

The printed circuit board component layout, wiring and copper foil master are detailed in Fig.12. Again, combined or separate heatsinks must be fitted to the integrated circuit's metal tabs. The p.c.b. is obtainable from the *EPE PCB Service*, code 348 (Twin TDA22003).

## HEATSINKS

A large area metal heatsink is required for the TDA2003 (Fig.9 and Fig.11). Because the device incorporates overload protection, the actual size is not too critical (the i.c. will shut down when it begins to overheat), but sustained high output will only be developed if the heatsink is adequate. At the very least use 40sq. cm (6.5sq. in.) of 16s.w.g. aluminium per chip, or fit a proprietary heatsink with a thermal resistance not greater than 7°C per watt.

The i.c.s are arranged on the p.c.b. (see Fig.10 and Fig.12) so that they can be bolted to the back of a metal case by their metal tabs. A 50mm x 150mm x 200mm (2in. x 6in. x 8in.) aluminium box would be more than adequate as a heatsink. Insulating washers are not required, but a smear of heat transfer compound should be applied.

## COMPONENTS

Slight differences in the i.c. type numbers can cause confusion. The LM386N-1 has the lowest power rating of this group of devices. The suffixes "N-3" and "N-4" indicate devices rated at 700mW and 1W respectively. The suffix "M" indicates surface mounting. Suppliers offering the

LM386 are usually referring to the N-1 version.

The TDA7052 is sometimes given the suffix "A". This indicates that the chip contains a d.c. volume control and is *not* suitable for the circuit described here.

Some suppliers give the LM380 the suffix "14" to indicate the 2.5W 14-pin version, and the suffix "8" for the 8-pin 600mW alternative. When ordering, make it clear that the 14-pin chip is required.

The suffix "P" or "V" is sometimes added by suppliers to the TDA2003 to indicate that it is for vertical, and "H" for horizontal, mounting. There is no electrical difference, but the p.c.b.s illustrated here have been designed for vertical chips.

## CONSTRUCTION

All the amplifiers covered in this part are assembled on printed circuit boards and construction is reasonably straightforward. The use of an i.c. holder will permit the substitution and checking of the low power amplifiers. However, if reliance is to be placed on the p.c.b. foil for minimal heatsinking of the LM380, the device should be soldered directly in place. Solder pins, inserted at the lead-out points, will simplify off-board wiring.

It may help to start construction of the chosen circuit board by first placing and soldering the i.c. holder

on the p.c.b. to act as an "orientation" guide. This should be followed by the lead-off solder pins, and then the smallest components (resistors) working up to the largest, electrolytic capacitors and presets. Finally, the lead-off wires (including the screened input cable), off-board Volume control and loudspeaker should be attached to the p.c.b.

On completion, check the board for poor soldered joints or bridged tracks. Check the orientation of the electrolytic capacitors and the i.c.(s).

If using a mains power supply, make sure the voltage delivered does not exceed the safe working voltage of the amplifier for the load impedance being used.

If all is in order, connect the power supply and check the quiescent current consumption. Inject a signal and re-check the current drain and supply voltage.

### Next Month: Transistor preamplifiers

