

Poor Tone from Amplifier.

J. A.B., Christchurch, complains that his two-stage amplifier used in connection with a crystal set goes A1 until a gramophone record is broadcast, and this does not come through clearly. "All the records are the same," he says, "but particularly piano records, when some of the chords simply roar." He has a good aerial and a good earth, and wishes to know of something that will remedy the trouble.

ANSWER: It is rather difficult to conceive of a set distorting on gramophone records only. The probability is that the set is distorting continually, but this is not noticed until a gramophone record, which the correspondent has probably heard somewhere else, is put on the air. It is then that, comparing this with the record already heard, distortion is evident.

The circuit is quite simple and provision is made for grid bias. In all probability faulty transformers are used. Good transformers are essential if a crystal set is to handle volume. Usually these are constructed with a view to cheapness more than efficiency, with the result indicated above. The correspondent has placed a fixed condenser across the secondary of one of his transformers. This should be placed across the primary. At the same time, the voltmeter should be put across the B and C batteries to make certain that the voltages are what they should be.

A Variometer Crystal Set.

"I WANT to know if you can give me information to the following questions regarding the Variometer Crystal Set," writes T.P.B., Petone.

(1) Sometimes when I remove the cat's-whisker from the crystal there is a terrible howling noise. Could you tell me what it is? **ANSWER:** This howling is perfectly natural and is the result of an "open circuit." In other words, the lifted cat's-whisker breaks the circuit, and a howl results.

"Can you give me a good wave trap to connect with my set to cut out Wellington?"

ANSWER: It would be an exceptionally good crystal set, that, employing a wave trap, would bring in another station. A wave trap, while usually efficient with a valve set, would reduce volume rather considerably on a crystal set. However, if the correspondent wishes to experiment, he can find little better in the way of wave traps than that described by "Pentode" several weeks ago.

(2) "Would double tuning, that is, an extra variometer, give better results?"

ANSWER: Yes, it should do, if the full wave circuit is used. A full wave variometer crystal set will be described next week.

The correspondent finds that Galena is preferable to the permanent type, particularly for distance.

The Crystal and Amplifier.

RE your "Crystal and Amplifier to operate from A.C. mains," could you tell me what valves you would recommend? writes "A.H.F." (Brooklyn).

ANSWER: The 201A could be used as a rectifier and as an amplifier, but other valves of this type are equally suitable. Philips 615, and other valves which have a high amplification factor, are particularly suitable for the last stage.

Types of Valves for Amplifiers.

VALVES at the present time are divided into four main groups. High frequency valves, with a very high impedance and amplification factor; detector valves, with a medium amplification factor and impedance; power valves with a low amplification and low impedance; and general purpose valves.

Power valves require a high plate current and usually a large amount of current on the filament and are thus unsuited to single-stage amplification. They are capable of handling a greater output which the crystal cannot supply.

Detector valves are usually specially constructed to meet their particular requirements, that is, detection: so that we are left now with two types, high-frequency amplifiers and general purpose valves. Usually it pays to use one of the latter, as the high impedance in the former type of valve tends to offset the high amplification factor. High-frequency valves are made with this high impedance to prevent re-radiation. If a valve with a fairly high amplification factor and a reasonably low impedance is used, the best results may be obtained.

The question of double grid valves and pentode valves for crystal amplifiers has already been discussed. The screen grid valve, is, of course, quite unsuitable owing to the very high voltage required on the plate and control grid.

The Loudspeaker.

THE owner of a crystal set and amplifier should not purchase a large-size loudspeaker. These require a high voltage current to drive them, and consequently will not give good reproduction when reasonably weak signals are impressed upon them. That is not to say that small type loudspeakers should be employed, as their metallic tone soon becomes quite annoying, and a listener who has not heard a better speaker may say that it is merely a "wireless tone."

A good speaker can reproduce almost faithfully the sounds going into the microphone at the other end. Such a speaker needs a very good set to co-operate with it, and the crystal owner should not be disappointed if his reproduction is not quite perfect.

Where low voltage is used, such as with a double grid valve, there is bound to be a certain number of notes which are missed, particularly in the bass. However, this cannot be avoided and if the owner of a small amplifier can obtain faithful reproduction with the exception of the very low notes, then he should be well satisfied.

Many small high-class speakers are at present on the market, and some of them are very reasonably priced, but are not what one would call cheap, and the owner of a crystal set and amplifier would do well to hear some of these models before buying a more unsatisfactory but low-priced speaker.

Our Crystal Corner

By "Galena"

Speaker Extension.

The speaker can be operated at a very great distance from the set by the provision of suitable leads. Tone and volume are very little weakened if the leads are of thick or stranded wire. For further information, on this point, the crystal user is referred to the "Beginners' Corner" in recent issues.

The Question of Condensers.

UNLESS very fine tuning is required, the condenser is not essential with a crystal set, or with a crystal set with an amplifier added. It certainly facilitates tuning and saves a great deal of trouble, but on the other hand, it is fairly expensive.

If a component of this nature is to be used the young constructor will ask himself what value condenser is the best. It has usually been found that a .0005 condenser of the S.L.F. (straight line frequency) type is the most suitable. By using a large condenser such as this, any discrepancy in the number of turns may be accounted for. If a condenser of too small capacity is used, there will be a difficulty in obtaining the right combination of turns to allow of efficient tuning.

The question of brass or aluminium condensers frequently arises. The former are the better, and are, consequently, dearer in price. The latter are light and are particularly adapted to light sets, such as portables.

Valve Considerations.

"WHAT valve shall I use?" asks the constructor of a valve amplifier.

In selecting the valve, several points have to be borne in mind:—

1. **B battery voltage.**—B batteries are expensive, and if a high voltage is to be used on the plate of the valve, the operator is going to have a set both expensive to set up and to operate, while the provision of too low B battery voltage spoils the tone as well as the volume. The ordinary general purpose valve requires at least 90 volts, and should not be worked under this.

2. **A battery consumption.**—At the present time, there are numerous dull emitter valves on the market which require about .06 amps. per hour. This renders them able to be used from dry cells. Although the plate draws of these valves is usually higher than that of the bright emitter valves, it usually pays to use them, especially as a good accumulator costs anything from about £4, and the extra B current consumed would take a long time to reward the constructor to this additional expense of the accumulator.

3. **Make of valve.**—Next season will see many new makes of valves on the market. Many of these will be reviewed through our columns, and the constructor would be well-advised to watch both the advertisements and notes so that he may obtain the valve that suits his purpose best. It is impossible to say that one make of valve is better than another. Each make is characterised by some outstanding feature, which renders it suitable under different conditions. These features, the young constructor should look for.

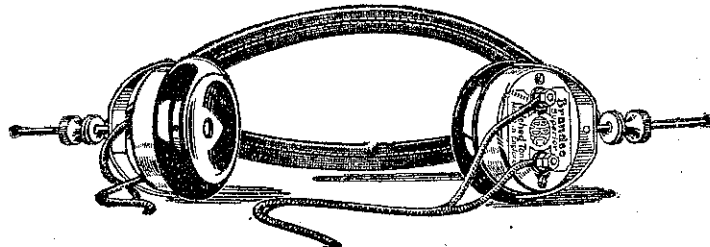
Headphone Hints.

IF you are using a crystal set it does not matter which way round the telephone leads are connected to the terminals.

If you are using a valve set be very careful that the 'phone leads are connected in circuit the right way round. Practically all telephone leads are marked with a red cord or a positive sign to denote which side of the telephones should be connected to that telephone terminal which goes to H.T. positive.

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