

77

INTEGRATED AMPLIFIER

INSTRUCTION BOOK

QUAD

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Please note that the 77 integrated amplifier is microprocessor controlled and a full system operating check is carried out when it is first switched on by the main power switch.

Because of this some types of brief power failure, or if it is switched off and on *very quickly*, may cause it to lock-up (controls don't function) - should this occur then just switch off and after a short delay (a few seconds) switch on again.

It is always good practice to switch off equipment before connecting or disconnecting signal leads. This will prevent unpleasant and loud noises coming from the loudspeakers and avoid the risk of damage to equipment.

This equipment is double insulated and does not need a safety earth. It is important though that any equipment connected to it is earthed according to the manufacturers instructions. This becomes more important as the number of units which are connected together increases.

Quad high fidelity equipment is designed to reproduce music at realistic levels, but there is a world of difference between the sound levels produced by a string quartet and a heavy metal group.

Please be aware that very high sound pressure levels can cause permanent hearing damage, but such levels would also cause severe annoyance to neighbours.

CE NOTICE



This product, Quad 77 Integrated Amplifier model 7710, has been designed to conform to the EU Electromagnetic Compatibility Directive 89/336/EEC and to the Low Voltage Directive 73/23/EEC and their respective amendments. The product is duly CE marked.

FCC NOTICE

USA and Canadian models

This product is intended to be used within the home as part of a home based entertainment system. It has been designed to meet the safety requirements typical of this type of product.

This equipment has been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- * Reorient or relocate the receiving antenna
- * Increase the separation between the equipment and the receiver
- * Connect the equipment into an outlet on a circuit different to that to which the receiver is attached
- * Consult the dealer or an experienced radio/TV technician for help

This Class B apparatus meets all the requirements of the Canadian Interference Causing Equipment Regulations.

Information to the user:

Alteration or modifications carried out without appropriate authorization may invalidate the user's right to operate the equipment.

INTRODUCTION

The Quad 77 integrated amplifier is one of a number of products in the 77 range. It may be operated as a high quality stand alone unit or as part of the fully integrated 77 remote control system. Three inputs are provided (source 1, source 2 and tape playback/record).

When connected as part of the 77 QUADLINK system all units are linked together by the QUADLINK data bus which handles power, signal and control functions. Any number of 77 units can be connected but the three normal inputs will still be available for non 77 range products. The 77 integrated amplifier also provides a low voltage supply for charging the batteries of the 77 remote control.

The optional 77 infrared remote control allows full operation of all units in the 77 system. It is fully interactive and transmits control commands and receives information back about all other units connected to the 77 bus. This ensures that the remote control is automatically updated when new equipment is introduced and connected - it will always be abreast of the latest technology. Operation is extremely simple. Commands for all 77 series products connected to the system are shown on an LCD display.

GUARANTEE

Your Quad 77 integrated amplifier is guaranteed against any defect in material and workmanship for a period of two years from the date of purchase. Within this period we will supply replacement parts free of charge provided that the failure was not caused by misuse, accident or negligence.

Within the UK this guarantee does not limit your statutory rights. A separate guarantee card is not supplied and your guarantee begins on the day of purchase.

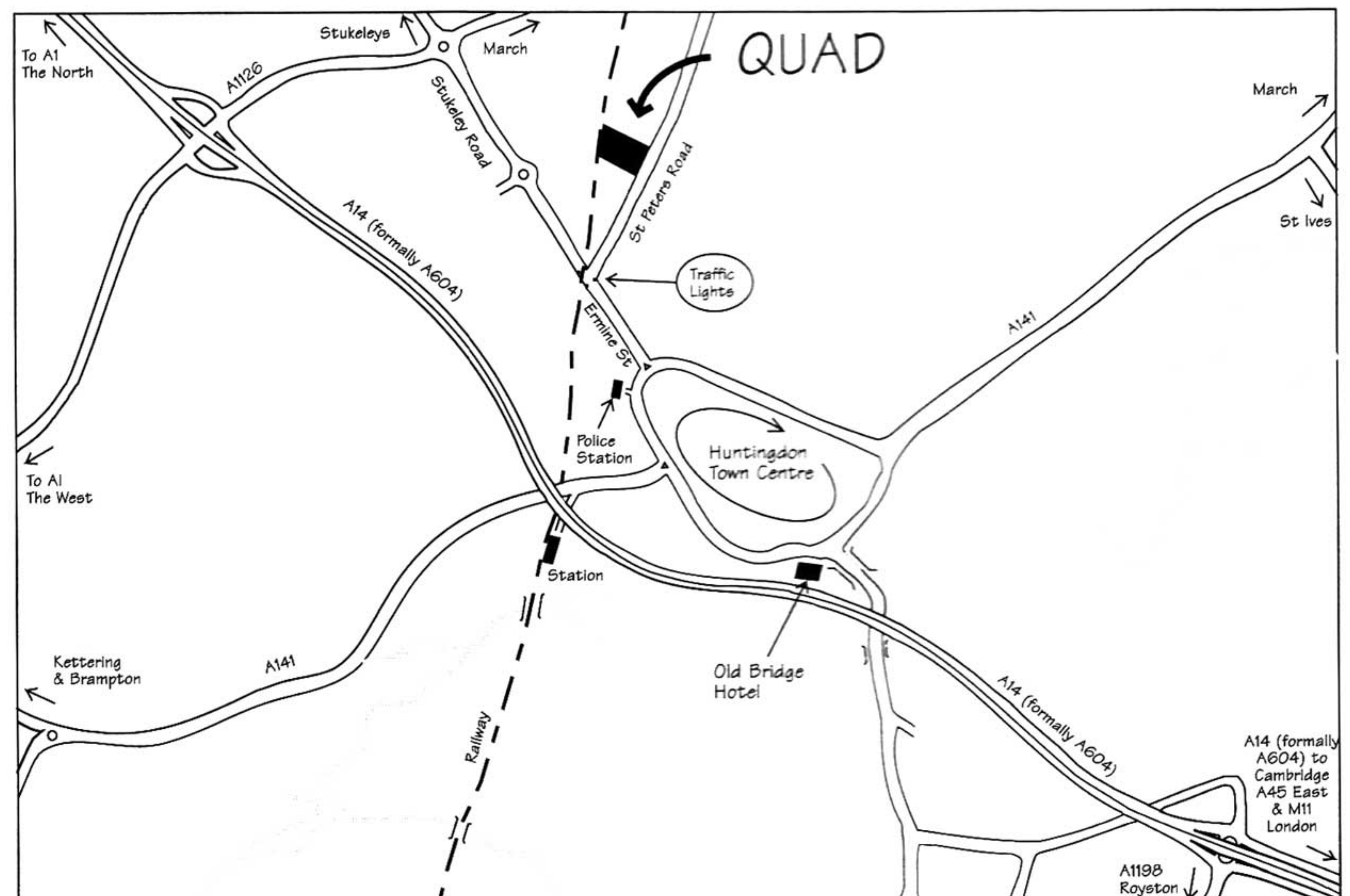
SERVICE

If your 77 integrated amplifier needs servicing return it to the supplier, the distributor for the country of purchase or Quad Electroacoustics Ltd. Enclose a brief note giving your name and address and the reason for returning it. Quad offers a same-day service from Monday to Friday except for bank holidays. Please contact us to make an appointment.

Important

The original packing should be retained in case the unit has to be returned for service.

How to Find us



INSTALLATION

Checking the AC power Supply

The 77 integrated amplifier is supplied in three versions suitable for connection to either 240-220V, 120-110V and 100V AC power supplies. Check that you have the correct version before you connect the amplifier to the AC supply. The operating voltage is clearly marked on the back. If in doubt ask your Quad dealer.

Check that the voltage range marked on the back matches the supply before you connect the unit.

Connecting to the AC power Supply

The 77 is supplied with an AC power lead with a moulded 13A 3 pin plug with 13A fuse. Do not cut off this plug or use it with its fuse cover removed. If however for any reason the plug has to be removed then it must be disposed of and ***under no circumstances*** plugged into a 13A socket outlet. A suitable plug can be fitted, as explained below:-

IMPORTANT - Fitting a mains plug.

The wires in the mains lead are coloured:

Brown = Live Blue = Neutral

The ***Brown*** wire must be connected to the terminal marked **L** or coloured **Red**. The ***Blue*** wire must be connected to the terminal marked **N** or coloured **Black**. If the lead also has a ***Green/Yellow*** wire than this must be connected to the terminal marked **E** or coloured **Green** or **Green/Yellow**.

Note

When a fused 13A plug is used a 13A fuse (ASTA approved to BS1362) will be adequate for a typical Quad system. For other types of plug, then fit a 13A fuse either in the plug, or adaptor, or at the distribution board. If in doubt consult a qualified electrician.

Positioning the Amplifier

This is not critical and it may be operated free standing or stacked. Note that the amplifier can deliver substantial amounts of power. The diecast housing will provide more than adequate cooling for normal domestic purposes but if the amplifier is played at very high volume levels for extended periods then adequate ventilation must be provided - the case will become quite warm to the touch. Do not place audio or video cassettes on top of the amplifier because the magnetic fields produced by its mains transformer may affect the quality of their recordings.

Loudspeaker Connection

The Quad 77 integrated amplifier is fitted with standard **binding posts**. It is unconditionally stable and can be used with any type of loudspeaker cable. For optimum performance it is necessary to ensure that the resistance of the cable is small relative to the loudspeaker impedance. QUAD loudspeaker cable gives the best results. Each loudspeaker should be connected to the appropriate output terminals so that the two pairs of wires are connected in the same way, to ensure that the speakers are correctly phased. The output terminals are colour coded to facilitate this. Should there be any doubt the phasing can be checked experimentally. See **Loudspeaker Phasing**, page 9 for information on how to check for correct phasing.

Note In special cases where the loudspeakers also require an energising supply follow the instructions for the loudspeakers.

Each loudspeaker should be capable of handling the **full output** of the amplifier. The outputs must not be connected in parallel or in **series** to produce a single channel amplifier.

Take care if heavier than normal grade **loudspeaker cables** are used as these can place undue strain on the output terminals.

SIGNAL CONNECTIONS

All input connections are clearly marked on the **back** of the amplifier. Phono sockets are used for non 77 equipment inputs and outputs.

Source 1 Auxiliary input for non Quad 77 equipment such as television tuner, video recorder etc. The signal cable should be connected to the **source 1 L** and **R** sockets.

Source 2 A second auxiliary input for non Quad 77 equipment. The signal cable should be connected to the **source 2 L** and **R** sockets.

Tape Record and playback connections for tape or cassette recorders. Record and replay levels have been chosen to match most recorders currently available. The signal playback cable should be connected to the **tape in L** and **R** sockets and the record cable to the **tape out L** and **R** sockets. Off tape monitoring is provided from these sockets.

OPERATION AS A STAND ALONE INTEGRATED AMPLIFIER

Main On and Off Switch

Press the **on/off switch** at the rear of the 77 integrated amplifier. This has a rocker action, press the bottom to switch it on and the top to switch it off.

In normal use the rear mounted switch is left switched on and the 77 turned off and on using the **standby button** on the front panel, see full details for **Standby** operation in the following section.

Switching on/off from Standby

Press the 77 amplifier **standby button** to resume operation with the same input and control settings as when standby was last selected. When you have finished listening simply press the **standby button** again and the 77 will switch to the standby mode indicated by a **red LED** in the standby button.

Note

The 77 can safely be left in the standby mode for long periods, but you may prefer to switch it off when you go away on holiday.

Input Selection

Press the button for the input required; **source 1**, **source 2** or **tape**. The source selected will be indicated by a **red LED** being lit in the button pressed.

Once **tape** has been selected the **tape button** has to be pressed a second time, to deselect the tape monitor function, before any other input source can be played through the loudspeakers.

Note

When tape is selected both a source button **red LED** and the tape button **red LED** will be lit at the same time - this is to indicate source to tape monitoring.

Volume

Press **vol** ◀ (down) or **vol** ▶ (up) until the required volume is obtained. The volume level is shown by the number lit in the display from **00** to **32**, the larger the number the higher the volume setting.

Balance

Adjust the balance for correct interchannel sound balance. To adjust the balance press the **bal button**, the **red LED** will light and the display will show **0** (central balance). Then press either **vol** ◀ (shift to the left) or **vol** ▶ (shift to the right) until the required setting is reached - the displayed number will change in steps of one from **0** to **9** (for each channel) to show the difference between channel levels. When the desired balance setting is reached press the **bal button** again - the display will change to show the volume level set.

Note

Each press of a button will change the volume/balance by one step - If either button is held down stepping will continue until it is released.

REMOTE CONTROL OPERATION IN 77 QUADLINK SYSTEM

When connected as part of a 77 QUADLINK system the 77 units are connected via a multiway bus cable (separate power and signal cables are not required). All 77 units connected may then be operated by the Quad 77 infrared remote control - its functions and LCD display being automatically updated to match the units connected. Full operation is covered by the 77 remote control instruction book and the separate book supplied with each 77 unit.

TAPE RECORDING

Recording

Select the source to be recorded (**source 1** or **source 2**) which will be heard through the loudspeakers as well as being fed to the **tape out** sockets. Recording will commence as soon as the **recorder** is started. Monitoring is achieved by pressing **tape**, and the **tape LED** will be also be lit. To return to listening to the source direct, press **tape** again, the **tape LED** will go out.

Monitoring

Off tape monitoring is automatically provided from any input, when **tape** is selected, via a recorder connected to the **tape** sockets.

CONNECTING OTHER 77 UNITS TO THE 77 BUS

When connected as part of the 77 QUADLINK system all units are linked together via the QUADLINK data bus which handles power, signal and control functions. Each unit incorporates a QUADLINK data bus connecting socket and is supplied with a special cable for linking the units together - daisy chained.

Only the correct interconnecting cables bearing the QUADLINK should be used - a range of different lengths are available. Do not put sharp bends in the QUADLINK cable.

AMPLIFIER PROTECTION

The 77 amplifier is fully protected against gross overload and short-circuited outputs and will automatically shut down if it is overloaded or gets too hot - this is indicated by the **standby button LED** flashing (**red** for overload and **orange** for overheating) and the output being muted. For overload conditions this is for about 30 seconds, after this time it will resume normal operation but if the overload persists then the process will be repeated - in this case the amplifier should be switched off and the cause of the problem investigated. When overheated, the shutdown can be from about 5 seconds, or an indefinite period, depending on the degree of overheating and the time it takes for it to cool down. If the amplifier is played at very high volume levels for extended periods make sure that it has adequate ventilation.

LOUDSPEAKER PROTECTION

The loudspeaker manufacturer will usually state a maximum recommended amplifier power output, but as the maximum safe power for most loudspeakers is time and frequency dependent it is difficult to define precisely for a musical signal. Some manufacturers will permit their loudspeakers to be used with amplifiers exceeding the quoted handling provided certain precautions are observed. This can sometimes be an advantage in enabling short duration peaks to be handled without overload. The advice of the loudspeaker manufacturer should always be obtained if in any doubt.

QUAD ELECTROSTATIC LOUDSPEAKERS

The 77 integrated amplifier is fully compatible with the Quad ESL63 electrostatic loudspeaker. It can be used with the earlier model ESL provided the ESL protection circuit (type QELCLPK) is fitted inside each loudspeaker - without this protection circuit they could be damaged by signal peaks - please contact Quad Electroacoustics Ltd for full details.

LOUDSPEAKER PHASING

If there is any doubt about the way the loudspeakers are connected their phasing can easily be checked by playing a mono source when the sound should appear to emanate from a point midway between the two loudspeakers. If this is indefinite then the connections to one of the loudspeakers should be reversed. When correctly connected the loudspeakers will give a definite centre sound source with more full bodied tenor and bass registers.

HEADPHONES

Headphones will normally be used in place of loudspeakers and there are a number of suitable switch units available designed to enable the loudspeakers to be switched off when the headphones are plugged in. Most of these incorporate a simple attenuator circuit to permit operation at normal volume control settings.

Electrostatic or other types of headphones requiring a high level input should be operated in accordance with the manufacturers instructions.

CHANGING INPUT SENSITIVITIES

The input sensitivities for **source 1**, **source 2** and **tape** are set at the factory for 300 mV which should match most current equipment. These sensitivities can be changed separately, using the 77 remote control, to 100 mV or 775 mV if preferred. To change the setting carry out the following steps for each input separately.

Select the input you want to change by pressing the **button** (on the 77 remote) next to the **required source** - the display will change to show the functions available for the source selected. Press the **sens button** - the display will show the sensitivities available (**100; 300; 775**) the programmed level will be indicated by an '▲' next to it (eg **300 ▲**) to change the setting just press the button next to the level required and the '▲' will move next to the new chosen setting. Now press **up** to return to the source menu.

PREAMPLIFIER OUT

The preamplifier output of the 77 integrated amplifier is 775 mV which is suitable for feeding most power amplifiers. Phono sockets are fitted and an appropriate cable should be used to make connection to the power amplifier signal input.

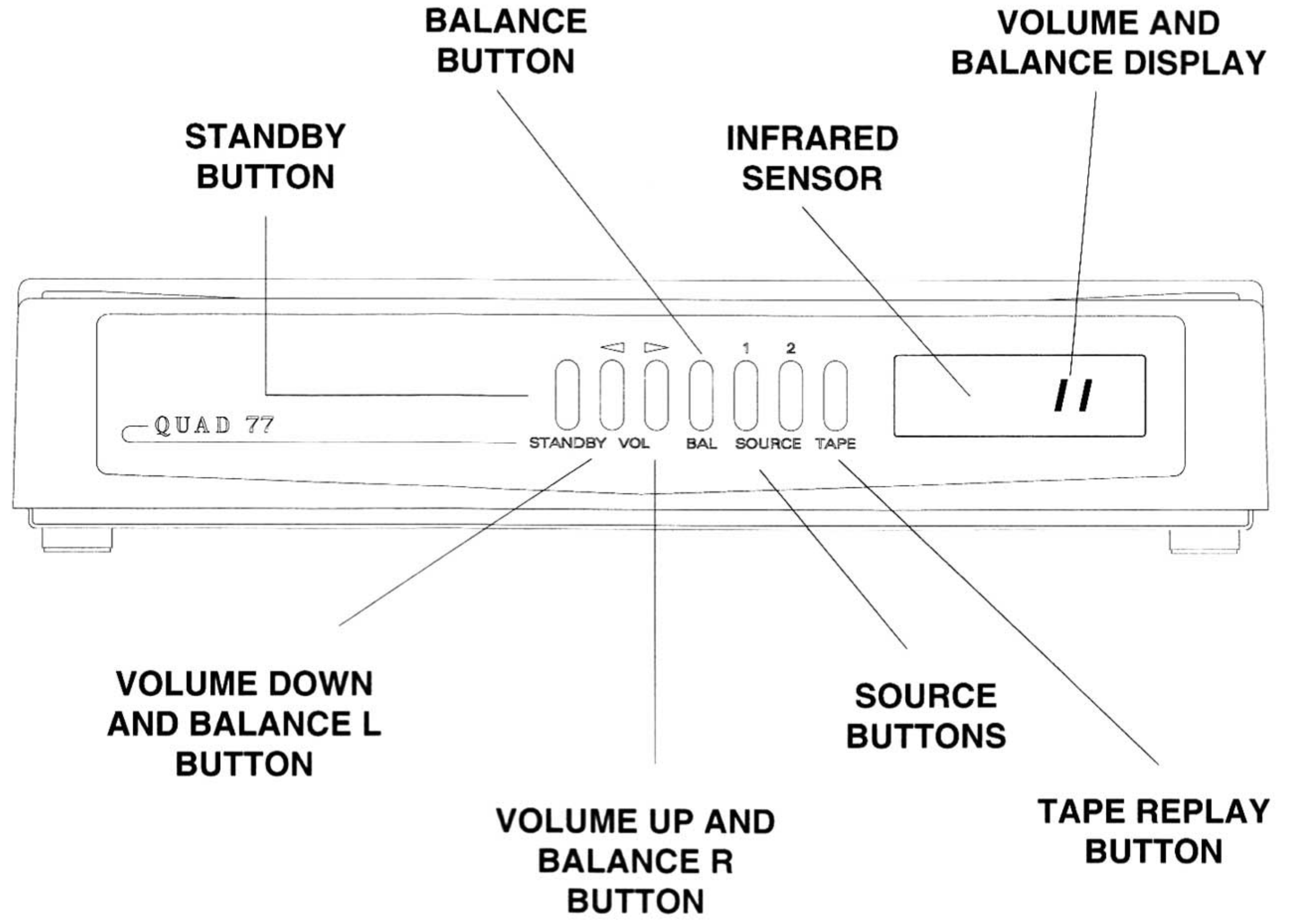
CHARGING OUTPUT

An output for charging the batteries in the 77 remote control unit. Not to be used for any other purpose or for feeding other types of equipment.

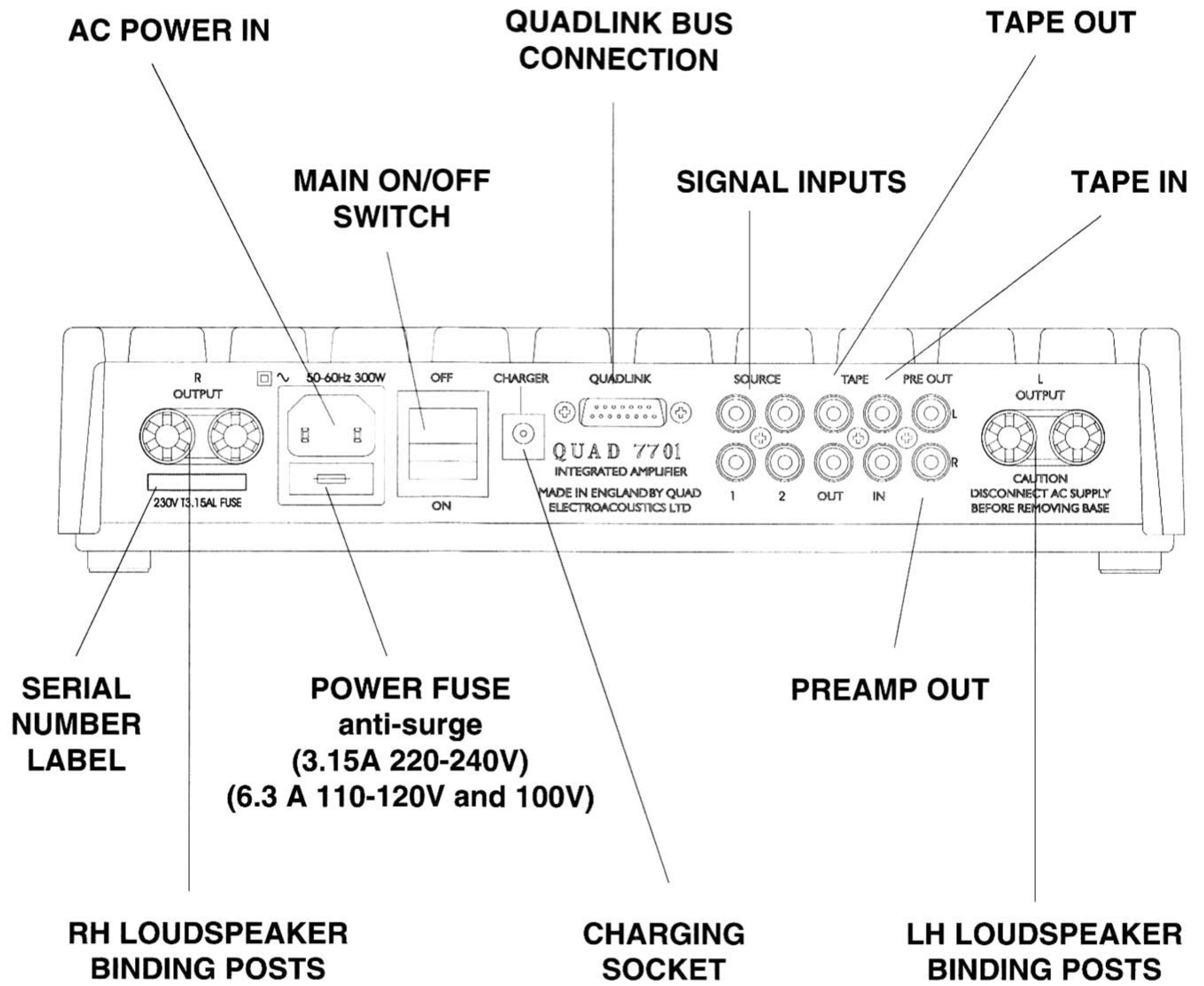
MAINTENANCE

The case can be cleaned with a soft brush or, for more stubborn marks, a slightly moistened lint-free cloth. In this case remove the mains plug from the supply socket. Do not use cleaning agents, solvents or abrasives.

FRONT VIEW



REAR VIEW



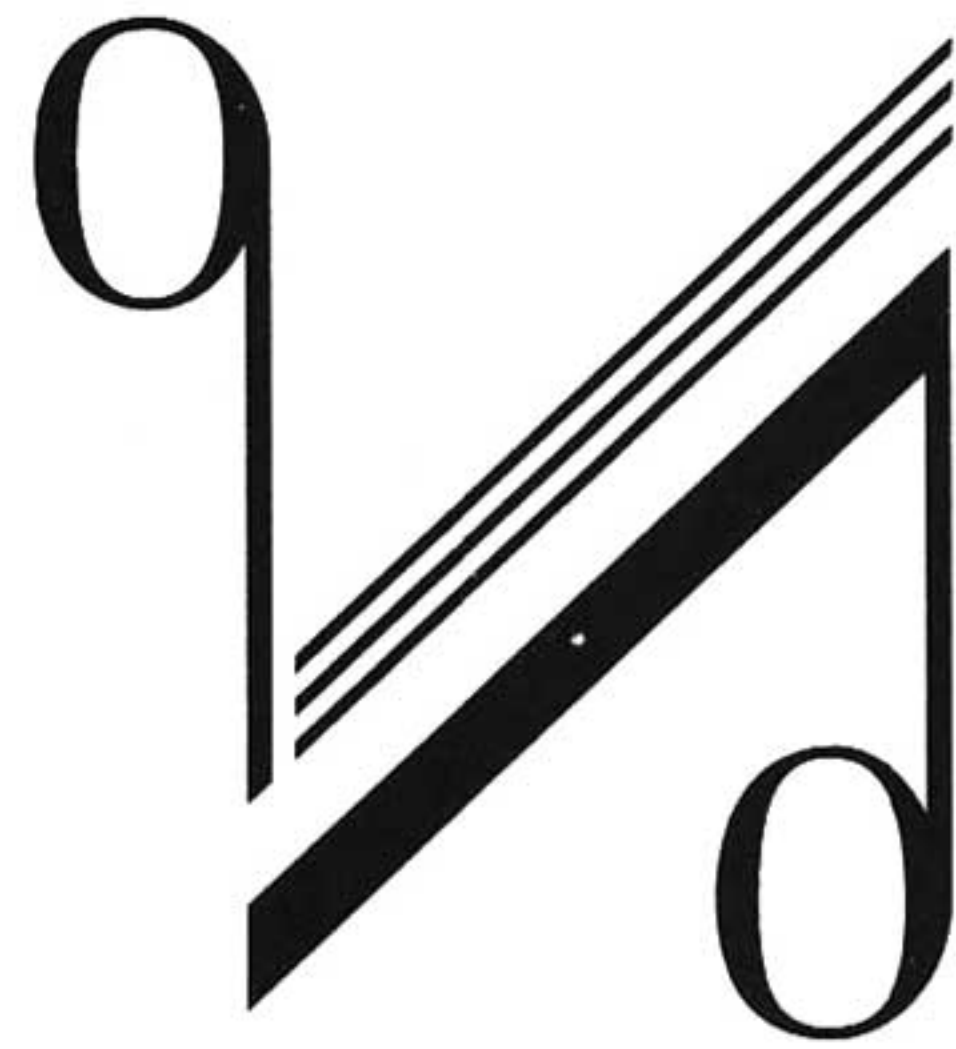
SPECIFICATION

Operation:	Stand alone by press buttons also full function by optional 77 infrared remote control.	
Controls: (on 77 integrated amp)	Press buttons for Standby, Volume, Balance, Source 1, Source 2 and Tape.	
Signal Bus:	QUADLINK. For any number of QUAD 77 series products.	
Inputs:	Source 1, Source 2, Tape.	
Input Sensitivities:	Source 1 & 2 300 mV (can be changed by 77 remote control to 100 mV or 775 mV)	Tape 300 mV
Load impedance;	33 kΩ	33 kΩ
Signal/noise ;	>100 dB (Noise figures 'A' weighted ref 775 mV)	>100 dB
Outputs:	Preamp-out	Tape-out
Output level;	775 mV	same as input level
Source impedance;	850Ω	300Ω
Residual Noise:	'A' weighted. Volume control at minimum -105 dB with reference to full output.	
Interchannel Balance:	±0.3 dB with volume control varied between maximum to -70 dB.	
Maximum Power Output:	84W into 8Ω <0.05% dtot. 115W into 4Ω <0.05% dtot.	
Maximum Current Output:	11A peak per channel.	
Distortion (total harmonic):	Continuous sine wave into 8Ω resistive load, any level up to 70W.	
	20 Hz;	<0.005% (22 kHz bandwidth).
	1 kHz;	<0.005% (22 kHz bandwidth).
	20 kHz;	<0.05% (80 kHz bandwidth).
Output Internal Impedance:	1.5 μH parallel with 3.3Ω.	
DC Offset:	Typically < 20 mV.	
Frequency Response: (ref 1 kHz)	-0.3 dB -3.0 dB	at 10 Hz and 20 kHz. at 3 Hz and 50 kHz.
Power Response (ref 1 kHz):	-0.75 dB	at 10 Hz and 20 kHz.

Crosstalk:	<- 90 dB at 1 kHz.
Hum and Noise:	-105 dB ref. 75W (22 kHz measurement bandwidth unweighted).
Stability:	Unconditionally stable with any load and any signal.
AC Input: (double insulated)	240-220V, 120-110V and 100V.
Power Consumption:	30-350 VA depending on signal level.
Power Consumption: (in standby)	<10 VA.
Power Fuse:	3.15A anti-surge for 220-240V. 6.3 A anti-surge for 110-120V and 100V.
Weight:	6.3 kg.
Dimensions:	321 mm wide; 65 mm high; 300 mm deep.

All voltages quoted are rms. Measurements apply to either channel and were made at 230V AC.

The right is reserved to alter performance and specifications as required.



QUAD

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