



328A

Reference Monitor



English

Français

Deutsch

日本語

Operating Guide

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, within the enclosure, of uninsulated dangerous voltages 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.

WARNING

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

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 safety purpose of the polarised or grounding type plug. A polarised plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
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. Lightning storms. Unplug this apparatus during lightning storms or when unused for long periods of time.
18. Objects and liquid entry. Do not let objects or liquids fall into the product. Do not expose the product to dripping or splashing. Do not place a vessel containing liquid on top of 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.

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UK USERS PLEASE READ THIS IMPORTANT SAFETY INFORMATION

Replacing the fuse in the mains plug

This appliance is fitted with a non-rewireable 10 Amp mains plug. The plug contains a 10 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 10 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 Linn 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 10 Amp BS1363A approved plug with a 10 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.

CE Declaration of Conformity

Linn Products Ltd declare that this product is in conformance with the Low Voltage Directive 73/23/EEC and Electromagnetic Compatibility 89/336/EEC as amended by 92/31/EEC and 93/68/EEC.

The conformity of the designated product with the provisions of Directive number 73/23/EEC (LVD) is proved by full compliance with the following standards:

Standard number	Date of issue	Test type
EN60065	1998	General requirements Marking Hazardous radiation Heating under normal conditions Shock hazards under normal operating conditions Insulation requirements Fault conditions Mechanical strength Parts connected to the mains supply Components Terminal devices External flexible cords Electrical connections and mechanical fixings Protection against electric shock Stability and mechanical hazards Resistance to fire

The conformity of the designated product with the provisions of Directive number 89/336/EEC (EMC) is proved by full compliance with the following standards:

Standard number	Date of issue	Test type
EN55013	2001	Conducted emissions
EN55013	2001	Absorbed emissions
EN55020	2002	Immunity

FCC Notice

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital 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 receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



System Overview	1
Introduction	1
High Sound Pressure Level warning	1
Cellphone warning	1
Applications	1
Unpacking	1
Inspection	1
Voltage selection	1
Technical Overview	2
Twin LF drivers	2
Closed-loop LF control	2
3-K driver array technology	2
Amplifiers and power supplies	2
Cabinet design	2
Graphs	2
Features	3
Mains Power inlet / fuse drawer	3
Power on indicator	3
Overload protection	3
Controls	3
Balanced Audio in	3
Speaker Sensitivity	3
Treble Shelf	3
Bass Roll-on	3
Installation and Operation	3
Mounting recommendations	3
Connecting the Audio Input	3
Servicing	4
LF Driver removal and replacement	4
3-K Driver Array removal and replacement	4
Fuse replacement	4
Ordering spares	4
Cleaning	4
Technical Specification	5

INTRODUCTION

The Linn 328A is a fully active, 4-way, self-powered reference monitor designed for professional audio applications where accurate, revealing and realistic playback is essential. Employing unique Linn playback technology, the 328A offers high power, low colouration, low resonance, low distortion and exceptionally good low frequency response for the size of enclosure.

HIGH SOUND PRESSURE LEVEL WARNING

Linn monitors are capable of generating high sound pressure levels (SPL). Your hearing can be damaged by exposure to high SPL for an extended period of time. Therefore we recommend that you use an integrating type sound level meter to measure your exposure to SPL while using these monitors, and that you limit your exposure to within that recommended by your national health authority.

It is not sufficient to rely on your own judgement concerning SPL when working with high quality monitors because your perception of SPL is dependent on the amount of distortion introduced by them. Because this distortion is very low in the Linn 328A, you can be led into believing the SPL is lower than it actually is and hence risk exposure to damaging levels.

CELLPHONE WARNING

Cellular telephones should not be placed in close proximity to this monitor due to the possibility of damage to the monitor, the cellphone, or both caused by electromagnetic interaction.

APPLICATIONS

The 328A is suitable for the most exacting, high resolution audio monitoring applications.

The unit's compactness and low-profile silhouette give excellent working visibility, making it an ideal reference tool for professional music, broadcast, post-production and mastering applications.

UNPACKING

Your 328A Reference Monitor comes packed in a box with the following accessories:

- one mains lead
- this manual

The 328A monitor is heavy (45 kg) and must therefore be handled using appropriate precautions to avoid the possibility of personal injury. It should always be lifted and handled by two people while unpacking or repacking and during subsequent positioning operations.

We recommend you retain the packaging for reuse in case you need to transport the unit at any time.

INSPECTION

Your 328A left the factory in perfect condition but it is possible damage may have occurred in transit. After unpacking your monitor, and before connecting to mains power or other equipment, inspect the monitor for such damage. If damage is found, immediately contact the carrier for advice on their claims procedure.

VOLTAGE SELECTION

Voltage selection is not needed. Your 328A is factory set to operate from your local mains supply. The mains lead supplied may be fitted with a fused plug according to local regulations. If this is the case, always replace this fuse with another of the same type and rating.



The 328A Reference Monitor must always be earthed when connected to mains power. Use the earthed moulded mains lead supplied. Never use an unearthed plug or adapter with this unit.

Technical Overview

TWIN LF DRIVERS

Two identical 8"/8Ω aluminium-alloy diaphragm LF drivers deliver a -3 dB point of 20 Hz with a usable response down to 15 Hz at -6 dB. These units are user-replaceable.

CLOSED-LOOP LF CONTROL

To obtain the ultimate in low frequency response for the cabinet size, closed-loop feedback is used to control the LF drivers. This system uses an accelerometer mounted on each diaphragm. These feed motion-related signals back to circuits that ensure each 500 W power amplifier produces exactly the right drive current under all conditions, resulting in a highly accurate and extended low frequency response.

3-K DRIVER ARRAY TECHNOLOGY

An innovative positioning technique is used on the 328A whereby the midrange, tweeter and super-tweeter drivers are mounted on the 3-K driver array (patent applied for) in front of an acoustically-shaped reflection cavity extending below the baffle plane. This provides unmatched signal reproduction accuracy in the mid and high frequency ranges, together with excellent stereo imaging and dispersion. The 3-K driver array is user-replaceable as a unit.

AMPLIFIERS AND POWER SUPPLIES

All five amplifiers are conservatively rated for delivering sufficient power to the drivers to achieve the rated maximum acoustic output. The power supply high voltage rails track the average output for maximum efficiency and minimum heat generation.

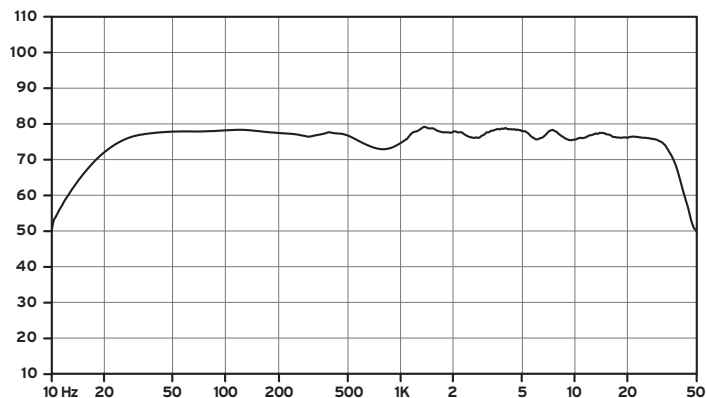
CABINET DESIGN

The closed-cabinet design is low profile, flat fronted with curved sides. Carrying handles on the sides make for easy handling. The back panel comprises two large aluminium heatsinks for the power amplifiers with a central plate carrying the controls and connectors. Ventilation slots for the amplifiers and power supplies run across the top of the cabinet at the rear.

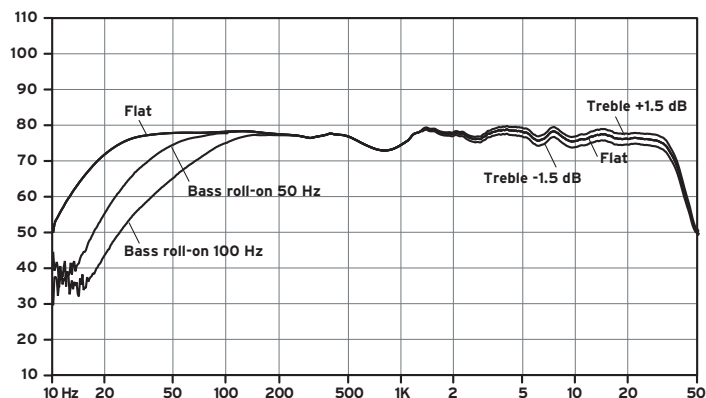
The sides and top of the cabinet are formed from painted Hornflex™, an MDF-based material. This innovative material makes possible the curved surfaces of the 328A that greatly reduce internal standing wave patterns, and hence practically eliminate colouration.

Four adhesive-backed rubber feet are supplied for positioning on the base of the unit as required.

GRAPHS



Anechoic response (flat)



Anechoic response showing effect of Treble Shelf and Bass Roll-on equalisation features



Features

MAINS POWER INLET / FUSE DRAWER

A combined mains power inlet with integrated fuse drawer is situated on the rear panel.

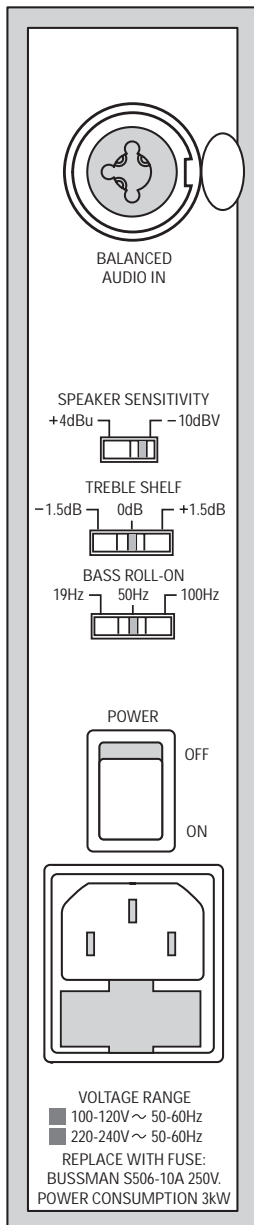
POWER ON INDICATOR

A blue LED on the front panel indicates when the unit is operating. The LED will flash for 30 seconds when power is turned on. During this time the servo circuitry is stabilising and no audio will be issued from the bass drivers.

OVERLOAD PROTECTION

Voltage clamps on the balanced amplifier input protect the 328A from accidental overdrive or spikes while allowing excellent working headroom.

The amplifiers and power supplies are individually protected from overload. If a protection circuit operates, the associated driver will cease operation until the circuit automatically resets. Thermal and current protection is used on the power supplies, while the amplifiers incorporate thermal overload protection.



CONTROLS

The user controls described below are mounted on the rear panel of the 328A.

Balanced Audio In

Accepts the output from an audio signal source via an XLR connector or 1/4" jack. The signal can be balanced or unbalanced (see *Connecting the Audio Input*).

Speaker Sensitivity

Switches the input sensitivity of the 328A monitor to either +4 dBu or -10 dBV as required.

Treble Shelf

Provides a 1.5 dB boost or cut adjustment to the HF response of the 328A if required.

Bass Roll-on

Applies a 12 dB / octave roll-on (at three preset frequencies) to the LF response of the 328A if required.

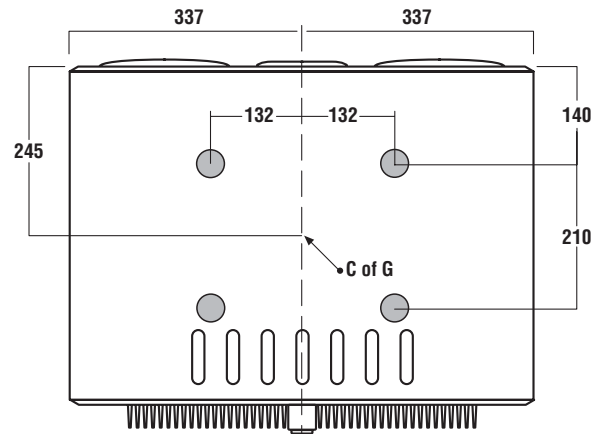
Installation and Operation

MOUNTING RECOMMENDATIONS

The most suitable position to mount the monitor is on a stand behind the mixing console. Any stand used must be able to carry the 45 kg weight of the monitor.

To help ensure safe operation it is important to consider stability when mounting the monitor on a stand. There are two methods of stand-mounting a 328A:

- Placing directly on the stand platform (normally rubber covered). The illustration below shows the location of the centre of gravity (C of G) of the monitor to help you position the 328A safely. The C of G should fall as close to the centre of the platform as possible.
- Fixing the four rubber adhesive-backed feet to the base of the monitor and placing it on the stand platform. The feet should be positioned surrounding the C of G and as far from it as the platform size allows. (See the illustration below for a suggested placement.)



Positioning the feet relative to the C of G

CONNECTING THE AUDIO INPUT

The 328A's combined XLR / 1/4" 3-pole input connector is wired to the balanced amplifier input as shown in the table below:

	XLR input	Jack input
Signal (+)	Pin 2	Tip
Signal (-)	Pin 3	Ring
Ground	Pin 1	Screen

If the source itself has a balanced output, use twin-conductor shielded cable (microphone cable) connecting Pin 2/Tip to Pin 2/Tip, Pin 3/Ring to Pin 3/Ring, and Pin 1/Screen to Pin 1/Screen (using the shield).

If the source has an unbalanced output, use single conductor shielded cable with Pin 2/Tip of the input connected to the 'hot' signal pin of the source, and Pins 3/Ring and Pin 1/Screen linked together and connected to the source signal ground.

Quick and easy maintenance was foremost in the design brief for this monitor and therefore the drivers use modular mounting arrangements so that they can be replaced without the need for special tools or specialist personnel. The replacement procedures are outlined below but fuller versions (including explanatory graphics) can be supplied on request.

LF DRIVER REMOVAL AND REPLACEMENT

An LF driver can be removed by an experienced technician following the procedure below. This is most easily carried out with the front of the monitor facing upwards.

1. Carefully remove the rubber trim ring covering the rim of the grille, taking care not to damage the front panel.
2. Unscrew and withdraw the eight M5 retaining screws using a No.25 Torx driver-bit.
3. Carefully remove the grille.
4. Withdraw the driver unit until the two cable connectors are exposed.
5. Cut all cable ties securing wires to the driver chassis, taking care not to damage any of the wires.
6. Unsolder the cables from the driver terminals, taking careful note of how the connections are made.
7. Disconnect the 3-way JST connector to free the unit.

Replacement is a reversal of the above procedure, taking care to remake the driver connections correctly.



Damage to the driver may result when the unit is switched on if these connections are remade incorrectly.

Tighten the retaining screws no more than is necessary to hold the driver firmly in position.

3-K DRIVER ARRAY REMOVAL AND REPLACEMENT

The 3-K driver array can be removed by unscrewing the seven M4 retaining screws and carefully withdrawing the unit directly away from the baffle until the built-in connector at the back of the unit disengages. Replacement is a reversal of the above procedure, taking care to tighten the retaining screws no more than is necessary to hold the driver array firmly in position (set torque driver to 200 cNm if used).

FUSE REPLACEMENT

The fuse is a time delay type. Always replace with a fuse of this type and rating (see the *Technical Specification* section). If the fuse repeatedly blows within a short time of being replaced, please contact Linn for advice.

ORDERING SPARES

Service kits to replace the LF drivers and the 3-K driver array and the amplifier module are available if required. These service kits are user-installable and can be ordered from Linn using the following codes:

Servo-base Driver	328A SDR
3-K Driver Array	328A S3K
Servo-base Driver and 3-K Driver Array	328A SPRS

You can place an order with Linn via:

orders@linn.co.uk

Or, if you need more information (on pack contents, pricing, etc.), you can contact the Linn Helpdesk via:

helpline@linn.co.uk

or by telephone on:

+44 (0)141 307 7777

CLEANING

Disconnect the 328A from the power supply before cleaning. Remove dust and fingerprints with a soft, dry cloth. Avoid using domestic cleaning products on the unit.

Technical Specification

Acoustic

Free-field frequency response	24 Hz – 33 kHz (- 3 dB points)
Maximum short-term output @ 1m on axis	114 dB SPL

Electrical

Input impedance	6 kΩ balanced
Input sensitivity	+4 dBu or -10 dBV switchable
Crossover frequencies	
LF to MF	455 Hz
MF to HF	3.50 kHz
HF to SHF	12.10 kHz
Crossover slope	24 dB/octave Linkwitz-Reilly
Power amplifiers	
Bass	2 x 500 W
3-K driver array	MF: 250 W HF: 125 W SHF: 125 W
Power	
Standby	62 W
Typical	115 W
Peak	3000 W

Controls

Speaker Sensitivity	92 dBA @ 1m ref. 0 dBu
Treble Shelf	-1.5 dB above 10 kHz Flat +1.5 dB above 10 kHz
Bass Roll-on	12 dB/octave below 19, 50 and 100 Hz
On/Off	Rocker switch on rear panel

Physical

Drive units	
LF	Two 8", servo-controlled, aluminium-alloy cone diaphragm
Midrange	75 mm dome
Tweeter	25 mm dome
Super-tweeter	13 mm dome
Cabinet construction	Flat front and curved sides with a carrying handle on each side
Input connector	Combined XLR / 1/4" 3-pole jack
Power On indicator	Blue LED on front panel
Mains fuse	Bussman 10 A 250 V Time Delay Type S506-10A
Dimensions	
Actual	Height: 280 mm (11") Width: 675 mm (26 1/2") Depth: 570 mm (22 1/2")
Shipping	Height: 400 mm (16") Width: 840 mm (33") Depth: 685 mm (27")
Weight	
Actual	43.5 kg
Shipping	51 kg



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