TRILOGY

USER MANUAL

993

THANK YOU

Welcome

Firstly, thank you for purchasing your Trilogy Audio Systems 993 Power Amplifier, we value your custom.

We strive to design and build world class products that stand the test of time. By reading this manual you can gain a clear understanding of the 993's operation and learn to care for it correctly. In turn, it will reward you with a lifetime of outstanding performance.

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Nic Poulson.
CEO Trilogy Audio Systems.
www.trilogyaudio.com

2

CONTENTS

4

Introduction

We prefer that your Trilogy dealer delivers, installs, sets up and explains your 993's operation to you. However, we still recommend that you read through this manual thoroughly and keep it to hand for reference.

Should any part of this manual or the operation of the 993 not be clear to you, please do not hesitate to contact your Trilogy dealer. If they are not available please contact ourselves directly.

About this manual

Throughout this user manual, the following icons are used:

[power]	This refers to a physical control or indicator on the 993.
LEFT OUTPUT	This refers to a physical connection on the 993.

From this point on, any information presented on the left hand pages are pictorial representations of either the front or back views of the 993 or other diagrams. Therefore consider the left hand pages as additional information to accompany the written descriptions on the opposite pages.

6

Unpacking

Be careful when unpacking your Trilogy amplifier, it is heavy: 19kg. Seek assistance if necessary. Store the packaging safely for future use. It is the ideal method of protecting your amplifier from damage during transport.

Environment

Do not site the amplifier near liquids, or place water-filled containers near the unit. If water does come into contact with the unit there is serious potential for an electric shock or fire hazard. Immediately pull out the mains plug from the wall socket. Contact your dealer to arrange an inspection before further use.

The amplifier is cooled by convection and so needs good circulation of room temperature air under and around it. Do not place it near sources of heat such as radiators or in direct sunlight. Do not enclose in a cupboard. Do not place directly on carpet.

A flat, smooth surface is required. As with all high resolution audio equipment, your amplifier is sensitive to vibration, strong magnetic fields and radio interference. A dedicated high performance equipment platform sited away from other appliances is the optimum location.

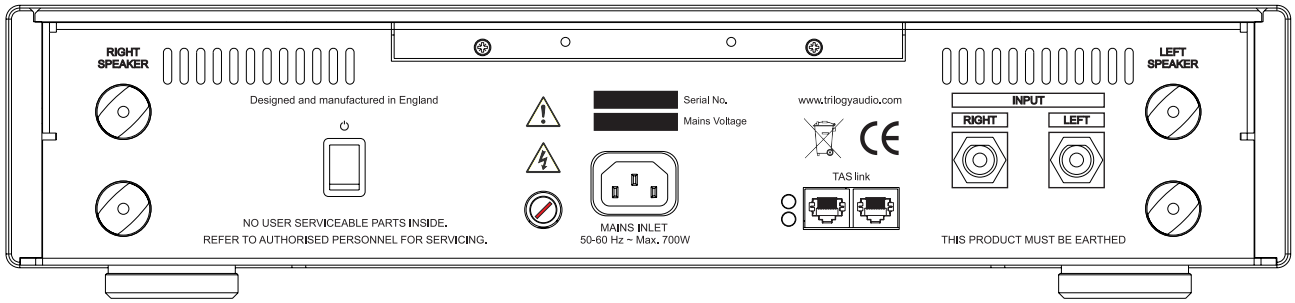
Power Supply

The AC input voltage has been set for the country where it was purchased. Check that the label on the rear panel matches your AC supply voltage before connecting the supply. The provided AC inlet cable should be used.

The 993 must be earthed through the IEC inlet connector. Do not disconnect the AC earth at any time. If in doubt about any aspect of power supply, consult your Trilogy dealer or a qualified electrician.

To realise your amplifier's full potential we recommend high quality mains conditioning. See www.Isol-8.co.uk for more on power supply and system solutions from our highly acclaimed sister company. If you are not using a mains conditioner for best performance, make a direct connection to a mains outlet. Avoid using adapters where possible.

The input mains fuse is housed in a rear panel fuseholder. This is a 20mm ceramic type, full specification on page 23, which the user can replace if required. Good quality power supplies, such as that in the 993, often have relatively high inrush current when first powered. Note this is when the 993 is turned on from standby, not when it is connected to the mains. Depending on the exact position of the incoming mains sinusoidal waveform this can rarely blow the fuse or age the fuse and lower its rated capacity for subsequent use. This is not unusual, it is similar to traditional light bulbs blowing usually when first turned on. It would therefore not be unknown to replace the fuse occasionally. However, if a replacement fuse blows again immediately then there may be a serious fault. The unit should be unplugged from the mains, then please contact your Trilogy dealer.


RIGHT SPEAKER
Designed and manufactured in England
NO USER SERVICEABLE PARTS INSIDE.
REFER TO AUTHORISED PERSONNEL FOR SERVICING.
Serial No.
Mains Voltage
MAINS INLET
50-60 Hz ~ Max. 700W
www.trilogyaudio.com
TAS link
INPUT
RIGHT
LEFT
THIS PRODUCT MUST BE EARTHED
LEFT SPEAKER

Connections

It is good practice to complete all interconnections before switching on to avoid any damage to your system's loudspeakers. Do not make connections or disconnections while the amplifier is powered.

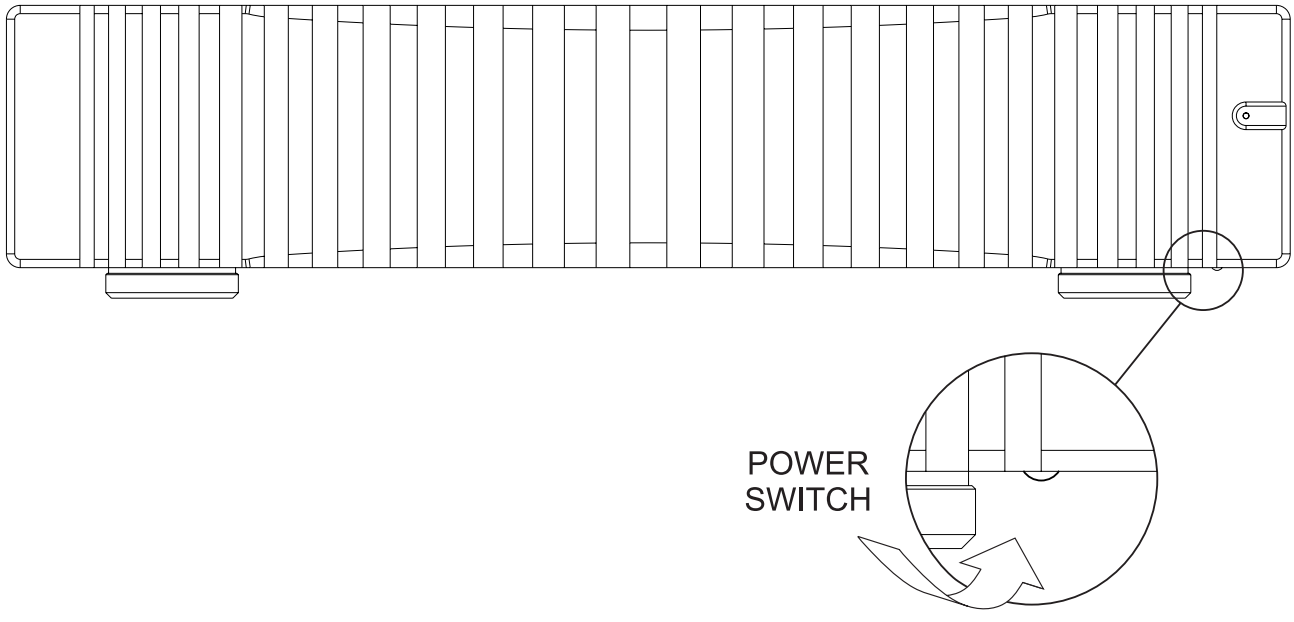
Connect with the supplied power input cable. The 993 can be left connected at all times to ensure reliable operation. If not being used for extended periods of time, switch off at the mains outlet or at the rear panel power switch.

The amplifier has single ended inputs on RCA "Phono" connectors.

The output is via copper terminals for connection to your loudspeakers. It is important to connect the speaker cables correctly. Connect the red terminal (+) to the positive terminal of your loudspeaker, and the black (-) to the negative. Take note of left and right and make sure that each connection is secure and the cable terminals are not touching another. Do not over tighten the terminals as damage may result. Finger tight is sufficient torque.

Twin TAS link connectors allow system interconnection and control with other Trilogy Audio System products. TAS link allows remote on and off switching plus status reporting of various parameters which can be displayed on your Trilogy preamplifier. See your Trilogy preamplifier manual for further details.

TAS link cables of varying lengths are available from your Trilogy dealer.


POWER
SWITCH

Operation Guide

Having made and checked all appropriate input, output and power connections, power can be applied by turning on the [rear panel rocker switch]. The [power indicator] will be dimly lit to indicate the 993 is in standby. To fully turn on the 993 press the [power button]. The power button is a momentary (non-latching) type and is located on the underside of the front panel/heatsink on the right, normally hidden from view.

The [power indicator] will pulsate for 50 seconds. During this “warm up” period, the output will be muted.

The [power indicator] will now remain on. The 993 is now ready for use.

Optimal performance will be achieved in about 1 hour once the amplifier has become quite warm to the touch. The high mass heatsink for the output devices is at the very centre of the 993’s design, also serving as the front panel. Normal extruded finned heatsinks resonate strongly, this has a negative effect on the small signal performance of the output stage. The 993’s heatsink is machined from a solid billet and deliberately designed to be of high thermal inertia. This maintains the 993’s output stage at the optimal operating temperature whilst amplifying music. The temperature of the heatsink will vary depending on the temperature of your room, the efficiency of the loudspeaker used and listening levels, Typically the heatsink will feel quite warm to the touch, this is normal.

To turn the amplifier off, press the [power] button and the amplifier will go into standby. The 993 consumes very little power in this mode and will stand by waiting for return to operation via TAS link or another press of the [power] button. If the amplifier is not being used for an extended period, the [rear panel rocker switch] removes power completely.

Power Indicator Normal	Mode	993 Status		TAS link Message
Dim	Standby	Off	Turn on with TAS link or button	Standby..Temp xxC
Pulsate	Warm up	Mute	Warm up takes 50 seconds	Warm Up
On	On	Operational	Trip counter is reset at power up	Temp xxC..Trip xx
Equal Flash	On	On	Shows TAS link pre is muted	Temp xxC..Trip xx

Power Indicator On flash to off	Warning	993 Status		TAS link Message
1	Over current	Mute output and increment trip counter	Mute time varies	Current !
2	VLF		250msec minimum mute	VLF !
3	DC Offset		Mutes when DC present	DC Offset !
4	Temperature Hot	Operational	Heatsink hotter than 57C	Hot !

Power Indicator Off flash to on	Shutdown	993 Status		TAS link Message
1	Over current	Off can turn on	Shuts down excessive current	Shutdown..Current
2	VLF	Off can turn on	Shuts down VLF over 2 seconds	Shutdown..VLF
3	DC Offset	Off can turn on	Shuts down DC over 1 second	Shutdown..DC Offset
4	Temperature Hot	Off until 53C	Shuts down heatsink over 62C	Shutdown..Overheat
5	Power Supply	Locked Out	Contact Trilogy dealer	Service..Code 058
6	Output Stage	Locked Out	Contact Trilogy dealer	Service..Code 101

Warning flashes are 0.5 second duration, spaced one second apart, sequence repeating every 8 seconds

Operational Warnings

The 993 contains no audio processing to compress or limit amplification. This approach is combined with a generous power supply to deliver an unconstrained dynamic performance for both low frequencies and high frequency transients. This design philosophy frees the amplifier to operate within its physical limits without early onset of clipping or similar performance degrading safeguards found in lesser amplifiers.

This philosophy is only possible because the amplifier continually and invisibly monitors various parameters and can warn the user of excessive listening levels or unusual amplifier output. Only if absolutely necessary, the amplifier can shut down to protect itself or the connected loudspeaker if required.

Usually the [Power indicator] is dim for off, pulsating equally on and off for warm up, or continually lit when the amplifier is operational. However, for some monitored conditions the [Power indicator] will flash a fixed number of times followed by a break before repeating this sequence. While the 993 is running the [Power indicator] is on with flashes to off, but after any shutdown the [Power indicator] will be off with the sequence seen as flashes to on

If the 993 is connected to a Trilogy preamplifier via TASlink, then messages relevant to operational warnings will also be reported on the Preamplifier's display. The user can view a trip counter which is only reset at power on and shows the number of times that the amplifier has had to intervene.

Over Current

The amplifier's output is ultimately limited by the maximum temperature the output stage can withstand. High temperatures are caused by high currents which equate to loud listening levels, the exact loudness depending on speaker type.

Heating of the output stage has two components, the most obvious is a long term heating that is reflected in the temperature of the front panel heatsink and an explanation of this is given below. The other component of heating, to which this Over Current warning applies, is due to short term transients which are allowed for best audio performance but are cumulative in heating the output device. One short, very large transient or many quieter transients close together might have equal heating effect.

By design the heatsink temperature will not immediately change, or may not change at all, even with large transients. Initially the heat is very much within the output devices and cannot be measured using traditional methods. Instead these over current warnings rely on sophisticated, custom algorithms that model the hidden effects of overload. These algorithms were the result of intense research by Trilogy and accumulate a record of transient heat, but also predict how quickly this heat dissipates into the heatsink. Again, this allows the amplifier to operate unconstrained as much as possible.

Because the amplifier will intentionally not reduce the listening level, over current warnings are accompanied by a short break in audio while heat from the output device dissipates. The shortest break is one second and this also acts as a cue for the user to reduce listening levels. Extreme currents can produce breaks of several seconds and ultimately the amplifier will turn off to prevent damage.

Where the user has a TASlink equipped Trilogy pre amplifier the user gains additional functionality. The 993 power indicator will flash evenly on/off when the preamplifier is muted, not to be confused with warning flash codes. The accumulated 993 valve hours can also be viewed in the pre amplifier, but of particular interest the user can view the live working of the algorithm described above. Refer to the pre amplifier manual for the display of live and accumulated energy.

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VLF

VLF is the acronym for Very Low Frequency, a signal which the 993 can output indefinitely. However excessive amounts of VLF will heat loudspeaker voice coils beyond their limit. Playing source material with extremely low frequencies at relatively high levels may cause VLF warning, badly warped vinyl for example.

DC Offset

There is a very fine line between VLF and true DC as the monitoring circuit may have to make a quick decision for protection of the connected loudspeaker. As with VLF, playing source material with extremely low frequencies at relatively high levels may cause a DC warning, but it is also possible after a brief interruption of the electrical supply that was not long enough to cause the amplifier to turn off completely.

Temperature Hot

The temperature of the 993's heatsink is constantly measured by a sensor. If the temperature of the heatsink is too high a warning will be given before shutdown at excessive temperatures. Common causes of high heatsink temperatures are placing the amplifier in direct sunlight, obstruction of airflow to the heatsink, sustained heavy drive for very long periods of time or very low impedance load.

Protective Shutdown and Lockout Modes

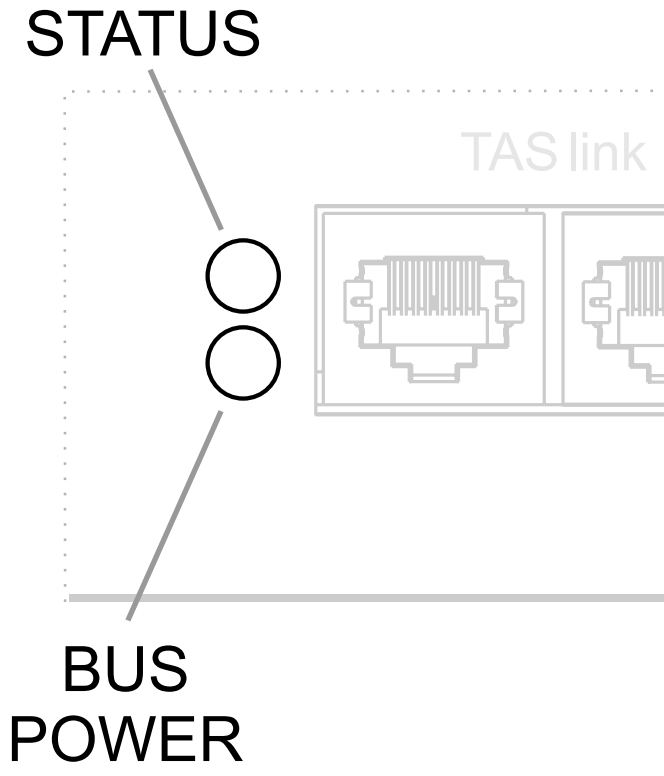
If the 993 has entered a protective shutdown or lockout mode the 993 will have turned off to protect itself from permanent damage.

It is important to take appropriate action to avoid the shutdown recurring before you attempt to switch the 993 back on. Examples are a short circuit in the loudspeaker cabling or the airflow over the heatsink is obstructed.

If you are confident that you have found the cause of the shutdown and have taken action to prevent it from recurring, you can attempt to re-power the 993. Follow normal turn on procedure.

If the 993 re-enters the same shutdown mode, (remember it may take some considerable time for the fault condition to re-appear if, for example, it was an over temperature shutdown) it is important to consult your Trilogy dealer as there may be an internal fault.

Power supply and Output stage lockout modes indicate an internal fault has occurred and switch on will not be possible to prevent damage. In this event please consult your Trilogy dealer.


STATUS
TAS link
BUS
POWER

TAS link Overview

TAS link is Trilogy's proprietary bus system offering power and data to remote displays, and also data to other Trilogy audio products to synchronise power on/off and provide reporting information. TAS link has a bus remote line (GPI) allowing equipment from other manufacturers to be powered on/off by a Trilogy pre-amp, or allow the 993 to be turned on by another system.

Standard screened Cat5 or Cat5e cables are used with RJ45 plug terminations to take advantage of any existing structured wiring.

WARNING! Do not cross-plug computer, or any other network with TAS link. They are not compatible and damage may result. It should be noted that Cat5/RJ45 cables are not unique to computer networks and are often used for telephony and other control systems. The cross-plugging issue is not unique to Trilogy products and Trilogy can take no responsibility for damage caused by failure to follow this instruction.

Security Bonding

To protect your investment in Trilogy equipment, this facility allows your 993 to be security bonded to a TAS link equipped Trilogy preamplifier. Your 993, once bonded, cannot be turned on with its local power button or via TAS link, other than with the original bonding Trilogy preamplifier.

TAS link must be used to bond one component to another. See the relevant section on Bonding in the Trilogy preamplifier's user manual.

Please note: there is deliberately no indication of which Trilogy component is bonded to your 993 for your security.

Rear Panel LEDs

There are two rear panel LEDs associated with TAS link. As in the diagram, these are used to indicate:

BUS POWER: if TAS link is connected and Bus Power in enabled on the Pre amplifier.

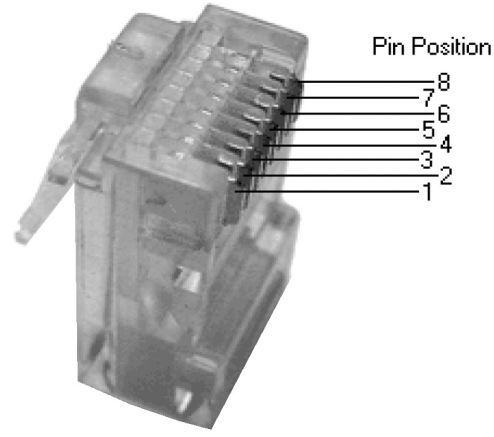
STATUS: microcontroller and TAS link bus activity.

Diagnostics using these LEDs is possible. You may be asked to look at these LEDs as part of any telephone support.

18

TAS link Pinout

RJ45	CAT5 COLOUR	FUNCTION
2	Orange/white	BUS POWER
1	White/orange	0V
6	Green/white	LSW
3	White/green	LSS
4	Blue/white	DATA+
5	White/blue	DATA-
8	Brown/white	BUS REMOTE
7	White/brown	LSD



TAS link pinout is shown for completeness but most signals are proprietary for use by Trilogy equipment. However, to turn amplifier on remotely the user can apply 8-24VDC between pin1 (0V) and pin8 (24V max). Remove this voltage to return amplifier to standby.

Cleaning

Dust the unit regularly with a soft cloth or soft brush. For more stubborn marks make sure the unit is switched off and disconnected from the power supply. Use a slightly damp cloth with a very small amount of mild, PH neutral detergent. Do not use a wet cloth. Be careful when using cleaning or polishing agents. Never use abrasives or alcohol based agents, they will harm the surface finish. Do not allow the unit to become wet when cleaning.

Servicing

Your 993 uses thermionic valves or vacuum tubes for amplification. They are the key component in realising your amplifiers very high performance. Valves have a finite lifespan and will need replacing during the lifetime of the amplifier. This lifespan depends on how long and how hard they are used. In typical use, small signal valves can last for 5000 hours. Frequent switching on and off reduces valve life.

Early valve failures can occur, usually due to mechanical stresses that can occur during shipping. This is not due to the amplifiers design but is an inherent characteristic of all valves, and is impossible to predict even during the amplifiers factory burn in period. The good news is considerate circuit design and modern manufacturing methods mean that valves are now typically very reliable once established in service.

It is good practice to replace the valves your amplifier periodically to prevent sudden loss of a signal path. Your Trilogy amplifier uses readily available and inexpensive valves should replacement be needed. If you are in any doubt your Trilogy dealer will help you assess whether your valves need replacing.

If your amplifier exhibits noticeable loss of performance, extreme sensitivity to vibration or becomes excessively noisy then new valves should be fitted by your authorised Trilogy dealer.

WARNING! There are no user serviceable parts inside. Do not open or attempt to repair the unit, potentially fatal voltages are present inside even when disconnected from the power supply. Refer to your authorised Trilogy dealer for servicing.

Declarations

This product is guaranteed against defects in material and workmanship for 3 years from the date of purchase.
This Guarantee excludes valves which are guaranteed for 6 months from date of purchase.
The Guarantee is not transferable and is offered to the original purchaser only.
This guarantee does not limit your statutory rights within the country of purchase.

Failure to comply with any of the above instructions during installation or operation will render the manufacturers warranty null and void.

Marking by the “CE” symbol indicates compliance of this device with the EMC (Electromagnetic Compatibility) and LVD (Low Voltage Directive) standards of the European Community.

This amplifier has been tested to ensure that its operation is not adversely affected by normal background levels of radio frequency interference, and that it does not itself generate excessive amounts of radio frequency energy. If your amplifier exhibits sensitivity to nearby radio frequency devices or is suspected of affecting another device, increase the distance between them. If the problem persists, consult your Trilogy dealer.

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Glossary

Single ended input	An input with the signal referenced to earth.	RJ45	A standard latching connector chosen for TAS link.
Bond	A unique security feature allowing your 993 to be controlled ONLY by your Trilogy preamplifier and be included in it's the PIN CODE protection.	Cat5(e)	A standard 4 pair data cable chosen for TAS link.
TAS link	Trilogy Audio Systems' proprietary Link between products.	GPI	General Purpose Interface.

993 Specifications

Input	1 pair RCA phono sockets	Weight	19Kg
Outputs	2 pair 5-way copper binding posts	Weight (packaged)	22Kg
Input impedance	400K Ohms	Standby power consumption	< 1 Watt
Input sensitivity	2.0V RMS for rated output	Idle power consumption	50 Watts
Frequency response	5Hz-30KHz +/-0.5dB	Maximum power consumption	700 Watts
Distortion	< 1% A weighted at rated output	British model	240V Rear panel fuse: T5A Ceramic 20mm
Phase	Phase correct (non inverting)	European model	230V Rear panel fuse: T5A Ceramic 20mm
Rated Power (8 Ohms)	125 Watts per channel	USA/Canadian model	120V Rear panel fuse: T10A Ceramic 20mm
Rated Power (4 Ohms)	200 Watts per channel	Japanese model	100V Rear panel fuse: T10A Ceramic 20mm
Recommended load Impedance	4-16 Ohms	Storage temperature	-20 to +50°C
Size	465*346*106 (W*D*H)	Operating temperature	0 to +30°C
Size (including connectors)	465*378*106 (W*D*H)	Operating humidity	10 to 80% (no condensation)
Size (packaged)	590*510*250 (W*D*H)		

SPECIFICATION SUBJECT TO CHANGE

Returns

Should it be necessary for your 993 to be serviced, please send it in the original packaging to your dealer.

If this is not possible please contact us directly and request a Return Authorisation Number. Please mark this number in the space provided on the outer packaging.

Please do not send products back to us without this number as we will not accept liability for the product.

If a product is not returned to us in its original packaging, after servicing we will return it, in Trilogy packaging and a nominal charge will be made.

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Whilst the information given in this document is correct at the time of printing, small production changes in the course of our Company's policy of improvement through continued research and development might not necessarily be indicated in the specification.

If clarification of any point or specification is required, please refer to your Trilogy dealer.

We welcome your feedback, whether positive or negative, to help us further refine our products.

Please write to; Trilogy Audio Systems
PO Box 56402
London SE3 7WQ
United Kingdom

Or email; user@trilogyaudio.com

Please visit our web site; www.trilogyaudio.com

Acknowledgements

Many people have worked tirelessly to help bring the 993 to you, and I would like to take this opportunity to thank - Emeka Chigbu, Nigel Crump, Simon Dart, Chris Sims and Simon Quill for their dedication to this project.

TRILOGY

Designed & Manufactured in London, England.

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