CBA 1G-150 80 KHZ TO 1 GHZ 150 WATT AMPLIFIER

USER MANUAL

601-287A

TESEQ

Advanced Test Solutions for EMC

CBA 1G-150 80 KHZ TO 1 GHZ 150 WATT AMPLIFIER

USER MANUAL

CONTENTS

1 SAFETY INFORMATION

This apparatus has been designed and tested in accordance with BS EN 61010-1, and has been supplied in a safe condition. This manual contains some information warnings which must be followed to ensure safe operation, and to retain the apparatus in a safe condition.

This apparatus does not incorporate components liable to explode or implode during normal operating conditions.

In normal operating conditions this apparatus does not liberate injurious or poisonous gases.

Sound levels of this apparatus after installation in a rack are below 85 dBA, as required by EN 61010-1. However local regulations may have a lower limit or the system as a whole may exceed the local limit. In this case appropriate action should be taken, ie of use of any protective equipment required by local regulations.

This apparatus is of installation category 2.

This apparatus is capable of delivering harmful levels of radio frequency power. Ensure at all times during operation that the RF output is properly terminated with an adequately rated termination or transducer, and that the cables and connectors attached to the apparatus are in good condition.

The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. The protective action must not be negated by the use of an extension cord without a protective conductor.

The opening of covers or removal of parts is likely to expose live parts.

This apparatus must be disconnected from all voltage sources before it is opened for adjustment, replacement, maintenance or repair.

Make sure that only fuses of the required rated current and of the specified type are used for replacement. The use of makeshift fuses and the short-circuiting of fuse holders is prohibited.

2 INTRODUCTION

2.1 CBA 1G-150 Introduction

The CBA 1G-150 is an amplifier capable of supplying 150 W into a 50 ohm load over the frequency range 80 MHz to 1 GHz, during the course of EMC tests on electrical equipment. The amplifier is designed with sufficient gain such that it may be used with normal output levels of signal sources. A safety interlock on the rear panel is also provided, which will mute the amplifier when grounded.

The unit is powered from a switched mode power supply for high efficiency, high power factor and wide voltage range operation. The unit is air cooled with integral fans, and is protected against faulty cooling by excess temperature sensing.

A front panel indicator is provided to indicate over-temperature. The amplifier is designed for rugged operation into a variety of loads. The amplifier is primarily intended for use as a power source for EMC susceptibility testing, but is also applicable to other systems requiring a wide-band linear amplifier.

This amplifier is designated as 'professional equipment' and should not be operated by untrained staff.

As this product has the capability to generate high levels of RF energy it is not intended for use in a residential environment.

Potential or theoretical hazards.

Threat	Precaution
Exposure of personnel to high RF fields produced by an antenna connected to the output of the amplifier.	Ensure that the antenna is inside a screened enclosure and fit an interlock to the entry door to prevent access while the amplifier is operating.
RF burns caused by contact with the antenna connected to the output of the amplifier.	Ensure that the antenna is inside a screened enclosure and fit an interlock to the entry door to prevent access while the amplifier is operating.
Amplifier self oscillation caused by feedback from un-terminated connectors.	This is an unlikely but theoretical possibility. Always ensure that the amplifier input is terminated either by the system signal generator or by a suitable RF load/attenuator before switching the amplifier on.
Arcing due to high RF voltages present at the output connector.	Always ensure that the output of the amplifier is terminated either by the system antenna or a suitable high power RF load or attenuator.

3 UNPACKING AND INSTALLATION

3.1 Unpacking

The CBA 1G-150 package should contain:

CBA 1G-150, 80 MHz to 1 GHz amplifier
Power cable (UK)
Power cable (USA / Japan)
Power cable (Europe)
Spare fuse T 10 A time delay 20 mm
CBA 1G-150 Operating manual (this document)
Calibration report

If any signs of damage are found, no attempt should be made to install the instrument, which should be returned to Teseq or their agent. If the shipping carton has been damaged, retain the shipping carton and packing material for the carrier's inspection. Check that the equipment is complete as in the packing list above.

3.2 Installation

This instrument must be earthed.

4 OPERATION

4.1 Front panel

Mains switch (on amplifier power unit)
Operating the mains switch will apply power to the amplifier gain stages and fan.

Power indicator (on amplifier power unit)
This indicator will illuminate when the mains switch is turned on, and power is available from the mains.

Standby indicator
With a short circuit applied to the safety interlock connector on the rear panel, this indicator will illuminate and the amplifier gain stages will all be turned off. The fan will continue to operate.

Fault indicator
Should the amplifier be subject to a failing in the cooling system, either by a fan failure, inadequate air supply or excess ambient temperature, this indicator will illuminate and the amplifier gain stages will all be turned off. The action is non-latching, so the gain stages will switch on again when the amplifier has cooled down. No fault indication will be present if the interlock is operated.

RF input (front or rear panel)
The RF input will accept a signal from an RF generator. This input must be within the operating frequency range of the amplifier. An amplitude of up to 0 dBm will be sufficient to saturate the amplifier. Operation outside the specified frequency range should not be attempted, and may subject the amplifier to undue internal stress.

RF output (front or rear panel)
This connector must be suitably terminated at all times during operation. Ensure that the external N type connector, 50 ohm coaxial cable and load are all capable of handling the power available, which may be as much as 250 W. On no account operate the amplifier without a proper termination or with defective cables or connectors. The centre conductor of the RF output represents a severe burn hazard to personnel.

Air inlet
The amplifier and power unit depends upon a free air supply for cooling. Ensure that the front air inlets are not restricted.

4.2 Rear panel

Mains input
The mains input is an IEC 320 (EN 60 320) 16 A type. The cable attached to the mains input must be rated at 16 A to ensure proper operation. The fuse-holder is next to the mains connector. The fuses are 15 A T (time delay).

Safety interlock
This connector may be left open-circuit if no safety interlock is required, or other safety methods are in place. The amplifier will operate satisfactorily. To operate the safety interlock, short-circuit this connector. Current drawn from this connector under short circuit conditions will typically be 2.8 mA.

Fan outlets
The air outlets for the amplifier and power supply units must have unrestricted access for proper operation.

5 SPECIFICATION

The following specification applies over the operational temperature and frequency range unless otherwise stated, and does not include the characteristics of connecting cables.

Frequency range (instantaneous)	80 kHz to 1000 MHz
Rated output power	150 W minimum
Output power at 1 dB gain compression	120 W minimum
Input power for saturation	0 dBm maximum
Maximum input power	10 dBm operating, 15 dBm survival
Gain	52 dB
Third order intercept point	61 dBm
Gain variation with frequency	±2 dB
Harmonics at 120 W output	Better than -20 dBc
Output impedance	50 Ω
Stability	Unconditional
Output VSWR tolerance	Infinity:1
Input VSWR	10 dB minimum (VSWR < 2:1)
RF connector style	Type N female
Safety interlock	50 Ω BNC female s/c to mute 10 mA
USB interface	Optional
EMC and safety	
Conducted and radiated emissions	EN 61326 class A*
Conducted and radiated immunity	EN 61326: 1997 table 1
Mains harmonic currents	EN 61000-3-2
Voltage fluctuations and flicker	EN 61000-3-3
Safety	EN 61010-1

* Note: Radiated emissions will exceed that specified in EN 50081-1 when the amplifier is in normal operation, owing to leakage from the output connector and cable. It is therefore necessary to place the amplifier in a screened cabinet to comply with this specification.

Power	
Supply voltage (single phase)	90-240 Vac (+/-10%)
Supply frequency range	45-63 Hz
Supply power	<1 KVA
Mains connector	IEC C13
Environmental	
Operating temperature range	0 to 40°C, non condensing
Mechanical	
Dimensions	19 inch, 4U case, 400 mm deep
Weight	23 kg

Options (select at time of ordering)

341-736 Bench model with front panel mounted input/output connectors
341-836 Rack mountable with front panel mounted input/output connectors
341-936 Rack mountable with rear panel mounted input/output connectors

Notes

1 The third order intercept point is a nominal value, as its calculation depends upon the power level at which distortion measurements are made.

2 Output VSWR tolerance is specified for excitation within the permitted levels and frequency range.

6 WARRANTY

Hardware

Teseq Limited (the company) warrants its amplifiers to be free from defects in workmanship and materials, under normal use and service, for three years from the date of purchase from the company or its authorised agent.

If a product does not operate as warranted during the warranty period, the company shall, at its option, repair the defective product or part, deliver an equivalent product or part to replace the defective item, or refund the purchase price paid for the defective product. Transportation of the defective product or part to the factory or service centre is to be pre-paid by the customer. All products that are replaced will become the property of the company. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

All information in this manual is given in good faith. However, the company shall not be liable for any loss or damage whatsoever arising from the use of this manual, the product described in it or any errors or omissions in either.

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