Laboratory Jottings

Paillard Pick-up

ABEL, SMEETONS, Ltd., Auckland, have sent us for test a Paillard Pick-up and its performance has been well up to standard. It is a very neat job and is finished in black. The pick-up head is arranged on a free hinge and the rest of the arm is quite rigid, as far as vertical motion is concerned.

A small but important feature of this movable head is that it can be raised right back on the stationary part and will not fall over on to the record at the slightest movement. Although of ample size, the head is not unduly heavy and tracks well on records. Everything on the instrument is solid and well finished. The volume control is cutely housed in the swivel and is adjusted by thumb. Our tests show that while it covers a range of frequencies from below 40 to 8,000 it is especially good on the bass. We do not mean by this that it over emphasises the bass, for it does not, but it gives a slightly better output at low frequencies than at high. We found that while our standard pick-up gave a third of the output of the Paillard at 43 cycles, it was four times as great at 6,000. At the middle frequencies, we found the output was slightly greater than our own. Generally speaking it could be said that the pick-up gives good loud signals over quite a wide range. It begins dropping off at 5,000.

A perfect pick-up would respond equally to frequencies from 25 to 10,000 but in practice even response from 50 to 5,000 is considered good.

Most of the frequencies can be brought through with perfect clearness and instruments can be quite well picked out.

Our tests have shown us that the Paillard is a first class instrument and that it is not unduly hard on records.

Exploring the Universe

New Use for Beam Radio

RADIO waves of the beam type may be utilised in the near future to explore the outer reaches of space and thus solve some of the secrets of the universe.

Senator Marconi in a recent address in Italy expressed the belief that beam waves travel far beyond the layer of air surrounding the earth, thus differing from the two kinds of radio waves that are purely terrestrial. These are, firstly, the ground wave that follows the surface of the earth, and, secondly, the sky wave, which is reflected from the "heaviside layer" of ionized air some 100 miles above the earth.

Just how far beam waves would travel in space is at present purely conjectural, but some estimates vary from 25 to 48 millions of miles. This is a comparatively short range, when judged by distances separating heavenly bodies, but it would reach many planets that are near neighbours of the earth.

Tasting and Seeing Radio

Novel Method of Communication

THE use of visible indicators for reading incoming signals dates back to the early days of ordinary telegraphy when Morse impulses sent over a line were first recorded by a vibrating needle. The change-over from sight to sound came with the introduction of the telephone and its greater sensitivity.

In wireless signalling, owing to the relatively small amount of energy picked up by the receiving aerial, there would at first sight seem to be no possible alternative to the use of headphones. In these days of broadcasting, the valve amplifier and the loudspeaker, the term "listener" has, in fact, stuck fast.

SAM DUNCAN

A very popular Wellington tenor. He will appear in vocal solos and duets from 2YA on January 10.

—Andrew, photo.

At the same time there are certain circumstances in which the ear cannot function efficiently, so that the use of headphones becomes unsatisfactory. For instance, in an aeroplane the noise of the engines is sufficient to deaden any wireless signal.

In practice this difficulty is overcome by wearing a sound-proof helmet with the earphones snugly encased inside. Although effective in allowing wireless signals to be received, the use of a sound-proof helmet has certain decided drawbacks. For one thing it cuts out all other external sounds, a fact which is not altogether desirable when the helmet is worn by a pilot who is in sole charge of the machine. Also the headgear is cumbrous and cannot easily be discarded in case of sudden emergency.

As an alternative, it has been suggested that, for aircraft work, wireless messages should be received by taste instead of by ear. This may at first sight appear rather far-fetched, but the proposal has been thoroughly tried out, and as the result of a series of tests was favourably reported on by Professor Goldsmith, of the Radio Corporation of America. He found that it was perfectly feasible to substitute the tongue for the ear, and to detect incoming signals by taste. The sensitivity was considerably less, but this could be made good by suitable amplification.

It is a well-known fact that a peculiar and characteristic taste is experienced if two wires at slightly different potentials are applied to the tongue. To a minor extent the sensation is felt when strips of two different metals, such as copper and zinc, or a copper and silver coin, are placed together and applied lightly to the tip of the tongue. The combination, when moistened, forms a miniature voltaic cell, and the resulting E.M.F. is "tasted."

This effect was utilised in the aeroplane tests mentioned above. The incoming signals are fed to two electrodes, preferably made of strips of silver so as to prevent the formation of injurious salts. The electrodes—separated by a thin sheet of insulating material and fastened together—are held lightly in the mouth, with the tip of the tongue pressing gently on the end, so as to bridge over the insulating strip between one silver electrode and the other.

The incoming signals could not only be definitely detected by their taste, but they also gave rise to a curious effect on the sight. At first the operator thought that a lamp nearby "flickered" each time a signal was received. It was subsequently found that a definite "flash" accompanied each signal, which could be "seen" even when the eyes were tightly closed.

Treating Sulphated Accumulators

A LONDON radio writer says: "What is to be done when the battery is 'sulphated?'" First, take action before the evil has gone beyond hope of redemption, that is, preferably, at the first signs of sulphate. I doubt whether anything could save a cell which has begun to bulge. I have, however, been successful in rescuing a badly-sulphated cell by the somewhat drastic method of washing the plates repeatedly in cold water, which removed a lot of the outside sulphate. When no more could be removed by these physical means, washing and gentle shaking, I filled up with electrolyte and gave the cell a long charge. He never recovered his beauty, but he certainly regained a lot of capacity."

DO not make marks on the back of the panel with a lead pencil, as the pencil mark affords a high resistance conductive path on the ebonite surface, and impairs its insulation.