Amplifiers

User Manual: CA2 Preamplifier
SCA2 Preamplifier
SIA2-150 Integrated Amplifier
SPA2-150 Power Amplifier
SPA2-200P Power Amplifier

MULTICHANNEL

ATC®

ACOUSTIC ENGINEERS

Electronics

Introduction

Welcome. In selecting ATC you have chosen an example of the finest audio engineering available. ATC was founded on a principle of engineering excellence, and that principle still defines our products today. Given the right opportunities, ATC products will deliver exceptional audio performance, but the opportunities will only arise from careful and thoughtful installation and use. Please read the following manual fully. It will help you understand the product and to realise its full potential. We are happy to answer questions and offer advice on any issues that arise through installation or use of ATC products. Contact details can be found at the back of this manual.

ATC was founded in London in 1974 by Australian emigre Bill Woodman, who still heads the company today. An enthusiastic pianist and engineer he was naturally drawn to loudspeaker design and after a period working at Goodmans, where many of the names that went on to found British loudspeaker companies began their careers, he struck out on his own. The premise on which ATC began is a simple one, and one that in many respects is still true today: hi-fi loudspeakers tend to be detailed and accurate but of limited dynamic range, while professional monitor speakers tend to express the opposite character. ATC products were designed from the outset to offer the best of both. It's an easy concept to describe, but surprisingly difficult to engineer.

The difficulty inherent in designing such loudspeakers is one of scale. Hi-fi levels of accuracy and detail call for lightweight moving parts and delicate engineering. Professional monitor levels of performance however demand far more robust components engineered to survive the rigours of high level use for extended periods. The only way to combine the two is through precision engineering of a class and scale more often associated with aerospace or motorsport. But the results are worth the effort and the cost. ATC loudspeakers, with their unique in-house designed drivers, combine the best of hi-fi and professional to devastating effect.

ATC has become synonymous with active systems. Choosing to offer active loudspeakers (where the passive crossover network is replaced by active filters and multiple power amplifiers) is simply a result of the uncompromising attitude to loudspeaker design. While passive systems still have their place, and ATC engineering skills can still bring remarkable results from them, "active" is a fundamentally better solution to the problems posed by accurate, high level music reproduction. The ATC instinct is always for the better solution. Not cheaper, not quicker, but better.

It was the development of active loudspeakers that first brought ATC into electronics design and engineering. Active speakers demand multiple power amplifiers so ATC from the mid 1980s became not just a loudspeaker manufacturing company but an electronics manufacturer too. The further step from electronics for active speakers to a range of stand-alone amplifier products was natural and now means that ATC engineering is available from the recording desk or CD player output to the ears.

From modest beginnings ATC has grown to become one of the very few manufacturers successful across both domestic and professional audio. By selecting ATC you join a group of music lovers, professional audio engineers, studios and musicians across the World that understand and value the engineering that goes into an ATC product - and the sound that comes out.

Contents

4.1 Description

The SPA2-150 and SPA2-200P are high quality power amplifiers designed to partner ATC passive monitors and other loudspeaker systems. They are both capable of output power considerably in excess of specification. Both also incorporate the same gain reduction and loudspeaker protection circuits as ATC's active monitors. This ensures that even when working at very high levels the amplifiers are held back from clipping so improving the subjective performance and protecting the loudspeakers from damage.

The SPA2-200P features a stereo pair of balanced inputs on XLR sockets while the SPA2-150 incorporates switch selectable balanced and unbalanced signal inputs on XLR and RCA phono sockets respectively. Loudspeaker output connections on both power amplifiers are made through two pairs of WBT connectors.

The SPA2-200P includes a multi-pin connector on the rear panel that provides wired remote control interface facilities while the SPA2-150 can be switched into and out of Standby mode by either ATC remote handset.

Both power amplifiers incorporate comprehensive performance monitoring and feedback through a front panel display.

4.2 Installation

The SPA2-200P and SPA2-150 are designed to be free standing. The power dissipation of the amplifiers is considerable and makes them warm to touch. Temperature stability will be reached after approximately three hours from mains switch-on but full audio performance is available immediately and is not influenced by temperatures within the amplifiers' normal operating range. Care must be taken not to obscure the ventilation holes in the top and bottom covers. Please contact ATC for advice if the amplifier is required to be mounted in an enclosed area.

The SPA2-150 is an aesthetic match for the SCA2 preamplifier and it is quite in order to sit the SCA2 on top of the SPA2-150.A general recommendation regarding the layout of the system is that the distance between the power amplifier and loudspeakers should be minimised. Reducing the length of speaker cables improves the control of amplifier over the loudspeaker system through the reduced resistance of the loudspeaker leads. It may therefore be appropriate to locate the power amplifiers close to the loudspeakers.

There is no general benefit from reducing the length of the interconnect from the an ATC preamplifier to the power amplifier, especially when balanced connections are used. However, non ATC preamplifiers may not be capable of driving cables of more than a few metres.

4.3 Mains Connection

The SPA2-150 and SPA2-200P can be used with mains voltages from 100V to 240V, 50/60Hz. Mains voltage is factory set and should only be adjusted by ATC or your local dealer or distributor. It is wise to ensure that the local mains voltage matches that specified on the rear panel before applying mains power.

The mains cable is specifically supplied to comply with local statutory safety approvals and alternatives should not be substituted. If you intend to use your power amplifier in an alternative territory please contact ATC for advice. The mains connection must always be earthed.

A power supply fuse is fitted to the rear panels of the power amplifiers. The fuse is 20mm "Type T anti-surge". Should a unit fail to switch on when the power switch is operated the fuse should be inspected. Lift out the fuse holder cover using a small flat-blade screwdriver, remove the fuse and inspect it for damage. The fuse rating is 3.15A for 200V - 250V mains voltage and 6.3A for 100V - 120V. Fuses most often fail only because of a serious electrical fault. If this is the case then simply replacing the fuse will only result in another fuse failure. The power amplifier should be returned to ATC for service if a second fuse fails.

4.4 Inputs

The SPA2-150 is fitted with both unbalanced RCA Phono and balanced XLR inputs. A switch on the rear panel selects between the two. The SPA2-200P incorporates only balanced XLR inputs.

Note: Do not attempt to connect both balanced and unbalanced inputs at the same time. The selector switch is not a toggle between the two inputs. The XLR and RCA input connectors are wired in parallel and the switch merely arranges for either balanced or unbalanced input.

The signal is present on the centre conductor of an unbalanced RCA Phono style input and the signal return is made via the screened outer. If there is any hum present on the inputs this must be traced to its source and not suppressed by the removal of screens or earths. Removal of the screen on an unbalanced input is likely to result in uncontrollably loud hum.

All signal cables and plugs should be of a good quality. Poor cable and plug quality will compromise the performance of your system. The signal input pin configuration for XLR sockets is illustrated in Diagram 1 while Diagram 2 illustrates a balanced cable.

4.5 Signal Cable Options

Balanced cables are always the preferred option, for the SPA2-150P however unbalanced connection is possible. Diagrams 2 and 3 illustrate the signal cable connections required for each option. Balanced (XLR to XLR) connection offers lower noise and better immunity to "hum" pick-up. Unbalanced (XLR to Phono or Two Pole Jack) connection carries risk of hum caused by multiple signal earths.

Hum problems resulting from unbalanced connection may be reduced by making ONE of the following modifications to the signal cable connections: If the driving preamplifier (or desk) is "double insulated" (i.e. has no mains earth), disconnect the signal cable screen at the RCA Phono plug end. Alternatively, disconnect the signal cable screen at the XLR end. This second option will make the source the reference signal earth.

4.6 Outputs

Loudspeaker connections are made to the SPA2-150 and SPA2-200P through WBT connectors on the rear panels. The left and right channels are clearly marked. The loudspeaker terminals are labelled positive and negative. The wire used for the connections to the monitors will have some identification for the positive conductor. Usually this is red, but may be a moulded stripe on the insulation. The terminals will accept either bare wire up to 5.7mm diameter or 4mm male plugs. When bare wire connections are made the insulation should be carefully removed to expose 12mm of conductor. The conductors should be tightly twisted together and inserted into the connector ensuring that no stray strands of wire cause a short circuit.

It is important that both loudspeakers are connected with the same polarity. That is; both positive loudspeaker terminals are connected back to positive amplifier terminals and both negative loudspeaker terminals connected back to negative amplifier terminals.

The SPA2-150 and SPA2-200P are suitable for loudspeaker systems with a nominal impedance of 4 Ohms or greater.

Diagram 1 - input connection pins

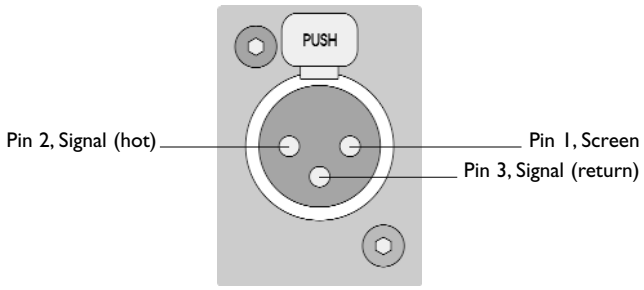


Diagram 2 - balanced cable

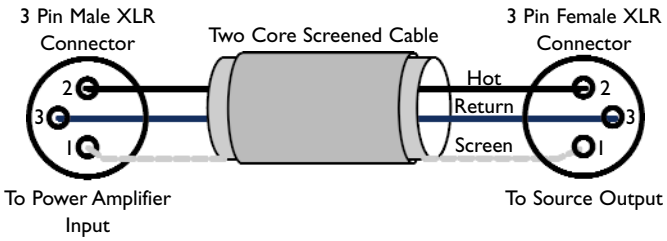
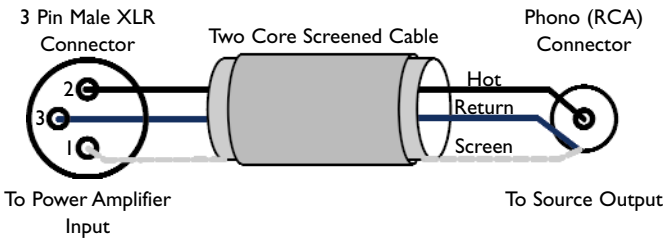


Diagram 3 - unbalanced cable



4.7 Operation

Once connected to mains power and powered-up from the rear panel mains switch, the front panel Standby button (or ATC remote handset Standby button) will switch the SPA2-150 between standby and active modes. The SPA2-200P can only be operated remotely by a custom wired remote system

With the power switch on, the front panel Standby indicator will illuminate. The unit will then respond to control either from the front panel or, in the case of the SPA2-150 an ATC remote handset. The Standby button on the front panel will switch the amplifier between active and standby modes. The rear panel power switch should be used to isolate the SPA2-150 and SPA2-200P from the mains supply if the units are to be unused for any significant period.

When switched into active mode the unit will go into an initialisation sequence under the control of the internal microprocessor. The standby indicator will extinguish and be replaced by the LED display displaying 0 followed by a flashing decimal point. At this time it is quite possible that the loudspeakers will emit a mild thump as the

amplifier powers up and the initialisation routine is carried out. When, after a few seconds, the initialisation is complete, the figure *0* is replaced by a constantly lit decimal point. The unit is now in the normal active mode. The initialisation sequence is illustrated in Diagram 4.

An indicator adjacent to the left of the Standby button illuminates when the amplifier receives remote control signals. It will also illuminate if the signals received are not intended for the amplifier - CD or preamplifier controls for example.

At all times during the operation of the SPA2-150 and SPA2-200P their internal microcomputer will monitor the important aspects of amplifier operation. Their front panel LED displays will warn of overdrive and fault conditions on either or both channels. The units will shut down if excessive temperature or DC offset faults arise but, as the amplifiers are designed to accommodate overdriving abuse indefinitely, they will keep running. Sound quality will however be impaired by the operation of the protection circuitry. There is also the possibility of damage to the loudspeakers when driven at such high levels. It is therefore prudent to reduce the system volume level to below the overdrive indication threshold. The display and its interpretation is illustrated in Diagram 4.

Excessive temperature and DC offset are both potentially very damaging and the amplifier will shutdown whilst displaying the fault condition that caused the problem. Excessive temperature is only likely if the output load is too great or if the ventilation is inadequate. The amplifier will not reset until the operating temperature has had time to return to normal. DC offsets generally indicate a faulty source or preamplifier. The power amplifier will not reset until the fault has been cleared.

Due to the nature of the electronics in ATC amplifiers it is quite normal for a sound to be heard from the speaker when the power is applied or disconnected. The noise heard will not damage the speaker and is quite normal. Although ATC uses the highest-grade components, a different noise may be heard from each speaker due to slight tolarance variations in the amplifier components.

Diagram 4 - Display legends

Initialisation: The decimal point flashes to show initialisation is in progress.

Normal Operation: The decimal point illuminates to show the amplifier is powered-up and is healthy.

Over Temperature: Indicates that the temperature is over 90°C in the **left** amplifier channel. This condition will shut down the amplifier. Pressing the Standby button will restore the amplifier to normal only if the temperature has dropped significantly.

Over Temperature: Indicates that the temperature is over 90°C in the **right** amplifier channel. This condition will shut down the amplifier. Pressing the Standby button will restore the amplifier to normal only if the temperature has dropped significantly.

Over Temperature: Indicates that the temperature is over 90°C in **both** amplifier channels. This condition will shut down the amplifier. Pressing the Standby button will restore the amplifier to normal only if the temperature has dropped significantly.

DC Offset: Indicates a DC voltage of greater than 1V present on the output of the **left** amplifier. This condition will shut down the amplifier. Pressing the Standby button will restore the amplifier to normal only if the fault has been cleared.

DC Offset: Indicates a DC voltage of greater than 1V present on the output of the **right** amplifier. This condition will shut down the amplifier. Pressing the Standby button will restore the amplifier to normal only if the fault has been cleared.

DC Offset: Indicates a DC voltage of greater than 1V present on the output of **both** amplifiers. This condition will shut down the amplifier. Pressing the Standby button will restore the amplifier to normal only if the fault has been cleared.

Overdrive: Indicates that maximum drive has been reached on the **left** amplifier and that the gain reduction circuits are operating to prevent clipping.

Overdrive: Indicates that maximum drive has been reached on the **right** amplifier and that the gain reduction circuits are operating to prevent clipping.

Overdrive: Indicates that maximum drive has been reached on **both** amplifiers and that the gain reduction circuits are operating to prevent clipping.

4.8 Remote Operation

ATC remote control handsets may be used with the SPA2-150 to provide remote operation of the standby function.

The SPA2-200P incorporates a rear panel multipin connector that enables custom remote control systems to be developed. Please contact ATC directly for technical information and advice on the development of such systems.

	SPA2-150	SPA2-200P
Output Power	150 Watts/Channel into 8 Ohms	200 Watts/Channel into 8 Ohms
Balanced Input Sensitivity	1V	1V
Balanced Input Impedance	10 kilohms	10 kilohms
Balanced Input C.M.R.R	-90dB @ 1kHz	-90dB @ 1kHz
Unbalanced Input Sensitivity	2V	2V
Unbalanced Input Impedance	10 kilohms	10 kilohms
Signal/Noise	>110dB	>110dB
Amplitude Response	5Hz - 200kHz ±0.1dB	5Hz - 200kHz ±0.1dB
Crosstalk	<-105dB	<-105dB
Distortion (at rated power)	<-95dB	<-95dB
Power Requirements:	100, 115, 230V factory set, 50/60Hz	100, 115, 230V factory set, 50/60Hz
Power Consumption	10 VA (Standby minimum) 180 VA (Nominal) 600 VA (Rated Output)	10 VA (Standby minimum) 180 VA (Nominal) 600 VA (Rated Output)
Dimensions (HxWxD)	146 x 440 x 426mm	130 x 428 x 325
Overall Weight	26kg (57.3lb)	22kg (48.5lb)

4.9 Care and Maintenance

High technology metal finishes are used in these products. The surfaces are durable and with a little care can be kept as good as new even under conditions of heavy use. Normally a dry duster will be all that is required to keep the finishes clean.

Heavier soiling of the aluminium can be cleaned using a cloth slightly moistened with a non-abrasive household cleaner - taking extreme care not to allow any liquid to enter the units. Switch off and disconnect the units from the mains power before cleaning.

There are no components within the units that would benefit from regular maintenance. There is no requirement for any kind of routine service work and there is no schedule for preventative maintenance.

There are no user replaceable parts within the units and in the unfortunate event of any malfunction, repair should be referred to either the supplying dealer or consultant, the relevant distributor, or ATC.

4.10 Warranty and Contact

All ATC products are guaranteed against any defect in materials or 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.

Purchasers who complete and return the Warranty Card will have their warranty period extended up to a period of six years from the date of purchase. This guarantee does not limit statutory rights.

ATC can be contacted at:

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