

the variable resistance. It sounds like the ganged pot(s) you have used are not what they seem. We would suggest disconnecting the pot and checking the linearity of both halves with a multimeter. If the operation seems suspicious try acquiring one from a different source.

If the pot checks out OK, have a careful inspection of the whole integrator phase shifting network. But we're most suspicious of that pot!

Playmaster 60/60

I have a problem with setting the quiescent current in the left channel of the Playmaster 60/60 amplifier kit, which I purchased from Jaycar last year. The quiescent current in the right channel can be set satisfactorily.

The $\pm 50V$ and $\pm 15V$ power supply was perfect, and when the 560Ω resistors were installed in place of the fuses in the left channel, the voltage across these resistors could be adjusted up to about 9V. But after any further adjustment of VR1 the voltage began to oscillate violently. In time the mean voltage across these resistors would creep upwards.

I cannot find any short circuit between collector and emitter, or any short to heatsink on Q13 — Q16. The 560Ω resistor in the left channel does become warm.

In experimenting with this problem I have swapped Q9, 10, 11, 12, 13, 15 between channels, but I still cannot set the left channel quiescent current.

The only difference after these changes is that when the 560Ω resistors are installed across the fuses in the left channel, the voltage across this resistor can be adjusted to 5-9V, and then it goes to 50V with a minute further adjustment of VR1. This happens when the set is relatively cold.

Also with VR1 in the left channel set fully anticlockwise, the voltage across the 560Ω resistor slowly increases up to 5-9V, and then shoots to 50V. This occurs over about 10 to 15 minutes with VR1 still in the full anticlockwise position.

Other differences I have noted are that the $8.2k\Omega$ resistor in parallel with the 0.012 capacitor in the collector circuit of Q10 gets very warm. The voltage across it is 65V and the resistor has developed a brown mark, as though it is overheating. This occurs in both channels. Checking the resistor while in circuit indicates it has the correct value.

Also I am confused about the orientation of some of the transistors depicted

in the circuit diagram. For transistors Q9, 10 and 11 the diagram shows a round hole in the face of the transistor with ECB written under the three legs left to right.

I understand this to mean that when you look at the transistor and you see a round hole in the face of it, then the right hand terminal is the base. When checking this by a low ohm resistance scale measuring between the base and the emitter or collector, I believe you should get either a high or low resistance reading at both emitter and collector terminals, depending on the polarity of the base lead. This does not happen with the above orientation. It only occurs if you interpret the terminals as being BCE left to right.

The transistors Q9, 10, 11 supplied with my kit have a round hole in a shiny metallic insert on one side, and the hole on the other side opens into a three leafed clover arrangement, with three round indents outside this hole. I have installed these transistors as BCE left to right when looking at the round hole in the shiny insert. If this is wrong, I have been consistently wrong in both channels, and therefore why will only the right channel work.

I have checked solder tracks and that components are in the right place.

Can you please offer some advice on what I should check next. (I.S., Concord NSW)

• From your letter it sounds as if your amplifier is suffering from thermal instability and/or supersonic oscillation.

The Playmaster 60/60 follow-up article in EA May 1987 may help in tracking down the cause. Reprints of this are available from our office at a cost of \$4.

When measuring the voltage of B-E junctions around the circuit, the quiescent current (voltage across the 560Ω resistor) should not change. This effect may be due to a faulty multimeter (unlikely) or perhaps again supersonic oscillation.

Finding transistor orientation is helped with the following rule. They are shown from the bottom (MJ15003 etc), or looking from the front (BF470 etc). The front being the plastic face with the identification numbers. It seems you have them the correct way around.

Finally, recheck your component orientation paying particular attention to the diode polarities. You may also find the other voltages shown on the circuit some help in leading you to the faulty area. EA