

ELECTRONICS TODAY

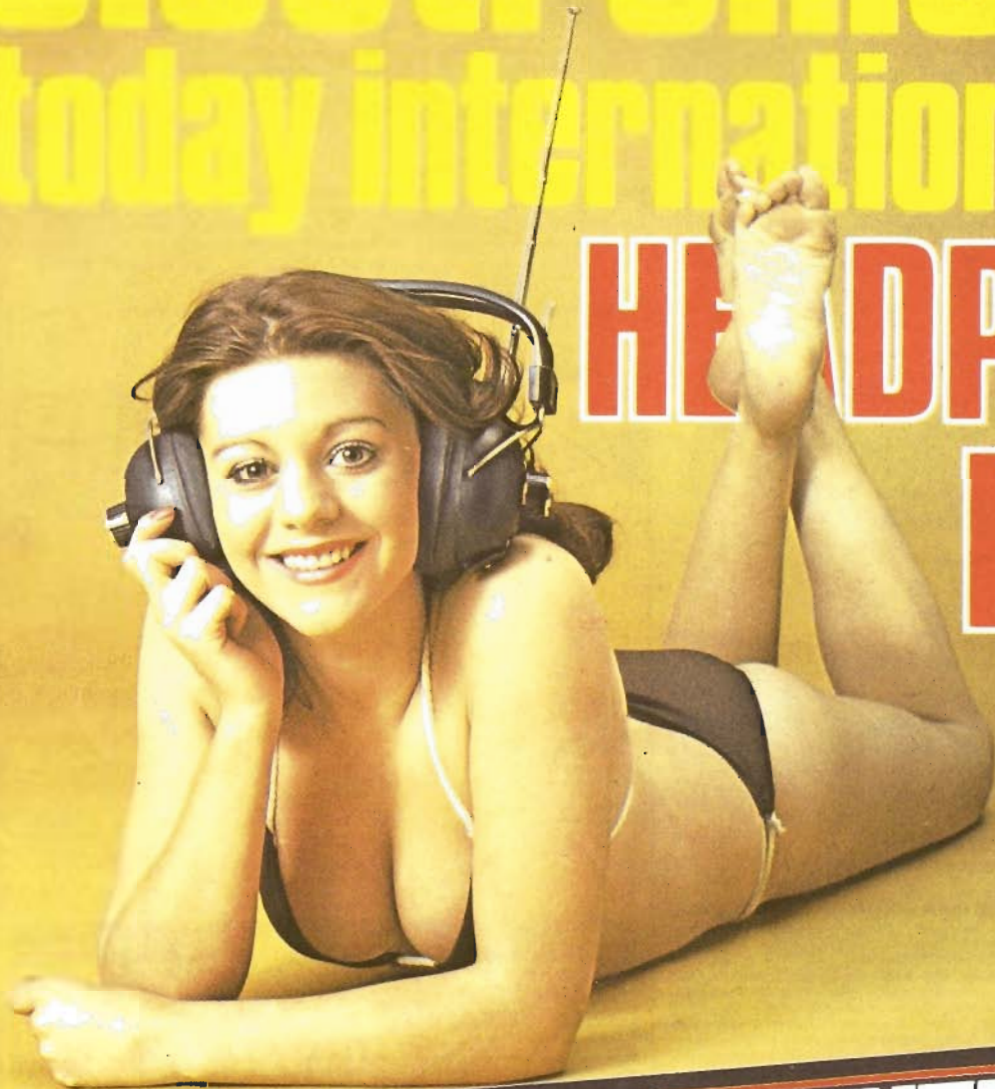
# electronics today international

AUGUST 1976

30p

SOUTH AFRICA 60c  
CANADA \$1

## HEADPHONE RADIO



**LOW  
COST  
VDU**

**TO BARGAIN MONTH IN ETI**

# HEADPHONE RADIO

**ed project**



WHILST IT MIGHT BE argued by some of our readers (and our competitors!) that this project is merely a cheap trick to boost sales by giving us an attractive (well isn't it?) cover, we think that the 251 headphones radio stands on its own merits as a good but simple project. It was designed simply because it seemed like a fun project which readers would enjoy building, and it was also a good trick to boost sales by giving us an attractive cover. (You bought it, didn't you?)

With summer upon us already people have taken up such worthwhile pursuits as sunbathing, walking in the park, or slaving over a hot soldering iron conjuring up projects like this one. It is only natural, in this solid state age, to grasp for one's personal pocket radio as one exits into the summer sunshine, in order to do whatever it is one intends to do, to music. The trouble is, a lot of people believe that transistor radios are unnatural devices, especially when efficiently radiating a watt or so into the air around their earhole.

## SPOT THE . . .

This project then, is dedicated to those electronic ecologists who regard noise as pollution and who, in order that their fellow men (and women!) shall not suffer are willing to walk about looking completely loony with this contraption on their heads. On, then to the project itself.

In the interests of keeping the cost down, and the designer sane, it was decided not to include facilities for FM stereo reception in the 251. Consequently, the circuit is (ridiculously?) simple, using our old friend the ZN414, and we were going to use another well-known chip, the MFC4000B for audio output except that it's gone the way of all silicon, and so we used what the man in the shop gave us instead, an MC1306P. This is quite a nice little device which will deliver

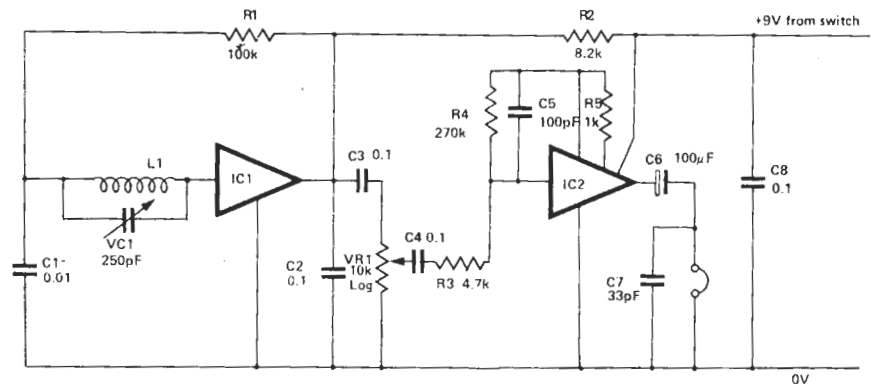


Fig. 1. Circuit diagram.

$\frac{1}{2}$  a watt for around 3mV input. Great, we said, and off we went, with a hey-ho, the ZN414 and the MC1306P, to buy a pair of headphones. We got ours from the local branch of a large photographic/hi-fi chain, called D'x'ns, and very cheap they were too. The assistant couldn't understand why we didn't want to buy the model XYZ1001 $\frac{3}{4}$ s with volume and tone controls plus built-in cocktail cabin-

et and binoculars, but we explained that we were mad electronics enthusiasts with journalistic aspirations, so he stopped the sales talk and humoured us.

Virtually any pair of 'orrible 'eadphones will do, and obviously the size will vary enormously so that we have only given a generalized PCB layout as the PCB may have to be smaller or larger to suit your phones.

## CONSTRUCTION

Construction is straightforward, with virtually all components mounting on the board except for the loudspeakers, on-off switch, and the 9V battery which we mounted together in the other earpiece. This meant that we had to replace the cable in the headband, with a three-core type, to carry +9V, speaker connection and earth/common. The speakers were wired in series since we didn't know how the MC1306P would like a 4 ohm load and didn't want to find out the hard way! Of course, if you want to try it . . .

The ZN414 is a 3-terminal TRF radio which suffers from one major bugbear: instability. If R2 is too low it will take off like a bat out of \*&%+, whistling as it goes. If you do have a problem with instability, try increasing R2, and this may cure it. On the other hand, if you have a particularly docile 414, it could need just that little extra bit of oomph that a 6.8k for R2 might give it.

Apart from that, the only piece of advice is don't wear the things in public or you'll have a lot of explaining to do! Incidentally, these things are great for doing that old trick of getting people to put them on and then . . .

### PARTS LIST – ETI 251

|     |         |
|-----|---------|
| R1  | 100k    |
| R2  | 8.2k    |
| R3  | 4.7k    |
| R4  | 270k    |
| R5  | 1k      |
| VR1 | 10k log |
|     |         |
| C1  | 0.01pF  |
| C2  | 0.1pF   |
| C3  | 0.1pF   |
| C4  | 0.1pF   |
| C5  | 100pF   |
| C6  | 100μF   |
| C7  | 33pF    |
| C8  | 0.1pF   |
|     |         |
| IC1 | ZN414   |
| IC2 | MC1306P |

L1 80 turns close-wound  
32swg enamelled wire on  
42 x 9mm ferrite rod  
VC1 250pF (Home Radio  
type TP4 is suitable)  
PCB ETI 251 Knobs, switch,  
9V battery (PP3), etc..

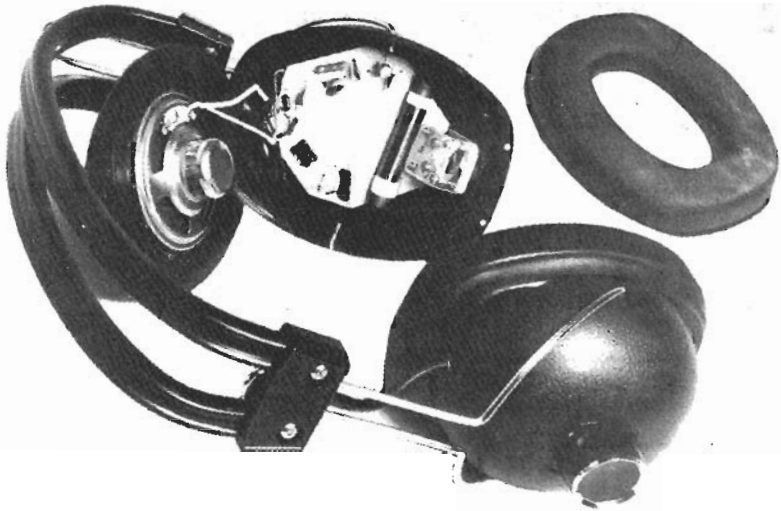


Fig. 2. Printed circuit board (full size),

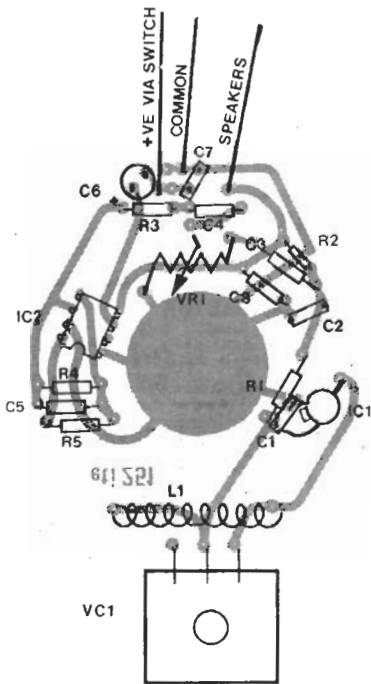
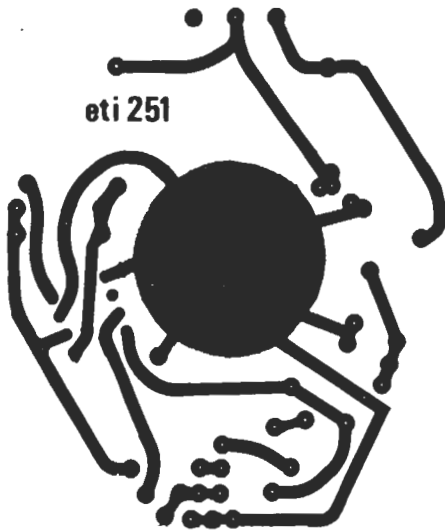


Fig. 3. Component overlay.