

Sunday, September 2

1YA, AUCKLAND (333 METRES), SUNDAY, SEPTEMBER 2.

- 9 a.m.: Result of All Blacks match in South Africa.
 3 p.m.: Afternoon session, selected studio items.
 4.0: Literary selection by the announcer.
 4.8: Selected studio items.
 4.30: Close down.
 6.0: Children's song service, conducted by Uncle Leo, assisted by children from Knox Presbyterian Sunday School.
 6.55: Relay of Service from St. Mary's Cathedral. Preacher, Rev. Percival James. Organist, Mr. Edgar Randall.
 8.30: Relay of Auckland Municipal Band concert, military band selections. Conductor, Mr. Christopher Smith.
 9.30: God Save the King.

2YA, WELLINGTON (420 METRES), SUNDAY, SEPTEMBER 2.

- 9 a.m.: Result of All Blacks' match in South Africa.
 3 p.m.: Afternoon session—Selected studio items.
 6.0: Children's Sunday service, conducted by Uncle Ernest, assisted by Vivian Street Baptist Church Sunday School Choir.
 7.0: Relay of service from St. Gerard's Redemptorist Church. Choir-master, Mr. F. J. Oakes. Organist, Mr. H. Mount.
 8.15 (approx.): Studio concert by Mr. Len. Barnes.
 God Save the King.

3YA, CHRISTCHURCH (306 METRES), SUNDAY, SEPTEMBER 2.

- 9 a.m.: Result of All Blacks match in South Africa.
 3 p.m.: Studio concert, selected studio items.
 4.30: Close down.
 5.30: Children's song service, conducted by Uncle David, assisted by children from Oxford Terrace Baptist Sunday School.
 6.30: Relay of evening service from Linwood Baptist Church, Linwood Avenue. Preacher, Rev. A. W. Stuart, B.A. Organist, Mr. W. E. Wilson. Choirmaster, Mr. S. J. P. Grigg, M.Sc.
 7.45 (approx.): Studio programme of selected items.
 8.15 (approx.): Gramophone recital.
 God Save the King.

4YA, DUNEDIN (463 METRES), SUNDAY, SEPTEMBER 2.

- 9 a.m.: Result of All Blacks match in South Africa.
 5.30: Children's song service, conducted by Big Brother Bill, assisted by children from the Central Mission Methodist Sunday School.
 6.30: Relay of evening service from Knox Church.
 8.0: Studio concert.
 9.15: Close down.

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Two Radio Puzzles

I HAVE had two experiences that appear somewhat unintelligible to me, and an explanation might be of interest to your readers. Firstly, I had a super-heterodyne set and a neutrodyne set alongside of each other. The super-het. was receiving well off the loop only and not grounded, but of course being immediately under the aerial and only a few feet from the lead-in, but in no way connected. The neutrodyne was connected to the aerial, and its own batteries, but no loud-speaker. I found on tuning the neutrodyne (which had no speaker) to the same station that the super-het. was receiving, that the volume of the super-het was considerably increased. Of course I was not satisfied with one trial, but got the same result time after time. I have been at it long enough to know that I was not being deceived by a chance synchronising.

This experience is perhaps more easily explained than my second one, which was as follows:—I had a super-het. set working on aerial and loop but no ground. Suspecting the wet B battery (which was an alkali one) to be at fault, I substituted dry batteries and the set operated faultlessly. I then had the alkali battery standing on the floor at the foot of the console super-het., and got to work with a voltmeter to test it. The battery was connected to nothing. On putting the second terminal of the voltmeter on to a cell in advance of where the first terminal was, the reception of the set was considerably upset—there was a distinct variation, and this happened again and again, as I tested the battery a few cells at a time. Can you elucidate please?—Mostyn Jones (Te Kuiti).

The Phenomenon Explained.

Our contributor M.I.R.E., to whom we submitted this letter, writes:—Mr. Mostyn Jones's first problem is very easily explained. The neutrodyne was connected to the aerial, and the super-heterodyne was not, but the latter was connected to the loudspeaker. Presuming the super-heterodyne to have six valves and the neutrodyne five, the net number of valves in operation between aerial and loudspeaker would be eight, because the first two valves in the neutrodyne would act as radio frequency amplifiers, and this amplified energy would excite the super-heterodyne by virtue of the inductive coupling existing between the two sets, and thus in effect add two radio frequency stages to the super-heterodyne. As a matter of fact, the third valve in the neutrodyne, which under normal circumstances is a detector valve, would act to a certain extent as an amplifier and assist the before-described action somewhat. Had Mr. Jones shifted either of the two sets, an angle would have been found where this coupling arrangement would have had a maximum effect.

With respect to the second set of circumstances, as far as can be judged, this is a freak effect dependent on the fact that a receiver using a loop as a pickup, becomes very much more sensitive if an aerial is attached to the receiver, and the earth left disconnected. The aerial under these circumstances, will impulse the receiver, due to the aerial becoming an aperiodic pickup. If the earth is connected, the aerial takes up a definite time period, and is no longer aperiodic, and the received signals are consequently

materially reduced unless the natural period of the aerial approximates the wave length being received. Presumably, the wet "B" battery described by Mr. Jones as having been located close to the receiver, had a material self-capacity with respect to the receiver and to earth, and increased the coupling between receiver and ground just sufficiently when the self-capacity of his body was also connected to the battery sufficiently to disturb the efficiency of aperiodic action of the aerial.

This latter explanation is purely hypothetical, but as a loop-driven receiver attached to an aerial and not earth, is particularly sensitive to near-by capacity effects, it is not at all an improbable explanation.

Heterodyning of 3YA.

THE Americans are experimenting with simultaneous broadcast from several different stations at the same frequency (or on the same wave length). This has decided advantages in that much duplication of programmes is saved, but it has a disadvantage in that the slightest variation in the number of frequencies sent out by any station cause heterodyning and mushiness.

AN example of heterodyning occurred recently when 3YA had to drop two metres in wave-length (or, more accurately, increase its frequency six kilocycles per sec.) to avoid interference by 2GB. The normal frequency at which 3YA should transmit is 980 kilocycles per sec., while 2GB should transmit at 950 k.c.s, thus leaving a margin of 30 k.c.s.

To heterodyne at the proximity of this wave-length the stations must differ by 5 kilocycles (a note of 5000 frequencies) or less. It is evident, therefore, that one of these stations must be off its wave-length.

Frequent testing at 3YA would indicate that 2GB is at fault, but there is hardly yet time to definitely determine this. If both of these stations were crystal controlled, variation of this dimension would be impossible. Herein lies the value of a crystal controlled transmitter. Without going into details, the principle of this type of oscillator consists in a smooth crystal of definite dimensions, within two metal plates, which are connected to a suitable circuit. This crystal has a natural frequency determined by its physical dimensions. These frequencies are true to within .00001 per cent. Arranged in a circuit, the minimum variation is about .005 per cent., while the maximum is .2 per cent.

IT can thus be seen that were these two stations crystal controlled their maximum variation would be 1.9 k.c. in the case of 2GB, and 1.96 k.c. in case of 3YA, although in practice this variation would be much lower. Compare this with the 25 k.c. variation which has led to heterodyning.

FEW valves die a natural death, at least few of those in the sets of radio enthusiasts. They are either short-circuited, dropped, or have something dropped on them. A simple "valve safe" for valves not in use can be constructed out of a few strips of corrugated cardboard, such as used for wrapping bottles, glued into a suitable box. Valves are more secure there than if left lying on the table or chair.