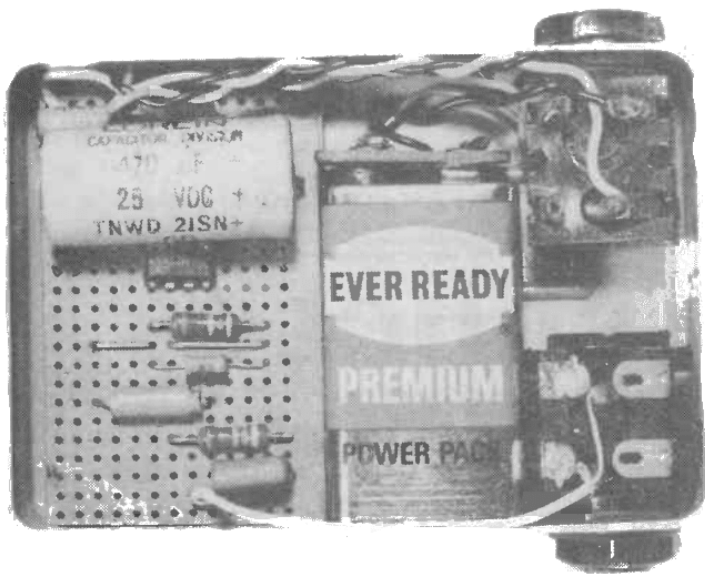


# GUITAR HEADPHONE AMPLIFIER

M. G. Argent

This little amplifier allows guitar practice and tuning up without disturbing others.



The component parts of the prototype amplifier fit snugly into a small plastic case

The amplifier to be described is a very useful unit which enables the electric guitar player to practice without outside disturbance. It is particularly valuable when tuning up in a dressing room while another band or group is playing live on stage. Using the guitar under such conditions would otherwise be virtually impossible.

## THE CIRCUIT

The circuit, which appears in Fig. 1, employs an MC1306P integrated circuit, which will give an output in excess of the headphone requirements.

The input from the guitar passes via C1 and R1 to pin 6 of IC1. The gain and frequency response are determined by R2, C2 and C3. The output of IC1 appears at its pin 3, and this is applied to the output jack via C5. C4 and R3 form a Zobel network which counteracts the inductive properties of the headphones and aids stability.

Both the input and output jack sockets are standard  $\frac{1}{4}$  in. types. The output jack socket has a contact which makes when the headphone plug is inserted. This contact switches on the amplifier and saves an on-off switch. However, an ordinary jack socket can be used, if desired, and a normal on-off switch fitted. There is no volume control, as the guitar will have its own control built-in. The headphones may have any

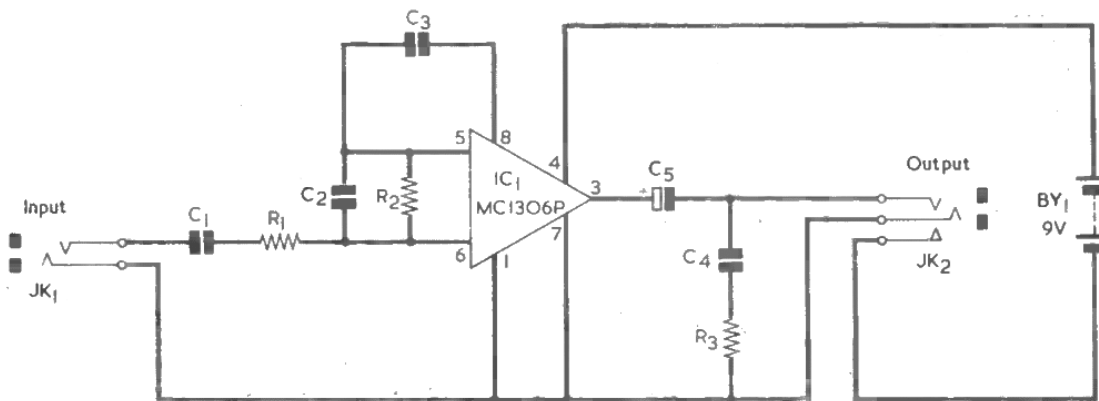


Fig. 1. The most important component in the guitar amplifier is the integrated circuit type MC1306P. This provides all the amplification required

impedance provided this is not lower than  $8\Omega$ . When using the amplifier for the first time keep the guitar volume low initially. With sensitive low impedance phones the volume level could be high, as the i.c. is capable of developing 500mW in an  $8\Omega$  load.

The integrated circuit is available from Chromasonic Electronics, 56 Fortis Green Road, Muswell Hill, London N10 3HN. Standard  $\frac{1}{4}$ in. jack sockets having two "make" contacts (of which only one is required here) may be obtained from Home Radio (Components) Ltd.

The amplifier can be powered by a PP3 or PP3-P battery, the latter having a longer life. Quiescent current consumption is approximately 4mA.

## COMPONENTS

### Resistors

(All  $\frac{1}{4}$  watt 10%)

- R1 47k $\Omega$
- R2 470k $\Omega$
- R3 10 $\Omega$

### Capacitors

- C1 0.1 $\mu$ F plastic foil
- C2 47pF ceramic tubular
- C3 0.047 $\mu$ F plastic foil
- C4 0.047 $\mu$ F plastic foil
- C5 470 $\mu$ F electrolytic, 10 V. Wkg.

### Integrated Circuit

IC1 MC1306P

### Sockets

- JK1  $\frac{1}{4}$ in. jack socket
- JK2  $\frac{1}{4}$ in. jack socket with "make" contact (see text)

### Battery

BY1 9 volt battery type PP3 or PP3-P (Ever Ready)

### Miscellaneous

- Veroboard, 0.1in. matrix
- Battery connector
- Plastic or wooden case

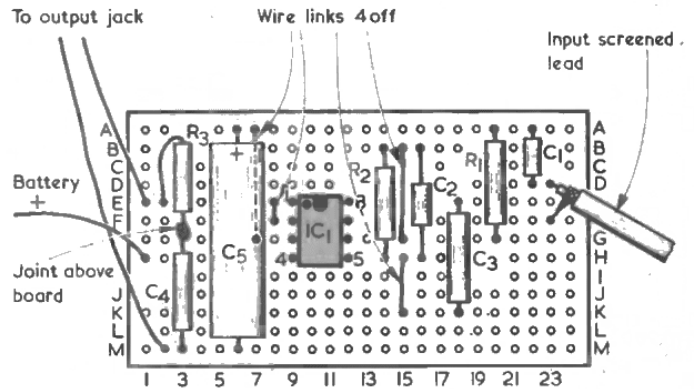
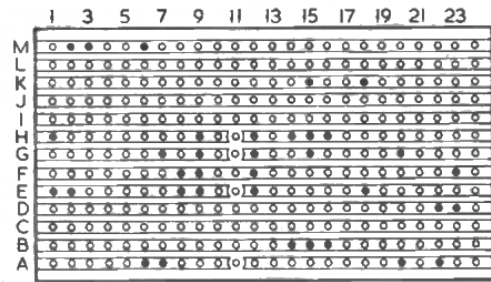


Fig. 2. The copper and component sides of the Veroboard panel on which the amplifier is assembled

## VEROBOARD LAYOUT

Apart from the two jack sockets, the components are assembled on a piece of 0.1in. matrix Veroboard having 13 strips by 24 holes. The component and copper sides of this board are illustrated in Fig. 2. The strips are cut at four points, as indicated in the diagram, by means of a Vero spot face cutter or a small twist drill.

When fitting components to the board, ensure that IC1 and C5 are installed the correct way round. Assembly will be eased if C5 is the last component to be fitted. The junction of R3 and C4 consists of a solder joint above the board; this junction does not connect to any of the copper strips.

The input lead consists of screened wire, the braiding of which connects to the "sleeve" contact of JK1 whilst the centre wire connects to the "tip" contact. The lead from hole M2 connects to the "tip" contact of JK2, and the lead from E1 connects to the "sleeve" contact of this socket. A lead from the "make" contact of JK2 then connects to the negative terminal of the battery.

The amplifier may be housed in any small plastic or wooden case of suitable size. The author's unit fitted comfortably in a small plastic soap dish with lid, this measuring approximately  $3\frac{1}{2}$  by  $2\frac{1}{2}$  by  $1\frac{1}{2}$ in. deep. The layout can be seen in the accompanying photograph, which also illustrates the types of jack socket employed. JK2 is the socket alongside the battery connector. The Veroboard panel fits snugly across the width of the plastic case, and a piece of foam plastic glued to the inside of the lid holds the battery in place when the lid is fitted.