

# A Further Analysis of Fading Reports

This week, in connection with the fading test, we publish four graphs from different parts of the Dominion—Port Waikato, Te Aroha, an island in the Hauraki Gulf, and Invercargill. These graphs were prepared by the set owners with a view to being of assistance in the test, and they prove to be of great interest. The first graph is given just as originally set out on squared paper, but the next two, not being to the same scale, have been carefully redrawn in order to make comparison easier. The last one, from Invercargill, is given as originally set out, the length being correct, though the amplitude, or movement up and down, is on a smaller scale. The main point to notice is the position of groups of irregularity of reception in each one, also making a slight time allowance of up to a minute either way, owing to quite possible discrepancies in timing. It should be noted that at present only the first day of test, September 26, is being dealt with.

## THE GRAPHS COMPARED.

It was unfortunate for the station that during the first few minutes transmission "went to the pack," and fading was evident here in Wellington just prior to the second break. Many listeners making records had not tuned in at this time, and so did not record the breaks, whilst others have only regarded them as fades. In three of the graphs printed herewith the breaks are clearly shown. It will be noticed that the graphs are fairly unanimous in noting excessive volume, which seems to have occurred in bursts during the evening, and if controls could have been used this could have been made normal, although in excess of that at the commencement of the session. Volume was greater, and fading less, during the second half of the programme, generally speaking, as is shown by a great many reports. Whilst graphs 3 and 4 show a fade at 8.8, this is unnoted in 1 and 2. Reception appears to have been generally bad or indifferent until after 8.11, when matters improved. Around 8.25 was a bad period, and appears as such in a large number of reports. There is a deep sag here on all four graphs, but Invercargill, being further away by nearly two hundred miles, felt it sooner than the others, apparently feeling the first sign of weakening. The curves are, with the exception of No. 3, unanimous in a general steady-going just before 8.50, and with a great many distant listeners this steadier and stronger reception continued until 10 o'clock. From the general survey of reports already made it is probable that graph No. 1 represents a fairly average curve for distant reception of 2YA on this particular night. Graphs 3 and 4 show considerable fluctuation from 9.0 to 10.0, but they are probably quite correct chartings of reception at the position they represent. It is quite possible that these two receivers are rather more selective than Nos. 1 and 2, and would, therefore, be more susceptible to any interference with the transmitted wave that had any tendency to cause alteration in frequency.

A good graph was sent in from Napier, but as it only gives the first half of session on the 26th, it was not included with those illustrated, but will, no doubt prove useful for comparison. The first half, as recorded, shows the first break to inaudibility at 8.6½, 8.15½, bad modulation, at 8.22 a drop in volume, as shown in No. 1, at 8.28 shown on Nos. 1 and 2. At 8.35 there is a drop to about half volume, as on No. 1, and a similar drop at 8.39½, as on No. 4; then at 8.47½ a sudden drop, as in

In a further review of the valuable data secured from listeners in connection with the fading investigation, "Megohm" discusses some of the features noticed, and presents an interesting set of graphs from four different points.

No. 1, returning to normal one minute before 9 o'clock.

## HOW RECEPTION VARIES.

A survey of the charts received certainly gives an impression that distant reception in the same locality may be either good or bad. A settler, say, 350 miles from 2YA, may be getting enjoyable concert married by very little fading, while his neighbour, only a few miles away, gets results that are at best nothing more than indifferent. In such cases distance gives no advantage to the one over the other. Then one begins to seek for possible other differences, height and direction of aerial, its insulation, the efficiency of the receiver itself, and possible difference in operating. Then local geography, the position of hills, their composition, areas of bush, may all be potential contributors to the general disturbance of uninterrupted reception. In connection with the foregoing remarks, the following sentence contained in a report from the Far North shows a typical example. Enclosing a chart showing only a few fades, all slight, the report states: "I do not attribute fading to the stations, as a listener friend of mine a couple of miles away rarely suffers fading." This is

from a place 160 miles north of Auckland, where the person reporting is troubled with fading to a certain extent from all stations, 1YA in particular.

Reception of 2YA in the Far North is on the whole good, and fading comparatively slight, and on looking at the map we see an apparent reason for this. Taking an air-line from 2YA to Dargaville, the wireless waves travel the whole of the distance, 360 miles, over water, with the exception of about 60 miles across Taranaki. Going southward, the position is very much the same, so far as southern coast towns are concerned, for waves from 2YA to Dunedin have only to cross a few miles of land on the Banks Peninsula, the remainder of the route being all over water. There are set owners in Nelson district troubled with more fading than are others two or three hundred miles further away in either island. One of the objects of this test is to endeavour to find out whether or not there are certain zones where fading is more prevalent than in others, but it will take some little time to arrive at a conclusion of this kind. The whole matter is one for calm thinking and continual comparison of reports.

Further diagrams will be published next week, showing other aspects of the question.

## LOCAL INTERFERENCE.

Some of the reports from populated districts contain a great number of slight fades indicated, much more than the average for that place. In such a case one of two causes will probably be responsible. The receiver is either ultra-selective, but possibly not very sensitive, and so responds to slight differences of frequency that would be unnoticed in a broadly-tuning set, or else reception is being marred by a nearby radiating set.

There are many contributory causes of radiation from receivers which, however, it is not necessary to more than mention here. Reports show that the five-valve neodyne is an extremely popular circuit, and if such a set is properly neutralised, reasonable handling will cause no trouble or interference. Some types of neutralised circuit require reneutralisation when a new radio-frequency valve is put in, and unless this is attended to, radiation will occur. Owners of small sets without a proper knowledge of tuning-in may cause much trouble if they persist in attempting to bring in a station that is beyond the capabilities of the set. Such attempts are generally accompanied by violent oscillation, which has a varying effect upon the reception by other sets

on the same wave-length. Howling and distortion of signals is the usual result, but it is often accompanied by a "blanketing" effect upon neighbouring sets which is equivalent to fading, and may reduce the volume in other receivers to half, or cut out strong signals altogether. Experienced listeners can usually tell when fading is caused by local interference, but not so the novice. Quite likely steps will have to be taken to suppress undue or continued radiation, which at times is apt to be an intolerable nuisance.

## DAYLIGHT RECEPTION.

There is not very much mention of daylight reception in the reports, but where reference is made, it is stated to be better than evening reception, and usually free from fading. The reason for this is that the wireless waves can only travel effectively near the earth in the day-time, so that they are not distorted by meeting waves reflected from the heavy layer, such reflected waves frequently not synchronising with the ground waves on rejoining them, and thus complicated blurring and distortion is caused. A report from Helensville states that good speaker reception is obtained in the afternoons with a three-valve set. This appears to be good reception for a distance of 320 miles in daylight, and speaks well for the carrying power of 2YA apart from the fading trouble.

At this stage any ideas expressed must not be taken as final conclusions, as they may have to be modified as the investigation continues.



## SHORT-WAVE HINTS

### TO SECURE OSCILLATION.

It is often the case with a short wave receiver that when the grid circuit is tuned to some particular wave-length the set refuses to oscillate. Such an effect is produced when the aerial and the grid coils are tuned to the same frequency. To get over this, use a small two-point switch. Connect the aerial to the movable arm of the switch, and from the contact point to the aerial of the receiver. Then connect a fixed condenser with a capacity of 0.0002 mfd. across the points of the switch.

When the point where the set refuses to oscillate is reached, open the switch, and the fixed condenser will be placed in series with the aerial, thus shifting the "dead spot" to some other frequency where it will not be troublesome.

It is a common idea amongst many persons that on the short wave-lengths a correspondingly short aerial should be used. This is not so, as experiments have proved. It was found that for five metre reception the longest aerial possible, but no earth connection, proved to be the best possible method of pick-up. For reception on wave-lengths from 15 metres up to 100 metres an aerial with an overall length of 250 feet is advisable. This will give a greater pickup of R.F. currents.

## REACHING OUT FOR DX

### AN AMERICAN'S CLAIMS.

"An American contemporary in its correspondence columns gives the following DX claim which was sent in by a reader. After stating that since reading a report of Australia being received on a crystal set, he feels impelled to give a brief account of his own DX successes, and goes on to say:—

"My set was built from a hook-up furnished by one of your competitors and the parts were obtained from a local dime store. The initial cost was but four and a half dollars, but I must admit that the upkeep was something terrible.

"Simplicity and efficiency plus were obtained by using the local telegraph line as an aerial and the Delaware River as a ground. San Francisco, Shanghai and Ilasa came in easily; although I must admit that the broadcasting of Babylon and Damascus could be improved upon immensely.

"Not content with these notable contributions to DX literature, I added several more tubes and condensers and with some suspense twirled a few of the dials.

"After an agonising pause the most unearthly howlings that I ever heard proceeded from the loudspeaker, followed by the distinct sentence: 'A little more coal boys!' An eminent English clergyman who was standing nearby (the very soul of truth, by the way) immediately recognised this broadcasting as proceeding from Station L, Gehenna. 'Those howls,' he remarked simply, 'are undoubtedly the anguished cries of deceased DX hounds who are paying the penalty of their misdeeds and misrepresentations on earth.'

"It would appear boastful were I to tell of receiving certain celestial

harmonies that were never produced on earth and the daily weather reports from Mars. However, I believe that I have said enough to convince the wildest DX enthusiast that he has a formidable rival."

## FAST WORK

### THE RAPIDITY OF RADIO.

Radio communication, says "Nature," is proving of great value to isolated communities on various parts of the earth's surface. For example, the lonely Parsan Islands in the Red Sea, which are about 400 miles north of Aden and the same distance south-east of Port Sudan, are being examined for oil by the Red Sea Petroleum Company. The prospectors are equipped with an ordinary Marconi ship's transmitter. Through the neighbouring ports, or through any of the large number of ships within radio range passing up and down the Red Sea, they can easily link up with main telegraph circuits, and also secure, if necessary, medical advice and other assistance.

The new short-wave beam stations enable news to be transmitted to the Dominions much more rapidly than by ordinary radio services. Last year it took sixty seconds to transmit the name of the winner of the Derby to the Melbourne central telegraph office. This year the name of the winner was transmitted in three seconds, and in fourteen seconds after the finish of the race the full result was known in all the principal newspaper offices in Australia. This result was equalled on Budget day this year, only a few days after the beam stations had been handed over to the General Post Office. A thirteen-word "empiradio" message, giving the first news of the Budget, was transmitted to Australia in thirty seconds.

## A BEAM BROADCAST

3LO, MELBOURNE, TO ENTERTAIN ENGLAND.

The management of broadcast station 3LO, Melbourne, has made an application to the Amalgamated Wireless (A'sia) Ltd. for the use of the Beam station for broadcasting to England from 7 a.m. to 8 a.m. one morning, so that the programme will be received in England at night, when it will be generally heard. Small additional equipment is necessary, and when this is carried out the station will be equivalent to a broadcasting station of a million watts owing to the concentrated energy of the beam, and this should ensure more satisfactory transmission than anything previously attempted in any part of the world. This will be the first time that the Beam has ever been used for broadcasting purposes.

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