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User's Manual

Car amplifier DLS MRA22 2-channel

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How to install and operate the
DLS Marine Audio amplifiers
MRA22
MRA31
MRA41



Welcome!

This owners manual is written in easy english and uses a lot of drawings to simply the installation and use of the above amplifiers.

Your DLS amplifiers must be installed correctly in order to work well. This manual will show you how to install the amplifier like a pro. Please read the entire manual before beginning the installation. Install the amplifier yourself if you feel confident with our instructions and if you have the proper tools. However if you feel unsure, turn over the installation job to someone better suited to it.

Warranty Service

This amplifier is covered by warranty, depending on the conditions in the country where it is sold. If the amplifier is returned for service, please include the original dated receipt with the product.



Technical Assistance

For technical assistance ask the shop where the product was sold or the distributor in your very country. You can always phone the DLS Helpdesk in Sweden+ 46 31 84 00 60 or send an e-mail to info@dls.se. Information can also be found on our WEB-site www.dls.se

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All models include

- ◆ RCA inputs
- ◆ High Level input
- ◆ Continuous variable low pass and high pass crossover
- ◆ Remote turn on / off
- ◆ Automatic remote turn on/ off on high level input without connecting any remote wire
- ◆ Electronic protection circuitry against short-circuit, DC offset and thermal overload. Bridgeable design to direct full power to one or two subwoofers etc.

IMPORTANT!

While these amplifiers are specially designed for marine applications, they are not waterproof and should not be mounted where it is likely to get wet. The cover is made to resist moisture as well as the PC-board.



Installation

Before you begin installation

Before you begin you need to read the manual, to have some tools, cables and other material available. There is one such list of material on the following page.

Amplifier location

Important

Allow air circulation around the amplifier.

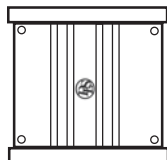
The DLS Marine Audio amplifiers have a compact design that allows great flexibility in mounting.

Safety Considerations:

Your amplifier must be installed in a dry, well-ventilated environment and in a manner which does not interfere with your vessel's factory installed electronic devices. You should also take the time to securely mount the amplifier so that it does not come loose in the event of a collision or a sudden jolt to the vessel.

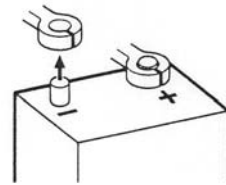
- Check before drilling any holes in your vessel to make sure that you will not be drilling through the hull, a fuel tank, fuel line, wiring harness or other vital vessel system.
- Do not run system wiring outside or underneath the vessel. This is an extremely dangerous practice which can result in severe damage to your vessel and person.
- Protect all system wires from sharp edges (metal, fiberglass, etc.) by carefully routing them, tying them down and using grommets and loom where appropriate.
- Do not mount the amplifier in the engine compartment or in any other area that will expose the amplifier circuitry to the elements.
- Do not mount the amplifier upside down!

This is the best way to mount the amplifier to get good cooling.



Disconnect Battery

Before starting the installation, always disconnect the negative terminal of the battery.

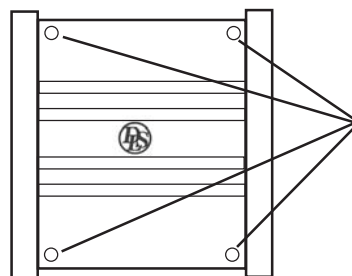


DLS logo on amplifier cooling flange

The DLS logo on top of the amplifier is attached with two 1 mm hex. screws. The logo can be removed and twisted 90 or 180 degrees, and then screwed back in wanted position. The logo can be mounted in four different ways to match your installation.

Removal of side flanges

In order to attach the amplifier to the surface and connect speaker and power cables, the side flanges must be removed. This is done by removing the hex screws on top of the amplifier. Use a 3 mm hex key.



Remove these screws using a 3 mm hex. key for removal of side flange. Remount after attaching the amplifier and connection of the speaker and power cables.



Wiring

Tools and material needed

Tools:

- ◆ Flat and Phillips screwdrivers
- ◆ Wire cutter, Wire stripper
- ◆ Electric drill with drills
- ◆ Crimping tool
- ◆ Digital multimeter or test lamp

Material:

- ◆ Speaker wire: minimum
12 AWG = 4 mm² for subwoofers
13 – 16 AWG = 1,5-2,5 mm² for other speakers
- ◆ Stainless metal screws for mounting the amplifier to the amplifier board and the amplifier board to the vessel, and some extra for fuse holder.
- ◆ Electrical insulation tape

Amplifier installation kit:

If available, buy an amplifier installation kit. It contains normally all you need. This is what you have to buy if you buy the items separately.

- ◆ Power cable, minimum 8 AWG = 10 mm² for MRA22, 4 AWG = 21 mm² for MRA 31/41.
- ◆ 1 pc of fuseholder to install close to the battery + fuse 50 Ampere.
- ◆ 15 AWG = 1,5 mm² wire for remote turn on/off cable from radio / CD.
- ◆ RCA-cable for input from radio. Different lengths are available.
- ◆ Two ring crimp terminals – one for connection to the battery plus and one for the battery minus connection.
- ◆ Two heavy fork crimp terminals to connect + and – to amplifier – but you do only need them if you use heavy cable or to make the installation look nicer.
- ◆ Four to ten fork crimp terminals to connect the speaker cables – but you do only need them if you use heavy cables or want the installation to look nicer.
- ◆ One fork crimp terminal to connect the remote wire to the amplifier, but you need it only to make it look nicer.
- ◆ Four to eight splicers to connect speaker cables to high level input cable, if high level input is used.
- ◆ Wire ties

If amplifier installation kits are available with different size of power cable, choose the most heavy power cable to improve sound quality and to allow more amplifiers to be installed now or later.

These are the minimum sizes we recommend for the amplifiers:

MRA22 10 mm² (7 AWG)

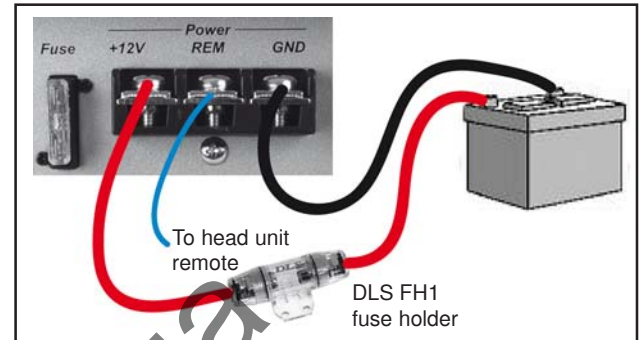
MRA31/41 21 mm² (4 AWG)

This is for cable lengths up to 5 meters.

The ground cable must have the same size.

Connect power and remote

Connect the fuse holder as close to the vessel battery + as possible, using AWG 8 = 10 mm² or heavier cable. Use a ring crimp terminal cable to connect to battery +. Apply silicon grease to the fuse to prevent corrosion. Use a 50 Amp fuse for both amplifiers.



Connect the battery cable by a crimp fork terminal (spade) to the +12 Volt on the amplifier. Do likewise with the negative cable. If you use a AWG 8 = 10 mm² or thinner cable, you can do without the crimp terminal and put the cable right into the connector. Be sure to use a rubber grommet or a plastic insulating tube where the cable passes places when it can easily be jammed. Use wire ties to secure to existing cables.

Remote terminal (REM)

For RCA cable signal input:

Connect the radio power antenna lead = remote turn on/off from the car stereo to the amplifier remote connection. This turns on the amplifier when the car stereo is turned on.

You can either use the built in remote cable in the RCA cable itself or use a separate cable.

We recommend to use a separate remote wire and run the RCA lead separate from remote wire, power cables and speaker cables.

You can either use a crimp fork terminal or insert the cable directly into the amplifier terminal. If there is no remote voltage available from the stereo, you must connect to the ignition key through the radio or any accessories fuse.

For High Level input:

We recommend you to connect the remote wire as described above. The amplifier will produce soft on / soft off operation this way. You must set the Hi level/Low level switch to High level position in this case.

In the case that there is no remote voltage available from the car stereo or you want to simplify the installation, the amplifier can be turned on/ turned off by the high level input voltage. This is done when the Hi level/Low level switch is set to Hi level position. There is a small disadvantage that this function gives soft turn on operation but some pop sound when switching off.



Input and controls

Input Wiring

Inputs may be low level from the RCA output of the car stereo or high level from the car stereo speaker output. Low level = RCA is to prefer for the best sound quality.

Important

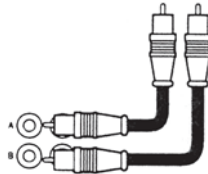
On MRA22 use either the low level or high level input, do not use both at same time.

Low level input

Use a pair of shielded stereo audio cables with RCA type jack. RCA cables are available in different lengths up to 5,5 meters.

Avoid placing the RCA cable close to speaker cables, power cables and remote control cable. Connect to input socket A/B.

MRA31 has also a separate input (C) for the mono sub channel.

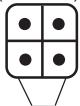


High Level Input

Connect left and right speaker wires coming from the car stereo to the high level input as shown. You must connect both plus and minus as the inputs are balanced, connecting plus only gives lower level and bad sound quality. By changing the polarity of plus and minus, you can change the phase.

MRA 22, MRA31 High level input socket

High Input (C/D Ch)



White: A ch.+
White/Black: A ch.-
Grey/Black: B ch.-
Grey: B ch.+

Hi level input plug on amp.

MRA31

On MRA31 the high level signal is fed internally to channel C when using high level input.

Automatic turn on when using high level input.

With the Hi/Low input switch set to Hi, the amplifier turns on automatically on high input. You dont need to connect a separate remote wire from your head unit.

Parallel input on MRA31, MRA41

Parallel Input MRA31



On MRA31 the PC position internally connects the A/B input with the input for channel C.

Parallel Input MRA41



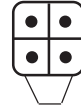
On MRA41 the PCD position internally connects the A/B and C/D inputs.

MRA41 High level input sockets

The MRA41 four channel amplifier is connected likewise, however we have four channels.

You can feed two channels from RCA and two channels using high level input from rear speaker cables.

High Input (A/B Ch)



White: A ch.+
White/Black: A ch.-
Grey/Black: B ch.-
Grey: B ch.+

Hi level input plug on amp for CH A/B.

High Input (C/D Ch)



Violet: C ch.+
Violet/Black: C ch.-
Green/Black: D ch.-
Green: D ch.+

Hi level input plug on amp for CH C/D.

Hi / Low level input switch

To ensure best possible performance from the amplifiers a switch is installed to select between Hi and Low input.

When using High Level input:

Push in the button to position "Hi Level"

When using Low level input:

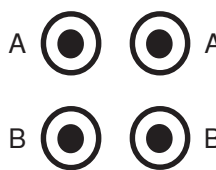
Push out the button to position "Low Level"



If the switch is set to wrong position, the amplifier still works, but the risk for disturbances or distortion increases.

RCA Output

Input Output

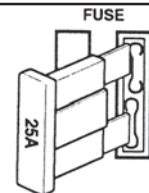


Use RCA Outputs to connect additional amplifiers (not available on MRA31).

Fuses

MRA31 and MRA41 uses two 30 ampere ATC blade type fuses.

MRA22 uses one 25 A fuse.



Power Light / Protect light

Power (Green)
Protect (Red)

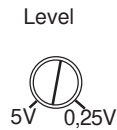
The power light (green) comes on when the amplifier is turned on.

The protect light (red) comes on when the amplifier shuts down from overheating, or a short circuit (speaker failure)



Input Level control

The input level control, 5V – 0,25 V, matches the output of your radio to the input of the amplifier. After installation is complete, make sure the input of the amplifier is turned down all the way (counter-clockwise at 5V).



Play a tape or CD, make sure all bass or treble settings or equalizer are flat, and turn the volume of the radio up until you just start to hear distortion. Turn the volume control down just a bit. On the amplifier increase the input level control (clockwise or to the right) until you just start to hear distortion, then back the level control just a bit. Now your radio and amplifier levels are matched.

Phase control MRA31

The phase control on MRA31 can be set continuously from 0 - 180 degrees. This is very useful when you want to adjust the bass sound for best front stage image. Start on 0 and turn the control slowly clockwise until you experience that the bass sound is coming from the front. If you dont get the result you want, also try to phase reverse the subwoofer connections and make a new adjustment.

PHASE



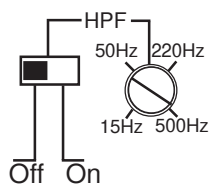
NOTE: This function is intended for car use and may not be fully functional in boats. Set the control to 0.

Crossovers

All amplifiers include high pass filter (HPF) and low pass filters (LPF).

All filters are continuously variable and all filters can be switched on and off. MRA31 also include a subsonic filter.

High Pass Filter (HPF)



Filter frequency range:

MRA22: 15-150 Hz

MRA31: 50 - 150 Hz

MRA41:

Ch A/B: 15 - 500 Hz

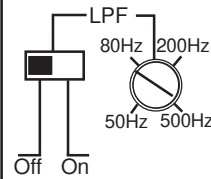
Ch C/D: 15(150)Hz - 500(5k) Hz

The **HPF** (high pass filter) blocks very low frequencies from reaching the speakers. It is mostly used at say 60 Hz to protect small speakers (like 6 inch and smaller) from deep bass. It can also be used as subsonic filter to take away the very deepest frequencies from a bass box. The typical setting is then around 25 – 40 Hz.

The filter can be switched off if you want to run the amplifier in full range mode.

On **MRA41** the filter can also be used for active crossover in a 2-way speaker component kit, a typical crossover point is then 3,5 - 4 kHz.

Low Pass Filter (LPF)



Filter frequency range:

MRA22: 50-500 Hz

MRA31: 50 - 120 Hz

MRA41:

Ch A/B: 50(500)Hz - 500(5k)Hz

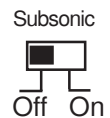
The **LPF** (low pass filter) mostly used for subwoofers. It will allow low frequencies only and blocks higher frequencies. A typical setting is 50 – 80 Hz. The filter can be switched in and out.

This is normally used for subwoofers

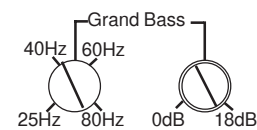
On **MRA41** the filter can also be used for active crossover in a 2-way speaker component kit, a typical crossover point is then 3,5 - 4 kHz.

Subsonic filter MRA31

The **Subsonic filter** blocks the very deepest frequencies from reaching the subwoofers. It has a fixed frequency of 25 Hz and can be switched On / Off. For sub channel C only.



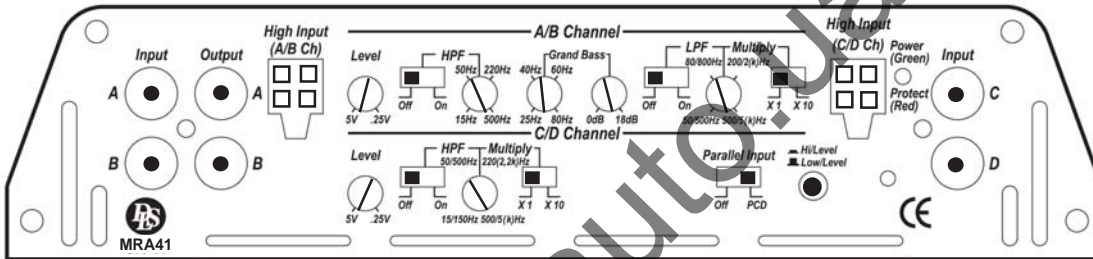
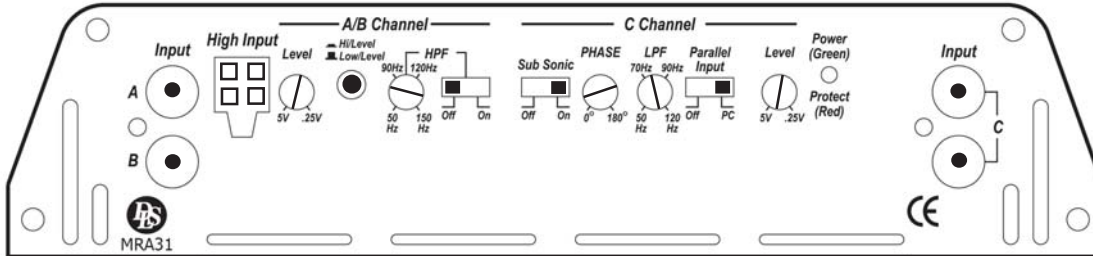
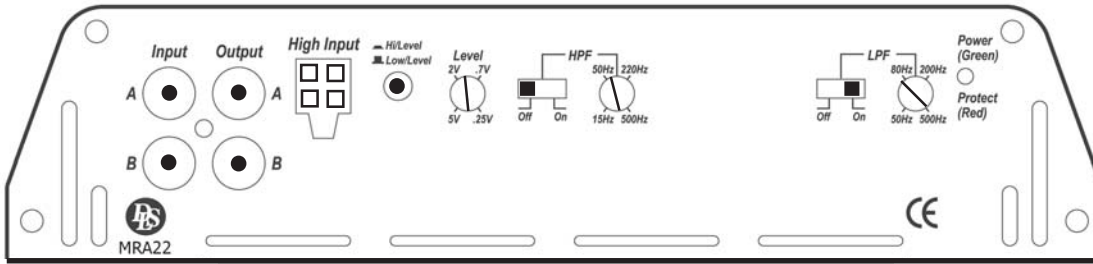
Grand bass on MRA41



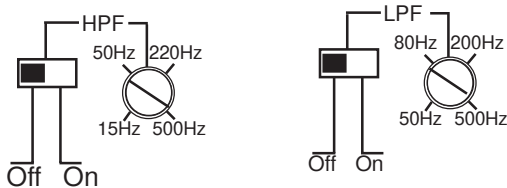
Grand Bass is used to increase the bass volume at an interval of bass frequencies. You can select the center frequency between 25Hz and 80 Hz and the amplification between 0 dB (no amplification) and 18 dB (full amplification).

The slope of the filter is 10 – 12 dB at maximum setting.

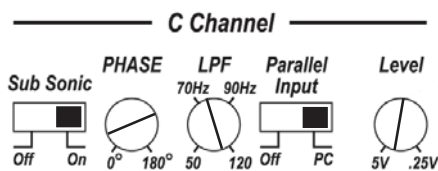
This function is used to compensate for the bass box function and to adjust for your own taste of bass. Set level control at 0 dB if you want it to be inoperative.



The **MRA22** is a two channel stereo amplifier. It has a variable high pass filter, (HPF) 15-500 Hz. It also has a variable low pass filter, (LPF) 50-500 Hz for subwoofer use.

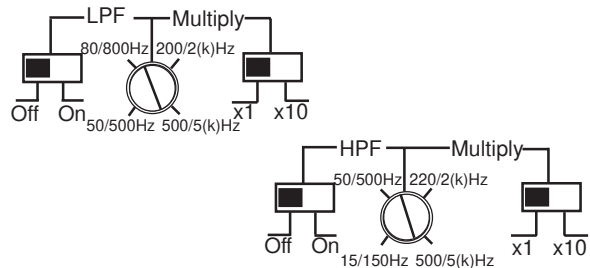


The **MRA31** is a three channel amplifier. It has a variable high pass filter, 50-150 Hz, for channel A/B. The C channel is for subwoofers and has a subsonic filter, a variable low pass filter, 50-120 Hz, and a phase control variable from 0 - 180 degrees. The subsonic filter can be switched IN-OUT and has a fixed frequency of 25 Hz.



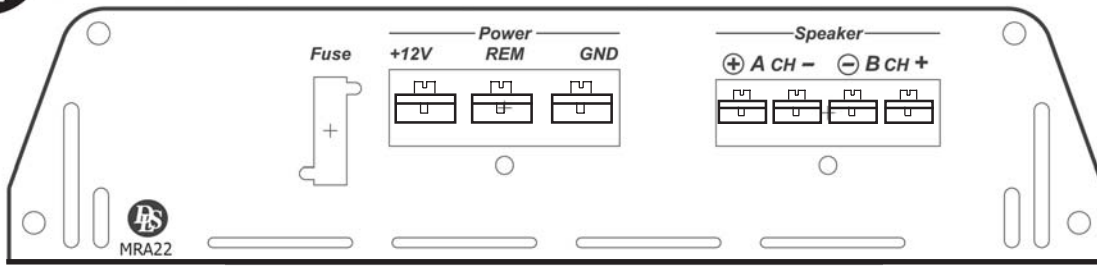
The **MRA41** is a four channel amplifier. It is mostly used with a front system connected to channels C/D and a subwoofer connected to channel A/B. You will find speaker wiring and filter setting example on page 9. Please observe the proper settings of the channel A/B LPF multiplier switch and of the channel C/D HPF multiplier switch.

The MRA41 can also be used to feed a 2-way front system with active crossovers between midbasses and tweeters. This is described in a speaker wiring and filter setting example on page 10.



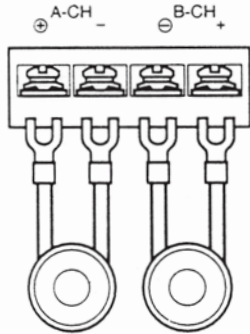
Channel A/B is equipped very much like the MRA22, however the LPF has a multiplier. Thus the frequency range of the LPF can be varied from 50 Hz – 500 Hz in the x1 position or 500 Hz – 5 kHz in the x10 position. This way we can use this amplifier to feed a 2-way system, where the midbasses are fed from 80 Hz – 4 kHz.

The tweeters connected to channel C/D, operate from 4 kHz upwards using the HPF in multiplier position x 10 150 Hz – 5 kHz.

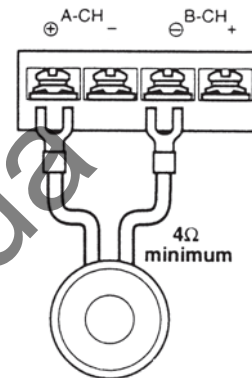


Speaker wiring MRA 22

Two fullrange speakers to MRA22



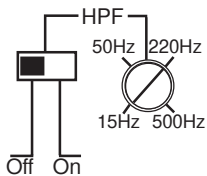
One subwoofer connected in bridge mode to MRA22



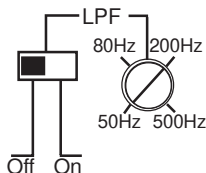
NOTE!

4 ohm minimum load when using bridge mode connection. Lower impedances may damage the amplifier. In bridge mode the amplifier sees a 4 ohm load as 2 ohm.

Filter settings

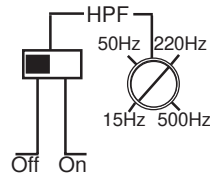


With the HPF-filter in OFF position the amplifier allows the speakers to play fullrange. If you for some reason want to limit the low bass reproduction switch on the HPF-filter. The typical setting is then 60 – 80 Hz.

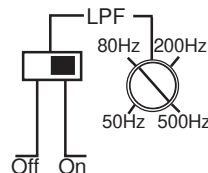


The LPF-filter should be OFF.

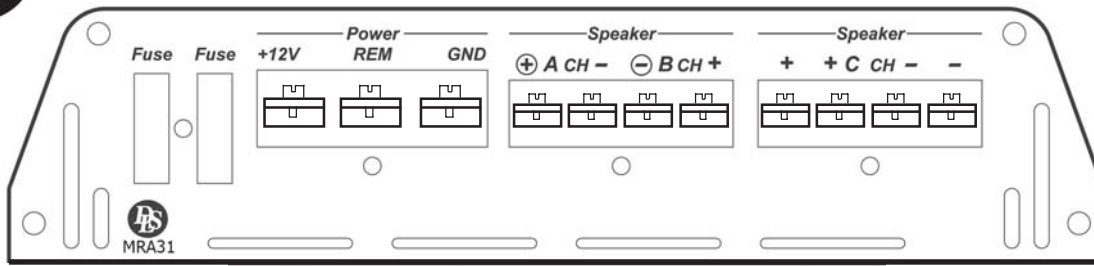
Filter settings



The HPF filter is here used as subsonic filter to take away the very deepest frequencies. The typical setting is around 25 – 40 Hz.

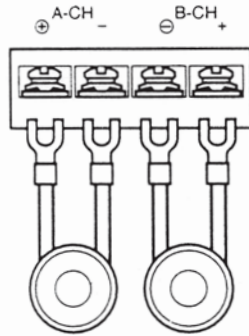


The LPF will allow low frequencies only and blocks higher frequencies. A typical setting is 70 – 90 Hz.

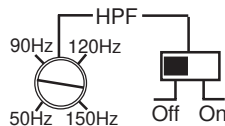


Speaker wiring MRA 31

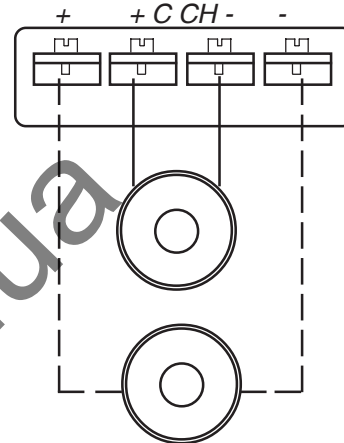
Two fullrange speakers to channel A/B



With the HPF-filter in OFF position the amplifier allows the speakers to play fullrange. If you for some reason want to limit the low bass reproduction turn on the HPF-filter. The typical setting is then around 60 – 80 Hz.

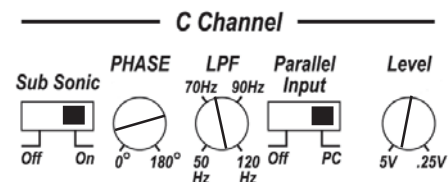


One (or two) 4 ohm subwoofers to channel C



A single 2 ohm subwoofer can also be connected.

Filter settings channel C

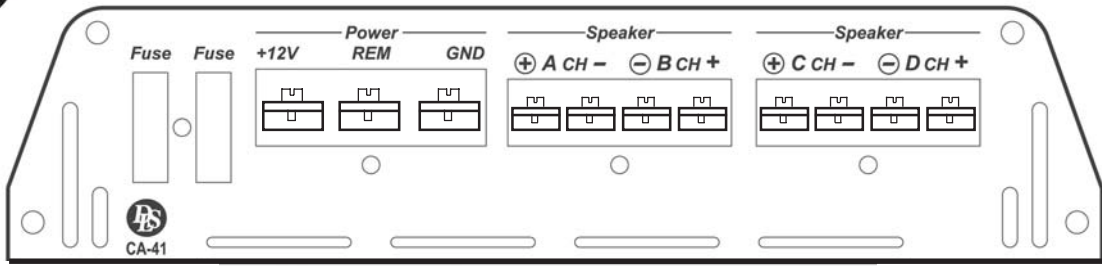


The subsonic filter takes away the very deepest frequencies. Turn on the subsonic filter if you want to remove these frequencies.

The LPF will allow low frequencies only and blocks higher frequencies. A typical setting is 60 – 80 Hz.

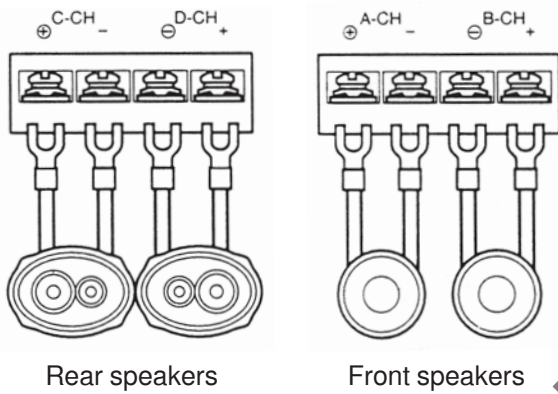
The **phase control** can be set continuously from 0 - 180 degrees. This is very useful when you want to adjust the bass sound for best front stage image. Start on 0 and turn the control slowly clockwise until you experience the bass sound coming from the front. If you don't get the result you want, also try to phase reverse the subwoofer connections and make a new adjustment.

NOTE: This function is intended for car use and may not be fully functional in boats. Set the control to 0.

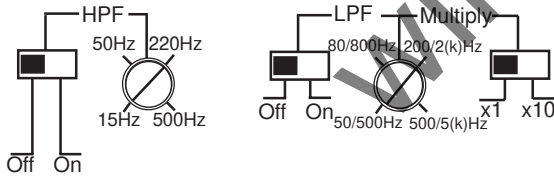


Speaker wiring MRA 41 - three different wiring examples

1. Four fullrange speakers to MRA41. One pair in front and one pair in rear.

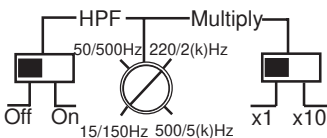


Filter settings A/B Channels



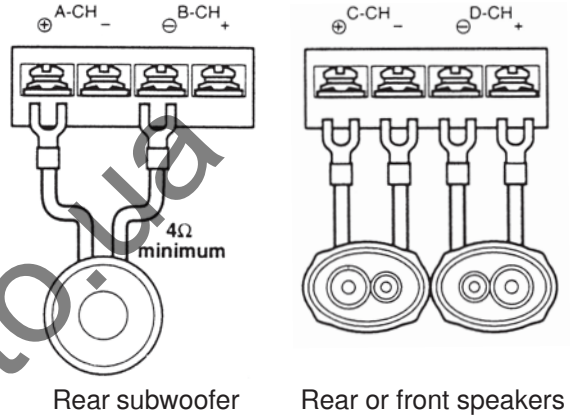
With the HPF-filter in OFF position the amplifier allows the speakers to play fullrange. If you for some reason want to limit the low bass reproduction switch on the HPF-filter. The typical setting is then around 60 – 80 Hz. The LPF-filter switch should be in OFF-position

Filter settings C/D Channels

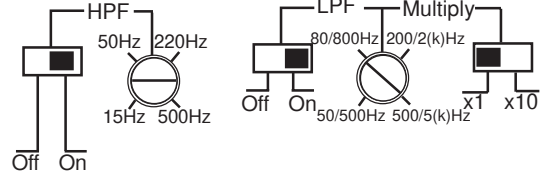


With the HPF-filter in OFF position the amplifier allows the speakers to play fullrange. If you for some reason want to limit the low bass reproduction switch on the HPF-filter. The typical setting is then around 60 – 80 Hz.

2. Two fullrange speakers and one subwoofer to MRA41.

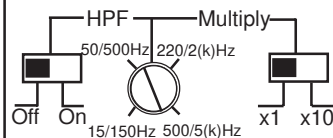


Filter settings A/B Channels

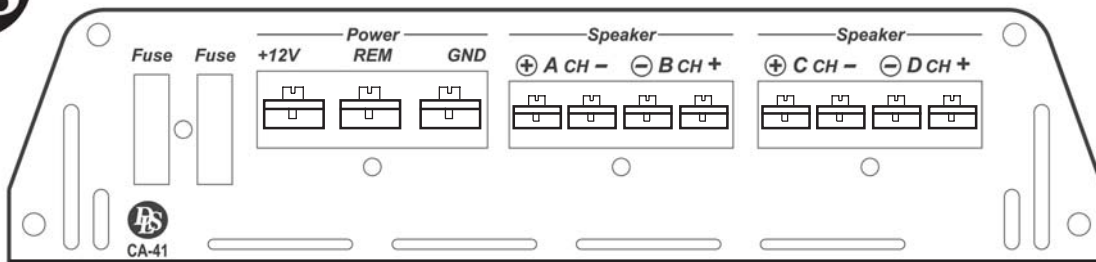


The subwoofer should be connected to channel A/B in bridge mode. The Grand Bass mode can now be used for the subwoofer. Set the HPF-filter switch to ON-position. Adjust the filter setting to 25-40 Hz. Set the LPF-filter switch to ON-position and the Multiply switch to x1. Adjust the frequency setting to 70-90 Hz.

Filter settings C/D Channels

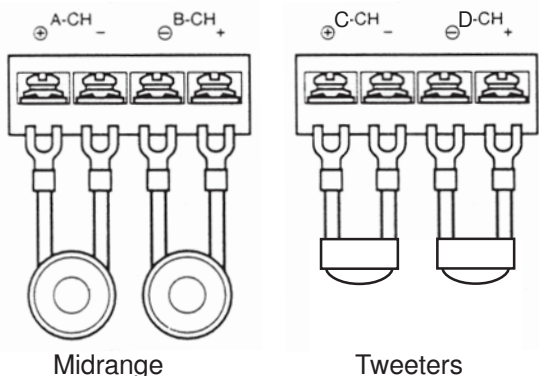


With the HPF-filter in OFF position the amplifier allows the speakers to play fullrange. If you for some reason want to limit the low bass reproduction switch on the HPF-filter. The typical setting is then around 60 – 80 Hz.

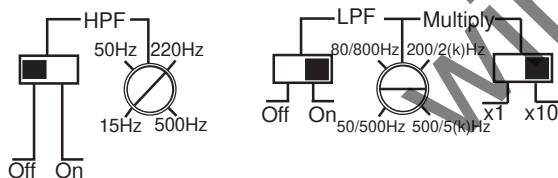


Speaker wiring MRA 41

3. One 2-way speaker system to MRA41 using active crossover between tweeter and midrange / bass

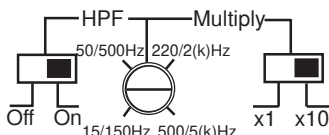


Filter settings A/B Channels



We want a crossover point of 4 kHz between tweeter and midrange. If you for some reason want to limit the low bass reproduction switch on the HPF-filter. The typical setting is then around 60 – 80 Hz. Switch the LPF-filter switch to ON and the Multiply switch to x10 position. Now you can adjust the filter setting from 500 Hz to 5 kHz. Adjust the setting to 4 kHz.

Filter settings C/D Channels



Channel C/D are used for tweeters and must be set to play from 4 kHz and up. The HPF-filter switch must be ON and the multiply switch in x 10 position. Now you can adjust the filter setting from 150Hz to 5 kHz. Adjust the setting to 4 kHz.

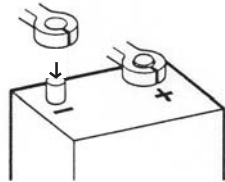


Testing

Before you finish the installation, you should do the following tests to make sure the wiring is correct and everything is operating properly.

Reconnect Battery

When wiring is complete, reconnect the battery negative terminal.



Test power wiring

1. Turn on the head unit but do not turn up the volume. The amplifier power light should come on. If not, check the remote and +12 volt wires. Also check the ground connection.
2. Turn up the head units volume slightly. All speakers should operate. If not, check wiring connections at amplifier and speakers.

Test speaker connections

Make sure the speakers are connected correct. Use the balance control on the head unit to make sure right channel is on right speaker etc. If speakers don't play at all, one or both speaker wires may be disconnected.

Troubleshooting

If problems occur during the installation, or later, this guide might help you to find out what's wrong.

THE AMPLIFIER IS DEAD:

1. Check power lead, ground and remote connections at the amplifier using a multi meter.
2. Check the battery terminal connections.
3. Check the power lead fuse or circuit breaker. If fuse damage continues, inspect the power lead for short circuits.
4. Check the amplifier protection fuses. Are these broken change to new ones with the same value. If short circuiting continues, contact your local DLS dealer. A fault may exist in the amplifier.
5. To start the amplifier requires a remote voltage of 9-15 volt. Check the voltage with a multi meter.

AMPLIFIER PROTECTION FUSE BLOWS AT LOW VOLUME

1. One or more speaker cables are shorted. Make an insulation test with a multi meter. The cables must not have a connection to earth.

THE AMPLIFIER TURNS OFF AFTER 10 - 30 MINUTES.

The amplifier is overheating due to inadequate ventilation. Check mounting position is free from obstruction.

Do this:

1. Move the amplifier to a place with better ventilation.
2. Install one or two fans to cool down the heat-sink.
3. Overheating can also be caused by an impedance load below the level permitted.

NO OUTPUT FROM ONE OR MORE SPEAKERS:

Check the following:

1. Balance control position.
2. Fader control position.
3. Speaker cable connections to both amplifier and drivers.
4. Signal lead plugs and cables.
5. Change left and right signal lead plugs in the amplifier to see if the problem moves to a different speaker, the lead has a fault. If the problem remains, the speaker or amplifier are at fault.



Professional Tip:

NOISE PROBLEMS

WHINING NOISE VARYING WITH ENGINE REVOLUTIONS:

Do this:

1. Rewire the power supply (12 V) to source unit direct from battery.
2. Check all power connections to ensure that they are clean and tight.
3. Check quality of system ground connection.
4. Install a Power Cap capacitor. This can be helpful against most noise problems.

CONSTANT WHINING NOISE:

Do this:

1. Ensure that all equipment has a common ground point.
2. Disconnect signal cables from amplifier to see if noise disappears. If so the leads are picking up noise. Test this by laying a new cable over the seats and reconnecting to the amplifier. If the noise does not return, re-route original cable away from source of interference.
3. Try to reduce the amplifiers input sensitivity.

If noise remains regardless of cable position, try to use so called Quasi-balanced signal cables. DLS PRO-cables are Quasibalanced.

Professional Tip:

Crimp connections

Purchase crimp connectors and crimping tool. Connectors are color coded.

1. Strip 1/4 inch (6 mm) of insulation from the wire.
2. Insert into connector
3. Crimp tightly

Professional Tip:

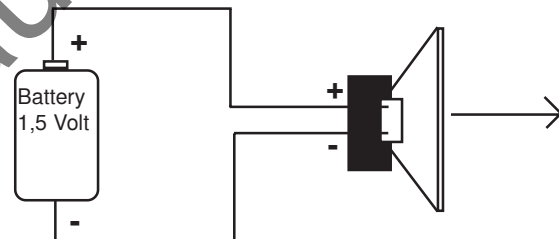
SPEAKER POLARITY CHECK.

All speakers in a car audio system should be connected in phase (the same polarity). All speaker cones must move in the same direction. Out of phase speakers will cause a lack of bass, and a poor stereo soundstage.

Checking polarity:

Hold the - connection of the speaker wire to the - terminal of a 1,5 Volt flashlight battery. Tap the + wire on to the + terminal of the battery, and observe the movement of the cone. The cone should move outwards when the wire touches the battery, and inwards when the battery is removed. If it is the other way around, the speaker has been connected backwards and it must be removed and connected correctly.

If your system also has a subwoofer connected through a passive 6 or 12 dB crossover, try to connect this with various polarity and judge what sounds best. The phase shift in passive crossovers sometimes makes it necessary to change polarity.

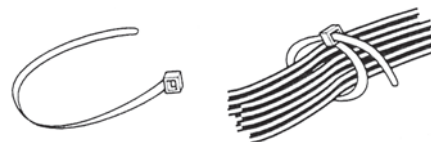


NOTE! Tweeters can not be tested this way, double check the connections instead.

Professional Tip:

Securing wires

Use wire ties to bundle together when possible. (But never bundle speaker wires or signal cables together with power wires.)



Professional Tip:

Speaker and power wires

Do not run speaker and power wires next to each other. Power wires can generate a "siren" sound in the speakers. Run speaker and power wires separated from each other.



Specifications

MRA22, MRA31, MRA41

DLS MARINE AUDIO	MRA 22	MRA41
Number of channels	2	4
Power output, 4 ohm (0,1% THD)	2 x 60 W	4 x 70 W
Power output, 2 ohm (0,2% THD)	2 x 100 W	4 x 125 W
Power output, 4 ohm bridged	1 x 200 W	2 x 200 W
Signal to noise ratio, A-weighted	>100 dB	>100 dB
Damping factor	>100	>100
Frequency response	10 Hz - 35 kHz	10 Hz - 35 kHz
Input impedance, low level	>10 kohm	>10 kohm
Input impedance, high level	100 ohm	100 ohm
High level input with auto start	Yes	Yes
Low output (RCA output)	Yes	Yes
Input sensitivity	0,25 - 5V	0,25 - 5V
Grand bass adjustable frequency	-	25 Hz - 80 Hz
Grand bass adjustable gain	0 - 18 dB	0 - 18 dB
Filter highpass /subsonic	15-500 Hz*	see spec. below
Filter lowpass	50-500 Hz*	see spec. below
* can be switched in/out		
Power consumption, idle	0,5 A	1,0 A
Fuse	1 x 25 A	2 x 30 A
Dimensions HxWxD(mm)	70x230x268	70x372x268
Dimensions (inch)	2,92x9,06x10,55	2,92x14,65x10,55
Weight	2,7 kg	4,2 kg

DLS MARINE AUDIO	MRA 31
Number of channels	3
Power output, 4 ohm (0,1% THD)	2 x 65 W
Power output, 2 ohm (0,2% THD)	2 x 90 W
Power output, 4 ohm bridged	1 x 170 W
Power out mono sub ch. 4 ohm	1 x 170 W
Power out mono sub ch. 2 ohm	1 x 280 W
Signal to noise ratio, A-weighted	>100 dB
Damping factor	>100
Frequency response	10 Hz - 35 kHz
Input impedance, low level	>10 kohm
Input impedance, high level	100 ohm
High level input with auto start	Yes
Low output (RCA output)	No
Input sensitivity	0,25 - 5V
Variable phase shift control CH C	0-180 degrees
Filter high pass CH A & B	50-150 Hz*
Filter low pass CH C	50-120 Hz*
Subsonic filter CH C	Fixed 25 Hz*
* can be switched in/out	
Power consumption, idle	1,0 A
Fuse	2 x 30 A
Dimensions HxWxD(mm)	70x357x268
Dimensions (inch)	2,92x14,06x10,55
Weight	4 kg

Filter configuration MRA41

Channel A/B:

Highpass: 15 - 500 Hz*

Lowpass: 50(500) - 500(5k) Hz*

(x 10 switch)

Channel C/D:

Highpass: 15(150)Hz - 500(5k)Hz*

(x 10 switch)

* can be switched in/out

All output power ratings at 13,8 VDC

We follow a policy of continuous advancement in development.

For this reason all or part of specifications & designs may be changed without prior notice.

