RAM Audio®

BUX Series

Professional Power Amplifiers

Manufactured in the EEC by C.E. Studio-2 s.l.
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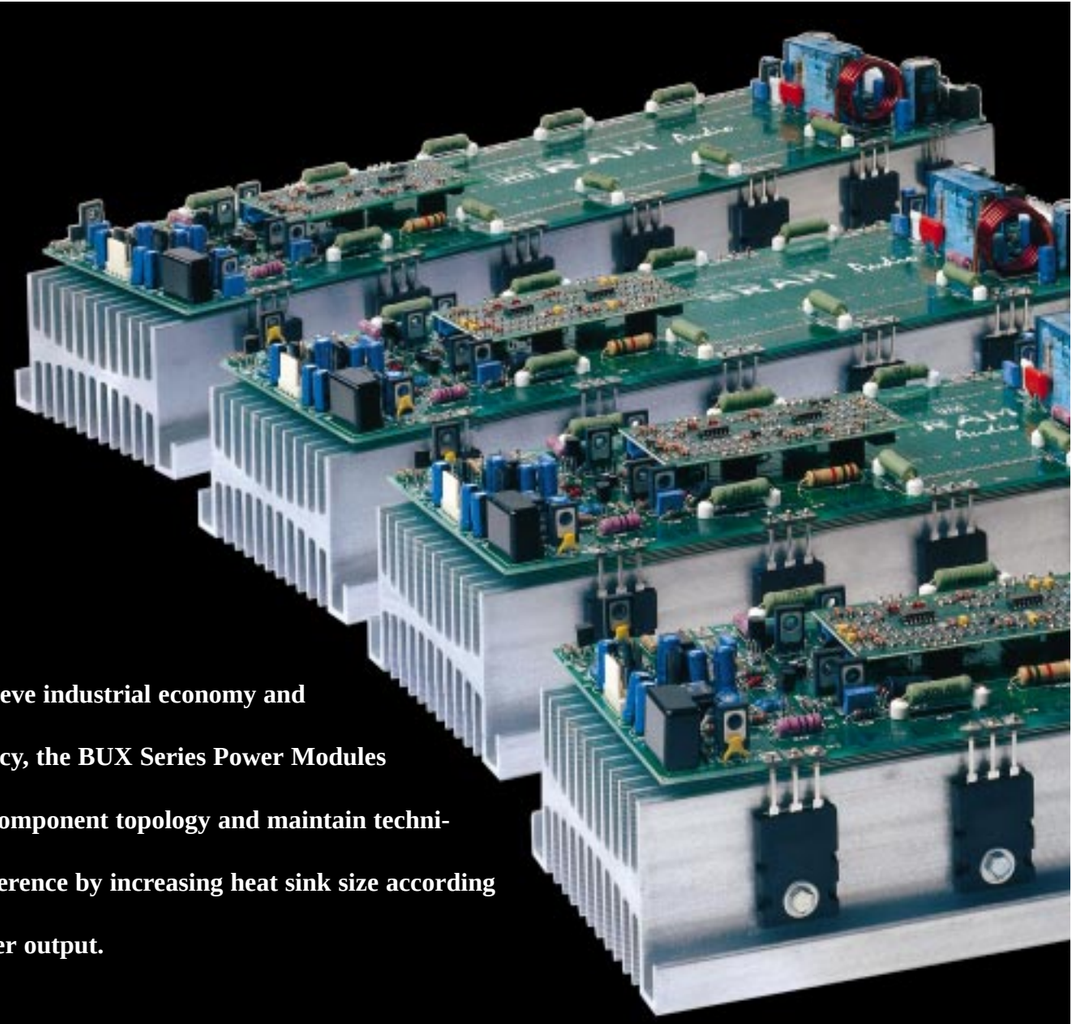
Power amplification at its best means absolutly linear handling of any complex audio signal.

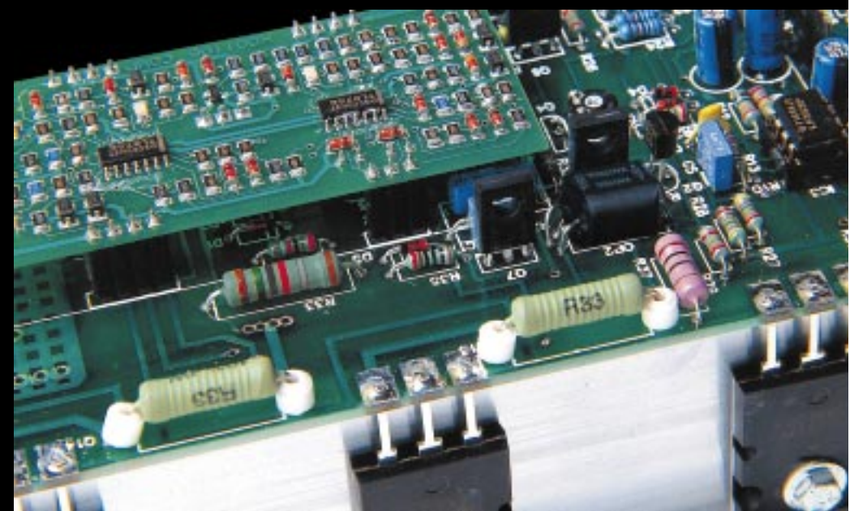
Our BUX Series are unique, powerful amplifiers built to meet the highest professional requirements, thanks to new circuit philosophy that guarentees outstanding performance with field proven reliability.

With these qualities, RAM Audio units outperform most modern amplifiers in terms of technical specs and pure sonic performance.



To achieve industrial economy and efficiency, the BUX Series Power Modules share component topology and maintain technical coherence by increasing heat sink size according to power output.

BUX Series have been designed giving extreme attention to all production steps from the engineering stand point. All boards are naturally double sided platethrough fiberglass. Most advanced SMT circuits are used for overall reliability, ease of assembly and full field servicing.



Features

- 2/3U high, heavy duty steel chassis
- Modular construction for easy servicing
- Symmetrical layout for even weight distribution
- High efficiency toroidal main transformer
- Oversized, high energy, linear power supply
- Dual or bridged operation
- Twin balanced inputs (Neutrik® XLR connectors)
- Dual Speakon and Binding posts outputs
- 41 step detented input attenuators
- High quality components used throughout
- Dual, continuously variable speed axial fans
- Efficient back to front cooling
- Fault, signal, and clip indicators
- Duraluminium, 8 mm thick front-panel
- Unobtrusive carrying handles

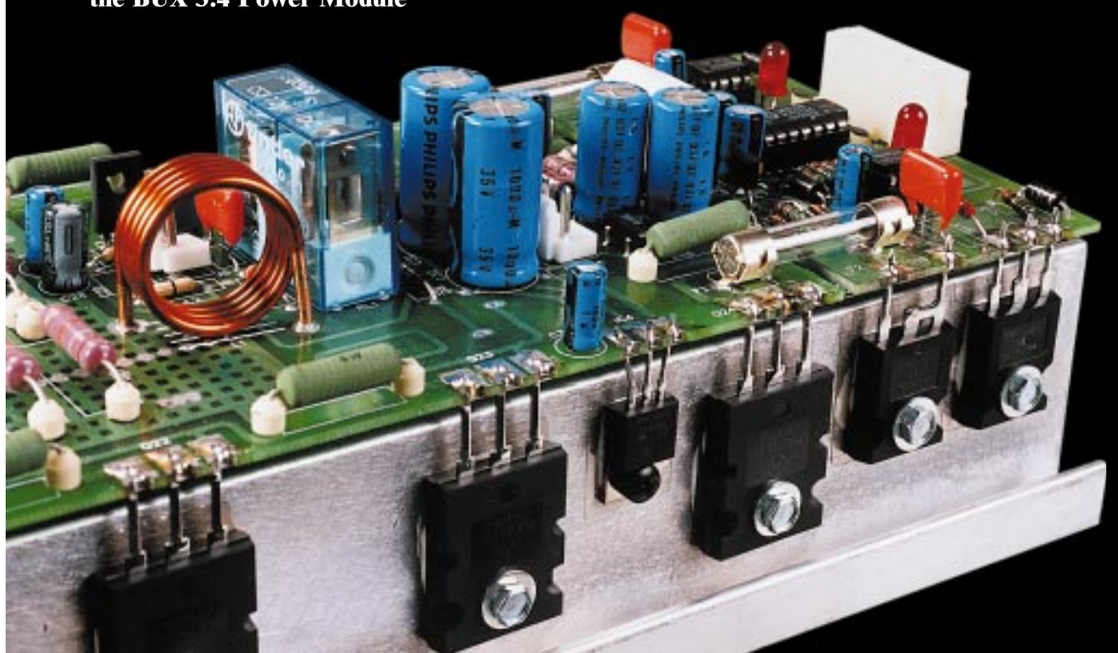
Protections

- Calibrated mains fuse
- Independent channel supply fuses
- Input signal muting at turn on
- Continuous short-circuit protection (CSP™)
- Thermal overload protection
- Inteligent clip-limiter (ICL™)
- Progressive Ramp input signal
- Currentless Relay Operation (CRO™)

BUX Series Rear Panels

BUX Series feature a novel and unparalleled protection developped by RAM Audio that enables the amplifiers to withstand any load short-circuit however long its duration may be. Our CSP™ system protect the amps at low or full power and maintain perfect stability. Furthermore this safety circuit offers perfect output signal with reactive loads throughout the audible frequency range.

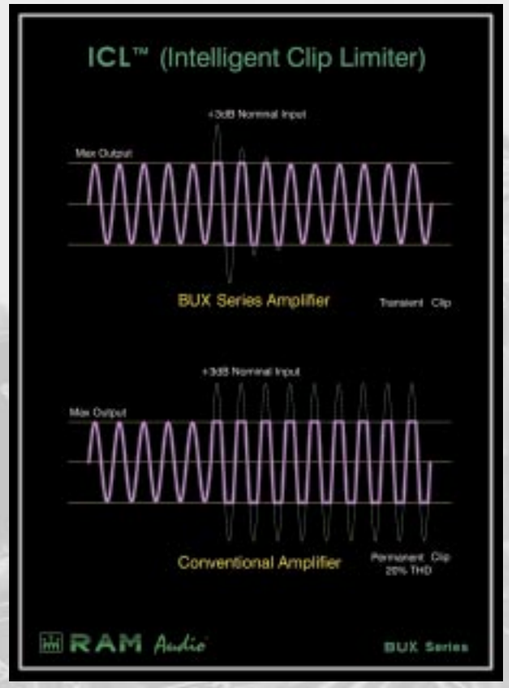
Class H conmutation detail on the BUX 3.4 Power Module



Recessed carrying handles


RAM Audio
BUX 3.4

BUX Series Protection Systems

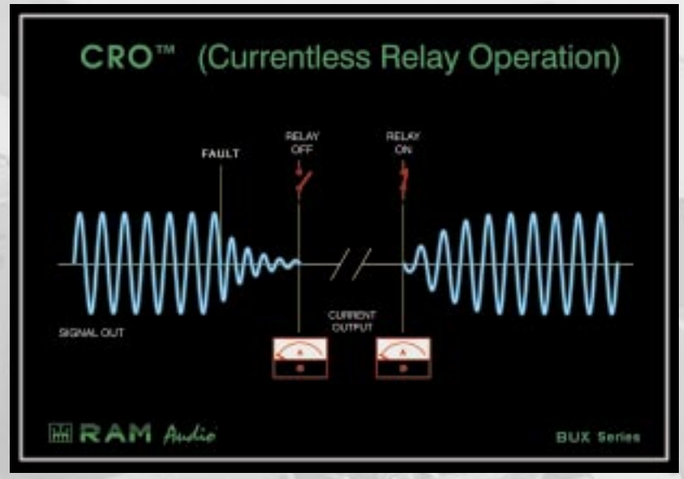


I.C.L.™ - INTELLIGENT CLIP LIMITER:

The RAM Audio ICL is an anticlip system that differentiates from conventional clip reduction systems in its dynamic tracking of the power supply rail values, to provide instant current/voltage demand and thereby eliminating any limiting of the signal dynamics. More like a valve amplifier, RAM Audio's ICL system maintains sonic quality even when the amplifiers have exceeded the threshold of clipping, providing very high dynamics at negligible distortion levels.

Commonly the anticlip systems limit the input signal matching it with a fixed reference. The ICL system varies its threshold reference depending on the status of the output signal and the power supply rails. When the system detects the clipping status, it compares the above mentioned parameters, then changes the input signal amplitude to fit the signal between the supply levels, thus avoiding clipping. This change is made on the basis of two time constants, attack and release, this permits no dynamics loss in the first cycles and avoids the "pumping" effect.

This system avoids effectively continuous clipping situations, even when an excessive signal is applied to the amplifier, and protects the speakers against the high frequency harmonics produced.



C.R.O.™ - CURRENTLESS RELAY OPERATION:

The CRO is a system that protects the amplifier components and avoids transient situations at the speaker outputs when the output relay opens due to an abnormal event (high temperature, short-circuit, etc).

In a conventional amplifier the relay operates with all the signal voltage between its contacts and has to interrupt all the current this voltage produces through the load. This type of operation reduces considerably the relay's life because of the electric arc generated between the contacts. This arc may damage the contacts permanently or at the least, increase the contact resistance, decreasing the damping factor dramatically.

On the other hand, the speakers must be isolated from all the unpredictable situations taking place between the open and closed status of the relay contacts,- which may include the electric arc generation-, to protect them from spurious high frequency signals that may damage them.

RAM Audio has developed the CRO protection system to avoid those dangerous situations. Basically, the CRO anticipates to the opening or closing of the output relay acting on the input signal, muting it, to permit the relay contacts to work always with zero current. If the relay operates, the contacts close first and then the signal is let through. If the relay is going to open, the signal is muted first and then the contacts open. The delay between the signal muting and the contacts opening or closing is negligible and the listener will not notice any evidence of the CRO system working. Additionally The CRO system applies the signal with a ramp envelope to avoid the instantaneous volume increase when the signal is applied to the amplifier as the relay closes.

C.S.P.™ - CONTINUOUS SHORT-CIRCUIT PROTECTION:

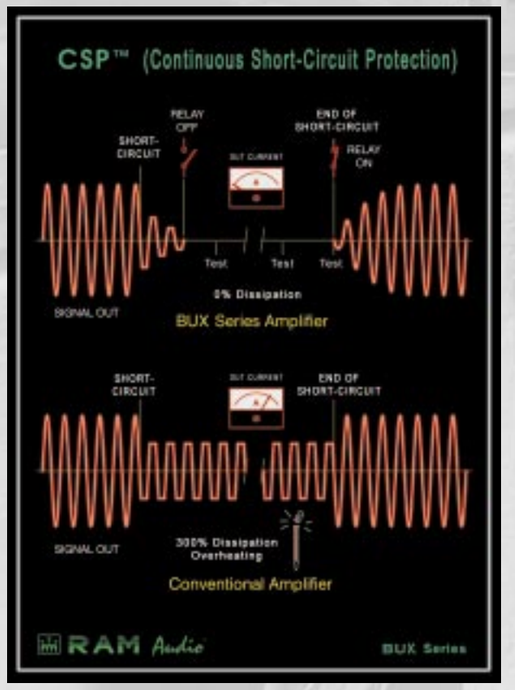
The CSP is not a conventional short-circuit protection at the amplifier's output.

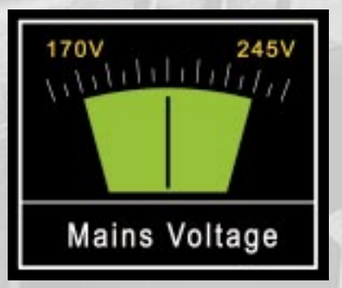
Conventional short-circuit protection systems rely on simple output current limitation where excessive current through the output terminals continues to be conducted through the output devices, causing excessive stress. This may still lead to failure of the output transistors and associated circuitry, depending on the nature and duration of the short-circuit.

Also, conventional current limiting systems find it hard to differentiate between a direct short-circuit across the speaker terminals and high current transients found in normal music operation. The CSP is a sophisticated protection system where the output current is continually monitored and set according to the load impedance, relative to zero ohms impedance. This allows dynamic performance at relatively higher current ratings in the case of music, but much lower current values in the case of a direct short-circuit or excessively low load impedance.

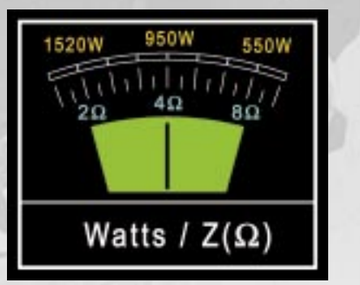
At the onset of current limiting, the CSP circuit activates, opening the output relay which disconnects the excessive load. Every few seconds, the CSP monitors the short-circuit and maintains that situation if the short-circuit condition persists. This cycle repeats until the load returns to the correct value. The CSP system saves the output transistors from the high current stress of short-circuits, and in conjunction with the CRO system, protects the output relays and all the associated circuitry.

This highly sophisticated current limiting system allows improved dynamic sonic performance at higher power levels, and at the same time, provides the amplifiers with a high degree of immunity against continuous short-circuits and mismatched loads.





In many countries, voltage stability is less than optimal. RAM Audio's devices are prepared to withstand voltage drops down to 170V (90V at 120V nominal), in a 230V network. The same applies to peaks up to 245V (128V at 120V nominal).



BUX Series Amps are prepared to work under 2 ohms loads continuously. Some manufacturers also claim this feature. A quick glance to their specs which shows a small increase in the available watts at minimum load, proves the relativity of their statement.

To sum it up, RAM offers outstanding qualities thanks to real to life engineering planning and uncompromising use of customer feed-back. Most amplifiers, irrespective of power rating, have the short-coming that the power supply will not deliver the current and voltage that the signal demands, especially on high power bass transients. This is especially so with highly reactive loads such as a bass-bin approaching resonance. Power supply limiting means that an amplifier's high power rating is academic if the power supply cannot deliver the goods.

Technical Specifications

	BUK-1.0	BUK-1.4	BUK-1.6	BUK-2.0	BUK-2.8	BUK-3.4	BUK-5.0
Output Power							
Continuous Average Power							
RMS, 1kHz, 1.0% THD+N							
@ 2Ω	2x 600 W	2x 900 W	2x 1200 W	2x 1520 W	2x 2200 W	2x 2900 W	2x 3850 W
@ 4Ω	2x 475 W	2x 650 W	2x 750 W	2x 950 W	2x 1400 W	2x 1750 W	2x 2550 W
@ 8Ω	2x 340 W	2x400 W	2x475 W	2x 550 W	2x 760 W	2x 970 W	2x 1380 W
Bridge @ 4Ω	1200 W	1800 W	2400 W	3040 W	4400 W	5800 W	7700 W
Bridge @ 8Ω	950 W	1300 W	1500 W	1900 W	2800 W	3500 W	5100 W
Pink Noise 12dB Crest Factor							
@ 2Ω	2x 1000 W	2x 1300 W	2x 1600 W	2x 1900 W	2x 2750 W	2x 3500 W	2x 5100 W
@ 4Ω	2x 700 W	2x 850 W	2x 1000 W	2x 1200 W	2x 1700 W	2x 2200 W	2x 3070 W
Frequency Response							
Power Bandwidth ±0.25dB	20Hz-20kHz	20Hz-20kHz	20Hz-20kHz	20Hz-20kHz	20Hz-20kHz	20Hz-20kHz	20Hz-20kHz
Phase Response							
@ 1 watt 20Hz-20kHz	±15 deg	±15 deg	±15 deg	±15 deg	±15 deg	±15 deg	±15 deg
Total Harmonic Distortion							
20Hz-20kHz	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%	<0.1%
Intermodulation Distortion							
SMPTE	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%	<0.05%
Crosstalk							
20Hz-20kHz	>75 dB	>75 dB	>75 dB	>75 dB	>75 dB	>75 dB	>75 dB
Voltage Gain	33.1 dB	33.1 dB	33.1 dB	33.1 dB	33.1 dB	33.1 dB	33.1 dB
Sensitivity							
Rated Power @4Ω	0.96 V	1.1 V	1.15 V	1.33 V	1.66 V	1.82 V	2.25 V
Signal-to-Noise Ratio							
A weighted	112 dB	113 dB	113.5 dB	115 dB	116.5 dB	118 dB	120 dB
No weighting	99.5 dB	100.5 dB	101 dB	103 dB	105 dB	106 dB	108 dB
Required AC Mains							
230V/50Hz or 120V/60Hz							
1/8 rated power (230V @4Ω)	3.4 A	4 A	4.5 A	5.3 A	7.5 A	8.5 A	13.7 A
Dimensions							
W x H x D (mm)	483x89x442	483x89x442	483x89x442	483x89x442	483x89x442	483x133x480	483x133x480
W x H x D (inches)	19x3.5x17.4	19x3.5x17.4	19x3.5x17.4	19x3.5x17.4	19x3.5x17.4	19x5.25x18.9	19x5.25x18.9
Weight							
Shipping	16.8-37	19.8-43.7	20.8-45.9	23.3-51.4	21.8-48.1	40.6-89.5	41.3-91.1
Net (Kg-Lbs)	16-35.3	19-41.9	20-44.1	22.5-49.6	21-46	38-83.8	38.7-85.3

Protections

Soft-start, Turn-on Turn-off transients, Muting at turn-on, Over-heating, DC, RF, Short-circuit (CSP), Open or mismatched loads, Overloaded power supply, Input overload (ICL), CRO