

# Hi-Fi magic from A&R





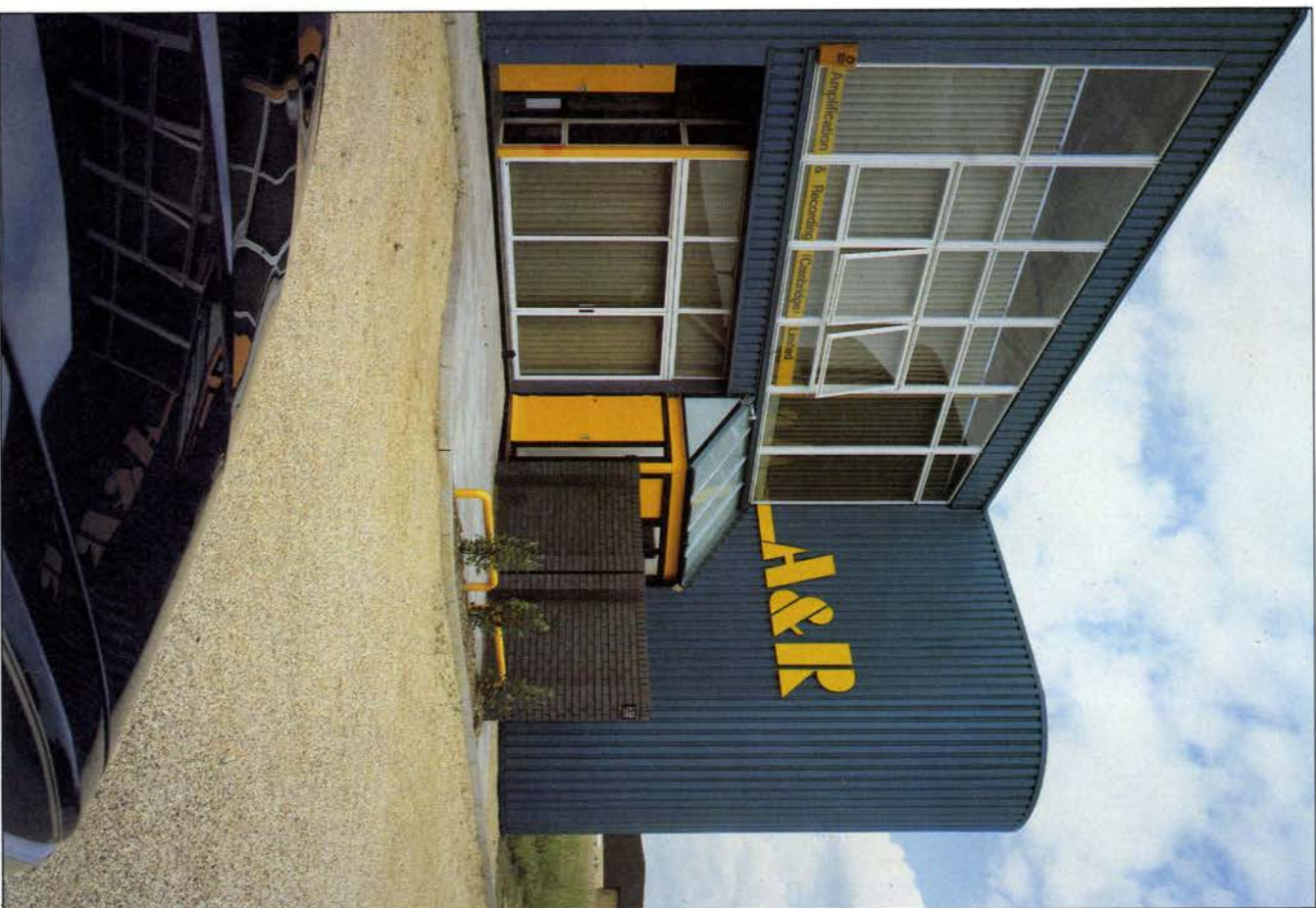
# Introducing A&R

In the mid-1970s there was a very real need in the British audio market for a popularly priced integrated amplifier with high quality performance and trouble free operation. A&R Cambridge was formed to design, produce and market the A60 Integrated Stereo Amplifier that has since established for itself an unparalleled international reputation.

Based on the experiences of designing and manufacturing the A60 amplifier, A&R has extended the product line into a family which includes a Stereo FM Tuner, a separate Stereo Power Amplifier, active electronic cross-over units and a variety of other plug-in options for system optimisation.

A&R has also recently released a second major range of amplifiers, the 200 series. These units are providing the most discerning and demanding audiophiles with equipment to match their highest expectations.

The product range does not end with amplifiers and tuners. A&R also provides a range of high quality moving magnet cartridges. As well as being compatible with all A&R electronics these have, in their own right, proved exceptionally popular over the complete range of magnetic cartridge requirements.





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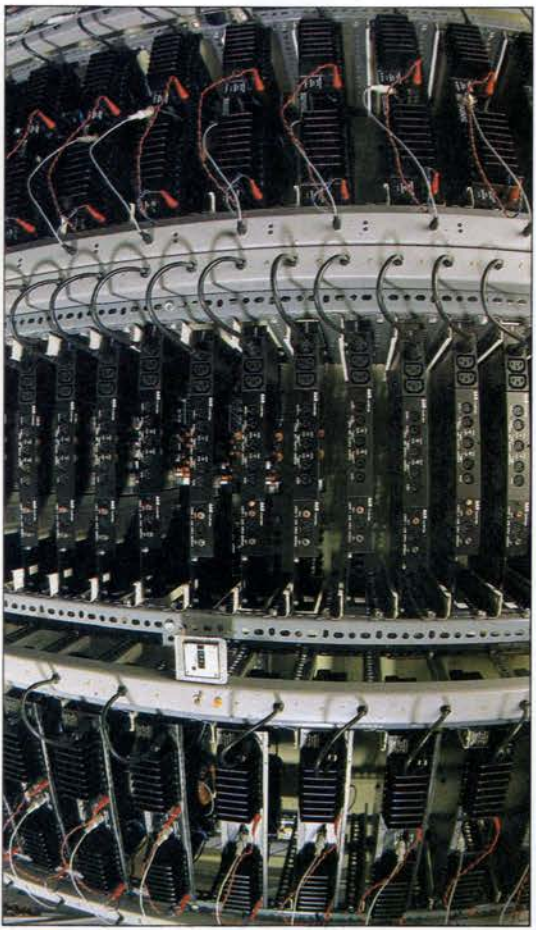
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At A&R we have, over recent years, designed and produced a number of products that have differed from most other top performance audio units in several ways. Through exceptionally careful and considered designs with great attention paid to production standards we have established ourselves in the highly discerning, long term market of quality hi-fi equipment.

We have studiously avoided the ephemeral, gimmicky designs for front panels which are found on many of today's units. A&R equipment has no fussy adornments of highly questionable usefulness but simply a clean, attractive appearance.

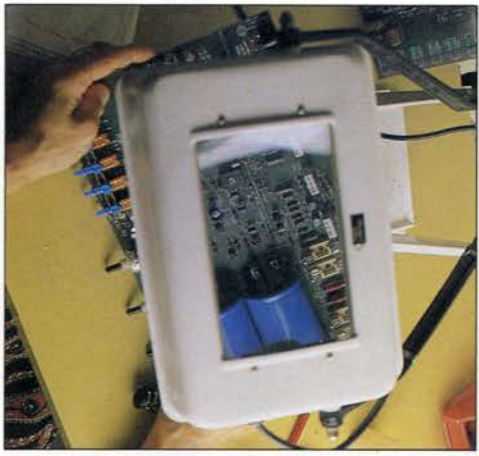
A&R audio designs concentrate on sound performance and reliability, physically presented in ergonomic cases which will stand the test of time. Any feature incorporated in our equipment is completely electronically and sonically justifiable.

Technically our policy is to ensure the highest possible standards in all respects. Our first priority throughout is the quality of the audio output. No amount of technical excellence can, in the end, replace the need for sound performance. In both our A60 series and our 200 series the presentation of audio output is second-to-none.

The internal layouts of our units are the result of much careful research and study. Fibre glass printed circuit boards, with the minimum of wiring, are used for internal stability and for ease of servicing. Circuitry is included, where appropriate, to prevent that annoying and possibly damaging 'thump' in speakers when switching on or off.

Toroidal mains transformers ensure very low internally generated hum levels and a very high transient power capability. All components are operated well within their ratings and each unit is rigorously checked at all stages of production, both for performance and for appearance.

Automatic test equipment is used in the



factory not only to test individual circuit boards but also to carry out thorough pre-delivery inspections of the fully assembled units. All equipment is 'burnt in' for several working days before leaving the factory to ensure that the likelihood of subsequent component failure is reduced to a minimum. A&R's test engineers finally record the major test parameters of each unit and this information is stored in the company files. Our carefully selected dealers are



fully qualified to give detailed information on any aspect of our equipment, its use and its capabilities. The dealer and the customer liaison department at the factory will always be happy to oblige with the latest news of our products and any technical information not fully covered in this brochure. In the very unlikely event of our equipment proving to be faulty, a full after-sales service is provided through our dealer network.





A60 Integrated Amplifier

disc tuner aux tape filter mono

volume

treble

bass

balance

phones

T21 Stereo FM Tuner

1 2 3 4 5 tune

88 92 96 100 104 108

signal strength stereo tuning

frequency

AFC mono

A&K Cambridge

A&K Cambridge



# The A60 Series

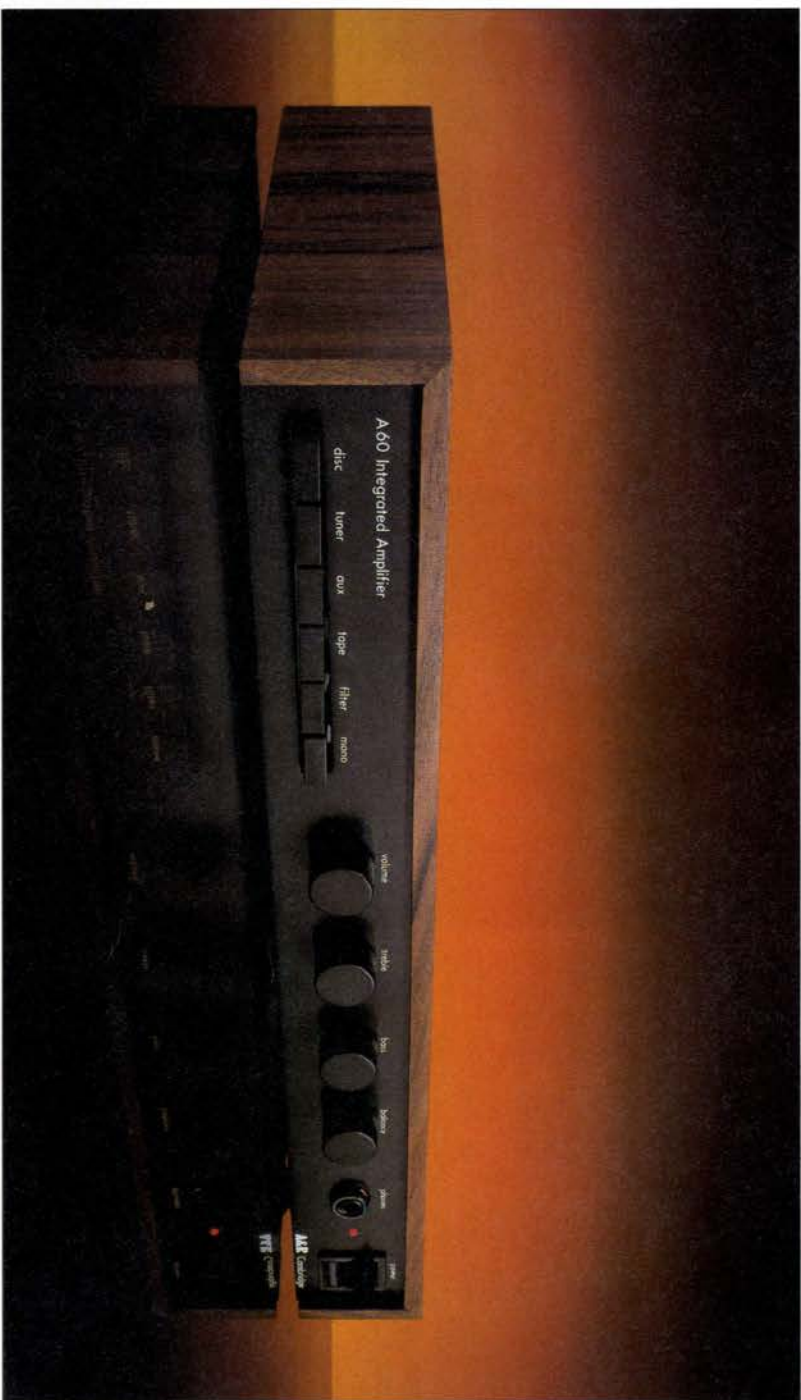
Since its introduction in 1976, the A60 Integrated Stereo Amplifier has achieved tremendous acclaim from customer and reviewer alike. It is now well established in the international market and has truly become the standard by which all other amplifiers are judged.

Success has not brought stagnation and complacency. A continuing and significant research effort has produced refinements in performance. The A60 is now better than ever and continues in its leading role as a low cost audio amplifier providing superb sound quality.

Further equipment has been developed to give maximum flexibility to our customers in their choice of hi-fi systems. Included in the family is the T21 Stereo FM Tuner, already established as a worthy companion to the A60 amplifier. Also now available, based on the A60 circuitry, are a separate power amplifier which can include electronic cross-over units for active loudspeakers and the A60AP, a more flexible integrated amplifier. All the units in the family are matched for use with each other although they can, of course, be used within any good hi-fi system.

The same care that was taken with the technical and audio design has also been taken with the appearance of the series. The units are all finished with the same matt black fascia, knobs and switches. The dimensions are such that in any selected system the units stack neatly together. Their slim style and choice of finishes for the cases - teak, rosewood, walnut or matt black - give the opportunity to blend with any room setting.

Our very popular A60 series gives everything expected in equipment costing far more: high sound quality, attractive and functional styling and, perhaps above all, exceptional reliability.



**The A60 Integrated Stereo Amplifier** The A60 Amplifier delivers unsurpassed sound quality and performs with its legendary reliability. It is presented in a highly attractive but appealingly restrained cabinet that will continue to please for years to come. This equipment is genuinely in a class of its own.

The A60 can accept any magnetic or moving coil cartridge. The cartridge may be optimally matched by the addition of a switchable loading module and, in the case of a low output moving coil cartridge, the internally fitted MC 60 pre-amplifier board.

All the inputs to the A60 have high overload margins so that almost any input source can be accepted without distortion. A switchable high frequency filter is fitted to reduce the noise from

scratches on old records and stereo FM noise on tuners. The bass and treble controls have been designed so that deficiencies in some small speakers and cartridges may be corrected without coloration of the mid-frequency band. All input sockets have high quality silver-plated contacts for minimum noise. The loudspeakers are connected via heavy duty screw terminals which can accept either bare wires or 4mm plugs. Although the speaker sockets are wired directly to the amplifier outputs to obtain the best possible sound quality, switched outputs are also fitted enabling the speakers to be cut out when headphones are plugged in.

Tape recording outputs are provided from both auxiliary and tape sockets, matching the inputs of both cassette and

reel-to-reel recorders. The tape button allows source/tape monitoring of the signal when using a tape recorder with separate record and playback heads, while preset replay level controls are provided so that the A and B levels can be equalised.

The amplifier section of the A60 is designed to ensure distortion-free drive to loudspeakers of moderate to high efficiency in the most demanding of home listening environments. Maximum power is typically 40 watts per channel into 8 ohm speakers. Electronic protection in the power output stages safeguards against any incorrect loads or short circuits. This short term protection is backed by easily replaced output fuses should a fault persist.



The A60 is an extremely well behaved amplifier which works well into all practical loudspeaker loads. If moderately overdriven the sound does not break up but remains clean without undue harshness enabling higher volume levels to be achieved than the power ratings would suggest.

One of the features of this amplifier which gives it its great flexibility as the central unit of a high performance sound system is the option of a universal cartridge loading module. This is switchable, providing a range of set loadings plus an extra position for the user's own customised loading. The module can be fitted very easily as it is simply plugged on to the mother board. A variety of input loads is then instantly available for the optimisation of individual system performance.

Outputs from many moving coil cartridges are too small to drive standard amplifier inputs unaided. To enable A60 owners to upgrade their systems with such low output moving coil cartridges we have allowed for the extra option of our MC 60 internally fitted moving coil pre-amplifier. This too can be easily added at any time and the sensitivity can be dealer adjusted if required. Again, for

optimum results, an extra switchable loading module can be fitted giving the flexibility to match any moving coil cartridge.



MC60 moving coil pre-amplifier

### SA60 and SA60X Power Amplifiers

Using the same power amplifier electronics as the A60, the SA60 is the 'power amp only' member of the family. It is designed to be used with a separate pre-amplifier to provide the basis of a high quality sound system.

The SA60 is extremely versatile because it can accept a variety of plug-in input boards. In particular, two-way electronic cross-over units for active loudspeakers can be supplied. These are designed and produced in collaboration with the appropriate loudspeaker manufacturers and the availability is fully detailed in our price list. With an approved cross-over fitted, the amplifier is then designated the SA60X and together with our A60AP amplifier forms a complete set of low cost high quality electronics for use in an active system.

### A60AP Stereo Amplifier/Pre-amplifier

The specifications and performance of this specialised integrated stereo amplifier are essentially the same as for the basic A60. The main technical difference is that the pre-amplifier outputs and the power amplifier inputs are

brought out to a special 'AP' socket at the rear. (When the supplied shorting plug is placed in this socket, the A60AP is returned to the standard A60 specification.) The auxiliary socket as such is not then available but the auxiliary input is re-routed to the tuner socket and a special lead is available to simplify the external connections. All A60 amplifiers can be upgraded, if required, to the A60AP specification by an approved dealer.

The A60AP was primarily designed to be used in conjunction with our SA60X power amplifier with electronic cross-over to drive two-way active speaker systems. However the 'AP' socket may also be used to interface the unit with external signal processors such as ambisonic decoders, graphic equalisers or extra power amplifiers such as our SA200. The SA200 produces over 100 watts per channel into 8 ohms and provides a simple way to upgrade any A60 based system.

### Accessories

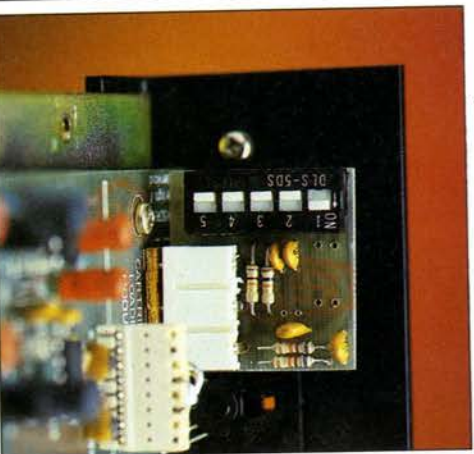
To ensure that any of our amplifiers and hi-fi systems can be set up with as few problems as possible, we supply a range of accessories for all A60 series equipment. They are carefully chosen for their quality, maintaining for our clients an unbroken spectrum of reliability across a complete system.

The audio leads we provide are carefully assembled and fully tested to ensure absolute reliability.

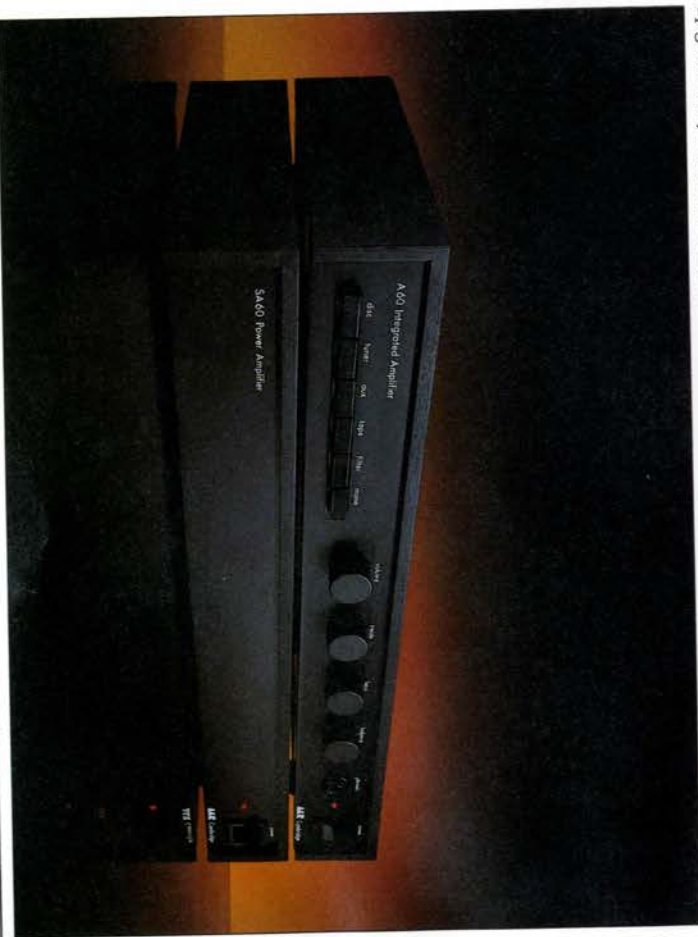
Spare wooden covers are available for the units in a variety of finishes (teak, rosewood, walnut, matt black).

The full range of accessories is shown in our latest price list.

For the earlier production models of the A60 amplifier, prior to serial number 13250 the separate moving coil pre-amplifier HA10 is required before using it with low output moving coil cartridges. This is supplied with the appropriate lead to power it from the A60.



Universal cartridge loading module





## Specifications

All input sensitivities, nominal output levels and noise figures refer to 35W into 8 $\Omega$  at 1kHz. All noise figures are CCIR/ARM weighted. These specifications refer to the complete range of the A60 series, where appropriate, except where stated otherwise.

### Inputs

#### Magnetic Cartridge

Sensitivity 2mV;  
Overload Margin > 38dB 20Hz-20kHz;  
Noise < -70dB;  
Frequency Response better than +0.3 to -0.5dB, 40Hz-20kHz, typically  $\pm 0.2$ dB 70Hz-20kHz, -2.5dB at 20Hz;

Input Impedance 47k $\Omega$  in parallel with 50pF  
Switchable loading module available to provide the following additional loads: 30k $\Omega$ , 8k $\Omega$ , 150pF, 270pF, 370pF and user programmable option.

#### Moving Coil Cartridge (MC 60 board fitted)

Sensitivity 100mV;  
Overload Margin > 38dB at 1kHz;  
Noise < -63dB;

Input Impedance 330 $\Omega$  in parallel with 1000pF  
Switchable loading module available to provide the following additional loads: 100 $\Omega$ , 30 $\Omega$ , 10 $\Omega$ , 100nF and user programmable option.

#### Tuner & Auxiliary

Sensitivity 100mV;  
Overload Margin infinite;  
Noise < -80dB;  
Input Impedance 100k $\Omega$ .

#### Tape

Sensitivity variable via adjustable preset controls  
100mV-10V;  
Noise < -80dB;

Input Impedance 47k $\Omega$ -100k $\Omega$  depending on sensitivity setting

#### Power Amp (A60AP and SA60 only)

Sensitivity 600mV;  
Input Impedance 20k $\Omega$ ;  
Noise < -100dB;  
Gain to Loudspeaker terminals 29dB, phase non-inverting.

#### Power Amp (SA60X)

Input Impedance of cross-over 10k $\Omega$ ;  
Nominal sensitivity 600mV rms

#### Tone Controls

Treble up to  $\pm 12$ dB at 15kHz;  
Bass up to  $\pm 12$ dB at 50Hz;  
High Filter turnover frequency 7.5kHz, slope 12dB/octave, Bessel (linear phase) characteristic.

## Outputs

### Tape

Nominal output level 100mV or same as Tuner or Aux input;

Output Impedance 5k $\Omega$ ;

Tape monitor switch allows instant A/B monitoring.

### Auxiliary (A60 only)

Nominal output level as Tape output;

Output Impedance 100k $\Omega$

### Pre-amp (A60AP only)

Nominal output level 600mV;

Maximum output before clipping 1.8V rms;

Noise < -80dB;

Distortion at nominal output level < 0.03%

20Hz-20kHz;

Output Impedance 500 $\Omega$ ;

### Cross-over (SA60X only)

Filtered bass and treble, left channel -

Nominal output level 600mV;

Noise < -85dB;

Distortion at nominal output level < 0.01%

20Hz-20kHz;

Output Impedance 500 $\Omega$

(Filtered bass and treble, right channel internally fed through power amplifier section).

### Headphones

Nominal output level (no load) 6.5V rms;  
Output Impedance 130 $\Omega$ ;

Suitable for headphones of 8 $\Omega$ -2k $\Omega$  impedance.

### Loudspeakers

Nominal output level 35W into 8 $\Omega$  at 1kHz;

Low frequency damping factor > 50.

### Performance

#### Power Output & Distortion

Both channels into 8 $\Omega$  > 35W at 0.2% THD

20Hz-20kHz;

1kHz output at 0.2% THD into 8 $\Omega$ ;

40W (both channels driven);

47W (one channel driven);

IHF burst power into 8 $\Omega$  typically 55W (4 $\Omega$  typically 90W)

1kHz THD < 0.08% at any level up to 35W/8 $\Omega$ ;

typically < 0.05% at 35W

#### Frequency Response

Disc see input facilities;

Other inputs 20Hz-20kHz +0.5-1dB reference 1kHz;

Output falls continuously beyond these limits.

#### Crosstalk

< -50dB at 1kHz

### Protection

Short term: delayed V-1 electronic protection.  
Long term: 1.6A 20 $\times$ 5srm quick-blow fuses

### Power Supply

Maximum Load 120VA;

Mains Voltage 240V nominal, range 190-255 volts.

May be dealer adjusted to 120V nominal, range 95-128 volts;

or 220V nominal, range 175-235 volts

Operation at below the nominal mains voltage will produce a corresponding reduction in the maximum output power

### Dimensions

Width: 450mm (17 $\frac{3}{4}$ in)

Depth: 250mm (9 $\frac{7}{8}$ in)

Height: 60mm (2 $\frac{3}{8}$ in)

### Weights

A60 & A60AP:

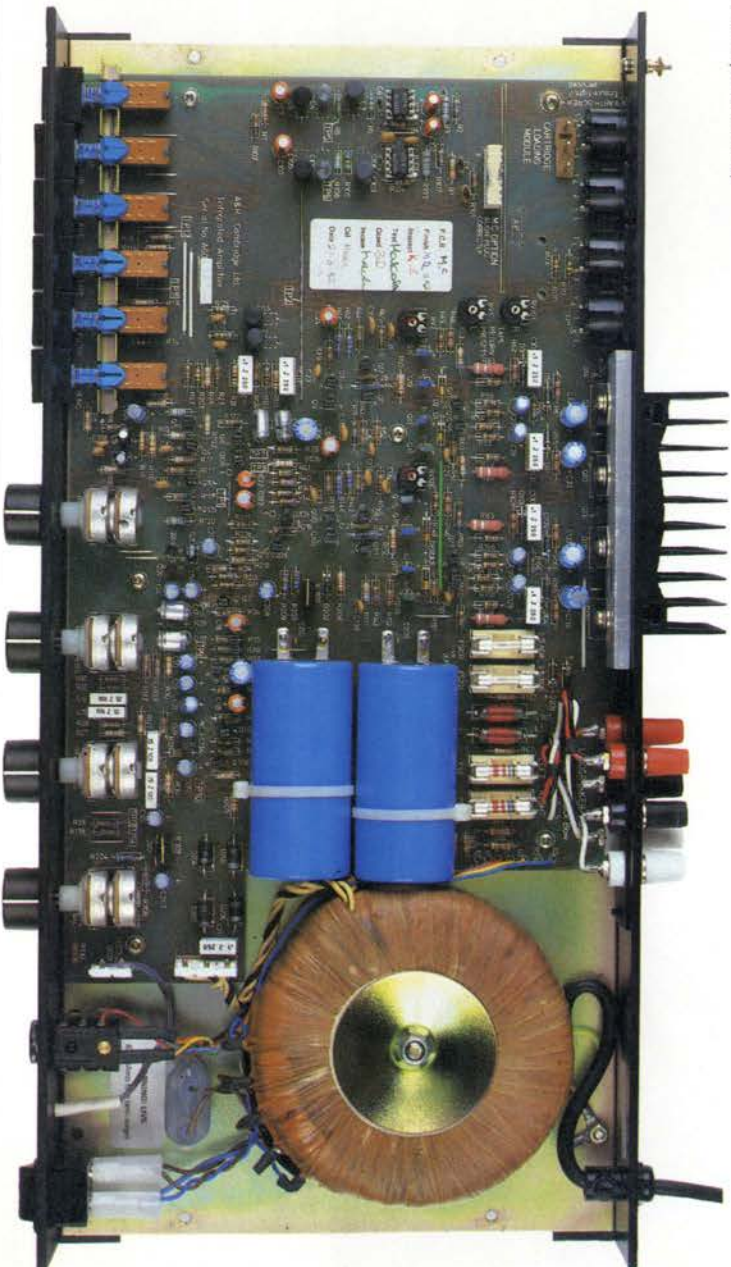
Net 4.8kg (10.6lb)

Packed 5.6kg (12.3lb)

SA60 & SA60X:

Net 4.5kg (9.9lb)

Packed 5.3kg (11.7lb)





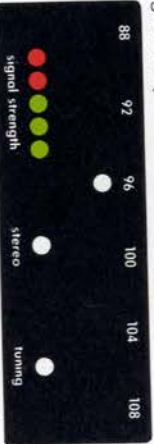
# The T21 Stereo FM Tuner



The qualities of the A60 amplifier series demand a tuner that is a complete partner. The T21 is that partner, an ideal match in looks, performance and price.

With no moving pointer tuning scale the T21 has instead a row of light emitting diodes (LEDs) spaced at precise 1MHz intervals. These light up to produce an accurate and unusual tuning indicator. Which LED on the scale lights up depends on the signal frequency to

which the tuner is currently set. As the tuning knob is turned the LED that is on gradually fades out as the next one along



the scale fades in. Careful matching of the components at the production stages ensures that it is possible for this scale

to be used to a precision of typically 0.2MHz.

The signal strength meter is a row of



five LEDs, two red and three green. With the first two red LEDs on, the signal strength is sufficient for good mono

reception; the stereo signal-to-noise ratio is adequate when the first green one lights up; the strongest and best stereo signal is indicated when all five LEDs are on.

The tuning indicator is a further row of three LEDs: red-green-red. The two red LEDs on either side indicate the frequency direction of any tuning error; correct tuning is shown when only the green one is on.



Also included in the tuning window is a single red LED as a stereo beacon.

Tuning can be carried out by either the manual tuning control or one of the five preset push buttons. Full station search with continuously variable tuning is provided by the rotary knob which has a pleasant and useful flywheel action.

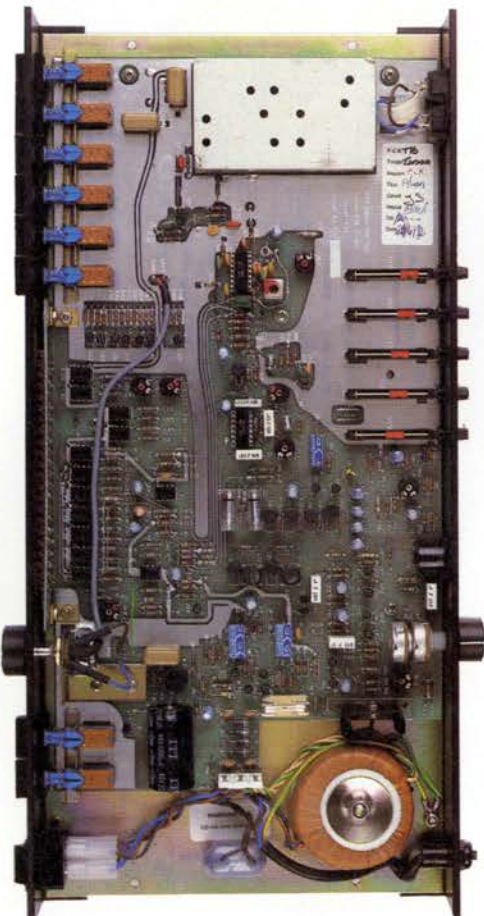
For the more frequently used stations each of the five buttons can be individually preset with the controls at the rear of the tuner. A mute facility is provided to remove background noise between the stations. To ensure that a station, once selected, remains accurately tuned in, an AFC (automatic frequency control) is fitted.

The T21 can be used with any amplifier, including, of course, the A60 itself. A level control knob on the rear of the tuner allows unwelcome variation in the output volume between the tuner and, say, a record deck to be equalised. Thus only minimal adjustment of the amplifier's volume control is ever needed. Both 75 ohm and 300 ohm balanced aerial sockets are provided.

together with their matching plugs, allowing easy connection to all standard FM aerial systems.

Great care has been taken in the design of the sound circuitry of the T21 to produce an unusually flat frequency response over the critical listening bandwidth. A 'birdie' filter, fitted before the stereo decoder, considerably reduces the unpleasant whistles ('birdies') caused by closely positioned stereo broadcasts. It also compensates for phase errors in previous stages which would otherwise add to distortion and crosstalk. A highly efficient multiplex filter removes the 19 and 38kHz high frequency tones produced by the stereo decoder circuitry, preventing damage to loudspeakers and interference with the bias oscillator in a tape recorder.

Overall, our design and production standards have been carefully maintained with the T21 tuner. We believe it is the perfect complement to our range of high performance, value-for-money sound equipment.



## Specifications

### Tuning

**Tuning Scale**  
21 matched red LEDs in steps of 1MHz, a gradual changeover in light intensity between adjacent LEDs allows frequency readings of typically 0.2MHz to be achieved. Range of tuner and scale 87.5-108.5MHz.

### Signal Strength Meter

Bar graph scale using 5 LEDs, 2 red and 3 green.

### Tuning Meter

3 LEDs, red-green-red.

### Stereo Beacon

Single red LED.

### Aerial Inputs

Sockets for 75 and 300Ω aeriels.

### Performance

Sensitivity (IHF) typically 1.3μV\*  
-3dB limiting point typically 1.0μV\*.

Capture Ratio 1.5dB  
Alternate Channel Selectivity better than 60dB.  
Repeat Spot Suppression better than 80dB

IF Rejection better than 80dB  
AM Suppression better than 50dB (reference 75kHz deviation, 30% AM at 400Hz, aerial signal 10μV-10mV).

Ultimate Signal-to-noise Ratio (CCIR/ARM weighted)  
Mono better than 70dB  
Stereo better than 68dB

Pilot Tone Suppression better than -50dB\*  
Subcarrier Suppression better than -40dB\*

Distortion (THD), 1kHz-

Mono better than 0.15%, typically 0.08%+

Stereo better than 0.25%, typically 0.15%+

Channel Separation >40dB+

Frequency Response 20Hz-12kHz ±0.5dB, typically

-3dB at 15kHz.

Channel Balance within ±1dB.

Output Level continuously variable 10mV-1V at full deviation.

Output Impedance <1kΩ.

Recommended Load >10kΩ.

\*95MHz, reference 75kHz deviation, 75Ω input

+95MHz, reference 22.5kHz deviation at 1kHz.

### Power Supply

200-250V AC, 6VA maximum.

100-120V AC version to special order.

### Dimensions

Width: 450mm (17 3/4in)

Depth: 240mm (9 1/2in)

Height: 60mm (2 3/8in)

### Weights

Net 3.3kg (7.3lb)

Packed 4.0kg (8.8lb)



Your approved A&R Dealer is:



# A&R Cambridge

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