INSTRUCTION BOOK

THE QUAD ELECTROSTATIC LOUDSPEAKER

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This Loudspeaker is fundamentally different from other loudspeakers and it is essential that these instructions be followed if proper performance is to be obtained.

Attention is drawn to the heavy type on page 10. This point in particular must receive attention before any attempt is made to use the loudspeaker for listening.

ASSEMBLY

The Loudspeaker pack contains :—

The Loudspeaker
3 legs
12 screws
2 signal plugs
1 mains plug
1 Instruction Booklet

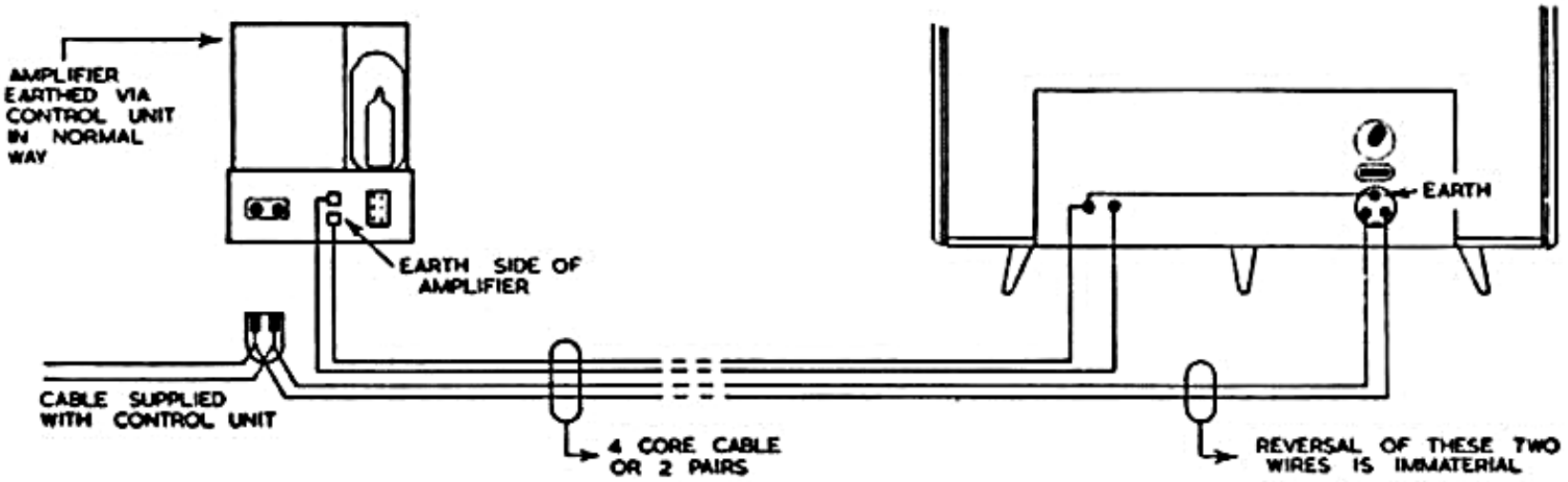
The legs are removed to avoid damage in transit, etc., and should be re-assembled before the loudspeaker is put into use. The three legs are not interchangeable. The one with the different off-set angle is the rear leg and when in position it should point towards the rear. The remaining two legs are slightly off-set right and left respectively. They should be mounted so that they point forward and slightly outward. Screws are provided for fixing and the operation does not involve dismantling any part of the loudspeaker. As the expanded metal front grille marks rather easily, it is recommended that care be exercised when laying the speaker down on its face.

CONNECTING

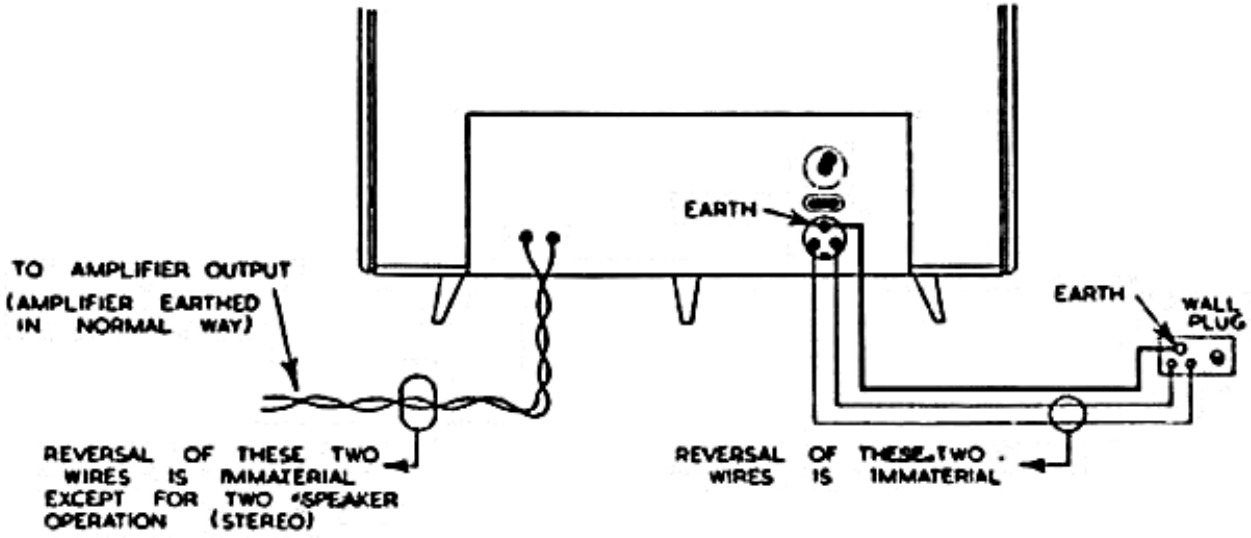
It is a good plan to connect temporary long leads to the speaker so that it may be moved round the listening room to find the optimum position for listening (see page 5).

Having set the voltage adjustment tapping to the appropriate voltage the AC mains and earth leads can be connected to the three pin socket provided. The

RECOMMENDED CONNECTIONS FOR AUTOMATIC SWITCHING FROM AMPLIFIER



ALTERNATIVE CONNECTIONS



three connections are marked inside the cable end connector L, N and E, corresponding to live, neutral and earth respectively. It will probably be found most convenient to connect a pair of wires to L and N and to connect their other end to the two pin cable-end mains socket leading into the power amplifier. In this way the loudspeaker power supply will be switched on and off by the amplifier volume control switch.

The E connection should be taken to any convenient earth point. As the amplifier should already be earthed, it may be convenient to connect the E terminal to the "earthy side" of the signal input to the loudspeaker (since this is already earthed in the amplifier).

As with any mains operated apparatus, the services of a competent electrician should be sought if there is any doubt.

The signal output from the amplifier is connected to the sockets provided on the back of the loudspeaker. The phasing (which way round) is immaterial except for instances where more than one loudspeaker is used in the same room — stereophonic reproduction for example.

The signal and the mains supply may be carried on a multiple four or five core cable and in most cases this will be the most convenient method.

The thickness of the wire carrying the signal can be of the calibre of ordinary lighting flex for lengths up to 20 or 30 ft. For longer runs correspondingly thicker cable should be used.

SWITCHING ON

The indicator lamp above the mains plug should glow upon switching on, and the loudspeaker will be reasonably well charged by the time the amplifier has warmed up assuming both to be switched on simultaneously. It can thus be used immediately although the frequency response and maximum power may not be strictly correct for the first few minutes.

ROOM POSITION

With any type of loudspeaker the room will affect the performance quite considerably. This effect will be less with the QUAD Electrostatic than with most other types of speaker but care taken initially in finding the most suitable position in the room is always worthwhile.

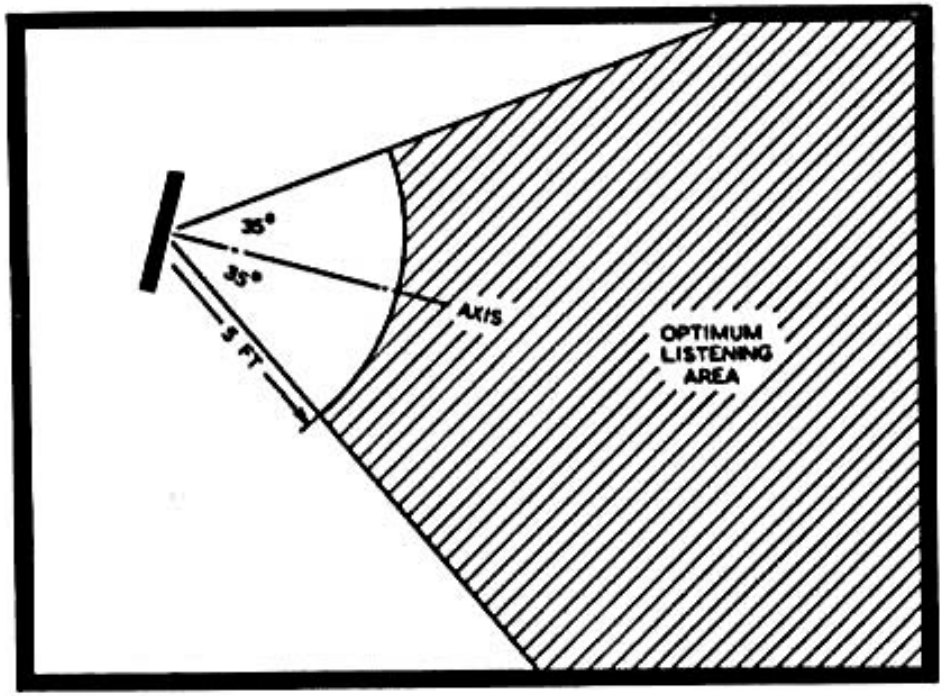
As a general guide, radiation of the sound waves from both front and rear of the speaker should be restricted as little as possible, while corners and positions close to and parallel with walls should be avoided. A corner position is often necessary for other types of

loudspeakers because it accentuates the low frequencies but such a position for the QUAD will both reduce the bass seriously and cause deterioration at middle frequencies due to standing waves.

If the loudspeaker has to be close to a wall, however, it should be stood at an angle so that reflections from the wall are not returned trapped. For example one end of the speaker could almost touch the wall provided the other end were say two feet away from it.

The best position may now be found experimentally and should be that which gives the best perspective.

The objective on a concert programme is that the loudspeaker should appear as an open window beyond which lies the Concert Hall. The "closeness" of the orchestra is dependent upon the acoustics and microphone placing at the transmitting end. With modern studio practice the window should appear to open into a position about halfway down an idealised Concert Hall (front row —dress circle). Of course, in these tests for optimum perspective, the volume level must be adjusted with care so that the intensity is commensurate with the perspective as broadcast or recorded (see page 7). It is practically impossible to predict which position in a room is likely to be the best and time spent in trying the loudspeaker in all possible positions is usually very well worth while. Two symmetrical positions in an apparently symmetrical room do not necessarily give similar results.



Possible positions should take into account that the listeners should be within 35° of the loudspeaker axis and not closer than 5 ft. (see figure above).

THE LOUDSPEAKER AND THE CONTROL UNIT

At first thought it would appear that the purpose of a volume control is solely to enable the listener to have his music loud or soft according to his whim. Whilst it, of course, fills this requirement, it has a further purpose—that of adjusting the intensity of sound so that it is correctly related to the perspective as recorded or broadcast.

If a voice is picked up close to a microphone in a very absorbent studio, then on reproduction that voice will take up a position at the centre of, and in the plane of the loudspeaker. For natural sound, therefore, the loudspeaker should radiate similar power to that of the original voice. If on the other hand the voice is picked up some way from the microphone in a more live studio, then the voice on reproduction will take up a position through the loudspeaker and a considerable distance behind it. It is clear that the power required for the loudspeaker for natural sound is now very much less than in the first case. The *position* or *perspective* of the reproduced sound is fixed at the studio end and there is little that can be done at the listening end to alter it. It follows that the volume setting for natural sound is to a large extent fixed at the studio end.

Studio monitoring is usually carried out at a reasonable level and the whole aim is to produce listening as from a favourable seat in the Concert Hall. Adjusting the volume control to a level to give this correct acoustic perspective will produce the most natural reproduction. The level is usually such that it is quite possible to speak to a person sitting next to the listener without raising the voice or turning down the sound level — as indeed this is possible in the Concert Hall.

Raising the level to "bring the orchestra into the room" or turning it down to a low background will both distort the perspective, although this may have to be tolerated on certain occasions. It should be pointed out that no amount of tone control or loudness control can affect the perspective, although these effects can be used to produce a new sound which although quite unlike the original is sometimes found acceptable.

Popular music is often recorded or transmitted with close microphone technique and would therefore tend to require reproduction at higher levels. It is in fact generally monitored at a higher level. There are a

The higher the frequency the less easily can the stylus trace the groove, hence tracing distortions (and noise) increase. As the frequency increases, therefore, the ratio of musical content to unwanted sound reduces. Minimum distortion is obtained when the filter slope corresponds to the slope of the distortion rise. This will vary with the type of musical content and the recording level.

With the best recording the filter should be set to 10K and with the slope initially at level, the slope control should be rotated until the reproduction is clean yet without sacrificing any other aspect of quality. The optimum will usually be found somewhere between LEVEL and 15. With many good modern recordings the same procedure should be applied with the filter set to 7 K.

Older recordings and 78 r.p.m. recordings will usually require the filter at 5 K with more severe settings of the filter slope.

The filter controls are very carefully designed and their correct use is important in obtaining a satisfactory musical sound.

STEREO REPRODUCTION

The loudspeaker is symmetrically designed so that all frequencies have the same line or point source. This arrangement is the ideal one for stereo reproduction.

Proper stereo should produce a complete picture of the orchestra and concert hall acoustics *evenly* spaced over the area between the loudspeakers. Failure to achieve this objective can be due to unsatisfactory recording technique or unfortunate room reflections. The loudspeakers should be moved to find the best positions. In difficult rooms optimum result may sometimes be obtained by directing the speakers inwards.

LARGE ROOMS

In rooms much larger than 5,000 cubic feet, with wood floor, wood panelling or normal absorbent fittings, the reproduction will be unsatisfactory. This is because the loudspeaker will not excite the room reverberation in proportion to the direct sound. The ratio of direct to reflected sound will be too low and the sound will appear to lack size.

This can only be overcome by using two loudspeakers placed with their planes at an angle to each other.

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An exception occurs with large rooms of concrete construction with little furnishing. Such rooms are so reverberant that reproduction is normally extremely difficult. Here the directional characteristics are a help and lack of room excitation can result in an improvement over a conventional system.

As a rule the QUAD Electrostatic is not recommended for rooms larger than 5,000 cubic feet.

MAINTENANCE

The QUAD loudspeaker requires no routine maintenance. Should a fault occur, the dealer supplying the loudspeaker or other competent engineer should be consulted.

The pilot lamp at the rear indicates that the AC mains is reaching the loudspeaker.

AMPLIFIER REQUIREMENTS

THIS LOUDSPEAKER IS DESIGNED FOR OPERATION WITH A STANDARD QUAD II POWER AMPLIFIER AND IT IS ESSENTIAL FOR BOTH PROPER PERFORMANCE AND RELIABILITY THAT IT IS USED ONLY WITH THIS AMPLIFIER OR ONE SPECIFICALLY DESIGNED FOR THE QUAD LOUDSPEAKER.

Under ionizing or near ionizing conditions the reliability of the loudspeaker is very intimately related to the amplifier design. Experience has shown that nearly all commercial amplifiers not specifically designed for use with this loudspeaker will sooner or later cause damage unless they are of very low power, in which case, however, they are usually unsuitable for other reasons.

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