Efficient Three-Tube Reflex Receiver Based on Development of Two Coils

the matter of wiring to proceed as in. several methods of arriving at the

If you are bothered by howls, which

sometimes occur because of peculiar characteristics of the audio frequency transformer which cause oscillations in the amplifier circuit, try swapping the leads to the primary treminals of the transformer. This will clear up 90 per cent of any trouble you may

have in this part of the circuit. with a good ground to a water pipe or It is recommended that you use either an outdoor or indoor aerial steam radiator for the receiver, although a counterpoise ground works very well. To tune the receiver start with the rotor at an angle of about 45 degrees and rotate the dials, always in step or approximately so. WEAF should come in at approximately 65-65. You may find that, due to some peculiarity of your own receiver, the settings may wary a little, but you will pick up the same stations at the same setting on the dial every night.

Just a word of caution about transformers. Due to the extraordinary duty required of the first transformer which becomes a part of the radio frequency circuit, it is absolutely necessary to use the very best ones obtainable, for if there is a defect in your transformer this hook-up will show it up and, by the same token if you have trouble swap your trans formers one for the other and see

WOAW Program

Saturday, February 21. 6 P. M.—Dramatic hour, Davis Studiof Expression. Selected readings from well-known authors and poets.

Well-Rhown

Readings:
(a) "My Shadow."
(b) "Naughty Claude."
Mary "Swestness" Bauers Omamary System of Paris System of Ellis Davis.

Ellis Davis Victor Y

It will be noticed that there are two fixed condensers on the first audio maha Printing company, "The Off Supply House," arranged by Euge Whitmore Dlaklas.

frequency transformer. The first one (a .00025) is shunted across the primary and the second (a .001) is put between the plate terminal of the secondary winding of the transformer and the filament terminal of the primary and the second (a .001) is put between the plate terminal of the primary and the second (a .001) is put between the plate terminal of the secondary winding of the transformer (b) "A Good Night Song" (b) "A Good Night Song" (c) "A Good Night Song"

astrumental trio:

(a) "Serenade from the Rallet Milenka Jar Bac Bac mary. This may seem an unusual ar- Instrumental trio rangement of fixed condensers, but

(b) "Meditation" Bach-Goundd
Mrs. Conrad Young
Belle von Mansfelde
Eugenie Whitmore Dinkins, planosaritone solos:
(a) "When Two That Love Are
Parted Secrit quently must be different in receiver. Barito (b) "Song of the Open"... La Forge that look exactly alike, because of different values of the transformers (c) "Mully"
Harry Disbrow.
Violin solo. "Romanze".
Mrs. Conrad Young. Lehman

fixed condenser should be placed across the secondary winding of the second audio frequency transformer.

A fourth fixed condenser and a Mable Allen Smalls.

Vocal duet "Starry Night"

John Densmon

variable grid leak are placed between
the grid terminal of the detector tube
and one of the terminals of the secondary winding of the tuning coil. In
the event of difficulty in balancing
the set try reversing the leads from
the secondary winding of the tuning
coil, putting the condenser on the
plane solos:

(b) "Contraits solos:
(a) "Sone of April"
(b) "Contentment"
Harriet Clark Heigren.

Violin solo, "Bercuse"
Violin solo, "Bercuse"
Mrs. Conrad Young.

coll, putting the condenser on the plana solos: Engenie Whitmore Dinkins.

Baritone solos:

(b) "The House of Memories"

(c) "The Last Song"

(d) "The Last Song"

(e) "Sweet Little Woman o Mine"

Bartlett

Harry Disbrow.
Cello solo "Ballade"
Belle von Mansfelde. eceiver should bring in broadcasting tations at about the same points on l

It's the superlative

achievement in

Radio, the world's

outstanding Phon-

ograph in scientif-

ically developed condensation - an instrument years

ahead of its field.

You Can Have the

Brunswick Radiola

Super-Hetrodyne

...for...

o solos:
"Black Bird" Meyer
"A Brown Bird Singing"
Mable Allen Smalls.

11:00 P. M.—Frank W. Hodek. is Omaha Nightingales at gardens, 11:30 P. M.-Organ music,

RADIO

PROGRAM FOR FEBRUARY 21. (Courtesy of Radio Digest.)

By Associated Press.

By Associated Press.

WEEL. Boston (silent).*

WGR. Buffalo (319): 6. music.

WLS. Chicago (3446): 7. entertainers;
7:20. barn dance. Harmony Aces. Isham
Jones harmony girls; 11:15. revue.

WEBH. Chicago (370): 7. religious.
concert. Riviera theater: 3. dance. readines, vocal; 11. dance. solos.

KYW. Chicago (5454): 7. concert: 8. musicale. 9:35-11:35. classical program;
12-1. nounlar; 1-2. frolic.

WMAQ Chicago (8447.5): 6. announced: 8. orchestra: 8:20. photologue;
9. Checago theater.

WLW. Cincinnati (422.3): 6. concert, lafactione.

WLW. Cincinnati (422.3): 6. concert, lafactione.

WEW. Sent Juan (400): 7:30. concert punits.

WGAW. Omaha (526): 5. dramatic file 30. announced: 6:45. program; 3. program; 3. program; 11. Nightingales: 11:39. organ.

WFI. Philadelphia (295): 6. talk WIP. Philadelphia (396.2): WLW, Checkmall (122-9), afsobone, WFAA, Dallas News (475.9); 8:30, banquet; 11, entertainers, WOC Davenport (484); 7, Sandman; 7,50, religious; 9, orchestra, ROA, Denver (323); 9, dance, WHO, Des Moines (silent), WMJ, Detroit News (252.7); 6, orchestra,

both dials and should cover a range from something less than 200 meters to nearly 600 meters.

In balancing the receiver there are several methods of arriving at the proper setting of the balancing or Soprane soles.

Vocal duet, "Carmena Waltz".....Wilson Harriet Clark Helgren.

Instrumental trio:

(a) "Love's Garden"..... Schumann (b) "Londonderry Air".... Fritz Kreisler Mrs. Conrad Young.

Belle von Mansfelde.

Eugenle Whitmore Dinkins.

KNX. Hollywood (337): 8:15, musically school of the Air; 11:45, frolic.

KHJ, Los Angeles Times (404): Concert: 8:26, children: 9:45, talk: 10 features: 12, orchestra: 1, Lost Angeles frolic.

WHAS, Louisville Times (399.8); con froise.

WHAS, Louisville Times (399.8): conlevit.

WMC. Memphis Commercial Appeal
(499.7): 8:30. concert.
WCO, Minneapolis-St. Paul (416.4): s.
philosophies: 8:39. surprise: 9:30. dance.
CKAC. Montreal (427): 6:30. concert.
7:30. varied: 9:30. orchestra.
WEAF. New York (491.5): 6. trio. 6:26.
stories: 8:30. blind entertuher: 9. tenor.
19:20. phianist: 10. orchestra.
WHN. New York (461.2): 6:30. health
talk: 6:35. dance: 7:30. orchestra: 8:10
music: 10:15. entertainers: 10:30. dance.
WJZ. New York (454.3): 6. dance.
Talk: 7:13 soprano: 8. talk: players: 3:45,
songs. trio. orchestra.
WNYC. New York (528): 6:35. Chateau
five: 7:20. police quartet: 8. songs; 8:30,
instrumental; 9:10. talk.
WOR, Newark (495.2): 7:30. pianisi
5:45. piano.
KGO, Oskland (239.8): 5. concert; 10.
sclitish." soloists. address: 12. dance.
scloists.
WOAW. Omaha (526): 5. dramatic:
6:30. announced: 6:45, program: 9. program: 11. Nightingales: 11:38, organ.
WFI. Philadelphia (336): 5. talk: 7.
recital.
WIP. Philadelphia (509.3): 6. talk: 7.

KFQX, Seattle (238): 10, orchestra; WBZ, Springfield (331.1): 6:15, histor KSD. St. Louis Post Dispatch (545.1) 6. or WRC. Washington (469); 6. musle; 7. Bible islk; 7:15. soperane; 7:30, talk; 9:39, dance; 10:15, organ.



the Zenith has been correctly named. This Super-Zenith model, in a deluxe cabinet, gives all that

radio offers. Easily tunes in on distant stations, despite interference. You pick up most any desired station with great clarity and volume. Six tubes, two for tuned radio frequency amplification, one for detector, three for audio frequency ampli-

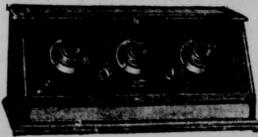
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\$30 to \$100



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and CKAC, Canada; WOC, Daven-ly as possible, take the baseboard off connections between bus wire and teur has had experience enough in

fect an efficient three-tube reflex cir- the walls into the next apartment, denser of the radio frequency unit. coil in the center of the panel and zation after the set is completed and the back panel. The best way of all

pany have been serving to per seven-room apartment. Set is completed and fect an efficient three-tube reflex circult which would use a tube for a detector instead of a crystal, and detector instead of a crystal, and photograph shows this arrangement which would be a seven-room apartment. Set is completed and indicate a few little things to do to it the two 23-plate variable condensers at either end. The accompanying of the radio frequency unit. Coll in the center of the panel and indicate a few little things to do to it is highest state of efficient three-tube reflex circults are indicate a few little things to do to be it is properly set whitmore Dinkins.

After drilling the back panel and photograph shows this arrangement circults and experiment. The accompanying apartment is the walls into the next apartment. Coll in the center of the panel and indicate a few little things to do to be it is properly set whitmore Dinkins.

After drilling the back panel and photograph shows this arrangement circults and experiment. The walls into the next apartment. Coll in the center of the panel and indicate a few little things to do to be it is properly set. The walls into the next apartment. Coll in the center of the panel and indicate a few little things to do to be it is properly set. After drilling the back panel and photograph shows this arrangement. which would have great selectivity For the locals and the not too dis- After drilling the back panel and photograph shows this arrangement clency. and volume enough to bring in the tant stations an indoor aerial from mounting the neutralizing or by-pass as opposed to the diagram, which is real DX stations on the loud speaker. 20 to 30 feet long is ample to give condenser, proceed with the wiring, the more efficient receiver of the two. third rheostat on the panel to con-

As far as the writer knows there is satisfactory reception, but this re- Follow the diagram as closely as pos-

neers of the Ambassador company have been striving to personal pany have been striving to personal pan

If you wish, you can provide for a there is no need of touching it again

no receiver on the market today or in ceiver is so selective that the fan can sible as to spacing of the wires and proved to be more efficient when the which the writer took care of by usany great use outside of experimental use an outdoor aerial without any your results will be better. The re- negative side of the A battery was ing an automatic filament control. laboratories similar in any great de real interference even from the locals, ceiver was designed with a view to grounded between the negative side This proved thoroughly satisfactory

The above drawing shows the location of the parts of the new Ambassador three-tube reflex receiver as well as the circuit. It can be used as a mounting pattern if the relative spacing is

gree to the circuit described herein. Even with an outdoor antenna the the greatest efficiency possible and of the switch and the No. 2 connect if an automatic filament control is had full sway, reflex receivers of one er volume on distance, and the writsort of another are going to become er has both and can change from one. more and more popular both with the to the other by merely throwing a manufacturers of radio sets and switch. New Colls Set's Heart. The object of the engineers was to The basis of this reflex receiver are

make the three tubes of this new reflex hookup do double duty or, in other words, come as nearly as possible to making the three tubes do the work of five. No three-tube remarks the new low-loss Ambassador and the antenna coils, which actually is the stator of the low-loss coil. The wiring of these two coils, especially made "litz," represents months of exmade "litz." represents months of ex-160 per cent, probably, but the set perimentation and research work. The parts needed for this newly de near to it as appears possible now

in the detector circuit. The princi-

ples of both regeneration and reflex

are comparatively old, but little has

ones used a crystal for detection.

yank' in truly distant stations.

One Ambassador tuning coil, low for the amateur radio receiver buildloss type. One Ambassador antenna coll. This new circuit employs first a Two 23-plate variable condensers stage of radio frequency, a detector

ow-loss type. tube and then one stage of audio fre-Two baby variable condensers. The tube detector is em-Two 4 to 1 audio transformers. ployed rather than a crystal because for additional sensitiveness it was

Three sockets. Two rheostats; one 6-ohm; one 30necessary to provide for a feedback

One automatic filament adjuster. One open circuit jack. Two .00025 fixed condensers,

done either by amateur experi-Two .001 fixed condensers. menters or in the laboratories of con-One two-meg, grid leak, cerns marketing radio products to-One variable gird leak. ward the development of a receiver Six binding posts. combining both of these principles.

One panel 7x21 inches. There have been, however, several One black panel, 2 1-4x20 1-4 inches. "klts" put on the market for reflex One cabinet, 7x21 inches. receivers, but the more successful Bus wire, screws, soldering lugs,

The receiver described here is reflex In this reflex the radio frequency in principle, pure and simple, although regeneration is developed to a tube is used also as an amplifier, as slight extent, and the two principles is the detector to some extent. In order addo signal reception are thus order to achieve the reflex amplifi-The receiver described cation the secondary of the first hereln is not an easy one to build nor audio frequency transformer is intro to properly stabilize after it is built. duced into the grid circuit of the ra-None but advanced "home builders" dio frequency tube, between the con had better try it, although a fan who denser and the filament of the tube has built a three-tube set should be. The secondary of the first audio fre able to put this reflex together and quency transformer then becomes chronize it properly. When the re- part of the radio frequency unit. As ceiver has been completed however, the capacity of this winding is usual-the fan will be amply rewarded for ly not large enough to provide ap his pains and will be highly amazed efficent by-pass for the radio fre at the remarkable results obtained quency currents, a small by-pass con ne to selectivity and its ability to denser, one of the two baby variable

strong point. One half a point on the ings. In starting your set, drill the panel dials is sufficient to tune out one sta-tion and bring in another one, sharp and clear. A half turn of the knob of the vernier condenser mounted on be attached to the panel. Follow the the panel will itself frequently serve measurements on the front and rear to tune out a station and bring in panel diagrams and you will avoid another without disturbing the con- much trouble. Mount the condensers denser dials at all. The receiver does two rheostats, coil, switch, baby varinot possess enormous volume. It will able condenser and jacks on the panel produce a signal that will tear and lightly screw the baseboard to signal off the walls, but it will the panel. After marking the posiin medium distant stations such tions of the other parts on the base as KYW and WLS, Chicago; CNRO board, following the diagram as near

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John McCormack, owner of the world's most famous tenor voice, has finally yielded to the radio-broadcast urge. He is seen burling gold-plated Selectivity is this reflex receiver's the terminals of the secondary winddonna, has also joined the radio ranks, as you see

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Cryatal Sets, \$6; De Luxe Cryatal
Set, complete with headphones,
serial and ground, \$10; 2-Tuhe Set,
\$16; 2-Tuhe Amplifier, \$15. FREE
descriptive literature on request. Money Back

Tube Sets. \$12; Long Distance Crystal Set. complete with headphones. Set. complete with headphones. Set. arise and ground. \$10; 2-Tube Set. \$16: 2-Tube Amplifier, \$15. FREE descriptive literature on request.

ply connect with set and follow instructions. Requires no additional tubes or hatteries. You must be pleased and delighted or you get money back promptly on your say so. \$1 postpaid anywhere in U. S. when cash accompanies order. These two big Atchison banks will testify to my reliability: Exchange National Bank. Atchison Savings Bank. Order today—a dellar bill will do.

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Put this interference eliminator on your set and note amaxing improvement. Siment's time required to install. Full directions with each instrument. Siment's time required to install. Full directions with each instrument. Siment's time required to install. Full directions with each instrument. Siment's time required to install. Full directions with each instrument. Siment's time required to install. Full directions with each instrument. Siment's time required to install. Full directions with each instrument. Siment's time required to install. Full directions with each instrument. Siment's time required to install. Full directions with each install directions with each install directions. Requires no additional tubes or required to install directions.

the writer found that it was the prop-

er combination to produce results

The placing of fixed condensers fre

and other parts used. A second .001

other terminal and the lead to fila-

ment of the audio and detector tubes

on the other. The hook-up as shown

in the diagram proved the more suc-

reseful way for the writer, however,

If you follow these directions your

necessaryself-contained.

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