. Identify the X-Spat Controller Installer application on the CD-ROM and double click on it. In the Installer's dialogue window, select Install. The Installer will ask you to select the drive in which to install the software of X-Spat. Select your Startup drive. Follow the instructions on the screen to complete the installation.

The third and last step is to connect the card to the computer's Firewire interface. *NB. You have already done this step if you are installing X-Spat Controller for Windows XP.*

To connect an X-Spat system via Firewire:

Connect one of the Firewire ports in the X-Spat card installed in Rosetta 800, to the computer's Firewire connector.

Always switch on the Rosetta 800 first and then the computer.

Whichever the operative system in use, at this stage you will have to set the desired sources in and out of the converter on the front panel of the Rosetta 800; for example, select Option in both cases if you want to input and output the computer via Firewire while, at the same time, you want to use the analogical outputs.

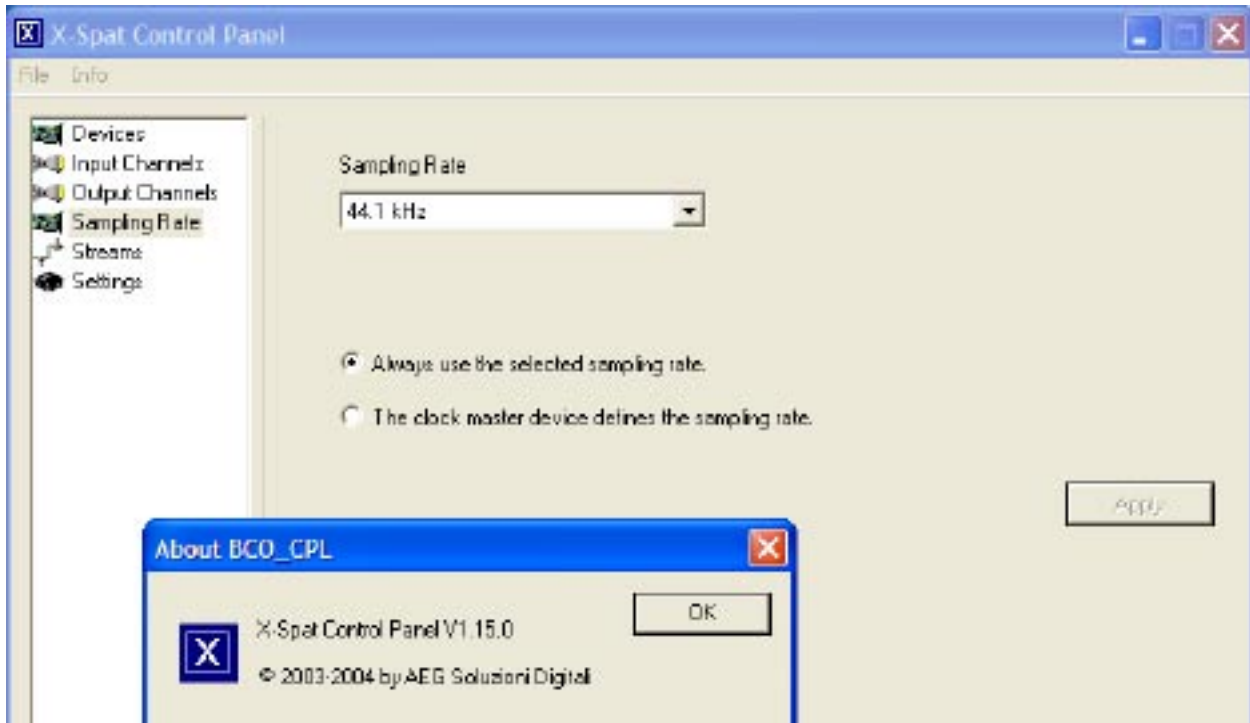
When both the units have completed the set up procedure, you will be able to use your X-Spat system. In case of any difficulty please refer to this manual and, if necessary, to the trouble shooting section.

X-Spat Controller and controlling software for the X-Spat system

The X-Spat system can be completely controlled via MIDI and this feature makes it compatible with the vast majority of software commonly used by sound designers all over the world. This chapter provides the necessary information to use the system correctly with some of the most popular software.

The X-Spat Control Panel for Windows XP

The main function of the X-Spat Control Panel is to provide the system with some information relating to the hardware configuration by which you intend to achieve Spatialisation™ or surround reproduction. The panel includes the following controls and options.

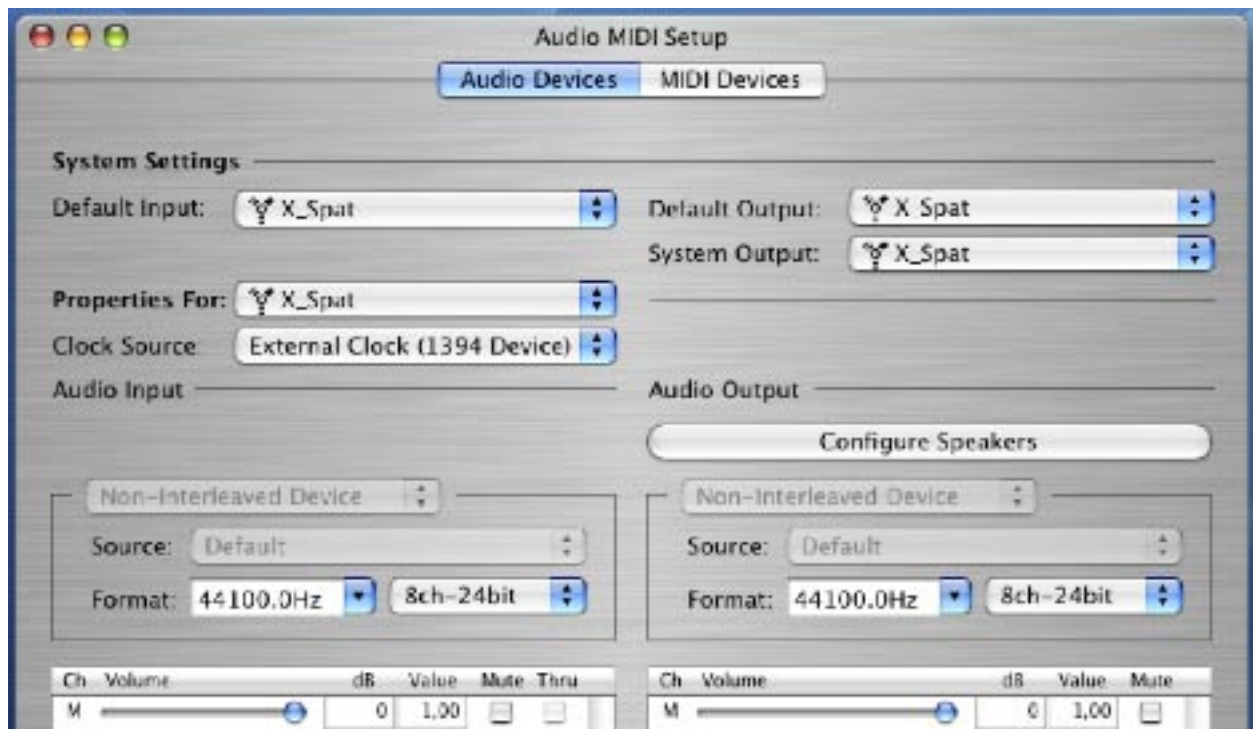


Select Sampling Rate in the left list to access the "Sampling Rate" popup menu. The selected value must always match the value previously selected on the Rosetta 800 front panel. Check the "Always use the selected sampling rate" checkbox then click on the "Apply" button to confirm your selection. Please leave the other options available in the left list untouched.

X-Spat for Mac OS X and the Audio MIDI Setup window

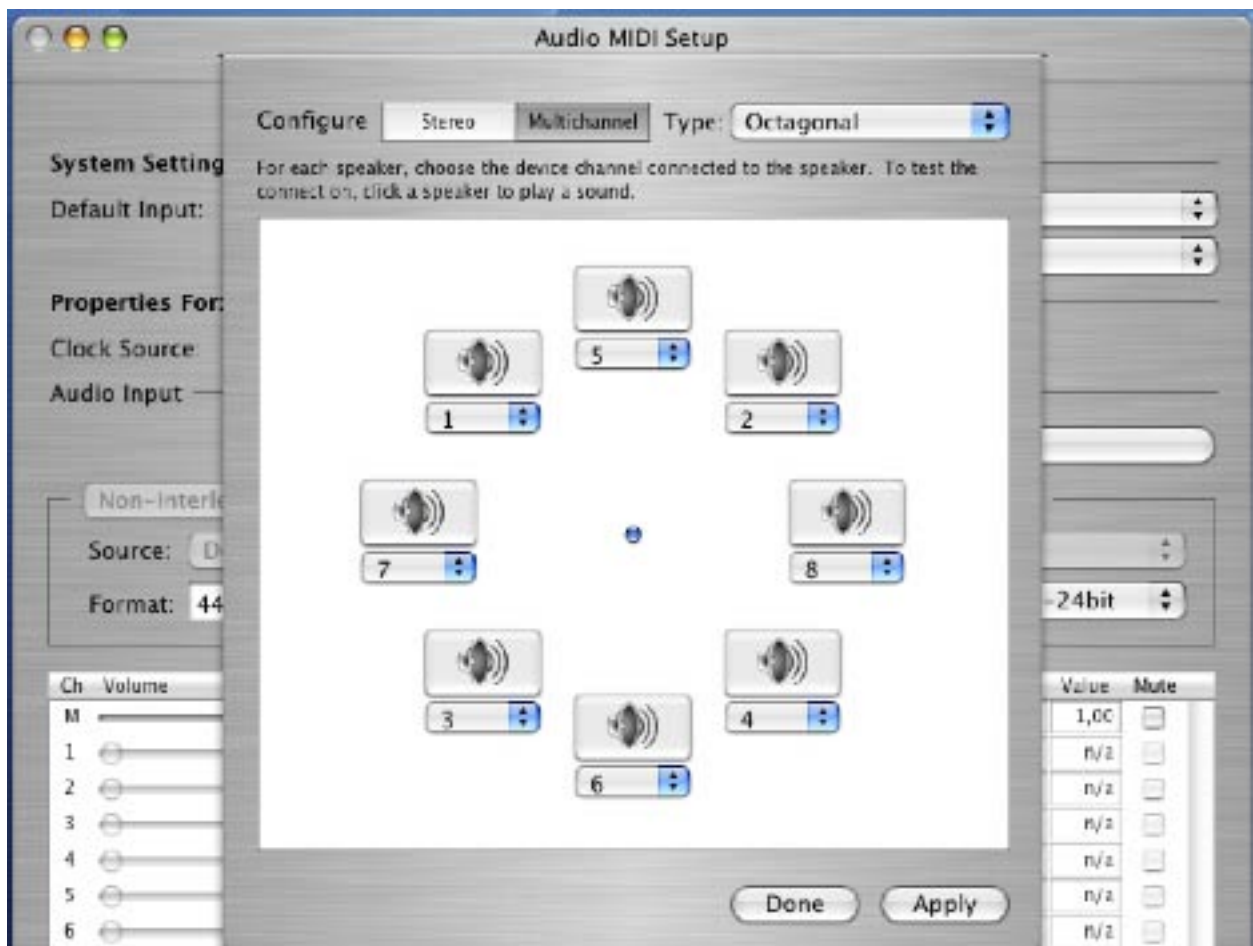
The main function of the Audio MIDI Setup window is to provide the system with some information relating to the hardware configuration by which you intend to achieve Spatialisation™ or surround reproduction. The panel includes the following controls and options.





The pop-up menu 'Format' will allow you to choose the sampling frequency. Available frequencies are 44.100, 48.000, 88.200 and 96.000 Hz. *N.B.: remember that the frequency must be the same as the one manually selected in the front panel of the Rosetta 800 96.*

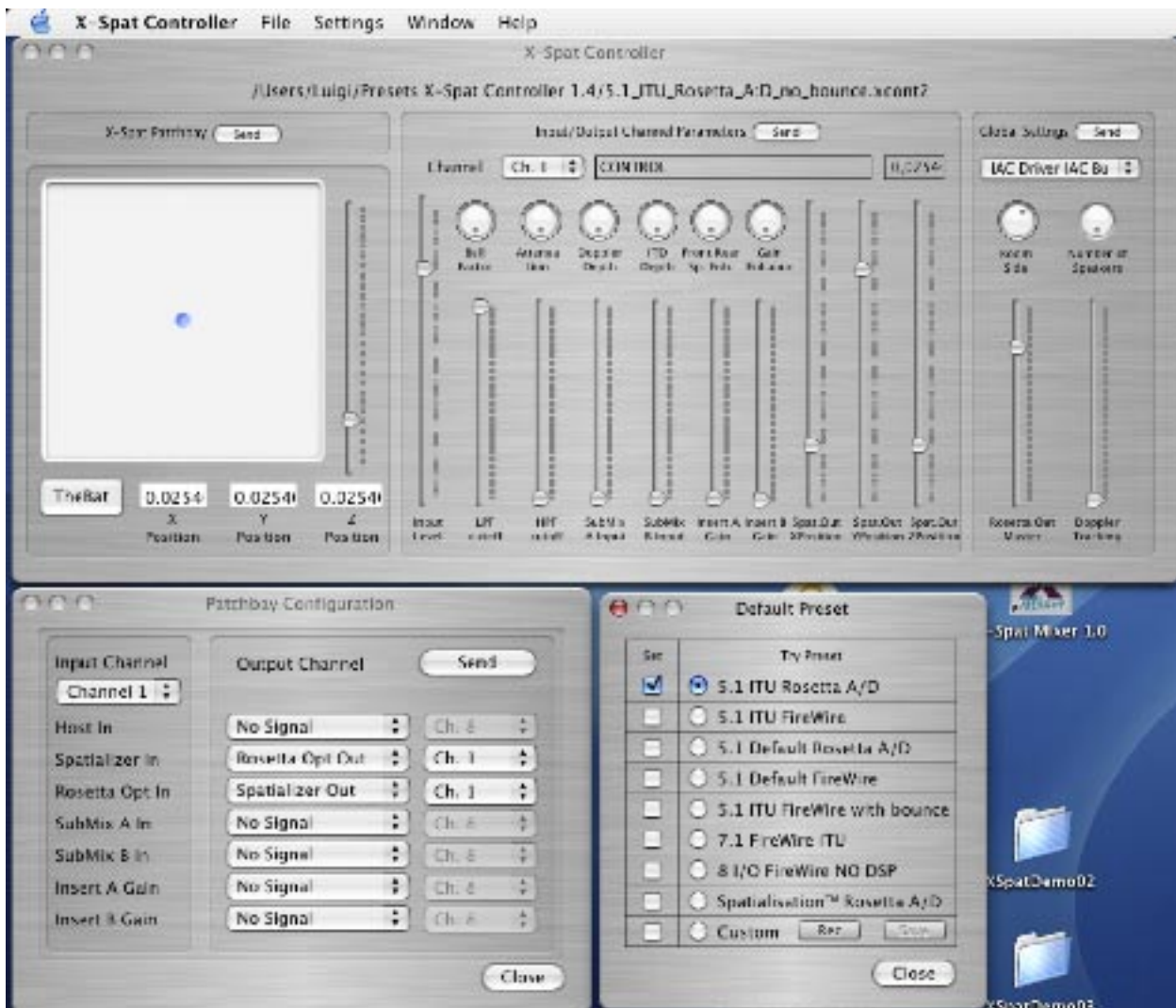
In the Audio Output area you can select the number of outputs necessary for your Session. Select "Configure Speakers", then "Multichannel". Select 'Octagonal' in the popup menu. Select "Apply", then close the window selecting "Done".



The windows of the X-Spat Controller software for Mac OS X

The X-Spat Controller for Mac OS X provides various complementary screens to visualize a set up: the main window, which remains always visible, with parameters that can be modified in real time; the “Patch Bay” window for the card’s internal connections; “Default Preset” for set ups to be kept after Rosetta 800 has been switched off, and for the selection of a custom preset by the user; “Stereo Position Manager” to manage stereo sources.

The origin of the axes XYZ is positioned at default at the absolute center of the virtual cube containing your listeners. Keep this convention in mind when you consider the dimensions of the space to be spatialized.



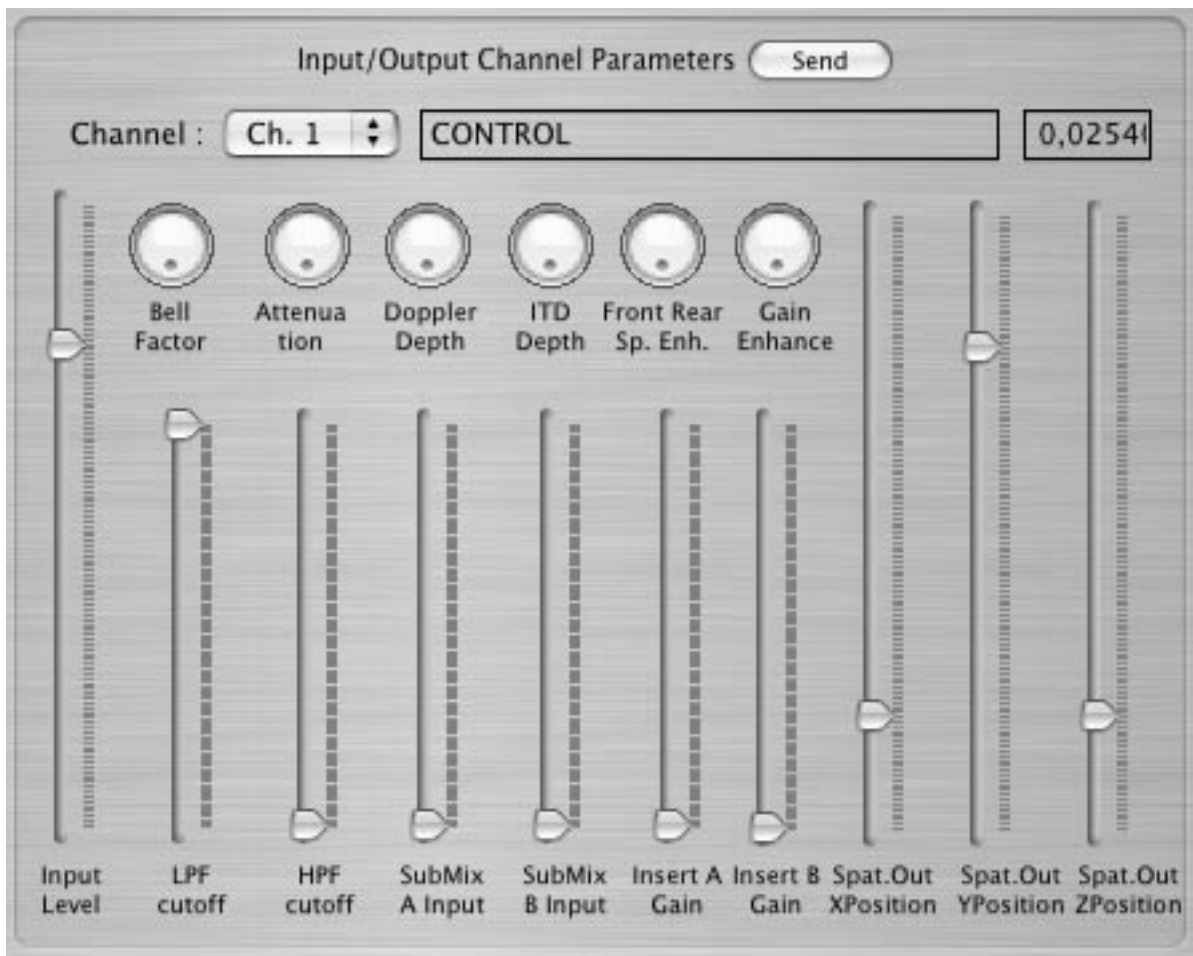
In the main window you can manage the X-Spat parameters that can be modified in real time, independently for each audio channel. Select the channel for which you want to set the input and output parameters using the “Channel” popup menu. Modify the parameters as you like. Repeat the operation for all the channels and save your set up file on the hard disk.

At any time, you can select one of the three “Send” buttons to send the MIDI Control Change messages needed by X-Spat. You have three available “Send” buttons, one for each type of set-up to be sent, because, if necessary, you may also record some set-ups directly during the working session of your MIDI sequencer, using the IAC Bus driver of Mac OS X’s Core Audio/MIDI.

Now let’s analyze the different available parameters and their graphic representation.

‘Input/Output Channel Parameters’ area

In this section of the main window, parameters change according to the channel number selected in the ‘Input/Output Channel Selection’ area. The type of parameter in use and the set value will be visualized respectively in the “Control” field and in the field to its right.



In this area, proceeding from left to right and from top to bottom, we find the following level or vectorial sliders:

‘Input Level’: regulates the input volume of the Spatializer for the selected channel.

‘Bell Factor’: it allows you to compensate for the speaker’s directionality for the output of the selected channel. NB. We advice values slightly above or below the default value 64.

‘Attenuation’: Regulates the percentage of level variation for the selected channel in relation to the distance of the source from the center of the virtual cube. Default value: 64.

‘Doppler Depth’: sets the depth of the Doppler effect for the selected channel. Default value: 0 (no effect), recommended value to obtain the most realistic result: 64.

‘ITD (Interaural Timing Difference) Depth’: sets the depth of the ITD intervention for the selected channel. Default value: 0 (no effect). Recommended value: circa 64. NB. It’s advisable to use it only to position audio static sources and not for movement.

‘Front-Rear Spectral Enhance’: sets the depth of intervention of the filter dedicated to the simulation of the rear positioning of the source in relation to the center of the virtual cube for the selected channel *NB. It’s advisable to use values only slightly above or below the default value of 64.* Set the value to cancel the effect.

‘Gain Enhance’: increases or decreases the level of the spatialized signal for the selected channel within the area designated by the speakers. *NB. If used only for some channels, it may modify the Spatialisation™ effect, sometimes with unlucky results.* To be used sparingly. The value 64 corresponds to no set-up.

‘Input LPF (Low Pass Filter) Cutoff’: sets the cut off frequency of the first-degree Low Pass filter for the selected channel. The default value is 127, no filter.

‘Input HPF (High Pass Filter) Cutoff’: sets the first-degree high pass filter cutoff frequency for the selected channel. The default is equal to zero, or no filter.

‘Sub Mix A Input Level’: sets the input volume for the Sub Mixer A marked by the same number as the selected channel.

‘SubMix B Input Level’: sets the input volume for the selected channel of the Sub Mixer B marked by the same number as the selected channel.

‘Insert A Gain’: sets the input volume for the insert channel of group A marked by the same number as the selected channel.

‘Insert B Gain’: sets the input volume for the channel inserting Group B marked by the same number as the selected channel.

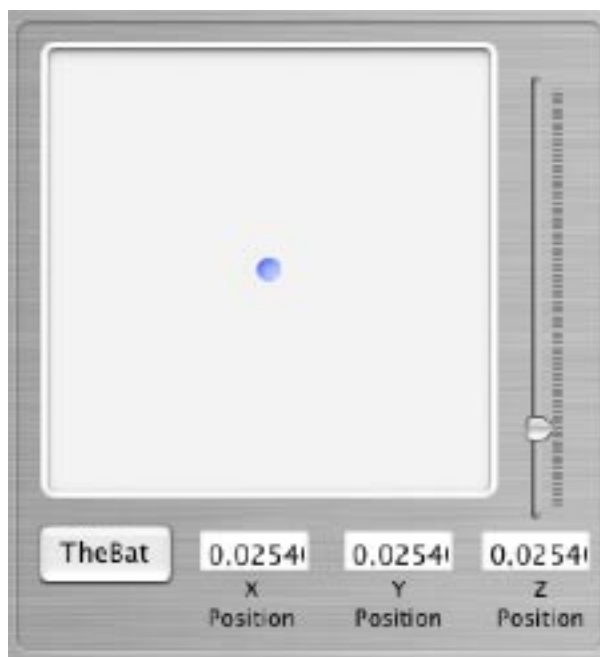
‘Speaker X (Y or Z) Position’: the three faders set the ns in meters of the speaker marked by the same number as the selected channel, in relation to the center of the virtual cube.

NB. For example, in an environment with a height of 6 meters, a speaker positioned at a height of 3 meters from the floor and at the exact center of the environment, will have the positions X=0, Y=0, Z=0, since the zero value is conventionally set at the center of the virtual cube.

'Source Position Manager' area

You can set the virtual space position of the audio source coming from the selected channel in the “Source Position Manager” area, by moving the blue sphere with the mouse. The fields X and Y indicate the positions in relation to the center of the virtual cube, in meters. The field Z, modifiable through the fader above it, indicates the height of the source. *NB. For example, in an environment with a height of 6 meters, the floor will be at -3 meters, since zero is set at the center of the virtual cube.*

The values of Speaker Position and of Source Position Manager vary according to the value of Room Side set in the Global Settings area; it is therefore advisable to set the latter parameter first of all. In order to fix the positions of the speakers at a predetermined position, even when the Room Side parameter varies, set the option ‘Lock Speakers’ in the A&G X-Spat menu.



The button “TheBat” allows the connection and control of the three parameters in the Source Position Manager by the three-dimensional ultrasound controller produced by A&G and denominated, in fact, TheBat. As this controller that can be connected via USB, TheBat must be switched on and connected to the Mac before you start the X-Spat Controller application, otherwise the software will fail to recognize the controller. In the guide to TheBat, contained in the A&G Collection CD-ROM, you will find further information on the use of this device.

The ‘Global Settings’ area

The parameters included in this part of the main window are independent from the number of channels selected in the ‘MIDI Channel Selection’ area because they control the global set-ups of the X-Spat system. Proceeding from top to bottom, we find the following sliders:

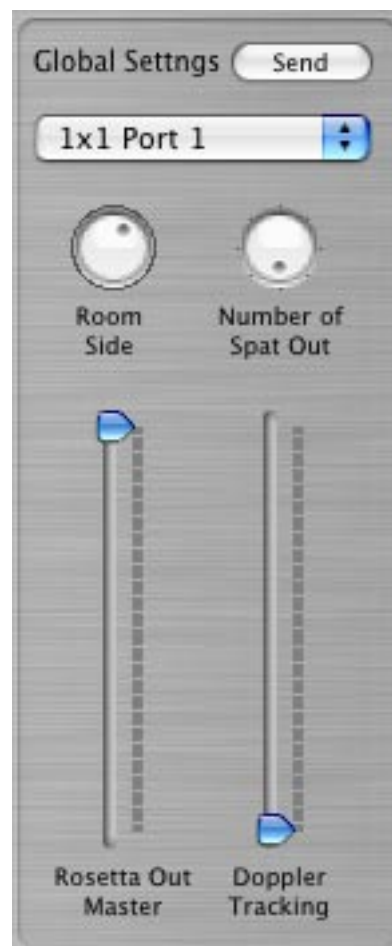
‘Rosetta Out Master’: regulates the global volume of the spatialized channels exiting Rosetta800/96.

‘Doppler Tracking’: sets the speed of detection of the audio sources’ movement, in order to apply the Doppler effect.

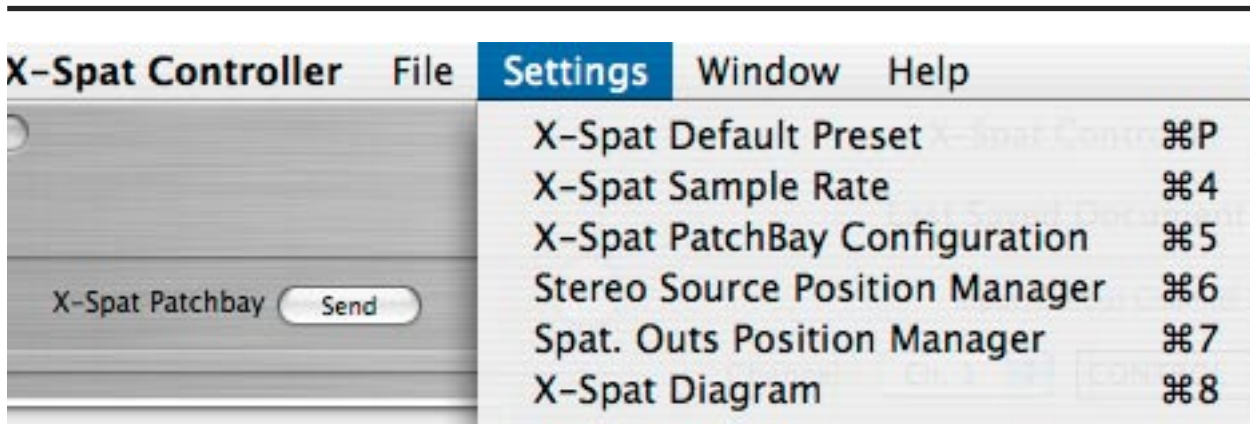
‘Room Side m.’: sets the measurement in meters of the side, which, in turn, determines the dimensions of the virtual cube inside which the three dimensional Spatialisation takes place. If you are working in surround (two-dimensional) it sets the dimension of the virtual square’s side.

‘Number of Spatializer Outs’: sets the number of channels exiting the Spatializer. This number must necessarily match exactly the number of speakers used to reproduce Spatialisation™ or surround, otherwise the effect will not be reproduced correctly.

In this area you can also find the pop-up menu to assign the output MIDI port through which X-Spat Controller will send messages of the MIDI Control Change type. Such messages can be sent directly to X-Spat or to a MIDI sequencer that will take care of recording the data and sending them to X-Spat at the same time.



The main window menu



Heading	Action
File >New	Creates a basic set up for X-Spat Controller.
File>Import...	Visualizes the standard dialogue window of Mac OS X, which allows you to visualize the content of the hard disk. Localize the desired XCon2 document and select Open to open a previously saved X-Spat Controller document.
File >Close	Closes the current X-Spat Controller set up.
File >Save Session as...	Saves an XML.XCon2 document containing all the values assigned to the X-Spat parameters, allowing the choice of a name. In the selected window type the name chosen for your document, then select "Save ".
Settings>Default Preset	Visualizes the "Default Preset" window. Consult the following chapters for a detailed description of the functions contained in this window.
Settings>Sample Rate	Visualizes the "Sample Rate" window. Consult the following chapters for a detailed description of the functions contained in this window.
Settings>Patchbay Config.	Visualizes the "Patch bay" window. Consult the following chapters for a detailed description of the functions contained in this window.
Settings>Stereo Source P...	Visualizes the "Stereo Source Position Manager" window to manage the stereo audio sources. Consult the following chapters for a detailed description of the functions contained in this window.
Settings>Spat. Outs Pos...	Visualizes the "Spatializer Outs Position Manager" window to manage the Spatializer outputs 3D coordinates. Consult the following chapters for a detailed description of the functions contained in this window.
Settings>X-Spat Diagram	Visualizes the "Diagram" window, containing a flow diagram, which allows you to visualize the connections that can be made between available inputs and outputs in X-Spat.
Window>Minimize	Hides the X-Spat Controller windows and creates a

temporary alias in the Finder's Dock of Mac OS X.

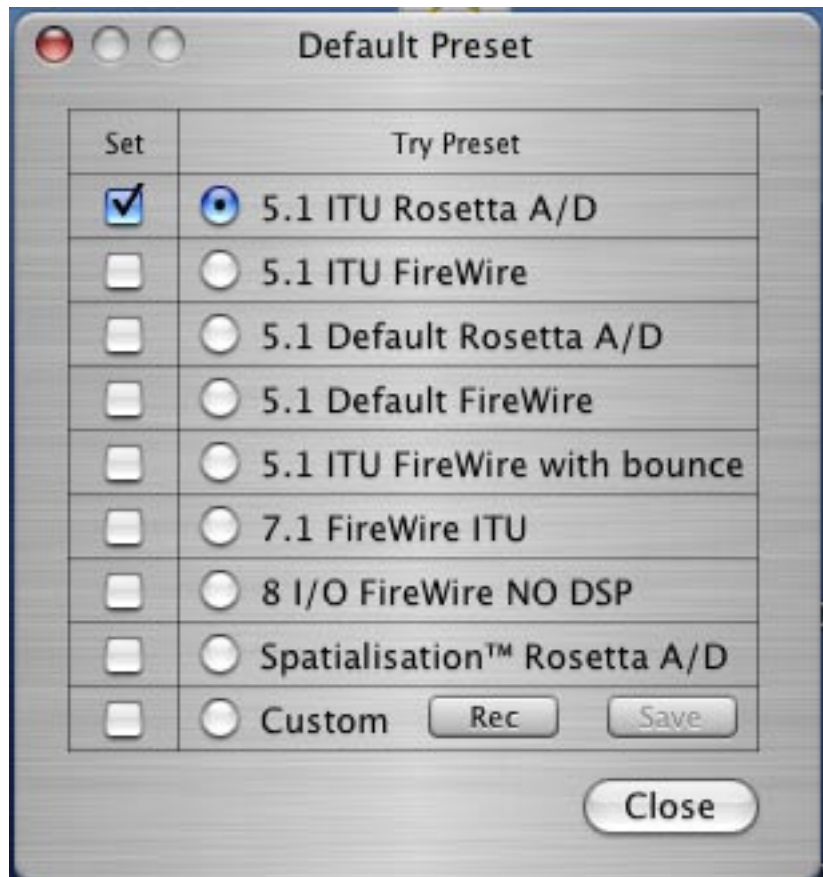
Window>Bring all to front	Brings to the front all the X-Spat Controller windows currently in use.
Help>X-Spat Controller PDF	Opens a PDF document that visualizes the pages of the X-Spat manual.
Help>X-Spat Controller Help	Opens the browser application and visualizes the pages of the X-Spat manual directly in the host computer.

The 'Default Preset' window

The main aim of this window is to allow you to set the Default Preset. This term identifies the collection of value settings assigned to the parameters of X-Spat, which will be available each time you switch on the Rosetta 800.

NB. Saving the Custom preset and setting the default preset cannot be done using the MIDI port of the Firewire connection, therefore you will have to use the MIDI port in the front panel of X-Spat.

To set the default preset of your Base X-Spat, select the square checkbox placed next to the desired Preset. The round selectors before the names of the presets will allow you to try the settings before you choose. Each preset corresponds to a particular MIDI message of the Program Change type, which may be also sent to the card using a normal sequencer. In order to know the values to be assigned to the messages, consult the MIDI implementation chart in this manual (see MIDI Implementation Chart).



You can modify the Custom preset anytime and anyway you want, using the following procedure:

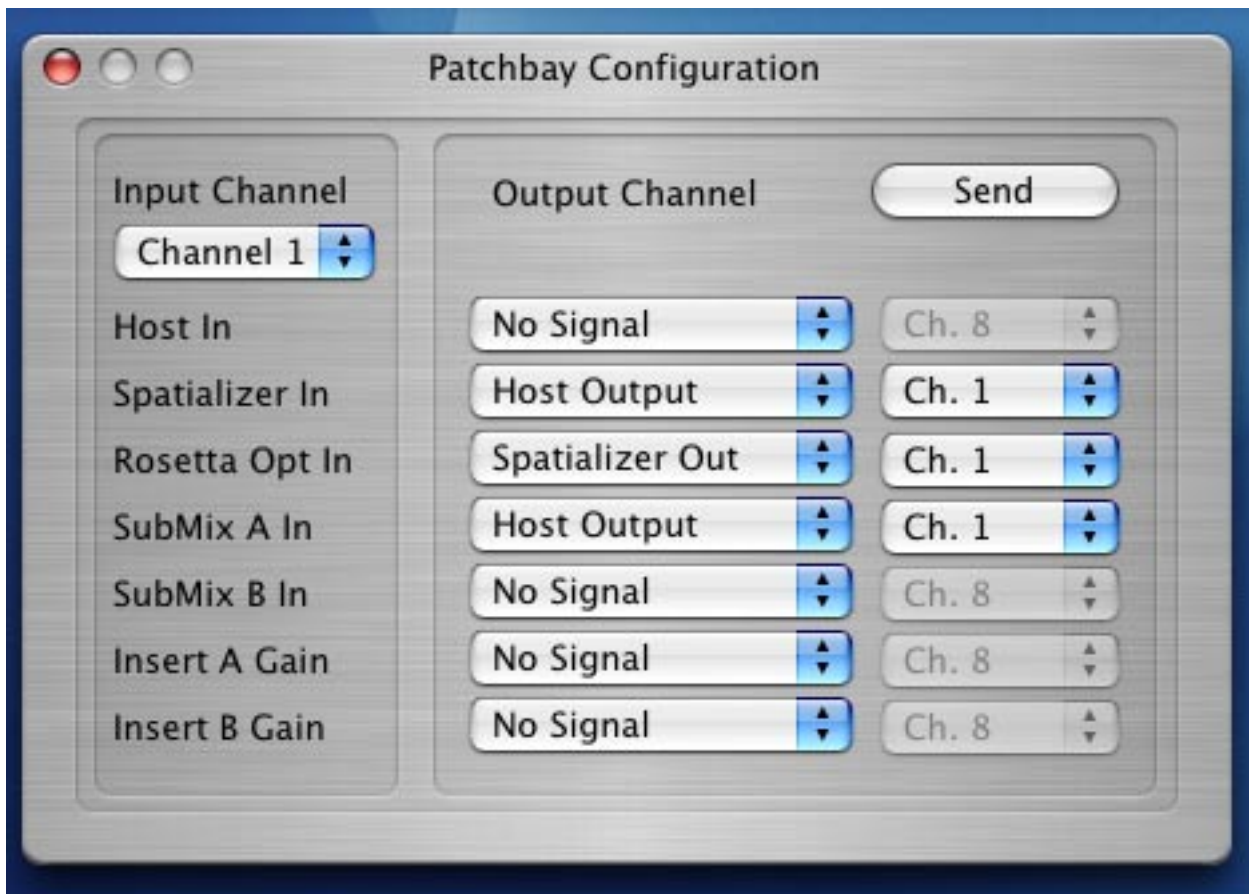
- select the Rec button (the letters inside will form the words Stop);
- modify the X-Spat Controller parameters as you wish;
- send all the parameters to the card by selecting the three Send buttons of the main window in succession;
- select the Stop button (previously it was Rec);
- select the Save button.
- switch off the Rosetta 800 and then back on.

At this point your preset has been memorised in the card and you may even make it your Default Preset by simply selecting the corresponding square check box.

For a detailed description of the available presets, consult the chapter "Suggestions for a correct usage of the X-Spat system".

The X-Spat Patchbay window

The X-Spat Patch-bay window allows you to connect the system's inputs and outputs and to send the desired setups through the button Send.



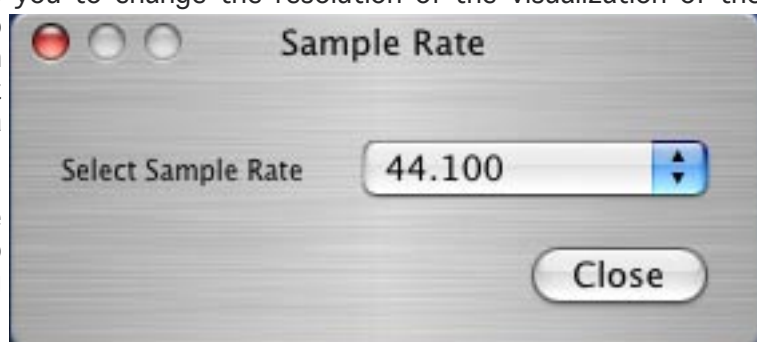
Like in the main window, by choosing a channel through the Input Channel pop-up menu, you activate the group of parameters corresponding to the channel by the same number.

The first column shows a list of available input for each channel, the second is made up of the same number of pop-up menus allowing you to select the output to which you want to connect the input to the left of the menu. If necessary another pop-up menu will be available to the far right of the window to allow you to choose the output number. In this way, for instance, with channel 1 selected, the Spatializer In 1 can be connected to any Host Output from 1 to 8. When opening X-Spat Controller, the patch bay and all the other parameters are set to the default value. Selecting the Send button and the consequent sending of the new settings will modify the state of the card with results that are totally dependent on your actions. In case of any problem, we advise you recall one of the presets situated in the Default Preset window of X-Spat Controller.

The Sample Rate window

The Sample Rate window allows you to change the resolution of the visualization of the LPF and HPF filter values according to the sampling frequency in use, which depends exclusively on the value set in the front panel of the Rosetta 800.

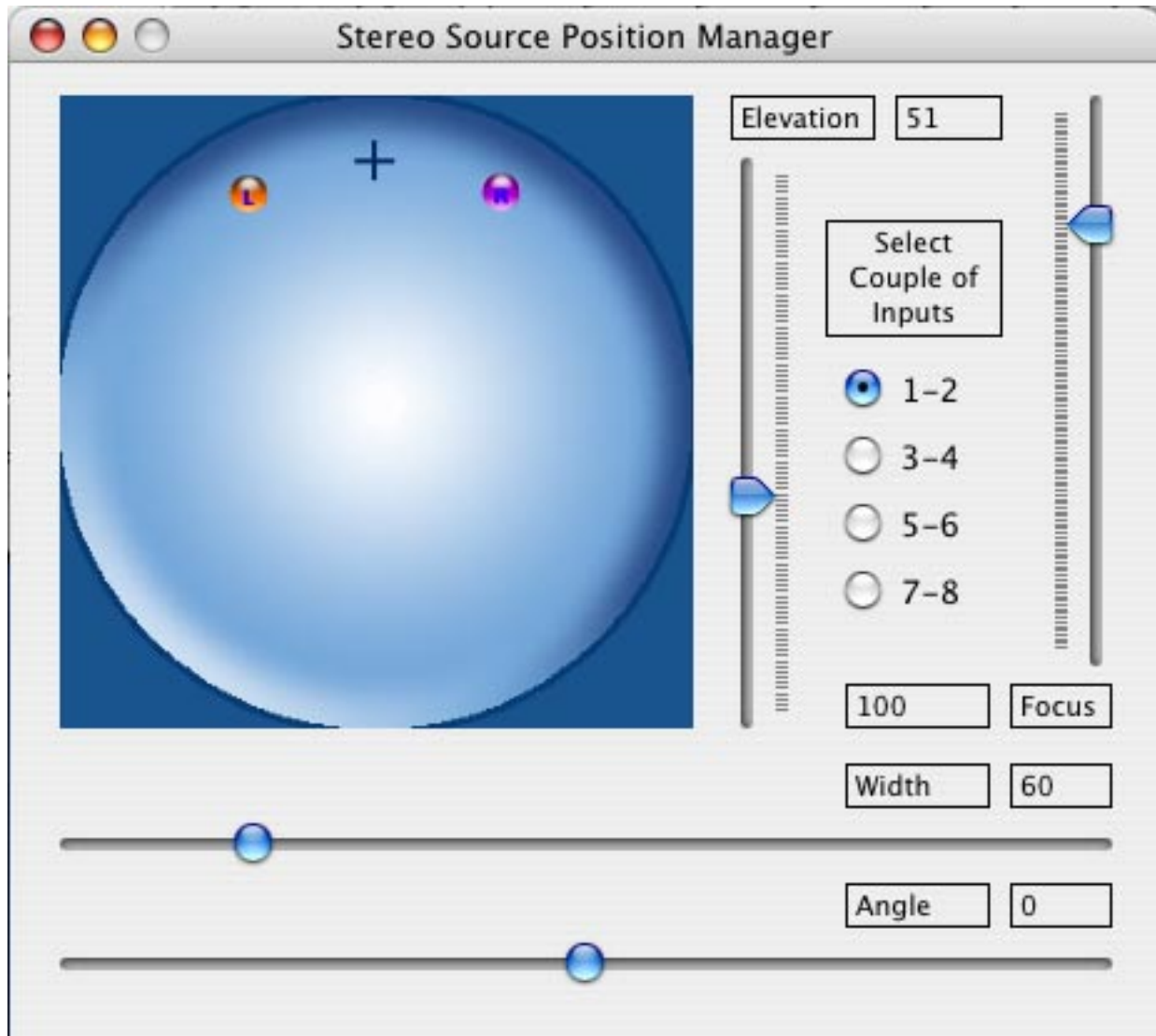
Select Sample Rate in the Settings menu and use the pop up menu to set the desired sampling frequency.



The Stereo Source Position Manager Window

The Stereo Source Position Manager window allows you to position or move stereo audio sources inside the Spatializer of X-Spat.

Select the couple of channels for which you want to set the movement parameters using the radial buttons in the top right section of the window. The vertical fader controls the elevation (Z) of the couple of sources; the cross between the two spheres in the graphic area controls their coordinate values X and Y.



The 'Focus' fader modifies the distance of the couple from the centre of the environment.

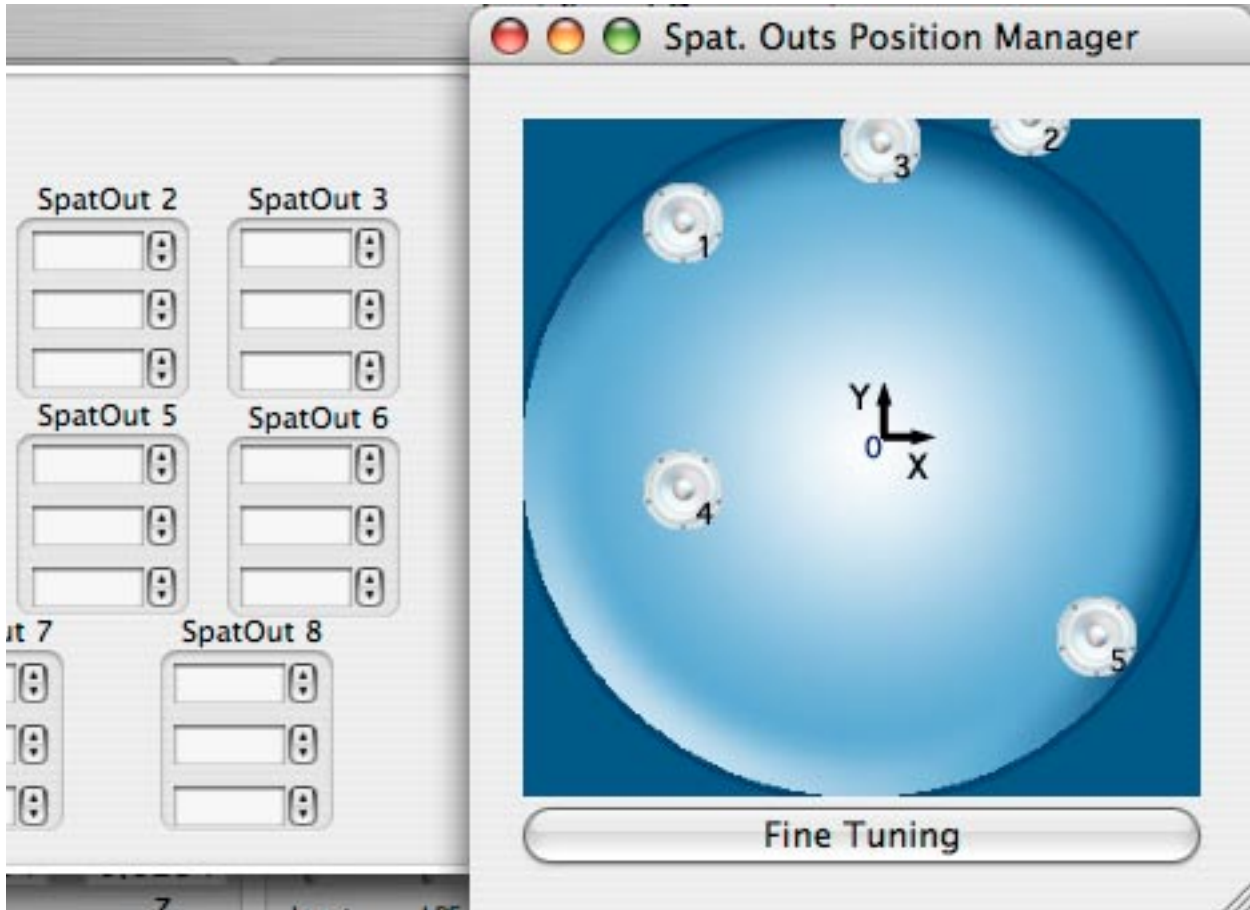
The 'Angle' fader modifies the angle of the line between the two spheres in relation to the centre of the environment.

The 'Width' fader modifies the distance between the two sources in the circumference.

Click on the cross and move it to modify the Focus and Angle values, at the same time. Use the Width fader to enlarge the stereo image without changing distance and angle. Use the Angle fader to move the stereo image in the circumference without changing its distance from the centre and its width.

The 'Spatializer Outputs Position Manager' window

The window Spatializer Outputs Position Manager allows the virtual positioning of the audio sources in output from the Spatializer of X-Spat. We remind you that the correspondence between these outputs and the actual positions of the speakers used in your environment, depends on the settings made in the current patch bay of X-Spat Controller.



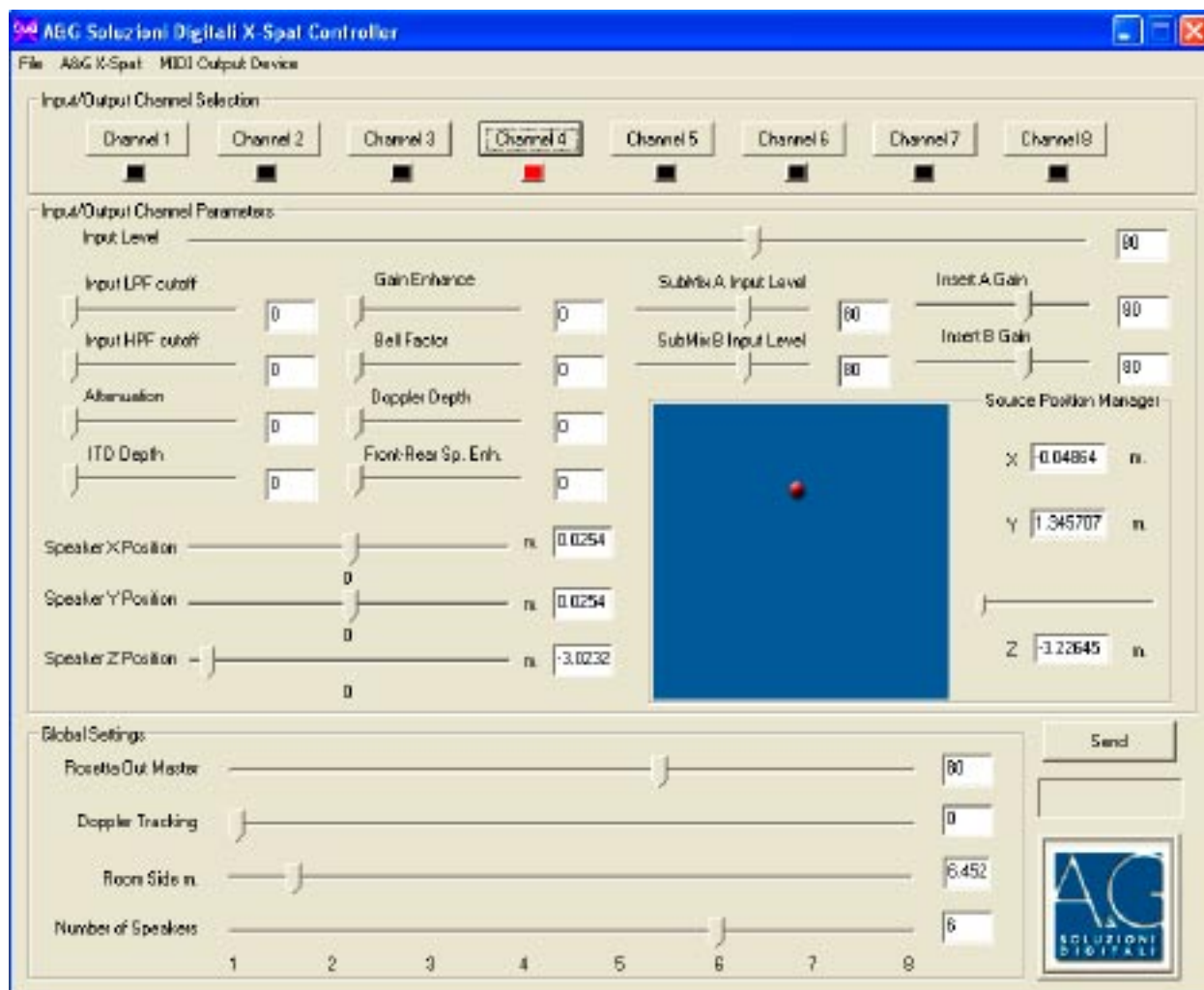
Click on the selected output and move the mouse, keeping it pressed down, in order to change the position approximately. Release the mouse wherever you prefer and select "Fine Tuning" to open a box containing the fields with the coordinates X, Y and Z of all the outputs. Use the "Stepper" buttons next to each field in order to insert the coordinates with greater precision. Moving the mouse, after Shift-clicking on an output, you can set the value of Z for the selected output. Recalling one of the presets in the "Default Preset" window, the outputs will automatically position themselves in the default position of the selected type of preset.

The X-Spat Controller software for Windows XP

X-Spat Controller for Windows XP provides two complementary screens to visualize a set-up: the main window, which always remains visible, with parameters that can be modified in real time, and the 'Patch bay' window for internal connections to the card.

The origin of the axes XYZ is positioned at default at the absolute center of the virtual cube containing your listeners. Keep this convention in mind when you consider the dimensions of the space to be spatialized.

The principal elements of these windows are exemplified in the following sections.



The main window

In the main window you can manage, independently for each selected audio channel, the X-Spat parameters that are modifiable in real time. Select the switch button marked with the same number as the channel for which you want to set input and output parameters. Modify the parameters as you wish. Repeat the operation for all channels and save your setup file in the hard disk. At any time, you can select the button 'Send' to send the necessary MIDI Control Change messages to X-Spat.

Now let's analyze the different available parameters and their graphic representation.

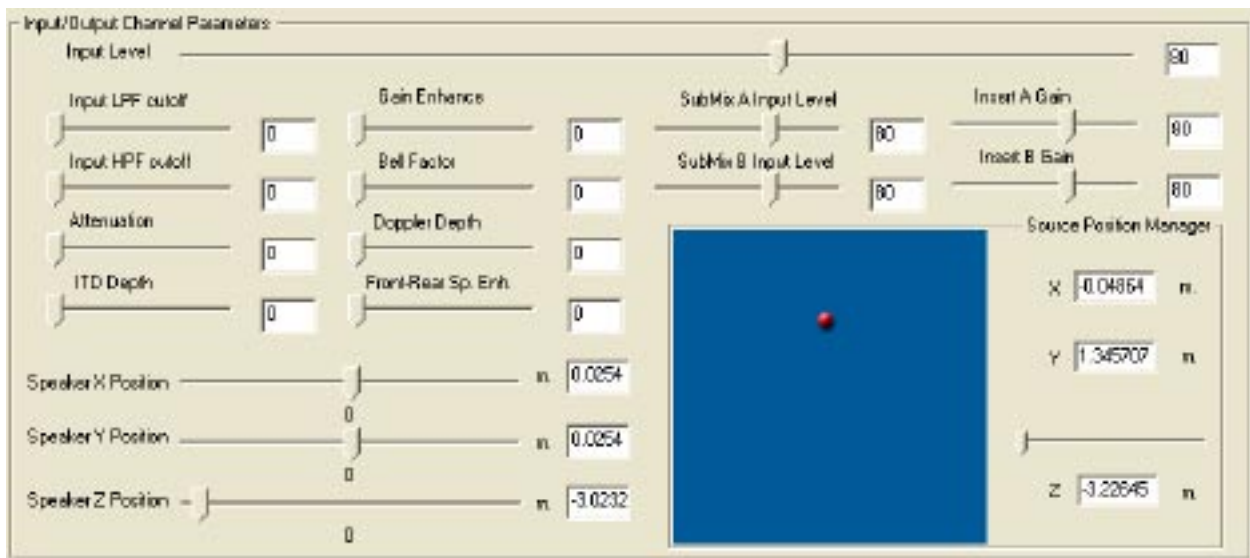
'Input/Output Channel Selection' area

Each button marked by a number activates the group of parameters corresponding to the channel identified by the same number. A red LED visualizes the activated selection.



'Input/Output Channel Parameters' area

In this section of the main window, parameters change according to the channel number selected in the 'Input/Output Channel Selection' area. The features of the parameters however stay the same for each channel.



In this area, proceeding from left to right and from top to bottom, we find the following level or vectorial sliders:

'Input Level': regulates the input volume of the Spatializer for the selected channel.

'Input LPF (Low Pass Filter) Cutoff': sets the cut off frequency of the first-degree Low Pass filter for the selected channel. The default value is 127, no filter.

'Gain Enhance': increases or decreases the level of the spatialized signal for the selected channel within the area designated by the speakers. *NB. If used only for some channels, it may modify the Spatialisation™ effect, sometimes with unlucky results.* To be used sparingly. The value 64 corresponds to no set-up.

'Sub Mix A Input Level': sets the input volume for the Sub Mixer A marked by the same number as the selected channel.

'Insert A Gain': sets the input volume for the insert channel of group A marked by the same number as the selected channel.

'Input HPF (High Pass Filter) Cutoff': sets the first-degree high pass filter cutoff frequency for the selected channel. The default is equal to zero, or no filter.

'Bell Factor': it allows you to compensate for the speaker's directionality for the output of the selected channel. *NB. We advice values slightly above or below the default value 64.*

‘SubMix B Input Level’: sets the input volume for the selected channel of the Sub Mixer B marked by the same number as the selected channel.

‘Insert B Gain’: sets the input volume for the channel inserting Group B marked by the same number as the selected channel.

‘Attenuation’: Regulates the percentage of level variation for the selected channel in relation to the distance of the source from the center of the virtual cube. Default value: 64.

‘Doppler Depth’: sets the depth of the Doppler effect for the selected channel. Default value: 0 (no effect), recommended value to obtain the most realistic result: 64.

‘Source Position Manager’: moving the red sphere with your mouse, you can set the position in the virtual space of the audio source entering the selected channel. The fields X and Y indicate the positions in relation to the center of the virtual cube, in meters. The field Z, modifiable through the fader above it, indicates the height of the source. *NB. For example, in an environment with a height of 6 meters, the floor will be at -3 meters, since zero is set at the center of the virtual cube.*

‘ITD (Interaural Timing Difference) Depth’: sets the depth of the ITD intervention for the selected channel. Default value: 0 (no effect). Recommended value: circa 64. *NB. It’s advisable to use it only to position audio static sources and not for movement.*

‘Front-Rear Spectral Enhance’: sets the depth of intervention of the filter dedicated to the simulation of the rear positioning of the source in relation to the center of the virtual cube for the selected channel *NB. It’s advisable to use values only slightly above or below the default value of 64.* Set the value to cancel the effect.

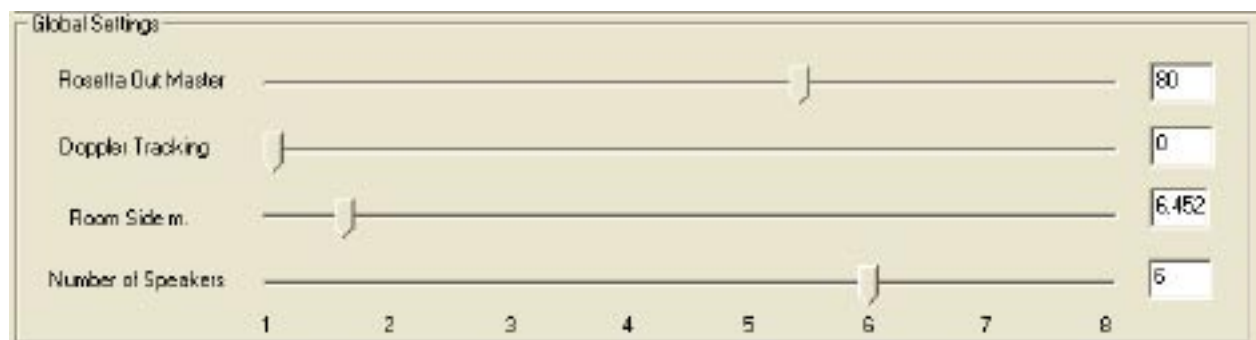
‘Speaker X (Y or Z) Position’: the three faders set the ns in meters of the speaker marked by the same number as the selected channel, in relation to the center of the virtual cube.

NB. For example, in an environment with a height of 6 meters, a speaker positioned at a height of 3 meters from the floor and at the exact center of the environment, will have the positions X=0, Y=0, Z=0, since the zero value is conventionally set at the center of the virtual cube.

The values of Speaker Position and of Source Position Manager vary according to the value of Room Side set in the Global Settings area; it is therefore advisable to set the latter parameter first of all. In order to fix the positions of the speakers at a predetermined position, even when the Room Side parameter varies, set the option ‘Lock Speakers’ in the A&G X-Spat menu.

The ‘Global Settings’ area

The parameters included in this part of the main window are independent from the number of channels selected in the ‘MIDI Channel Selection’ area because they control the global set-ups of the X-Spat system.



Proceeding from top to bottom, we find the following sliders:

‘Rosetta Out Master’: regulates the global volume of the spatialized channels exiting Rosetta800/96.

‘Doppler Tracking’: sets the speed of detection of the audio sources’ movement, in order to apply the Doppler effect.

‘Room Side m.’: sets the measurement in meters of the side, which, in turn, determines the dimensions of the virtual cube inside which the three dimensional Spatialisation takes place. If you are working in surround (two-dimensional) it sets the dimension of the virtual square’s side.

‘Number of Speakers’: sets the number of channels exiting the Spatializer. This number must necessarily match exactly the number of speakers used to reproduce Spatialisation™ or surround, otherwise the effect will not be reproduced correctly.

The main window menu



Heading

Action

File >Open

Opens a previously saved X-Spat session. Locate and select the file name, then select ‘Open’. You can only open one session at a time.

File >Save as...

Saves an X-Spat session allowing you to choose its name. Write the name chosen for your session in the suggested window, then select ‘Save’.



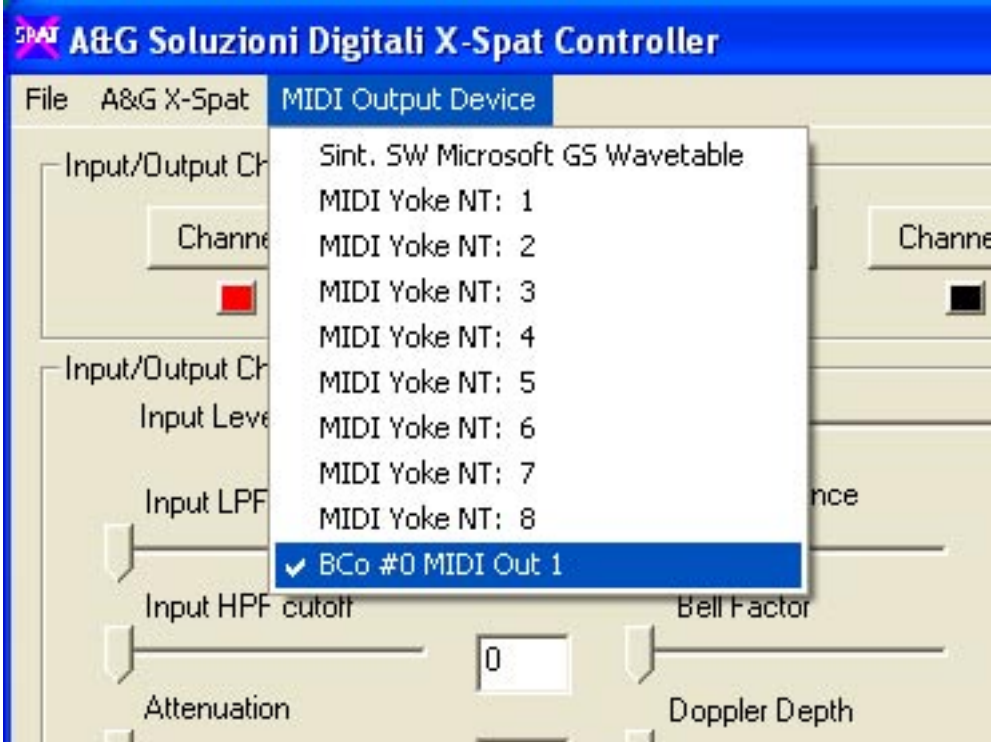
A&G X-Spat> X-Spat Diagram

Visualizes the ‘Diagram’ window containing a flow diagram allowing you to visualize the possible connections between inputs and outputs available in X-Spat.

A&G X-Spat> X-Spat Patch bay

Visualizes the ‘Patch bay’ window containing the Pop-Up menus which allow you to operate the

	connections between inputs and outputs available in X-Spat.
A&G X-Spat> Lock Speakers	If this option is marked by a ‘V’ sign, the position of the speakers cannot be modified. Select the option again to cancel the previous setting.
A&G X-Spat> Help	Opens the browser application and visualizes pages from the X-Spat manual directly in the host PC.
A&G X-Spat> About	Visualizes the window containing information relating to the version of the system currently in use.
A&G X-Spat> xspat.aegweb.it	Visualizes the Internet site dedicated to X-Spat in your predefined browser, if the host PC is on line.



Heading	Action
MIDI Output Device >...	It allows you to select the MIDI port output for the X-Spat Controller software. In order to control the X-Spat card and the Rosetta 800, you must select the X-Spat #1 MIDI out, but for different uses you can select any of the MIDI ports, real or virtual, made available by the host computer.

The X-Spat Diagram window

Select X-Spat Diagram in the A&G X-Spat> menu or File >Diagram from the only menu in the Patch bay window, to visualize a flow diagram, which we hope may be useful to dispel possible doubts relating to the configuration of the X-Spat internal patchbay.

Some preliminary considerations: the Patch bay area, with its 34 inputs and 56 outputs, to the left of the diagram, allows the routing of incoming audio signals to any of the available outputs.

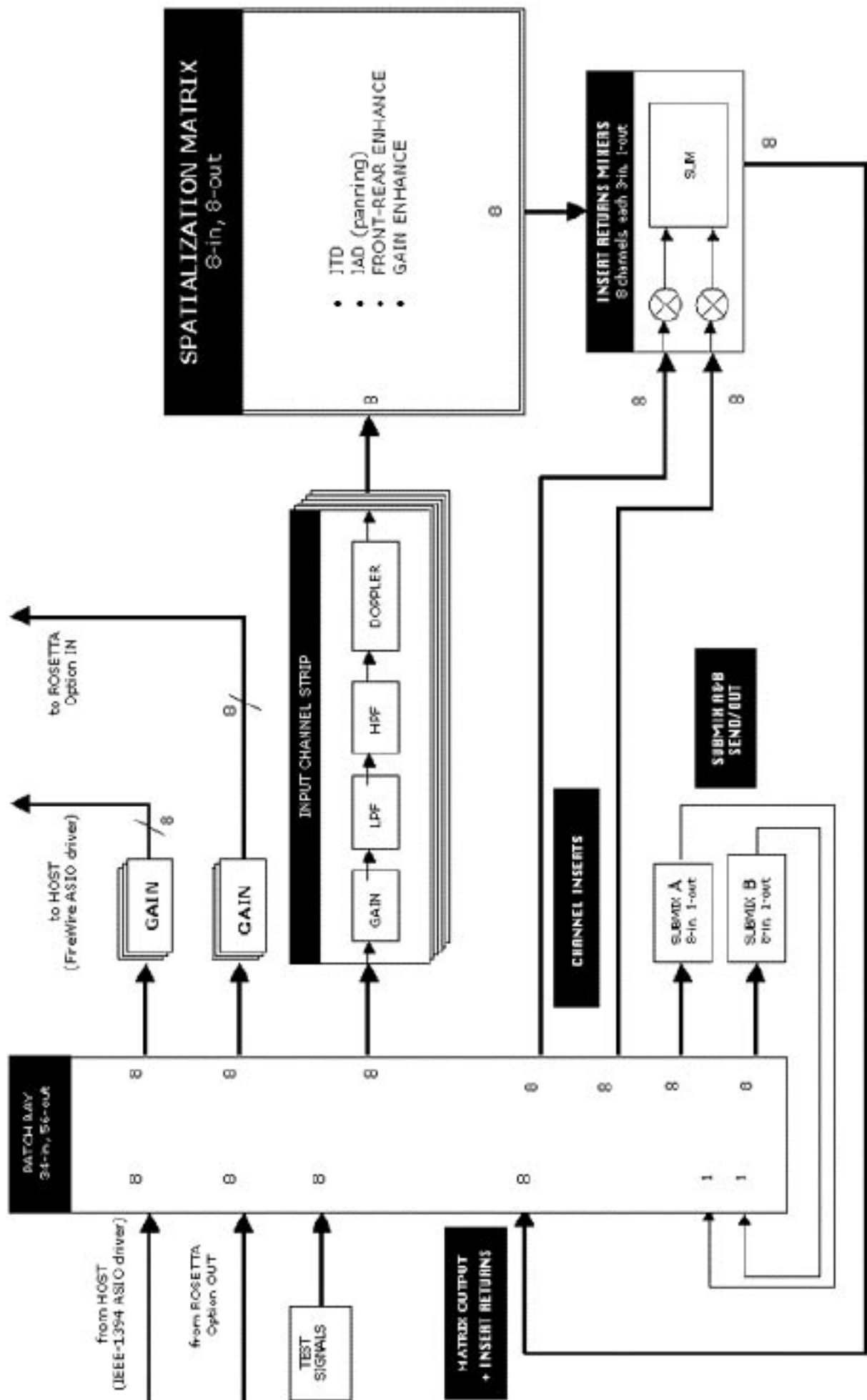
For instance:

The eight “to HOST” outputs correspond to the eight firewire channels inputting the computer. The eight channels outputting the “Spatialisation Matrix”, either mixed with the “Insert Returns” or not, can also be directed to the “to HOST” outputs for a possible codification of the Spatialisation in one of the multi-channel encoding formats.

The 8 input channel strip correspond to the 8 inputs of Spatializer and its 8 outputs can be connected to the 8 direct ‘to ROSETTA Option IN’ outputs, which correspond to the analogical or digital Rosetta/800 96 outputs.

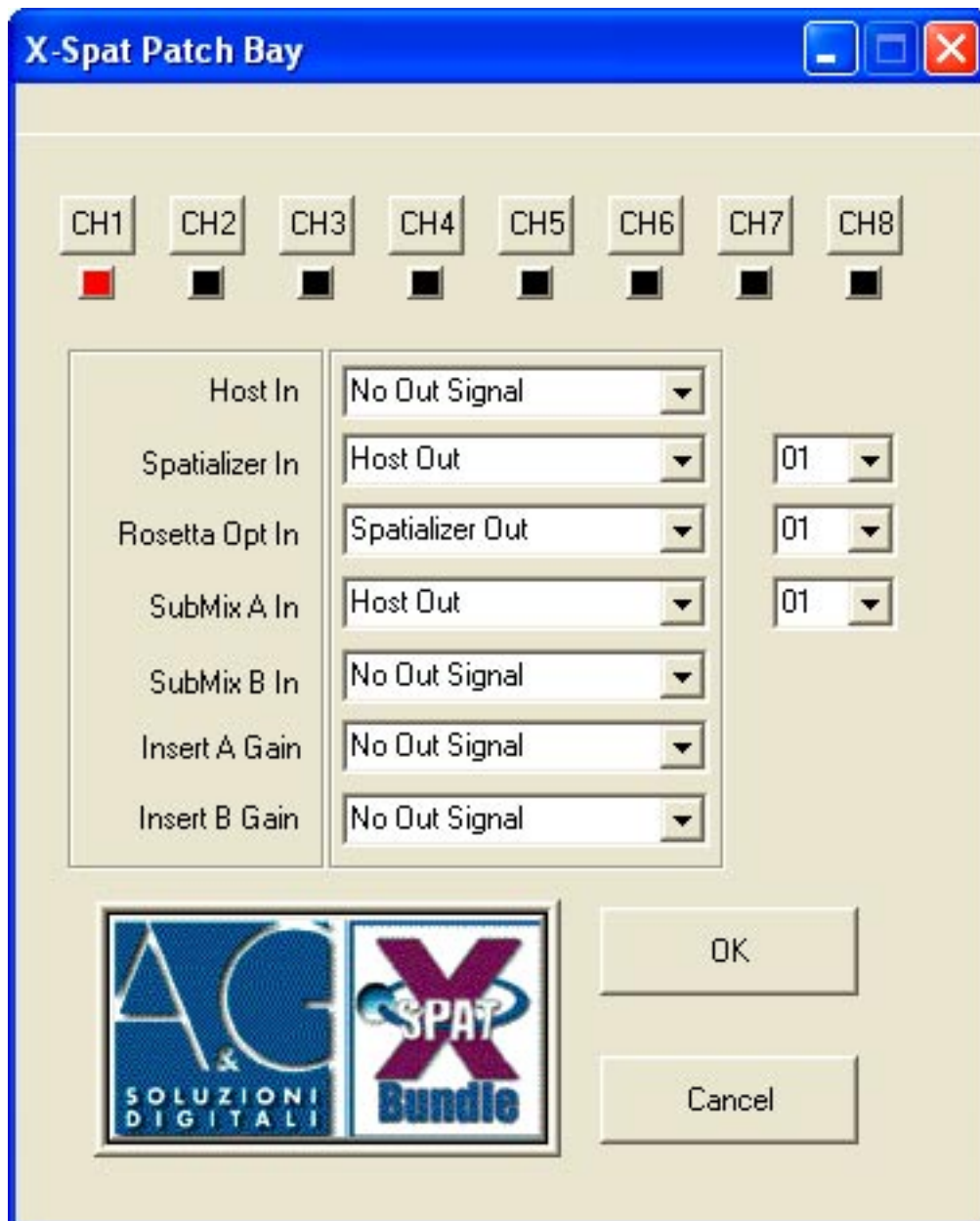
The ‘Number of Speakers’ parameter of the area ‘Global Settings’ can be set to a value equal or inferior to 8, and, to actuate a set-up 5.1, this value must be equal to 5. The channel reserved to the subwoofer could be output 4 of ‘to Rosetta Option In’, connected to ‘Send/Out’ of the ‘Sub Mix A’. The Sub Mix A could receive as inputs the 8 channels coming from the host or from ‘Rosetta Option OUT’ itself. This would provide a separate non-Spatialized channel, which would be the result of the mix of all the incoming audio sources that are already spatialized through the Spatialisation Matrix. The 16 ‘Channel Inserts’ can also be used in a similar way in order to have as many separate channels that can be assigned to any ‘physical’ output.

There are also 8 test signals, (really 7 as the condition ‘No Signal’ must also be selectable). It’s advisable to connect any non-used patch bay input to ‘No Signal’. Watch out for possible signal feedbacks, which may happen in the host computer software used. X-Spat’s patch bay is very versatile and powerful and we have tried to eliminate all possible ‘dangerous’ configurations. However, we can’t do anything to avoid wrong external connections.



The X-Spat Patchbay window

The X-Spat Patch-bay window allows you to connect the system's inputs and outputs and to send the desired setups through the button OK.



As in the main window, each button marked by a number activates the group of parameters corresponding to the channels marked with the same number. A red LED visualizes the activated connection.

The first column shows a list of the available inputs for each channel. The second is made up of as many pop-up menus, which allow you to select the output to which you want to connect the input to the left of the menu. If necessary, another pop-up menu will be available to allow you to choose the output number. In this way, for instance, with channel 1 having been selected, the 'Spatializer In 1' can be connected to any of the 'Host Out's, from 1 to 8. When opening 'X-Spat Controller', the patch-bay and all the other parameters are set at default value. Closing the X-Spat Patch-bay window and consequently sending the changes to the set-up, will modify the status of the card, with results that are totally dependant on your actions.

In case of problems, we advice you to open one of the many default configurations that can be found in the installation CD ROM of the software.

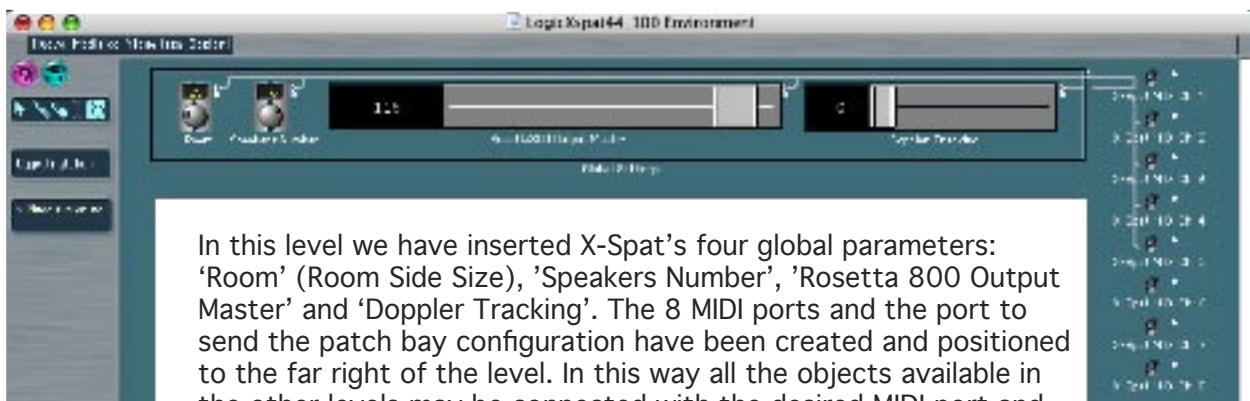
X-Spat Environment for Emagic Logic Pro

To control an X-Spat system in a Mac OS X context, using Emagic Logic Pro, it's advisable to create and use a specific 'Environment', i.e. a personalized working situation.

A&G provides you with some practical examples like the one outlined here.



Logic's Environments can deal on various levels with the objects that make them up and this option is particularly useful in our case. There is also a level dedicated to 'global' objects, which have a function common to all other levels of the Environment



In this level we have inserted X-Spat's four global parameters: 'Room' (Room Side Size), 'Speakers Number', 'Rosetta 800 Output Master' and 'Doppler Tracking'. The 8 MIDI ports and the port to send the patch bay configuration have been created and positioned to the far right of the level. In this way all the objects available in the other levels may be connected with the desired MIDI port and

X-Spat's four global parameters may be visualized or modified at any time.

The available parameters are the same that we have already described previously, when talking about X-Spat Controller.

But this time, in order to visualize them, we will use the pop-up menu that controls the levels in the Logic Pro Environment window. Selecting a channel from one to eight (Channel 1, Channel 2, etc.) we will be able to use the parameters of the corresponding channel; selecting 'Audio Channels' we will be able to visualize and manage X-Spat's audio channels.

Furthermore 'Logic' will naturally allow us to record a different type of automation for each object, and to add various types of effects in real time to one or more channels.



For instance, selecting 'Audio Channels', the Environment will appear as follows:



The patch bay set-ups are contained in the MIDI 'X-Spat Setup' track and automatically sent to the Rosetta800 each time you reproduce the Song by pushing the Play button.

We advise you to record your Song's MIDI and audio data a few seconds after the beginning of reproduction, in order to allow the complete transmission of MIDI Control Change data and the complete set-up of X-Spat's patch bay.

We advise you to use the X-Spat Controller software to modify the patch bay set-ups. Selecting an IAC Bus as a MIDI output for X-Spat Controller, you will be able to send the desired set-up to the 'X-Spat Setup' MIDI track of your Logic Pro Song. You must obviously assign the same IAC Bus to the MIDI track input and switch it to record. Start recording in Logic and immediately after send the data from X-Spat Controller pressing the button OK in the patch bay window of X-Spat Controller.

X-Spat Base Bundle and Digidesign ProTools



X-Spat Base, the bundle made up of the Spatialisation-X-Series card and the Rosetta 800/96, represents an ideal solution for all the Digidesign users who want to endow their hard disk recording system with an extended capacity for multi-channel production and better quality in the conversion of audio from analogue to digital and vice versa. Not to mention the extremely accurate low jitter clock of the Apogee converter, which we naturally advise you to set as the Master Clock of the whole system.

Unlike other software quoted in this manual, Digidesign products cannot “see” the X-Spat channels via Firewire, so it becomes necessary to operate a traditional connection between the two systems, using the standard ADAT TosLink. Therefore connect, respectively, the in out ADAT gates of the Digidesign system to the out and in ADAT gates of the Rosetta 800. Select ADAT as “Source to Digital Output” in the front panel of the Rosetta. Leave the selected “Option” as “Source to Analog Output”. In the “Hardware Setup” window of ProTools select “ADAT” as the source of external synchronization. In this way the 8 output channels from ProTools can be controlled via MIDI by the X-Spat Controller software. If you wish to record in the MIDI tracks of ProTools the MIDI messages corresponding to the trajectories generated by X-Spat Controller, you must use the IAC bus driver of the Core Audio Apple as a MIDI port outputting the X-Spat Controller.

Enable a MIDI track in ProTools to receive all the necessary MIDI messages of the Control Change type (consult the ProTools manual if you don't know how to do it). Set the IAC bus 1 MIDI port as input for the channel and the MIDI port assigned to X-Spat as output MIDI port.

The configurations made possible by the combination of the powerful ProTools mixer and the X-Spat patch bay are infinite, therefore we will only analyze one example, which you can also find in the CD-ROM ‘A&G Software Collection’ and in the internet site of A&G at this address:

http://www.aegweb.it/html/html_interne/downloadsD.html

In the suggested ProTools Session, various audio channels have been assigned to 8 ADAT

monophonic digital channels in output, and as many MIDI channels have been created to register the movements and positioning set through the Source Position Manager of the X-Spat Controller, possibly also the modifications of other available parameters in real time. You can set the patch bay of X-Spat in 5.1 or in any other way, from the stereo at 8.0, and listen to the resulting effect on the setup of your speakers, while you send the same thing digitally from Rosetta to a Dolby encoder, a digital multi-track recorder or even back to the mixer of ProTools, to use any codifying plug-in, through the 8 ADAT inputs of ProTools.

If you also have a Command8, you may use the other example at the page: [downloadsD.htm](#) - the session named XSpatCommand8Setup - in order to load a Preset for the Stand Alone operation of the unit in the Digidesign controller, via SysEx. Using the relevant switch, which is in fact called Stand Alone, you will be able to control both the ProTools software and X-Spat passing from one unit to the other by a simple click of the switch.

Each channel of the X-Spat offers at least 16 parameters that can be modified via MIDI in real time, excluding the coordinates of the source in the Source Position Manager, while the Command8, even when using the Bank function, only allows you to personalize 4 dynamic controllers and 6 on/off switches per channel. Therefore, by way of example, we have selected a Preset that controls the input volume, the LPF and HPF filters, the input volumes to SubMix A and the optional enabling at the highest possible value, of some algorithms that you can modify according to your requirements.

Follow the instructions at chapter: “Loading and Saving Presets with SysEx” of the Command8 Guide in order to load the settings in your controller. The data have been recorded on MIDI track number 9.

X-Spat Setup for Steinberg Cubase SX



To control an X-Spat system in a Windows XP or Mac OSX environment, using Steinberg Cubase SX, you can use a specific configuration file, i.e. a personalised working environment.

As an illustration, A&G provides some practical examples contained in the installation CD ROM of the software. One of them is described here:

Open the XspatTemplate.cpr file in Cubase SX for Mac OS X.

Select Mixer in the Devices menu.

In the MIDI channel you can use the User Panel that we have prepared with some of the main parameters of X-Spat. You may of course personalise the panel at any time, changing the parameters as you wish. If you don't know how to do it, consult the Cubase SX manual.

Use the MIDI Control plug-in of Cubase SX, open as insert in the MIDI channels assigned to X-Spat in order to control the other parameters of the system.

In order to move the audio sources, you can use the Source Position Manager of our X-Spat Controller software, and send the data, via an interapplications driver (i.e. MIDI Yoke for Windows XP or Apple IAC bus), to the input of the desired MIDI channel.

Remember, however, that the A&G X-Spat Controller software can always be used in the background, and it may be the best solution to manage X-Spat set-ups that do not require automation in real time.

For instance you may control X-Spat from its own software and use Cubase SX, without the help of any custom set-up, only to control the audio and those control parameters you wish to automate (source positions, filters, etc.).

You only have to change the MIDI output of X-Spat Controller after sending the data to the card, or use the MIDI Thru function of the Steinberg software. Change from X-Spat #1 #0 MIDI out 1 to any bus in your MIDI virtual driver and set the same bus to input for a Cubase SX track that can receive on all MIDI channels. Set the X-Spat MIDI driver as MIDI out of the track and it's all done.

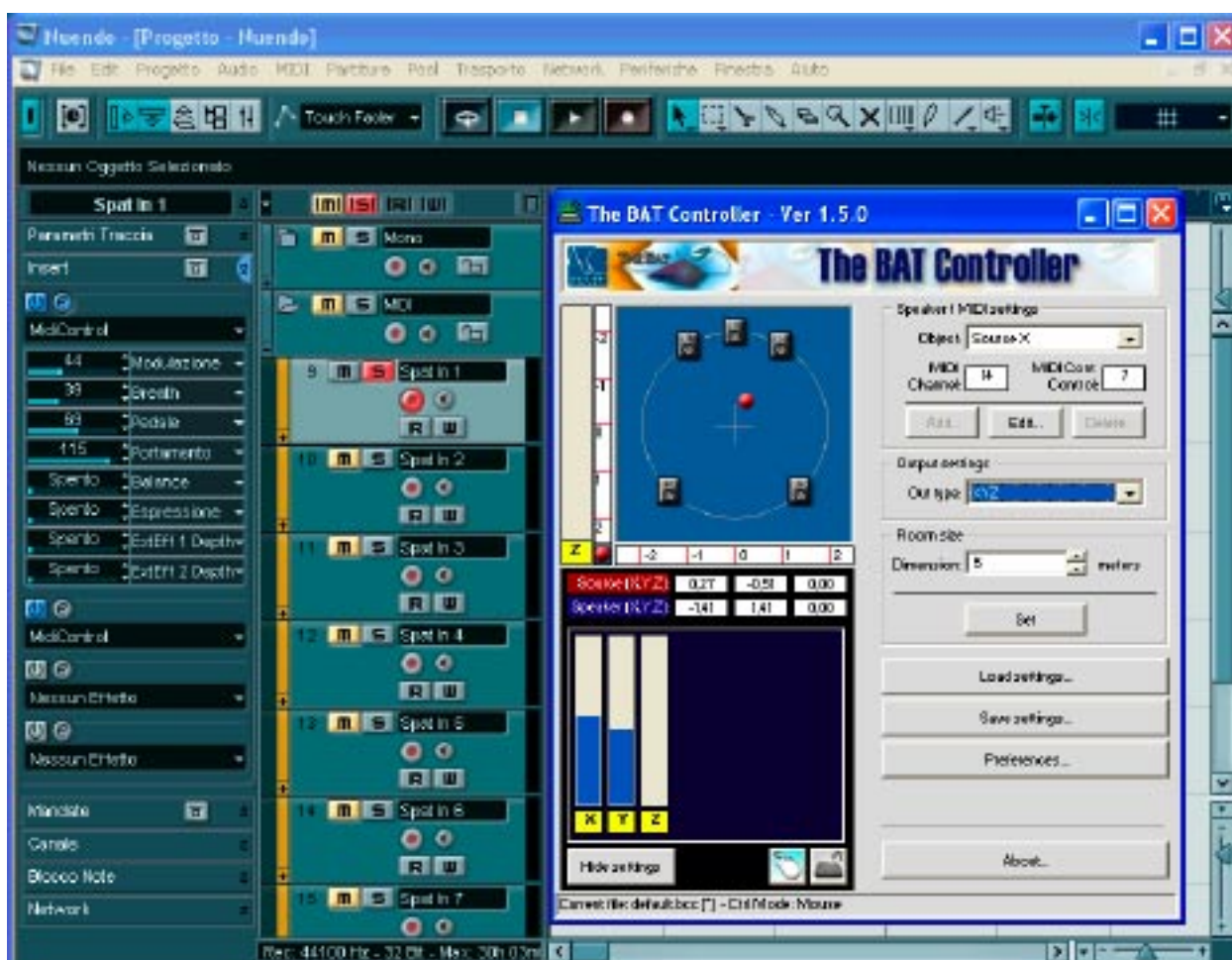
You may also record all the card set-up data inside your Cubase SX project.

There are many items of freeware or donation-ware that can control the movement of the audio sources in X-Spat. We have tested some of them and we recommend, amongst others, the excellent CC-Control by Tobybear Productions, for Windows XP (you will find the application inside the MIDI Bag bundle that you can download from <http://www.tobybear.de>), or ControlAid for Mac OS X, that you can find at <http://www.charlie-roberts.com/controlAid/>.

Note that CC-Control, as a VST plug-in that can be perfectly integrated into Steinberg sequencers, allows you the direct recording and editing of the automation from the main window of the plug-in itself.

We invite you once again to consult the Cubase SX manual for further information regarding the setting of the Device Setup window. This is necessary for the X-Spat card to be recognised by the Steinberg VST management, which, in any case, is simple and intuitive.





TheBat Controller and Steinberg Nuendo for Windows XP.

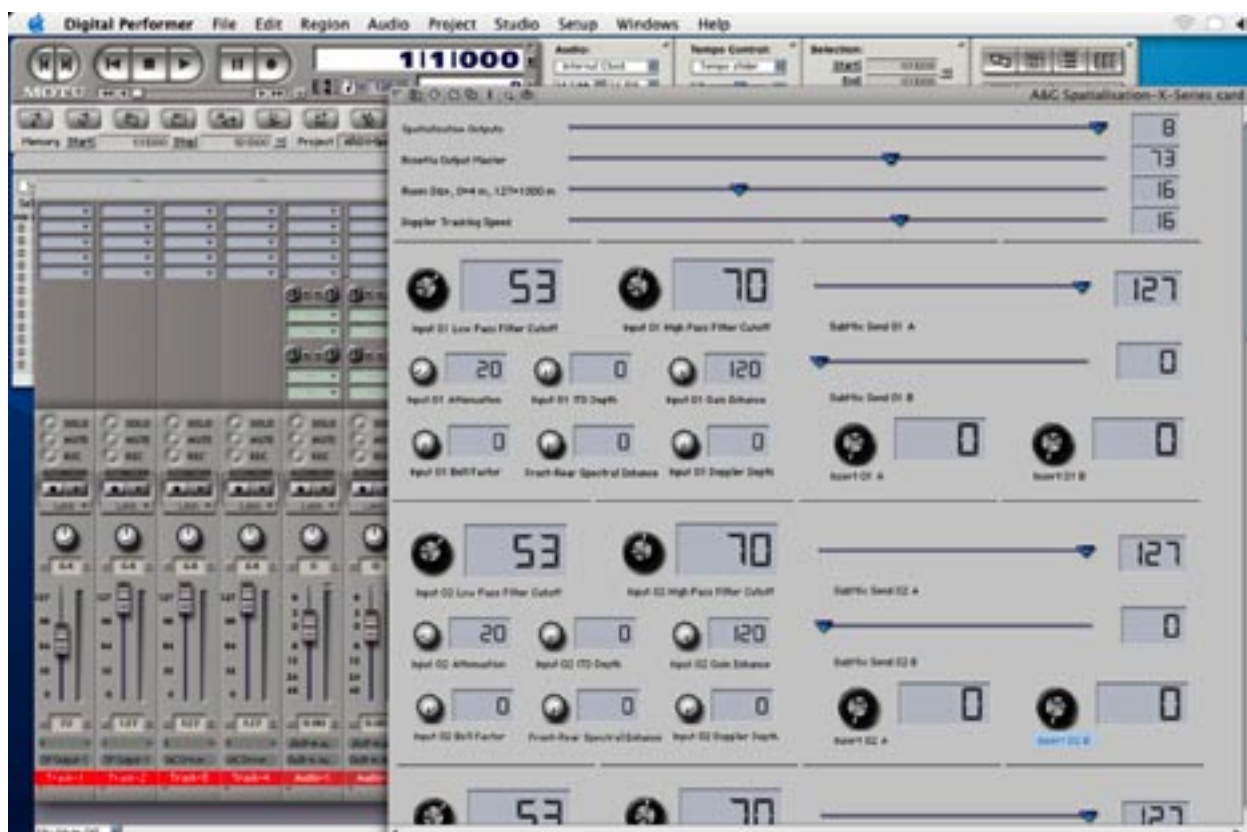
Steinberg Cubase SX with Tobybear CC-Control for Windows XP.



X-Spat Console for MOTU Digital Performer

To control an X-Spat system for Mac OS X, using Mark of the Unicorn Digital Performer 4, it's advisable to create and use a specific Console, i.e. a personalized working environment.

A&G offers a few practical examples, including the one that follows:

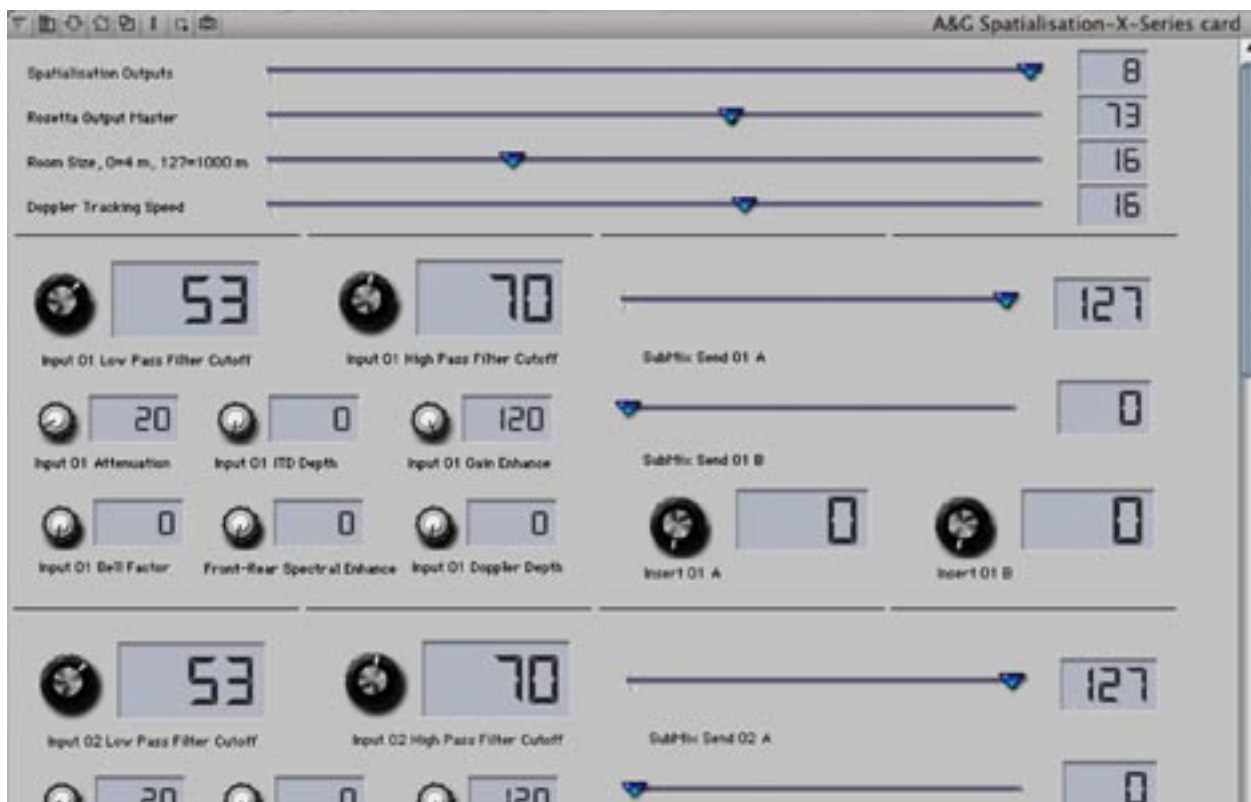


We created four faders to control the four global parameters of X-Spat - 'Room' (Room Side Size), 'Speakers Number', 'Rosetta 800 Output Master' and 'Doppler Tracking' - and we have placed them in the top part of the console, for an immediate set-up of these parameters as soon as you open it. The twelve parameters can be modified in real time and are available for each of the 8 audio/MIDI channels; they are logically replicated vertically. The real time parameters are really thirteen but, thanks to the perfect correspondence between the MIDI messages sent by the faders in the DP4mixer and the ones that are necessary to control the audio level entering the X-Spat Spatializer, some space can be saved and the mixer fader can be used directly.

The available parameters are the same we have described previously when speaking about X-Spat Controller. In addition, Digital Performer 4 will allow us to record a different type of automation for each object and to add various types of effects in real time to one or more channels. Once more, to set up the X-Spat patch bay, we need the X-Spat Controller software, which can also be used to position the audio sources. We will point you again to various items of software for the management of the audio sources' movement, through the sending of XY positions in the shape of MIDI Control Change messages: amongst others, the already mentioned ControlAid and the open source software Fingamidi (<http://fingamidi.sourceforge.net>).

The first uses the mouse at full screen; the second uses the track pad of laptops.

We remind you that all the parameters included in the console can be recorded together with the others, by connecting the X-Spat Controller output to the input of any MIDI channel of DP4, as long as this can receive all the MIDI channels at the same time.

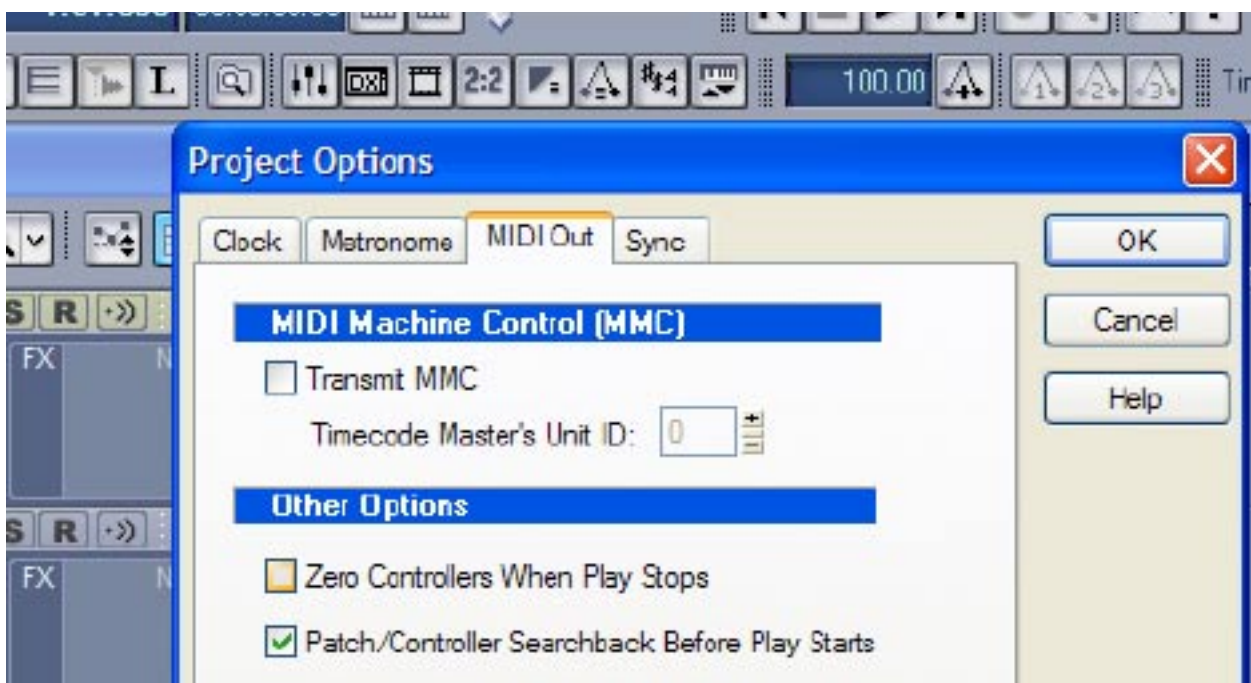


Always record the data at the beginning of a working session and start the audio and the MIDI only after a few seconds, allowing the card the necessary time for reconfiguration.

X-Spat Studioware for Cakewalk Sonar

In order to control an X-Spat system for Windows XP using Cakewalk Sonar 3, you can use a specific configuration file called 'Studioware', which is the personalized working environment according to Cakewalk terminology.

Prima di tutto deselezionate il checkbox "Zero Controllers When Play Stops" che trovate nelle "Project Options" selezionando il Tab "MIDI Out". Quest'opzione potrebbe inviare dati MIDI non desiderati ad X-Spat ogni volta che tornate a "Zero", annullando le vostre impostazioni.





Naturally the available parameters are the same as the ones we have previously described when speaking of X-Spat Controller, but this time, in order to visualize them, we will use the rotation potentiometer top left in Studioware, called: 'Input Channel Nr'. Selecting a channel from 1 to 8, we will be able to send the desired parameters coming out of the selected MIDI channel.

Naturally Sonar, will also allow us to record a different type of automation for each object and to add to one or more channels various types of effects in real time.

Remember that A&G X-Spat Controller software used in the background is probably the best solution to manage the X-Spat set-ups that do not require automation in real time. You may control X-Spat from its own software and use Sonar 's Studioware just to control the audio and the control parameters you wish to automate.

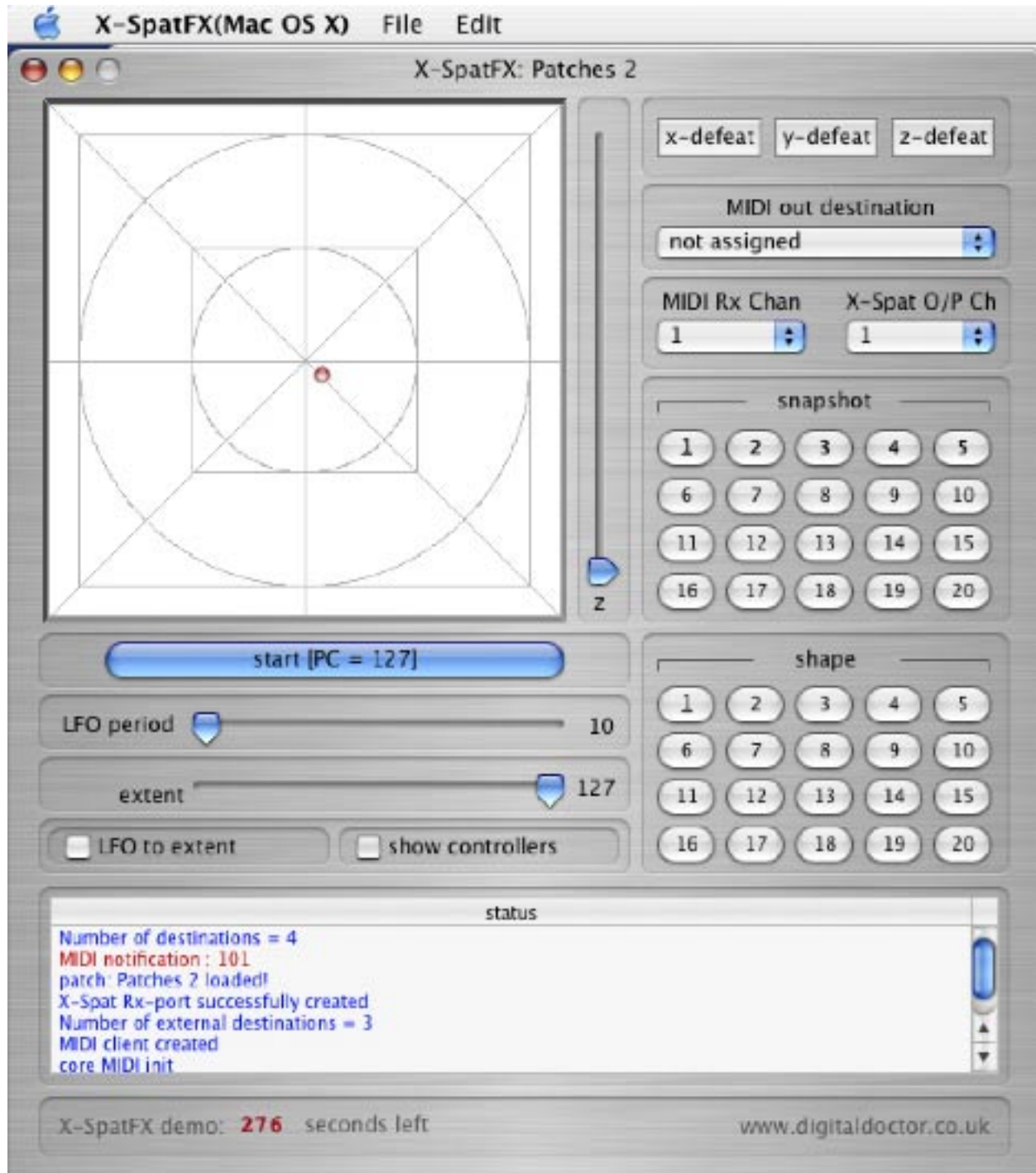
For instance, three rotation potentiometers are available in Studioware to control the positions of the speaker, but we advice you to set up and manage these data through the X-Spat Controller software, which, in addition, allows you to convert the data to metric values.

You only have to change the MIDI output of X-Spat Controller after sending the data to the card, or use the MIDI Thru function of the Cakewalk software. Change from X-Spat #1 #0 MIDI out 1 to any bus in your virtual MIDI driver and set the same bus to input for a Sonar track that may receive on all MIDI channels. Set the X-Spat MIDI driver as MIDI out of the track and it's all done.

You may also record all the card set-up data inside your Sonar project. This will send the static details of your set-up to X-Spat, each time you start your Sonar project. *NB. Please be sure to uncheck the "Zero Controllers When Play Stops" checkbox under Project Options>MIDI tab.*

Digital Doctor's XSpaFX

An ever growing number of software designers, both in Italy and abroad, are producing new and interesting solutions for our hardware. Among the ones developed by an A&G Development Partner, the first software currently available for X-Spat is XspatFX. You will find a demo version inside the A&G Collection CD ROM.



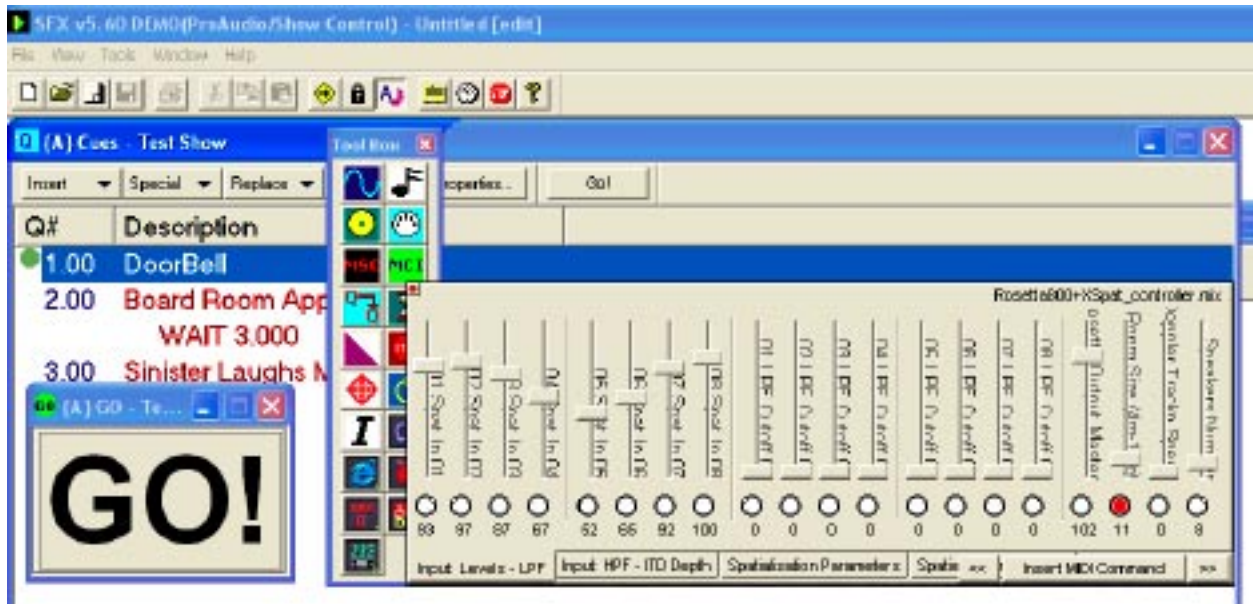
Aimed at applications in a live environment, and particularly to be used in conjunction with the ShowControlPro software, also designed by Digital Doctor UK, it provides a series of preset trajectories (Shapes) that can be controlled via MIDI, and the facility to memorize some settings of the X-Spat parameters (Snapshots) that can also be recalled via MIDI.

For further information, consult the site: <http://www.digitaldoctor.co.uk>

X-Spat Mixer for Stage Research SFX

The X-Spat system can be exploited at its best only in a live context, where the free positioning of the speakers, the three dimensionality of the virtual audio trajectories and the control of the parameters via MIDI are not restricted by the specifications of surround in post-production and take on a full performance value.

The mixer we have designed for the famous show control program Stage Research SFX offers an excellent example of system integration in this context.



To use the mixer you must, first of all, install the MIDI Control plug-in.

Selecting the red dot located top left in the mixer window, you will access the menu to load or to save personalized mixers.

Load the mixer for X-Spat, assign the output to the X-Spat #1 MIDI driver and you are ready to work.

The movement of the sliders can be automated and, by changing the tab in the lower part of the window, you can access to the other groups of faders assigned to most of the X-Spat parameters. You may also create new ones, if you wish. As usual, A&G X-Spat Controller software used in the background is the best solution to manage X-Spat set-ups that do not require automation in real time, like the position of the speakers and the set-ups of the internal patch bay.

MIDI Implementation Table

Parameter	MIDI Channel	Control Change	Value	Default Value
Number of Speakers	2	0	from 1 to 8	5 (5.1)
Rosetta Out Master	3	0	from 0 to 127	100
Room Side Size	4	0	from 0 to 127	11 (6,5 m)
Doppler Tracking	5	0	from 0 to 127	0
Input Level	from 1 to 8	7	from 0 to 127	100
Input LPF Cutoff	from 1 to 8	4	from 0 to 127	127 (off)
Input HPF Cutoff	from 1 to 8	5	from 0 to 127	0 (off)
Doppler Depth	from 1 to 8	6	from 0 to 127	64
Attenuation	from 1 to 8	8	from 0 to 127	64
Bell Factor	from 1 to 8	9	from 0 to 127	64
ITD Depth	from 1 to 8	11	from 0 to 127	64
Front-Rear Spectral Enhance	from 1 to 8	16	from 0 to 127	64
Gain Enhance	from 1 to 8	12	from 0 to 127	64 (0)
SubMix A Input Level	from 1 to 8	28	from 0 to 127	0
SubMix B Input Level	from 1 to 8	29	from 0 to 127	0
Insert A Level	from 1 to 8	30	from 0 to 127	0
Insert B Level	from 1 to 8	31	from 0 to 127	0
Source Position X	from 1 to 8	20	*from 0 to 127	^64 (center)
Source Position Y	from 1 to 8	21	*from 0 to 127	^64 (center)
Source Position Z	from 1 to 8	22	*from 0 to 127	^64 (center)
Speaker Position X	from 1 to 8	13	*from 0 to 127	^64 (center)
Speaker Position Y	from 1 to 8	14	*from 0 to 127	^64 (center)
Speaker Position Z	from 1 to 8	15	*from 0 to 127	^64 (center)
*The resolution depends on the value of the side of the virtual cube inside which Spatialisation is taking place.				
^ Value 64 corresponds to the center of the virtual cube inside which Spatialisation is taking place.				

Patchbay

						Outputs			
Inputs			1 No Signal	7 Test Signal	8 Host Out	8 Rosetta Opt. Out	8 Spatializer Out	8 Sub Mix Send A	8 Sub Mix Send B
Eight Inputs for each kind of channel	Control Change	MIDI Channel	Value	Value for channel	*Value for channel	Value for channel	Value for channel	Value for channel	Value for channel
Host In	2	1 to 8	0	from 1 to 7	from 8 to 15	fr.16 to 23	fr.24 to 31	32	33
Spatializer In	1	1 to 8	0	from 1 to 7	from 8 to 15	fr.16 to 23	fr.24 to 31	32	33
Rosetta Opt. In	3	1 to 8	0	from 1 to 7	from 8 to 15	fr.16 to 23	fr.24 to 31	32	33
SubMix A In	24	1 to 8	0	from 1 to 7	from 8 to 15	fr.16 to 23	fr.24 to 31	32	33
SubMix B In	25	1 to 8	0	from 1 to 7	from 8 to 15	fr.16 to 23	fr.24 to 31	32	33
Insert A In	26	1 to 8	0	from 1 to 7	from 8 to 15	fr.16 to 23	fr.24 to 31	32	33
Insert B In	27	1 to 8	0	from 1 to 7	from 8 to 15	fr.16 to 23	fr.24 to 31	32	33

* It means, for example, that values from 8 to 15 must be used for channels 1 to 8: value 8 for channel 1, value 9 for channel 2, and so on.

Presets Management

Parametro	Program Change	SysEx e Program Change ID
Preset 1	1	ID 00H
Preset 2	2	ID 01H
Preset 3	3	ID 02H
Preset 4	4	ID 03H
Preset 5	5	ID 04H
Preset 6	6	ID 05H
Preset 7	7	ID 06H
Preset 8	8	ID 07H
Custom Preset	64	ID 40H
Save Mode	-	FOH 00H 20H 5EH 08H F7H
Stop Mode	-	FOH 00H 20H 5EH 06H F7H
Rec Mode	-	FOH 00H 20H 5EH 04H F7H
*Default Setting Mode	-	FOH 00H 20H 5EH 0CH (ID) F7H

*Replace “ID” with the hexadecimal number corresponding to the preset to be set as default.

Suggestions for a correct usage of the X-Spat system

The X-Spat system is a versatile and powerful resource for a wide range of applications, even if its natural ‘habitat ‘ is multichannel audio production, from surround to ‘Live ‘performance. This chapter provides the necessary information to use the system correctly in some applications, including surround 5.1 and 7.1.

Common factors to be considered for all applications

Spatialisation [™] is the result of the sum of all the speaker outputs. If one of the speakers doesn’t work properly or is in mute, we advice you to change the number of output speakers through the parameter in the ‘Global Settings’ area of the X-Spat Controller software.

In order to get the best possible effect, set correctly the position of the spatializer’s outputs and control that these outputs are correctly assigned to the Rosetta 800 outputs in the Patch Bay of X-Spat Controller.

For example, in a 5.1 ITU set up, the number of outputs of the spatializer must be set to the value 5, through the “Number of Spat.Outs” parameter in the “Global Settings” area of X-Spat Controller. However the ITU standard provides that the subwoofer should be connected to channel 4 of the Rosetta. Therefore, in the Patch bay window, we will connect output 4 of the Spatialiser to output 5 of the Rosetta and output 5 of the Spatializer to output 6 of the Rosetta. Output 4 of the Rosetta, destined to the Subwoofer, can be directly connected to one or more inputs or to one of the internal submixers of X-Spat.

In practice always consider that:

each output of the X-Spat spatializer can use any of the outputs of the Rosetta 800;

the price to pay in order to take advantage of this versatile and convenient option is the extra attention we need to pay while setting the internal patch bay of X-Spat.

For the playback from DVD, it's much easier to encode the audio file produced by X-Spat in AC3 or DTS. Connect the outputs of the Rosetta 800, whether they are digital or analog, to a multi-track recording system on hard disk. Record your Spatialisation and then load the resulting audio files in one of the many encoders available on the market, like A.Pack or similar.

It's worth noting the behaviour of Cubase SX for Mac OS X in this situation.

The Steinberg audio sequencer allows the creation of a virtual multi-track bus which accepts the Firewire Host In channels of X-Spat as input and the internal hard disk as destination, independently from the fact that the Host Out Firewire channels of the card are used at the same time as outputs from Cubase SX to X-Spat itself. An X-Spat Base bundle and a Powerbook with Cubase SX and A.Pack will be sufficient for the production and mastering of multi-track projects onto DVD.

Multi-track audio production

The various items of software, and systems made up of software and hardware, that we have described in previous chapters, represent today real 'advanced working environments' for sound engineers and musicians all over the world.

From the progenitors Digital Performer and Sonar (ex Cakewalk Pro) to the modern Cubase, Logic and ProTools, all these splendid items of software provide, in varying degrees, everything that is necessary to carry out multi-track panning. Often panning is sufficient for applications required by multi-track audio production for video, or for supports like Audio DVD and video games. But X-Spat is the ideal product if sufficiency is not enough. While it maintains the necessary compatibility with traditional panning and with the various necessary encoding algorithms, X-Spat provides more demanding engineers with the most effective psycho-acoustic algorithms to simulate the positioning or the movement of audio sources in any point of a given space. In addition, using the Spatialisation 3D provided by the two DSP of X-Spat as a support or in place of the normal 2D 'panning' of the above items of software, the latter will dispose of increased power of calculation for other effects that must use the host computer or the hardware assigned to them.

The X-Spat system's capacity to recalculate all that is necessary to reproduce the same Spatialisation, each time there is a change in the position and the number of speakers used, also creates new possibilities in terms of production if you want to use live multi-track and preserve the original sensations as much as possible, when transferring to a mass-circulation multi-track system, i.e. DVD.

Let's look at some examples of system configuration, also included in the X-Spat Library file of the installation CD-ROM.

The file 51ITU_AD_plusExtStereo.xcont2, if loaded in X-Spat Controller and correctly sent to the card, allows you to use inputs 1 to 6 as channels to be spatialized and the couple of inputs 7 and 8 as stereo inputs not spatialized, but directly added to channels L and R of the 5.1. Therefore our output will be a 5.1 ITU made up of a stereo mix and of 5 channels in Spatialisation plus a Subwoofer, always controllable both during the mixing and during the mastering, the ideal solution for the typical recording of music.

File Ext51ITUplus7-8Spat.xcont2 instead, if loaded in X-Spat Controller and correctly sent to the card, will allow you to use inputs 1 to 6 as input channels for an external 5.1 premix in 2D panning, and the couple of inputs 7 and 8 as mono channels to be spatialized or as a single stereo channel to be spatialized. Our output this time will be a 5.1 ITU made up of the sum of the signals mixed by an external workstation in panning and by Spatialisation 5.1 ITU of X-Spat.

These two examples represent two ideal extremes in a wide range of settings that you will be able to create and memorize in your hard disk at your own pleasure, and will allow you to deal with almost any requirement in multi-track audio production.

Live Performance

As previously mentioned, the X-Spat system's capacity to recalculate all that is necessary to reproduce the same Spatialisation each time you change the number and position of your speakers, creates new production possibilities for live use of the multi-track. Therefore the dividing line between production and performance can be made even thinner thanks to Spatialisation, which makes it easier to transfer the spectacular effect of a performance from Live to DVD. However, operative requirements are still an essential factor and they are certainly different in the two working environments. This is another reason why A&G provides two different types of software with the card. The one for live applications is IMEASY X.

IMEASY X uses various types of interactive markers to control in real time Spatialisation and MIDI as data transmission protocol, but also as control for each single node of its trajectories. So we recommend the use of this item of software, even as "slave SMPTE" of your favourite application, for your installations or multi-track audio performances.

Keep in mind that X-Spat can also simulate the virtual position of one or more audio files, not just their movement. For example, you can successfully simulate the presence of a noise on stage, even if the speakers are installed around the audience. X-Spat considers the speakers as emission points (literally, i.e. as dots: please refer to the central-middle part of the speaker to calculate its positioning). The cabinets can be placed wherever you prefer in the real environment to be spatialized. Theoretically all the speakers could be bunched together! Naturally it's best to place them around the audience and create two or more levels of positioning at different heights, for a better result with three-dimensional trajectories.

We have observed that the most advisable arrangement for live performances, using the basic version of the system in traditional environments like theatres and halls, is as follows: 4 speakers positioned at a height of 1 meter, at the corners of a square and four more in the same positions but 2 or 3 meters higher. This is just a suggestion and you may experiment to find better solutions. Each show or installation is different, but your X-Spat system will adapt to almost any situation.

X-Spat inputs can be moved manually in real time, even while play is synchronized to an external SMPTE code. However, you must consider that the tools of the sequencers controlling X-Spat require the use of the mouse, which naturally is two-dimensional. The best solution could be to use an external three-dimensional controller like A&G's 'TheBat ' or to use predetermined trajectories, originally two-dimensional, but modified step by step through the Z parameter.

Production of Spatialisation™

The specific Spatialisation™ designed for an environment can always be digitally recorded on an ADAT compatible or other similar multi-track recorders. If you are sure that all the parameters of the environment where Spatialisation™ is being used are invariable, you can leave your X-Spat system in the studio, or pass Spatialisation™ to others, using a simple multi-track digital support, i.e. an ADAT cassette.

Production in Surround™

X-Spat can also be a very powerful tool for audio post-production of videos, providing new functions that had never been thought of before in Surround™ productions, such as the use of predetermined three-dimensional trajectories and control via MIDI in real time. Obviously the use of the X-Spat system presupposes the presence of another Dolby certified system to listen and codify in Surround. In this case it will be enough to position the outputs of X-Spat following the standard specifications of the Surround™ setting. A simple connection of the X-Spat outputs to the Dolby codifier will ensure the direct feedback of the effect resulting from the conversion of Spatialisation™ into Surround™.

Troubleshooting

We advise you to regularly make back ups of your work, and especially before you operate changes in the system configuration.

Back up of the sessions

Similarly, we advise you to regularly make back ups of your X-Spat sessions, and of any audio you used. There are different types of media that are suitable to back up projects of various dimensions, i.e. DVD-ROM or CD-ROM mastering devices.

Common Problems

Do not disconnect the firewire cable if the Rosetta 800 and the computer are still switched on.

Any change in the sampling frequency must be made first on the front panel of the Rosetta 800, and then in the computer's software.

The very convenient Firewire connection unfortunately has a latency in the transmission of the data that is too high for multi-track recording. Therefore we advise, when possible, to use the analog or digital channels of the Rosetta 800 and of the MIDI portal in the front panel of X-Spat.

Performance Factors

There are various conditions that may negatively affect the performance of the X-Spat Controller in Windows XP. They include:

Other applications. Any active software in the background or generating activity in the hard disk, i.e. virus protection software, disk optimizers or file saving software should be deactivated or removed.

Screen Saver. Any screen saver software should be totally removed before you use X-Spat Controller.

Power Saver Utilities. Some utilities for automatic power saving, like the ones limiting the system's hard disk activity, may influence the performance of X-Spat Controller. Such utilities should be deactivated.

Before you call technical support

Register your X-Spat System.

All registered users of a new 'A&G Soluzioni Digitali' product covered by guarantee, are entitled to A&G Technical Support. Fill the Registration Form, sign it and send it via post or fax to the address provided with the registration paperwork.

Refer to the registration paperwork accompanying your system for details of your cover and for available services.

Use the resources of 'A&G Soluzioni Digitali'

In addition to this X-Spat Reference Manual, your system includes the following information resources:

ReadMe files. They contain last minute information and known problems regarding the possible software and hardware configurations of X-Spat. The ReadMe files are installed in the X-Spat Controller folder when you install the software.

Website. The Website of 'A&G Soluzioni Digitali' includes an area for Technical Support. Visit <http://xspat.aegweb.com> and go to the area dedicated to Technical Support for X-Spat.

Collect Important Information

'A&G Soluzioni Digitali' wants to help you to solve problems as fast and efficiently as possible. If you have the following information available when you contact Technical Support, this will make it easier to diagnose your problem:

About your Computer

Make, Model, processor speed

RAM size

Operative System (version of Mac OS or Windows)

Version of X-Spat Controller Software

Any Driver, Expansion, Control Panel, Disks or other applications connected to the system that you may have installed.

X-Spat and Rosetta 800 Hardware

Type of cards, interface or peripherals

Additional Hardware

If you are using any additional hardware, please refer to the manufacturer's paperwork for operative details. The most common supplementary hardware include the following:

SCSI Accelerators (maker, model, setting)

OPEN GL Accelerators (maker, model, setting)

Video Capture Cards (maker, model, setting)

Refer to the A&G paperwork for compatibility or contact your A&G retailer to check that the hardware has been approved to be used with your X-Spat system.

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- EN55022;
- EN50082-1;

Relative alle seguenti direttive:

- 89/336/EEC – EMC Directive
- Nr. 615 del 12/11/1996 recepimento direttive 92/31/CEE, 93/68/CEE, 93/97/CEE
- Nr. 626 del 25/11/1996, attuazione della direttiva 93/68/CEE
- Nr. 277 del 31/7/1997 modifiche alla Nr. 626 del 25/11/96

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