



# LINN LINTO

DIRECT COUPLED PRECISION PHONO PREAMPLIFIER  
OWNERS MANUAL

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# Important safety information

Explanation of symbols used in this manual and on the product:



This symbol is intended to alert the user to the presence of uninsulated dangerous voltages within the enclosure of sufficient magnitude to cause electric shock.



This symbol is intended to alert the user to the presence of important maintenance and servicing information in the instruction and service manuals.

## **CAUTION**

TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT REMOVE THE COVER.

NO USER SERVICEABLE PARTS INSIDE.

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING: SHOCK HAZARD. DO NOT OPEN.  
AVIS: RISQUE DE CHOC ELECTRIQUE. NE PAS OUVRIR.

CAUTION: REPLACE FUSE WITH SAME TYPE AND RATING.  
ATTENTION: UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE.

DISCONNECT SUPPLY CORD BEFORE CHANGING FUSE.  
ATTENTION: DEBRANCHER AVANT DE REMPLACER LE FUSIBLE.

## **WARNING**

TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

## **MAINS PLUGS**

This appliance is supplied with a non-rewireable mains plug for the intended country.

Replacement mains leads can be obtained from your Linn retailer. Should you need to change the plug please dispose of it carefully.

A plug with bared conductors is dangerous if engaged in a live socket.

The Brown wire must be connected to the Live (Line) supply pin.

The Blue wire must be connected to the Neutral supply pin.

The Green/Yellow wire must be connected to the Earth (Ground) supply pin.

Please contact your retailer or a competent electrician if you are in any doubt.

## GENERAL SAFETY INSTRUCTIONS

1. Read instructions. Read the safety and operating instructions before operating the appliance.
2. Retain instructions. Retain the safety and operating instructions for future reference.
3. Heed warnings. Observe all warnings on the appliance and in the operating instructions.
4. Follow instructions. Follow all operating and use instructions.
5. Water and moisture. Do not use the appliance near water, for example near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool and the like.
6. Carts and stands. Use only with a cart or stand that is recommended by the manufacturer.
- 6a. An appliance and cart combination should be used with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
7. Wall or ceiling mounting. Mount to a wall or ceiling only as recommended by the manufacturer.
8. Ventilation. Site the appliance so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings, or placed in a built-in installation such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
9. Heat. Site the appliance away from heat sources such as radiators, heaters, stoves, or other appliances (including amplifiers) that produce heat.
10. Power sources. Connect the appliance to a power supply only of the type described in the operating instructions or marked on the appliance.
11. Grounding or polarisation. Do not defeat the precautions taken to ground or polarise the supply to the appliance.
12. Power cord protection. Route power cords so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, power sockets, and at the point where they exit from the appliance.
13. Protective attachment plug. As a safety feature the product is equipped with an attachment plug containing overload protection. See the instruction manual about resetting or replacing the plug. Should the plug need replacing ensure that a replacement is used which has the same overload protection as the original.
14. Cleaning. The product should be cleaned only as recommended by the manufacturer.
15. Power lines. An outdoor antenna should be located away from power lines.
16. Outdoor antenna grounding. If an outdoor antenna is connected to the tuner/receiver ensure that the antenna system is grounded to provide some protection against voltage surges and static build up.  
  
In the USA see article 810 of the National Electrical Code ANSI/NFPA 70 concerning installation requirements.
17. Non-use periods. Unplug the power cord from the outlet if the product will be unused for a long period of time.

18. Objects and liquid entry. Take care not to let objects or liquids fall into the product.
19. Damage requiring service. The product should be serviced by qualified personnel if:
  - a) The power cord or plug has been damaged.
  - b) Objects or liquid have fallen into the product.
  - c) The product has been exposed to rain.
  - d) The product does not appear to operate normally or exhibits a marked change in operation.
  - e) The product has been dropped or the enclosure damaged.
20. Servicing. Don't attempt to service the product beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

**UK USERS PLEASE READ THIS IMPORTANT SAFETY INFORMATION**  
**Fuse replacement**

This appliance is fitted with a non-rewireable 13 Amp mains plug. The plug contains a 5 Amp fuse. If the fuse has blown it can be replaced as follows:

- a) Pull out the red fuse cover/carrier.
- b) Remove and dispose of the blown fuse.
- c) Fit a new 5 Amp BS1362 approved fuse into the carrier and push the carrier back into the plug.

Always ensure the fuse cover is fitted. If the fuse cover is missing do not use the plug. Contact your Linn retailer to obtain a replacement fuse cover.

Fuses are for fire protection and do not protect against electric shock.

**Mains plug replacement**

Should your mains plug need replacing and you are competent to do this proceed as follows. If you are in doubt contact your Linn retailer or a competent electrician.

- a) Disconnect the plug from the mains supply.
- b) Cut off the plug and dispose of it safely. A plug with bared conductors is dangerous if engaged in a live socket.
- c) Only fit a 13 Amp BS1363A approved plug with a 5 Amp fuse.
- d) The cable wire colours or a letter will be marked at the connection points of most quality plugs.

Attach the wires securely to their respective points. The Brown wire must go to the Live pin, the Blue wire must go to the Neutral pin, and the Green/Yellow wire must go to the Earth pin.

- e) Before replacing the plug top ensure that the cable restraint is holding the outer sheath of the cable firmly and that the wires are correctly connected.

**WARNING**

THIS APPLIANCE MUST BE EARTHED.

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**Listening to your new  
Linn hi-fi should be the  
nearest you can get to  
being at a superb live  
performance.**

# Introduction

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We believe that good music is not a luxury, but a necessity, and we at Linn have dedicated the better part of two decades to making sure that our customers are given the best possible experience of the music they love. In other words, we take music seriously, which is why we dedicate ourselves to building hi-fi which sets the highest possible standards in bringing music to life within your home.

Listening to a Linn hi-fi system should be the nearest you can get to being at a superb live performance. By using the Linn Linto in conjunction with your Linn system, you bring that live performance to your home. Once up and running, the Linto will bring you an unrivalled listening experience from your record collection that we know you'll enjoy again and again.

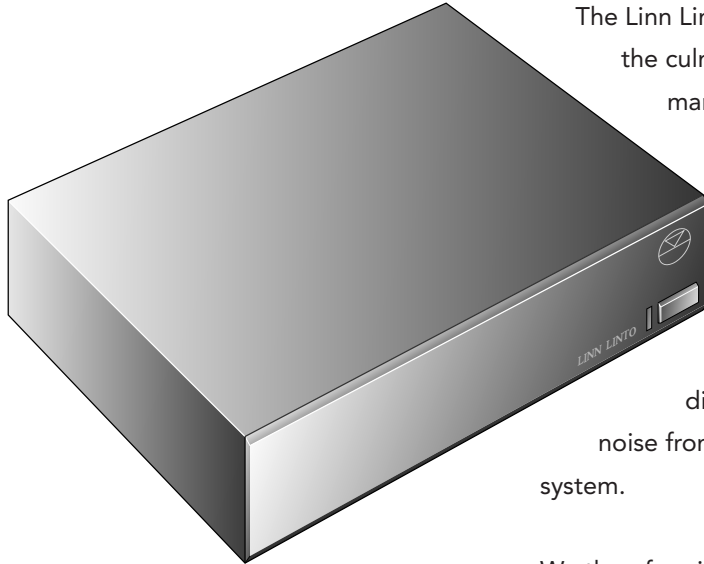
To do that, you need to know exactly how to get the best out of your Linto and that is what this manual is all about. In the next few pages you will find out everything you need to know about how to set up the Linto, and how to use it to get the best possible results.

We hope that you will spend a few minutes getting to know the Linto well, and so derive the maximum enjoyment from it.



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## The Linto and music



The Linn Linto direct coupled precision phono preamplifier is the culmination of fourteen years of development and manufacturing of ultra low noise audio circuitry.

Linn's interest in phono preamplifiers started when we developed our own record mastering system in 1983. As we improved our mastering lathe we reached the point where we could no longer measure the noise from it on the master discs. The measurement was limited by the residual noise from the phono preamplifier in our measurement system.

We therefore invested many months of research into developing a very quiet phono preamplifier to allow us to continue the development and improvement of our mastering system. This design was further developed and eventually used in our first audio preamplifier. The Linto is our third generation phono preamplifier, taking advantage of all the experience gained by making records, record players and electronics.

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## Some background information

The scale of the signals involved in a moving coil preamplifier make the design an interesting challenge. Linn MC cartridges generate about  $100\mu\text{V}$  (100 millionths of a Volt) from a reference 'cut velocity' on a record. This represents a fairly loud signal. A modest background noise level from a phono preamplifier would be about  $100\text{nV}$  (100 thousand-millionths of a Volt). A low noise level would be closer to  $10\text{nV}$ .

One of the delights of a good audio system is that it allows you to hear signals which are below the 'noise floor'. This understanding, and how to achieve it, has transformed the performance of digital audio systems since the first (very rough!) digital recordings.

It is however naïve to assume that just because a signal is in the analogue domain you get this resolution 'for free'. A moving coil preamplifier is probably the best example of this.

The conventional method of making a stable amplifier is to have an amplifier with much more gain (amplification) than required, and then to 'feed back' some of the output signal to the input such as to reduce the input signal to the amplifier and reduce its gain to the required amount. This gives a very predictable, stable amplifier with (generally) a high input impedance (so it does not load the signal source), a low output impedance (so it can drive the next stage), a very controlled gain and low distortion. For most signals this is a completely acceptable arrangement.

However when the original signal is of the levels mentioned above a problem appears. A reasonable feedback amplifier would feed back about 99.9% of the input signal. This has the effect of reducing the *true* input (what the amplifying devices see) to about one thousandth of the signal from the source. In the case of a MC signal we end up with a *true* input of a few pV (million-millionths of a Volt). This is now a very small signal. In fact it is so small that in the transient times of a music signal not many electrons get to move through the amplifying devices. The result is that the amplifier stops amplifying very small signals and information is lost.

The circuitry of the Linto was designed to get around this fundamental limitation and to extract all available information from a moving coil cartridge. The input stage actually takes signal power

from the cartridge (about 25pW) and transfers this directly into the amplifying transistors. In most other preamplifiers this power is wasted in resistors and cartridge loading networks. This signal power transfer sets the ultimate resolution of the Linto well above conventional preamplifiers. Every available electron is used!

### **Loading networks**

Unlike other MC preamps the Linto does not have an adjustable loading network. A moving coil cartridge has a very low output impedance (a few Ohms) and is relatively unaffected by any reasonable loading impedance. A loading network does two things: it wastes valuable signal power, and it generates more signal and noise than the cartridge.

A cartridge loading network is usually altered by switching in resistors and capacitors. The switch contacts alone can generate more voltage than the cartridge!

A cartridge loading network also increases the size of the circuitry on the input of the amplifier. We have gone to extreme lengths to keep the connection from the input sockets to the amplifier transistors as short as possible and enclosing the minimum possible area. Our precision surface mount technology makes this possible. A square centimetre of circuit area can pick up more interference signal than the cartridge generates as music signal.

The Linto makes one concession to flexibility. To accommodate the highest output moving coil cartridges which could overdrive the Linto or a subsequent control amplifier there is a single wire link which can be cut to drop the gain by 10dB. We recommend that you only use this if the front panel indicator light flashes red while playing a loud record.

### **RF immunity**

Radio Frequency Interference is the bane of phono inputs. Obviously with the signal levels involved a MC preamplifier is likely to pick up radio signals. The Linto was designed from the outset to have high immunity to RF interference. Instead of relying purely on filtering and screening the circuitry itself is 'well behaved' at radio frequencies. The fixed input loading network forms an RF filter, doing nothing in the audio band.

### **Power supply technology**

The Linto is unique in many ways but especially in its use of the Linn Brilliant switch mode power supply. This technology, with which we now have several years experience, goes completely against conventional audio practice which for many years has used ever larger transformers and capacitors for audio equipment power supplies. Current conventional thinking would use a power supply capable of delivering several hundred Watts to power a preamplifier requiring under five Watts. Obviously something is not quite right here!

The Brilliant slimline power supply is our solution to the problem. It converts the incoming mains into a very high voltage DC then chops it up at a high frequency before applying it to a transformer measuring about 30mm square. The output of this tiny transformer is then converted back to a very smooth DC voltage. To make this technique work as an audio power supply, and understand why it works, took two years of hard work and involved expensive research.

# Setting up the Linto

This chapter explains how to unpack your Linn Linto direct coupled precision phono preamplifier, and how to install it with your other hi-fi components.

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## Unpacking

Before connecting the Linto to the mains supply, you should check the following:

- that everything is in the box
- that the correct voltage has been selected
- that the correct fuse has been fitted.

### **What is in the box**

The Linto comes in a box with the following accessories:

- a mains lead
- one phono to phono lead
- two 800mA fuses
- this manual.

We recommend you retain the packaging in case you need to transport the Linto at a later date.

### **Fuse ratings**

120V and 240V settings: T800mA

### **Replacing the fuse**

Should the mains fuse blow replace it only with an equivalent part. The fuse holder is located just below the mains inlet socket. To replace the fuse disconnect the product from the mains supply. Using a flat blade screwdriver remove and replace the fuse. If the fuse blows a second time there is a fault in the product. Contact your local retailer.

### **Mains voltage operating range**

120V setting: 90Vac to 132Vac. 50Hz to 400Hz.

240V setting: 180Vac to 264Vac. 50Hz to 400Hz.

### **Setting the mains operating voltage**

All products with a voltage selector switch must be set to the local mains supply voltage before connecting to the mains supply.

Please check the setting of the voltage selector switch at the mains input socket before connecting the product to a mains supply.

To set the mains operating voltage unplug the mains supply cable and using a flat blade screwdriver turn the selector switch to the appropriate voltage.



**WARNING!!** THE POWER SUPPLY MAY BE DESTROYED IF IT IS CONNECTED TO 240V WHEN SET FOR 120V.

### **Earthing the Linto**

The earthed moulded mains lead supplied must always be used with the Linto. Never use an unearthed plug or adaptor.

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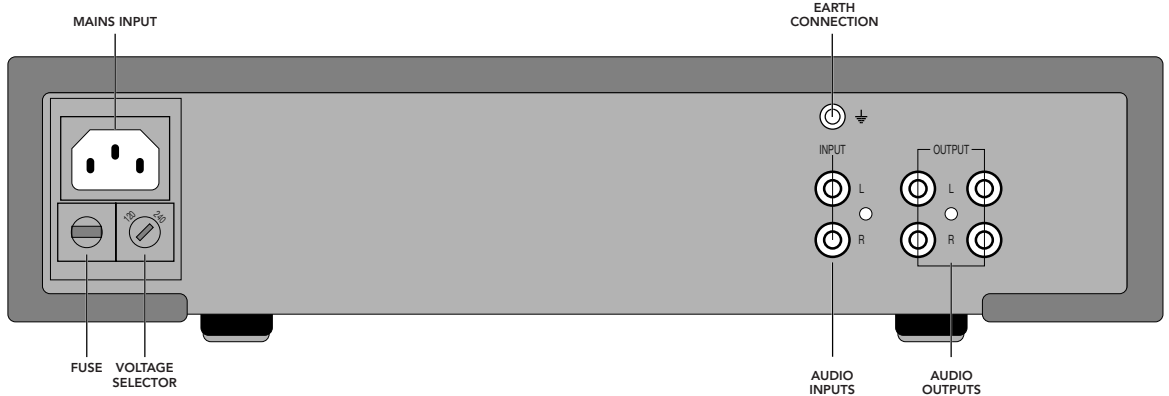
## Positioning

The Linto needs to be close to the turntable (and cartridge). It needs to be kept away from mains transformers in other equipment. Power amplifiers need to be kept at least 30cm away. When properly installed there will be no audible hum, only a very gentle hiss at full volume.

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## Connecting

The following diagram shows the connections for the rear panel of the Linto:



### Connections

The connections are very simple. There are two sets of identical outputs from the Linto allowing feeds to both a control amplifier and, for example, a multi room sound distribution system.

## **Operation**

The power consumption of the Linto is very low. Nothing in it runs hot so it can be left on continuously with no wear or tear.

Alternatively just switch it on when you play records (which will be all the time...). It doesn't need much warm up time. The output is well de-thumped so even if you do not turn down the volume control on your control amplifier you won't get a fright when you switch the Linto on and off.

The front panel light is normally green. There is an overload detector in the Linto which will change the light to red if an overload occurs. This will only happen with very high output cartridges, in which case get your retailer to cut the gain reduction links.



# Guarantee and service

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This product is guaranteed under the conditions which apply in the country of purchase.

In addition to any statutory rights the customer may have, we undertake to replace any parts which have failed due to faulty manufacture. To help us, please ask your Linn retailer about the Linn warranty scheme in operation in your country.

In the UK and other markets an extended warranty is offered, where this scheme is in operation, to customers who register their purchase with Linn. A registration card can be obtained from your Linn retailer and should be stamped by them. This will also enable you to receive the Linn RECORD newsletter and details of hi-fi and music available from Linn.

## **Warning**

Refer all enquiries to authorised Linn retailers only. Unauthorised servicing or dismantling of the product invalidates the manufacturer's warranty.

If you are in any doubt, please contact your nearest Linn retailer. For information on your nearest Linn retailer, contact the Linn factory in Scotland or your national distributor.

## **Important**

- 1 Please keep a copy of the sales receipt to establish the purchase date of the product.
- 2 Please ensure that your equipment is insured by you during any transit or shipment for repair.

# Technical information

## Specifications

Input connectors	One pair of gold plated, direct circuit board mounting RCA phono.
Output connectors	Two pairs of gold plated, direct circuit board mounting RCA phono.
Audio input level	150 $\mu$ V nominal on high gain setting. 500 $\mu$ V nominal on low gain setting.
Input impedance	150 $\Omega$ in parallel with 4.7nF.
Output impedance	100 $\Omega$ , both pairs of outputs.
Gain	64dB at 1KHz on high gain setting. 54dB at 1KHz on low gain setting.
Maximum input	6.7mV at 1KHz on high gain setting. 19mV at 1KHz on low gain setting.
Maximum output	10.1V p/p at 1KHz.
Mains supply	90Vac to 135Vac 50/60Hz or 190Vac to 264Vac, 50/60Hz, switched.
Power consumption	6 Watts, 12VA approximately.
Dimensions	320 x 320 x 80mm
Weight	1.5kg
Fuse rating	120V T800mA. 240V T800mA.
Safety approvals	EN60065 (Europe), UL1270 (USA), CSA22.2 (Canada). EMC approval to European standards.



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