



## BONANZA BOARD

# BASS BOOSTER

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**F**OLLOWING the recent series of *Bonanza Board* projects (March and April 1966) we are presenting here an additional project, based on BB1, to provide bass boost to an existing audio amplifier. Two methods may be employed and suggestions are made to suit low impedance and high impedance inputs.

Whichever method is selected, the unit should be housed in a metal box with the box connected to the "earth" of the main amplifier. This is conveniently arranged by using a coaxial output socket, whereby the screen is used as the earthing connection.

Reference is made to the article, "Simple Pre-amplifier", on page 182 of the March 1966 issue, since this is the basic unit used. The printed circuit board used is the same; the components are mounted on it according to the layout diagram given on page 183 with additional components as reproduced in this article.

### SIMPLE BASS BOOST

Fig. 1 below shows the circuit of the pre-amplifier with two feedback capacitors C6 and C7 added. Different values of capacitor may be used for different degrees of bass boost; if only a small amount of boost is required C6 could be  $0.005 \mu\text{F}$  and C7 should be omitted. A larger degree of boost is achieved when C6 is  $0.01 \mu\text{F}$  and C7 (also  $0.01 \mu\text{F}$ ) is inserted. The bass can be boosted further by doubling these values so that C6 and C7 are  $0.02 \mu\text{F}$  each.

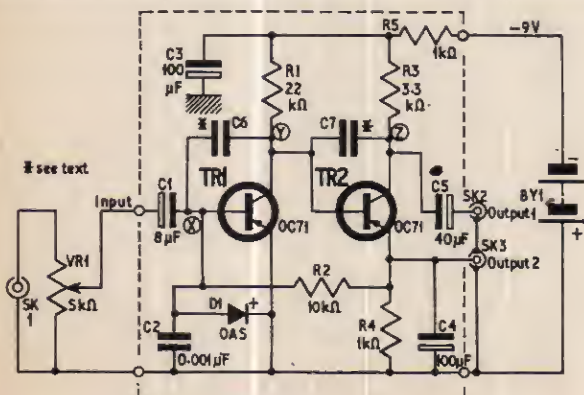


Fig. 1. Circuit diagram of the pre-amplifier modified to form a bass booster

### STEPPED CONTROL

It may be preferable to fit switched variable bass boost control. Here the circuit is basically the same, but C6 and C7 are replaced by the network shown in Fig. 2. This is easily made up on a two-pole, six-way rotary wafer switch S1 and connected to the pre-amplifier at points (X), (Y), and (Z). Figs. 1 and 5 show the appropriate positions.

Provision can be made for the unit to be switched in and out of use at the flick of a switch. Fig. 3 shows how this is done; S2 provides this function and also acts as an on/off switch for the pre-amplifier battery.

To reduce noise generation, TR1 (and TR2 if necessary) can be replaced by low noise transistors such as AC107. This modification may be desired by hi fi users but for most purposes the OC71 is quite satisfactory. Resistors R1, R2, and R3 may be replaced if desired by low noise or high stability types.

Component values in Fig. 3 are selected according to the type of input and output to which the unit is to be matched. High impedance signal sources such as crystal microphones or ceramic pick-ups would require a high impedance input network on the booster. Conversely, low impedance signal sources such as dynamic microphone or pick-up would require a low impedance network.

The values of the output components are similarly important. For feeding another transistor amplifier of

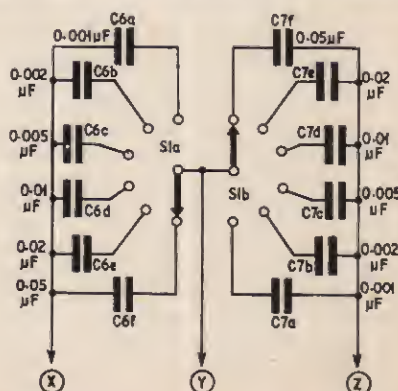


Fig. 2. Capacitors C6 and C7 can be replaced by a stepped control connected to (X), (Y), (Z) on the pre-amplifier

# COMPONENTS...

## Resistors

R1 22k $\Omega$  R5 1k $\Omega$   
 R2 10k $\Omega$  R6 } see text  
 R3 3.3k $\Omega$  R7 }  
 R4 1k $\Omega$  R8 }  
 All 10%  $\frac{1}{4}$  watt carbon

## Potentiometers

VR1, VR2 see text

## Transistors

TR1, TR2 OC71 (2 off)

## Diode

D1 OA5

## Capacitors

C1 8 $\mu$ F elect. 15V  
 C2 0.001 $\mu$ F polyester  
 C3 100 $\mu$ F elect. 15V  
 C4 100 $\mu$ F elect. 15V  
 C5 40 $\mu$ F elect. 12V  
 C6, C7 (see text)

In the stepped "bass booster" circuit, C6 and C7 is replaced by:

C6a, C7a 0.001 $\mu$ F }  
 C6b, C7b 0.002 $\mu$ F } Ceramic or  
 C6c, C7c 0.005 $\mu$ F } mica, 2  
 C6d, C7d 0.01  $\mu$ F } off each value  
 C6e, C7e 0.02  $\mu$ F }  
 C6f, C7f 0.05  $\mu$ F }

## Battery

BY1 9 volt light duty

## Switches

S1 2-pole 6 way wafer  
 S2 2-pole changeover toggle switch

## Plugs and sockets

PL1 and SK1 coaxial for the input  
 PL2 and SK2 coaxial for the output

## Miscellaneous

Printed circuit board 2in  $\times$  2in  
 Battery connectors and p.v.c. wire

low impedance input low values are required. For feeding into a high impedance valve amplifier high values would be used. Table 1 shows suggested values. Some experimenting might be necessary to achieve a more perfect match.

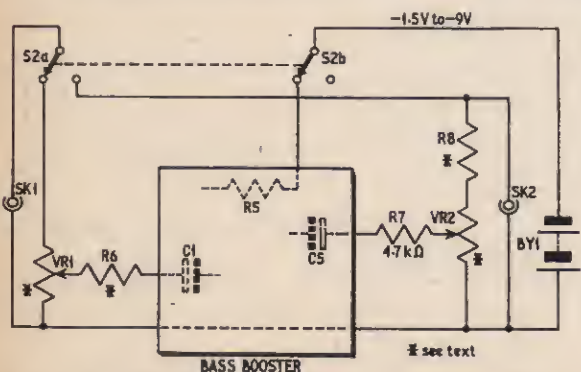
**Table 1: COMPONENT VALUES FOR HIGH AND LOW IMPEDANCE**

Component reference	Input impedance		Output impedance	
	High	Low	High	Low
R6	270k $\Omega$	10k $\Omega$	—	—
R8	—	—	270k $\Omega$	4.7k $\Omega$
VR1	250k $\Omega$	5k $\Omega$	—	—
VR2	—	—	100k $\Omega$	5k $\Omega$

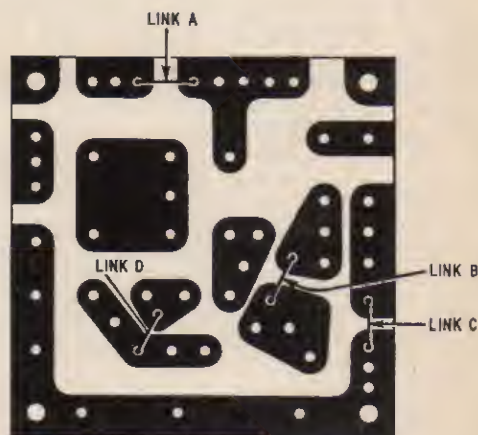
## PRINTED CIRCUIT

Fig. 4 shows the basic pattern of the printed circuit board full size. The link wires at positions B, C and D only are used. Components for the circuit in Fig. 1 are mounted on the board as shown in Fig. 5.

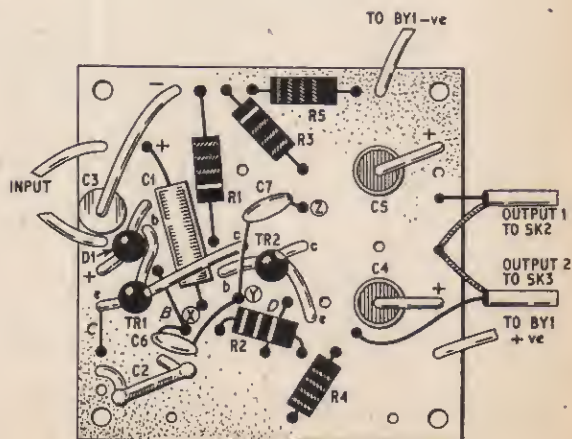
If C6 and C7 are replaced by the stepped control (Fig. 2) lead out wires should be connected at points (X), (Y), and (Z) for linking the control. ★



**Fig. 3.** The bass booster can be switched in by using this circuit. Components marked with an asterisk are given in Table 1 above



**Fig. 4.** Basic pattern of the printed circuit board. In this circuit links B, C, and D only are used. Link A is replaced by resistor R5



**Fig. 5.** Layout of components on the printed circuit board