

## PHASING.

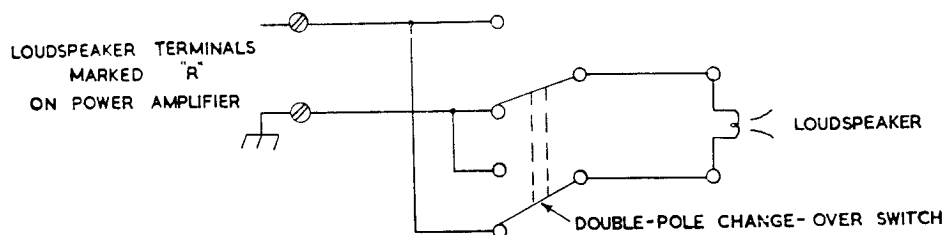
10. It is vitally important that the diaphragms of your two loudspeakers move in phase, i.e. in the same direction at the same instant. To make sure of this note very carefully the following :—

- (i) If you are using identical loudspeakers (as you certainly should if you want true stereo) the manufacturer will doubtless have kept to a convention when marking the terminals, very often simply red and black. In this case the loudspeakers will be in phase when connected as shown below.



If your loudspeaker terminals are unmarked or you are using dissimilar loudspeakers you can check the phase as follows :— place the two loudspeakers as close together as possible ; set the “FUNCTION” switch to ‘R’ and the input selector to “PICKUP”. Connect an unscreened length of wire (about 1-ft.) to the “PICKUP R” socket. Turn “BASS” control to maximum and then turn up “VOLUME” control until the hum picked up by the unscreened lead is fairly loud. Then reverse the leads to *one* loudspeaker ; the condition which gives you noticeably more bass hum is the correct connection, i.e. the loudspeakers are in phase.

- (ii) Most unfortunately, some manufacturers of stereo records and tapes were inconsistent over phasing. We have stereo records containing several bands where the signals change phase from band to band ! The same is even true of a Hi-Fi demonstration tape ! If you have these earlier records and tapes you will need to fit an external switch to reverse the phase of one of the loudspeakers, as shown below. You will find, when you operate the phase-change switch rapidly, that the correct position is obvious on most records, though less obvious on others : this is due to a combination of musical content and recording techniques. When musical signals are out of phase you will generally have a loss of stereo effect, a deficiency in bass reproduction and a “hole in the middle” (the sound appears to come from each loudspeaker with little sound apparently coming from the area between them). With a good stereo system, properly phased, there is no “hole in the middle” effect.



## MAINTENANCE.

11. The circuit diagram provides a qualified engineer with all information required for servicing. However, the following points may be of interest :—

- (a) The “STEREO 20” does not depend upon the output valves (tubes) being matched pairs to give the stated performance, and if one output valve fails it is not necessary to replace both valves.
- (b) Should it ever be necessary to replace the reservoir capacitor C13 (which is in the same can as C12) note that the C13 must be of a type capable of handling a ripple current of 190mA.