LINEAR AMPLIFIER USER MANUAL

L144-1-100
LPM144-1-100
L144-3-100
LPM144-3-100
L144-10-100
LPM144-10-100

SPECIFICATIONS

	L&LPM144-1-100	L&LPM144-3-100	L&LPM144-10-100
Linear Amplifier			
Frequency Range		144.000 MHz to 148.000 MHz	
Class of Operation		Class AB1	
Input Impedance		50 ohms unbalanced	
Minimum Input Power		500 mW RMS	
Maximum Input Power	2W RMS	5W RMS	15W RMS
Recommended Input Power	1W RMS	3W RMS	10W RMS
Output Impedance		50 ohms unbalanced	
Output Power (maximum)		100W RMS +/- 0.5 dB	
Insertion Loss (straight through)		1.5 dB +/- 0.5 dB	
Power Requirements	13.8Vdc , 14A +/- 15%	13.8Vdc , 14A +/- 15%	13.8Vdc , 12A +/- 15%
Preamplifier			
Frequency Range		144.000 MHz to 148.000 MHz	
Receive Gain		12 dB typical	
Noise Factor		better than 1 dB	
Input Impedance		50 ohms	
Output Impedance		50 ohms	
Power Requirements		13.8V dc , 100mA +/- 15%	
Mechanical			
Height		68mm (2.68")	
Length		230mm (9.06")	
Width		146mm (5.75")	
Weight		2.5 kg (5.5 lbs)	

OPERATION

LINEAR ON/OFF SWITCH : With this switch in the OFF position the linear operates in "straight through" mode. The ON condition is indicated by the green LED above the switch.

PREAMP ON/OFF SWITCH : The pre-amplifier operates independantly of the linear and has a seperate change-over relay. This allows it to be used when the linear is switched off. The Pre-amps ON condition is indicated by the green LED above the switch.

MODE SSB/FM SWITCH : The "hang-up" time of the change-over relays can be selected using this switch. A long time constant for when the linear is in SSB mode is indicated by the red LED above the switch.

TX LED : This is a yellow LED which lights up when the relays are in the Transmitt state.

HARD WIRED SWITCHING : The linear operates either on the R.F. VOX change over or, if desired, can be "hard wired" using the PTT socket on the rear panel. The change-over is effected when the centre pin of the jack socket is grounded.

NOTE: The manual of the transmitter should be consulted for hard wired interconnection.

In the interest of continuing improvement, the specification on this product may change without prior notice.

CARE OF YOUR LINEAR

HINTS & TIPS.

1. Check the output power of the transmitter and adjust if neccessary for the correct input level for the linear.

2. Check the VSWR of the antenna, which should be adjust low as possible. A VSWR of less than 1.5:1 is required for optimum performance.

3. Connect the transmitter to the XMTR socket on the linear using lead lengths of 341mm (13.4"), 681mm (26.8") or 1363mm (53.7"). This will give the best input match. The lead length being the total length including the connectors.

4. Connect the linear to the power supply keeping the leads as short as possible. This minimises the power los in the power leads. When installing the linear for mobil use the power leads should be connected directly to the vehicles battery.

Any loss in the power leads will result in a proportional loss of R.F. output power.

5. When the linear is installed double check all connections BEFORE switching the linear on.

FAULT FINDING.

a. Input fuse blows when the linear is connected to the supply :- Power lead connected in the wrong polarity.

b. High input VSWR causing transmitter to shut-down:- Input lead incorrect length.

c. Linear producing low output :- Poor VSWR on antenna, low supply voltage or insufficient input power.

INTRODUCING A NEW CONCEPT IN RF POWER AMPLIFICATION

The 'C' Series provides a new concept in RF amplification allowing you, the user, to precisely define the specifications of the amplifier required. Nothing new, you may think, custom built units have always been available for a premium. Where the 'C' series scores is by providing custom-built versatility for an off-the-shelf price.

The incredibly flexible design of the 'C' series provides an amazing array of user-definable parameters. The first step is to choose a nominal frequency of operation (centre frequency) somewhere between 40 and 600MHz. The next step is to work out the desired bandwidth. The maximum available is dependent on the centre frequency but 0.5dB Bandwidths of up to 20MHz are available.

The next thing to decide is what you are amplifying and what level you want it amplified to. BNOS Amplifiers are available with input RF requirements of as little as 250mW yet can produce outputs of up to 200W. Typical maximum gain figures are about 23dB but higher gain is available through the use of two stages.

Additional versatility is offered by the type of unit available.

CTX models are straightfoward amplifiers which make an ideal building block for high power transmitters.

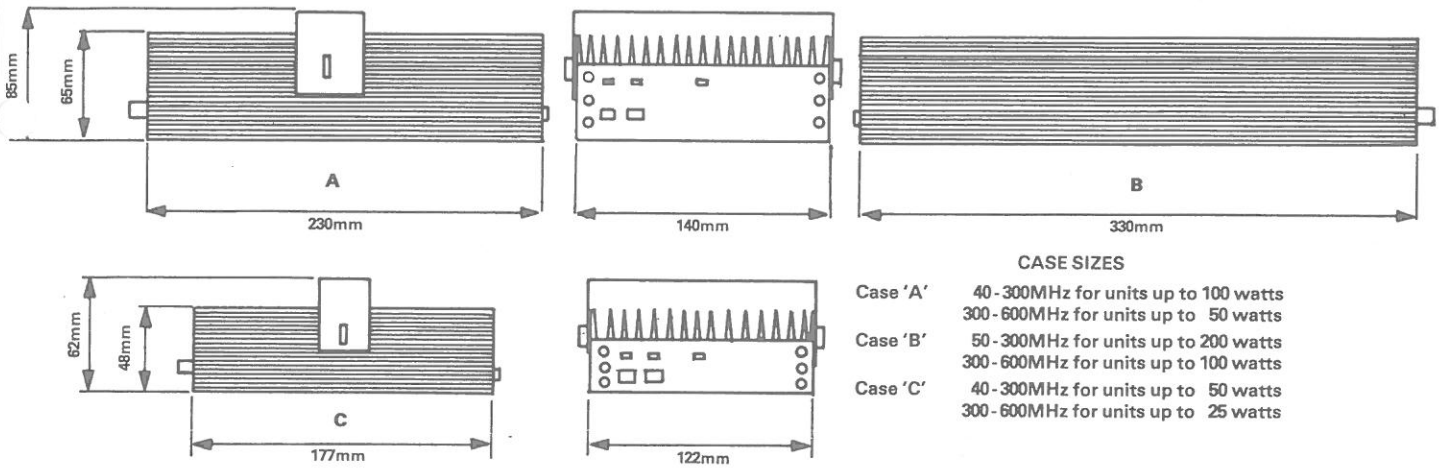
CLX models allow you to use the unit in two-way communications systems by the provision of a receive path. This path is automatically selected by advanced RF switching techniques or may be manually overridden using DC switching.

CLP models provide a small signal pre-amplifier in the receive path so that even received signals are amplified. All amplifier stages can be switched in and out of circuit using front panel controls so you can use the extra power judiciously.

Even the receive pre-amplifier (on CLP models) is user definable. Gain of up to 20dB, frequency of operation (different to the transmit amplifier is used for semi-duplex), noise factors better than 1dB and overall bandwidth are all selected at the time of order.

Finally you can choose your DC power supply voltage. Many applications require 24V operation whilst PMR and Marine Communications prefer the 12V standard. BNOS also supply a range of Linear Power Supplies which are designed to complement the range of amplifiers.

The BNOS 'C' Series — Made to measure for an off-the-peg price!



CASE SIZES

Case 'A'	40-300MHz for units up to 100 watts 300-600MHz for units up to 50 watts
Case 'B'	50-300MHz for units up to 200 watts 300-600MHz for units up to 100 watts
Case 'C'	40-300MHz for units up to 50 watts 300-600MHz for units up to 25 watts

SPECIFICATION	PARAMETERS
Frequency Range	Up to 20MHz between 40 and 600MHz
Class of Operation	Class AB1 in general (others may be specificed)
Mode of Operation	All mode (FM, AM, CW, SSB, SSTV, FSTV inc. Colour, PCM PCW etc).
Input Impedance	50ohms unbalanced
Output Impedance	50ohms unbalanced
Efficiency	40 — 60%
Input Power Range	250mW to 25W (RMS)
Output Power Range	10W to 200W (RMS)
Power Amplifier Gain Range	3dB to 23dB
RX Amplifier Gain Range	10dB to 20dB
Supply Voltage	12—14 Volts or 24—28 Volts
Connectors (I/P + O/P)	BNC, TNC, UHF, N and C type are available in any configuration
Interfaces Available	PTT, ALC, remote switching, dc output power signal
Harmonic and Spurious Output	<60dB with respect to wanted signal
Ambient Operating Temperature	−10°C to +40°C
Protection — Supply	Reverse polorisation
Protection — Input Power	Overdrive protection switches to straight through mode when over driven by 50% or more (CLX and CLP models)
Protection — Output VSWR	Automatic VSWR shutdown on high power models (case size B) other models will withstand a 30:1 VSWR at all phase angles.

For further assistance, quotation or advice, please do not hesitate to contact our technical sales department.

Note: This equipment is not type approved for telecommunications use within the United Kingdom.

YOUR LOCAL STOCKISTS

Our guarantee — All products that carry our logo are designed and built by our engineers in Great Britain, and, carry a full 12 month parts and labour warranty against faulty materials, components and workmanship.

All aspects of production takes place in our factory under stringent inspection and qualtity control with no outwork or subcontraction. A full certificate of conformity can be issued against any products detailed in this brochure.

In line with this company's policy of continual research and development, specifications may be subject to change without prior notice.

E & O.E.

British Designed and Manufactured

B.N.O.S. ELECTRONICS LIMITED

British Technology and Innovation

Tel: 0371-86681 Tlx 817763 BNOS G

B.N.O.S. ELECTRONICS

British Technology & Innovation

British Designed & Ma

Take a look at the world's most advanced range 2 metre Linear Amplifiers

Over 40 years of design experience has gone into what is fast becoming acclaimed as the biggest break-through in linear technology. Performance and reliability have been designed in, which gives us the confidence to offer a free 5-year warranty. Why not take a closer look at our products and see where value for money really counts.

The LPM144 Range

This sophisticated, but simple to use, range of amplifiers have performance characteristics and extra features previously not available in the UK. The pre-amplifier uses the highly regarded BF981 MOSFET, and an LED bargraph power meter is provided, to highlight only two of the amazing number of features.

The L144 Range

To complement the LPM range, we have introduced the L series linear-only versions for the amateur who may a be equipped with a good pre-amplifier and power meter excellent linear performance is maintained and both RF and hard-wired changeover are standard.

- *Linear all mode operation*
- *Continuous rated RF output power (RMS)*
- *RF & HARD switched changeover with selectable delay*
- *Trouble-free RF switching at low drive levels*
- *Straight-through mode when switched off*
- *Unique over-drive protection circuit*
- *Mobile mount on all 100 Watt models*

LPM144-1-100	£172.50
LPM144-3-100	£172.50
LPM144-10-100	£149.50
LPM144-25-160	£207.00
LPM144-3-180	£235.75
LPM144-10-180	£235.75

LINEAR PART NUMBERING SYSTEM

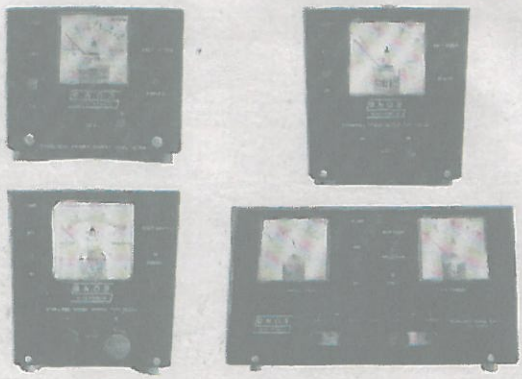
LINEAR / PREAMP / RF METER — LPM144-3-100 — OUTPUT POWER / INPUT POWER / FREQUENCY (BAND)

L144-1-100	£143
L144-3-100	£143
L144-10-100	£120
L144-25-160	£178
L144-3-180	£207
L144-10-180	£207

BNOS 'A' Series Power Supplies

12/6A £52.90
- 13·8V, 6A continuous output
- 7A maximum output current
- 10A current meter
- 10A output terminals
- LED shut down indicator
- Fully protected

12/25A £138.00
- 13·8V, 25A continuous output
- 30A maximum output current
- Large 30A current meter
- 30A output terminals
- LED shut down indicator
- Fully protected



12/12A £95.45
- 13·8V, 12A continuous out
- 15A maximum output curr
- Large 20A current meter
- 15A output terminals
- LED shut down indicator
- Fully protected

12/40A £276.00
- 13·8V, 40A continuous out
- 50A maximum output curr
- Large 50A current meter
- Large output meter
- LED shut down indicator
- LED out of regulation ind
- Output sensing terminals
- Fully protected

Our Guarantee *Our aim is to provide you with high quality products at realistic prices, to give you the best value for your money.*

All products that carry our logo are designed and built by our engineers in the UK and carry a full 12-month guarantee, which includes all parts and labour.

We are so confident that our linears are simply the best that we offer to unit at component cost for up to 5 years from date of purchase. That m repair, calibrate and return to you free of charge.

All other products sold by us carry our standard 12-month guarantee

Available direct or from one of our many UK agents — or come and see us at most rallies and exhibition

BARCLAYCARD VISA

BNOS Electronics (Dept RC) Bigods Hall, Great Dunmow, Essex CM6 3
Telephone (0371) 4677 SAE for further details
PLEASE NOTE NEW ADDRESS AND PHONE NUMBER
All prices include VAT. Postage free on all Mainland UK orders

RADIO COMMUNICATION June 1984

THE 'LPM' RANGE

This sophisticated, but simple to use, range of amplifiers have performance characteristics and extra features previously not available. The linears utilise advanced strip-line techniques coupled with a rugged PA device. The pre-amplifiers use highly regarded MOSFETS and GaAs FET's to give a remarkable improvement to your system's performance. An LED bargraph power meter is incorporated to give a visual indication of output power.

LPM144-1-100
LPM144-3-100
LPM144-10-100
LPM144-25-160
LPM144-3-180

LPM144-10-180
LPM432-1-50
LPM432-3-50
LPM432-10-50
LPM432-10-100

LINEAR PART NUMBERING SYSTEM

LINEAR / PREAMP / RF METER — LPM144-3-100 — OUTPUT POWER / FREQUENCY (BAND) / INPUT POWER

THE 'L' RANGE

To complement the LPM range, the L series, linear only versions, have been introduced for the user who may already be equipped with a good pre-amplifier and power meter. The excellent linear performance is still maintained and both RF VOX and hard-wired changeover are standard.

L144-1-100
L144-3-100
L144-10-100
L144-25-160
L144-3-180

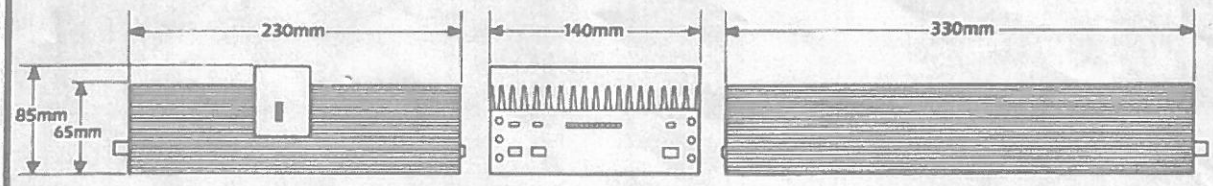
L144-10-180
L432-1-50
L432-3-50
L432-10-50
L432-10-100

2 METRES — LINEAR AMPLIFIER	L&LPM144-1-100	L&LPM144-3-100	L&LPM144-10-100	L&LPM144-25-160	L&LPM144-3-180	L&LPM144-10-180
Frequency Range		144.000MHz to 148.000MHz			144.000MHz to 148.000MHz	
Class Of Operation		Class AB1			Class AB1	
Input Impedance		50ohms unbalanced			50ohms unbalanced	
Minimum Input Power		500mW RMS			500mW RMS	
Maximum Input Power	2W RMS	5W RMS	15W RMS	30W RMS	5W RMS	15W RMS
Recommended Input Power	1W RMS	3W RMS	10W RMS	25W RMS	3W RMS	10W RMS
Output Impedance		50ohms unbalanced			50ohms unbalanced	
Output Power		100W RMS +/- 0.5dB		160W RMS +/- 0.5dB	180W RMS +/- 0.5dB	180W RMS +/- 0.5dB
Insertion Loss (straight through)		1.5dB +/- 0.5dB			1.5dB +/- 0.5dB	
Power Requirements	13.8Vdc, 14A +/- 15%	13.8Vdc, 14A +/- 15%	13.8Vdc, 12A +/- 15%	13.8Vdc, 20A +/- 15%	13.8Vdc, 24A +/- 15%	13.8Vdc, 24A +/- 15%
PRE-AMP (LPM models only)						
Frequency Range		144.000MHz to 148.000MHz			144.000MHz to 148.000MHz	
Receive Gain		12dB typical			12dB typical	
Noise Factor		Better than 1dB			Better than 1dB	
Input Impedance		50ohms			50ohms	
Output Impedance		50ohms			50ohms	
Power Requirements		13.8Vdc, 100mA +/- 15%			13.8Vdc, 100mA +/- 15%	

70 CMS — LINEAR AMPLIFIER	L&LPM432-1-50	L&LPM432-3-50	L&LPM432-10-50		L&LPM432-10-100	
Frequency Range		430.000MHz to 440.000MHz			430.000MHz to 440.000MHz	
Class Of Operation		Class AB1			Class AB1	
Input Impedance		50ohms unbalanced			50ohm unbalanced	
Minimum Input Power		250mW RMS			250mW RMS	
Maximum Input Power	2W RMS	5W RMS	15W RMS		15W RMS	
Recommended Input Power	1W RMS	3W RMS	10W RMS		10W RMS	
Output Impedance		50ohms unbalanced			50ohms unbalanced	
Output Power		50W RMS +/- 0.5dB			100W RMS +/- 0.5dB	
Insertion Loss (straight through)		1.5dB +/- 0.5dB			1.5dB +/- 0.5dB	
Power Requirements	13.8Vdc, 11A +/- 15%	13.8Vdc, 11A +/- 15%	13.8Vdc, 8A +/- 15%		13.8Vdc, 20A +/- 15%	
PRE-AMP (LPM models only)						
Frequency Range		430.000MHz to 440.000MHz			430.000MHz to 440.000MHz	
Receive Gain		12dB typical			12dB typical	
Noise Factor		Better than 1dB			Better than 1dB	
Input Impedance		50ohms			50ohms	
Output Impedance		50ohms			50ohms	
Power Requirements		13.8Vdc, 100mA +/- 15%			13.8Vdc, 100mA +/- 15%	

UHF (SO239) SOCKETS ARE FITTED TO 144MHz MODELS. N TYPE SOCKETS ARE FITTED TO 432MHz MODELS.

IN LINE WITH THIS COMPANY'S POLICY OF CONTINUAL RESEARCH AND DEVELOPMENT, SPECIFICATIONS MAY BE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.



L&LPM144-100W MODELS
L&LPM432-50W MODELS

L&LPM144-160 & 180W MODELS
L&LPM432-100W MODELS

YOUR LOCAL STOCKISTS

Our Guarantee — Our aim is to provide you with high quality products at realistic prices, to give you the best value for your money.
All products that carry our logo are designed and built by our engineers in the UK and carry a full 12-month guarantee, which includes all parts and labour.
We are so confident that our linears are simply the best that we offer to repair your unit at component cost for up to 5 years from date of purchase. That means we will repair, calibrate and return to you free of charge.

E&OE

British Designed and Manufactured

B.N.O.S. ELECTRONICS LIMITED

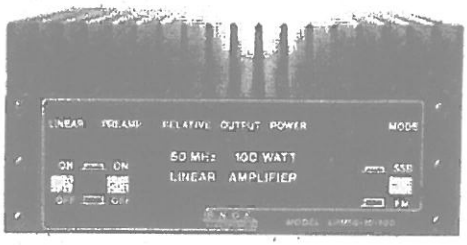
British Technology and Innovation

B.N.O.S. ELECTRONICS + CUE DEE

THE ULTIMATE PARTNERSHIP

With the recent surge in interest in the lower VHF bands the average amateur is looking around for new equipment on these bands. In what promises to be the ultimate partnership BNOS have teamed up with Cue Dee of Sweden to offer the highest quality equipment available anywhere.

BNOS, of course, have always offered a five year guarantee on all our linear amplifiers and the 4m/6m range is no exception. The compact LP models for 6 metres incorporate many of our popular features which offer peace of mind to the user. The LPM models for both bands contain all of our user friendly additions including the power meter and our famous overdrive protection circuits.



	LP50-3-50	LP50-10-50	LPM50-10-100	LPM70-10-100
Frequency Range	50-54MHz	50-54MHz	50-54MHz	70-72MHz
Class of Operation	AB1	AB1	AB1	AB1
Minimum input power	500mW	500mW	500mW	500mW
Maximum input power	5W	15W	15W	15W
Recommended input power	3W	10W	10W	10W
Output impedance	50 ohms	50 ohms	50 ohms	50 ohms
Output Power	50W	50W	100W	100W
Power Requirements	13·8V 6A	13·8V 6A	13·8V 12A	13·8V 12A
Pre-Amp gain (typical)	12dB	12dB	12dB	12dB
Noise Figure (Better than)	1·5dB	1·5dB	1·0dB	1·0dB

As is usual with BNOS products the specifications mean what they say. Power is quoted in RMS and harmonic outputs are kept incredibly low.

Many black boxes produce terrible second and third harmonics and at six metres these harmonics are even more troublesome. The second harmonic of 50 MHz is slap bang in the middle of the broadcast FM band. BNOS's range of low pass filters are designed to remove harmonic problems without cutting out the DX too. Fit a BNOS filter and the next time there's a stateside opening on 6, you can rest assured that the bloke next door can still listen to "The Archers".

Cue Dee are the Aerial world's BNOS. They also can offer a five year guarantee on their products because of the superior construction of their antennae. The aerials are made from the finest Aluminium and tested to Sweden's stringent national regulations.

The Cue Dee Duo is a combined yagi with 5 elements on 4 metres and 6 on 6 metres. The Duo incorporates a factory adjusted gamma match so you don't have to mess about tuning up like with other aerials. The boom is strong 28mm tube with a 1.5mm wall. Each element is a big strong 12mm diameter yet the overall effect of tubular section materials is to reduce wind loading by up to 66% over square section aerials.

With a 5 year guarantee, 6db gain over a dipole on each band and a preset gamma match the Cue Dee Duo – like all Cue Dee Aerials – is a fit and forget product.

BNOS and Cue Dee – The Ultimate Partnership.

Model	Band MHz	Insertion Loss dB	Harmonic 2nd	Rejection 3rd	Non Harmonic Rejection	Power Handling	Connectors
F50-L/U	50	Better than 0·5	50dB	75dB	75dB	250W	UHF
F70-L/U	70	Better than 0·5	50dB	75dB	75dB	250W	UHF
F144-L/U	144	Better than 0·5	50dB	75dB	75dB	250W	UHF
F144-L/N	144	Better than 0·5	50dB	75dB	75dB	250W	N
F432-L/N	432	Better than 0·5	50dB	75dB	75dB	250W	N

Note: Rejection Figures are typical and w.r.t. the wanted signal

6 metre Amps

LP50-3-50 Linear/Preamp	175.00
LP50-10-55 Linear/Preamp	175.00
LPM50-10-100 Linear/Preamp	235.00

4 metre Amps

LPM70-10-100 Linear/Preamp	235.00

CUE DEE Duo Antenna 5 elle on 4m & 6 elle on 6m 6dBd on both bands 129.95

Filters

F50-L/U	29.95
F70-L/U	29.95
F144-L/U	29.95
F144-L/N	35.35
F432-L/N	35.35

Access VISA

B.N.O.S. ELECTRONICS
Mill Lane, Stebbing, Dunmow, Essex, CM6 3SL.
Tel: 0371-86681 Tix: 817763 BNOS G