

Alternative Mains-bridge Energising Circuits

MODIFICATIONS TO THE NOVEL C/R BRIDGE

By F. W. Austin

CERTAIN readers have found difficulty in obtaining a suitable mains transformer for use with the *Novel C/R Bridge*, described in the January, 1955, issue of this journal. There may also be others who are interested and would like to know of alternative arrangements for energising the bridge.

The principal difficulty appears to be the additional 50 volts/50 mA. winding, which is commonly used on mains-energised bridges in general. This difficulty

Transformers "In Reverse"

This will entail the use of a transformer in reverse (in other words, making use of a low-impedance secondary winding as a "primary" input source, whilst using the original primary as a "secondary" for energising the bridge). In making our choice for this purpose there is a certain latitude permissible, but an L.S. Output Transformer and a Television Frame Output Transformer, have both been found entirely suitable.

"Tapping" the Input

Fig. 2 shows the most convenient and practical means of employing this method with such transformers. The resistor marked simply "R" in the circuit can be a 20 ohms variable component as usually employed for volume control purposes on low-impedance extension speakers. This resistor is adjusted until a voltage of between 30 and 35 volts A.C. is obtained across the 2 K ratio arms.

If the constructor wishes to try this arrangement out before incorporation in the bridge, great care must be taken to ensure that the output from the transformer has 3,000 ohms load shunted across it before taking any measurements. Unloaded transformers employed in this manner are capable of delivering quite a nasty shock unless one is fully prepared. The shunt loads the transformer and limits the output to reasonable proportions.

When the correct voltage has been secured, the resistor "R" may be replaced by a fixed component equal to the value of "R" remaining in circuit. It may even be dispensed with entirely if the voltage output stipulated is not exceeded. One Frame Output Transformer tried by the author needed no limiter for the input and delivered approximately 26 volts across the ratio arms. This was found quite adequate for operating the bridge on all ranges.

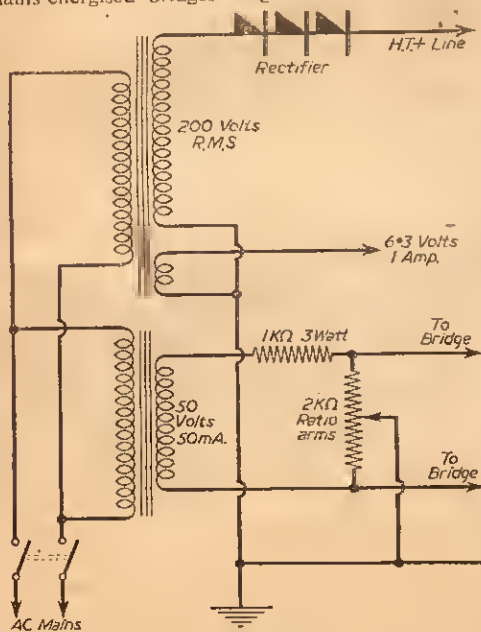


Fig. 1.—Direct substitution (separate transformer).

was foreseen at the time of constructing the original model and different methods were tried out with varying success, but it must be appreciated by all readers that a mains-driven bridge could hardly be presented at the outset in any other than approved and conventional style.

The problem has now been thoroughly explored and certain recommendations can be made.

Direct Substitution

The simplest and most satisfactory course is to employ a *separate* transformer with mains input, supplying the 50 volts/50 mA. from the secondary winding as shown in Fig. 1.

Voltage "Step-up" Method

If we cannot obtain the separate transformer as above, we must discover how such a voltage can be obtained by other means. If the 6.3 volts winding of our mains transformer can be "stepped-up" we have a most excellent alternative.

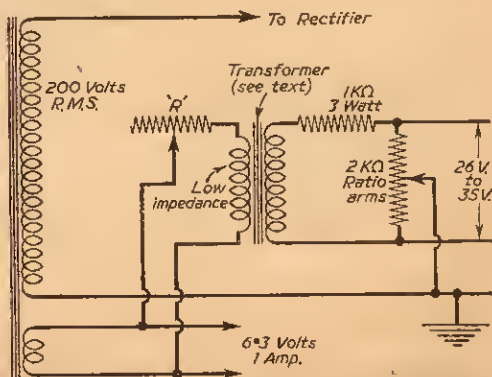


Fig. 2.—Alternative arrangement using transformers "in reverse" (see text).