

In discussing one of the primary considerations in the purchase of a radio set in the last issue of this paper, it was pointed out that it was an absolute necessity to choose a machine of standard make in order that satisfaction and service could be guaranteed and redress obtained in the event of trouble of any sort materialising. The recommendation to purchase a standard make was based on the fact that receivers operate according to laws well known to the initiated, and that in consequence infinite confidence could be placed in standard designs providing only the recognised agents, distributors, or manufacturers are consulted when advice or assistance is necessary in maintaining the equipment at maximum efficiency.

This consideration is of such paramount importance that it has been judged necessary to repeat a definition of it in order to emphasise its value to potential buyers.

It is hardly the function of this paper to give advice as to the best means of judging what makes of apparatus can be considered standard. Obviously, any types of equipment to be steered clear of cannot be named any more than it would be fair to state that this paper's advertising columns represent all the makes or names of distributors who fall into the category just laid down. A buyer would, nevertheless, be well advised to consult the advertising columns of publications devoting space to the subject of radio, and after having made a selection of likely machines write or phone the agents or distributors for further information. Invariably the get-up of advertising matter and method of dealing with inquiries will give an indication as to the service likely to be received at a later date in the event of a machine having been installed. The exercise of judgment along these lines will invariably narrow further inquiries into more restricted channels.

THE TYPE OF MACHINE.

Having arrived at a perspective of the market, infinitely greater confidence may be enjoyed in dealing at first-hand with the representatives of the concerns vending the machines of interest. The next step is to decide which type is best suited to the individual task and pocket. Before passing to some semi-technical considerations which it is necessary to discuss in order to arrive at a reasonably intelligent understanding of the subject, it is thought fitting to make reference to the habit which has become almost ingrained in the pub-

For Prospects and Recruits

By M.I.R.E.

lie in demanding a demonstration of apparatus in their own homes. Years ago, when electric irons were first introduced, electrical dealers were accustomed to having an ironing blanket and a piece of cloth in their shop in order to demonstrate that it was possible to actually iron by electricity.

The prospective buyer, however, didn't ask the dealer to send round an iron to his house to do the family's weekly ironing for a week or two in order to be satisfied that it wouldn't blow up or electrocute the washer-lady.

To-day any novelty of ironing by electricity is non-existent—in fact, any sort of an iron in use in a house where power is available is looked upon as a sort of curiosity.

WHO PAYS THE COST?

To-day the radio dealer is invariably in the position of the electrical dealer of yesterday. The prospective buyer is not prepared to select a set out of the shop, but he wants one sent to his place and an aerial erected, etc., in order to make certain that the set will actually receive signals on his property. That is unreasonable enough from many standpoints, but then he wants the set left for sufficient time to apparently satisfy himself that it is a set which works every day in the week, and is not one which knocks off on Tuesdays and Fridays! Last, but not least, he wants it for nothing, and the dealer has to take the risk of damage to apparatus and carry the burden of expense in time, and wear and tear of apparatus and accessories. Part of his job? Perhaps, but who pays? The public, of course, because the cost of selling radio under these circumstances is too high.

A gramophone concern will not make a machine and records available for prospective buyers to amuse themselves with while they are making up their minds; nor will a vendor of motor-cars let a demonstration model loose for several days in the charge of a prospect, and incidentally supply him with petrol! Yet this is parallel to

what is being demanded from the radio trade at present.

The remedy and obviously simple procedure is to act on the advice given previously and decide on either one or several standard makes having models attractive both from point of view of advertised performance and price, and make the arrangements most suitable to dealer and the buyer to try the machine out. The dealer will be able in the majority of cases to make arrangements in the best interests of the intending purchaser, such as an audition at his place of business or some other spot where several models of the same or competitive makes can be switched on at will, thus enabling a comparison to be made which it would be palpably impossible to arrange at the buyer's house, without very great inconvenience to everybody concerned. As a result of this a final decision may be made with ease and confidence at home, after a more or less temporary installation of the machine has been made, and the receiving conditions at the machine's ultimate destination checked up.

GUARANTEE OF SATISFACTION.

Presupposing that the dealer concerned is handling his business on sound lines, he will be willing to guarantee satisfaction. If the results obtainable after a fair trial, extending over a week, for instance, are not commensurate with the outlay, then the dealer should be invited to explain the position and make further recommendations. If continuing with receiver trials, it is necessary to take out a license (a short-period one will do in this case) should the trials extend over a week.

The only reason that a receiver which passes satisfactory trials in one receiving position, and will not apparently repeat the same performance in another, is because the second receiving position is inferior to the first, due either to the mysterious vagaries of the ether or to electrical interference with the functioning of the receiver.

The former is an uncertain factor, but in only isolated cases will it ever become of such importance as to cause

serious trouble unless any particularly desired station is consistently weak and unsatisfactory, whereas in another position this same station is strong. Where signal variations act to the detriment of reception in one direction they will act the opposite in another direction, and balance things up to the satisfaction of the listener.

Any suspicion that a receiver is not acting up to scratch can be checked by the dealer by setting up a similar model alongside and changing the aerial quickly from one set to another, using equivalent valve and battery power. The same symptoms should show up on each.

THE RANGE OF INTERFERENCE.

Electrical interference takes two forms, the first being caused through natural, and the second through man-made means. Natural interference or "static" is caused by electrical disturbances in the atmosphere and in the earth's crust. This becomes audible in a multi-valve receiver in the form of crashes or frying sounds, and when at its worst is intensely irritating and annoying. It comes in storms and will vanish for weeks in the winter months, but is usually present to a slight extent through the summer months. However, static is only apparent when distant stations are being tuned in and a large amount of amplification is being used in the receiver. With stations comparatively near, and especially stations of some power, static loses its ability to annoy because the relation of signal strength to noise becomes of such value that the signals easily win out and the static fades into an insignificant background of no more consequence than the needle-scratch of a gramophone. The point to be noticed by prospective buyers is that the signal strength of a distant station will always appear to be stronger under conditions clear of static than when there is a "noise" background. However, this question of static interference can be safely shelved for a future article because it is a subject which should be given a comprehensive treatment or left alone. Suffice to say that it is not

entitled to the serious consideration that it receives in the minds of intending purchasers of radio sets simply because any point, practically, in New Zealand to-day, is within range of at least one station which can deliver a signal strength sufficient to beat even bad mid-summer static and the listener in therefore has a programme always available.

Those districts within a hundred miles of Auckland, Christchurch or Dunedin or within 250 miles of Wellington are definitely assured of programmes throughout the year.

Man-made interference comes principally from power or lighting mains and also from tramway wires, and is caused by the various electrical machines being fed by current from the wires setting up electrical impulses, which are radiated from the wires (just as a wireless transmitter radiates its energy), and are picked up by the radio receiver in the form of noises, which can scarcely be described as pleasant in most cases. Faulty insulators on power lines will invariably cause interference with radio reception in an area surrounding the fault extending over several hundreds of yards on occasions. The remedy to these troubles lies in action by the power supply authorities, who are now fully alive to the desirability of keeping their distribution systems as free of trouble as possible. The dealer is in a position to take the necessary action towards coping with these troubles when they assume prominence, and it is only in isolated cases where the interference is of a very definite nature that a receiver is seriously affected.

Summed up, the question of interference is only a serious one under any circumstances to those who have ambitions towards distant reception, and who are of the same turn of mind as the individual who wants every Saturday afternoon to be a sunny one in order that he may always get his game of tennis. True radio broadcast reception consists of tuning in a station whose signals are of such a strength compared to any interfering noises that the signals preponderate to such an extent as to render the interference relative in noise to a gramophone needle scratch. In terms of a year's use of a receiver, there is really no spot in New Zealand where these conditions are not obtainable for at least 300 days out of the 365, and in the main centres this is obtainable for 365 including the 366th in Leap Year.

POWER BY RADIO

WONDERS IN STORE

PREDICTIONS BY EXPERT.

Beams of radio power, criss-crossing a city like searchlight rays and carrying light and power as wires do now, were discussed as future scientific possibilities, following spectacular demonstrations of present power transmission by radio shown by two Westinghouse engineers, Dr. Harvey C. Rentschler and Dr. Phillips Thomas, to the New York Electrical Society, at the Engineering Auditorium, New York City, recently.

Electric lamps, held up by Dr. Thomas in empty air, glowed brightly although not connected to power wires. In a novel radio furnace displayed by Dr. Rentschler, chemical reactions possible only in a vacuum were initiated by radio waves. A disc of metallic tungsten, among the most infusible of all metals, was heated white hot in an instant by the invisible rays. That radio-power beams of a special variety might prove to be the long-imagined "death ray" was mentioned, not as a fantastic dream of some modern Jules Verne but as a sober scientific possibility.

MARVELS OF BEAM.

Radio waves like those used in broadcasting, except of shorter wave-length, can be reflected from metal mirrors to make narrow beams, like the beams

from automobile headlights. Dr. Thomas, who is research engineer of the Westinghouse Electric and Manufacturing Company, at East Pittsburgh, Pennsylvania, U.S.A., generated before the society waves of this type, not in beams but as short as 240 centimetres or eight feet, which is only about one-hundredth of the wave-length of the shortest waves ordinarily used in broadcasting. Dr. Thomas predicted that still shorter waves will be produced, capable of being concentrated into narrow and powerful beams.

"We may visualise," he said, "a parallel beam of radiation ten centimetres or four inches across, along which is being sent ten kilowatts of energy. What sort of effects shall we find? Will this be a means of delivering energy for heat and lights to individual houses?"

Tesla had a similar idea many years ago. Later improvements in the radio art make it interesting to consider such a possibility once more. We may imagine each house furnished with a half-wave oscillator in line with a parallel beam from a sending station, so that heat and light may be obtained very much as at present, by simply turning a switch, but without the costly transmission wire equipment now required.

A DEADLY RAY.

"Again, suppose it should happen that this four-inch beam of highly-concentrated energy should render conducting the air through which it passes. Then ordinary electric power could be sent along the beam as though the beam were a transmission line. The beam could be directed to any desired spot, with dire results to the target. It would constitute the so-called 'heat ray' employed with such deadly effect by the Martians in H. G. Wells' well-known story of their descent upon the earth."

The radio furnace demonstrated to the society by Dr. Rentschler, who is Director of Research of the Westinghouse Lamp Company at Bloomfield, New Jersey, U.S.A., is designed to concentrate large amounts of radio power within a small space, rather than to send it for long distances over projected beams. Certain metals, although long known to the chemists, cannot be prepared usefully in metallic form by ordinary methods, because these metals are combustible when in fine powder, taking fire in the air like tinder whenever they are heated. By conducting the heating of these remarkable inflammable metals with radio power and in a vacuum, Dr. Rentschler has made them in metallic form and in some quantity. Two of these metals, thorium and uranium, belong to the group of radio active metals including radium. Now that the use of the vacuum radio furnace has made these peculiar metals available they are expected to find uses, Dr. Rentschler said, in industry.

GOLD AND SILVER INTO GAS.

Another use of the radio furnace is to turn metals like gold and silver into gases, so that their individual atoms can be weighed. These metallic

"MICROPHONE FRIGHT"

"Microphone fright" is a very real difficulty broadcast studio announcers have to contend with when some people are about to make their first broadcast speech.

At 3LO, Melbourne, only recently a successful sporting man and his coach were billed to broadcast their experiences and sat before the microphone for some time to acclimatise themselves, but when the fateful moment came neither of them was able to collect either his wits or his breath sufficiently to break into speech, and in dumb show they notified the infuriated announcer that they could not go on with it. The rest of their time had to be eked out by gramophone records.

Occasionally, however, a very poor starter develops with practice into quite a creditable long-distance speaker, once the "nerves" have been mastered. The announcer is in such cases a very present help in time of trouble. "Oh! Mr. Andrew!" wailed a lady speaker one afternoon to 3LO's announcer, "I am shaking all over—I don't believe I'll be able to speak!" Mr. Andrew replied: "That's nothing; I often feel that way myself. You just have to screw up your courage! After a few words you'll be all right." Amazed at this confession from a personage regarded as the very embodiment of sang froid, the lady screwed her courage to the sticking-point and made her talk one of the clearest and best she had ever done.

Countless other performers have also testified to the helpfulness of the announcer's presence and kindly smile at a critical moment.

atoms are so tiny that more than ten thousand billion billions of them are necessary to make an ounce. Some of them are capable of existing in free condition only for a ten-thousandth of a second or less. Nevertheless, the radio furnace permits them to be studied and weighed, with results of important value, Dr. Rentschler said, to atomic science.

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