

TRILOGY

990

User Manual

THANK YOU

Welcome

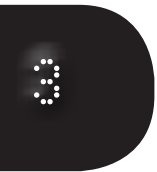
Firstly, thank you for purchasing your Trilogy Audio Systems 990 Power-amplifier, we value your custom.

We strive to design and build world class products that stand the test of time. By reading this manual you can gain clear understanding of its 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



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Introduction

We prefer that your Trilogy dealer delivers, installs, sets up and explains your 990'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 990 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 on the 990.
LEFT OUTPUT	This refers to a physical connection on the 990.

From this point on, any information presented on the left hand pages are pictorial representations of either the front or back views of the 990 or other diagrams. Therefore consider the left hand pages as additional information to accompany the written descriptions on the opposite pages.





Unpacking

Be careful when unpacking your Trilogy amplifier, it is heavy. 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 it was purchased in. Check that the label on the rear panel matches your AC supply voltage before plugging in. The AC inlet cable provided should be used. If another cable is used check it is wired correctly. The fuse should be rated at 10 amps.

The wires in the AC input cable supplied are coloured in accordance with the following code:

Green and yellow.....Earth
Blue.....Neutral
Brown.....Live

The amplifier must be earthed. 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.

A direct connection to a mains outlet is best for your amplifier, avoid adapters. 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.



Designed and manufactured in England
www.trilogyaudio.com

Serial No. [REDACTED]
Mains Voltage [REDACTED]

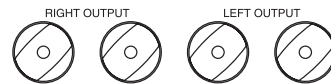
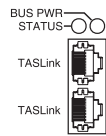


THIS PRODUCT MUST BE EARTHED.

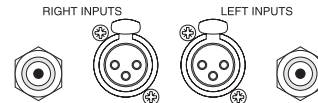
POWER INLET



50 - 60 Hz ~
Max. 1000W



CAUTION: DO NOT EARTH ANY OUTPUTS



NO USER SERVICEABLE PARTS INSIDE.
REFER TO AUTHORISED PERSONNEL FOR SERVICING.

Connections

It is good practice to complete all interconnections before switching on to avoid any damage to your systems loudspeakers while plugging in.

The IEC inlet provides the unit with power. Connect with the supplied AC input cable. It 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.

The amplifier has two alternative line level audio inputs.

There is a single ended input on RCA “Phono” connectors or balanced input on Neutrik XLR connectors. Connect your preamplifier’s Main output to either of these as required. If your pre amplifier offers a choice, it is better to use the balanced connection.

Each channel has outputs via copper terminals for connection to your loudspeakers. It is important to connect your speaker cables correctly. Connect the terminal marked + to the positive terminal of your loudspeaker, and the terminal marked – to the negative. Make sure that each connection is secure and not touching another. Do not over tighten the terminals as damage may result. Finger tight is sufficient torque.

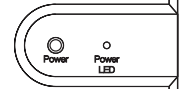
Twin TASLink connectors allow system interconnection and control via QuietBuss with other Trilogy Audio System products. This 990 can be remotely switched on and off and safe operation monitored via TASLink. Various other operational facilities are also available. See your Trilogy Pre amplifier manual for further details.

TASLink cables of varying lengths are available from your Trilogy dealer.





TRILOGY 990



Operation Guide

Having made and checked all appropriate input, output and AC connections, the [power indicator] will be dimly lit. To turn on the 990 briefly press the [power button].

The [power indicator] will flash slowly for 25 seconds, then flash more rapidly for a further 25 seconds. During this “warm up” period, the output will be muted.

The [power indicator] will now remain on. The 990 is now ready for use.

Optimal performance will be achieved in about 1 hour once the amplifier has become quite warm to the touch.

To turn the amplifier off, press and hold the [power] button for half a second.





Keep Warm Mode

The central fluted heatsink is at the very core of the 990's design. Firstly it forms a very rigid and inert structural spine. Secondly, it separates the AC mains and power supply from audio electronics. Thirdly, normal finned heatsinks resonate quite badly and this noticeably effects the performance of the output stage. The 990 does not suffer from this. Finally, the heatsink is designed deliberately to be of high mass and low efficiency. Both of these work together to maintain the 990's output stage at the optimal temperature, a temperature that does not vary much whilst amplifying music. This temperature will vary slightly depending on the temperature of your room but will typically be 45 degrees Centigrade. This will feel quite warm to the touch and is quite normal.

Once the 990 is on, you may enter "keep warm" mode by briefly pressing the [power button]. The [power indicator] and heatsink flutes illumination will now slowly and continually cycle between full intensity to dim.

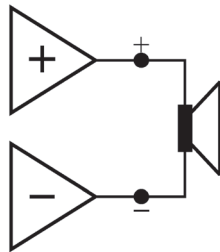
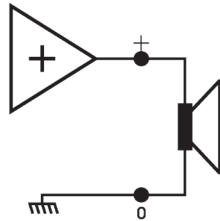
To bring the 990 back to operation, again briefly press the [power button]. The start up sequence will happen in the usual manner. From this keep warm mode, optimum performance will be achieved in a much shorter period of time.

If the 990 is connected to a Trilogy Pre-amplifier via TASLink, control over the keep warm mode can be made from the Pre-amplifier or the PRC (Personal Remote Control). See your Trilogy Pre amplifier manual for further details.





standard



bridge

Bridge operation

The 990, very unusually, is a true balanced amplifier from input, right up to the output stage. In a normal amplifier (even if it has a balanced input), the output to the loudspeaker is connected between the amplifier hot (or +) terminal and system earth.

In a bridge amplifier, the loudspeaker is connected between the output of two power amplifiers.

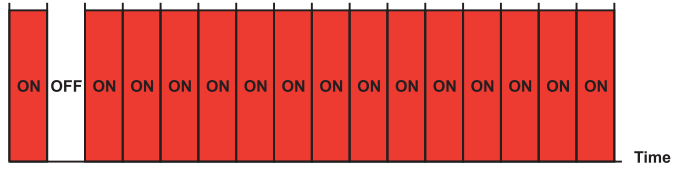
Whilst this method is much more costly as four amplifiers are required for stereo, the enormous currents that flow to and from the loudspeaker, do not in any way influence the very delicate system earth.

DO NOT in any circumstances allow either the + OR the – outputs of the 990 to be connected to earth or each other. This may be the case with some kinds of loudspeaker switching matrix or some headphone adaptors.

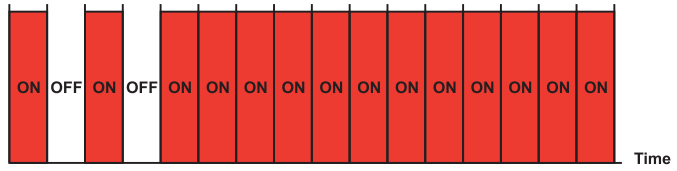




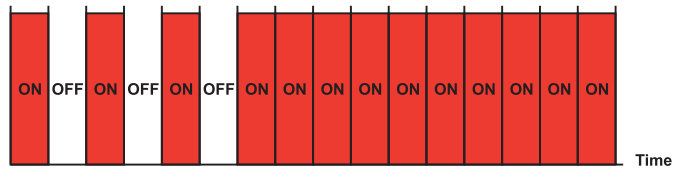
Over Current



DC Offset



Temperature Hot



Operational Warnings

The [Power indicator] is not only used to indicate the operational status of the 990, but also provides a visual indication of any possible overload or fault condition. It should be stated that you should not experience any of these conditions in normal use.

Whilst the [Power indicator] is flashing during the warm up period, it is on and off for equal amounts of time. However, when it is indicating a warning or fault condition, there will be a series of one tenth of a second “blinks” or “flashes”, which indicate different conditions.

This page details the WARNINGS. These are arranged so that the [Power indicator] is mainly on and “blinks” off. If the [Power indicator] is mainly off and “flashes” on, then the 990 has entered a Lockout mode. This is covered on the next page.

The three warnings are detailed below:

Over Current

The 990 is being asked to supply too much current to the loudspeaker. The 990 will momentarily mute and repeatedly continue to do so until the volume is lowered. The [Power indicator] will “blink” off once in the 1.6 second period. Continued operation in this state will cause the 990 to enter Over Current Lockout.

DC Offset

The output signal of the 990 has a DC component, or contains very low frequencies at high amplitude. The 990 will mute until this condition has ceased. Generally this condition will be caused by a brown out, or playing source material with extremely low frequencies at relatively high levels. The [Power indicator] will “blink” off twice in the 1.6 second period. Continued operation in this state will cause the 990 to enter DC Offset lockout.

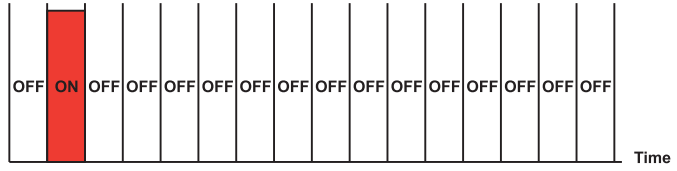
Temperature Hot

If the temperature of the 990's heatsink reaches 60 degrees centigrade, the following warning will be given, but the 990 will remain operational. The [Power indicator] will “blink” off three times in the 1.6 second period and will continue until the 990 cools below 55 degrees centigrade. If the temperature exceeds 65 degrees centigrade, then the 990 will enter Over Temperature Lockout.





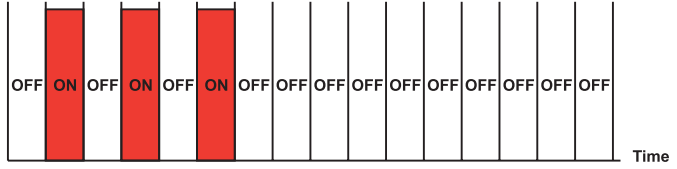
Over Current Lockout



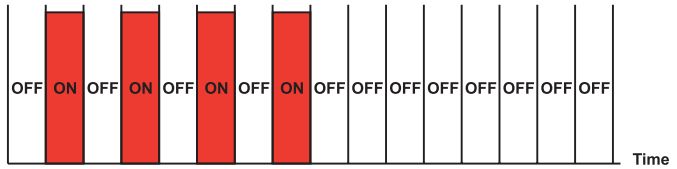
DC Offset Lockout



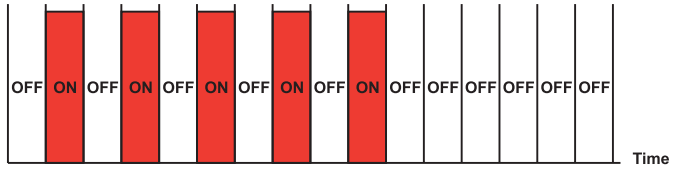
Over Temperature Lockout



Power Supply Lockout



Output Stage Lockout



Protective Lockout Modes

As described on the previous page, if the warning condition continues for a period of time, the 990 will enter Protective Lockout Mode. Once in this mode the 990 will turn off. This will be indicated by the [Power indicator] being largely off with brief flashes on. Again the number of flashes will indicate the reason for the shutdown. At this point it is important to record or remember the number of flashes. We call this mode a Lockout, because you cannot simply turn the 990 back on from the [power button]. We thought this condition too important for a simple reset. There may, for example, be a problem that needs correcting before re-powering the 990. Examples are there is 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 lockout you can attempt to re-power the 990. You will need to remove the IEC power inlet cable, wait for 10 seconds and then plug it back in again. Then follow normal turn on procedure.

If however, the 990 re-enters lockout mode, (remember it may take some considerable time for the fault condition to re-appear if, for example, it was a temperature lockout) it is important to consult your Trilogy dealer as there may be an internal fault.

1 flash	Over current lockout.
2 flashes	DC Offset lockout.
3 flashes	Over temperature lockout.
4 flashes	Power supply lockout.
5 flashes	Output stage lockout.

If the 990 is connected to a Trilogy Pre amplifier via TASLink, then these conditions will also be indicated on the Pre-amplifier's display.

Designed and manufactured in England
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Serial No. [REDACTED]
Mains Voltage [REDACTED]

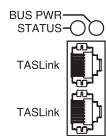


THIS PRODUCT MUST BE EARTHED.

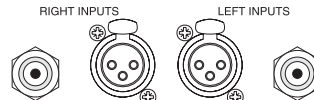
POWER INLET



50 - 60 Hz ~
Max. 1000W



CAUTION: DO NOT EARTH ANY OUTPUTS



NO USER SERVICEABLE PARTS INSIDE.
REFER TO AUTHORISED PERSONNEL FOR SERVICING.

TASLink Overview

TASLink 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 error information. TASLink has a bus remote line (GPI) allowing equipment from other manufacturers to be powered on/off by a Trilogy pre-amp, or allow the 990 to be turned on by another system.

Standard Cat5 or Cat5e cables are used, the same as used for computer networks with RJ45 plug terminations. Do not however cross-plug computer networks and TASLink, as 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.

By using standard Cat5 wiring, users can take advantage of any structured wiring in their buildings.

Security Bonding

To protect your investment in Trilogy equipment, this facility allows your 990 to be security bonded to a Trilogy pre-amp should you have one. Your 990, once bonded, cannot be turned on with its local power button or via TASLink, other than with the original bonding Trilogy pre-amp.

To achieve this bonding TASLink must be used.

See the relevant section on Bonding in the Trilogy Pre amplifier's user manual.

Please note there is deliberately no indication of which pre-amp is bonded to your 990. This is a security issue.

Rear Panel LEDs

There are two rear panel LEDs and these are used to indicate:

BUS PWR: if TASLink is connected and Bus Power is enabled on the Pre amplifier.

STATUS: if the micro controller within the 990 is active.

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

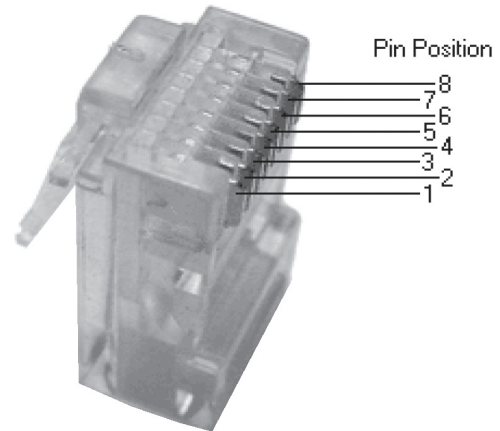




Appendix A

TASLink Pinout

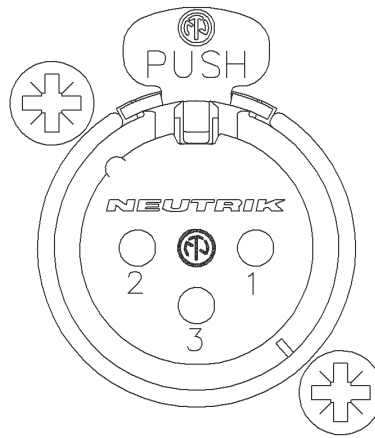
RJ45		FUNCTION
2	Orange/white	BUS POWER
1	White/orange	0V
6	Green/white	LSW
3	White/green	LSS
4	Blue/white	DATA+
5	White/blue	DATA-
8	Brown/white	BUS REMOTE
7	White/brown	LSD





Appendix B

- Pin 1 Earth
- Pin 2 Hot (+ phase)
- Pin 3 Cold (- phase)





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 detergent such as washing up liquid. 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 Trilogy amplifier 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.

Please bear in mind that some failures can occur early on in a valve's working life, usually due to mechanical stresses that can occur during shipping. This is not a reflection on 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.

There are no user serviceable parts inside. Do not open or attempt to repair the unit. 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.



Glossary

Single ended input	An input with the signal referenced to earth
Balanced input	An input with two signals referenced only to each other.
XLR	A professional three pole connector allowing balanced signal operation
Bridge amplifier	Unusual configuration where the loudspeaker output is not referenced to earth but is across the output of two balanced amplifiers.
Keep warm	A facility to keep the 990 in near optimum state but with reduced power consumption.
Bond	A unique security feature allowing your 990 to be controlled ONLY by your Trilogy pre-amplifier and be included in it's the PIN CODE protection.
TASLink	Trilogy Audio Systems' proprietary Link between products.
RJ45	A standard latching connector chosen for TASLink.
Cat5(e)	A standard 4 pair data cable chosen for TASLink.

990 Specifications

Size	424*428*113 (W*D*H)
Size (including connectors)	424*460*113 (W*D*H)
Size (packaged)	590*610*250 (W*D*H)
Weight	24.5Kg
Weight (packaged)	27Kg
Standby power consumption	4 Watts
Idle power consumption	90 Watts
Max power consumption	1000 Watts
Inputs (single ended)	RCA "phono"
Inputs (balanced)	XLR 3 Pin female
Input impedance (single ended)	130K Ohms
Input impedance (balanced)	2*130K Ohms
Input sensitivity	1.5V RMS for rated output
Frequency response	10Hz - 30KHZ +/-0.5dB
Rated power (8Ohms)	100 Watts per channel
Rated power (4 Ohms)	200 Watts per channel
Distortion	Less than 1% A weighted at rated output
Phase	Phase correct (non inverting)

Specification subject to change.

Returns

Should it be necessary for your 990 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.



