EMPHASER EA-M1 1 Channel Amplifier Installation Guide

Contents

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EMPHASER EA-M1 1 Channel Amplifier

Product Information

Specifications

- **Model:** EA-M1
- **Number of Channels:** 1
- **Rated Power Output (RMS) At 4 Ohms / 14.4V (THD 85 dB):** > 250
- **Frequency Response:** 20 – 5000 Hz
- **Dimensions:** 240x185x65 mm

Key Features

- 4CH Class-D Amps for 4/2 Ohms Stereo Operation
- 1CH Class-D Amp for 4/2/1 Ohms Mono Operation
- Bridge Operation into 4 Ohms
- Adjustable 12dB/octave HP + LP and BP X-Over
- Extended X-Over Range for 2-Way Active Speaker Setup
- Bass Boost for EA-M1
- EA-M1 Remote Control included
- EA-M4/4x Remote Control ready
- Protection Circuit
- Tiffany RCA Sockets
- Moulded Power + Speaker Terminal

Thank you

Thank you for purchasing this peerless EMPHASER amplifier!

To maximize the performance of this amplifier and your complete car audio system install, we recommend that you acquaint yourself thoroughly with all technical features and controlling options of this EMPHASER amplifier.
Please read this manual carefully, before attempting the installation.
If, after reading this manual, you still have questions regarding functions or the installation of the amplifier, we recommend that you consult your dealer.

KEY FEATURES

- 4CH Class-D Amps for 4/2 Ohms Stereo Operation
- 1CH Class-D Amp for 4/2/1 Ohms Mono Operation
- Bridge Operation into 4 Ohms
- Adjustable 12dB/octave HP + LP and BP X-Over
- Extended X-Over Range for 2-Way Active Speaker Setup
- Bass Boost for EA-M1
- EA-M1 Remote Control included
- EA-M4/4x Remote Control ready
- Protection Circuit
- Tiffany RCA Sockets
- Moulded Power + Speaker Terminal

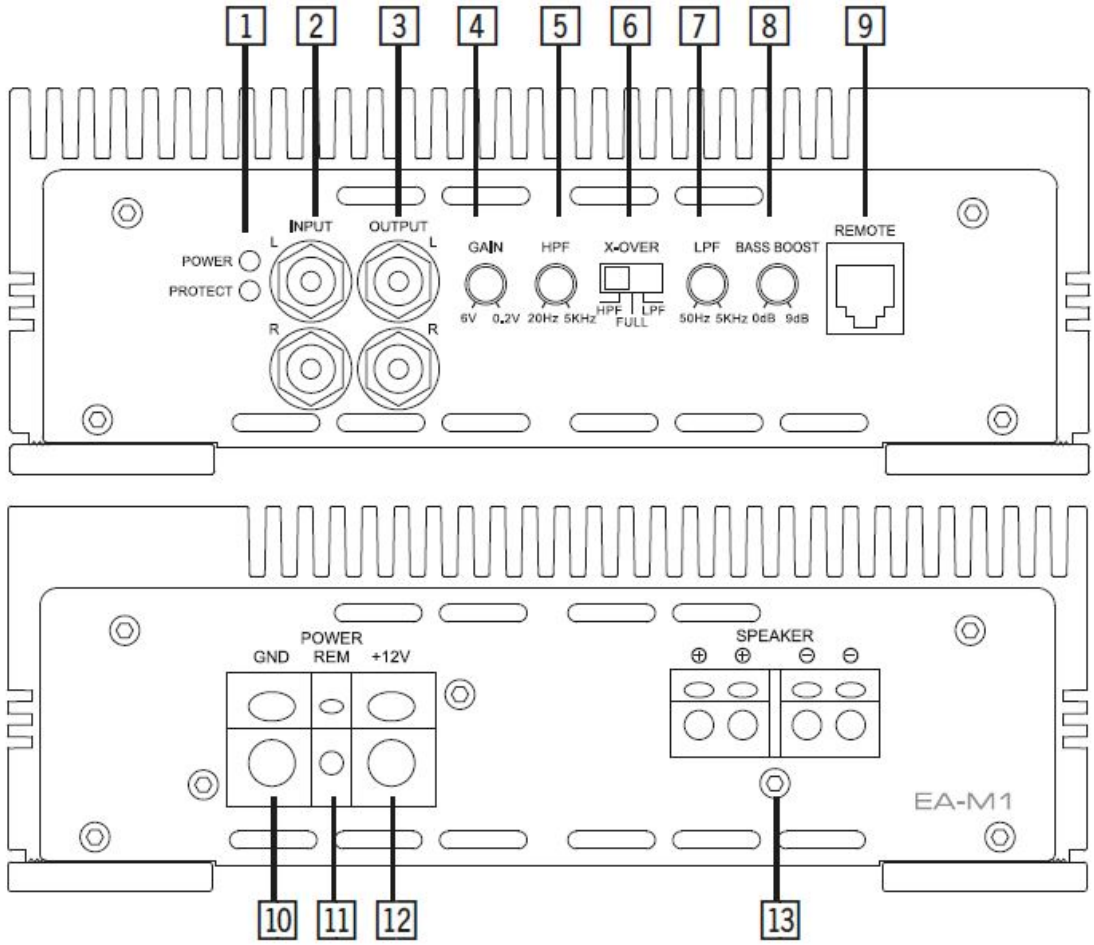
TECHNICAL SPECIFICATIONS

Model	EA-M1	EA-M4	EA-M4x
Number of Channels	1	4	4
Rated Power Output (RMS) At 4 Ohms / 14.4V (THD<=0.1%)	600 W x 1	105 W x 4	230 W x 4
Rated Power Output (RMS) At 2 Ohms / 14.4V (THD<=1.0%)	1000 W x 1	165 W x 4	325 x 4
Rated Power Output (RMS) At 1 Ohm / 14.4V (THD<=1.0%)	1500 W x 1	n.a.	n.a.
Rated Power Output (RMS) Bridged, 4 Ohms / 14.4V (THD<=1.0%)	n.a.	340 W x 2	670 x 2
Damping Factor 4 Ohms/100Hz	> 250	> 250	> 250
Signal-to-Noise Ratio (All channels)	> 85 dB	> 85 dB	> 85 dB
Frequency Response (x-over set to FULL)	10 Hz – 22 kHz	10 Hz – 36 kHz	10 Hz – 36 kHz
Channel Separation	n.a.	> 55 dB	> 55 dB
Input Sensitivity	0.2 – 6 V	0.2 – 8 V	0.2 – 8 V
Integrated X-Over Slope Rates HPF / LPF	12 dB/Oct.	12 dB/Oct.	12 dB/Oct.
Cross-Over Frequency: High Pass Low Pass	20 – 5000 Hz 50 – 5000 Hz	20 – 5000 Hz 50 – 5000 Hz	20 – 5000 Hz 50 – 5000 Hz
Dimensions (W x H x D)	240x185x65 mm	240x185x65 mm	350x185x65 mm

CONNECTIONS / CONTROLS

CONNECTIONS + CONTROLS EA-M1

Side panels

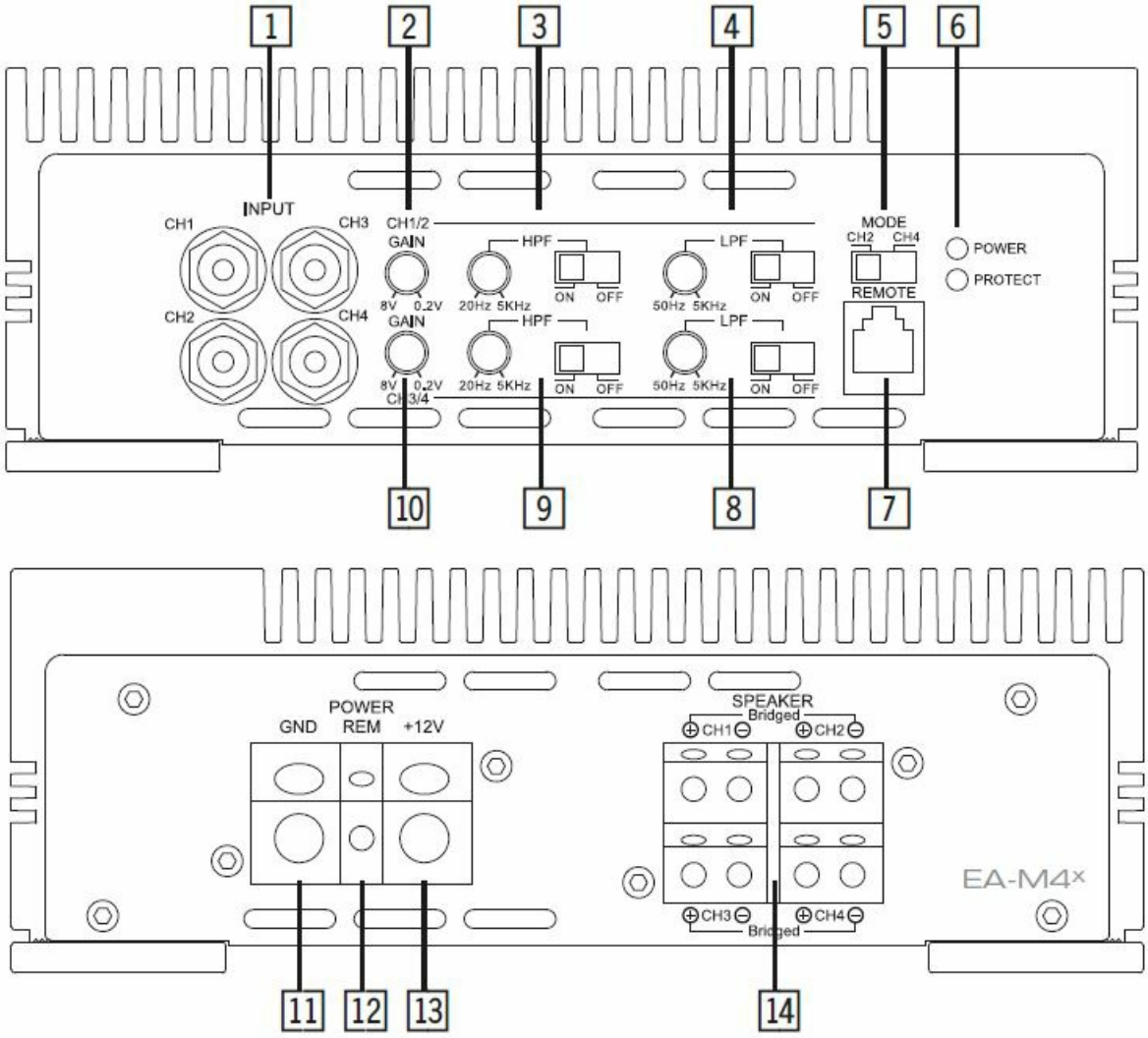


1. POWER LED
    - LED to show proper operating status of the amplifier by white illumination.
    - Protect state of amplifier is signaled by the red LED.
2. RCA INPUTS L/R-CH
    - Low-level stereo RCA signal input L/R-CH for connection to head-unit.
3. RCA OUTPUTS L/R-CH
    - Low-level stereo RCA signal output L/R-CH for connection to another amplifier.
4. INPUT GAIN CONTROL L/R-CH
    - Input gain potentiometer for channel L/R-CH, to match the output voltage of the headunit to the amplifier’s input.
5. HIGHPASS FREQUENCY CONTROL
    - Control potentiometer to adjust the crossover highpass filtering frequency point of the amplifier.
6. X-OVER MODE
    - Switch to choose between high- and lowpass filtering and fullrange signal.
7. LOWPASS FREQUENCY CONTROL
    - Control potentiometer to adjust the crossover lowpass filtering frequency point of the amplifier.
8. BASS BOOST
    - To increase bass performance from 0 – 9 dB @ 45 Hz.
9. REMOTE CONTROL
    - Port for the provided remote control (EA-M1 only, EA-M4 and EA-M4x as option).
10. “GND” POWER INPUT TERMINAL
    - Terminal to connect the amplifier to the chassis ground or negative pole of the car battery.

11. “REM” INPUT TERMINAL
    - Terminal to connect the amplifier to the automatic (remote) turn-on / turn-off lead of the head unit.
12. “+12V” POWER INPUT TERMINAL
    - Terminal to connect the amplifier to the positive +12V pole of the car battery.
13. SPEAKER OUTPUT TERMINAL
    - Output terminal to connect the speakers to the amplifier.

CONNECTIONS + CONTROLS EA-M4 AND EA-M4x

Side panels



1. RCA INPUTS
    - Low-level RCA signal input CH1/2/3/4 for connection to head-unit.
2. INPUT GAIN CONTROL 1/2-CH
    - Input gain potentiometer for channel 1/2-CH, to match the output voltage of the headunit to the amplifier’s input.
3. HIGHPASS FREQUENCY CONTROL 1/2-CH
    - Switch set to “ON” activates the highpass control potentiometer to adjust the crossover highpass filtering frequency point of the amplifier.
4. LOWPASS FREQUENCY CONTROL 1/2-CH

- Switch set to “ON” activates the lowpass control potentiometer to adjust the crossover lowpass filtering frequency point of the amplifier.

5. INPUT CHANNEL MODE
    - In case you only have one stereo RCA cable, switch set to “2-CH”, connect the RCA cable to the CH1/2 RCA input sockets and the amplifiers internally routes the signal to CH3/4. If you connect four RCA cables, set the switch to “4-CH”.
6. POWER LED
    - LED to show proper operating status of the amplifier by white illumination. Protect state of amplifier is signaled by the red LED.
7. REMOTE CONTROL
    - Port for the optional available remote control.
8. LOWPASS FREQUENCY CONTROL 3/4-CH
    - Switch set to “ON” activates the lowpass control potentiometer to adjust the crossover lowpass filtering frequency point of the amplifier.
9. HIGHPASS FREQUENCY CONTROL 3/4-CH
    - Switch set to “ON” activates the highpass control potentiometer to adjust the crossover highpass filtering frequency point of the amplifier.
10. INPUT GAIN CONTROL 3/4-CH
    - Input gain potentiometer for channel 3/4-CH, to match the output voltage of the headunit to the amplifier’s input.
11. “GND” POWER INPUT TERMINAL
    - Terminal to connect the amplifier to the chassis ground or negative pole of the car battery.
12. “REM” INPUT TERMINAL
    - Terminal to connect the amplifier to the automatic (remote) turn-on / turn-off lead of the head unit.
13. “+12V” POWER INPUT TERMINAL
    - Terminal to connect the amplifier to the positive +12V pole of the car battery.
14. SPEAKER OUTPUT TERMINAL
    - Output terminal to connect the speakers to the amplifier in either stereo or bridged mode.

SPEAKER IMPEDANCE & POWER WIRE INFO

It is recommended that you follow the optimum speaker / subwoofer impedance info suggested below.

- EA-M1 → 4/2/1 ohms mono
- EA-M4 → 4/2 ohms stereo / 4 ohms mono bridged
- EA-M4x → 4/2 ohms stereo / 4 ohms mono bridged

AMPLIFIER MOUNTING

Attention: For your own safety, disconnect the negative battery terminal (GND) or remove the main fuse in the positive power cable near the car battery, before you start any wiring work!

Before you proceed to install this EMPHASER amplifier, it is recommended to map out the complete system and the respective wiring required. Consider all additional electrical requirements and accessories, such as power cables, interconnect cables etc., to complete the install. Please note that – because of possible interference

problems with the existing car electrics and electronics – especially the routing of the signal cables and the chassis ground connection will have a profound impact on the trouble-free (noise free!) operation of the amplifier.

The mounting location should be carefully selected and in the interest of passive driver and passenger safety, the amplifier must be securely mounted. Make sure that there is no wiring harness, fuel tank etc. behind or below the mounting surface that may be damaged by the drilling of the holes for the amplifier mounting screws. After installation, there should be a clearance of at least 5cm to all sides including the top of the amplifier heatsink. Make sure the unit is not exposed to direct sunlight, humidity, water, oil or spill of other fluids that may enter the amplifier. Once the location where the amplifier will be mounted is defined, use the unit as a template for the marking of the mounting holes with pencil or felt-tip marker. The mounting holes should be pilot-drilled, using a 2,5mm or 3mm drill bit. Bolt the amp down.

Important

- There must not be a direct contact of the amplifier heatsink, bottom panel or any other metal part of the amplifier to the vehicle metal panel! Electrical ground-loops will cause audible hum!

WIRE ROUTING

MAIN POWER WIRES

We recommend a minimum main power cable cross-section (5m total length) of 20 mm² (based on pure copper cable), for both the positive and the ground wires. Following these recommendations guarantees a trouble-free operation of your amplifier, as well as full power output.

Run the positive main power cable („+12V“) directly from the positive terminal of the car battery to the amplifier. For protection of your car audio system against electrical fire hazards, resulting from a short-circuit of the main power cable to chassis ground a main fuse holder must be inserted within the first 30 cm of the positive main power cable. The applicable fuse value must be matched to the limitations of your main power cable AND the current draw of the amplifier – therefore choose an appropriate fuse value.

Attach the ground cable to the amplifier. In most cases it will be best to keep the ground cable („GND“) as short as possible, i.e. to find a chassis contact very close to the amplifier. The ground power wire must have the same cross-section as the positive power cable. The contact point where the ground wire is attached to, must be solid and clean, i.e. free from rust or paint! Tighten both power input terminals of the amplifier, and double check for perfect fit of both main cable leads!

RCA & REMOTE WIRES

For best interference free transmission of the music signal, use double or triple shielded RCA interconnects only. Twisted pair Interconnects offer excellent noise rejection as well. Route the RCA interconnects away from potential sources of Interference, such as engine computers, gas pumps, etc.

Carefully run the audio signal interconnects, the remote wire and – if applicable – the cable ofthe bass level remote control from the head unit or dashboard to the amplifier. As mentioned before, the audio signal cables should always be routed completely separate from the power cables. Connect the remote (turn on/turn off) lead to the respective input terminal of the amplifier and to the remote output of your head-unit. Now you can connect the RCA interconnects to the respective outputs of your head-unit and to the inputs of the amplifier. Pay attention to connect the stereo interconnects correspondingly, left is 1CH and right is always 2CH a.s.o.

LOUDSPEAKER WIRES

For longer distances to the speakers, it is best to use 2.5 mm2 or 4 mm2 speaker cables to avoid a loss of power

or risk degradation of the signal quality.

Once the speaker cables have been routed, turn loose the screws of the speaker terminal binding posts and – after inserting the stripped and bare speaker cable ends – re-tighten the screws. Maintain correct polarity („+“ to „+“; „-„ to „-„). Close the electrical circuit by attaching the ground wire to the battery and switch on your head unit. The white status LED should turn on. If the status LED does not illuminate or the red protect LED lights up, your installation is wrong! Immediately turn off your head-unit and carefully re-check all installation and wiring steps!

CROSSOVER ADJUSTMENTS

For the amplifier to perform best with your speakers, the electronic crossover controls must be set and adjusted accordingly

SELECTING THE OPERATION MODE

You must select and set the appropriate operation mode before you can proceed to adjust crossover frequency points. This operation mode depends on the speaker system connected to the respective amplifier channels.

- Select HPF if the speaker system is a component-, coaxial- or triaxial- type.
- Select LPF in case of a kickbass or a subwoofer system.
- Select Crossover “OFF” if your speaker system will handle a full range signal without electrical or mechanical overload.

HIGH PASS CROSSOVER FREQUENCY ADJUSTMENT

For satellite speaker systems, select the “HPF” mode, to cut off the bass content in the music signal. Highpass filtering will take away unnecessary mechanical and electrical ‘strain’ from the connected speaker systems. Depending on cone surface, voice-coil diameter and the power handling of the speakers, the following recommendations can be issued:

FRONT DOOR SATELLITE SPEAKER SYSTEM („HPF” MODE) HP CROSSOVER FREQUENCY

- **13 cm 2-way Component System:** 80 – 110Hz
- **16 cm 2- or 3-way Component System:** 50 – 80Hz

REAR SATELLITE SPEAKER SYSTEM („HPF” MODE) HP CROSSOVER FREQUENCY

- **13 cm 2-way Coaxial or Component System:** 120 – 140Hz*
- **16 cm 2-way Coaxial or Component System:** 110 – 130Hz*
- **6×9” or 7×10” Triaxial Speaker System:** 100 – 120Hz*

* When a subwoofer is part of the audio system install.

LOW PASS CROSSOVER FREQUENCY ADJUSTMENT

Select “LPF”, to activate the lowpass filter of the integrated electronic crossover. The lowpass cut-off frequency setting depends on the woofer system and each vehicle is different! As a rule of thumb, settings in between 60 to 90 Hz will usually give solid results. The woofer lowpass frequency point is mostly a matter of taste, and must therefore be ‘played by ear’.

INPUT GAIN ADJUSTMENT

To reach a maximum in dynamic response from each individual head-unit/amplifier/speaker combination, it is important to set the respective input sensitivity controls („GAIN“) of all channel pairs correctly.

Before you start, you MUST set all tone controls (Bass, Mid, Treble, Loudness etc.) and the fader on the head unit to their neutral or center positions. Now turn all input gain controls of the installed amplifiers anti-clockwise to their minimum positions and start with the channel pair that drives the subwoofer system.

SUBWOOFER CHANNEL(S)

Set the volume control of your head-unit to approximately ¾ of full volume, while playing a dynamic piece of music. Slowly increase the input gain control of the channel pair driving the subwoofer(s), by turning the GAIN control clockwise. Increase clockwise until the bass starts to distort. Reduce the main volume level of your head-unit to a medium listening level. Proceed with further channels, if applicable.

SATELLITE CHANNELS

- Slowly increase the input gain control of the channel pair driving the satellite system, by turning the GAIN control clockwise.
- Increase clockwise until you reach a good tonal balance with a slight emphasis of the bass range. Repeat for all further channels.

FINE TUNING OF ALL CROSSOVER FREQUNCY POINT SETTINGS

Finally you can attempt to fine-tune the H.P.F. and/or the LPF crossover frequencies on your amplifier setup, to reach the maximum tonal balance and channel integration of all loudspeakers connected to your car audio system.

WARRANTY

WARRANTY CONDITIONS + LIMITATIONS

Dear customer

Please read the warranty specifications below carefully.

Should your EMPHASER amplifier require warranty service, please return it to the retailer from whom it was purchased or the distributor in your country. Do not send any product to EMPHASER Inc. U.S.A. Should you have difficulty in finding an authorized EMPHASER service center, details are available from your local distributor.

This EMPHASER amplifier is fully warranted against defective materials or workmanship for a period of two years from date of purchase at retail to the original buyer. Warranty work will not be carried out unless this warranty certificate is presented fully completed with serial number, purchaser’s address, purchasing date and dealer stamp together with the original sales slip and either an authorized dealer’s confirmation of installation or authorized dealer’s installation approval!

This warranty does not cover any damage due to:

1. Unauthorized or unapproved installation, incorrect audio or mains connection(s).
2. Defects caused by exposure of the amplifier to humidity, water and organic fluids, prolonged exposure to sun

rays or excessive dirt or dust.

3. Mechanical defects caused by accidents, fall or impact.
4. Unauthorized repair attempts and modifications not explicitly authorized by the manufacturer.

This warranty is limited to the repair or the replacement of the defective product at the manufacturer's option and does not include any other form of damage, whether incidental, consequential or otherwise. The warranty does not cover any transport costs or damages caused by transport or shipment of the product. Any additional or further claims and requirements for compensation of auxiliary components that have been damaged by the amp in sequence, directly or indirectly, are strictly excluded.

WARRANTY SLIP

- **MODEL:** ❑ EA-M1 ❑ EA-M4 ❑ EA-M4x
- **Date of purchase:** …….
- **Your name:** …….
- **Your address:** …….
- **City:** …….
- **State: ZIP or Postal Code:** …….
- **Country:** …….
- **Your phone number:** …….

Dealer's address & stamp: …….

Installation Approval

- Installed by authorized dealer
- Self-installed by customer
- **Installation date:** …….
- **Inspected and approved by:** …….

Contact

EMPHASER

- Exclusive distributor for Europe
- ACR, Brändli + Vögeli AG, Bohrturmweg 1, CH-5330 Bad Zurzach, Switzerland
- **Phone:** (+41) (0)56 269 64 64,
- **Fax:** (+41) (0)56 269 64 65,
- **mail@acr.eu**,
- **www.acr.eu**

EU Legal Representative

- ACR S & V GmbH, Industriestraße 35, D-79787 Lauchringen, Germany

WWW.EMPHASER.COM

Documents / Resources

	EMPHASER EA-M1 1 Channel Amplifier [pdf] Installation Guide EA-M1 1 Channel Amplifier, EA-M1, 1 Channel Amplifier, Channel Amplifier, Amplifier

References

- ACR – Car HiFi, Multimedia und Navigation
- Manual-Hub.com - Free PDF manuals!
- User Manual