

GENELEC[®]

A C T I V E M O N I T O R I N G

Genelec 1091A
Active Subwoofer System

Operating
Manual



1. General Description

The Genelec 1091A active subwoofer is a powerful low frequency loudspeaker, incorporating all the amplifier and crossover electronics needed to combine it with the Genelec 1029A monitors.

Drivers

The 1091A contains a single 210mm (8") low frequency driver, housed in a 15 litre vented cabinet.

Crossovers

The active crossover within the amplifier unit filters the input signal, the sensitivity can be attenuated by 8dB in 2dB steps. Due to the input sensitivity of the 1091A subwoofer it can only be used with the Genelec 1029A active monitors.

Amplifiers

The amplifier unit is mounted between the radiation ports for optimum cooling. The 1091A amplifier output power is 70W. The amplifier incorporates special circuitry for driver overload protection.

2. Installation

The subwoofer is supplied with a mains cable and operating manual. Once unpacked check that the subwoofer voltage selector switch is set to the correct setting and then place the subwoofer in a suitable position. The amplifier panel and ports can be positioned facing a wall or pointing upwards, they should never be facing the floor. Before connecting the audio signals, ensure that both the subwoofer and the main monitors are switched off. Audio connections to the subwoofer are made via balanced XLR and balanced 1/4" jack connectors. Signals from the source are fed to the 1029A input connector, and signals for the subwoofer are taken from the 1029A sub output connectors (see Figure 1 below). When used in

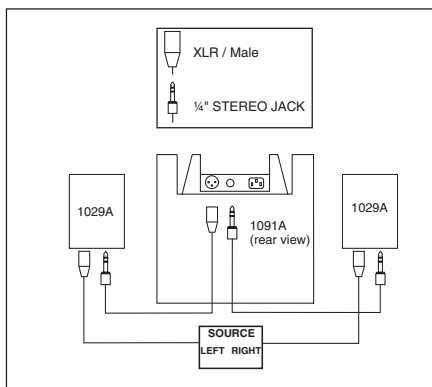


Figure 1: How to cable the system.

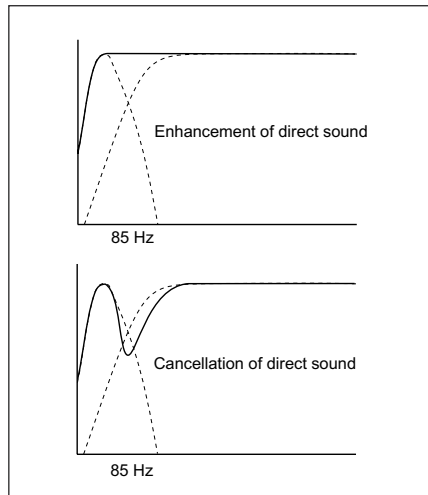


Figure 2: The effect of phase on the system. In conjunction with the 1029A the bass "roll-off" (switch 2) on the 1029A should be in the ON position. Once all connections have been made, the subwoofer and main monitors are ready to be powered up.

Avoiding an uneven frequency response.

Considering a usual room, a free standing speaker is always surrounded by walls that will generate reflections. These walls act as acoustical mirrors to the speaker's radiation, enhancing (see top of figure 2) or cancelling (bottom part of figure 2), the direct sound at the listening position. The cancellation occurs at a certain frequency which is primarily determined by the distance from the sub to the front wall, however the distance to other walls also affects the cancellation frequency.

Moving the cancellation frequency

There are basically two ways to overcome this problem. The first is to position the speakers far enough from the wall to move the interference dip below the operating range of the speaker. To move the dip down to 30 Hz, the distance needed is 2.8 meters. This would not be possible in most rooms simply because of lack of space.

The second method is to push the speaker as close to the wall as possible to decrease the time delay of this reflection relative to the direct sound. This moves the interference problem to a higher frequency. If the distance is small enough then the frequency where the dip occurs is above the operating range of the subwoofer. If the distance is decreased so the subwoofer is flush against the wall then the mirror image of our speaker created by the wall now merges completely with the actual speaker radiation. Because of this "dou-

ble" speaker effect the total sound power radiated into the room has gained up to 6 dB.

Setting the Input Sensitivity

The subwoofer is set to the same sensitivity as the 1029A in free field conditions. However when placed near to reflecting surfaces the sensitivity typically needs to be attenuated due to increased room loading. A typical starting point would be -4 dB. This is achieved by adjusting the DIP switches on the amplifier plate. The use of proper measuring equipment together with careful listening is highly recommended. The maximum attenuation by the use of one switch is 8 dB. However an attenuation of 12 dB is possible by activating all switches. The switches do not add linearly.

3. Maintenance

No user serviceable parts are to be found within the amplifier unit. Any maintenance of the unit should only be undertaken by qualified service personnel.

4. Safety Considerations

Although the 1091A has been designed in accordance with international safety standards, to ensure safe operation and to keep the instrument under safe operating conditions, the following warnings and cautions should be observed.

Servicing and adjustment should only be performed by qualified service personnel. Opening the amplifier's rear panel is strictly prohibited except by persons who are aware of the hazards involved.

It is forbidden to use this product with an unearthed mains cable, which may lead to personal injury.

There must be at least a 100mm gap between the amplifier plate and any other surface or obstruction. This is to allow sufficient air to circulate and cool the amplifier.

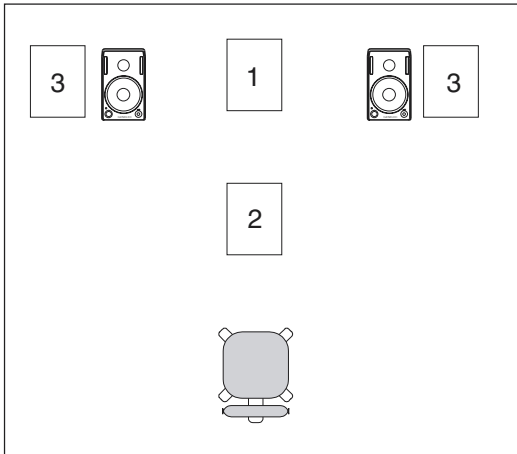
WARNING!

This equipment is capable of delivering sound pressure levels in excess of 85dB, which may cause permanent hearing damage.

5. Guarantee

This product is guaranteed for a period of ONE year against faults in materials or workmanship. Refer to supplier for full sales and guarantee terms.

Subwoofer positioning.

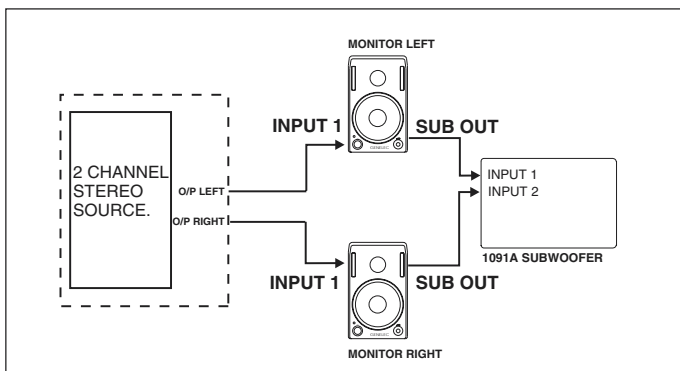


The figure to the left shows some example subwoofer positions within a room.

- 1 Recommended position.
- 2 This arrangement may cause a loss in low frequencies if the distance from the subwoofer position to any wall is between 1 and 3m. This position may be available beneath a mixing console or desk.
- 3 Recommended only when using two subwoofers.

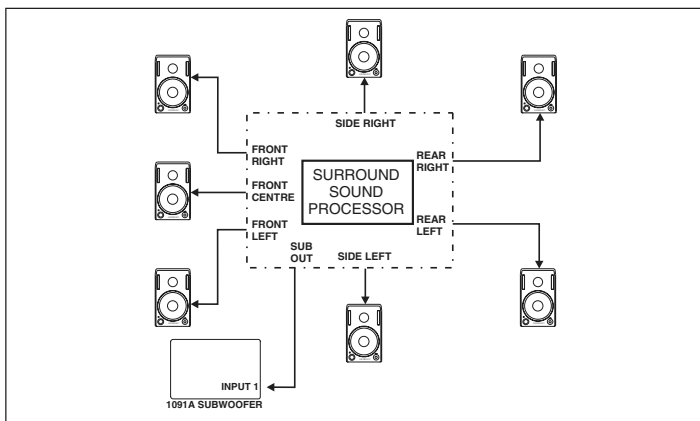
System Configurations.

The following diagrams show various ways the subwoofer can easily be included into an existing system. All connections to the subwoofer should be of the balanced XLR type to maintain the noise immunity of the speaker system. The output of the 1029A is of the balanced type.



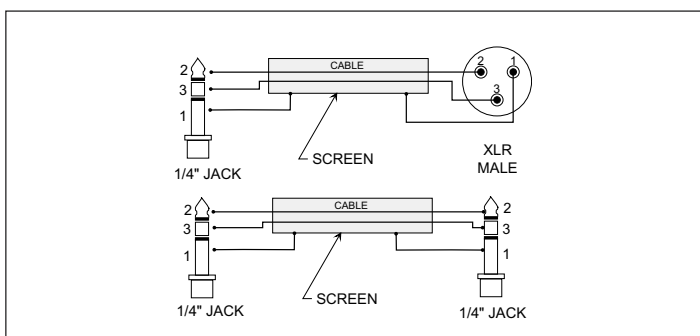
Subwoofer in two channel Stereo configuration.

Both left and right stereo channels are fed into the corresponding monitor. Each monitor output is then connected to the subwoofer. It should be noted that the subwoofer should only be placed at the end of the signal chain. Never use the 1091A as a loop-through device.



Subwoofer in consumer Surround Sound configuration.

When using the 1029A in a surround sound system with the 1091A the "bass roll-off" switches on the 1029A should be set to -6dB. The centre channel on the decoder should be set to "wide band", "large", or "full range" mode.

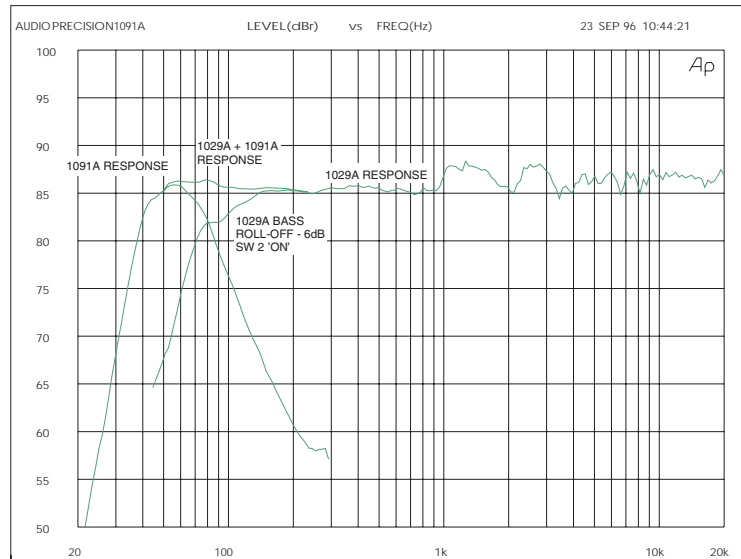


Wiring diagram for interconnects.

The diagram to the left shows how to make the required cables for the system. The connections to the subwoofer are always balanced. One of each type of cable is required.

GENELEC®

ACTIVE MONITORING



1091A SYSTEM SPECIFICATIONS

Free field frequency response of system (± 2.5 dB):	38 - 85 Hz
Maximum short term sine wave acoustic output in half space, averaged from 45 Hz to 80 Hz @ 1m:	≥ 103 dB SPL
Self generated noise level in free field @ 1m on axis (A-weighted)	≤ 10 dB
Harmonic distortion at 95 dB SPL @ 1m on axis in half space (40...85 Hz):	$< 3\%$
Driver:	210mm (8")
Weight:	10.2 Kg (22.4 lb)
Dimensions:	Height 505mm (19 7/8") Width 251mm (9 7/8") Depth 230mm (9")

AMPLIFIER SECTION

Amplifier output power : (Long term output power is limited by driver unit protection circuitry.)	70 W (16 Ω)
Amplifier system distortion at nominal output:	THD $\leq 0.08\%$ SMPTE-IM $\leq 0.08\%$ CCIF-IM $\leq 0.08\%$ DIM 100 $\leq 0.08\%$
Signal to Noise ratio, referred to full output:	≥ 90 dB
Mains voltage:	100/200 or 115/230V
Voltage operating range:	$\pm 10\%$
Power consumption (average):	Idle 9 VA Full output 100 VA

FILTER SECTION

Lowpass filter above 85Hz:	24dB/Octave
Subsonic filter below 40Hz	18db/Octave
Crossover frequency, (sub/main monitors)	85 Hz
Mid Band Rejection frequency ≥ 400 Hz:	≥ 50 dB
Level control operating range in -2 dB steps	from 0 to -8 dB (Reference to 1029A output)

INPUT SECTION

Input connectors XLR & 1/4"	XLR female 1/4" Jack pin 1: gnd sleeve pin 2: + tip pin 3: - ring
Input impedance:	2x33k Ω balanced.
Input level for 100dB SPL output @ 1m in full space:	variable from -23dBu to -15 dBu in 2dB steps.

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Data Sheet No. 1091-0106-1
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