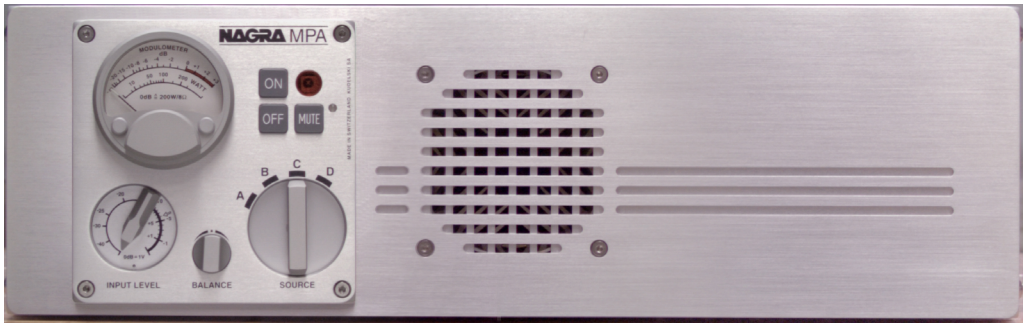
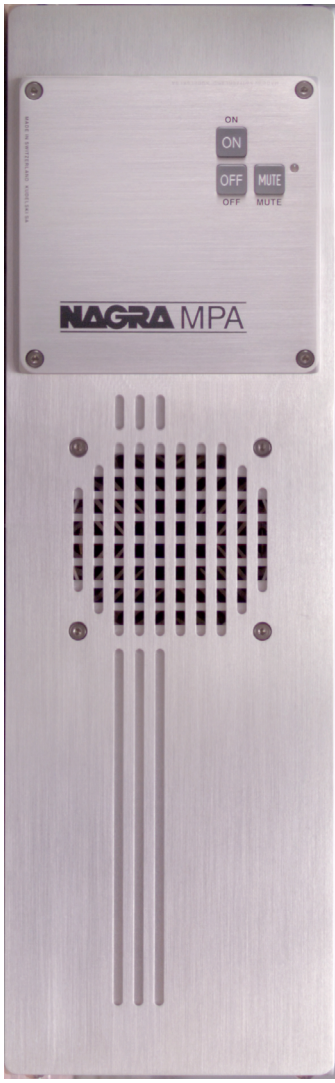
Nagra MPA Amplifier
Owner's Handbook





Nagravision S.A. Kudelski Group
CH-1033 Cheseaux, Switzerland

KSA P/N 2055 005 151

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IMPORTANT SAFETY WARNINGS

HIGH VOLTAGE

The MPA amplifier operates with extremely high internal voltages, which exceed 400V on certain parts of the circuitry.

Do not open the case of the amplifier under any circumstances. Refer any service/repair work to qualified personnel. There are no user serviceable parts inside the amplifier.

Read the user manual carefully before operating the MPA amplifier.

If you have any questions regarding the installation or operation of your MPA amplifier please contact your dealer.

NAGRAVISION S.A. DECLINES ALL RESPONSIBILITY IN THE EVENT OF AN ACCIDENT CAUSED BY THE NON-OBSERVANCE OF THESE INSTRUCTIONS OR ANY OTHER FORM OF USER NEGLIGENCE.

SAFETY

In the event that the case of the MPA is opened the AC mains power must be disconnected. However it should be remembered that the high voltage capacitors in the amplifier power supply will remain charged for several minutes, even though each of them is equipped with a parallel resistor to prevent any long-term voltage storage.

WARRANTY

NAGRAVISION certifies that this instrument was thoroughly inspected and tested prior to leaving our factory and is in accordance with the data given in the accompanying measurement protocol and test sheet.

We warrant the products of our own manufacture against any defect arising from faulty manufacture for a period of one year from the date of delivery to the user.

This limited warranty covers the repair of confirmed defects or, if necessary, the replacement of the faulty parts, excluding all other indemnities.

All freight costs, as well as customs duty and other possible charges, are at the customer's expense.

Our warranty remains valid in the event of emergency repairs or modification being made by the user. However we reserve the right to invoice the customer for any damage caused by an unqualified person or a false manoeuvre or operation by the user.

We decline any responsibility for any and all damages resulting, directly or indirectly, from the use of our products.

Other products sold by NAGRAVISION S.A. are covered by the warranty clauses of their respective manufacturers.

We decline any responsibility for damages resulting from the use of these products.

We reserve the right to modify the product, and / or the specifications without notice.

CONGRATULATIONS

You have just purchased one of the best audiophile Mosfet Power Amplifiers ever made! The Nagra MPA is designed to provide the highest performance in an ultra-high resolution audio system, especially one with competent source and speaker components.

The Nagra MPA was created by an engineering team with over 50 years of experience designing world-class products for the professional audio, national security and military businesses. Since its inception in 1951, Nagra products continue to earn a reputation for delivering the best possible sonic and mechanical performance under many very difficult operating conditions. Numerous awards have been bestowed upon Nagra for its technical innovation, excellence in design and flawless construction.

In building the MPA amplifier, significant effort has been focused on building a product that is robust, easy to use and with sonic properties that will delight even the most demanding and critical audiophile.

Thank you for being our customer and enjoy your new Nagra MPA amplifier!

ABOUT YOUR MPA

The NAGRA MPA amplification system consists of a stereo block amplifier of the finest quality which is designed for vertically or horizontally position.
The MPA is designed and hand-built entirely in Switzerland by NAGRA engineers, using components of the highest possible quality from around the world.

- Fully symmetrical (balanced) design allowing better distortion, good hum immunity, intermodulation and short rise time characteristics.
- A special PFC technique (Power Factor Corrector) is used to deliver the power to the output stages. Thanks to the PFC, the AC current consumption becomes a sine wave and not a spike wave. The audible harmonics in the AC current drain are very low. This improves the facility to use other sensitive equipment nearby the MPA.
- Built-in Meter to indicate loudspeaker loading (only with RCMI option).
- Two pairs of loudspeaker terminals for all kind of loads.
- The MPA enclosure is CNC machined from hardened aluminium and is designed to provide many years of durable service.
- The MPA complies with all existing electrical safety and electromagnetic emission standards.

SETTING UP YOUR MPA AMPLIFIER

CONTENTS OF THE BOX

Your MPA amplifier system should contain the following:

1 x MPA amplifier stereo block unit in its own box with its serial number printed on the outside.

1 x Box containing the following:

1 x Set of Measurement protocol
2 x Set of feet (1 for vertical mounting, 1 for horizontal mounting with screws
2 x Adapter connectors XLR male to RCA
1 x Allen key (2.5)
1 x AC Mains power cable without plug
1 x Kit of spare fuses
1 x Owners handbook (English edition)

Please verify that everything is present before continuing. The serial number of the MPA amplifier unit is marked on the rear panel and in the test protocol and this serial number must correspond to the number on the outside of the box.

SELECTING THE VERTICAL OR HORIZONTAL POSITION

The MPA comes standard in a horizontal position. To change it to a vertical position, proceed as follows:
Remove the 4 Allen screws on the front panel. Pay attention to hold the panel in place when removing the last screw. Carefully remove the panel and turn it 90 degrees counter-clockwise. Put back the panel and replace the 4 Allen screws.

FITTING THE FEET

Horizontal position: Turn the MPA upside down.

Locate the 3 holes for the feed. Put the cones in place, fit the little rubber feet and lock the assembly using the 3 screws. (Allen key 2.5)

Vertical position: Turn the MPA upside down. Locate the four screws that need to be removed (Allen key 2.5).

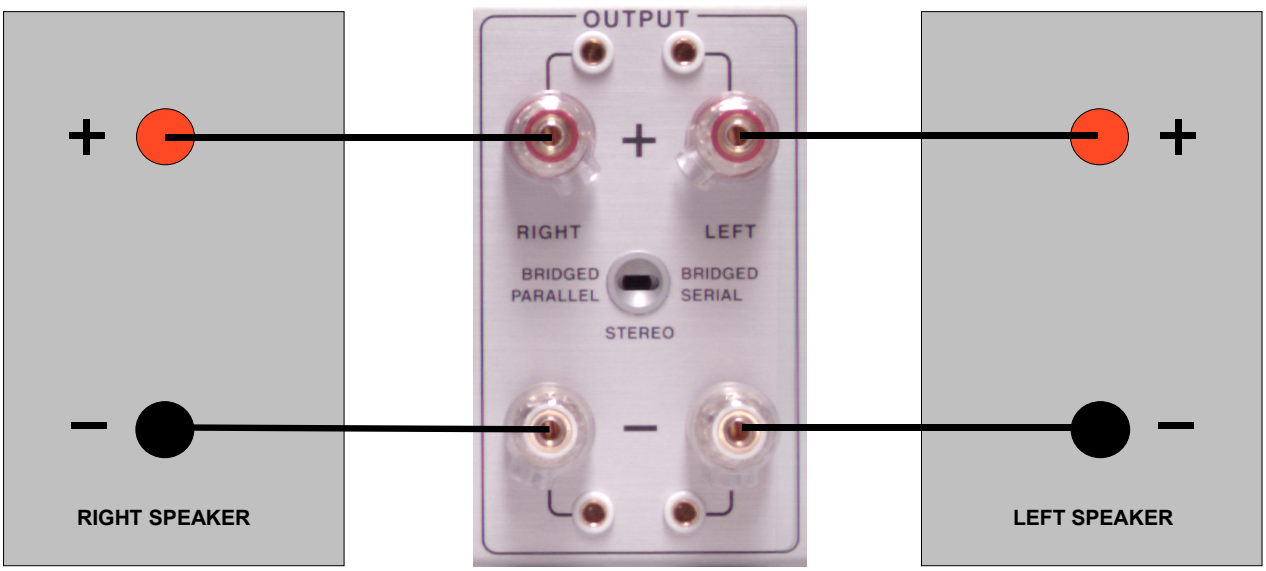
Put the two long feet in place and lock them with the four Allen screws provided.

CONNECTING THE MPA TO THE SOURCE PREAMPLIFIER

Connect the source preamplifier to the 3-pole XLR balanced input connectors left and right channel (“A” if no RCMI option) on the rear panel of the MPA. If necessary, use the XLR/RCA adapter connector supplied to connect an unbalanced RCA lead to the XLR connector.

CONNECTING THE LOUDSPEAKERS

On the rear of the MPA stereo block there are two pairs of gold plated loudspeaker terminals. The loudspeaker cables should be connected as shown below.

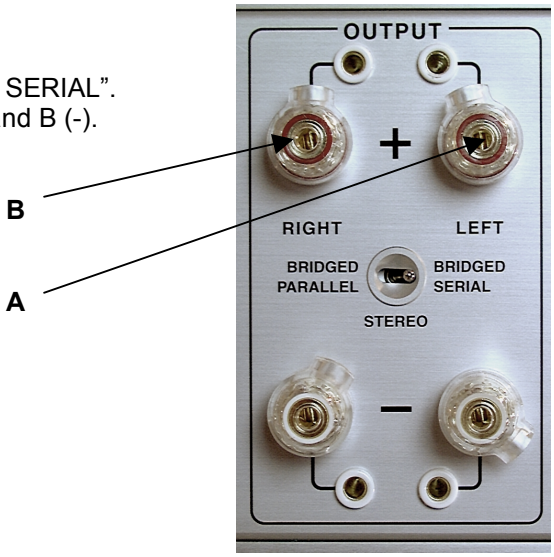


BRIDGING POSSIBILITY.

The MPA can be used as a mono power amplifier. Two ways are existing to connect the single loudspeaker. Both amplifier channels can be connected in serial or parallel way.

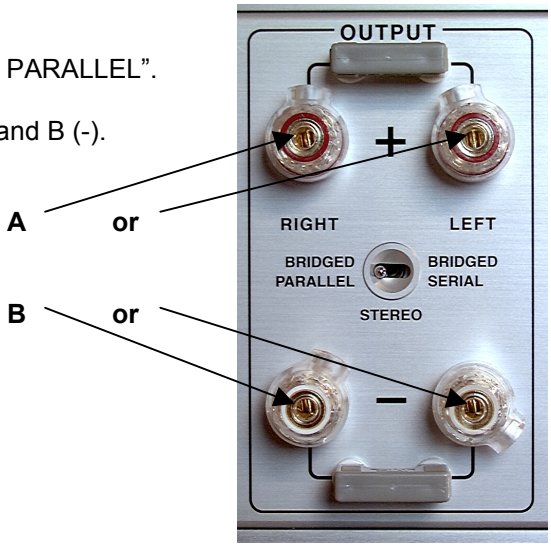
Serial

Put the stereo switch to the position “BRIDGED SERIAL”.
The speaker can be connected between A (+) and B (-).



Parallel

Put the stereo switch to the position “BRIDGED PARALLEL”.
Install the two grey jumpers.
The speaker can be connected between A (+) and B (-).



Stereo

When the bridging is not used, the switch must be in the middle position, called **STEREO**

CONNECTING THE AC MAINS POWER.

Verify that the correct fuse values are installed in the fuse holder of the AC mains supply, before connecting the power cable.

For 94V – 135V operation two 10A fuses should be installed
For 186V – 264V operation two 5A fuses should be installed.

If the supplied AC mains power cables delivered with the amplifier is not equipped with a plug, then please fit an appropriate plug and connect to the A.C mains supply.

SWITCHING ON.

Put the main power switch on the rear panel to “ON”.
Wait 20 seconds for proper setup.
Push the “ON” button on the front of the MPA.

ATTENTION: When switching on the MPA, an electro-mechanical noise is emitted. This is due to the start of the two PFC’s inside the machine.

SWITCHING OFF.

Always switch “OFF” the MPA by the front “OFF” button. Switching “OFF” by the main switch on the back panel will created a loud “pop” in the loudspeakers and the internal capacitors will stay charged.

FRONT PANEL

WITHOUT RCMI OPTION

ON: Power on button.
OFF: Power off button.
MUTE: Mutes the MPA. When muted, press the "ON" button to activate the MPA.
LED: The led is green when the MPA is switched "ON". The led turns red when the MPA is in the "MUTE" mode.

Lower LED: Turns green when the MPA is ON.

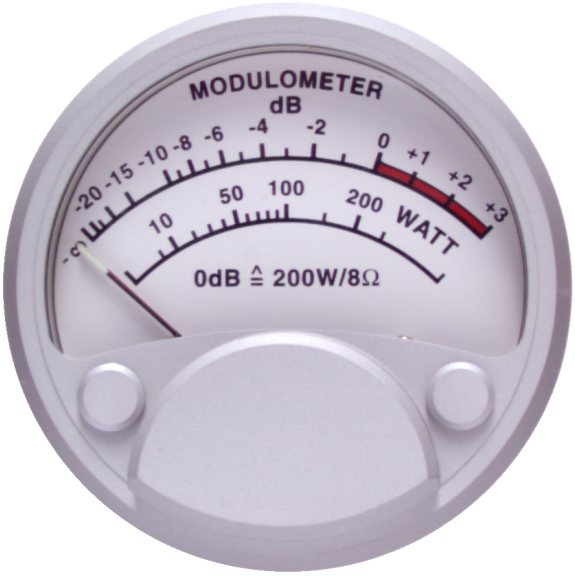
WITH RCMI OPTION

ON: Power on button.
OFF: Power off button.
MUTE: Mutes the MPA. When muted, press the "ON" button to activate the MPA.
LED: The led is green when the MPA is switched "ON". The led turns red when the MPA is in the "MUTE" mode.

Backlight on modulometer: Turns on to indicate that the MPA is on.

RED WINDOW: Infra-red receiver.
SOURCE SELECTOR: Permits to select the different line inputs.
BALANCE: Permits to adjust in a range of 6 dB, the output level between left & right.
INPUT LEVEL: The external scale is calibrated from –50 dB to 0 dB and indicates the absolute attenuation obtained with the potentiometer.
The internal scale (fat scale) is calibrated from +12 dB to 0 dB and shows the input level relative to 1 V when the modulometer indicates 0 dB. The same fat scale area also indicates the allowed region in which the potentiometer must be set to operate with 0 dB on the modulometer. If it is needed to set the potentiometer outside the fat scale range to obtain 0 dB on the modulometer, the input stages of the MPA could be saturated. In this case, to adapt the input level, external passive attenuators should be installed.
The arrow indicates the best position if the MPA is driven by the NAGRA PLP or NAGRA PLL pre amplifier.

THE POWER METER (RCMI option only)



The power meter has a ballistic identical to that of a modulometer. It shows the peak value of the signal.
The upper scale shows the input level up to +3 dB
The lower scale shows the output power up to 250 W
0 dB indication corresponds to 200 W if the speakers are 8 Ohm.

REAR PANEL

INPUT CONNECTORS
For an MPA without RCMI option, only the input “A” can be used, “B,C & D” are not connected.

For an MPA with RCMI option all four inputs can be selected from the front panel.

If the MPA is used in the bridged mode, only the left inputs can be used.

All inputs are balanced and floating. Explanations for the correct use of this connector are covered under the SIGNAL INPUT section.

LOUDSPEAKER TERMINALS
The loudspeaker terminals can be orientated to adapt the angle for the loudspeaker cables. The terminals are electrically isolated, this to be conform to the electrical security regulations. Maximum cable diameter to fit into the terminals is 4.5 mm.

POWER INPUT / FUSE / MAIN SWITCH
This moulded unit houses not only the main power switch, but also the AC mains fuses in the holder on the left side.
For 94V – 135 V operation two 10A fuses should be installed
For 186V – 264 V operation two 5A fuses should be installed

GROUND
A ground terminal is available in the lower left corner.

REMOTE CONTROL

Buttons 1 to 6

This remote control can be used as a common control for different Nagra products. The buttons 1 to 6 permit to select up to 6 Nagra products equipped with the remote control receiver. Dedicating a selected product number to the MPA is made by a jumper selection inside the machine.

Buttons A to D

Permit to select on the MPA the different line inputs. Buttons E & F are not used for the MPA.
The main power switch at the backside of the MPA must be in the ON position.
It is not possible to select an other line input if the MPA is muted.

ON & OFF

When the ON button is pressed for the first time, the MPA is powered, the led (red or green) turns green and the backlight of the modulometer switches on.
When the OFF button is pressed, the MPA goes back to standby mode and the backlight of the modulometer switches off. If the MPA was not muted before switching off, the led stays green, if the MPA was muted before switching off, the led stays red.
In the OFF status, only the remote receiver stays powered.

Mute

Pressing once on the mute button, the MPA output is muted. Pressing once the ON button, the outputs are enabled. When the MPA is muted, the led turns red. If not muted, it turns green.

Up & Down arrow keys

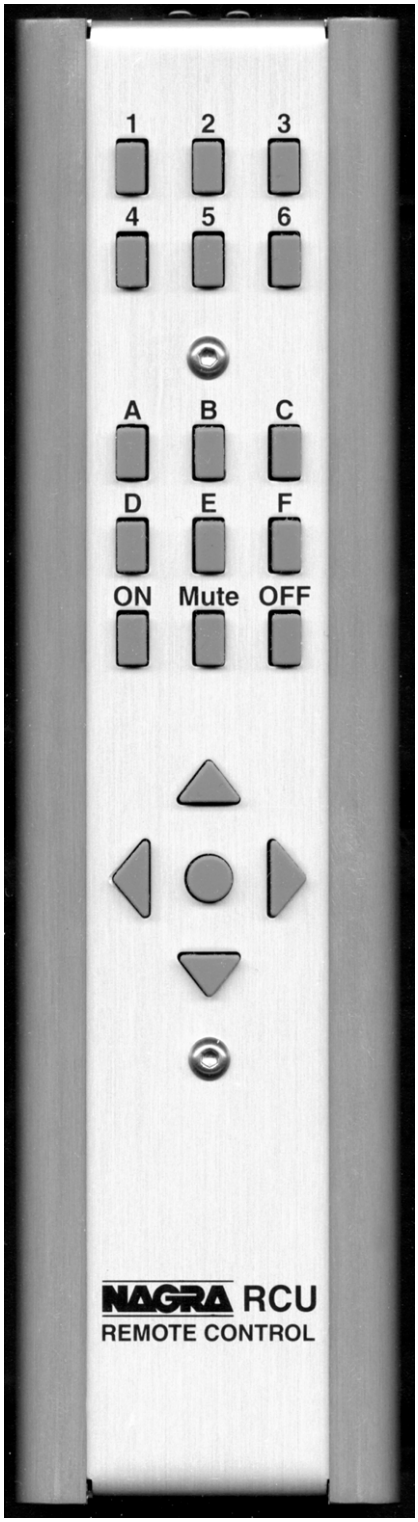
Adjusts the Volume potentiometer. When continuously pressing those buttons, the volume will increase or decrease over a 1/3 of the full range. To continue the adjustment, release and press again the same button.

Left & Right arrow keys

Adjust the Balance potentiometer.

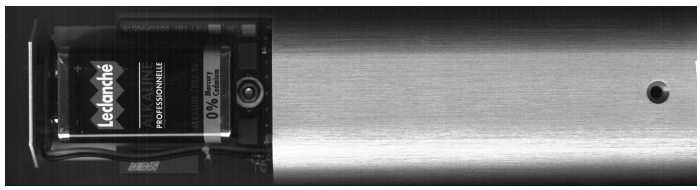
Center button

Not used with the MPA.



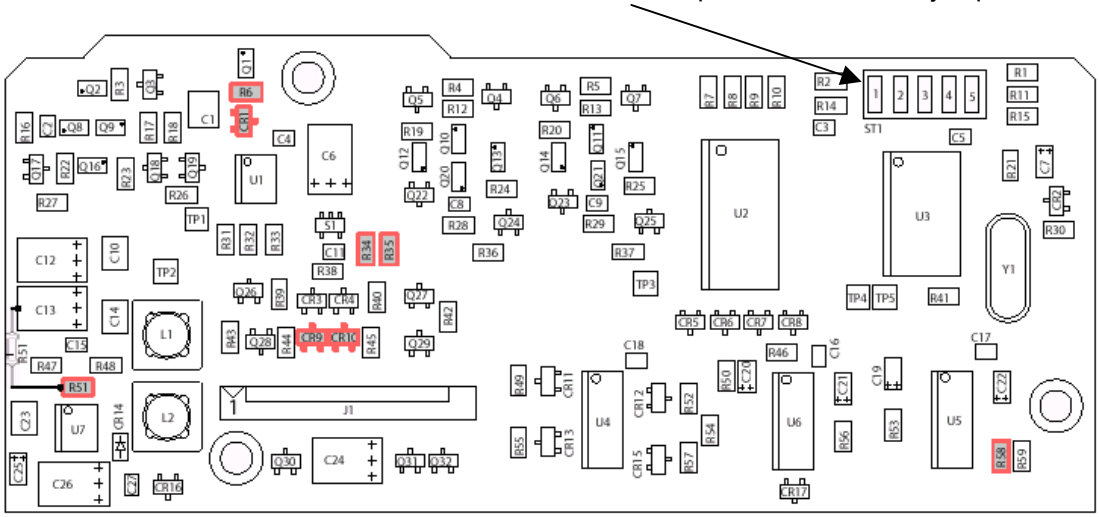
Battery installation

Turn over the remote control and remove the screw (screwdriver No 3).
Slide the housing from the front panel.
Install the 9V battery.
Reinstall the housing and lock the screw.

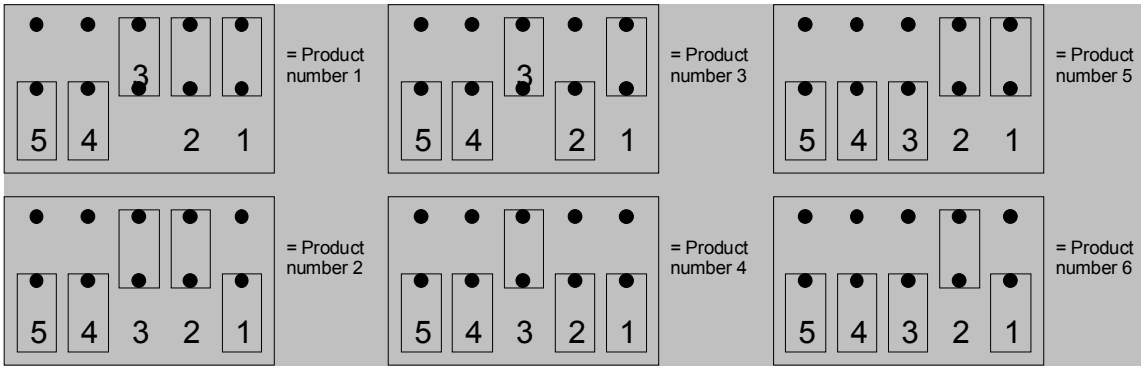


Product number for the remote receiver

Remove the front panel as described in “SETTING UP YOUR MPA AMPLIFIER”.
The remote receiver board sits at the backside of the front panel. Locate the 5 jumpers “ST1”.



The MPA is factory set to work as product number “1”
The following positions can be set:



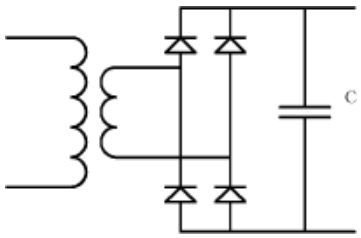
POWER SUPPLY

Starting from the 1st of January 2000, all equipment connected to public AC mains power networks and incapable of drawing less than 40 W, MUST be equipped with the aforementioned mysterious PFC.

Well, our “new-born” is very power thirsty; in fact he needs no less than 800 Watts in order to express himself with full thrust!

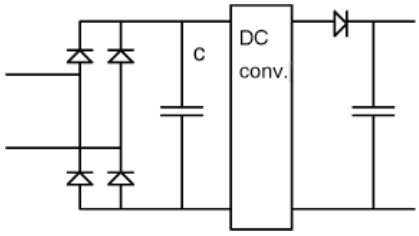
The PFC (Power Factor Corrector) is an indispensable accessory allowing all electrical equipment to behave, with respect to the AC-power network, as a pure resistance and hence draw a purely sinusoidal current.

What actually happens in a piece of modern equipment, such as an amplifier or a PC? Two cases are possible, both of which will cause the same problem.



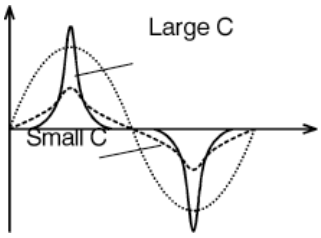
In the first case, figure 1 shows a pre-historic way of obtaining the constant voltage needed to power a piece of electronic equipment: The AC-mains feed a power transformer; a diode bridge rectifies the voltage of the secondary, which is then filtered by a capacitor, which gets larger as the quality of the equipment’s circuits increases.

Figure 1



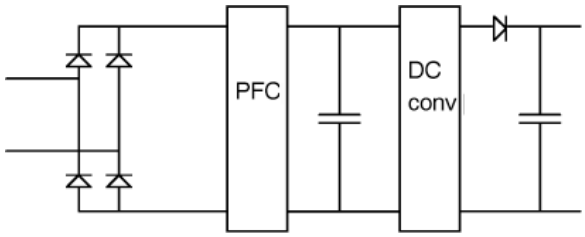
The more modern preferable way to obtain a continuous voltage is first to rectify the AC-supply directly, and then to filter it. From this point a DC/DC converter is used to bring the voltage to the required stable level with a minimum of loss. (Fig2.)

Figure 2



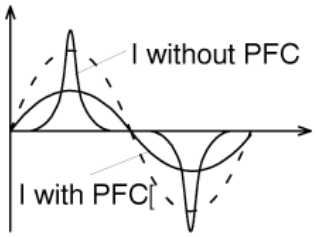
Both of the above methods have the inconvenience of drawing a current that is heavily pulsed, with current peaks increasing dramatically, as the necessary filter capacitance becomes larger. (fig 3)

Figure 3



Referring first to figure 4, if we now install a PFC, a kind of highly specialised DC/DC converter dedicated for the purpose, the current consumed will be sinusoidal as shown in figure 5.

Figure 4



The conclusion is evident: with a PFC, peak currents are drastically lowered.
But, I hear you say, apart from the additional cost incurred by such a system, and the satisfaction of conforming to the new regulations, how is the end-user going to be affected?

Figure 5

A typical example will help explain more clearly all the advantages of such a configuration:

A stereo power amplifier delivering 100 Watts on each of its outputs, in class AB mode, consumes about 350 Watts from the AC-supply. Using a typical 110V mains source, this equates to 3.18 Amperes-RMS or 4.5 Amperes-peak being drawn from the wall socket…**if the amplifier behaves as a pure resistance**.

Many high quality power amplifiers available today operate in the region shown in Figure 3, “With a large filtering capacitance”.
Under these conditions, the peak current reached during each half-period of the AC-power cycle is plus and minus 50 Amperes! This current passes through every socket, plug, connection and cable feeding the power supply. It won’t be long before they overheat and make doubtful connections. Perhaps the insulation will degrade and in some cases catch fire.

In addition, these highly “spiked” currents are wonderful generators of nasty harmonics that could well disturb other equipment nearby.

In the USA (and other 110V countries) in order to avoid these risks, users of power thirsty equipment often are forced to install dedicated 220V branch circuits from the main local transformer panel.

The PFC helps to resolve this costly inconvenience, and even if it has a repercussion on the equipment price, it is easy to understand its advantages.

The MPA is equipped with one PFC per channel. Each PFC supports up to 500 W.

The MPA is fitted with two AC mains power fuses which are installed in the holder to the right of the AC mains power switch on the rear panel. As a security measure, two fuses are provided, one is on the Live line of the supply and the second is in the Neutral line. The correct fuses, according to the AC mains supply voltage available, must be installed in the fuse holder before the MPA is used.

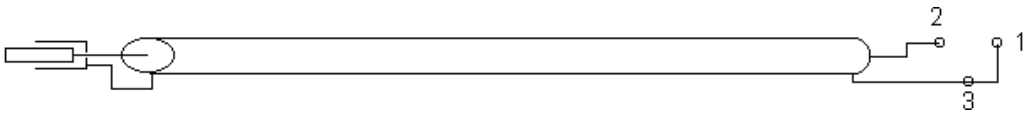
For 94 V– 135V operation two 10A fuses should be installed
For 186V – 264V operation two 5A fuses should be installed

SIGNAL INPUT

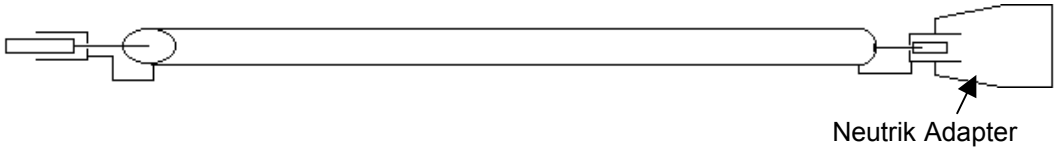
The MPA is totally balanced. A High quality balanced input stage is a perfectly straightforward development, and it offers better isolation from noise than an unbalanced input. This is especially true when the input source is not located close to the amplifier and therefore the cables on the inputs are long, and when in presence of a ground loop with the associated current circulation.

This situation naturally causes concern for those who have never come across such an input on an amplifier, questions such as “How do I connect my Preamplifier?” arise.

There are principally two different possibilities: the first is to simply make a short circuit connection between pins 1 and 3 inside the three pin XLR connector which plugs into the MPA, and the signal is then placed on pin 2 and the screen to the bridged 1+3. Adapters which do this are readily available on the market (Neutrik for example) and such connectors have a female RCA connector on one end and a male XLR on the other end.



or



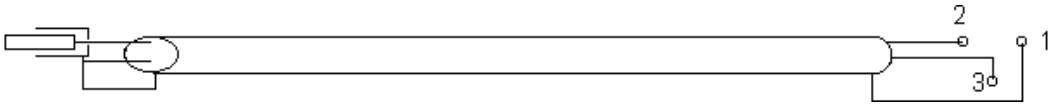
If hum difficulties arise, please refer to the manual of the PL-P for instructions on AC Mains supply wiring possibilities.

If hum still persists on the loudspeakers when the PL-P is connected to the MPA, then one of the following possible connections could be used. Each of the possibilities exploit the balanced input facilities of the amplifier. In this case we would get better electrostatic and magnetic cancellation, and we will break the eventual current loop.

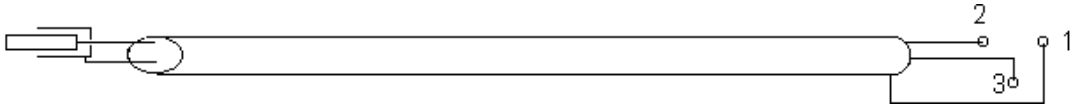
Remember that conventionally a balanced XLR connector is wired as:

Pin 1 = Ground
Pin 2 = High (or signal positive)
Pin 3 = Low (or signal negative)

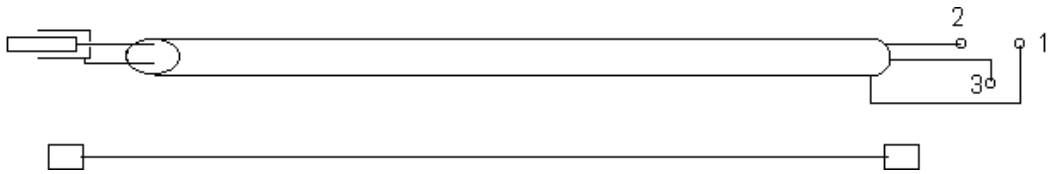
Solution 1: Connect an RCA connector for use in a balanced environment



Solution 2: Floating ground



Solution 3: Floating ground on signal cable, chassis connected via a separate wire to the chassis ground.



The input sensitivity (or level) is 1V for 200W. This level was chosen to be compatible with as many other manufacturers as possible.

OUTPUT STAGE

The MPA is equipped with a class AB push-pull output up to 250W maximum power per channel. The output stage uses low level of feedback including static and dynamic limitations. The advantage of such an output stage allows the MPA to accommodate a wide range of loads (capacitive, inductive, or varying resistance) without the risk of oscillation or intermodulation.

As an example, “WATT Puppy” speakers from the WILSON Audio specialities deliver an excellent performance despite their impedance variation between 1 Ohm and 16 Ohms. Even when connected to Quad electrostatic speakers the MPA is capable of delivering remarkable music reproduction.

A short circuit on the loudspeaker terminals or disconnection of the loudspeakers for a short duration will not damage the MPA in any way.

PROTECTIONS

Static limitation on the output stage starts at a current drain of 17 App (Peak to Peak).

Dynamic limitation on the output stage starts at a current drain of 25 App after approximately 150 ms.

If during a period of minimum 1 second a DC current of more than 200 mV appears at the output, the output stages are powered off and the protection led switches on.
This happens also if the MPA is switched on without the speakers connected.

In one of the above cases, switch off the MPA by the main switch at the backside and wait for approximately 30 seconds until the internal led is turned off. Verify that the speakers are correctly connected and switch on the MPA. If the led lights up again, contact your nearest dealer.

The same phenomenon can also happen if the main AC has a micro interruption. In this case repeat the previous paragraph.

The internal red led can be seen through the holes of the deck plate towards the front right side of the MPA.

CHASSIS

Opening the chassis of the MPA is reserved strictly for qualified specialist engineers. Inside, all the smoothing capacitors are designed to completely discharge in 15 minutes after the AC mains power cable has been disconnected.

Attention: Do never install the MPA without feet. In this case the cooling will not work correctly and the amplifier could be damaged due to high internal temperature.

TECHNICAL SPECIFICATIONS

AUDIO PERFORMANCE

Input sensitivity:	1V for 200 W
Input Impedance:	>100 kOhms
Output Power:	Max 250 W on 8 Ohms

POWERING

94Vac to 135Vac & 186Vac to 264Vac

Maximum power input 830 W

PHYSICAL ASPECTS

Dimensions (L x W x H) =	410mm x 135mm x 435mm (16¼" x 5½" x 17¼")
Weight:	25 kg (55.5 lbs.)

For additional specifications refer to the individual test protocol of the amplifier.

DECLARATION DE CONFORMITE
DECLARATION OF CONFORMITY

CE

FABRICANT: NAGRAVISION S.A. KUDELSKI GROUP, 1033 Cheseaux SUISSE

MANUFACTURER: NAGRAVISION S.A. KUDELSKI GROU*P, 1033 Cheseaux, SWITZERLAND*

APPAREIL : MPA or MPA & RCU

MODEL: *MPA or MPA & RCU*

NORMES APPLICABLES :
APPLICABLE NORMS:

Champ électromagnétique rayonné EN 55022 Cl. B

Radiated electromagnetic field EN 55022 Cl. B

Perturbations conduites sur secteur EN 55022 Cl. B

Disturbance voltage on mains terminal EN 55022 Cl. B

Immunity to electromagnetic fields EN 61000-4-3

Immunité aux décharges électrostatiques EN 61000-4-2

Immunity to electrostatic discharges EN 61000-4-2

Cheseaux 4 ème trimestre 2001

Cheseaux 4 rd quarter 2001

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