

P R I M A R E



SPA21 SURROUND PROCESSING AMPLIFIER

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Issue: SPA21

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This guide was produced by Condesign Ljungby AB.
www.condesign.se

200447



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INTRODUCTION

Welcome to the Primare SPA21 Surround Amplifier! This chapter introduces you to its key features, and explains how you can take advantage of its configurability to create a system perfectly suited to your requirements.

WELCOME TO THE SPA21 SURROUND AMPLIFIER

The SPA21 provides a comprehensive range of features to make it ideal as the heart of an unparalleled music or home entertainment system:

Exceptional processing and amplifying performance

The SPA21 uses proprietary DSP circuitry developed by Primare, providing better analog performance than the current off-the-shelf circuits used in many other surround amplifiers, resulting in a very high standard of multi-channel audio reproduction. The SPA21 provides up to 192kHz/ 24 bit processing to accommodate all the current multi-channel audio formats and allow for expansion as new formats are introduced. The SPA21 incorporates a high quality power amplifier providing 100 Watts per channel.

Flexible range of inputs

The SPA21 provides a range of inputs flexible enough to cater for virtually any combination of sources including: eight or five plus one external analog RCA inputs, two coaxial digital inputs, two TOS-Link optical digital inputs.

Video switching

The SPA21 provides two component video inputs, two S-Video inputs and four composite video inputs, allowing you to switch up to eight audio-visual sources.

Digital Surround Processing

The SPA21 can decode multi-channel sources encoded in the Dolby Pro Logic, Dolby Digital, or DTS formats to provide eight discrete output channels for up to eight loudspeakers in a surround system. The SPA21 provides

a wide range of processing options to allow you to choose the ideal mode for each type of material, including Dolby Pro Logic II, an improved version of Dolby Pro Logic, and several new processing modes designed to provide superb results with eight-channel systems from Dolby Digital and DTS encoded materials.

Multi-channel analog input

In addition to decoding encoded multi-channel sources, the SPA21 provides a discrete eight-channel analog input for a DVD audio or SACD player that provides a multi-channel output.

Full configurability

The SPA21 is fully configurable from either the front panel or remote control, using a simple set of on-screen menus, to allow you to set it up with the exact combination of sources and outputs that you want to use for your own system. The SPA21 is supplied already set up with a standard set of sources, designed to cater for the most usual combination of inputs and outputs in a typical system, but you can modify these or define your own sources with total flexibility.

Intuitive user interface

In keeping with the philosophy of the Primare range of systems, the SPA21's powerful range of features can be controlled through a very simple and intuitive interface, designed so that it will not distract you from the pleasure of listening to music or watching movies on your system.

In fact almost all the features of the SPA21 can be accessed through just two front panel controls and five push buttons; alternatively the same degree of control is provided through the C20 Remote Control supplied with the SPA21.

Using the SPA21 with other Primare products

Although the SPA21 is flexible enough to work with virtually any other equipment you have in your system, it is ideal for use with the other products in the Primare range. A particular benefit of using the SPA21 with the Primare DVD Player is that you can control both units with the single remote control, to give you a fully integrated system with the simplest possible user interface.

TECHNICAL SPECIFICATION

General

Output power	5 × 100W 8 Ω
Analog inputs	8 RCA.
Digital inputs	2 RCA, 2 TOS-Link.
Video inputs	4 composite, 2 S-Video, 2 component.
Analog outputs	Front (left and right), center, sub, surround (left and right), surround back (left and right).
Analog record output	1 RCA (left and right).
Digital outputs	1 RCA.
Video outputs	2 composite, 2 S-Video, 1 component.
Modes	Dolby Pro Logic II Dolby Digital 5.1 DTS Neo:6 DTS 5.1 DTS ES 6.1 DTS ES 6.1 Discrete

Video NTSC/PAL

Analog data

THD	<0.07 %, 20 Hz – 20 kHz
Signal-to-noise	-100 dB
Frequency response	<10 Hz – 100 kHz, -3dB

Digital data

Frequency response	<10 Hz – 100 kHz, -3 dB
Dimensions (W`D`H)	430 × 400 × 135mm
Weight	24,5 kg

HOW TO GET STARTED

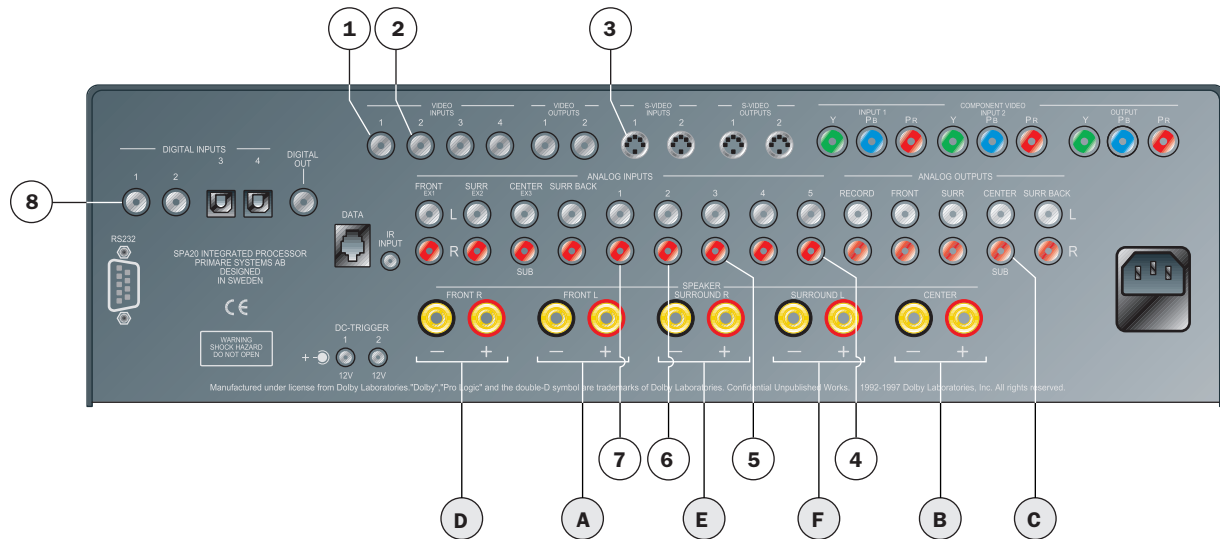
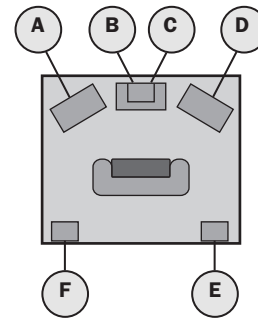
This chapter explains how to get started quickly with the SPA21 Surround Amplifier. More detailed instructions are presented in the following chapters.

Connecting the SPA21 Surround Amplifier with standard configurations

Source	Audio	Video	Surround mode	Description
CD	Analog 1	None	Bypass player	High quality CD
DVD	Digital 1	S-Video 1	2-CH	DVD player
Tuner	Analog 2	None	Stereo	FM radio tuner
TV	Analog 3	Video 1	Dolby Pro Logic II	Television or monitor
Sat	Analog 5	Video 2	Dolby Pro Logic II	Satellite receiver

Quick connection of speakers

The SPA21 is preset for you to connect a five channel surroundsystem with a subwoofer.



Standard video connections

1. TV
2. Sat
3. DVD

Standard audio connections

- | | |
|----------|--------|
| 4. Sat | 7. CD |
| 5. TV | 8. DVD |
| 6. Tuner | |

Power connection



WARNING: Before connecting power check that the required supply voltage, indicated on the back panel, corresponds to your local AC supply. If a different voltage is stated on the type plate do not connect the SPA21 to the mains power, and seek advice from your dealer.

Connect the mains power using the enclosed mains cable.

NOTE: Always disconnect the SPA21 and all other units from the mains power before connecting or disconnecting any of the cables. Failure to do this might seriously damage the unit.

Safety instructions

To prevent fire or shock hazard, do not expose this appliance to dripping or splashing. No objects filled with liquids, such as vases, should be placed on the SPA21.

If you want to build in the SPA21 you need to be sure to allow space of at least 20 cm behind, 10 cm on both sides and 30 cm above the top panel of the unit. This is to prevent fire or damage. Although you have to make sure that the main switch is accessible.

Switching on and off

To switch on

- Use the main switch under the left-hand edge of the housing (1).

During normal operation you can leave the SPA21 switched on and in standby mode.

To switch to standby

- Hold down the ϕ button on the front panel or the remote control.

When the SPA21 is in standby mode the red ϕ indicator will be illuminated.





To switch on from standby

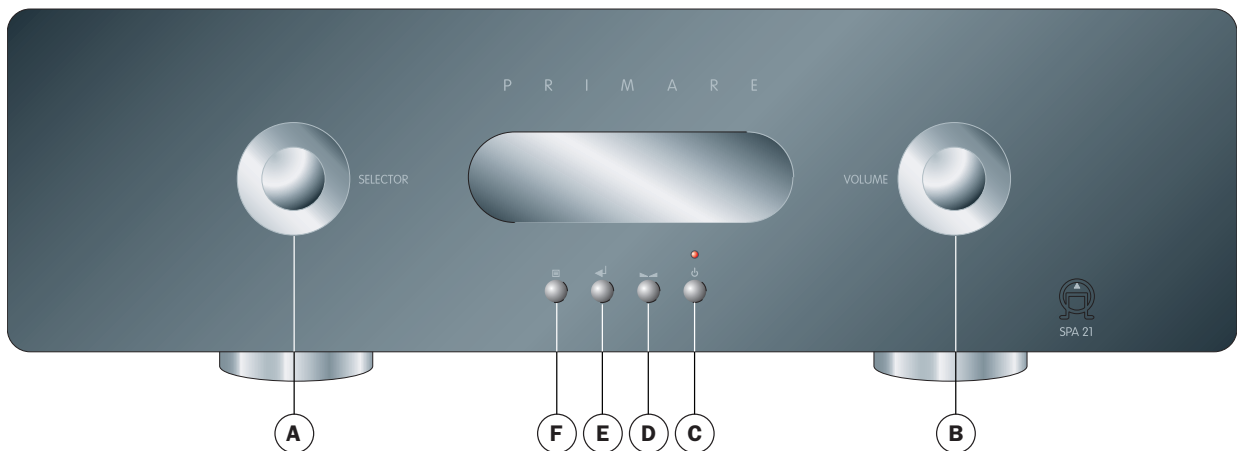
- Hold down the ϕ button on the front panel or the remote control.



Front panel controls

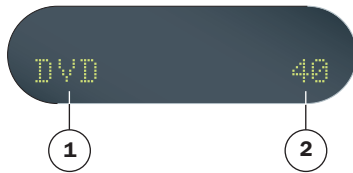
Almost all the functions of the SPA21 Surround Amplifier can be accessed using the two front panel controls and four push buttons, and information about its operation is displayed on the front panel display:

- A. The SELECTOR selects an input, or operates the on-screen menus.
- B. The VOLUME control changes the volume, changes a setting selected with the LEVEL button, or operates the on-screen menus.
- C. The  button switches the SPA21 to standby mode or to on if you press it and hold it for a few seconds. If you only press and release (as a normal push) it will simply mute the SPA21.
- D. The  button selects the balance and the individual volume controls for front, center, surround and sub-woofer.
- E. The  button on the front or the **SELECT** button on the remote control selects the current menu option.
- F. The  button selects the on-screen menus.



Front panel display

The following illustration shows the information on the front panel display:



1. Currently selected input, Mute, or level setting.
2. Volume setting.

To dim the front panel display

- Press the DIM button on the remote control.

The display will dim to a single bar. The normal display will reappear while you adjust any settings.

To restore the front panel display

- Press the DIM button again.

Selecting a preset source

The SPA21 Surround Amplifier allows you to define up to 15 sources. Each source can use one of the four digital and eight or five plus one external analog input, and any source can be combined with one of the video inputs.

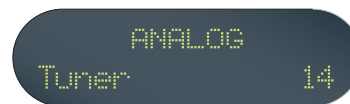
These five sources shown below are a selection of standard preset sources.

Source	Audio	Video	Surround mode	Description
CD	Analog 1	None player	Bypass	High quality CD
DVD	Digital 2	S-Video 1	2-CH	DVD player
Tuner	Analog 2	None	Stereo	FM radio tuner
TV	Analog 3	Video 1	Dolby Pro Logic II	Television or monitor
Sat	Analog 5	Video 2	Dolby Pro Logic II	Satellite receiver

To select a source

- Turn the SELECTOR control on the front panel until the name of the source is shown on the front panel display.

For example:



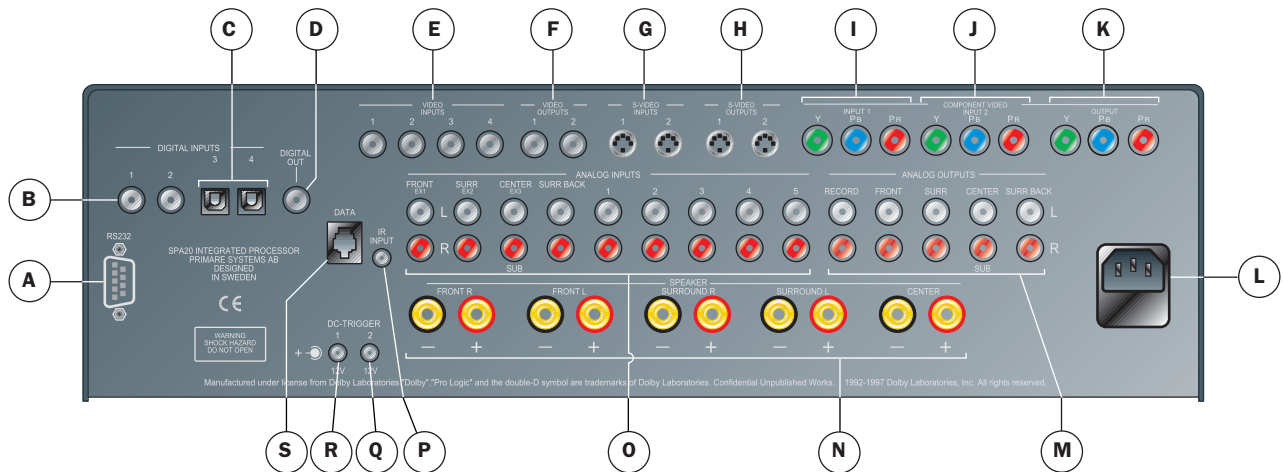
- Alternatively, press the ▲ or ▼ buttons on the remote control to step between sources.

You will find more details about what the SPA21 Surround Amplifier provides in the following chapters.

ADVANCED CONNECTING

This chapter explains the fully possibilities of how to connect the SPA21 to the other components in your system.

Back panel connections



A. RS232 input

B. Digital SPDIF inputs

C. Digital optical TOSlink inputs

D. Digital SPDIF output

E. Composite video inputs

F. Composite video outputs

G. S-Video inputs

H. S-Video outputs

I. Component video input 1

J. Component video input 2

K. Component video output

L. Main power input and fuse

M. Analog RCA outputs

N. Speaker outputs

O. Analog RCA inputs

P. External IR-input

Q. 12V DC-trigger, controlled by the menu option.

R. 12V DC-trigger, controlled by the standby-function.

S. Data input

Power connection



Warning! Before connecting power check that the required supply voltage, indicated on the back panel, corresponds to your local AC supply. If different voltage is stated on the type plate do not connect the SPA21 to the mains power. You then have to seek advice from your dealer.

Connecting the mains power using the enclosed mains cable.

Always disconnect the SPA21 from the mains power before connecting or disconnecting any of the cables.

Safety instructions

To prevent fire or shock hazard, do not expose this appliance to dripping or splashing. No objects filled with liquids, such as vases, should be placed on the SPA21.

If you want to build in the SPA21 you need to be sure to allow space of at least 20 cm behind, 10 cm on both sides and 30 cm above the top panel of the unit. This is to prevent fire or damage. Although you have to make sure that the main switch is accessible.

Main outputs

The main outputs provide eight discrete analog audio outputs for connecting to the power amplifiers and loudspeakers in the surround system.

Audio inputs

The SPA21 provides a total of 10 or 12 audio inputs, four digital and eight or five plus one external analog. Because the SPA21 is configurable, you have total flexibility about which digital input you use for each of your digital sources, and which analog input you use for each of your analog sources. In addition, you can optionally use four pairs of analog inputs for a single, multi-channel source, such as DVD-A or SACD, called external.

The SPA21 is supplied with a suggested set of sources already set up, and you may choose to leave the inputs assigned in this way. However, if you prefer, you can reassign the inputs to sources in any way you prefer to suit the equipment in your system, and the way you would like to wire it up.

Digital inputs

The SPA21 Surround Processor provides two SPDIF digital inputs, and two optical TOS-Link digital inputs.

Analog inputs

The SPA21 provides eight or five plus one external analog input.

Video connections

The SPA21 provides a choice of either component, S-Video, or composite video connections. If your source or monitor provides a choice of video connections we recommend using the component or S-Video connections, as these provide higher quality. However, we recommend you first connect up and calibrate your system using the composite connection.

Video inputs

The SPA21 provides two component video, three S-Video, and four composite video inputs.

Video outputs

The SPA21 provides one component video, two S-Video, and two composite video outputs. The on-screen display is only provided on the S-Video and composite outputs.

Connecting to a television or monitor

Connect the appropriate output to your television or monitor. If you are using video sources of more than one type you may need to make a connection from each video output to your monitor as the SPA21 only performs conversion from S-Video to composite.

If your television includes a tuner output you can use the SPA21 to perform switching between the television tuner and your other video sources such as DVD or Laser Disc. In this case connect the television tuner output to the video input corresponding to your TV source. If your television does not provide a tuner output you will need to switch the television between its internal tuner and the external video input.

Record outputs

The SPA21 provides two record outputs, one SPDIF digital and one analog RCA.

Data and RS232

The DATA input allows you to connect the SPA21 to an external interface. The RS232 port will allow you to connect to a home automation installation system. It will also allow for authorized personnel to connect to the SPA21 for service and future upgrades.

DC-trigger outputs (12 V)

The DC-trigger output 1 allows you to control other units in the system via the stand-by button.

The DC-trigger output 2 allows you to control surround equipment like home installations via the menu-option.

Connecting to the Primare DVD26 DVD player

The Primare DVD26 DVD Player is an ideal source for use with the Primare SPA21, to give superb quality video and 5.1 channel digital surround.

- Connect the S-Video or component output (recommended), or composite output, from the DVD player to an appropriate video input on the SPA21.
- Connect the digital audio output from the DVD player to digital input 1 on the SPA21.

OPERATING THE SPA21

This chapter explains in details how to operate the SPA21 Surround Amplifier, using either the front panel controls or the direct remote control commands.

Changing the volume

The SPA21 allows you to vary the volume from 0 (silence) to 99 (maximum volume), where each step is equivalent to 0.5dB.

To change the volume

- Rotate the VOLUME control on the front panel, or press the ◀ or ▶ buttons on the remote control.

To mute the sound

- Press the MUTE button on the remote control or shortly press the standby button on the front panel.

To restore the sound to its original volume

- Press the MUTE button again.

The sound is also restored to its original volume if you increase or decrease the volume.

Changing levels

You can independently change the balance, center level, side levels, rear levels, and subwoofer level to alter the balance of sound in your surround system. Changing the balance alters the level of both the left and right main loudspeakers to shift the position of the stereo image, keeping the overall level of the sound the same. The other adjustments change the level of the corresponding speaker(s) without affecting the remaining speakers in the surround system.

To change a level

- Press the LEVEL button on the front panel, or the BAL/SETUP button on the remote control, until the display shows the current value of the level you want to change.

For example:



- Use the VOLUME control on the front panel, or the ◀ or ▶ buttons on the remote control, to adjust the value of the level.

After a short delay the display will revert to volume.

The levels are selected in the sequence shown in the following table:

Display	Level	Range
LEFT, Balanced, RIGHT	Balance	Balanced to -9.5 dB to OFF
CENTER	Center	-10.0 dB to +10.0 dB
SURR	Surround	-10.0 dB to +10.0 dB
BACK	Surround back	-10.0 dB to +10.0 dB
SUB	Subwoofer	-10.0 dB to +10.0 dB


USING MENUS

This chapter explains how to use the menus, how to save and recall configurations. It also explains how to change surround mode.

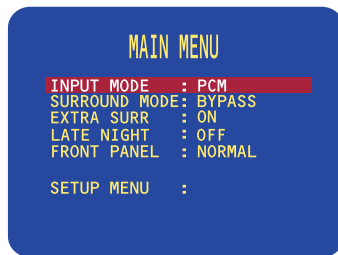
Using the main menu

The advanced options described in this chapter are all available from the MAIN MENU, which you can display on the on-screen display using the remote control.

To display the main menu


- Press the  button on the front panel or remote control.

The MAIN MENU will be displayed on the on-screen display:



The INPUT MODE option is initially highlighted to show that it is selected.

To exit from the main menu

- Press the  button on the front panel or remote control.

Using the menus

You can select a menu option, and change its value, using either the front panel controls or the remote control.

To select a menu option

Either:


- Turn the SELECTOR to highlight the menu option you want to select.

Or:

- Press the ▲ or ▼ buttons on the remote control to step between the menu options.


To change the currently highlighted option

Either:

- Turn the VOLUME control or press the ◀ or ▶ buttons on the remote control to step between the alternative values for the current menu option.
- Press  on the front panel or the **SELECT** button on the remote control to choose the highlighted option.

Selecting some menu options displays a further menu of options which you can select and change in a similar way.

To exit from the current menu

- Press the  button on the front panel or remote control.

From the main menu this returns to normal operation of the SPA21. From the submenus this exits to the previous menu.

Choosing the surround mode

The surround mode determines how the sound is divided between the loudspeakers in your surround system. Each source is associated with a default surround mode, which will be used when you select that source, but you can choose a different surround mode for the source if you prefer.


For example, the standard surround mode for the TV source is Dolby Pro Logic II, since most TV broadcasts are Pro Logic encoded, but if you are watching a music concert you may prefer to choose the Stereo or Bypass surround modes, as these give a more natural sound when listening to music. See the table at the right.

To change the surround mode

Either:

- Press the MODE button on the remote control to step between the available surround modes.

Or:

- Press the  button on the front panel or remote control to display the MAIN MENU.
- Use the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control to highlight the SURROUND MODE option.
- Use the VOLUME control on the front panel or the ◀ or ▶ buttons on the remote control to step between the available surround modes.

The menu option will flash while the SPA21 Surround Amplifier is locking to the input.

The options available depend on the source you are listening to.

If you are listening to a conventional two-channel analog or digital source, such as a CD, the following options are available:


Option	Description
BYPASS	The inputs are fed directly to the output, with no decoding for the most faithful possible reproduction of stereo or multi-channel sources.
STEREO	Conventional stereo, using just the main left and right loudspeakers.
DOLBY PRO LOGIC II DOLBY PRO LOGIC II CINEMA	Dolby's updated Pro Logic decoder provides 5.0 channel surround sound from any two channel source, with stereo rear channels and full frequency range. Dolby Pro Logic C is ideal for movie soundtracks and Dolby Pro Logic M is ideal for music sources.
DOLBY PRO LOGIC II MOVIE	
PARTY	The same signal to the front left and right and surround left and right loudspeakers; ideal for parties.
DTS NEO:6 C DTS NEO:6 M	DTS Neo:6 provides up to 6.0 channel surround sound from conventional stereo sources, and can be used with virtually any two-channel analog or digital stereo source such as CD, tape, or TV. DTS Neo:6 M is ideal for stereo music sources.

For Dolby Digital, DTS, or MPEG sources only the following option is available:

Option	Description
AUTO	Automatically detects an incoming digital signal and locks onto it.

The SPA21 Surround Amplifier automatically detects a Dolby Digital input and displays it on the front panel display.

To display information about the source

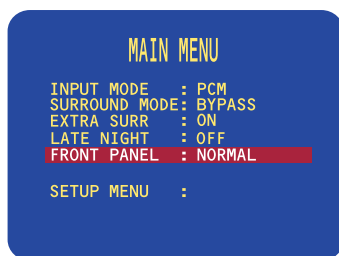
- Highlight the INPUT MODE option on the MAIN MENU.
- Press the  button on the front panel or the SELECT button on the remote control to display the characteristics of the source signal.

Locking the front panel

If you always control the SPA21 Surround Amplifier with the remote control, you may prefer to lock the front panel controls so they cannot be used.

To lock or unlock the front panel

- On the MAIN MENU highlight the FRONT PANEL option.
- Change the menu option to LOCKED to lock the front panel, or NORMAL to unlock it:



You can always unlock the front panel by switching the SPA21 off and on again, using the main switch.

Saving the configuration

Once you have defined your own custom set of inputs, and have calibrated the speaker settings and other configuration options to suit your own requirements, you should save your settings permanently in the SPA21. You can then return to your saved settings at any time using the RECALL SETTINGS option to undo any subsequent configuration changes.

If the SPA21 was set up for you by an installer, the installer will have saved a set of installer settings. You can also return the SPA21 to these settings using the RECALL INSTALLER SETTINGS option.

Finally a RECALL FACTORY SETTINGS option is provided, to return the SPA21 to the default factory settings.

After saving or recalling settings always wait at least 10 seconds before switching off the unit using the main switch.

To save your settings

- Highlight MEMORY in the SETUP MENU and press the **←** button on the front panel or the **SELECT** button on the remote control to select it.


The MEMORY MENU will be displayed:




- Highlight SAVE SETTINGS and press the **←** button on the front panel or the **SELECT** button on the remote control to select it.

After a short delay a message will confirm that the settings have been saved:



- Wait 10 seconds to allow the settings to be completely stored.
- Press the  button on the front panel or remote control to return to the MEMORY MENU.

To recall your settings

- Highlight RECALL SETTINGS in the MEMORY MENU and press the  button on the front panel or remote control to select it.

The following screen then confirms that your settings have been recalled:



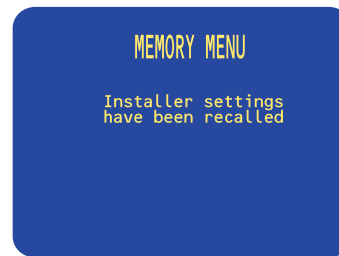
- Press the  button on the front panel or remote control to return to the MEMORY MENU.


To recall the installer or factory settings

NOTE: This will lose any inputs you have defined, or any calibration changes you have made. You should save your settings first if you have not already done so.

- Highlight RECALL INSTALLER SETTINGS or RECALL FACTORY SETTINGS in the MEMORY MENU and press the SELECT button on the front panel or remote control to select it.

After a short delay a screen will confirm that the appropriate settings have been recalled:



- Press the  button on the front panel or the remote control to return to the MEMORY MENU.

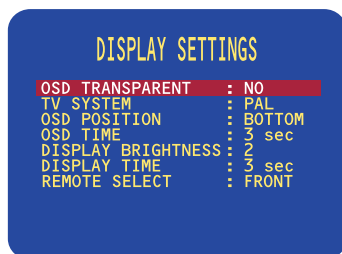
Configuring the on-screen display

You can choose to show information about the SPA21 settings superimposed on the video image as an on-screen display, and the SPA21 provides a range of options to allow you to configure the position and duration of the on-screen display.

To change the on-screen display

- Highlight DISPLAY SETTINGS in the SETUP MENU and press the ← button on the front panel or remote control to select it.

The DISPLAY SETTINGS menu will be displayed:



The following options on the DISPLAY SETTINGS menu determine the on-screen display:

Option	Description
OSD TRANSPARENT	Set to YES to allow the video image to show through the background of the on-screen display, or NO to blank the video image when the on-screen display is displayed.
TV SYSTEM	Specifies the TV system to ensure the correct size and position of the on-screen displays. Can be set to NTSC or PAL.
OSD POSITION	Specifies the position of the on-screen display as one of the options TOP or BOTTOM.
OSD TIME	Set to 1-10 sec to determine how long the on-screen display stays on the screen, or NONE to disable the on-screen display.

Configuring the front panel display

The next two options on the DISPLAY SETTINGS menu allow you to choose the brightness of the front panel display, and the delay before the display dims in DIM mode.

The following options are provided:

Option	Description
DISPLAY BRIGHTNESS	1-4 to specify the brightness, or OFF to blank the front panel display.
DISPLAY TIME	NONE for no delay, or 1 sec to 10 sec for a specified time delay before dimming.

Configuring the remote control

The final option allows you to control the SPA21 using an external control system:

Option	Description
REMOTE SELECT	Set to FRONT to control the SPA21 using an infra-red remote control pointed at the front panel, or REAR to control it via the IR-input at the back panel.

SETTING UP THE SPEAKERS

This chapter explains how to set up the speakers, levels, and delays for the best possible sound with your surround sound configuration


Configuring the speakers

The SPA21 can drive up to seven full-frequency loudspeakers and one subwoofer, but if your surround system does not include a full set of speakers, the SPA21 will distribute the signals from these channels to the other channels as appropriate in your system.

For front, center, surr and surr back you can specify whether the speaker is large, in which case it can handle the bass below the crossover setting for that channel. Alternatively you can specify the speaker to small, in which case the bass for that channel is handled by a subwoofer or any speaker set to large.

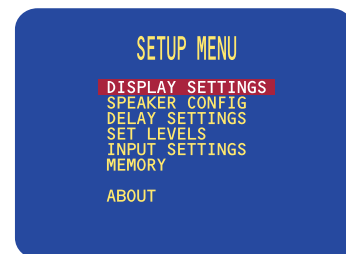
You can define four speaker layouts, labelled GENERAL, DTS, DOLBY DIGITAL, and OTHER. These are selected automatically for the appropriate source material.

To specify the speaker configuration

- Press the  button on the front panel or remote control to display the MAIN MENU .
- Use the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control to highlight the SETUP MENU option and press the ◀ button on the front panel or remote control to select it.

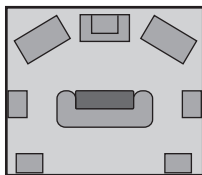
The SETUP MENU will be displayed:

- Use the SELECTOR on the front panel or the

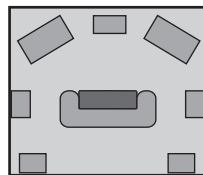


▲ or ▼ buttons on the remote control to highlight the SPEAKER CONFIG option and press the ◀ button on the front panel or remote control to select it.

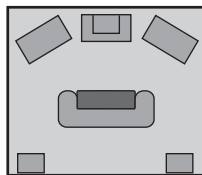
Selection of possible speaker configurations



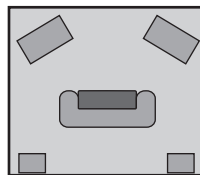
Full surround system with seven loud-speakers and a subwoofer



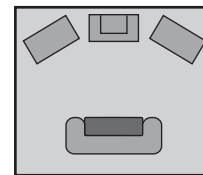
Seven-channel surround system with no subwoofer



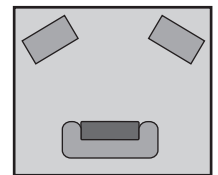
Five-channel surround system with a subwoofer



Four-channel surround system



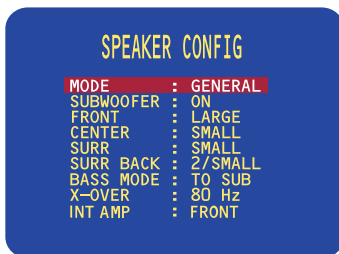
Three-channel system with a subwoofer



Conventional two-channel system

SETTING UP THE SPEAKERS

The SPEAKER CONFIG menu will be displayed:



To define the GENERAL layout

First define the GENERAL layout; the other layouts will all be based on this.

- With MODE highlighted use the VOLUME control on the front panel or the ◀ or ▶ buttons on the remote control to select GENERAL.
- Use the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control to highlight each menu option in turn.
- Use the VOLUME control on the front panel or the ◀ or ▶ buttons on the remote control to select the appropriate value for each option.

If you select SMALL for a channel, frequencies below the X-OVER setting are sent to the speaker(s) specified by the BASS MODE option.

The options are explained in the following table:

Option	Description
SUBWOOFER	Select OFF or ON to specify whether the layout should include a subwoofer.
FRONT	Select SMALL or LARGE to specify whether the front speakers can handle bass.
CENTER	Select NONE, SMALL, or LARGE to specify whether there is a center speaker in the system, and whether it is small or large.
SURR	Select NONE, SMALL, or LARGE to specify information about the surround speakers.
SURR BACK	Select NONE, 1/SMALL, 1/LARGE, 2/SMALL, or 2/LARGE to specify the number and sound of the surround back speakers.
BASS MODE	Specifies how to handle the bass from channels defined as SMALL. TO SUB sends it to the subwoofer, along with the LFE channel. TO LARGE divides it between the channels defined as LARGE. TO BOTH sends the bass information to both TO LARGE and TO SUB. EXTRA sends all bass information below the X-OVER setting to the subwoofer, along with the LFE channel.
X-OVER	Allows you to define the crossover frequency (40-200 Hz) used for speakers defined as SMALL, and by the BASS MODE EXTRA setting.
INT AMP	Select FRONT or S-BACK to specify which speakers should be supplied by the internal amplifier.

- Press the MENU button on the front panel or remote control to return to the SETUP MENU.

To define other layouts

You can now optionally define layouts DOLBY DIGITAL, DTS, and OTHER which modify the GENERAL layout when the source is Dolby Digital, DTS, or two-channel. For example, you can add a subwoofer to the Dolby Digital layout for use with movie soundtracks.

Setting the speaker delays

The next step in setting up the loudspeakers is to set the speaker delays to ensure that the sound image is correctly focused.

Delaying the sound from a speaker by 1 milli-second is equivalent to moving the speaker one foot (0.3 m) further away from the listener.

Because the center speaker is usually physically closer to the listener than the main left and right speakers you should add a delay to the center speaker to ensure that the sound from all three front speakers reaches the listener at the same time. In the case of the rear speakers you will normally add a delay to increase the spaciousness of the sound.

To change the speaker delays

- Use the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control to highlight the DELAY SETTINGS option and press the ◀ button on the front panel or the SELECT button on the remote control to select it.

The DELAY SETTINGS menu will be displayed:



- Highlight each of the speakers in turn, using the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control, and use the VOLUME control on the front panel or the ◀ or ▶ buttons on the remote control to adjust the delay.

Adjust the value according to the distance of each speaker from the listening position. You can adjust the delay for each speaker between 0 and 100 feet.

- Press the □ button on the front panel or remote control to return to the SETUP MENU.

Setting the speaker levels

You should next set the speaker levels, so that the sound from each speaker is equally loud at the listening position.

The MANUAL option allows you to adjust each speaker to equalize the loudness at the listening position.

To change the speaker levels

- Use the INPUT SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control to highlight OUTPUT LEVELS -MANUAL in the SET LEVELS menu and press the ◀ button on the front panel or the SELECT button on the remote control to select it.

The SET LEVELS menu shows the current speaker levels:



- With MODE highlighted use the VOLUME control on the front panel or the ◀ or ▶ buttons on the remote control to select the layout you want to define.
- Use the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control to highlight each speaker in turn.

A white noise signal will be played through that speaker, and you can use the VOLUME control on the front panel or the ◀ or ▶ buttons on the remote control to adjust the level.

- When you have adjusted each speaker to balance the levels press the □ button on the front panel or remote control to exit.

Setting the analog input level

The SPA21 allows you to adjust the input level to the analog-to-digital converter (ADC) to achieve the best possible signal-to-noise ratio.

- Use the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control to highlight SET LEVELS in the SETUP MENU. Press the ◀ button on the front panel or the **SELECT** button on the remote control to select it.

Default of the ADC value is set to 0.0 dB. Increase or decrease the value by means of the the ◀ or ▶ buttons on the remote control or the SELECTOR on the front panel.


- Press the ◀ button on the front panel or the **SELECT** button on the remote control to select the required value within the range +20.0dB to -20.0dB.

In the same way you can set the MUTE LEVEL. The default value is set to FULL. You can choose another value down to -60dB by means of the the ◀ or ▶ buttons on the remote control or the SELECTOR on the front panel.

- Press the ◀ button on the front panel or the **SELECT** button on the remote control to select the required value.

To adjust the ADC input level

If the ADC input level is set too high clipping will occur on loud signals, causing distortion. The SPA21 detects this and displays a SET ADC warning on the front panel and on-screen displays.

- Select an analog input.
- Use the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control to highlight ADC INPUT LEVEL and press the ◀ button on the front panel or the **SELECT** button on the remote control to select it.
- Use the VOLUME CONTROLS on the front panel or the ◀ or ▶ buttons on the remote control to reduce the level until the SET ADC warning stops flashing on the loudest passages.
- Press the  button on the front panel or remote control to return to the SETUP MENU.

SETTING UP THE SOURCES

This chapter gives details of the standard inputs that are defined when the SPA21 is first supplied. It then explains how to modify the standard inputs, or define new inputs, to give you total flexibility in the way you set up the SPA21 in your own system.

Standard sources

The SPA21 Surround Amplifier allows you to define up to 15 sources, referred to as INPUT 1 to INPUT 15. Each source can use one of the four digital and eight analog inputs, and any source can be combined with one of the video inputs. Alternatively, a multi-channel source can be defined using the dedicated eight-channel external input. This feature limits the analog inputs to a total of five.

The SPA21 Surround Amplifier is supplied with the standard sources shown in the table below already defined:

Source	Audio	Video	Surround mode	Description
CD	Analog 1	None	Bypass	High quality CD player
DVD	Digital 1	S-Video 1	2-CH	DVD player
Tape2	Digital 2	None	2-CH	Digital tape recorder or minidisc player
Laser	Digital 3	S-Video 2	Dolby Pro Logic II	LaserDisc player
Tuner	Analog 2	None	Stereo	FM radio tuner
TV	Analog 3	Video 1	Dolby Pro Logic II	Television or monitor
TapeA	Analog 4	None	Stereo	Analog tape output
Sat	Analog 5	Video 2	Dolby Pro Logic II	Satellite receiver

For each source you can define:

- A name for the source, to identify it on the front panel display.
- The analog or digital audio input used for the source.
- The video input used for the source, if the source includes video.
- The standard surround mode used for the source.
- For analog sources, an offset to balance the loudness when switching between sources.
- TV-system
- Trigger #2

If this standard set of sources meets your requirements, you will get excellent results by using them, and you can ignore the remainder of this chapter.

If these standard sources meet all your requirements, but include additional sources that you do not need, you may like to remove the unused sources to avoid having to step past them when selecting sources from the front panel or remote control. To do this, see the next section, Removing sources.

Alternatively, it may be that these standard sources generally meet your requirements, with one or two minor changes. For example, if your DVD player does not provide a digital output you can modify the DVD source so that it uses one of the analog inputs instead of the digital input as currently defined. To make changes to the existing sources see Editing sources, page 24.

Finally, you may prefer to create your own set of sources to suit the particular requirements of your system. To do this you should read all the remaining sections in this chapter.

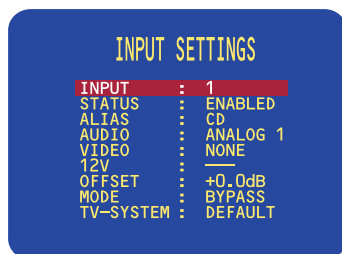
Removing sources

Every source can be enabled or disabled. If a source is enabled it will appear in the sequence of sources when you select sources using the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control. If a source is disabled it cannot be selected, but the settings are retained in case you want to enable the source again at a later date.

To disable or enable sources

- Use the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control to highlight INPUT SETTINGS on the SETUP MENU and press the ◀ button on the front panel or the SELECT button on the remote control to select it.

The INPUT SETTINGS menu will be displayed:



- Use the VOLUME control on the front panel or the ◀ or ▶ buttons on the remote control to select the number of the input you want to enable or disable.
- Use the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control to highlight STATUS, and press the ◀ button on the front panel or the SELECT button on the remote control to select ENABLED or DISABLED as required.

Editing Sources

To edit an existing source

- Highlight INPUT SETTINGS in the SETUP MENU and press the SELECT button on the front panel or remote control to select it.
- Use the VOLUME control on the front panel or the ◀ or ▶ buttons on the remote control to select the input you want to edit.
- Use the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control to highlight the options for the inputs, and use the VOLUME control on the front panel or the ◀ or ▶ buttons on the remote control to modify them as required.

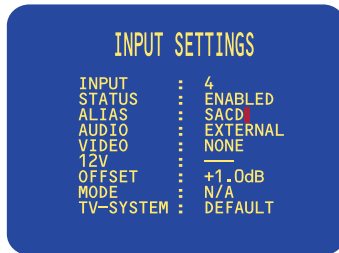
The options are explained in the following table:

Option	Description
STATUS	ENABLED or DISABLED to specify whether the source can be selected from the front panel or remote control.
ALIAS	A name of up to eight characters for the source; see To edit the source alias below.
AUDIO	The audio input used for the source: ANALOG 1 to ANALOG 5, ANALOG EX1 to ANALOG EX3, DIGITAL 1 to DIGITAL 4, EXTERNAL, or NONE .
VIDEO	The video input used for the source: VIDEO 1 to VIDEO 4, S-VIDEO 1 and S-VIDEO 2, COMPONENT1 and COMPONENT2 or NONE .
12V	Controls the second 12V DC-trigger on the back panel: ON, OFF or - - - "keep current status".
OFFSET	Allows you to compensate for variations in sensitivity of any analog or external source between -10.0 dB to +10.0 dB in 0,5 dB steps.
MODE	The default surround mode for the source: BYPASS, STEREO, 2-CH, DOLBY PRO LOGIC II, DOLBY PRO LOGIC II CINEMA, DOLBY PRO LOGIC II MUSIC, PARTY, DTS NEO:6 CINEMA, or DTS NEO:6 MUSIC. The options available depend on the audio mode.
TV-SYSTEM	Specifies the TV system for the video input: NTSC, PAL, or DEFAULT.

To edit the source alias


- Highlight ALIAS in the INPUT SETTINGS menu and press the ◀ button on the front panel or the SELECT button on the remote control to edit the alias.
- Select the character you want to edit using the SELECTOR on the front panel or the ▲ or ▼ buttons on the remote control.

The currently selected character is shown highlighted with a block:



- Use the VOLUME control on the front panel or the ◀ or ▶ buttons on the remote control to change the currently selected character.

Each key press steps the character through the sequence: space, upper-case letters, lower-case letters, digits, and symbols.

- Press the  button on the front panel or remote control when you have finished entering the alias.

To add a new source

- Proceed as for editing a source, but select an unused source as the starting point.

Examples of sources

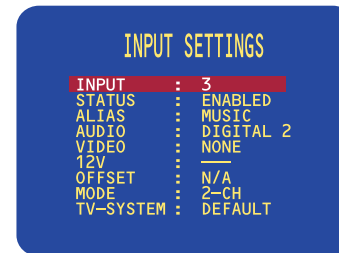
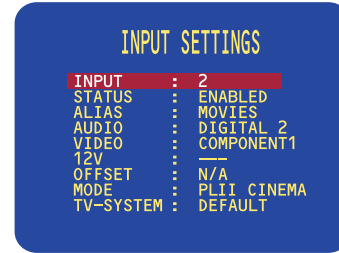
The following examples show how to set up sources to cater for more advanced applications.

Defining two sources that use the same input

Usually each source you define will correspond to a different input on the back panel. However, there are occasions when it is useful to be able to define two sources using the same input, and the SPA21 allows you to do this.

The following example shows how to define two sources, with aliases MOVIES and MUSIC, designed for use with a DVD player. Choosing the MOVIES source selects the DOLBY PRO LOGIC II CINEMA surround mode, which is ideal for movie soundtracks. Choosing the MUSIC source selects the 2-CH surround mode, for the best possible reproduction of audio CDs.

The definition of each of the two sources are shown in the following screen displays:



Defining a multi-channel source

If you have a source that provides multi-channel analog outputs, such as a DVD Audio or SACD player, you can define a source that allows you to connect this to the SPA21, bypassing the internal surround processor.

- Connect the multi-channel inputs to the eight-channel external inputs as shown in the following table:

Input	Left	Right
Front Ex 1	Front L	Front R
Surr Ex 2	Surr L	Surr R
Cent Ex 3	Cent	Sub
Surr back	Surr L	Surr R

- Define a source with the AUDIO option set to EXTERNAL and the VIDEO option set to the video input used for the DVD audio or SACD player.

You can use the OFFSET option to adjust the relative level of the multi-channel source compared with the other analog sources:

