

Meridian Configuration Program Guide

Copyright and acknowledgements

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Getting started

This chapter explains how to install the Meridian Configuration Program, and gives a general overview of its key features.

Overview

The Meridian Configuration Program is a Windows application that lets you design the configuration of your G Series system to suit both your own personal preferences and the particular configuration of other equipment in your system.

It uses an intuitive graphical interface that prompts you at every stage for the information it needs to complete the system. When you have designed the system to your requirements you can save the configuration to the appropriate Meridian products in the system via a serial link connected to the back of each product.

How it works

The Meridian Configuration Program reflects Meridian's system approach to designing audio products and presents a graphical representation of your whole system. It allows you to create a

single configuration file representing the settings of each product in your system and the way they are interconnected. This file is stored in the controller of the system for future reference. As well as being far more convenient than configuring each product independently, this approach also enables the Meridian Configuration Program to check that the settings you are proposing are appropriate for the particular combination of products in the system.

The Meridian Configuration Program is structured as a wizard; it leads you through a series of stages from the **Welcome** page through to the **Finish** page, which is reached when the configuration has been completed. A Breadcrumb trail below the toolbar at the top of the **Meridian Configuration Program** window shows your current position in the sequence of pages and allows you to jump back to an earlier page to check a particular setting you made.

Benefits of using the Meridian Configuration Program

Configuring your system with the Meridian Configuration Program offers several important benefits. In particular:

- You can configure the entire system in a single operation.
- It is more convenient and more intuitive than using the front-panel menus.
- You have access to many advanced configuration options that are not available from the front-panel menu.
- You can conveniently edit source, DSP preset, and other names using the keyboard.
- You can edit the G Series soft keys.
- If your controller is a digital surround controller you can take advantage of Meridian Room Correction.
- You can set up multiple systems far more conveniently than by manually configuring each product.
- You can keep a record of the configuration of your entire system in a single document on your PC.

If you have made manual adjustments to the configuration of a product from the front panel, you can fetch the product's configuration into the Meridian Configuration Program as the starting point for the configuration of your system, in order to retain the settings, such as calibration settings.

Installing the Meridian Configuration Program

Requirements

To use the Meridian Configuration Program you need:

- A computer running Windows 95, 98, 2000, NT 4, ME, or XP.
- 10Mbytes of free disk space.
- A 9-pin serial port.

The software requires a mouse or similar pointing device – it cannot be operated solely from the keyboard.

To install the Meridian Configuration Program

- Insert the Meridian Configuration Program Installation CD-ROM.

The Setup program should be run automatically when the CD-ROM is inserted. If not, locate **setup.exe** on the CD-ROM and run it.

The Setup program **Welcome** page will be displayed.

- Follow the wizard.

Note: Entering your personal details is optional; this information is only kept on your computer.

On the **Preferences** page:

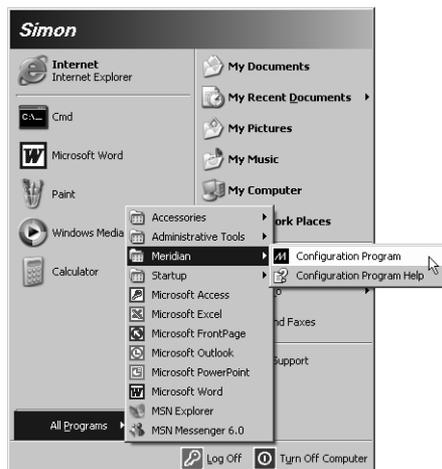
- Leave **Install for all users** selected, unless you want to restrict use of the program to yourself on a multi-user machine.

Quick tour

This section is designed to give you a quick tour of the Meridian Configuration Program. It shows how to create a complete configuration for a typical simple system. At each stage the Quick tour shows information about some of the more advanced features of the Meridian Configuration Program in grey tinted boxes.

Running the Configuration Program

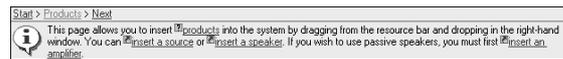
- Click **Start**, point at **All Programs, Meridian**, then click **Configuration Program**:



The **Welcome** page will be displayed. This provides links to useful information.

Using the Meridian Configuration Program

The simplest way to use the Meridian Configuration Program is to click the links in the Breadcrumb trail and Information bar at the top of the window; for example:



The Breadcrumb trail shows a sequence of hyperlinks to pages you have already visited; this is indicated by the blue underline. Clicking one of the links takes you to the corresponding page to allow you to check your settings on that page, or make changes. The last entry on the Breadcrumb trail is usually **Next**, which takes you to the next page.

The Information bar provides help about the current page, and tells you what to do next. The Information bar contains two types of hyperlink: definitions, prefixed by a question mark icon, which display a pop-up window with a definition of the item, and jumps, prefixed by an arrow icon, which perform an action or jump to another page.

Starting a configuration

To start creating a configuration from the **Welcome** page:

- Click the **Next** link in the Breadcrumb trail:



The **Products** page will then be displayed. This allows you to define the products in your system and indicate how they are connected together.

Getting help

For more detailed information about the Meridian Configuration Program see the on-line help. To display the help:

- On the **Help** menu, click **Configuration Program Help**.

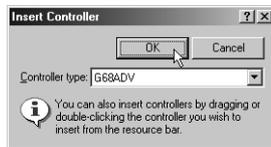
Products: Adding a controller

The controller is defined as the product that selects sources and controls the volume for the system; it is the digital surround controller, preamplifier, or combination product. In this example it is a G68 Digital Surround Controller.

- Click the **Insert a Controller** link in the Information bar.

An **Insert** dialogue box is displayed to allow you to specify the type of controller.

- Select **G68ADV** from the drop-down list and click the **OK** button to add the product:



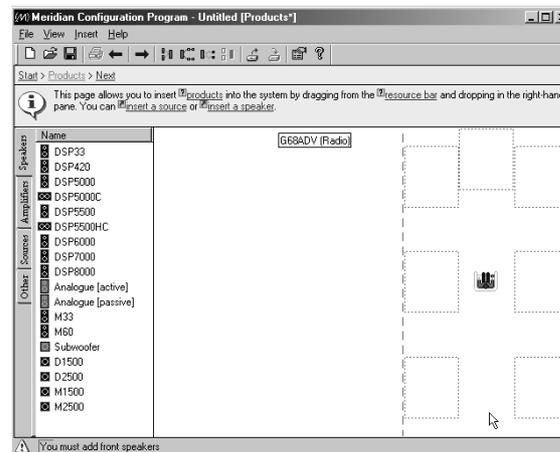
You will then be asked whether you want to fetch an existing configuration from the controller. If you are starting from scratch, as in this Quick tour, you do not need to do this. For more information see the *Advanced tips* on the next page.

- Select **Remember my decision** to avoid further prompts of this type.

- Click the **No** button to indicate that you do not want to fetch data from the digital surround controller:



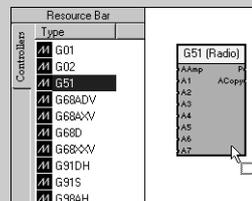
The **Products** page will then show the G68ADV Digital Surround Controller:



Advanced tips

Adding products by dragging them from the Resource Bar

The most flexible way of adding products is to drag an appropriate icon from the **Resource Bar** (to the left of the **Products** page) into the **Meridian Configuration Program** window:



Fetching settings from a product

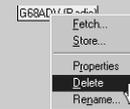
If you have changed any settings on a product from the front panel since making a previous configuration, you can retain the settings by using the Meridian Configuration Program to fetch the configuration from the product, rather than starting from a default configuration as described above. This is also useful if you cannot locate the file on the computer.

- Connect a serial cable between the product and your PC.

Follow the instructions in *Post-calibration fetch*, page 22.

Performing other actions

- Click with the right mouse button on most objects in the **Meridian Configuration Program** window to display a context menu of actions appropriate to that object:



For example, to delete a product:

- Click the product with the right mouse button and click **Delete** on the context menu.

Note: If you delete the controller you will need to restart the configuration from scratch.

Displaying or changing product properties

Many products provide a range of properties that you can change for specific situations. To display the product properties:

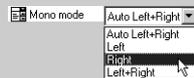
- Click the product with the right mouse button and click **Properties** on the context menu or double-click the product icon.

The **Properties** dialogue box shows a list of the properties associated with the product, and allows you to view or change their values:



Changing the value of a property

- Click the value of the property.
- Choose an option from the drop-down list:



If it is a numeric property you will get a spin button rather than a drop-down list:



If you have changed the value of a property an * is shown after its name.

Restoring a property to its default value

- Click the property with the right mouse button and click **Revert to Default** on the context menu:



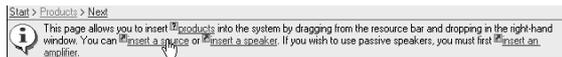
The menu option shows the default value.

For detailed information about what each of the properties mean refer to the Configuration chapter in the Installation Guide for the product, or the FAQ in the Meridian Configuration Program on-line help.

Products: Inserting a source

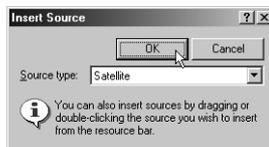
The next step is to add the sources in your system. For this Quick tour we will assume a satellite receiver is required.

- Click the **Insert a source** link in the Information bar.

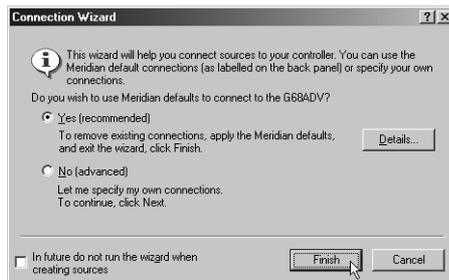


An **Insert Source** dialogue box is displayed to allow you to select the type of source.

- Choose **Satellite** from the drop-down list, and click the **OK** button to add the source:



The **Connection Wizard** is then displayed to assist you in connecting the source to your other equipment:

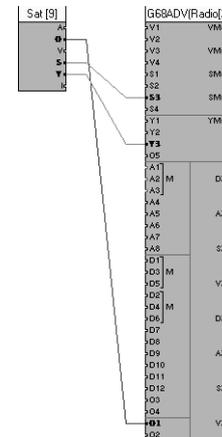


- Leave **Yes** selected to make the recommended connections between the source and the controller.

The Meridian Configuration Program will use a set of connections which match the back panel screening of the controller to make wiring up straightforward

- Click the **Finish** button to make the recommended connections.

The connections will be displayed on the **Products** page:



This shows the audio connection between the satellite receiver optical output and the optical input O1 on the digital surround controller, and the S-video and component video connections between the satellite receiver and the digital surround controller.

You can now proceed to add the other sources in your system in a similar way. In this example we are only inserting a single source.

See the *Advanced tips* opposite for information about modifying these connections; eg to use analogue rather than optical for audio.

Advanced tips

Showing a list of the recommended connections

If you choose the **Yes (recommended)** option in the **Connection Wizard** dialogue box, you can preview the recommended connections.

- Click the **Details...** button in the **Connection Wizard** dialogue box:



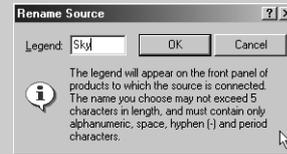
Renaming a source

You can give each source a name of up to five characters to identify it on the front-panel display:

- Click the source with the right mouse button, then click **Rename...** on the context menu:



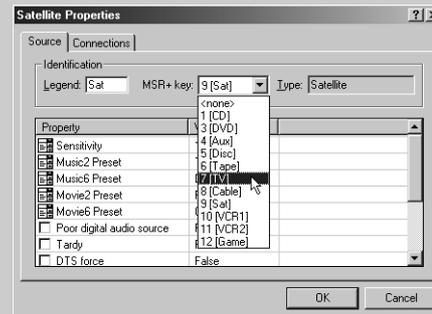
The following dialogue box allows you to enter a new name:



Changing the MSR+ key for a source

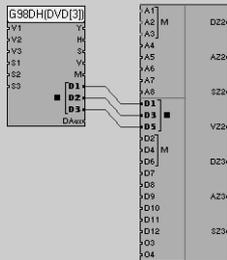
You can choose which MSR+ key selects each source:

- Click the source with the right mouse button, then click **Properties** on the context menu.
- Click the **Source** tab in the **Properties** dialogue box.
- Choose the MSR+ key from the **MSR+ key** drop-down list:



A prompt allows you to choose whether to make a single or multichannel connection.

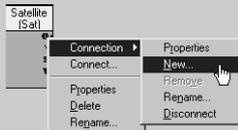
If you choose **Yes** the multichannel connection will automatically be made:



Adding or removing inputs or outputs

You can add new inputs or outputs, or remove inputs or outputs, to reflect the connectors provided by your source. For example, if your satellite receiver includes a digital coax output you can add a connector for this:

- Click one of the source's existing connectors with the right mouse button, point to **Connection**, then click **New...** on the context menu:



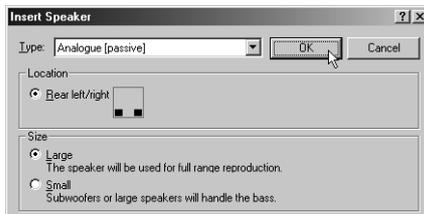
The **Add connector** dialogue box allows you to define the new connector.

- Specify the type of connector using the **Class** and **Type** drop-down list, enter a name, and choose **Output** or **Input** as appropriate:



- Click the **OK** button to add the connector.

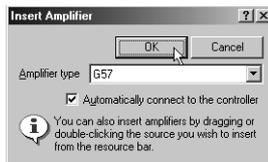
- In the **Size** section select **Small** to indicate that these speakers should not handle bass:



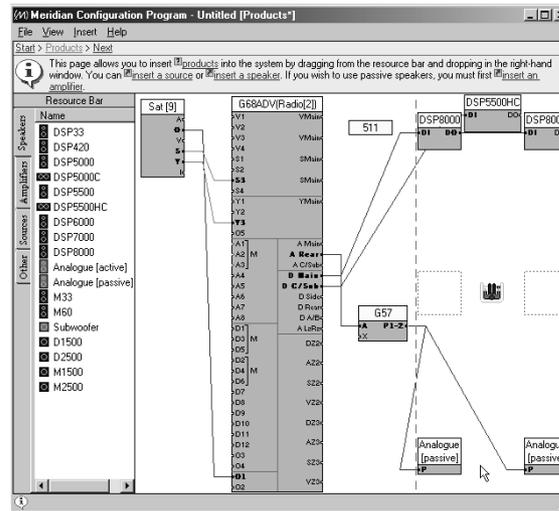
- Click the **OK** button to add the speakers.

The Meridian Configuration Program will automatically prompt you to add an amplifier to the layout to drive the passive speakers.

- Click the **Yes** button.
- Click **G57** on the **Amplifier type** drop-down list, and click the **OK** button to add the amplifier:

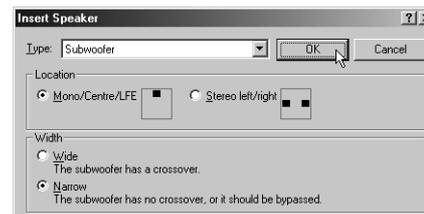


The G57 will automatically be connected up to the appropriate analogue output on the digital surround controller:



Finally insert a subwoofer into the layout:

- Click the **Insert a speaker** link in the Information bar and click **Subwoofer** on the **Type** drop-down list:



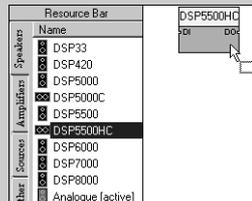
You can proceed to add any other speakers in your layout in a similar way.

- Click the **Next** link in the Breadcrumb trail to proceed to the next page.

Advanced tips

Adding a speaker by dragging it from the Resource Bar

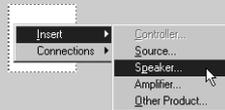
- Drag an icon from the **Speakers** panel of the **Resource Bar** (to the left of the **Products** page):



- Drop it onto the appropriate speaker position.

Adding a speaker at a specific position

- Click the position with the right mouse button, point to **Insert**, then click **Speaker...**, on the context menu:



Alternatively, double-click the speaker position.

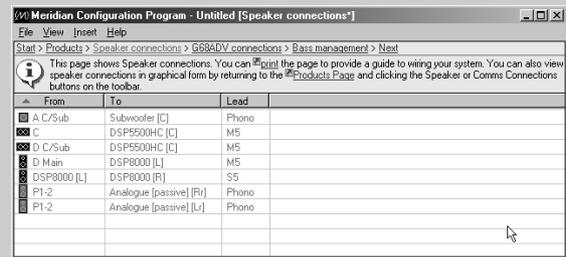
Reviewing and printing the source and speaker connections

You can display a list of the source and speaker connections, as a checklist, and print out a copy for help in wiring up the system.

- On the **View** menu, click **Review Pages**.

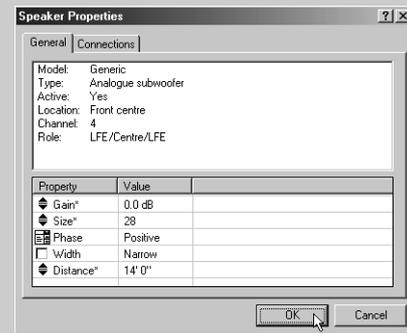
Additional **Speaker connections** and **Controller connections** pages will be available in the Breadcrumb trail.

- Click **Speaker connections** or **Controller connections** to display the appropriate list of connections:



Displaying or changing the speaker properties

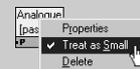
To display the speaker properties, double-click the speaker icon or click the speaker icon with the right mouse button and click **Properties** on the context menu:



You can edit the properties in the same way as for source properties.

Specifying whether the speaker should handle bass

If you do not want a speaker to handle bass click its icon with the right mouse button and click **Treat as Small** on the context menu:

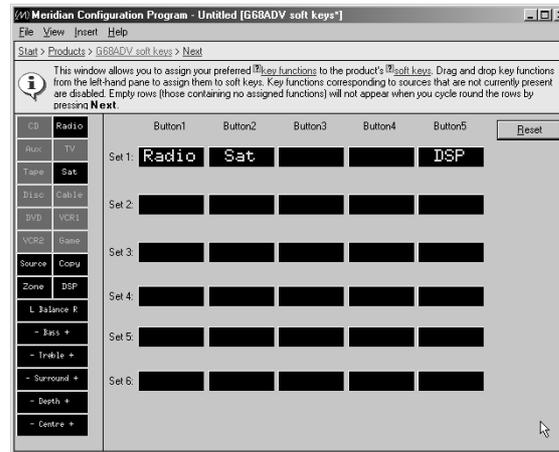


Soft keys

The **Soft keys** page allows you to customise the soft keys for each of the G Series products in the system starting with the controller. In this example the only applicable product is the G68ADV.

An initial recommended layout is provided for each product; for example, for a G68 this provides soft keys for each of the sources in the system, plus a DSP key in the rightmost position.

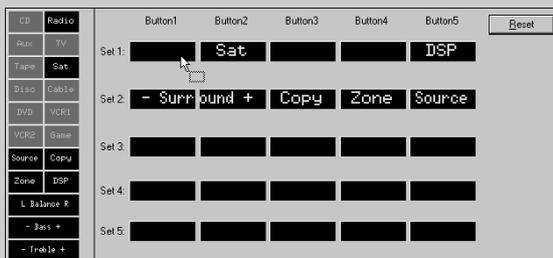
- Click the **Next** link in the Breadcrumb trail to proceed to the next page.



Advanced tips

Changing the soft key layout

- Drag a soft key from the left-hand list onto the set of soft keys you want to edit:



The first 12 buttons correspond to the 12 MSR+ keys. Only the ones corresponding to the sources you have defined in your system will be available – the others will be greyed out. Their names will reflect the names you have given the sources on the **Products** page.

Soft keys that work in pairs, such as balance, bass, treble, and bright, automatically occupy two adjacent soft key positions.

Renaming a source

- Click the source button with the right mouse button, and click **Rename Source...** on the context menu:



All occurrences of the source in the soft key sets will be changed.

Clearing a soft key

- Click the soft key with the right mouse button and click **Remove** on the context menu:



Restoring the recommended layout

- Click the **Reset** button for a recommended assignment of soft keys.

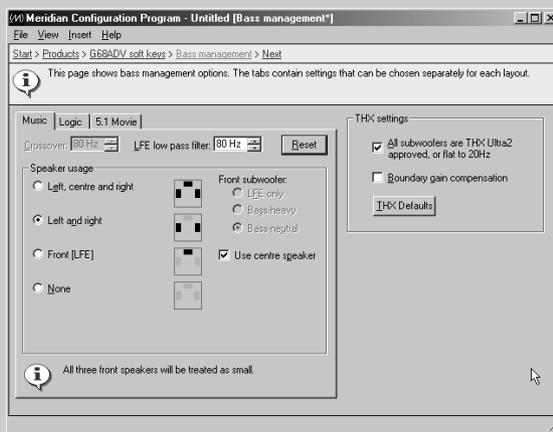
Bass management

The **Bass management** page specifies how bass is handled in the system for each of the three speaker layouts. The settings are automatically set to recommended values and can be ignored for a simple configuration.

- Click the **Next** link in the Breadcrumb trail to proceed to the next page.

Advanced tips

Meridian digital surround controllers allow you to define three different speaker layouts for use with different types of material: Music, Logic, and 5.1 Movie. The **Bass management** page allows you to specify how the bass is handled in each speaker layout:



You can select the subwoofer configuration, and whether the centre speaker is used in the layout, in the **Speaker usage** section. Information about your choice will be displayed below the **Speaker usage** section.

If you include only one subwoofer in the layout, and you have specified your main speakers as **Small**, the subwoofer will be used for the bass and LFE. If the main speakers are **Large** the **Front subwoofer** option allows you to choose whether the subwoofer handles just the LFE, all the bass (**Bass-neutral**), or the bass together with the main speakers (**Bass-heavy**).

If you include two or more subwoofers in the layout, irrespective of the size of the main speakers the subwoofers will handle the bass and LFE for the system.

The **Crossover** option allows you to set the crossover frequency for the subwoofers. This is disabled if the subwoofers are only handling the LFE. The Meridian digital surround controllers provide very high-quality crossovers for the subwoofers, and for best results you should use these instead of the subwoofer's crossover. To do this set the subwoofer **Width** property to **Narrow**, and remove any crossover in the subwoofer or set it to the highest setting (eg 200Hz). If you cannot do this set the subwoofer **Width** property to **Wide** to switch off the digital surround controller's crossover and use Sine/Sub mode to match the subwoofer's crossover frequency.

The **LFE low pass filter** option sets the low-pass filter for the LFE channel, for the Music and 5.1 Movie speaker layouts.

Click the **Reset** button to reset the crossover and low-pass filter to recommended values in all layouts.

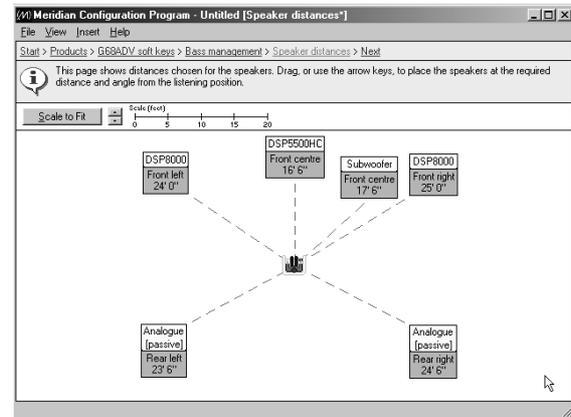
In addition, a **THX settings** panel allows you to specify that your subwoofers are **THX Ultra2 approved**, and select **Boundary gain compensation** to reduce bass levels if listeners are close to a wall. Click the **THX Defaults** button to set the crossover and low-pass filter to 80Hz in all layouts, as recommended by THX.

Speaker distances

The **Speaker distances** page gathers information about the relative positions of the speakers in your system, and the distance of each speaker from the listening position. First choose the units you would like to work in.

- On the **View** menu, click **Metric** or **Imperial**.
- Measure the distance to each speaker in the specified units.
- Drag the speakers until they are in the correct positions, with the correct distance shown on each speaker icon.

This information is used to generate the aspect ratio and rear speaker separation.



- Click the **Next** link in the Breadcrumb trail to proceed to the next page.

Advanced tips

- Click the ▲ or ▼ buttons to the left of the scale indicator to change the scale of the whole diagram.
- Click the speaker to select it, and then use the arrow keys to move the speaker in the corresponding direction.
- Use **Ctrl** ↑ and **Ctrl** ↓ to move a speaker away from or towards the listening position. Hold down **Shift** to move all the speakers at once.
- Use the **Ctrl** ← and **Ctrl** → to move a speaker in a circle around the listening position.
- Click the **Scale to Fit** button to increase the scale so the loudspeakers neatly fit in the screen.

Pre-calibration store

The **Pre-calibration Store** page stores the settings you have created to the G68 Digital Surround Controller and then automatically starts the calibration sequence so you can tune your speakers by ear using a series of listening tests.

To connect the serial cable

- Connect one end to the RS232 connector on the back panel of the controller in your system.
- Connect the other end to one of the serial ports on your computer.

The default is COM1. If you have to use a different port see *Advanced tips* below.

- Click the **Start** button to begin.

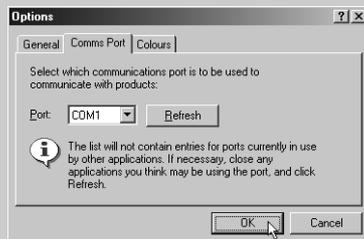
When the store has completed successfully the calibration procedure will start automatically and you will hear a noise signal from the first speaker in your layout. Refer to the *G Series Digital Surround Controller Installation Guide* for information about calibrating your system.

- Click the **Next** link in the Breadcrumb trail to proceed to the next page.

Advanced tips

Specifying the serial port

- Click the **Options...** button on the **Pre-calibration** store page to display the **Comms Port** panel on the **Options** dialogue box:



- Select the port you want to use and click the **OK** button.

Post-calibration fetch

The **Post-calibration fetch** page fetches the calibrated settings from the digital surround controller so you can complete the configuration.

- Click the **Start** button to start the fetch.

When the fetch is complete:

- Click the **Next** link in the Breadcrumb trail to proceed to the next page.

Speaker properties

The **Speaker properties** page allows you to check or edit the calibration of the speakers in the system.

This allows you to review the changes made during the calibration, and you should not normally need to alter the settings.

- Click the **Next** link in the Breadcrumb trail to proceed to the next page.

Advanced tips

The **Speaker properties** page allows you to edit the distance, gain, and phase for each speaker and the size for large analogue speakers or subwoofers:

Calibration Order	Speaker	Distance	Gain	Phase	Size
1	DSP8000 [L]	18' 0"	0.0 dB	Positive	n/a
2	DSP5000HC [C]	16' 6"	0.0 dB	Positive	n/a
3	DSP8000 [R]	18' 0"	0.0 dB	Positive	n/a
4	Analogue [passive] [R]	13' 0"	0.0 dB	Positive	17
5	Analogue [passive] [L]	13' 0"	0.0 dB	Positive	17
6	Subwoofer [C]	14' 0"	0.0 dB	Positive	28

- Click the value in the distance, gain, or phase, and either type in the new number or select the appropriate value from the drop-down list.

Room Correction store

The **Room Correction Store** page runs the Meridian Room Correction procedure. This is optional and you can skip this stage by clicking the **Next** link in the Breadcrumb trail

For information about running the Room Correction procedure see the chapter *Room Correction*, page 29.

- Click the **Next** link in the Breadcrumb trail to proceed to the next page.

Preset properties

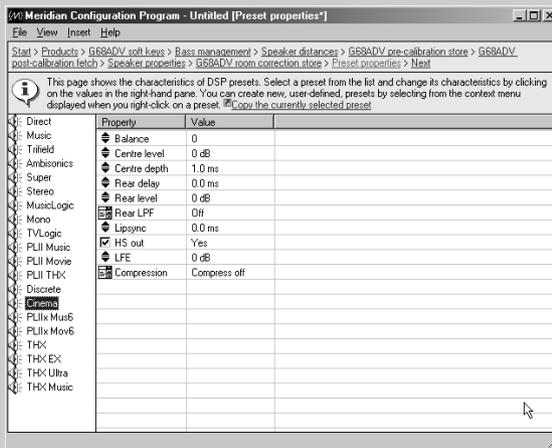
The **Preset properties** page shows the list of the presets available to the digital surround controller, and allows you to edit the values of each preset.

For a simple configuration you can skip this page.

- Click the **Next** link in the Breadcrumb trail to proceed to the next page.

Advanced tips

The **Preset properties** page shows the name and value of each of the preset properties:

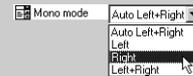


Displaying the properties for a preset

- Select the preset in the left-hand list.

Changing the value of a preset

- Click the value of the preset.
- Choose an option from the drop-down list:



If it is a numeric preset you will get a spin button rather than a drop-down list:



If you have edited a preset an * is shown after its name.

Restoring a preset to its default value

- Click the preset with the right mouse button and click **Revert to Default** on the context menu:



The menu option shows the default value.

For full information about the parameters for each DSP preset see the *G Series Digital Surround Controller Installation Guide*.

Store settings

This page stores the settings to the G68.

- Connect the serial cable.

For more information see *Pre-calibration Store*, page 21.

- Click the **Start** button to store the settings.

When the store has completed:

- Click the **Next** link in the Breadcrumb trail.

Finish

The **Finish** page confirms that you have successfully completed the configuration of your system.

Save a copy of your configuration

It is recommended that you save a copy of the final configuration document on your PC, with an appropriate name, so that you can refer to it again at a later date, if necessary.

- On the **File** menu, click **Save**.

A copy of the configuration document is also saved in the controller for your system, so if necessary you can retrieve it at a later date.

Room Correction

The G68 Digital Surround Controller incorporates room correction, which takes advantage of advanced digital signal processing techniques to compensate for room artefacts, including resonances and reflections, to give a significant improvement in the sound. This chapter explains how to run the Meridian Room Correction program and use it to create profiles for use with the digital surround controller.

Introduction

The Meridian Room Correction program works in conjunction with the Meridian Configuration Program to create a set of one or more room correction profiles matched to your room. These are then downloaded to the digital surround controller and can be associated with particular presets, or selected from the front panel. Selecting a profile applies a set of digital filters individually to each speaker to achieve the required room correction.

If you use a single loudspeaker layout you may choose to have one room correction profile, and use this with all presets. If you have separate speaker layouts for use with Music, Logic, and 5.1 Movie sources you will need to calculate a separate room correction profile for each speaker layout. These will then be selected automatically by the digital surround controller depending on the audio format. In addition, you can create separate room correction profiles to take

account of changes to the room, such as the position of large items of furniture, or with curtains open or closed.

How room correction profiles are calculated

Calculating a room correction profile is a time-consuming and mathematically complicated process. The Meridian Room Correction program performs the necessary sequence of measurements and calculations completely automatically, using a PC connected to the digital surround controller, with the minimum of interaction. It works as follows:

First you need to set up a microphone close to the listening position, and connect this to the A8 (L) input of the G68 Digital Surround Controller. Usually a standard sound pressure level meter will be used as a microphone; this can be the same one used for setting the speaker levels using the Calibration procedure. After an

initial short test sequence, designed to check that the microphone is set up correctly, a series of test signals are presented to each loudspeaker and measured at the microphone to determine how the room response affects the sound from each speaker. This phase of the procedure takes about one minute per speaker, and can be left to run unattended.

Finally after a complete set of measurements has been made for each channel and speaker layout, the program calculates a set of filters for each channel, and stores these to the digital surround controller. A copy of the measurements, together with the calculated filters in each profile, is also stored on the PC so they can be accessed at a later date if required. All the room correction settings and measurements will be saved in a folder named after the MSL file. For example if your MSL file is called G68_theatre.msl then all of the room correction settings and measurements will be in a folder called G68_theatre.mrd.

Examples

Most domestic rooms tend to be rectangular, or at the very least have one pair of parallel facing walls, and unfortunately these are the ideal conditions for low frequency resonances within the room. The wavelength of low frequency sounds is relatively large, so even bookcases and curtains act as an almost perfect mirror for low frequencies.

Frequencies close to the resonant frequency, determined by the distance between the two reflective surfaces, will sound louder and take longer to decay than other frequencies. In practice this means that when listening to music some notes will sound louder, giving a roughness or unevenness to the sound.

Other problems that can be corrected by room correction are imbalances between the speakers due to positioning constraints. For example, in an L-shaped room one loudspeaker may need to be close to the wall whereas its partner is in an open area, giving rise to an imbalanced sound field.

Unless your listening room has been specially designed for acoustic performance, you will almost certainly hear distinct benefits after incorporating room correction into your digital surround controller, and if the room has major resonances or imbalances the difference should be quite dramatic.

You can find more information about the theory behind Meridian Room Correction on the Meridian Web Site at:

http://www.meridian-audio.com/p_rc.htm

Auto set up

This section explains how to create a basic room correction using default settings.

The Room Correction program is run from within the Meridian Configuration Program, and adds the room correction profiles to the current configuration file.

The room should be as you would normally use for listening. Close/open doors, close/open curtains, and position your screen and furniture as they would normally be for listening.

To run the Room Correction program

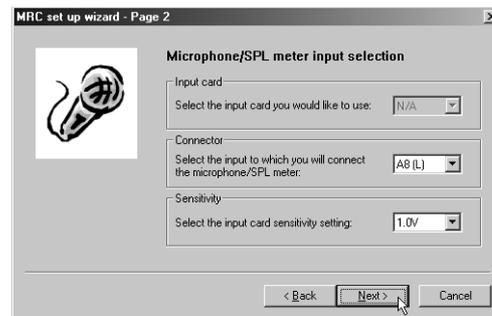
- Click the **Store** button on the **Room Correction store** page.

After successfully storing the configuration to the surround controller the **MRC set up wizard** will be displayed:



- Click the **Next** button to continue.

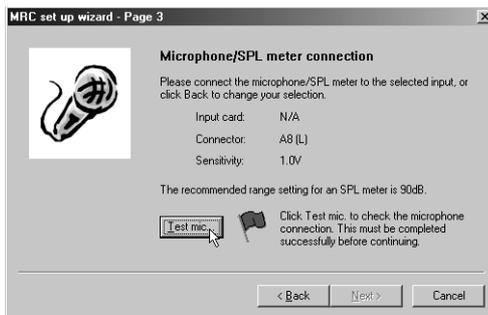
The next page allows you to set up the input for microphone or Sound Pressure Level meter:



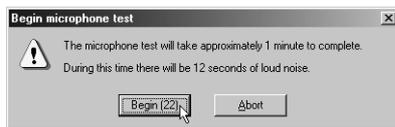
- Leave the input sensitivity at the default value.
- Click the **Next** button to continue.
- Connect the SPL meter or microphone to the analogue input A8 (L), switch on the SPL meter and position it at the listening position.

When using an SPL meter the C weighting must be used, and the 90dB range is recommended, unless the loudspeakers measured less than 75dB SPL during the calibration in which case the 80dB range is recommended.

- Click the **Test mic** button to run a test to check that the microphone is connected correctly:



The following dialogue box will count down to the test:



A signal will then be played through the main left loudspeaker.

- Check that the SPL meter reading does not indicate that the input signal is too large for the selected range.

On some meters this is indicated by the reading going above 0dB into the red range of the meter, and on others by the word **high** appearing on the display.

The **MRC set up wizard** will then indicate whether the test was successful:

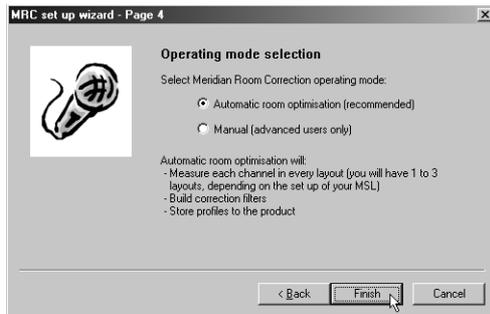


If the test did not complete successfully check the SPL meter or microphone connections and the input card and connector settings and try again. For more information about problems with the microphone test see *Troubleshooting*, page 48.

- Click the **Next** button to continue.

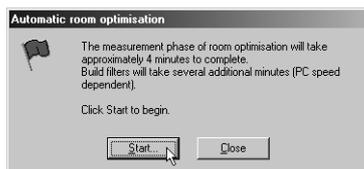
The next screen lets you choose whether to do an automatic room optimisation, or create profiles manually.

The **Automatic** option is recommended unless you are experienced in using the Meridian Room Correction program:



- Select the appropriate option.
- Click the **Finish** button to continue.

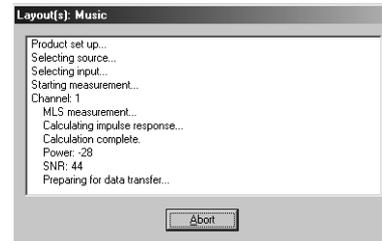
The following prompt then allows you to start the automatic room correction process:



- Click the **Start...** button to begin.

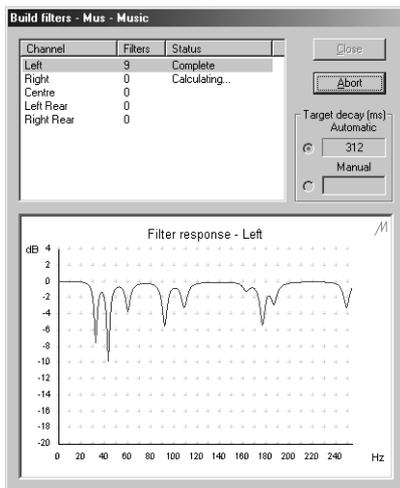
A countdown dialogue box will give you time to leave the room.

The Room Correction program will then present a test tone to each loudspeaker in turn for each of the distinct layouts defined in the digital surround controller Configuration file:



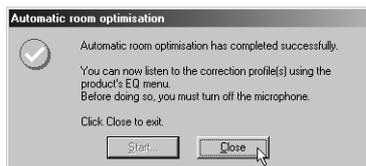
Depending on the number of channels and layouts in your configuration this may involve up to 24 tests and take up to 20 minutes to complete.

When the measurements have been completed the **Build filters** dialogue box will be displayed showing the filters being built for each channel and each speaker layout in turn:



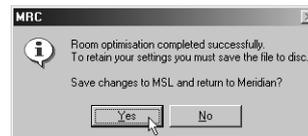
Finally the calculated filters will automatically be stored to the digital surround controller.

The following dialogue box confirms that the Auto set up has completed successfully:



- Click the **Close** button to close the dialogue box.

You will then be given the option of saving the settings:



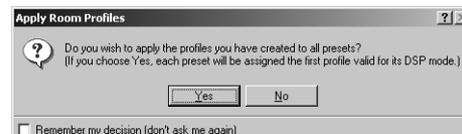
- Click the **Yes** button to save the settings and return to the Meridian Configuration Program.

All the room correction settings and measurements will be saved in a folder named after the MSL file. For example if your MSL file is called G68_theatre.msl then all of the room correction settings and measurements will be in a folder called G68_theatre.mrd.

You will then return to the **Room Correction store** page.

To apply the room correction profiles

The following dialogue box allows you to apply the room correction profiles:



- Click the **Yes** button to assign an appropriate profile to each preset.

Each preset will be assigned the profile designed for the layout used with the preset. The wizard creates profiles called Mus, Log, and Mov for the Music, Logic, and 5.1 Movie Speaker layouts respectively. If two or more layouts share the same settings, the profile name will include all the layouts it applies to; eg MusLog or MusLogMov.

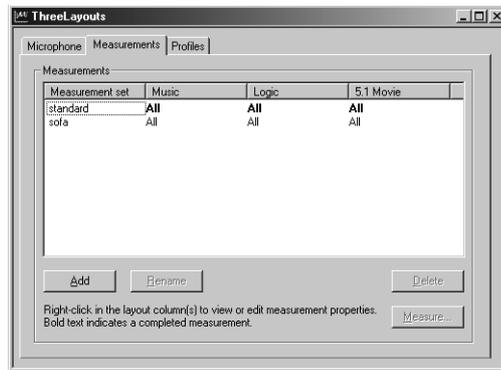
What next?

You have now completed the Auto set up, which creates a recommended set of room correction profiles. In most situations this is all you need to do in order to take advantage of room correction with your digital surround controller.

The next sections describe some of the more advanced options available in the Meridian Room Correction program, including the options for re-measuring channels, creating multiple profiles, selecting different filter parameters, and manually editing the filters.

Viewing and repeating measurements

The **Measurements** panel shows a measurement for each of the speaker layouts set up in the digital surround controller configuration. You can also create additional measurements, such as to cater for different furniture layouts, and for each measurement you can view the effect of applying different profiles:



For each speaker layout the **Measurements** list shows a list of the channels to be measured, or **All** for all channels, with channels already measured shown in bold.

The **Measurements** panel gives you the option of viewing or comparing the measurements. You can also repeat the measurements for individual speakers, for example if an external noise interfered with the test procedure.

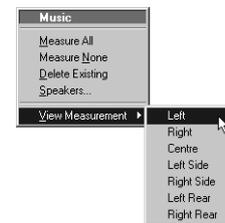
To display the measurements

- Run the Meridian Room Correction program.
- When the **Set up** wizard is displayed click the **Cancel** button.

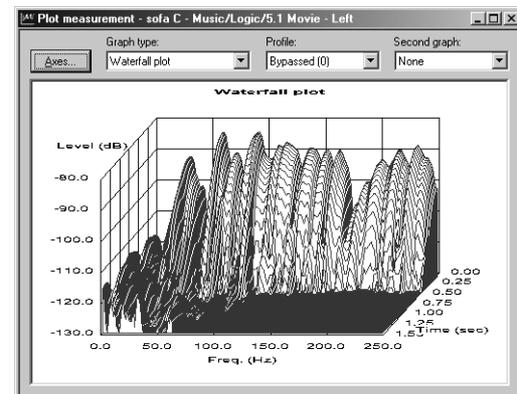
- Click the **Measurements** tab.

To view the measurements

- Click with the right mouse button on the measurement you want to view, point to **View Measurement**, then click the appropriate channel on the context menu:

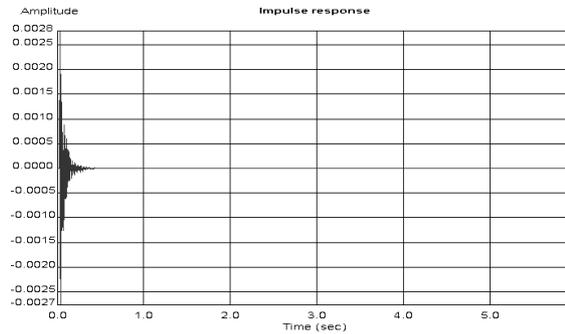


The **Plot measurement** window allows you to see the measurement for the specified channel:



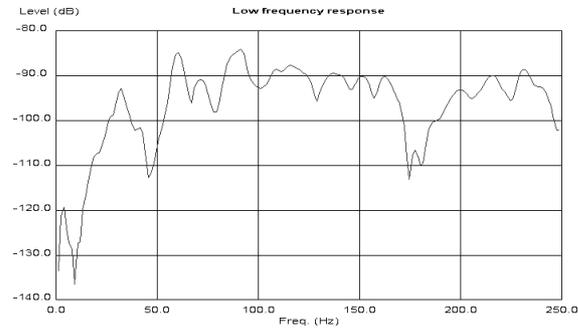
You can select one of the following three graph types from the **Graph type** drop-down list. All three views of the measurement are calculated from the same measured test signal:

Impulse response



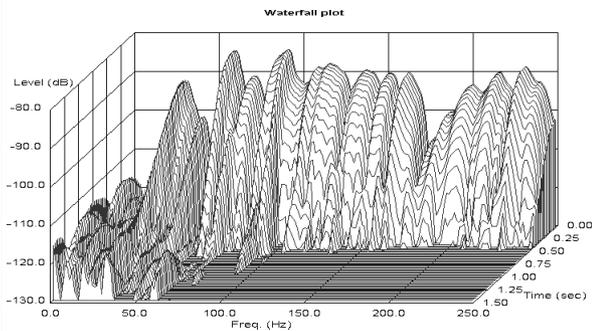
Shows the response over time of the loudspeaker to a click. The curve shows a maximum just after time zero, and then decays rapidly depending on the amount of reverberation in the room. Any additional peaks in the response indicate resonances set up by the initial impulse.

Low frequency response



Shows the loudspeaker-room response to a low frequency sine wave, swept between 0 and 250Hz. The ideal low frequency response would be smooth. A peak in the response indicates a resonance at the corresponding frequency. A dip in the response indicates absorption or cancellation at the corresponding frequency.

Waterfall plot



Shows the response of the room to a series of short sine wave pulses of frequencies between 0 and 250Hz. It shows how the response decays over time at each of those frequencies.

The ideal waterfall plot would have a smooth profile and decay evenly to a low level within 0.5 to 0.8 seconds. Peaks or dips in the waterfall plot indicate resonances or absorption at the corresponding frequency. Ridges extending forwards in time indicate reverberation at the corresponding frequency.

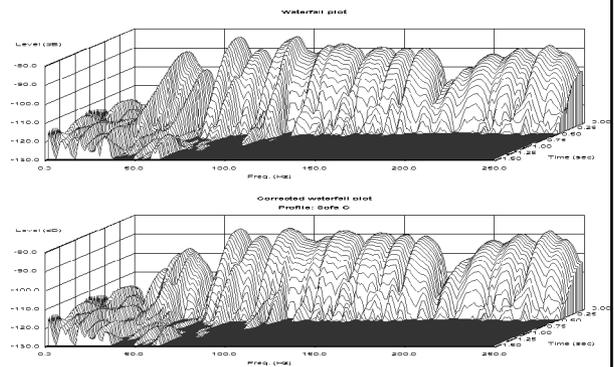
The room correction profile aims to identify the strongest resonances and to reduce the decay time of each strong resonance to the average decay time for the room.

To compare two measurements

The **Plot measurement** window allows you to display a particular graph type for two different profiles, or show the effect of one profile compared to the original uncorrected room.

- Choose the first profile to be compared from the **Profile** drop-down list, or choose **Bypassed** to display the uncorrected measurements for the channel.
- Choose the second profile to be compared from the **Second graph** drop-down list.

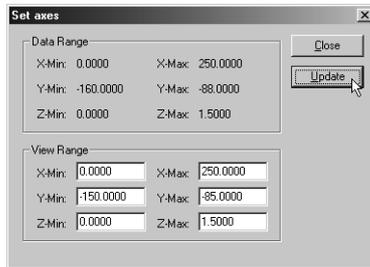
The two graphs will be displayed one above the other on the screen:



To change the axes

- Click the **Axes...** button in the **Plot measurement** window.

The **Set axes** dialogue box allows you to set the range of the x, y, and z (waterfall plot only) axes:



- Click the **Update** button to update the axes.

To repeat measurements

You can repeat measurements for one or more channels; for example, if an external sound interfered with an existing measurement.

- Click with the right mouse button on the measurement you want to repeat, then click **Speakers...** on the context menu:

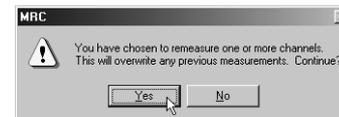


The following dialogue box allows you to select which channels you want to repeat:



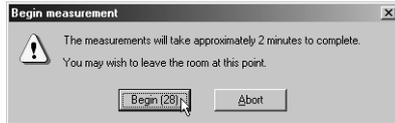
- Select the channels you want to repeat, or click the **Toggle** button to swap the set of selected channels.
- Click the **OK** button to confirm your selection.

The following dialogue box warns you that the existing measurements will be overwritten:



- Click the **Yes** button to continue, or the **No** button to retain the existing measurements.
- Click the **Measure...** button to measure the specified channels.

The following dialogue box then indicates how long the selected measurements will take, and gives you an opportunity to leave the room before the test sequence begins:



To create multiple measurements

You can create additional measurement sets to take account of different configurations of the room, such as with curtains open or closed.

- On the **Measurements** panel, click the **Add** button.

A new measurement set will be added to the list, with the default name **measurement**.

- Click the **Rename** button to rename the measurement set.
- Select the new measurement set and click the **Measure...** button to measure all the channels for each of the speaker layouts.

To delete a measurement set

- Select it in the **Measurements** list and click the **Delete** button.

Creating multiple profiles

After creating a measurement set you need to create a profile for each of the speaker layouts in each of the measurement sets.

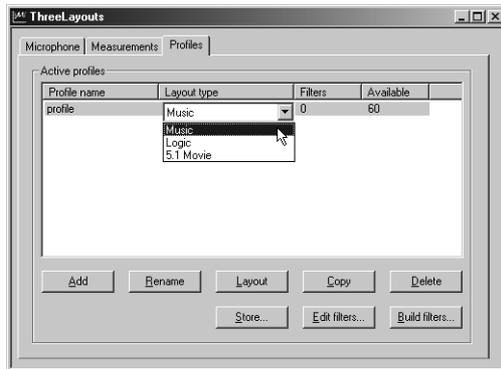
The **Profiles** panel shows a list of all the active profiles and allows you to create new profiles and build the filters for each profile.

To create a profile for each layout

- Click the **Add** button.

A new profile will be added with the default name **profile**.

- Select the speaker layout from the **Layout type** drop-down list:

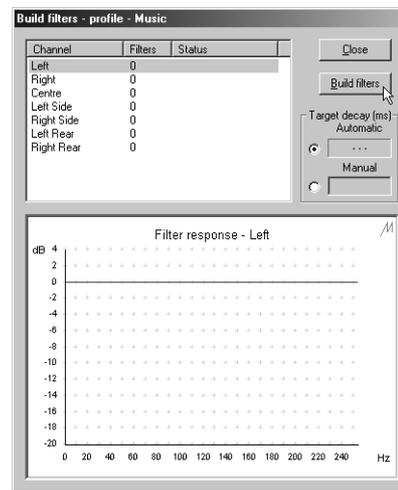


- Repeat to create profiles for each of the other layouts.

To build the filters for a profile

- Select the profile in the **Active profiles** list and click the **Build filters...** button.

The **Build filters** dialogue box is displayed to allow you to specify the target decay time:



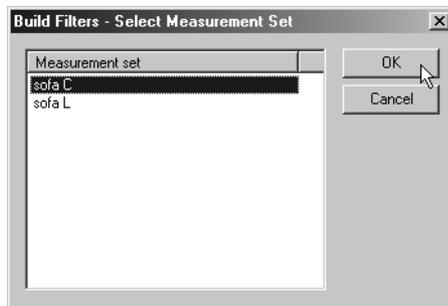
By default a target decay time is automatically calculated for the layout, but you can specify a value manually if you prefer, as follows:

- Select **Manual** and enter the decay time, in milliseconds, in the field.

Choosing a shorter decay time will lead to a profile with more filters, and filters which are deeper, which will take more bass out of the signal. Typically a decay time of 350 milliseconds is appropriate for domestic listening, and 200 milliseconds gives a drier reverberation suitable for a studio.

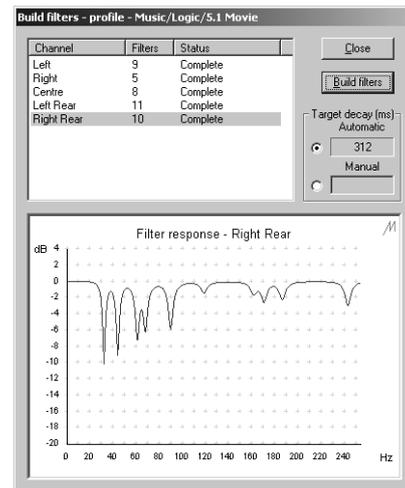
- Click the **Build filters...** button to start building the filters.

If you have more than one measurement set the following dialogue box is displayed to allow you to select which measurement set you want to use for the filters:



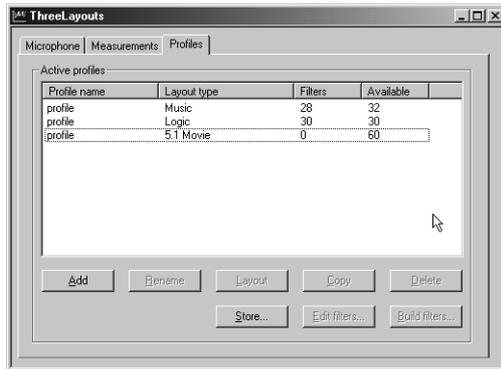
Note: The process of building filters is computationally intensive, and it is recommended that you do not try to run other programs at the same time.

As the filters are calculated the response will be displayed in the lower half of the dialogue box. When the filters have been completed, the status of each filter will be shown as **Complete**, and you can click on it to display the response:



- Click the **Close** button to close the **Build filters** dialogue box.

After building filters for a profile the **Active profiles** list shows the number of filters used for the profile, and the number of remaining filters available:



Each profile can use up to 60 filters; if a profile requires more filters than this, filters will be allocated in order of priority.

Each channel is limited to a maximum of 20 filters; a two-channel system therefore has a limit of 40 filters.

To store profiles temporarily to the digital surround controller

You can store profiles temporarily to the digital surround controller so you can listen to them while using the Meridian Room Correction program.

- Click the **Store...** button.

The following dialogue box confirms that the profiles have been stored:



- Click the **OK** button to continue.

Editing filters

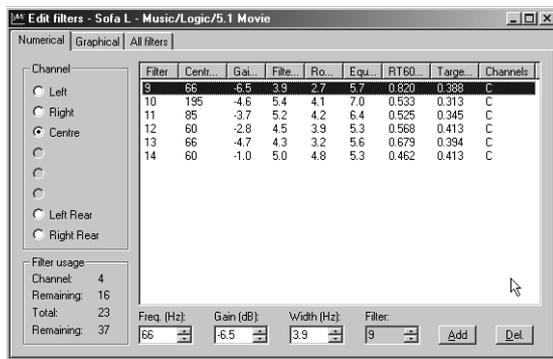
After building the filters for a profile you can edit the filters numerically or graphically to adjust their parameters, or change the response of each filter.

Note: This should only be attempted by users with an understanding of filter design. It is strongly recommended that you copy the profile first and then edit the copied profile. There is no undo function within **Edit filters**.

To display the filters for a profile

- Select the profile in the **Active profiles** list.
- Click the **Edit filters...** button.

The following dialogue box shows a list of the channels, and a list of the filters for each channel, together with the parameters for each filter:



- Select the channel in the **Channel** list to display the filters for that channel.

The columns give the filter number, centre frequency (Hz), gain (dB), and filter bandwidth (Hz), and you can adjust these parameters for each filter.

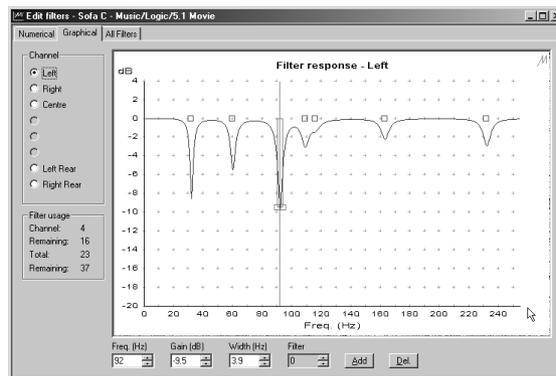
In addition, the list of filters shows the Room mode bandwidth (Hz), Equalized bandwidth (Hz), RT₆₀ (s), and Target RT₆₀ (s).

To edit a filter numerically

- Select the filter in the **Filters** list.
- Adjust the frequency, gain, and width in the fields below the **Filters** list.

To edit a filter graphically

- Click the **Graphical** tab to display the **Graphical** panel in the **Edit filters** dialogue box.
- Select the channel in the **Channel** list to display the filters for that channel in the Filter response graph:



- Select the filter you want to edit by clicking on the square above the filter trough:



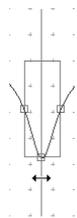
Alternatively if the filters are close together you can select a specific filter using the **Filter** field below the Filter response curve.

The filter will be displayed with a red vertical bar at the filter centre frequency, and a rectangle indicating the bandwidth of the filter.

You can edit each parameter of the filter interactively as described in the following sections.

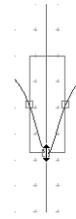
Centre frequency

- Drag the vertical bar to the left or right on the filter response curve:



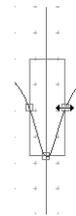
Gain

- Drag the handle at the base of the filter:



Bandwidth

- Drag one of the handles on either side of the filter:



To add a filter

- Click the **Add** button on the **Numerical** or **Graphical** panel.
- Edit the parameters of the filter as described above.

To delete a filter

- Select the filter you want to delete in the **Filters** list, or on the **Graphical** panel.
- Click the **Del** button.

Changing settings at a later date

This section describes how to change the room correction or configuration settings of the digital surround controller at a later date, subsequent to uploading the original version.

Note: You can only edit or add to existing profiles if you have the MSL file and mrd folder originally used to design the profile. If you do not have the original MSL file and mrd folder you will need to make new measurements, create new profiles, and then store these to the digital surround controller.

To edit an existing profile, or add a new profile

- Run the Meridian Configuration Program and open the MSL file used to create the original profiles.

If you have changed settings on the digital surround controller since the original profiles were made, and you want to retain these changes:

- On the **File** menu, click **Save as** to save the MSL file under a new name.

This will also create a renamed copy of the mrd folder containing the original measurements and profiles.

To fetch the settings from the digital surround controller:

- On the **Products** page, click the controller with the right mouse button, then click **Fetch...** on the context menu.
- Run the Meridian Room Correction program.
- When the **Set up** wizard is displayed click the **Cancel** button.

- Select the **Profiles** tab, and proceed as described in *Editing filters*, page 44, or *Creating multiple profiles*, page 41.

To change other settings if you have the original MSL file and mrd folder

- Run the Meridian Configuration Program and open the original MSL file.

If you want to keep the original settings:

- On the **File** menu, click **Save as** to save a copy of the MSL file and mrd folder under a new name.
- Change the settings as required and store the new settings to the digital surround controller.

For more information about changing configuration settings using the Meridian Configuration Program refer to the *G68 Digital Surround Controller Installation Guide*.

To change other settings if you have lost the original MSL file and mrd folder

If the original MSL file and mrd folder are not available you will be able to change all non-room correction settings, and which room correction profile you want to use with a given preset.

- Start a new document.
- On the **File** menu, click **Fetch** to fetch the settings from the digital surround controller.

The newly created file will contain the profile labels and these can be used to choose the profile you want to use with a given preset. It will not contain measurements or profile data for the Meridian Room Correction program. If you use the Meridian Room Correction program to create new measurements and profiles and store these to the digital surround controller, the old profiles will be overwritten.

- Change the settings as required and store the new settings to the digital surround controller.

For more information about changing configuration settings using the Meridian Configuration Program refer to the *G68 Digital Surround Controller Installation Guide*.

To change other settings directly on the digital surround controller

For information about changing other configuration settings on the digital surround controller refer to the *G68 Digital Surround Controller Installation Guide*.

After making changes on the digital surround controller you can add these changes to an existing MSL file as follows:

- Run the Meridian Configuration Program and open the original MSL file.
- On the **Products** page, click the controller with the right mouse button, then click **Fetch...** on the context menu to fetch the new settings from the digital surround controller.

If you want to keep the original settings:

- On the **File** menu, click **Save as** to save a copy of the MSL file and mrd folder under a new name.

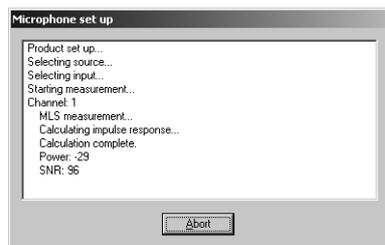
This will also create a renamed copy of the mrd folder containing the original measurements and profiles.

Troubleshooting

This section gives suggested solutions to typical problems that may occur when using the Meridian Room Correction program. If problems still persist after working through the following steps please send an email to support@meridian.co.uk with a zip file containing your MSL file and all the files in the associated mrd folder and its subfolders. For example if your MSL file is called G68_theatre.MSL then please send a zip archive containing this file together with all files in the G68_theatre.mrd folder and its subfolders. Please also supply details of the loudspeakers and amplifiers you are using.

Failed microphone/SPL meter test

During the microphone/SPL meter test details are displayed in the following dialogue box:

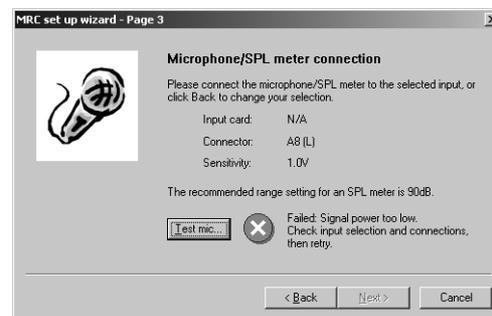


The pass/fail status of the microphone measurement is based on the Power and SNR (signal to noise ratio) values. In most rooms and with most SPL meters Power will usually be in the range -25 to -35 , and SNR will usually be in the range 44 to 60. The larger the SNR the better the measurement.

The following sections describe some of the most likely problems which will cause the Power and SNR values to go outside these ranges.

Power less than -44

The following error will be displayed:



This indicates that there is very little or no signal on the connector you have chosen as your microphone input. Check the following:

- That there was sound from the front left speaker during the test.

If in doubt, repeat the microphone/SPL meter test. If there is still no sound check the connections from the digital surround controller to the left loudspeaker. Switch the digital surround controller off and then on again, select **Calibrate** as described in the *G68 Digital Surround Controller Installation Guide*, and check that the left speaker plays the calibrate signal.

- The lead from the SPL meter is intact.
- The SPL meter is switched on and set to the 90dB band, or the band which includes 90dB, and with C weighting.

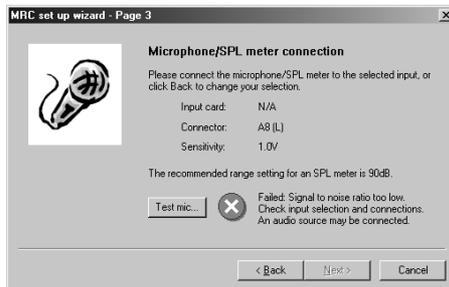
If the loudspeakers measured less than 75dB SPL during the calibration phase it may be better to use the 80dB range.

- The lead from the SPL meter is connected to the correct input, A8 (L) on the G68.
- The **Sensitivity** setting is adequate for the SPL meter or microphone.

The sensitivity value for analogue inputs is given in rms volts (Vrms). For example a sensitivity of 1Vrms allows a signal of 2.8Vpp. A sensitivity of 1V is recommended for use with most SPL meters though 0.7V may be preferable for those with lower level output.

Power OK, SNR less than 18

The following error will be displayed:



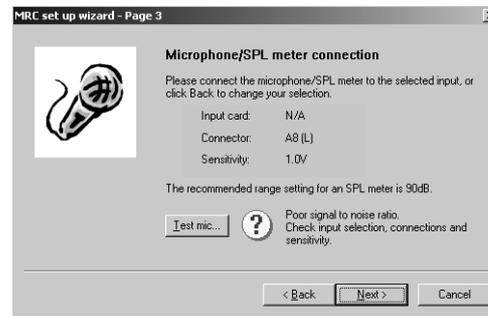
The most likely cause of this problem is that an analogue source is connected to the input chosen for the microphone.

- Check that the lead from the SPL meter is connected to the input you have chosen for the microphone test.

Another possibility is that the lead from the SPL meter is in bad condition and only making a poor connection.

Power OK, SNR between 18 and 34

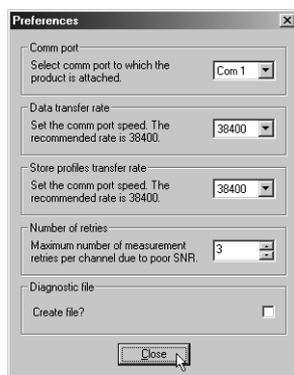
The following error will be displayed:



The reasons for this are described in detail in the following section where example measurements are also shown.

Repeated measurements due to poor SNR

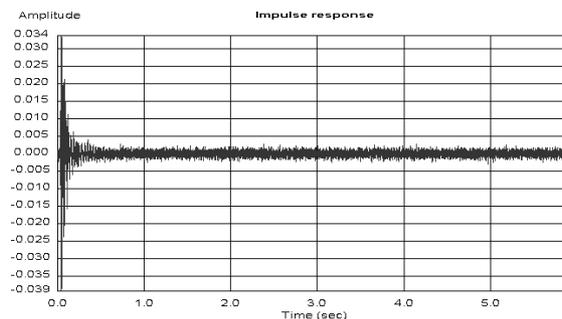
Measurements are retried until the SNR is larger than 39 (35 for subwoofers) or the maximum number of retries have been made. The maximum number of times each measurement will be retried due to poor SNR can be set in the **Preferences** dialogue box, accessed from the **Options** menu:



The default number of retries is 3. If the measurements are consistently giving poor SNR figures you can reduce the number of retries. However, it is better to follow the steps described below to improve the measurement conditions. The better the measurement the more accurate the results when calculating the filters for a profile.

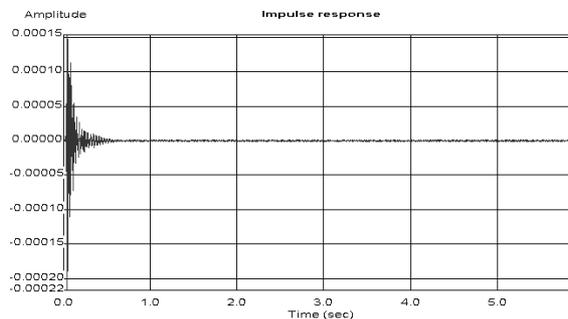
SPL meter is set on a low band

The following graph shows an impulse response obtained when a Radio Shack SPL meter was set on the 60dB band. The SNR value was only 22:



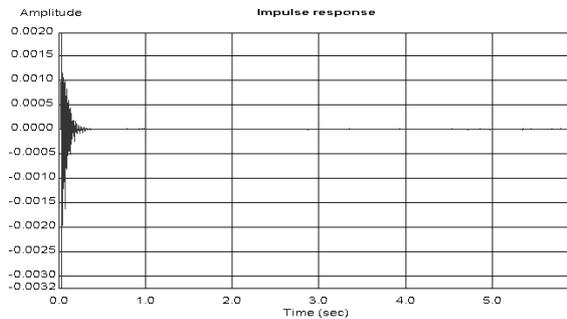
SPL meter is set on a high band

The following graph shows an impulse response obtained when a Radio Shack SPL meter was set on the 120dB band. The tail of the response is generally noisy. The SNR value was 39 but the Power was only -48:



Loudspeaker is running in a non-linear range

The effects of a loudspeaker running in a non-linear range is most easily observed in the impulse response. The tail of the response has small spikes, as shown in the plot below, where it should be zero. The larger these spikes are relative to the largest value at the beginning of the impulse response the smaller the SNR value:



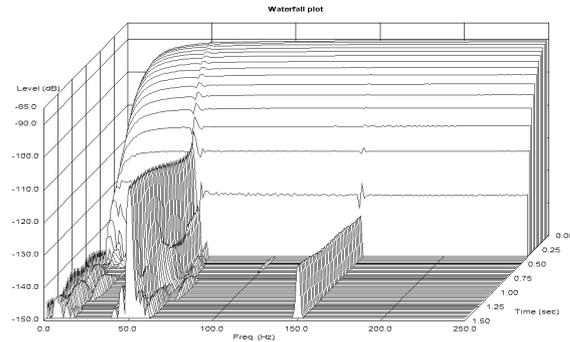
Check the following:

- That the bass protection size has been correctly set – see the *G68 Digital Surround Controller Installation Guide* for details.
- That the bass drive unit in your loudspeaker is not rubbing.
- That your amplifier is not clipping.

If problems are still encountered, use the phase/gain tab under speaker layout to reduce the gain of the channel. Use the reduced gain setting for the room correction measurements, then return to the correct level for a calibrated system after running room correction measurements.

Hum in the system

The effect of hum on the measurement is most easily observed in the waterfall plot. The continuing signal at 50Hz and 150Hz in the waterfall plot shown below indicates a mains hum loop:



You are likely to have heard this level of hum when playing analogue sources connected to the same analogue input card as the microphone/SPL meter.

In order to get a better measurement disconnect analogue sources from the analogue input card used for the room correction measurements. In order to improve your overall system reorganise wiring to remove the hum loop.

Hum may also be picked up by the lead from the microphone/SPL meter. It is best to use a shielded cable to reduce the chances of picking up hum.

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