

Listeners Discuss A Reception Problem

Diverse Views as to Wandering Waves and Land Absorption

The Winning Paper.

N. Cole-Baker, Port Waikato, wrote: The factors influencing conditions described, are usually explained as the effect of reflected waves and direct waves interfering. Beyond a certain distance, usually about fifty miles, from a station, the waves reflected at a sharp angle from the atmosphere, interfere with those travelling horizontally, causing poor reception. Further off, the ground waves become weaker, and the reflected waves arrive at a lower angle, so that there is no interference, and any alteration of the angle of reflection has less effect on reception. The strength of reception is then dependent only on the power of the receiver, and there is little or no distortion. The result is that there are three zones surrounding a transmitting station—an inner zone of perfect direct reception, up to fifty or sixty miles, a zone of poor reception, extending up to five hundred or more miles, but varying in width with the nature of the country and other unexplained causes. Lastly, an outer range of good reception, for sufficiently sensitive receivers. These zones, of course, only exist at night, when the phenomenon of wave-reflection comes into play. In the daytime the first, or direct reception zone, is extended somewhat, and the others cease to exist.

In the case under consideration, the listener is situated within the area of poor reception of 2YA, but in the area of good distant reception of 3YA. It is well-known that 2YA is consistently well received in Christchurch, so that the staff of 3YA have no difficulty in picking up the music from 2YA perfectly, and putting it on the air again for the benefit of their listeners. Had our listener lived near Christchurch, he would have been able to hear both stations equally well, and the same might apply to the far north or south of New Zealand.

IN our issue of three weeks back we cited the experience of a correspondent in Havelock North, Hawke's Bay, who wrote: "Can you explain the following? On Sunday, April 22, I tuned-in band programme from 2YA, and fading and mushiness was so bad, I gave it up and tuned-in 3YA, who were rebroadcasting 2YA. From that station the programme came in perfectly, with no sign of fading. I repeated the process continually, with the same result. What's the answer?"

To stimulate interest in this question we offered a prize of 10s. 6d. for the best answer or explanation to the question put, which, for exactness, was stated thus:—

What factors influence the following phenomena: "Perfect reception from 3YA of a rebroadcast by 2YA, when direct reception of 2YA is affected by fading and mushiness."

A NUMBER of interesting papers were received from a wide circle of readers. In our opinion the best grip of the subject and the most likely explanation of the reception phenomena reported, is revealed by Mr. N. Cole-Baker, of Port Waikato, to whom is awarded the prize of half a guinea. Some of the other papers submitted devoted more attention to the absorption of the radio waves by the nature of the land traversed, while others indicate that superior reception would have been effected by tuning-down the receiving set. Our thanks are extended to correspondents for the interest taken in this reception problem.

Better Reception Oversea.

J.S.C. (Nelson) First of all I should say that reception in Christchurch of 2YA would be better than in Hawke's Bay, on account of Christchurch being practically in a direct line across water from 2YA, whereas reception of 2YA in Hawke's Bay would more or less be liable to interference from hills, mountains, etc., not forgetting electric power plants, and high power transmission lines.

If this is the case, I should say that reception of 3YA in Hawke's Bay would be better than 2YA direct, as Christchurch and Hawke's Bay are more or less in a straight line across water, or very near to it, and I find that reception across water is far superior to reception across land, irrespective of distance. For instance, I live in Nelson, and 1YA is straight across the water from here, and I find reception from 1YA good both night and day; on the other hand, there is nothing but hills, mountains, and power plants and lines separating us here from 2YA, 3YA, and 4YA, and they come in patchy. I can only blame the nature of the country and surroundings for the trouble.

Influence of Hills.

F. Thurston (Blenheim): I think that the answer to your competition

may be: He may be living near some hills, where their direction affects the waves to a certain extent, when they are broadcast from 2YA. Their direction may not affect 3YA in the same manner as it does 2YA. The direction of his aerial will have an effect on them also.

The reasons for my answer are:—My place is in Blenheim, and I can receive 2YA best of all the stations. Then in Rai Valley, where it is very hilly, 2YA can hardly be heard, but 1YA and 3YA come in far the best.

Reduce the Voltage.

Frank Murdoch (Christchurch): I find 2YA is too powerful for ordinary reception, and when I use 10 volts for detector, and 30 volts for amplifier, on a 5-valve set, I get perfect reception, with no fading or "mushiness." Detuning is bad tuning, but reducing the B voltage and manipulating the rheostats, at the same time keeping the variable condensers on the correct wave reading, gives clear reception, and perfect tuning. Usually I have 100 volts B power, and in Christchurch this gives fairly broad tuning of 2YA, which is not in my opinion productive of continued clear reception. Mr. X— is near 1YA, which would give broad tuning. The same applies to 2YA, but

3YA being fairly distant requires sharp tuning and consequently clear, steady reception. I do not consider local interference as likely, because this has probably been well attended to before making inquiries.

Many listeners are too ready to blame the transmitter and take the easy course of tuning-in another station. In one evening I have heard several receivers bringing in 2YA—some perfectly and the others in various stages of mushiness. This latter I find is generally remedied by reducing the receiving power, and at other times cleaning and generally overlooking the set; testing C battery, etc., is all that is required.

Situation is the Factor.

T. A. Vincent (Masterton): Havelock North would be about 150 miles air line from 2YA. Leading authorities have concluded that, at broadcast frequencies, fading is considerably more noticeable at distances between 100 and 200 miles from the transmitter than at distances greater than or less than this. This may account for 3YA's transmission being received more consistently by your correspondent, as Christchurch would be about 300 miles, air line, from him, and, consequently, would be outside the most affected area.

Is the Wave-length Responsible.

J. A. Lynn (Hastings): This fading may result from the difference in wave-length of the two stations. Thus while fading is bad on 420 metres in the Havelock district, the 306-metre waves might be entirely unaffected. However, as 2YA consistently fades in this district while 3YA is comparatively steady another solution suggests itself. The waves from 2YA, in order to reach Havelock, have to pass over bushy and mountainous country, whereas to reach 3YA they pass over sea. Therefore distortion of the land-wave in the first case would result. This would make it arrive at the receiver out of phase with the other portion of the wave, which travelled upward when leaving the transmitter, and was reflected down to the receiver, thus causing fading. The absence of fading from 3YA at the same time might be caused, either as explained above from the difference in wave-length, or by the fact that 3YA's waves would pass for the greater distance over sea, and over land which is geographically different from that in 2YA's path.

Perfect Transmission.

W.J.B. Wairoa, writes: Perfect reception from 3YA must surely prove perfect transmission by 2YA, therefore the fault must be either in the receiver or in conditions between the transmitting station and the receiver. Fading may possibly be due to some atmospheric condition or pressure diverting the waves from their course anywhere between the transmitting station and the receiver. As for mushiness: I think the cause may be looked for in the grid leak. Taking into consideration the difference in the transmitting power of the two stations, and also (as far as the North Island is concerned) the distance, then a grid leak of a much lower resistance is necessary to get good reception from 2YA, than would be needed to get an equal quality reception from 3YA, as a high-resistance grid leak means easy oscillation.

Our Short Wave Corner

MR. F. W. SELLENS (Northlands) writes:—

I was glad to see reports in the "Short-wave Corner" from listeners in other districts.

Saturday, May 19.

3LO was transmitting early in the morning. They were fairly good, but faded badly at times. Gramophone records and speeches were heard. 5SW were putting out talk each time I "went over" to them.

At 1.30 p.m. PCJJ was tuned in, when they were received at fair phone strength, but announcements were not wholly intelligible.

A special programme for Australian and New Zealand listeners commenced at 3.35 p.m. with the (British) National Anthem. Then Australia and New Zealand was called, and it was announced that this special transmission would be from 4 till 7, Greenwich mean time, asking for reports to be sent to their Australian office at Sydney, giving their postal address.

The first record was by a New Zealand composer, Mr. David S. Sharp, Dunedin, "Caring For the Rose." The music for this was sent to Australia and a record made there and sent on to Holland. The managers of the various branches and agencies throughout Australia and New Zealand, also a few listeners, including myself, were called. The transmission continued till 6.37 p.m., the National Anthem being sung again just prior to closing down.

Reception was very weak at first and attained its maximum volume at from about 3 p.m. till 5 p.m., when it was good speaker; after this it decreased, till on closing down the closing announcement was barely readable.

Reports received at the local office of Messrs. Philips Lamps, Ltd., were all about the same as regards volume, etc. It was well received all over New Zealand during the period I mentioned as being the loudest.

2XAF were also heard. As both these stations are supposed to be on 31.4 metres, one must have altered their wave as they could be separated easily. The Palmolive Party supplied the programme. Reception was weak, but improved towards closing time at 2.30 p.m.

2RG, Goulburn, was heard testing at 5.10 p.m.

JIBB (Japan), on about 30 metres, were relaying JOAK. Talk and instrumental music was heard. RFM came in very well. A violin solo was especially good.

This was a day for variety. England, Holland, America, Russia, Japan, and Australia (two stations), not forgetting 2YA, New Zealand.

Sunday, May 20.

2XAF was spoilt by a morse station. Dance music was relayed from the Hotel Orchestra, Albany, New York. They signed off at midnight, Eastern

daylight saving time (3.30 p.m., New Zealand).

Several amateurs were heard, including 3AV and 2BO, the latter putting on quite a programme of gramophone records.

Monday, May 21.

3LO, through 3ME, came through at good volume from 6 a.m., but faded badly; there appeared to be two sorts of fading, one short and jerky, and a long fade.

RFM was heard during the evening.

Tuesday, May 22.

5SW did not start till 6.30 a.m., when "Big Ben" was heard very faintly. The talk following was not intelligible. At 7 a.m. volume was very little better, but at 7.25 a.m. a big improvement was noticed, an organ solo coming through at good 'phone strength.

At 7.10 p.m. a station was picked up on about 31.5 metres (same setting as PCJJ and 2XAF). Music was heard, but not any announcement, fading was very bad.

A station signing 1—, Brisbane, was also weak, and fading badly. Wave-length about 32 metres. RFM, as usual, had a lot of talk, and not any music while I was listening.

Wednesday, May 23.

PCJJ was tuned in at 5 a.m., and gave fair speaker strength, with 2 stages of audio. A few names of listeners in Australia, New Zealand (including myself), and Canada, thanking them for reports, also inviting further reports. The following particulars are requested:—

1. Is there any difference in reception since the station's transfer from Eindhoven?
2. Is fading experienced, and, if so, at what time?
3. What are the signal strength and general qualities of the transmissions?
4. Is the wave-length constant, and state general reception conditions?
5. At what time are strongest signals received?

This is often asked for over the air, and was detailed in a letter received from them this week. The programme concluded at 1.22 a.m., with the Dutch National Anthem.

At 5.30 a.m. a German station was heard on about 45.5 metres (probably AFK). "Achtung" was heard several times. Reception, fair 'phone. Another foreigner was picked up on about 15 metres, but was too weak to identify, except that it was foreign talk.

At 6.30 a.m., "Big Ben" was heard. The announcement, although fairly loud, was too unsteady to understand. At 7.30 they were more steady, and louder, when a talk was on.

2BO put on a gramophone programme during the evening on about 48 metres.

Thursday, May 24.

3LO, on 32 metres, came through at wonderful strength, and modulation early in the morning. 5SW was only just audible at 6.30 a.m., but was much better at 7 a.m. This station attains better volume later now than it did a while ago, caused, I suppose, by the days getting longer on that side of the world, and shorter here. During the evening a station on 28.5 metres was heard, but I did not hear a call. Was very weak.

Friday, May 25.

PCJJ was fair speaker, when tuned in at 5.15 a.m., but on account of the high winds, the aerial was swinging, and reception jerky.

5SW at 5.30 a.m. was too weak to be readable; it did not reach fair 'phone strength much before 7 a.m.

A strong carrier was picked up early in the evening on about 28.5 metres, and piano items were heard, then the call, 2FC, followed by a few minutes of the bed-time session. Reception was very weak, fading right out at times, and lost altogether soon after the stories started.

RFM was heard later, having a few words to say to all and sundry, as usual.

Auckland S.W. Reception.

Mr. S. Saunders, who has removed temporarily to Auckland, writes: I rigged up my S.W. set on May 20, and have received the following stations:—

May 20.—2HIF, Balmain, New South Wales, good modulation, and very loud. Records also 2XAF, WGY, GEC. Dance orchestra items by "Selenamano" and his De Witzlers' Hotel Orchestra. This is the Crystal Hotel "She's a Great, Sweet Girl" also piano solos and organ recital from Buffalo Theatre. (Closed down, 3.30, New Zealand time. This transmission came through very loud. 3AR, Melbourne, records.

May 22.—I received 5SW, Chelmsford. Organ music and choir, also lecture, medium strength. Also got cornet solo, "Killarney," very faint, 6 p.m. till 6.30 p.m., about 35 metres.

May 23.—PCJJ, Holland, came over, good strength, 31.4 metres. Closed down just after 7.30, New Zealand time. I also got 5SW, Chelmsford, but they were hard to hold in. I notice a lot of the wireless enthusiasts have got fixed to their aerials up there a copper cistern ball.

BODY CAPACITY

A correspondent recently outlined his difficulties with body capacity, and Mr. F. W. Sellens has kindly supplied the following from S. Gernsback's "Radio Encyclopedia," which is the practice he follows himself:—

"Body Capacity.—The effect of the human body when tuning a radio receiving set. The hand, when placed on or near the controls, very often throws the receiver out of balance with the incoming signals. In the case of very sharp tuning (as in short waves), this effect is more in evidence, and is likely to cause howls, due to self-oscillation. The howling is due to the production of an audible beat

frequency in the system, caused by the combination of the local oscillations with the incoming signal oscillations. The remedy may be to shield the panel with metal foil, or, in some cases, merely to alter the direction of the leads from the tuning condenser. The experienced operator seldom pays much attention to the phenomena, as a little practice enables the listener to compensate for the effect. To make this more clear, if, when tuning the set, the withdrawal of the hand from the dial detunes the set, or throws it out of balance, it is due to the fact that the hand has acted as a certain amount of capacity in the circuit, and naturally its withdrawal is equivalent to a change in the condenser setting. A simple system is to turn the condenser beyond the point of maximum volume, then when the hand is withdrawn, the capacity will drop to its proper value. This can be mastered very readily. If the tuning condenser is connected across the secondary, i.e., one side to the grid, and the other to the grid return, the stator plates of the condenser should be connected to the grid of the tube. If metal foil or thin copper sheeting is used for shielding, it should be connected to the ground part of the set.

The tendency of the human body is to insert an arbitrary capacity in the circuit. The phenomena are especially noted where maximum volume is obtained only by very critical control, close to the oscillating point, in which case the circuit may be thrown out of resonance.

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