THE OMAHA BEE: SATURDAY, JANUARY 10, 1925.

**Radio Proves** How to Construct Hoyt Augmentor; Coil and Circuit **Drawing Aid** Data for Three and Four-Tube Sets Are Explained By A. J. FARAON.

### Lessons Broadcast by Oakland Station Successful; Bring Big Response.

There have been so many requests for coil winding information and complete circuit data on the augmentaion system of signal amplification, that in order to satisfy these requests

only desire to play the locals, with-

it has been deemed advisable to go Successful drawing lessons by radio is the latest development in the experiment to use broadcasting for application before completing the deinstruction being con- scription of the several methods of accomplishing this result. ducted by the Oakland public schools

The circuits to be recommended for co-operating with KGO, the General the forms of signal augmentation Eeltric Pacific coast station. thus far presented are preferably of Children assembled under norma

the three and four-tube combinations, om conditions in eight differ- as shown in the illustrations herewith. The four-tube combination is ent schools in the city have just comparticularly adaptable for those per pleted a course of six drawing les sons who are excessively troubled sons. The problem assigned was to with interference, or for those who decreate an original design for a Christ- sire to play the distant broadcasting mas card using the Christmas tree stations while the locals are on the for a decorative motive and actually air

produce individual work in response to suggestions issuing from loud combination will prove very satisfacspeakers. tory for those broadcast listeners who

Greater Originality.

out having interference between Examination of the papers turned them, or who desire distance after the in reveal the fact that by radio locals have gone off the air. This last greater originality is accomplished statement must not be taken too literthan when lessons are conducted in ally, however, for some very remarkperson by the teacher before the able selective distance work has been class. As a result, it was stated, done with the three-tube outfit while teachers will find an inspiration to the locals were all at work. For extry other subjects, apparently as im-

# = 7:5 On the other hand, the three-tube

### Fig. 1. Three-tube agumentor receiver, having two stages of audio frequency amplification, one of which is combined with the augmentation tube.

ample, at a distance of 25 miles from therefore is only to be used in con-antenna coil should be made by the ing purposes are 13-plate U. S. Too possible as drawing seemed, in the New York, the three-tube augmenta-in playing the builder who only desires to build ing station which interferes to the with the inductances shown, will give in passing through the strata." tests to find out how to use radio in public school work. from 25 to 35 stations per evening, the three-tube receiver need not wind greatest degree when tuning to dis- the receivers a tuning range of from sharp contrast to other lessons

broadcast by KGO, when children with good volume. The foregoing re- is only necessary to follow the coil five meters from the locals. The standard 31-4 to 1 general radio only listened to lectures without re-sponding, the course just completed of a guide to assist the builder to de-ings, leaving off the primary entirely. While it is not the purpose of this transformers have worked out exceed of a guide to assist the builder to deonly listened to lectures without rewas designed to bring a type of response which could afterward he col-The antenna, in the case of both ment of a particular make, it is im- circuit, or for reflexing, if one pre to construct the three and four-tube sets, should perative, nevertheless, for the suc- fers to look at that stage in this man lected and judged. Children in the

eight schools selected to take part were seated at desks with ample space between, and care was exer cised to maintain the uncrowded atmosphere throughout the lessons

The first lesson of the series re quired paper, pencil, paste and a small dark circle of cardboard about one inch in diameter, on each pupil's desk.

#### Teacher at Microphone,

In the studio of KGO miles away from the schools, at a given time the radio teacher spoke her instruc tions before the microphone. She be gan by briefly suggesting the Christ mas spirit and the beauty of its expression in art.

Then, she proposed to her invisible pupils that they set about creating Christmas greeting cards for their nds. They were requested, how to conform to the general

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IN THE WORLD OF RA

all, of course, on the loud speaker and this part of the coll. In that case it tant stations varying from three to 210 meters to 600 meters. RADIOPHONE

of the radio telephone for private con-



MORE WEATHER Radio Will Aid **REPORTS ASKED Trapped Miners** Washington, D. C .- Urban and rur al radio fans are beginning to demand daily weather reports and time sig-Perfection of Underground nals from neighboring broadcasting Transmission and Reception stations, and it is believed that event ually at least one station in every lo Being Sought.

21,000 Letters Praise Mc-Cormack-Rori Recital; Next cality will have to broadcast both time signals and local weather fore-

Program January 15. casts. Complaints that certain sta-

Radio listeners-in have been so en-Washington, Jan. 9 .- The bureau tions do not broadcast either time sigthused about the first recital by inof miles, which is making a study of nals or weather reports, or that no ternationally known artists broadcast underground radio transmission and station in a certain locality pats these by the Victor Talking Machine comreception, has just made public a re- essential reports on the air, are be- pany that there is no question of the port of progress which discloses that ginning to come into the department continuance of the series, officiale of of commerce and the weather bureau, that company have announced four factors combine to make under-Neither governmental office has any-The next Victor concert will

ground radio transmission difficult. thing to do with the matter put on given on the night of January 15, If underground radio transmission and reception can be perfected it is by private broadcasters, and yet the with Mme. Frances Alda and Miguel believed it will be valuable in saving government is anxious to serve all Fleta as the principals. These artists the lives of entombed miners. If minopera and concert stage and their

ers entrapped underground could re ceive from a surface station they could WJAX Is Under a lept informed of the progress of the rescue parties in some cases, even New Ownership directed to different parts of the mine where their rescue could be facilitated or fresh air supplied.

"There are four chief factors that Station Acquired by Goodyear John McCormack and Lucrezia Bort affect electromagnetic field intensi-Tire Company; to Be says the report, "namely, disance, wave length or frequency o WEAR. carrier, efficiency of transmitting an

tenna and attenuation. Of these at the American Telephone and Tele-Radio station WJAX, Cleveland, graph company that more than 21,000 tenuation is of particular significance in underground radio communication. which has been operated for the last messages have been received thus "Attenuation is dependent upon two two years by the Union Trust com- far from radio listeners-in, all of factors-namely, the decrease in cur- pany, has been sold to the Goodyear them urging a continuance of the reut due to the geometrical spreading Tire and Rubber company, which will classic recitals.

and produce quotations, weather re

RADIO

The messages have been received out of the electromagnetic waves in take charge of the broadcasting imhanged to WEAR. in passing through the strata."

In announcing the purchase of the some of them from men and women station, officials of the Goodyear who are in isolated places. There company stated that the broadcasting also is a great number of messages from WEAR would be on a larger from those physically afflicted. SAVES LETTERS scale than in the past, with programs

tor artists.

**3 CONTINENTS ARE** HEARD IN AFRICA

Clifford C. H. Brazier, manager

pany, Whit's station, South Africa, in-

sists that in addition to receiving the

programs will include music, in

which they have appeared at their

best during their distinguished

The first of these radio recitals

inder the auspices of the Victor com-

pany was given on January 1, with

participating, assisted by other Vic-

It was announced at the offices of

**Victor Recital** 

Is Big Success

been demonstrated by Donald H. Johnson of Euclid Beach Park, this ports and financial news, but the re-Receiving the radio signals transcity.' For two years he has employed ports will be more condensed than in mitted from three different contithe past. These reports will be broad- nents and at considerable distances the radiophone for a daily chat with cast between 11:30 a. m. and noon, in the course of one evening's rehis father, Dr. William H. Johnson and from 3:30 to 4 p. m. ception is an exceptional accomplishof Collins, O., about 70 miles distant An unusually elaborate program is ment for a radio amateur.

These conversations were carried being arranged for the evening of on in broad daylight with the same January 15, when WJAX will present White's South African Cement comellability of a private telephone. its farewell and WEAR its first pro-

gram.

WAAW

o issue one or two cautions, together, perhaps, with a suggestion for correction of dimensional error in locat ing the augmentor or booster coil. The augmentor coupler has been de signed around standard dimension tubing, and in fact there are on the market one or two makes of vario-

versation between individuals has

cal stations at Johannesburg and Capetown, Africa, he also listened in to station 2LO in England, a distance of more than 2,000 miles, and to the program broadcast from the Westing-(Courtesy of Badio Digest.) (By Associated Press.) W. Omaha, 286 meters—8 p house station, KDKA in Pittsburgh, a distance of \$,300 miles by air line.

Cleveland, O., Jan. 9 .- Practical use of the finest music obtainable. The Union Trust company will continue to broadcast twice daily market

principles of proportion, massing and values, which are accepted as fundamental in the art of design.

Step by step in the next lesso the radio teacher explained how to cut a Christmas tree in black paper silhouette, rightly proportioned to fit into the background already prepared. Great enthusiasm was shown. Some of the trees, cut out of paper, were long and slim, some were pointed with Gothic grace, some wide spread and protective, some exagger ated for an effect of humor, some containing many fantastic branches and some were smooth in outline as though burdened with snow. Led by the suggestions of the radio teacher the various kinds of trees were criticized by students themselves.

D BOOSTER A Combination Coil.

TE D.S.C.

30 TURNI

ALL WINDINGS ARE IN

TO AUGMENTOR PLATE -

"3" 30 Parts -

TOTUENS # SODEC.

COUNTER CLOCHWISE DIRECTION

LOOMING ON THIS END. THIS RAFERS

It is emphatically not recomic coll will be about 60 turns of wire ont

nended, however, that the aperiodic a tube of the same diameter-three

+1111111-41111-

Fig. 2. Four-tube augmentor receiver, employing one stage of tuned radio treatmency amplification

be tuned with a coil and series con-cessful operation of the system that ner. Another transformer, which has take were the circuit a single tube In order to simplify as much as denser, as shown in the circuit draw certain standards be maintained, and also given excellent results in this regenerator). The proper booster possible, and to enable the builder to ings. No specification is given for since sufficient time has not elapsed stage, is the Hedge Hog 31.4 to 1. For turns are also shown here. construct either the three or four this coll as it will vary slightly-for from the date of the development of the last radio stage, either of these

Fig. 31.

DETECTOR GRID

WEMENTOR GRIL

MEGATIVE FIL

TO NEG. ML

To DET. GRID

Necessary Equipment.

The same applies to colls, so far as

A4.38.

Finishing touches were added when tube set, the coils as shown and ex- synchronism in tuning calibration- the circuit to specify all of the satis- transformers functions nicely, as, of there came over the air the com- plained here have a combination depending on the antenna, and it is de- factory accessories, those mentioned course, will many others. winding, including an aperiodic pri-sirable to add or remove a few turns here are given in the knowledge that mand: "Place candles on your happy Wiring Diagrams. tree!" After a pause, with joyous mary, which will permit either set until the dials all tune alike. A good correct functioning will be obtained Wiring diagram for the three-tube compromise for the first trial on this through their use

humor which was irresistible, the being constructed, radio voice continued, "Now light them!" Hundreds of pencils, like a flash, went to work. Halos were drawn around the candles, or little thin streams of smoke were made to trail upward across the designs.

From the instruction "put a candle on your happy tree," and from other suggestions given by the radio voice, it was found, when the papers were collected and examined, that there was scarcely a duplication in decorating the tree.

## HOOKUPS REDUCE AMPLIFIER NOISES

any radio fans find they have dis agreeable noises in their receivers when using two steps of amplification. This is found to be especially true when two transformers of a high ratio are employed.

There are three ways of reducing the noises. The first is by shunting the primary of the second step trans former with a fixed condenser or resistance, the capacity or resistance be ing governed by the ratio of the trans former. If two transformers having a ratio of five to one are used the correct capacity will be in the neighborhood of .001 mfd.

The second method is by shunting the secondary of the second stage transformer by a high resistance, the correct value again being determined by the ratio.

The third method of reducing the noises is the same as the second, only a small condenser is used in place of a resistance. The latter method is however, not the best, as it tends to reduce the volume of the over-tones which are essential for good repro duction.

#### New Record for Amateurs.

tenna when the receiver is to be used augmentor combination. This coll tain colls of the "low-loss" type are to N. J. L. Menars of Le Blancat Gan. in the city. The aperiodic primary is should be tuned with a condenser of be preferred, it is not within the only for use with a stage of tuned the same capacity as that used for realm of this article to attempt to hear Pau, writes that on April 11 last he received 108 American amateurs radio frequency connected, as shown in the four-tube diagram. This antenna tuning coll should be loss" coll construction. The simple addition several amateurs from Cuba in the four-tube diagram, on a two-tube set in one hour, and in With the present day congestion of very loosely coupled to the secondary solenoids specified will give satisfac d Porto Rico. Among the Ameribroadcasting wave lengths, the day with which it is associated; that is, fory operation, and can be constructed coast. On another occasion, last of the aperiodic primary for city use from two and a half to three inches, by the painstaking builder. cans received, 11 were on the Pacific spring, M. Menars received on a singie tube signals from 71 American selectivity is the goal, Antenna Tuning. stations, of which eight were on the Pacific coast.

is a thing of the past where extreme or it can even be practically at right. The fixed condensers used through angles. This position can be fixed, out all of the circuits have been of once it is determined. The final de the Dubilier mica construction, while The seven turn aperiodic primary termination for this position of the the variable condensers used for tun

Fig. 3. Side and assembly views of the augmentor coupler. Turn ratios and wire sizes are specified.

primary be used directly on the an- inches-as the outer tube of the efficiency is concerned, and while cer-

- Deres - 40 60

selves, although it will not be amiss



songs & banquet WHN, New York (360); 6:30, orchestra 3:50, entertainers; 10, orchestra; 10:20,

their more simplified theory, he is re-Fig. 4—illustration showing the relation in the speared in this paper, under the dates of December 13 and 30, respectively. The comber 13 and 30, respectively. The comber 13 and 30, respectively. The detector coil, when the booster coil and the detector coil, when the booster is at maximum coupling.
Fig. 4 is a cutaway section of the second in the method of antenna connection. In the method of antenna connection. In the matter of tubes, it is recommended that 201A or 301A types be employed, although the detector tube operate, usually this can be compered that 201A or 301A types be employed, although the detector tube operate, usually this can be compered to operate usually this can be compered to operate usually this can be compered to operate. Usually this can be compered to operate. Usually this can be compered to operate. Usually the provide to operate usually this can be compered to operate. Usually the provide to operate. Usually the provide to operate. Usually the provide to operate. Usually the sequence the booster may fail to operate. Usually the provide to operate. Usually the sequence to the provent operate. Usually the provide to operate. Usually the provide to operate. Usually the provide to operate. Usually the provi ferred to the two preceding article



3 and Fig. 4, are complete in them- piece of three-inch outside diameter tubing of any length which best suits to describe theni to some extent and the purpose of the builder.



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National Bank, Atchings Bark,

Steinite Gives distance **On Crystal Sets**! RESULTS truly amazing. Everyone as-tonished by STEINITE. The best Crystal made for Crystal Sets. Fits any standard holder. R. A. Conard, Jr., K. C., Mo., says: T got Dallas, Chicago, Schenectady, Pitts-burgh and Cleveland." H. Harryman, Op-dyde, III, says: "I have heard 26 stattom: most distant KDKA - WSB - WOAW -WOAF and WGY. Schenectady 825 ml." H. Lapsley, Council Bluffs, La, says: "The second night 1 got KDKA, E. Pittsburgh." Thousands of STEINITE users everywhere. You can't doubt your own ears. You can't doubt your own ears. 50¢ Special Offer Two ortinites 51 Steinite is no ordinary crystal. It's an ontriely new discovery. Opens upnew pos-sibilities for crystal set receivers. STEINITE CRYSTALS are being S Intiated. Bose femice them Stanped S My Moncy - Back GUARANTEE Luneserredit guarantee Steinite to give J. Gappleton eus 1500 Mi. SteiniteTubeS.ts, \$12; ance Crystal Sets, \$6; De Luze S16: Wave Trap B5. and Two fr . \$15. Five Tube Set. \$65. banks will testify to m eliability: Ex banks will testify to m eliability: Ex Don't deisy the radia rest in store for you. None genni without letter 8 stamped es

STEINITE LABORATORIES, 36 Radio Bidg., ATCHISON, KANSAS

receiver is shown in Fig. 1, and that for the four-tube set is illustrated in Fig. 2. These two diagrams are self explanatory, and should any doubt arise in the mind of the builder as to

ing, and in fact there are on the market one or two makes of varlo-couplers which can be purchased and rewound for this circuit. The side view, showing the three windings on the stator, is shown in Fig. 3 at "A." This member of the coupler is made of a 1 34-inch length of three (3 inch outside diameter tubing-bakelite. The number of turns, proper connections for the leads, and the spacing and gauge of turns, proper connections for the leads, and the spacing and gauge of turns, bown in Fig. 3 at "B." This ii. ustration shows the booster or aug-menter coll in its position of mini-is shown in Fig. 3 at "B." This ii. Ustration shows the booster or aug-the direction to that which it would itake were the circuit a single tubi a take were the circuit a single tub-a ture and encetions for the failer and "B." (246): an or chestra. sones. the direction to that which it would take were the circuit a single tub-a take were the circuit a

KFI, Los Angeles (458); 8:45, talk; 9. Canada Gives 125-Meter Wave orchestra: 9:45, talk; 10, instrumental: orchestra: 9:45, talk: 10, instrumental: RFSG, Los Angeles (273); \$:20, Divise Realing RFSG, Los Angeles (173); 5:10, bivine other dominant in the dominant anateur Rild, Los Angeles Times (351); 5, or-chestra: 5:20, children; 5:45, talk: 19, work; and the radio branch of the de-feature: 12, orchestra, KJS, Los Angeles (350); 5, service; partment of marine and fisheries based of the the service in the the service of th KJS, Los Anneles (156); S. service: particular of internation of 123 WMC, Memphis (162.9); S. bedtime story; \$20, concert. WCCO, Mianesmolis.St. Productional and the service of the se

ame: 10. orchestra. (KAC, Montreal (477): 4:30. concerti. N. enterisinment: 9:30. dance. WJJD, Mooseheart (278): 7:15. prohes-attraction and the state of the st

WNYC. New York (526); 6(15, quartet WOAW Program