

FIFTEEN MINUTES OF RADIO EACH DAY

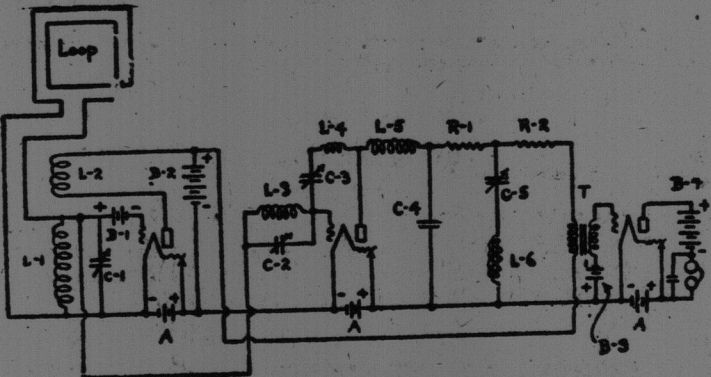
By Edward N. Davis
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Lesson No. 167.

THE ARMSTRONG SUPER-REGENERATIVE SYSTEM.

When the radio receiver, employing the vacuum tube, is so connected that a portion of the energy of the plate circuit, is "fed back" to the grid circuit, the radio oscillation in the grid circuit is reinforced and causes a considerable increase in the amplification of the plate current. This action is known as "regeneration" and may be considered as a method of reducing or "balancing out" the effective high frequency resistance of the circuit. If this method of regeneration is brought about by "feeding back" the energy of the plate circuit through the inductive coupling of a "tickler coil" it is found that as the coupling is increased the effective resistance of the oscillating circuit is decreased and there is a corresponding increase in signal intensity. As the resistance approaches zero, however, a certain point is reached where the tube starts to oscillate, evidenced by a pronounced "squeal," which results in discontinuance of amplification due to distortion of the radio signals.

The method of "Super-Regeneration," originated by E. H. Armstrong, effectively prevents the formation of tube oscillations and thus allows the coupling to be increased beyond the oscillating point. The resistance of the oscillating circuit is therefore rendered less than more or, in other words, the circuit has a negative resistance, with the result that signal amplification of a heretofore unapproachable value is obtained.



In the accompanying diagram of the Armstrong "Super-Regenerative" circuit, the various elements are assigned the following values to allow tuning of the circuit up to wave lengths of 700 meters.

For the loop antenna, from seven to twelve turns of No. 18 bell wire may be used spaced an inch apart and wound upon a three-foot frame, the loop being connected in parallel to the primary (L-1) of a variable-coupler having a range of approximately 100 to 700 meters. The secondary coil of the variable-coupler (L-2) is used as the "tickler coil" and should be rewound so that it has twice as much wire placed upon it. The two coils (L-3) and (L-4) are honeycomb coils L-1250 and L-1500, respectively, and it is not necessary for these coils to be placed in inductive relation to each other. (L-4) is an open core choke coil having a value of five millihenries and L-300 honeycomb coil may be used for this purpose. (L-6) is a choke coil with an iron core and has a value of 0.1 henry.

The tuning condenser (C-1) which is variable has a capacity of 0.001 microfarad. (C-2) may be either a fixed or variable condenser having a capacity of 0.0025 microfarad. Condenser (C-3) is a variable condenser of 0.001 microfarad capacity and may be used to adjust the tuned circuit if a new tube is inserted. The fixed condenser (C-4) is a telephone condenser having a capacity of 0.005 microfarad, while the condenser (C-5) is variable and has a capacity of 0.005 microfarad and is used to control the effect of the iron core choke coil (L-6). Across the telephone receiver is placed a small fixed condenser having a capacity of approximately 0.002 microfarad.

The battery for heating the filament of the respective tubes is shown at (A). In the accompanying diagram separate filament batteries are

shown, but one filament battery may be used by properly connecting the filaments and rheostat in multiple as in an ordinary amplifier. The transformer (T) is an audio-frequency amplifying transformer of standard design.

Battery (B-1) is a battery having a potential of 0 to 5 volts and consists of the small flashlight type of dry cells with the negative terminal connected to the grid. (B-2) is a plate battery having a range in potential of 50 to 100 volts. The grid biasing battery (B-3) is a "B" battery having a potential of 22 volts and is connected in series with the secondary of the amplifying transformer. The plate battery (B-4) has a potential of 100 to 200 volts.

(R-1) and (R-2) are Leavitt resistances, each having a fixed value of 12,000 ohms and they function as part of the filter system which filters out the high pitch note due to the oscillation of the second tube at a 20,000 cycle frequency.

Briefly, the necessary adjustments for efficient operation of this system consists in rotating the loop until it is in the direction of the broadcast station, whose radiated signals are to be received. The capacity of the condenser (C-1) is then varied to tune the loop and primary circuits to resonance with the incoming wave. Condenser (C-3) in series with the choke coil (L-4), when once adjusted for the tuned circuit need not be changed unless a different tube is used. Condenser (C-2) across the honeycomb coil (L-3) when once regulated may remain in that setting. Condenser (C-5) in series with the iron choke coil (L-6) is adjusted for maximum signal strength and then does not necessitate being changed.

These preliminary steps once established leave practically two remaining adjustments, namely, tuning of the loop circuit by means of the variable condenser (C-1) and controlling the "feed back" through regulation of the rotor coil (L-2) in its relation to the primary coil of the variable-coupler.

"The Armstrong Super-Regenerative Circuit," therefore, consists essentially of a regenerative, oscillator and amplifier, and these elements properly connected and effectively controlled produce a resultant amplification of signal heretofore unapproached.

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RECENT DEATHS

Mrs. Charles Morris.

The death of Mrs. Mary Elizabeth Morris occurred at her residence, 123 City Line, West St. John, yesterday and the news will be learned by many with sincere regret. Mrs. Morris was born in Calais, Me., on March 15, 1856, and before her marriage she was Miss Mary Hogan. Her husband, Charles Morris, died on September 2 this year. They had resided in Albert county until about seven years ago when they came to live in St. John. Mrs. Morris had been ill since March. She is survived by one daughter, Sister Marie Charles, of the Academy of the Assumption, Wellesley Hills, Mass.; five sons, Walter E., Charles O. and Frederick M., of St. John; Jerome A., of Chatham, and Edward L., of Moncton; two brothers, John Hogan, of Stanwood, Wash., and Edward Hogan, of this city; and two sisters, Miss Agnes B. Hogan and Mrs. Edward O'Melia, of Stanwood, Wash. The funeral will be held on Thursday morning from her late residence to the Church of the Assumption.

FAIRVILLE TALKS FIRE PROTECTION

The matter of fire protection for Fairville was discussed at a meeting last evening in Temperance Hall called by the Board of Management of the Parish of Lunenburg. Councillor Gold-Park presided and explained that the meeting was called with reference to the carrying out of a bond issue authorized at a meeting held on July 14, which had been held up owing to a technicality. Councillor O'Brien objected on the ground that the proposed expenditure of \$32,000 was too heavy for Fire District No. 1 to assume alone. Councillor Campbell said that in his efforts to get the matter through he had but been trying to carry out what he conceived to be the will of the people. Addressing part in the discussion were: Fire Warden Harry Waters, W. A. Nelson, Daniel Campbell, S. C. Tippet, Joseph O'Brien, Peter Clinch and Mr. Ellsworth spoke of the need for fire protection and of means of solving the difficulty. A committee was appointed to act in conjunction with the councillors and fire wardens to obtain figures and submit facts with reference to fire protection to report at another meeting.

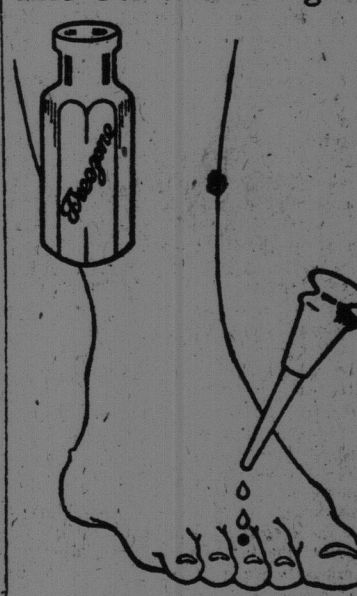
The following committee was named by the chairman: William Mc-

Carver, W. A. Nelson, George Tippet, J. L. O'Brien, Earl Barnhill, S. C. Tippet, M. Shout, W. J. Linton, Patrick J. McMurray, Mr. Phesney and O. D. Hanson. The committee will meet next Tuesday and organize and will get under way at once to obtain definite information.

During last night's meeting William Park acted as secretary.

CORNS

Lift Off with Fingers



Doesn't hurt a bit! Drop a little "Peezone" on an aching corn, instantly that corn stops hurting, then shortly you lift it right off with fingers. Truly! Your druggist sells a tiny bottle of "Peezone" for a few cents, sufficient to remove every hard corn, soft corn, or corn between the toes, and the calluses, without soreness or irritation.

CLEMENCEAU IN PLEA TO THE U. S. TO SAVE FRANCE

Chicago, Nov. 29.—Before an audience that packed the auditorium here, Georges Clemenceau yesterday pleaded with the U. S. to save France from possible extinction. He declared that France sought only peace, but that war was being forced upon her. "If France does not get the help that she needs," he declared, "she may perhaps disappear. Athens was a democracy, very great and very fine. But she disappeared. And if France were to disappear I believe that some day the people would begin to look around and ask if something had not disappeared that had brought life to the world."

MORNING NEWS OVER THE WIRES

At a conference held in Fredericton yesterday between the Senate of the University of New Brunswick and the faculty it was decided to equip the department of the engineering building with a new lighting system and to supply a new transit for the forestry department, and new equipment for the department of physics, electrical engineering and mechanical engineering.

Hon. J. P. Burchill, whose hip was fractured in a fall at Newcastle on Monday, has been removed to the Miramichi Hospital. He is showing some improvement but it still suffering considerable pain.

LIQUOR CURSE IN INDIA.

(Toronto Telegram.)

Dr. J. Niyogi, of Calcutta, arrived in Toronto this morning to attend the Anti-alcohol convention. He says: "I am a friend of Ghandi's, but we do not wish the British to leave India. We want them to stay and help us to help ourselves; we need them, and it would be cruel of them to leave us now, as there would be great danger of a pan-Islamic move which would end in war and breed perpetual religious intolerance, such as exists in other parts of the Empire."

The following are some figures which the doctor quotes to show the unfortunate condition in India. Death rate

thirty-eight per 1,000, twenty-three deaths per minute; 7,000,000 die yearly of malaria, which is due to bad drainage and lack of sanitation; 98 per cent. of the population are illiterate.

"Britain did wisely to protect the Sultan, because although India worships the power of Kemal, they have also a wholesome respect for the Sultan, and where 98 per cent. of the people are illiterate, superstition triumphs."

Mr. Niyogi was chiefly instrumental in bringing "Pussyfoot" Johnson to India last year. Mr. Niyogi is described as being one of the most virile and useful of the young Hindus of India.

L. D. Morse of Portland, Maine, for some years connected with the N. B. Telephone Company in the contract department, died suddenly at his home, P. J. Nisbet, exchange manager of the company, left last evening to attend the funeral.

FIRE SALE

—OF—

\$60,000 Stock

AT

Amdur's, Ltd.

No. 1 King Square

Goods must be cleared immediately to make way for regular Christmas lines.

Sale Hours: 9 to 11.30 a.m.; 1 to 5 p.m.; 7 to 9.30 p.m.

Send 15 c. for Trial Size

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Oriental Cream

Beauty Unsurpassed

The wonderfully refined, creamy-white complexion rendered, brings back the appearance of youth. Results are instant. Highly antiseptic. Exerts a softening action. Over 15 years in use.

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