

WIRELESS WEEKLY

February 16th, 192

## Broadcasting at Grace Bros.

### Free Musical Entertainments by Wireless.

During the 12 days' sale from the 2nd to the 16th Grace Bros. have been treating their customers to grand opera music by wireless. Such well-known artists as Julia Caroli, Miss Ella Goodman, Countess Filipini, Jean Ethelstone were engaged, so as to make these series of concerts the success that they have been.

Considering that Grace Bros. is one of the newest recruits to the wireless field, it has achieved in so short a time what it has taken most firms, not only in Australia

but in America, twelve months or more to do. The whole of the wireless part of this enterprise was under the direction of Mr. F. I. G. Graf, who was ably assisted by Mr. W. G. Keogh and Mr. W. M. B. Veitch. A single 5-watt tube was used for transmission, and the station was heard as far away as Moss Vale on a crystal, as far as Strathfield on a crystal. Six sets were situated in different parts of G.B. Building, and the concerts were heard by some thousands of people.

Sure to get it at **GRACE BROS.**

## RADIO BARGAINS.

at our 12 DAYS' SALE.

### MARCONI VALVES.

V-24	35/- each.
R	35/- each.
QX	36/- each.

### DOUBLE HEADPHONES.

SIDPE (French make), 4,000-ohms.	27/6
MURDOCK'S, 2,000-ohms.	31/6
MURDOCK'S, 3,000-ohms.	31/6
BROWN'S, 2,000-ohms.	£4/18/0

### LOUD SPEAKERS.

"MAGNAVOX" R3.—The Rolls-Royce of Reproducers	£14/10/0
"BABY BROWN'S" 2,000-ohms, Adjustable Receiver	£4/17/6
"CLEARTONE" complete, with 2000-ohm. Receiver	47/6
"SPIROLA"—Suitable to use your own headset	25/-

### "A" BATTERIES.

"LION" 6-volt, 60-A.H.	52/6
"FLAG" 6-volt, 60-A.H.	52/6
"EDISWAN" 4-volt, 40-A.H.	37/6

### "B" BATTERIES.

42-Volts	12/-
30-Volts	9/-

Complete set of component parts for making your own Crystal Receiver in an up-to-date manner, with full instructions and diagrams for connections.

10/- ONLY (not including 'phones).

WRITE AND ENCLOSE 6d. IN STAMPS FOR OUR

WIRELESS CATALOGUE.

LET US KNOW IF YOU HEARD AND ENJOYED OUR

WIRELESS CONCERTS.

February 16th, 1923

WIRELESS WEEKLY

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# The Trimm "Professional" Head Set.

3000 Ohms.

## A QUALITY PHONE AT QUANTITY PRICE.

### Perfect Reproduction and Articulation at any Range.

Weight Only 10½ ozs.

Compare these specifications with any head set on the market at any price, and see why the TRIMM "Professional" is the biggest value in the Head Set Field: . . . Moulded Bakelite cases and ear caps, which will not warp or crack like cheap composition, no exposed metal parts to become tarnished; single bar Tungsten steel magnets formed to shape to insure uniform tapering and magnetizing; coils wound with maximum number of turns of No. 40 enamelled wire to full resistance of 3,000 ohms; reinforced terminals of stranded wire brought out from coil windings to solder clips; coils covered with insulating cloth—no fine wires exposed; arrester gap across cord terminals; improved type head band covered with resilient tubing—comfortable, light weight and distinctive in appearance.

PRICE . . . . . 39/6 each.

Obtainable from all Wireless Supply Houses.

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37-39 PITT STREET, SYDNEY.

#### PROTECT THE RECEIVER WITH SHIELDS.

One of the peculiar things about a regenerative receiver, especially on short wave lengths such as are used in broadcasting, is body capacity. This is the condition that exists in all unshielded sets. No doubt you have observed that immediately after an adjustment is made and your hand is withdrawn, the set begins to squeal. If the adjustment is in a certain position, this squealing will stop as soon as you return your hand to the adjusting dial. On other occasions when the set is functioning perfectly, the moment you approach it, a terrific squeal will issue from the telephones.

You can eliminate this troublesome body capacity in only one sure way—by ground-shielding the set. Line the inside of the cabinet with very thin copper plate or tin plate. Solder the plating wherever there are any joints. It is necessary, of course, to make holes in these plates in order that the different connecting wires, the shafts of the vari-

able instruments, such as the condenser, tuning coils, and other parts, can be passed through without touching the shield. The shield should then be soldered to the ground connection. If this is done carefully, the squealing effect produced by the body will be eliminated and accurate tuning will be possible.

In cases where the feedback coil is in an inductive relationship with the tuning elements of the receiver, a shield should not under any circumstances be placed between them. There is one exception to this rule, however, and that is in case of the variocoupler-two-variometer type of receiver. In this case shields can be placed between the three tuning elements, for regeneration in this type is obtained by tuning the three circuits into unison, as will be explained later.

#### DO NOT OVERWORK THE RHEOSTAT.

The filament rheostat is the most important element in the regenerative receiver. It is constructed so that it can be mounted into a panel in two different ways and, in order to facilitate this, the manufacturers have made it so it can be taken apart easily.

When mounting the rheostat, it is important to make sure that the contact arm is in firm contact with the resistance wire. If this is not done, the arm will make only a loose contact, with the result that when the rheostat is turned on, an arcing will take place at the point of contact, rapidly burning the wire on the rheostat and destroying the instrument.

There is one other thing to consider about the rheostat itself. In resisting the flow of current, it becomes heated. To keep the coils as cool as possible, be careful to mount the rheostat inside the cabinet in such a way that a free circulation of air can carry off the heat, which might otherwise burn out the resistance wires.

Since heat rises, the rheostat should not be mounted inside the top of a shallow cabinet nor should coils be placed in a small space. The best mounting for a rheostat is on a vertical panel clear of the other instruments in the receiving set.

Remember that the average rheostat in general use is designed to regulate the filament current of one tube only. When more than one tube is controlled by a single rheostat, the temperature rise in the resistance coils may become excessive.

\*\*\*\*\*  
(C) TRANS-PACIFIC TESTS. (R)  
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*AMATEURS RADIO TEST*  
 between  
*AMERICA & ENGLAND.*

*We publish below particulars of Trans-atlantic Tests, now being carried out.  
 Have any such arrangements been made for TRANS-PACIFIC TEST.*

**THE TRANSATLANTIC COMMUNICATIONS.**

From the latest information received from America in connection with these tests, it appears that even greater enthusiasm is being shown there on this occasion than last year. As has already been announced in these columns, the American Radio Relay League has imposed stiffer conditions this year for their transmitters. They have stipulated that in order to qualify for an individual transmission period in the final tests, transmitting stations must have signalled over a range of at least 1,200 miles. These preliminary tests were held at the end of last month and a few British amateurs have reported reception of signals from some of the American stations during these tests. This result gives hope for the success of the main tests this month.

**Reception From America.**

The main transmission tests from the United States will continue for 10 nights and will last from midnight, G.M.T., to 6 a.m., on each occasion. This 6-hour period will be divided up into a "free-for-all" period lasting for 2 1/2 hours commencing at midnight, followed by individual transmission periods for the remaining 3 1/2 hours which will be divided up into shorter periods, which will be allocated to the various districts of the United States and Canada, much as was done last year. Before the commencement of the tests, details will be published of these time allocations,

as a guide to listeners in this country.

The wave-lengths to be used during each of the individual transmission periods will also be published as soon as they are received from the American Radio Relay League; but should they reach this country too late for publication in this way they will be circulated by post to all amateurs who have registered their names with the writer as desirous of listening-in for the signals.

**Daily Reports.**

Through the kindness of Marconi's Wireless Telegraph Co., and the Radio Corporation of America, arrangements have been made for the transmission at 0700 G.M.T. each morning during the tests of a report addressed to the "American Radio Relay League," giving details of any receptions that are reported here. In order to enable these reports to be prepared by the Sub-Committee of the Wireless Society, which is making the necessary arrangements, every amateur hearing signals is requested to report their reception immediately by telegraph or telephone to the writer. Such reports will be verified by comparison with the special code letters which will be sent over by the American Radio Relay League, before inclusion in the daily reports.

These daily reports will be sent by Carnarvon MUU at 0700 G.M.T. on a wave-length of 14,200 metres, at approximately 12 words per minute, and will be repeated five minutes later by New Brunswick WII.

Similar arrangements have been made by the French Transatlantic

Signals Committee for the daily transmission of reports of the reception of American signals by French amateurs. These reports will also be addressed to the American Radio Relay League and will be sent by Sainte Assise Radio Station at approximately 0710 G.M.T. on a wave-length of 15,000 metres. They will be repeated five minutes later by Marion station, in the United States.

During the transmission tests to America from this country and from France, similar daily reports will be made by the A.R.R.L. from New Brunswick Station, WII, on a wave-length of 13,600 metres, at 2000 G.M.T. (8.0 p.m.). These reports will be addressed to "Coursey, London," and will be repeated by Carnarvon MUU on a wave-length of 14,200 metres five minutes after reception there.

All wireless amateurs in this country will therefore be able to follow the progress of the tests from day to day by listening-in to these transmissions from Carnarvon at 0700, and from Sainte Assise at 0710 G.M.T., during the reception tests here, and to the Carnarvon reports at 2000 G.M.T. during the transmission tests from this side.

**Special Testing Signals.**

In order to help listeners here to adjust their sets to the maximum sensitivity arrangements have been made for the transmission each evening of special testing signals from a station near London on a lower power and using wave-lengths approximately covering the band to be used by the Americans.

These signals will be sent on wave-lengths of 200, 230, 275 and 325 metres, commencing at 2000 (8 p.m.) on Thursday, November 23rd. The signals will be in the following form:—

"TEST TEST TEST ds 2 VK  
 2 VK 2 VK. XXXXXX  
 XX. WAVE  
 LENGTH . . . . METRES."

The transmission on each wave-length will last for 10 minutes, and the change over from one

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wave-length to the next in the above order will be made as quickly as possible, so that the transmissions will be as follows:—

From 8 p.m. to 8.10 p.m. on 200 metres.

From 8.15 p.m. to 8.25 p.m. on 230 metres.

From 8.30 p.m. to 8.40 p.m. on 275 metres.

From 8.45 p.m. to 8.55 p.m. on 225 metres.

A lower power will be used for transmission in order to make the signals a real test of the receiving apparatus. Reports of the reception of these signals are invited, particularly in order to compare the relative transmission qualities of the various wave-lengths. These transmissions will not take place on Saturday and Sunday unless otherwise announced on Friday, November 24th. These test signals will continue until the evening of December 11th.

Transmissions from Europe.

These transmissions from Europe will be made from this country and from France. They will extend from December 22nd to December 31st inclusive and will last from midnight to 6.00 a.m. in each case. Three hours each night have been allocated to the British transmitters, and three to the French, the periods alternating on successive nights, commencing with British transmissions from midnight to 0300 on December 22nd, followed by French transmissions from 0300 to 0600 on the same night. The next night the French will have the first three hours, and the British the second period; and so on alternately. This arrangement should give a very fair distribution of the transmitting periods to the two countries.

In order to meet the desires of many of the ordinary low powered transmitters here, it has been decided to reserve the first half-hour of both British transmission periods for a "free for all" transmission, during which any licensed transmitting station in Great Britain may transmit on their licensed power and wave-length without registration in any way. These calls should simply be in the form of "TEST TEST TEST" the call letters, 3 lines," repeated as often as desired. These transmissions should preferably all be made on the shorter licensed wave-lengths in the 150 to 200 metres band.

To those transmitting stations which comply with the conditions recently announced in these columns, and have registered their names with the writer, special individual transmitting periods will be allocated, with special code letters to be used. Details of what is to be transmitted by these stations will be forwarded by post shortly before the commencement of the transmission tests.

Avoidance of Interference.

It is hoped that every amateur in the country will co-operate to make these tests a success by avoidance of interference during the periods of listening for American signals between December 12th and 21st. Not only should transmitters be kept quiet after midnight between these dates, but receiving sets also should not be used so as to avoid jamming other listeners in the vicinity. In particular also all those who intend to listen for the signals are urged to take every possible precaution against radiation from their signals by using a separate heterodyne far removed from the aerial circuit, in the manner that has already been outlined in recent issues of the "Wireless World and Radio Review."

TRANS-PACIFIC RADIO TESTS.  
APPEAL TO APATHETIC AMATEURS.

Dear Sir,

I would deem it a favour if you would permit me sufficient space through your columns, to make an urgent appeal to all those amateurs in New South Wales who have up to date failed to enter for the forthcoming Trans-Pacific Tests to do so at once.

Since accepting the position of Honorary Secretary to the Organization Committee, I have been astonished at the poor response to the appeal made by them. I was surprised to find such a lack of enthusiasm on such an important, world-wide and interesting experiment.

Seeing that the committee have tried and are still trying to make these tests successful, I do appeal to those amateurs who are able and capable of giving their support to come forward at once with their entry, and so back up the committee in their arduous task. If they do not, all the good work done up-to-date will be of a little use.

I feel sure, if ready response is made to this appeal, and the amateurs come forward and lend their hearty support and co-operation at once, this test will not end in chaos, as it may if this appeal is ignored.

In conclusion, may I point out that the amateurs of U.S.A. have committed themselves to a big expense in erecting stations, etc., with a view of transmitting messages across the Pacific. Should it be proved we were lacking in common courtesy, it would reflect on the prestige of the Amateurs of N.S.W. Whereas, should we be successful in receiving these messages, it would prove to the world that the N.S.W. Amateurs were at all times in the front rank.

Thanking you in anticipation, I am, sir, yours faithfully, G. W. Tatham, 58 Adelaide St., Woolahra.

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- Lessons in Wireless Telegraphy, by Morgan, 2/9 Posted.
- Experimental Wireless Construction, by Morgan, 2/9 Posted.
- The Construction of Amateur Valve Station, by Douglas, 2/3 Posted
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- Wireless for All, by Scott-Taggart, 11d. Posted.
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476 George Street

**MR. C. MACLURCAN RETURNS HOME**

**MUSIC IN THE AIR**

Mr. Charles Maclurcan returned to his home on Tuesday, last after an absence of about two months.

We feel sure that he will not remain long away from his wire-

less room. Anyway, Wireless Weekly suggests that a little listening in on a 1400 metres wave-length may produce results especially on Sunday nights at say 7.30 p.m.

**DODGING ICEBURGS**

A very important but little known branch of radio activity at sea is the patrolling of the Newfoundland Grand Banks by the International Ice Patrol. This is what they do.

Dodging ice bergs is a game in which every skipper is an adept, and since 1918, when the nations met at the London Conference, radio has taken a hand in it. The dreadful lesson taught by the Titanic, sunk in a little over a quarter of an hour by a monster iceberg, was not lost upon them, says a writer in The Broadcaster.

**The Ice Patrol.**

Equipped with the latest and best radio apparatus, patrol vessels (U.S. cruising cutters, some electrically driven) are constantly on the watch for these menaces. Thirteen nations foot the bill, and the United States is responsible for the actual work. Up and down the Grand Banks they go, these ice patrol vessels, watching, warning, and even drifting with the bergs themselves in order to accurately determine which way they are travelling.

**The Operator's Work.**

Day and night the radio cabin is the centre of activity. Every four hours all ships within range receive a radio request to send in their course, present position, and sea water temperature. These T.R.s, as they are termed, afford protection in a measure for the senders, and an astounding volume of work for the staff of the patrol. At 6 a.m. the radio cabin gets busy with a full report of the condition of the particular ice-field which the vessel is watching. This is for the New York Hydrographic Office, from whence it is handed on to Washington. From there it is passed along to the Arlington Naval Radio station and from there broadcasted far and wide. Often this first advice is received by the identical ship that originally sent it forth late in the same evening.

During the day the receiving and transmitting gear is constantly in operation and at 6 p.m. a bulletin of the day's information received is broadcasted twice. The commerce 600-metre wave-length is used and is particularly designed for seamen, so that they may know to a certain extent what's what and who's where on the

waters that night.

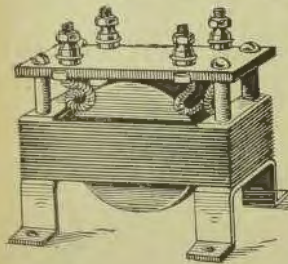
Two hours later out comes the iceberg chart of the patrol and a radio message goes into the ether asking every vessel to state its etc. Down it goes on the chart, and in return for the information present latitude, longitude, speed given the skipper knows that he and his vessel are under the watchful care of the patrol, and that any dangerous icebergs likely to cross his path will be announced first by the ever-present sentry.

Apart from this, a continual stream of questions pours into the ether, always upon the same subject—the Great White Scourge of the Newfoundland Grand Banks. Few if any masters still trust to their own "sixth sense" to warn them, or to the sudden fall in air and water temperature when a berg is within dodging distance.

**Three Months' Work.**

Checking temperatures is a task that occupies many, many hours of the operator's day. Some idea of the time and energy expended may be gathered from the fact that 945 ships reported themselves and their surroundings (air, water, temperatures, etc.) exactly 2,646 times within three months. These were, of course, the worst three months of the iceberg menace, when those destructive forces were most active. Seven hundred and seventy-one reports in fifteen days is the present record, held by the Tampa, an electrically driven cutter which possesses both arc and ½ k.w. spark transmitters. During the test period the ½ k.w. grew overheated and caused a bad note.

**INTERVALVE TRANSFORMER.**



CLOSED CORE—FOR AUDIO FREQUENCY AMPLIFICATION.

This Transformer, which is scientifically constructed, is of the shell type. It is simple, reliable and compact. Maximum results are assured. The complete measurements of this Transformer are 2½ x 1¼ x 1¾ in. It is provided with feet in order that it may be mounted in any desired position.

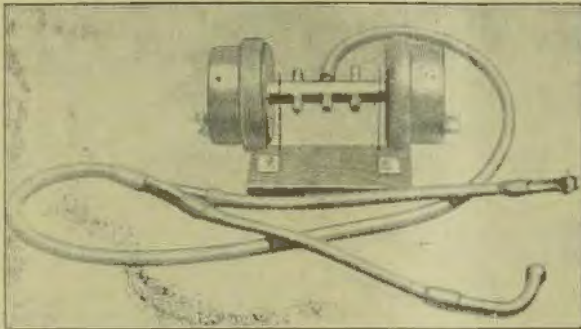
Price - 45s.

Postage 6d.

**Homecrafts** *Melb*  
P.H. McELROY.  
211 SWANSTON STREET

Strange to say the patrol actually see very few icebergs. Their work is to keep track of them by radio, and to broadcast this information. To watch the bergs from the floes, to the time they either break up beneath the benign influence of the Gulf Stream

or are carried back whence they came upon the Labrador current. The danger zones are now infallibly and unfailingly patrolled, and, thanks to radio, neither sea fog nor devastating gale need keep a vessel long in doubt should she need counsel, warning or information.



A Device for allowing a number of persons to listen-in.

### NEW FIELDS FOR RADIO

China is to form her own radio companies in the near future. Radio is not unknown there, for much business has been transmitted via the American Naval Station at Peking, which relays its messages through Cairo, P.I. Most foreign countries have at least one of their own official stations there to handle the various commercial and other messages that come through. By a recent treaty the Chinese Government can now prevent other principalities from putting up their own stations and compel them to use the native ones. Companies are now in formation to operate radio. They will have to import both operators and equipment, for as yet radio is a closed book to John Chinaman. For once Germany is behind the rest of the scientific world. Over there amateur radio telephony is still practically non-existent, owing to the activities of the German post office and Government authorities.

## RADIO COMPANY.

Before making your set, both Transmitter and Receiver, consult us for Designs and Novel Apparatus.

### Complete Valve Receiving Set £14.

Comprising—Cabinet, 6 Volt C.A.V. Battery  
Pair 2000 ohm Phones, 30 Volt "B" Battery,  
and Mounted Honeycombe Coil.

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Special Morse Code Class price 5s per night

Full Correspondence Course £4 4s.

1 month Course fully Illustrated £1 10s.

Full 3 months Course including Morse  
and Telephony £5 5s.

MAKE YOUR OWN.

BATTERY RECHARGING.

A recharging panel, efficient and easy to construct is described by V. G. Lehmann, in "Popular Science Monthly." The writer says:—

It will charge a 5-volt battery at an 8-ampere rate, a charging capacity even greater than that of the "six-sixty" size commonly used in radio work and in experiments. The transformer in the set can however, be so varied as to give any desired voltage and amperage.

The panel is composition, 8 by 9 by 1/4 in. The transformer may be purchased and made over for the purpose, but it is better to construct the instrument yourself. In a closed core transformer the windings may be computed from the equation.

$$E = 4.44 F \Phi N 10$$

$$N = \frac{4.44 F \Phi}{E}$$

where E is the voltage for that particular winding, F the flux per sq. in. of core—which may here be put at 60,000—f the frequency here 60, N the number of turns required per sq. in. cross section of core, and 10 is 1/100,000,000, giving

$$N = \frac{6.25 \times E}{A}$$

where A is the cross sectional area of the core in square inches.

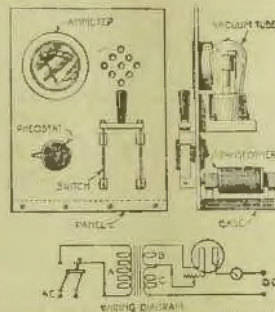
In other words, to find the number of turns needed in any winding, divide the voltage of the winding by the area of cross section of the core and then multiply by 6.25; that is, the number of turns needed for 60-cycle current and a flux density of 60,000 lines per sq. in. is 6 1/4 times the required voltage divided by the area of the core. For example, if the core is 1 by 1 in., and the voltage 9, then

$$N = \frac{6.25 \times 9}{1}$$

which gives approximately 56 turns. In such a transformer, small and of low power, it is not necessary to be exact, so long as the ratio between turns on primary and secondary is always the same as the ratio of their required voltages. Any core area can easily be substituted in the formula mentioned above—

$$N = \frac{6.25 \times E}{A}$$

The size wire depends only upon the current carried. The current carried by A is about 3 amperes, B carries 1, and C carries 8. The transformer is rated at 80 watts.



Front and end views of the panel, with wiring diagram showing how the parts are connected

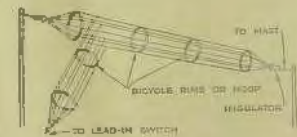
The core of this transformer should form a hollow rectangle, about 3 by 4 in. inside measurement. The primary, A, should be wound with No. 18 copper wire, B can be wound with No. 16 or 18, but C should not be wound with wire smaller than No. 14, or the comparatively heavy current is liable to cause heating.

For the rectifier, an ordinary vacuum tube, such as is used in radio, may be used, but it is better to utilize a rectifying bulb sold for the purpose. It can be purchased reasonably. The rheostat does not have to be of any special make, but it should be of the back mounting type. Direct-

ly above it is the ammeter, which registers the amount of the charging current. Beside the ammeter are openings through which the rectifying bulb may be seen. In the lower right hand corner is the main switch for turning on the current. A push-button, or turned switch may be used instead of a knife switch.

NEW TYPE OF CAGE ANTENNA FOR RADIO STATIONS.

The cage type of aerial is gaining considerable favour with commercial and amateur operators, as it is easy to construct, economical in the number of insulators required, eliminates much trouble due to poorly soldered joints, occupies less space, and offers less resistance to the wind than the old flat-top type. Height is essential in this type, as the lead in is also of the cage type which adds to the capacity of the aerial. With this kind of antenna and lead-in it is possible to get greatly increased range of radiation on 200 meters. A good ground system is required, and good results cannot be obtained without giving as much attention to the grounding as to any other detail of the transmitting equipment. Either a suspended counterpoise or buried ground



should be used, the latter being formed by burying 60-ft lengths of No. 14 bare copper wire in the ground, the wires being laid to radiate fanwise under the aerial. This size bare copper wire is also used in the construction of the



cage aerial, and a long insulator is used at each end of the cage; the spreaders or hoops are made of heavy wire, or discarded bicycle rims, which are light and strong, can be used, the separate wires forming the cage being secured to the hoops by several turns of wire, and then soldered. The ends of the wires are brought together, carefully soldered, and fastened securely to the insulators. The lead-in wires are soldered to the cage wires, and too much emphasis can hardly be placed on the necessity of careful soldering, as loose joints greatly reduce efficiency. All guy wires should be "broken up" with small insulators. The masts that support the aerial should both be of the same length so that each end of the aerial will be the same distance from the ground.

**JAPANESE MOVE.**

Application for government sanction to establish a wireless telephone system has been made by the Daido Electric Power Company, of Nagoya, Japan, according to advices received by the United States Department of Commerce. The company proposes to operate this wireless system primarily for its own convenience in connecting the various stations with its electric light and power system, but its use may be extended eventually to the general public if sufficient demand should arise.

**THE WIRELESS INSTITUTE.  
N.S.W. BRANCH.**

**WIRELESS EXHIBITION WEEK.**

Dear Sir.—The Wireless Exhibition Week, to be held under the auspices of the above Institute, details are being prepared for presentations to the Council of Institute when all matters will be finalised. In all probability there will be competitions for both individuals and collective exhibits from clubs, for which prizes will be donated. In order to suit the convenience of all, it is suggested to hold the exhibition some time in June next so that all amateurs and experimenters who intend to enter for the various competitions will have ample time to prepare the various apparatus. It is intended to make this exhibition

one of the best of its kind ever held, and every means will be taken to make it a success. As before stated details are yet to be arranged by the Council, which will meet at an early date.

**BROADCASTING IN ARGENTINA**

Transmissions from the Coliseo Theatre, Buenos Aires, have been greatly increased in power. An Italian Company recently rendered "The Geisha," which was an excellent transmission and highly appreciated by the wireless enthusiasts and others who listened in. The number of amateur transmissions in the Buenos Aires district has increased and now some commercial firms give regular transmissions. A suggestion

has been made that British apparatus might find a market in Argentina.

**550 Pair of Phones Used at one Reception.**

When the Finchley and District Wireless Society listened in to the Lord Mayor of Bristol's broadcast speech, two halls were used and 550 pairs of phones were used. The reception was effected on an indoor aerial. A demonstration and lecture was part of the programme, and loud speakers were used.

We beg to notify our readers that an article published last week signed C.M. was not written by Mr. Charles MacLurean of Strathfield.



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Condenser Plates, 2/- per doz.; Condenser Spindles, 2/9 per set; Condenser Ends, 1/9 pair; Honeycomb Coils, from 3/6; Honeycomb Mountings, 3/- each; Filament Resistances, 7/6 each; Calibrated Dials, 1/6 each; Knobs, 1/6, 2/-, 2/6 each; Contact Studs, 1/9 per doz.; Switcharms, 3/6, 4/6; Terminals, 6d. each; Phone Condensers, 1/6; Grid Condensers, 1/6; Variable Condensers, 25/-, 30/-.

Murdocks Phones, 37/6; Myers Valves, 35/-.

Catalogues, 9d. each including wiring and other diagrams. All makes of Telephones and Valves.

Crystal Cups, 1/-; Detectors, 5/- each; Loose Couplers 45/-; Cabinets, Ebonite, Bakelite and all round materials.

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All communications to the Firm.

## RULES OF THE RADIO ASSOCIATION OF NEW SOUTH WALES

### RULE ONE. TITLE.

The Society formed under these rules and hereinafter called the Association shall be known by the title of "The Radio Association of New South Wales."

### RULE TWO. HEADQUARTERS.

The Head Office of the Association shall be situated in Sydney.

### RULE THREE. OBJECTS.

The objects for which the Association is established are—

- To act officially on behalf of the Associated Societies and conduct all important business with the Authorities, or between the Associated Societies as may be necessary or be beyond the province of an individual Society.
- To assist the Radio Authorities in every direction possible, and to promote the General and Material welfare of Societies, etc., and to affiliate with any other body having like aims and/or objects upon such terms and conditions as may be decided by the Association.
- To encourage the Association of persons interested in the scientific development of radio communication in all its branches, and to do all such other lawful acts and things as are incidental or conducive to the attainment of the above objects or to the general progress of the Association.

### RULE FOUR. CONSTITUTION.

The Association shall be governed by delegates elected from Associated Radio Societies, as further provided in these rules, who shall constitute themselves as the official Executive of the Associated Societies.

The following office bearers of the Association shall be elected once annually from amongst the Delegates to the Association:—

Chairman.  
Two Vice-Chairmen.  
Hon. Treasurer.  
Hon. Secretary.  
Two Auditors

who shall not be either the Chairman, Hon. Treasurer or Hon. Secretary.

Such officers shall be elected at a special meeting for this purpose to be held in January of each year, and shall only hold office for twelve months from the date of the Election, or until other officers be elected in their stead.

### AFFILIATION OF SOCIETIES.

Radio Societies shall be eligible for affiliation with the Association provided such Societies possess not fewer than ten (10) financial members, and in the event of any such Society not holding a licence from the Controller of Wireless, it shall be essential that at least seven (7) members thereof hold Radio Licences.

### REPRESENTATION.

Each Society shall be represented on the Association as follows:—

Societies possessing over ten and not more than fifty members may elect one delegate to the Association.

Societies possessing fifty-one members and over, may elect two delegates to the Association.

In the event of any delegate withdrawing or resigning his commission, it shall be obligatory on the Society concerned to immediately elect another delegate in his stead.

### QUORUM.

A Quorum shall consist of three delegates to the Association.

### VOTES OF DELEGATES.

All delegates to the Association shall be entitled to one vote each including the Chairman, and in the event of a casting vote becoming necessary, the Chairman shall then be obliged to give a casting vote.

Any Delegate absenting himself from more than three consecutive meetings of the Association without reasonable excuse will ipso facto cease to be a delegate, and it shall be obligatory on the Society he represents to elect another delegate in his stead.

### RULE 5.—MEETINGS.

Meetings of the Association shall be held at least once every three months; it shall be in the power of the Chairman to decide when meetings shall be held. Special meetings shall be called by the Chairman upon requisition signed by at least three delegates to the Association.

### PROXIES.

Votes may be given personally or by proxy, but no person shall be appointed a proxy unless he be a delegate to the Association.

The instrument appointing a proxy shall be in writing, and must be in the hands of the Hon. Secretary at least 24 hours before the time appointed for the meeting at which the person named in such instrument proposes to vote in respect thereof. No proxy shall be available for any meeting other than that for which it is expressly given or any adjournment thereof.

### RULE 6.—FINANCE.

Capitation fees shall be paid by the Associated Societies as follows:—

- Societies possessing less than fifty one members, one pound £(1) per annum or portion thereof.
- Societies possessing fifty-one members or over three pounds £(3) per annum or portion thereof.
- The Association shall cause bank-accounts to be opened and kept in the name of the Association with such Banks in New South Wales as they may think proper.
- All cheques drawn upon the Bankers of the Association shall be signed by two delegates of the Association, and countersigned by the Secretary or Treasurer.
- Before the Association's accounts may be paid, they must be approved at a regularly constituted meeting of the Association.
- A properly audited balance sheet shall be presented, duly signed by the Treasurer and the two Auditors, at the first meeting in January of each year.

### RULE 7.—ALTERATION OF RULES.

Any alteration of these rules shall be by special resolution of the Association.

## LEARN THE FUNCTION OF CONDENSERS.

There are two terms used in connection with a condenser that my correspondents find perplexing—"bridging condenser" and "bypass condenser." Both terms apply to one and the same instrument. It is no different from any other condenser, and is simply put into the circuit to permit high frequency currents to pass easily by what would otherwise be an obstacle.

To explain: Consider the telephones. The windings around the coils inside telephones offer high resistance, or impedance, to high frequency currents. If a condenser is placed across the telephones, the impedance is immediately reduced to a minimum and the higher the frequency of the current, the easier it will pass through the condenser.

We can understand this function better if we consider the action of a condenser. We know that it consists of two sets of plates separated by an air space or other dielectric. Now, at the instant a direct current is applied to the condenser, there will be a short passage of current. But when the condenser is charged to its maximum, there will be no further current flow. If we reverse the current, there will be momentary current flow in the opposite direction.

If we use alternating current, this charging and discharging will occur at a rate corresponding to the frequency of the current used. At the moments when the current is at zero, there will be no passage through the condenser. It will be seen, therefore, that the more rapidly the current is alternating, the more readily it will pass through the condenser. Since broadcasting by radio is usually done on 360-meter waves and the frequency with which the current alternates is 833,333 cycles a second, it will be seen that the condenser plays an important part as a bypath of low impedance for these currents.

February 16th, 1923

WIRELESS WEEKLY

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## TYPES OF THERMIONIC VALVES

BY AN EX-WIRELESS OFFICER  
IN "THE BROADCASTER."

Do you know the difference between a "Kenotron" and a "Dynatron"? This article explains some of the technical terms applied to various kinds of thermionic tubes.

At the present time there exist so many different kinds of thermionic devices that it is a difficult matter for the ordinary amateur to keep abreast of the technical terms that have been applied to distinguish the various types.

In the first place the term "valve" is constantly misused. It is the correct name to give to the original Fleming two-electrode tube which functions simply as a detector or one-way valve for alternating currents; but it is a misnomer when applied to the modern thermionic amplifier or oscillator. To remove this ambiguity Dr. Eccles has suggested the use of the term "diode" for the two-electrode valve and "triode" for the modern tube fitted with a control or grid electrode.

The term "audion" which is still frequently used in wireless textbooks, particularly those of American origin, was the name by which Lee de Forest christened the first three-electrode tube, developed by him from the Fleming valve.

The expression "thermionic tube" is a generic one covering all gaseous or evacuated vessels comprising a heated filament cathode which forms the source of a supply of electrons, irrespective of the number or function of any other electrodes the tube may contain.

The earlier kinds of thermionic tubes were all more or less filled with gas, the stray molecules of which, on being struck by the electrons emitted from the glowing filament, were liable to disintegration, giving off in the process some of their own electrons. Such tubes were called "soft" and, owing to the secondary effects arising from the gaseous molecules, were found to be somewhat uncertain and irregular in their action, unless the utmost care and skill were taken in making the necessary adjustments.

Attention was therefore directed to the production of very highly exhausted globes or tubes which should contain practically

no residual gases and therefore no stray molecules to upset the quantitative control of the regular stream of electrons provided by the filament.

Dr. Irving Langmuir, working along these lines in America, finally succeeded in producing tubes exhausted to such a high degree of vacuum that the pressure of the residual gas amounts to less than that represented by a column of mercury one hundred millionth of a millimetre high.

A two electrode tube exhausted to this extent is called a Kenotron. For a three-electrode tube of the same hardness the technical name is Pilotron. Both of these terms are in general use in America, where the pilotron, in particular, is largely employed in high-power installations.

The term Dynatron is applied to those thermionic devices which possess a "negative resistance" characteristic, and which can therefore act as generators of high-frequency oscillations. It may in general be said that all "negative resistance" devices possess this property of being able to "oscillate." Any circuit in which an increase of electromotive force produces a decrease in current flow, and vice versa, possesses the quality of negative resistance. The oscillating arc as used in the Poulsen system is one of the most familiar examples.

In the dynatron the high tension is applied between the filament and "grid," the plate being kept at a lower positive potential than the grid. Owing to the

high potential of the grid, the electrons are given a tremendous velocity, and finally impact upon the plate with such force that they shoot off secondary electrons which in turn are attracted to the grid (by virtue of its superior potential) and so set up a reverse current flowing from the plate to the grid.

The Pilotron is a dynatron in which a second grid is provided. Speech-frequency variations of potential are applied to the additional grid and cause the original high-frequency oscillations to be modulated for telephonic transmission.

The Negatron is a term that has been applied to a thermionic tube which possesses a negative resistance characteristic, and which can therefore function as an oscillator, but which does not depend upon impact or secondary emission effects. Usually there are two plates set one on each side of a central filament, and a control grid which acts to divert the electron stream from one plate to the other, so that in one of the external circuits an increased potential is accompanied by a decrease in current.

In the Magnetron the control of the electron stream between the filament and plate is secured by means of an external magnetic field which forces the electrons into a spiral track parallel to the filament. A greater or lesser number of electrons succeed in traversing the space between the plate and filament according as the strength of the controlling magnetic field is diminished or increased.

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WIRELESS SUPPLIES.

**RADIO NOTES.**

**HONOR THE INDUCTIVE RELATIONSHIP.**

Whatever type of regenerative receiver you may use, whether it is a honeycomb coil, a variocoupler with tickler coil, a variocoupler alone, or a variocoupler and variometer, remember that the inductive relationship of the feedback coil to the tuning apparatus is of utmost importance. To explain inductive relationship simply, we may state that if alternating or pulsating current is flowing through a coil, it will set up a similar current in any other coil that is in the correct relationship with it. This interaction between the two will be stronger or weaker, according to the distance the two coils are from each other. A little experiment will show that there is one point in the distance between the two coils where a maximum induction takes place between them.

For those who assemble their own regenerative receivers, this position can be very easily determined before the set is finally mounted on its panel.

The arrangements for varying this inductive relationship are simply provided for in such instruments as the variocoupler and honeycomb coil mountings where two coils can either be moved apart from each other or turned around at various angles to each other. The operation of these two instruments easily explains the method of varying the inductive relationship between two coils.

**REMEMBER THE TICKLER IS MARRIED TO THE TUNER.**

One of the most puzzling questions to the average radio man is the correct ratio of turns in the tickler to those in the tuning coil. As a general principle, you cannot go wrong if you adopt a ratio of 1 1/2 to one in favor of the tickler coil where the latter is of fixed value and its variation is made by changing its angle in respect to the tuning coil. This means that if the tuner has 50 turns, the tickler should have 75.

Where the tickler is stationary in relation to the tuning coil, the tickler should be tapped in the same manner as is the tuning coil. These taps should be joined to

contact studs in the usual manner and then the regenerative effect can be controlled by varying the number of turns in the feedback circuit. The tube can be prevented from oscillating by reducing the amount of current flowing through the filament.

If you are building your own regenerative set and are in doubt about the exact ratio, remember that an ordinary short wave variometer makes an excellent tickler coil. All that is necessary is to connect it with the plate circuit of the vacuum tube detector and then place it alongside the tuning coil.

If there should be no regenerative action from the variometer, its connections should be reversed. The amount of regeneration in this case can be adjusted by varying the rotor of the variometer.

**LEARN TO USE THE TRIPLE TUNED REGENERATIVE RECEIVER.**

Many fans ask me how it is that the variocoupler-two-variometer type of receiver gives regeneration

when there is no inductive relationship between the plate circuit and the tuning circuit. Remember that there are two ways of obtaining regeneration, first by means of an inductive coupling, where two coils are placed in an inductive relationship, and second by means of a capacitive coupling where the coupling element is a condenser. The simplest regenerative connection of all is a condenser joined to the grid and plate terminals of the vacuum tube. This, however, is not entirely efficient.

To a certain extent the variocoupler-two-variometer circuit is capacitatively coupled in that it utilizes the internal capacity of the vacuum tube itself in conjunction with the inductances in the grid and plate circuits. These inductances are, of course, the two variometers. The regeneration occurs when both are tuned in exact resonance with the frequency of the incoming signal.

The variocoupler-two-variometer type of receiver is the most efficient in eliminating interference, but, of course, it is a little more difficult for the average novice to adjust.



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February 16th, 1923

WIRELESS WEEKLY

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**RADIO ASSOCIATION  
OF AUSTRALIA  
N. S. W. BRANCH**

A meeting was held on Monday, 5th February, 1923 to consider the amendment of the rules.

After careful consideration by the assembled delegates, the name of the Society was changed to the Radio Association of New South Wales, and new rules were adopted.

It was decided that the next meeting should be held on Monday, 19th February, at 8 p.m. at the Laurel Cafe, Royal Arcade, Pitt Street, to elect officers for the year.

It is hoped that all clubs will send a delegate to the meeting, even if they have not yet affiliated with the Association, so that they can report to their society on the work the Association is doing.

As the rules have been simplified and there is now no possibility of any one Club having more than its fair share of voting power in the management and the financial burden on the Clubs has been reduced, it is hoped that every Radio Society in New South Wales will affiliate and then the Association will be able to effectively represent the majority of Amateur Wireless Experimenters in New South Wales.

A copy of the Rules is enclosed.  
**ARTHUR E. H. ATKINSON,**  
Hon. Secretary,  
31 Balfour St., Kogarah.

**KURING - GAI DISTRICT  
RADIO SOCIETY**

At the Society's meeting on the 6th inst., a very interesting and instructive lecture on the subject of transformers was delivered by Mr. Toyer.

The lecturer concentrated on transformers suitable for battery charging purposes, it being his aim to enlighten members how to charge their own accumulators. Members felt grateful to Mr. Toy-

er coming forward with this interesting subject and they hope to hear him in action again in the near future.

There being a general impression among members that 3MD were going to disturb the peace of the atmosphere, the meeting closed early to enable members to return home and "listen in." Judging by the keenness of a few to get away, they anticipated the article on Garters and Corsets.

All enquiries relative to the Society's activities are welcome and should be addressed to the hon. sec, R. R. Wilshire, Help Street, Chatswood. The Society meets again at the Memorial Hall, Chatswood, on Tuesday, February 20th.

**WAVERLEY AMATEUR  
RADIO CLUB**

At the last meeting of the W.A.R.C., with Mr. Rowell in the chair, a large number of members were present.

Correspondence was received.

The president being absent, Mr. Howell was voted to the chair. Discussions took place on making the Club Room larger, enlarging the aerial and installing a transmitter. It was decided to set to work and get these various needs of the Club attended to. All communications to the Club should be addressed to the sec, Waverley Amateur Radio Club, 87 McPherson St., Waverley.

**LEICHHARDT & DIS-  
TRICT RADIO SOCIETY**

Members of the Leichhardt and District Radio Society held their fifth business meeting at the Club Room, Victory Hall, rear of Methodist Church, Johnston St., Annandale, on February 6th.

After formal business—including the election of four new members—had been dispensed with, Mr. W. J. Zech delivered the second portion of his lecture on Inductance, and was accorded a vote of thanks by acclamation.

Local interest in the Society's activities continue to grow, and inquiries are coming in all the time. All interested are invited to communicate with the hon. sec, Mr. W. J. Zech, 145 Booth Street, Annandale.

**RADIO LEAGUE OF  
VICTORIA**

The fortnightly general meeting was held at the Recreation Hall, Box Hill, January 25th.

The president, Mr. Howden, occupied the chair.

The minutes of the previous meeting were read and confirmed and then followed by a lecture.

Some of the items that received the attention of the council were: an Easter camping party to Britannia Creek. The arrangements for the same are well in hand.

Arrangements which were well in hand for the opening of a season of dances were also completed, one being held on the 12th February, to be followed about 12th March by a grand opening night and thereafter once a month.

One of the ideas incorporated in the rules of this Club, is that the council is to dispense with the business, leaving the general meeting to discuss wireless matter, lectures, buzzer practice, etc.

Mr. Chas. MacLurean was hard at work, last week-end altering his aerial so as to reduce his natural wave in anticipation of the coming Trans-Pacific Tests.

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AMATEUR CALLS

The following is a list of licenses issued to amateurs in the State of Victoria to the end of November, 1922:—

Call Signal.	Name.	Address.	Nature of Licence.
<b>SOUTH AUSTRALIA.</b>			
5 B T	Coles, H. C.	"Ringwood" Orchard, Ambleside	R
5 B U	Ryan, J. H.	Lucindale	R
5 B V	Wood, J. A.	Sacred Heart College, Glenelg	R
<b>QUEENSLAND.</b>			
4 C M	McDowall, V.	Preston House, Queen St., Brisbane	T
4 C A	Miller, H. L.	Loch Street, West End, Brisbane	R
4 C B	Flaherty, G. T.	H. Manning St., South Brisbane	R
4 C C	Isles, C. W.	Charlton Str., Ascot, Brisbane	R
4 C D	Stafford, J. H.	Ebbw Vale, via Ipswich	R
4 C E	Price, J. C.	Bardon Estate, Paddington Heights, Brisbane	R
4 C F	McLeod, A.	Musgrave, Red Hill, Brisbane	R
4 C G	Stephens, A. E.	Railway Parade, Clayfield, Brisbane	R
4 C H	Dillon, A. E.	"Electra," Brown St. New Farm	R
4 C I	Baker, E. W.	Ryan's Road, Northgate	R
4 C J	Weeks, H. L.	Currumbin	R
4 C K	Norris, E. L.	Hume Street, Toowoomba	R
4 C L	Olsen, O.	Stuart Street, Dalby	R
4 C N	McDowall, V.	Preston House, Queen St., Brisbane	R
<b>TASMANIA.</b>			
7 B A	Smith, C.	Stanley, Tasmania	R
7 B B	Sidebottom, G. L.	47 Mary Street, Launceston	R
<b>WESTERN AUSTRALIA.</b>			
6 B V	Wilson, J. H.	16 Davies Road, Claremont	R

SHIPS STATIONS, U.S.A.

Bell Brook KQEI, Bellbuckle K1TK, Bellemina KODS, Bellephine KOKF, Bellerose KOKD, Bellflower KOPQ, Bellhaven KOPC, Bellingham WCIA, Bellota KVEA, Beloit KNIO, Belvidere KEQK, Benjamin Brewster KFS, Benj F. Packard WLA, Benoni KERR, Benowa KOTZ, Bensalem KOFT, Benyonia KPUO, Berea KELJ, Berela KEKF, Berlin WRB, Bessemer K1GT, Bessemer City KDOF, Bethelridge KERT, Bethlehem Bridge K1JV, Bethnor KOKT, Betsy Bell K1TM, Betterton KUBG, Bibbeo KDHJ, Bidwell KESQ, Billingsley NUPQ, Biloxi KPAL, Biran KKOA, Birchleaf KEMD, Bird City KOBP, Birmingham City KUTT, Black Arrow WLN, Blair K1GR,

Blakeley WNUE; Blandon KPAU; Blue Eagle KPOA; Blue Point KDLU; Blue Blythedale KROA; Bobring WCAA; Bologan WLIU; Bockonoff WNUI; Boilston KPEA; Bollkow KEQD; Bonita KFT; Bonnafon KNOU; Bonnetterre KETL; Bonnie Brook KDGX; Bon Secour K1KV; Booby-alla KUGC; Boone KENL; Borad KUGC; Boone KENL; Borad K1DK; Borges WKEU; Boston KXA; Boston KXS; Boston Bridge NGC; Bothwell NEKD; Botsford WZAO; Bottineau WCAE; Boulton KNOE; Bound Brook K1FQ; Boxbutte KETS; Boxley KNUU; Boyce N1SD; Boykin KETT; Boynton KUGF; Brabant KUU; Brant KUBB; Brad-dock KETG; Bradford KNG; Brea WON; Braeburn WMO; Bramell Point KRO; Brandywine WGUI; Brasher KIUX; Brave Cocur

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Three Lines (approximately 15 Words), may be inserted in this Column for 9d.

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Cabegon KEJQ; Cabeza KKEA; Cabrille KENS; Cabrillo WBV; C. A. Canfield W1H; Cacique WBE; Cadaretta WLOO; Caddo KSK; Caddopeak WPUE; Cadmus WUAB; Cairo KDQW; Calaj-la KQAO; Calamares K1C; Calaveras KXIE; Caldas KOQV; Call-coroek KXII; Callspell KXIO; Callabaras WPUI; Callas WHF; Calno K1NV; Caloria KSP; Cal-vert WTUI; Calvin Austin KRN; Camaguey KWI; Cambrai KDJN; Cambridge KGR; Cambridge K1RR; Camden KDKL; Cananova KDBN; Camden KRC; Canco KUTP; Canbas WQEU; Campello WTAU; Canoga WKZ; Consum-set K1QD; Cantigny KDFO; Cape Henry KMIE; Cape May WDOI; Cape Romain KREA; Capillo KUPN; Capites KSAI; Caponka WCAO; Capital of Nebraska KUSF; Captain KKH; Captain WNB; Captain A. F. Lucas WTV;

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February 16th, 1923

WIRELESS WEEKLY

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WIRELESS WEEKLY

February 16th, 1923

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