SAGE AUDIO MODULES

Les Sage has been making some very immodest claims about his new 100W amplifier modules. Ian Pitt connects a couple of them up to see if the claims are justified.

You may not have heard of Sage Audio but the man behind the company should be familiar to all regular readers of ETI. Les Sage was the author of the series Designing Transistor Stages which appeared in the November and December 1985 issues and in February 1986.

Since writing that series Les has set up in business and brought out his first two products, a pair of 100W amplifier modules called the Superamp and the SuperMOS. The Superamp is an all-bipolar design while the SuperMOS is similar but has a MOSFET output stage. Both are said to offer very high levels of performance combined with ease of use and high efficiency.

Les Sage claims the modules will out-perform any other amplifier modules on the market and says the SuperMOS is particularly good. He believes it offers at least a ten-fold improvement over its competitors.

The internal circuit of the modules has not been disclosed but the data sheet includes a block diagram and the operating principles are described in general terms. The most notable features are a Class A output stage and the use of very low levels of feedback derived from nested loops. The output stage is fully-complementary and uses four bipolar or MOSFET transistors with very high transition frequencies. This arrangement is said to contribute greatly to the performance, combining high current capability, very high slew rate and an efficiency of around 70%, far higher than is normal for Class A amplifiers.

According to Sage's product literature, the modules have been designed so that high-quality audio systems can be constructed as simply as possible. To this end they contain all the circuitry of an audio power amplifier and the only additional items required are a dual-rail supply, a case and a signal feed from a suitable preamplifier.

Internal overload and short-circuit protection is provided and the heatsinking fins can comfortably dissipate the heat developed during domestic operation. Additional heatsinking may be required when the modules are to be used for sustained periods at high powers, as might be the case in a club or a disco.

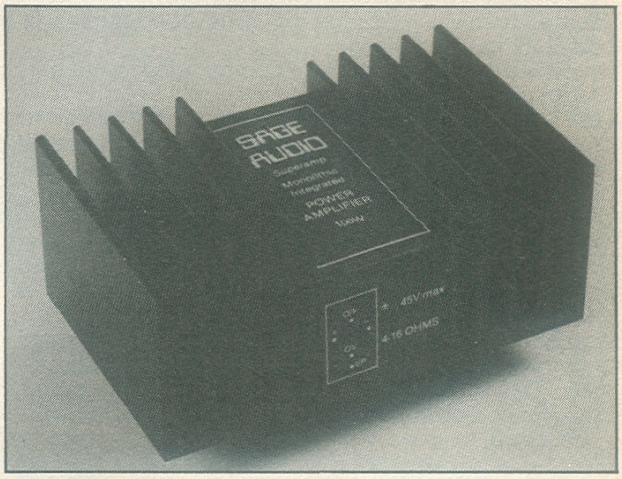
Gathering No MOSFETs

Both modules have already been launched onto the market but the SuperMOS has been suspended temporarily. Les Sage told us he is having difficulty obtaining MOSFET output transistors which are up to standard and consistent from sample to sample. For this reason the modules reviewed here are the bipolar version, the Superamp.

The modules consist of a black-anodised aluminium heatsink with a central well containing the circuitry. Black encapsulating resin covers the well, hiding the Superamp's circuitry from prying eyes, and a piece of paper stuck over the resin carries information on the pin connections, maximum voltage ratings, etc. The lead-outs protrude from the back of the module and the positive supply lead is coloured red to reduce the risk of confusion. Four nuts and bolts are provided to secure the module in place.

A considerable amount of information is provided, including a suggested layout, advice on wiring and earthing, some simple circuits to test various aspects of the amplifier's performance and a list of specifications. A suitable power supply circuit is given and the accompanying text suggests sources for some of the components and even lists the supplier's order codes. There is a paper template to help you drill the right pattern of holes for the module's lead-outs.

The recommended power supply circuit is a simple dual-rail unregulated design using two capacitors and a



bridge rectifier for each channel. Sage claims the modules have a differential input stage with balanced impedances and says this gives a very high power supply ripple-rejection ratio. However, the best results will only be obtained when the modules are fed from a source impedance which balances out the internal feedback loop impedance, in this case a figure somewhere below 1k0. Sage recommends using a preamplifier with an output impedance of 600R, and suggests that the power supply should be stabilised if significantly higher source impedances are to be used.

Transforming The Sound

Certain decisions have to be made before ancillary components can be purchased. The main one concerns the choice of mains transformer. Since this is likely to be the largest item in the amplifier it will also play a part in determining the size of case needed.

If the full output power of the modules is not needed, a low voltage, low VA rating transformer can be used instead of the specified type. The notes supplied with the modules list suitable DC supply voltages and the AC transformer output voltages which will provide them,