RADIO LORE FOR NOVICE AND EXPERIENCED FAN

B Battery Facts for Fans Who Still Use Them with Receivers

Life of Unit Depends Chiefly Upon Depolarizing Agent Used in Construction.—Long Shelf Life, Service Life, Quiet Operation Important Factors

struction, more than on any other single factor. In many factories, the chemical formula of the depolarizer is, of course, a carefully preserved trade

The purpose of the depolarizer is to prevent the formation of a film of hyirogen gas about the carbon or positive pole of the cell when current is flowing. Since hydrogen is a non-conductor of positive pole in contact with the electrolyte gradually decreases, causing the internal resistance of the cell to rise until a point is reached where current

Part of this reduction in current is caused by the fact that the hydrogen which caused the cell to become polarized, also sets up a flow of current within the cell itself in opposition to the normal flow. When the external circuit is opened the flow of current within the cell itself should theoretically cease, and the more complete the actual cessation the longer is the shelf life of the battery.

All the time current is flowing the zinc container or negative pole, in contact with the electrolyte, is slowly dis-integrating. If a short-lived battery, assuming, of course that it has not mal drain, is opened, the zinc cartridge may be found in almost perfect condition with no evidence of corrosion. On the other hand, if a very long-lived battery is opened, the zinc shell may be found to be badly corroded.

In the first case, due to polarization or to the drying up of the electrolyte, the positive pole, after a short period of use, has virtually become insulated from the negative. Consequently the cell is soon useless. In the second case the depolarizing agent and electrolyte have maintained their efficiency to the end. It should be remembered that it is the disintegration of the zinc that it is the disintegration of the since that causes current to flow, and natu-rally its size, thickness and purity also dtermine the life of the cell.

B batteries to be satisfactory must have the following characteristics: Long shelf life, long service life, freedom from noise and uniform quality. A battery that can render long service after long periods of idleness is said to have a long shelf life. The term "service" or "service life," when used in connection with batteries, is usually taken to mean the ampere hours or tery before the voltage falls to a fixed value. A 45-volt battery, for example. when the voltage has dropped to 34 pear serviceable, yet its internal resistance is fairly high and it is best to replace the battery.

Doors of Broadcasters

of the interference among broadcasting

the "air." There are too many sta-

tions going at the same time, especially

not yet have a "clear channel" across

In one city of 250,000 population in

this country, a tabulation was under-

taken and it was found that 12,000

crystal sets were still in use. A crystal set has certain uses, but when its

owner complains of interference be-

least, for its component parts may

payment for an up-to-date model.

Even a set of late design will not al-

ways work well and tune selectively

when it is connected to an incorrect

long. Counting the entire length from

the set to the farthest point, the aerial should not be more than 75 feet in

up to 150 feet over all is allowable

with their own receiving sets.

to "tune sharply."

with other stations.

BY AUSTIN C. LESCARBOURA.

The life of a B battery depends on the depolarizing agent used in its construction, more than on any other struction, more than on any other.

The useful life of a B battery is often prematurely ended by a short-circuit of that battery, without the owner of the set in which it is used realizing when or how it happened. If, for example, new batteries, which have supposedly been subjected to a purely normal drain for a short time, show an abnormally low voltage upon being tested, the chances are that they have been ruined by some faulty connection, either on the batterles themselves or in the set. Before a claim is made that the battery is defective, the connections inside the set should be examined. There may be a faulty or loose connection, a tube may be defective, a bypass condenser may be broken down or some metal object may have fallen across the battery terminals. The appearance of the battery itself will also help the set owner to determine whether or not a "short" has occurred.

The cells of a "shorted" battery will all, or in part, be corroded, the electrolyte will generally leak out, and the pressure of a finger nail against the zinc shell will often be sufficient to break through it, especially near the top. This point on the shell is where the upper part of the "bobbin" ends, and corrosion there is more pronounced than at any other place. The "bobbin is simply the little muslin bag, con-taining the carbon rod, electrolyte and depolarizer, which is placed inside the

which have become "shorted" after having delivered a great part of their energy through normal use, a subsequent short-circuit is generally not lie the three principal speeches of the sufficient to cause any change in the Prohibition Party's national convention

casual appearance of the zinc.

Internal shorts may be found in a B battery, but due to the rigid inspections made at the factories in which really good batteries are made, these lists had so desired it was his opinion are rare. In the case of an internal short, a single cell, or probably a few, will show a low voltage, and the balance will show their normal voltage (1.5-1.6). Yet there are extreme cases where all cells will be low, due to a stray wire or the like having been accidentally dropped into the battery as the below assembled. t was being assembled.

Another point of importance is that it is possible to "short" one-haif of a 45-volt battery and not the other half; that is, from the negative to the centre 22½-volt terminal, or from the centre. tre to the 45-volt terminal. This is exthis type really consist of two separate 22½-volt blocks connected together by a common wire, and also that taps are cometimes taken from the batteries to the set, that involve a partial battery. has reached the end of its useful life For example, if two 45-volt batteries are when the voltage has dropped to 34 used on a set, a tap may be taken from volts. At this voltage it may still appear serviceable, yet its internal restance is fairly high and it is here to would include only a portion of a 45-

SET FREQUENTLY where you live two stories or more from the ground, by all means connect your ground binding post to several different points. Make contact with a radiator, with a water pipe in kitchen and bathroom and also, if possible, run a direct wire through the floors to the sponsibility would have reverted to the after twater water main. Hence the sponsibility would have reverted to the individual stations involved. Neither Where you live two stories or more street water main. Using several ground connections has the effect of shortening

Don't Lay All Interference at Going back to the crystal set, it should be stated that a crystal receiver will yield untold pleasure to someone will yield untold pleasure to someone who is satisfied with amusement from one or two nearby and powerful stations and who won't be super-critical if a code station or perhaps another broadcaster should interfere a bit. Usually, the interference from another broadcasting station will manifest itself only when the station the set is constructed

Of course, it is well known that much of the interference among broadcasting. same class, with the important excep- any other party which had a formal tion that it is many many times as notification of its candidate, could ask stations is simply due to congestion in sensitive and so will bring in weaker for, and under the law, doubtless be stations and cause interference in granted e headphones or loud speaker where the lacilities. crystal set might hear one of the sta-

In other words, don't be afraid the country.
On the other hand, many listeners junk your old receiver if it is plainly out-classed so far as selective reception who complain to the Federal Radio is concerned. The new set will almost Commission, to broadcasting stations always be equipped with better ampliand other radio agencies because of in- fying apparatus, also, and will therefore terference will find the fault to lie give you much better tone quality.

SENATOR STUMPED

He Couldn't Figure Out What Loop Antenna Was.

tween certain stations, he is overlooking the inherent impossibility of his set United States Senator Ellison D. Smith servative in their purchasing, but the of South Carolina. Not long ago he constant introduction of the new and The old-fashioned regenerative receiving set, which has no radio frequency received a new set. The same night amplification, cannot very well cope a hurry call was received from the When the AC type of receiver was with the interference problem unless in Senator.

an outlying district, where there are no broadcasters within 50 or 100 miles. The head of the service department was hurriedly summoned. Inasmuch as industry, but time has demonstrated Twilight Hawaiian quintet will be on Even then, the more powerful broad-casting stations may come in over a the set was brand new, he was more or wide section of the dial and interfere less mystified as to what might be the latest type. Improvements have served at 8.05 p. m. on Friday. Saturday the of armloads of new tubes and numtrous other accessories. He was pre- automobile world and they are doing wCOT begins its weekly broadcasts. trouble. Nevertheless, he took a couple eners to hang on to their old apparatus, crous other accessories. He was prepared for anything. no doubt. However, don't forget that the old set has a "junk" value, at

utilized and sold even when the dealer Senator himself, who said: cannot hope to sell the set intact. Hence, almost any set will receive some allowance when turned in as a part

anks," Senator Smith said relief of the worried service man. That's all I wanted to know!" The set was found to be in perfect scheduled for the near future are such entenna. The aerial should not be too condition.

length with broadcasting stations with-in 10 miles. A total of 100 feet is all apartments built on steel skeletons in though less spectacular, are technically right when stations are 25 to 50 miles away and for rural listeners who are large cities should employ an outdoor radical. Truly, having a radio set does not mean knowing all that radio can to 200 miles from stations a length aerial rather than one inside an apart- give. To find that out, one must conment or in a low building. For between tinue to buy the newer, finer products These suggestions are only approximate. Apartment dwellers who have to the broadcast station and the aerial which reach the market. have lead-ins of 75 feet or more may there undoubtedly are many structures find that to use the lead-in alone for with metal frameworks, each of which receiving will bring poor results, because the aerial is shielded by building and the amount that reaches the set is masts for the suburban radio listener, and the amount that reaches the set is masts for the suburban radio listener, and the amount that reaches the set is masts for the suburban radio listener, and the amount that reaches the set is masts for the suburban radio listener, and the amount that reaches the set is masts for the suburban radio listener, and the amount that reaches the set is masts for the suburban radio listener. wails. In such cases the over-all aerial comparatively small. Brick, stone or if the aerial installation is made with length can be increased, and it will be wood or, in fact, any insulating mate-due regard for the fact that high winds necessary to insert a fixed condenser rial does not offer any obstruction to whip and bend the sturdlest giants of of capacity ranging from .00025 to radio waves, but metals do, and such a the forest. To prevent the aerial wire .0005 mfds, between the lead-in and thing as iron cornices or girders in the from breaking, arrange the wire so that aerial binding post. This approxi- wall may seriously affect reception if a sash-weight keeps it taut. A pullet lates the effects of a shorter aerial, they are in the path which the radio attached to a supporting wire from the hough not being quite as efficient. waves must traverse to reach the red tree will permit the aerial wire to give when the tree begins to sway.

Weekly Radio Test

- 1. What are the three eras in loudspeaker construction? 2. What is the "skip effect" of
- mics? 4. Is an underground antenna as efficient as one strung in the air?

3. What part of the study of electricity is electro-dyna-

5. Why must high-powered sta-tions have exclusive wave channels?

(Answers to these questions will be found elsewhere in the Radio Section). (Copyright, 1928).

POLITICAL PARTIES HAVE EQUAL RIGHTS

Law Prohibits Discrimination by Radio Stations

If Any Legally Qualified Candidate is Pennitted to Brondenst All Other Such Candidates for That Office Must Be Given Equal Onportunities to Be Heard.

The disparity between the number of stations which broadcast the Republi-However, in the case of batteries can and Democratic conventions at Kansas City and Houston and the one or two stations which gave to the pubat Chicago was noticed by the Federal radio officia; at Washington, one of under Section 18 of the Radio Act, they could have der anded the same coastto-coast, border-to-porder hockup, no only for three speeches but for their

ungestionably was dearest to the hearts of those Senators and Congressmen who framed the act, and which was calculated to give equal radio political privileges to all parties, reads:

"If any broadcaster shall permit any person who is a legally qualified candidate for any public office to use a broadcasting station, he shall afford equal opportunities to all other such candidates for that office in the use of such broadcasting station, and the licensing authority shall make rules and regulations to carry this provision into effect: Provided, that such broadcaster shall have no power of censor-ship over the material broadcast under the provisions of this paragraph. No m. will be broadcast the Eastern League obligation is hereby imposed upon any baseball game from Kinsley Park, Prov-broadcaster to allow the use of its sta-idence Grays vs. Springfield. The Broadbroadcaster to allow the use of its station by any such candidate."

individual stations involved. Neither does it mention political conventions that it is assumed it would cover this contingency.

It was pointed out, however, that the law clearly sets forth that the individual stations are not obligated to collow their stations are not obligated to collow their stations to be used for policities at 8.00 p. m. the Capital Them. the distance between the set and the

in granted exactly the same broadcasting

NO SATURATION POINT

New Developments in Radio Continue to Create Demand

One reason why there is no talk of a saturation point in radios is because constant improvements continually croate new demands and new markets. Every time some new development be broadcast Friday at 2.00 p. m. will crops up in radio, there are those to cry "premature" and to let loose the fear that many will be tempted to hold One of the newest radio fans is off purchasing receivers. It probably is true that certain persons are ultra-conwould have a disastrous effect on the would have a disastrous effect on the would have a demonstrated that thousandss of radioists turned in their less modern equipment for the the job quite as effectively in the case at 1:30 p. m. with an organ recital.

At the door the man was met by of radio, for the new art has not as Jacob Conn will give an address at 2:15 the distinguished, but very perplexed, yet reached the point where improve- p. m. Tomorrow at 8:30 p. m. a studio ments must be refinements or where style has been resorted to for the pur- Florist hour will be heard at 7:30 p. m. "Just tell me what this thing is." style has been resorted to for the partial action on Tuesday. At 2:30 p. m. on Wedness of creating new demands. Every change in radio design seems to be radical and to make much previous ist, will be on the air. The usual proequipment obsolete.

Nor is there any immediate sign of a

let-down in this process. Apparently developments as push button tuning, sets with fewer stages of amplification and more powerful tubes, television, home talking movies, wired radio and Radio listeners who live in houses or numerous other developments which

Today's Programs in Brief

For the convenience of radio fans the following hourly schedule of broadcasting today is given in brief form. Figures following station deform. Figures to note wave length. The hours are based on Eastern daylight saving time. LOCAL STATIONS

LOCAL STATIONS

11:00 - Church, WEAN, 275.
1:30 - Mudc, WCOT, 225.
2:00 - Church, WJAR, 484.
2:15 - Talk, WCOT, 225.
3:00 - Music, WEAN, 275.
Concert, WJAR, 484.
4:00 - Music, WEAN, 275.
6:00 - Band, WJAR, 484.
7:00 - Music, WEAN, 275.
7:20 - Music, WEAN, 275.
7:50 - Weather, WJAR, 484.
7:30 - Church, WEAN, 275.
Concert, WJAR, 484.
8:00 - Correct time, WEAN, 2

B 00—Correct time. WEAN, 275. Church, WISI, 248. 8 01—Continuation. 9.00—Taik, WJAR, 484. Masic, WEAN, 275. 0:15—News, WJAR, 484. 10.00—Music, WEAN, 275. EASTERN STATIONS

9.00-Children's hour, WJZ, 454; WPAP, 353. 9:30-Church, WKBW, 217. 10:20-Church, WFI, 405. 10:30-Church, WCSH, 366, WHAM, 280.

10:30—Church, WCSH, 300, WHASI, 280.

10.45—Church, WGR, 303; WKBW, 216; WEEI, 448; WIP, 340.

11:00—Church, KDKA, 316, WQAO, 305, WGY, 380.

12:00—Church, WRC, 469.

12:30—Organ, WHN, 306.

12 30-Organ, WHN, 396.

1:00-Peature, WJZ, 454.
Music, WEAP, 4°2. WRC, 469.
Organ, WKEW, 217.

1:30-Church, WCSH, 366.

2:00-Church, WEAF, 4°2.
Music, WHAM, 280; WHN, 306.
Roxy and his gang, KDKA, 316. WHZ, 333. WJZ, 454;
WRC, 469.
Orchestra, WHN, 396.
2:30-Church, WCSH, 366

3:00-Feature, WQAO, 395.
Music, WOR, 422; WCSH, 366;
WHAM, 380. WJZ, 454; WRC,

Music, WOff, 422; WCSH, 366; WHAM, 380, WJZ, 454; WRC, 469, WGR, 303. Conference, WEAP, 402. 3 30-Music, WPG, 273, WHAM, 380. 4.00-Organ, KDKA, 316. Conference, WEAP, 492; WCSH, 366. Music, WOR, 422; WJZ, 454; WHAM, 380. WAAM, 349; WRC, 469 4.15-Music, WPG, 273. 4 30-Feature, WEAP, 492; WAAM,

m, with the service from Mathewson

treet Methodist Episcopal Church. The

Columbia Chain programs will be heard

from the station at 3:00 p. m., 4:00 p. m., 9:00 p. m., and 10:00 p. m. At 7:00 p. m. will be broadcast an organ re-

cital. "Amos and Andy" will be on the air at 7:11 p. m., and the service from

the Mathewson Street Methodist Epis-copal Church will be broadcast at 7:30

p. m. Tomorrow at 8.30 p. m. will be

roadcast an instrumental program. At

6.15 p. m. on Tuesday will be heard the

WJAR commences its weekly pro-

Ringside description of the Gene Tun-ney-Tom Heeney championship bout direct from Yankee Stadium, New York

city, will be given by Phillips Carlin and Graham McNamee at 9:00 p. m.

on Thursday. The Automobile Club of Rhode Island will give a talk at 9:30

p. m. on Friday, Saturday at 8:30 p. m. the New York philharmonic-symphony orchestra concert direct from the Lewi-

sohn Stadium, New York city, will be

2.00 p. m. temorow with a studio program. The Family hour will be on the air at 6.00 p. m. Tuesday, Wednesday

and Thursday the usual programs will

be broadcast a musical program. The Virginian Troubadours will be heard from the station at 2.00 p. m. on Satur-

WLSI starts broadcasting at 6:30 p

he air. Thursday the station will be

WCOT begins its weekly broadcast

program will be on the air. The Olympia

grams will be broadcast the remaining

WEAN-THE SHEPARD STORES-275

11.00 a. m.—Service from Mathewson Street
Methodist Episcopal Church.
3:00 p. m.—Symphonic hour, United symphony orchestra, Columbia Chain program: Overture to "The Paris"

0 p. m.—Symphonic hous, United symphony orchestra, Columbia Chain program: Overture to "The Bartered Bride," Smetana: "Romanza from Symphony No IV., Schumann: Two Movements from "Scheherazade," Rimsky-Korsakoff, two pieces for string orchestra by the string section of the United symphony orchestra, waltz, "F-pana," Waldteufel; suite, "Jeux d'Enfants," Bizet, United Symphony orchestra.

1 p. m.—Calliedral hour, Columbia Chain program, chimes: processional, "Gustavus Adolphus Hymn," full ensemble, prelude "Aria," Bach, orchestra, "Refore the Crucifix," La Forge, contraito solo, "I Will Dwell in the House of the Lord," Eville, solo volcey, chorus and Grehestra; "Adogio Pathetique," Codard, orchestra: "God In a Spirit," Bennett, full ensemble, "Mediation," Trechalkovsky, orchestra "The Lord is My Strength," Smott, solo volces, chorus and orchestra: "Lamento," Slocum, orchestra, "The Lord is My Light," Allit-

days of the week.

Home hour will be broadcast

silent.

WFCI begins its week of programs at

RADIO PROGRAMS

11 00

W.I.St starts productively a starts or and the starts of the International Bible Students' program. The service from the Church of the Seventh Day Adventist

10:00 n.m.—The Captivators, Columbia.

10:00 n.m.—The Captivators, Columbia.

10:00 n.m.—Providence Journal and Evening Bulletin news flashes.

349. Music, WRC, 469. 5.09—Music, WOR, 422: WHN, 396: WAAM, 349: WJZ, 454: KDKA, WAAM, 349; WJZ, 454; KDKA, 316.
Church, WRC, 469.
5:15—Church, WPG, 273.
5:30—Talk, WEEI, 448.
Music, WEAP, 492; WGY, 380.
6:00—Band, WEAP, 492; WGR, 303; WGY, 380; WRC, 460; WTAG, 517; WFI, 405; WEEI, 448; WCSH, 366; WIC, 535.
Music, WJZ, 454.
6:25—Bascball, WJZ, 454.
6:30—Music, WJZ, 454; KDKA, 316.
7:00—Music, WJZ, 454; KDKA, 380; 7.00-Music, WEAF, 492; WGY, 380; WFI, 405; WHAM, 380; WTIC, 535; KDKA, 316. Baseball, WTAG, 517; WGR.

535: KDKA, 316.
Baseball, WTAG, 517: WGR.
303.
Talk, WFEI, 448.
Church, WKBW, 217.
Organ, WJZ, 454.
7:05-Music, WTAG, 517.
7:15-Music, WBZ, 333.
7:25-Baseball scores, WEAF, 492:
WTIC, 535: WGY, 380.
7:30-Music, WBAL, 286: WJZ, 454:
WOR, 422.
Church, WQAO, 395.
Capitol Theatre program,
WEAF, 492: WTAG, 517: WGY,
380: WRC, 469. WTIC, 535.
7:45-Music, WHAM, 380: WBZ, 333.
8:00-Church, WGR, 203.
Music, WEEI, 448: WHAP,
236. WJZ, 454: WTAG, 517:
WHAM, 280: WOR, 422:
KDKA, 316.
8:15-Music, WIAM, 380.
Reading, WHAP, 236.
8:30-Reading, WGB, 349.
8:45-Music, WIAM, 280: WJZ, 454:
KDKA, 316.
8:30-Reading, WGB, 349.
8:45-Music, WIAM, 280: WJZ, 454:
KDKA, 316. WBZ, 333.
9:00-Talk, WGR, 303: WTAG, 517:
WGY, 2300, WCSH, 266: WEAF,
492. WRC, 469.
Feature, WGR, 422.
News, WPG, 273: WEEI, 448.
9:15-Atwater Kent hour, WEAF,
402: WGR, 363: WEEI, 448.
9:15-Atwater Kent hour, WEAF,
402: WGR, 363: WEEI, 448.
9:15-Music, WBZ, 333: KDKA, 316:
WBAL, 286: WHAM, 280.
Band, WJZ, 454.
Reader, WHAP, 236.

Reader, WHAP, 236.

9:45—Music, WEEI, 448.
Drama, WEAF, 492: WGY, 380.
Speaker, WHAP, 236.
10:00—Music, WHN, 296: WOR, 422.
10:15—Organ, WEAF, 492.
Music, WKEW, 217: WJZ, 333.
Baseball, KDKA, 316.
10:30—Music, WPG, 273: WGBS, 349.
10:45—Music, WPG, 273.
11:30—Organ, WHN, 396.
Music, WPG, 273.
11:30—Orchestra, WHN, 396.
12:00—Church, WBSO, 384.

sen, tenor solo: "Cradle Bong." Iljin-sky, orchestra: "God In Nature." Beethoven, full ensemble: "Andante Meloul'oso," Rachmaninoss, orchestra.

7 00 p. m.—Organ recital.
7:11 p. m.—Organ recital.
7:11 p. m.—Wanos and Andy."
7:20 p. m.—Continuation of organ music.
7:30 p. m.—Service from Mathewson Street
Methodist Episcopal Church.
8:00 p. m.—Correct time.
8:01 p. m.—Continuation of church services.
9:00 p. m.—"Come to the Fair," Columbia

D m -- Providence Journal and Eve-ning Bulletin news flashes.

Tuesday.

10.30 a. m.—Organ recital.

11.25 a. m.—Time signals.

12.00 m.—Musical program.

12.30 p. m.—Weather report.

13.00 p. m.—Providence Journal and Evening Bulletin news flashes.

1.00 p. m.—Official market report of Providence Bureau of Markets, Rhode Irland State Department of Agriculture.

4.00 p. m.—Musical program.

4.30 p. m.—Weather report.

6.00 p. m.—Providence Journal and Evening Bulletin news flashes.

6.05 p. m.—Army recruiting realities revealed.

6.15 American American broadcasting period,

"America for Americans."

"America for Americans."

6 30 p. m.—Bilimore Hotel orchestra.

7:11 p. m.—"Amos 'N' Andy."

7:20 p. m.—Continuation of Bilimore Hotel ovchestra.

7:30 p. m.—Information service.

8:02 p. m.—Correct time.

8:01 p. m.—Musical program.

9:00 p. m.—La Palina hour. Columbia.

10:00 p. m.—Hank Bimmons's Bhow Boat,

Columbia.

11:00 p. m.—Providence Journal and Evening Bulletin news flashes.

Wednesday

Wednesday

9:45 a. m.—Women's Institute conducted by June Abbott.
10:30 a. m.—Orpan recital.
11:00 a. m.—Orpan recital.
11:00 a. m.—Colonial Trio.
11:55 a. m.—Time signals.
12:00 m.—Musical program.
12:30 p. m.—Weather report.
1:00 p. m.—Providence Journal and Evening Bulletin news flashes.
1:05 p. m.—Official market report of Providence Durent of Markets, Rhode Island State Department of Agriculture.
1:10 p. m.—Clood gardening talk.
3:15 p. m.—Eastern League baseball game, brondenst for Kinsley Fark, Providence Grays vs. Springfield.
6:00 p. m.—Providence Journal and Evening Bulletin news flashes.
6:05 p. m.—Junior Asia Serenaders.
7:00 p. m.—Information service.

9:45 a. m.-Women's Institute

dians.
7.40 p. m.—Information service.

9:45 a. m.—Women's Institute programmed and members of the conducted by June Abbott.
10:00 a. m.—Home Service radio chat.
10:30 a. m.—Organ recital.

DISTANT STATIONS

12:45—Feature, WGHP, 277.
2:00—Music, WMAQ, 428; KSTP, 220. Roxy and his gang, KYW, 526; WJR, 441.

3:00—Music, WGHP, 284; KOA, 336; WJR, 441; WSB, 476. WOC, 353; WMAQ, 428; WSAI, 461, KOG, 384.

3:30—Band, VLW, 423.

3:30—Music, KSTP, 220.

4:00—Organ, WLW, 428. Music, KOA, 326; WSAI, 461; KYW, 526.

4:30—Peature, KOA, 526; WSAI, 461; KYW, 526.

4:45—Orchestin, WLW, 428.

5:30—Music, KPIX, 336. KFI, 469; WGHP, 441; KYW, 526.

5:30—Music, WMAQ, 448; WLW, 428, 326.

326.
6.00—Music, KFI, 469; WSAI 461; WLW, 428
6:30—Music, KGO, 384; WJR, 441.
6:45—Music, WAIAQ, 448; WLW, 428.
7:00—Music, KOA, 326; WSAI, 461; KNX, 336; WJR, 441; KYW, 526.
7:15—Children's hour, K65TP, 220.
7:30—Capitol Theatre program, WSB, 476; KOA, 326; WSM, 441; Music, KFI, WBAI, 461; WLW, 428.

Music, KFI, W8AI, 461; WLW, 428, 7:45—Music, WJZ, 441. 7:50—Music, WMAQ, 448. 8:00—Music, KFI, 460; WLW, 428; WMAQ, 428; WSAI, 461. 8:15—Music, KYW, £26; KSTP, 220; VJIR, 441. Collier's Radio hours, WJR, 441. 8:45—Music, KOA, 320; WLW, 428; WJR, 441; WCCO, 405; KYW, 526.

WJR, 441; WCCO, 405; KYW, 526.

9:00-Music, -WGHP, 441; WMAQ, 448; KSTP, 220. Talk, WSB, 476; WCC, 375; WSAI, 361.

9:15-Music, WSAI, 461; WSB, 476, Atwater Kent hour, KGO, 384; WCCO, 405; WCC, 375.

9:37-Music, KFI, 469; KOA, 326, KSTP, 220.

9:37-Music, KYW, 526.

9:38-Music, KYW, 526.

9:48-Music, WCC, 375; WSAI, 461; WCCO, 405.

10:00-Music, KSTP, 220; KOA, 326; KYW, 520.

10:15-Music, WLW, 428; WSAI, 461; WSB, 476; WCCO, 405.

10:32-Organ, WCCO, 405.

10:32-Music, KFI, 469.

10:43-Music, KFI, 469.

11:10-Music, KFI, 469; KNX, 336; KGCO, 408.

11:15-Music, KFI, 469; KNX, 336; KSTP, 220.

12:10-Organ, KSTP, 220.

12:10-Organ, KSTP, 220.

12:50-Music, KFI, 469.

Test out all the small fixed conden-

8:00 p. m.—Correct time, 8:01 p. m.—Nicholson Thackray Home Sweet Home. 8:30 p. m.—Ifalian Hawalian troupe. 9:00 p. m.—Porest and Meadow, Columbia. 9:30 p. m.—United Military Band, Colum-bia.

9:30 p. m.—rorest and acadow, Columbia.
9:30 p. m.—United Military Band, Columbia.
10:30 p. m.—Koleter hour, operetta in miniature. Columbia.
11:30 p. m.—The Buccaneers, Columbia.
11:30 p. m.—Providence Journal and Evening Builetin news flashes.

Thursday.
9.45 a. m.—Women's Institute program conducted by June Abbott.
10:30 a. m.—Musical program.
11:30 a. m.—Musical program.
11:55 a. m.—Time signals.
12:30 p. m.—Weather report.
1:00 p. m.—Providence Journal and Evening Bulletin news flashes.
10:5 p. m.—Official market report of Providence Bureau of Markets, Rhode Island State Department of Agriculture.
4:30 p. m.—Weather report.
6:30 p. m.—Weather report.
6:30 p. m.—Weather seport.
6:30 p. m.—Weather seport.
6:30 p. m.—Drovidence Journal and Evening Bulictin news flashes.
6:30 p. m.—Drovidence Journal and Evening Bulictin news flashes.
6:30 p. m.—Drovidence Journal and Evening Bulictin news flashes.
6:30 p. m.—Drovidence Journal and Evening Bulictin news flashes.
7:10 p. m.—Continuation of dinner dance music.
7:10 p. m.—Ontinuation of dinner dance music.
7:11 p. m.—"Amos "Andy."
7:20 p. m.—Continuation of dinner dance music.

American singers: "Liberty Porever,"
Caruso-Bellezza, band: "What the
Chimney Sang," Parks, American
sincers: "La Cinquantaine," GabrielMarie, band; bass solo by Frank Croxton; "Heavy Artillery." Bergenholtz,
band; quartet from "Rigoletio," Verdi, full ensemble; "Sound Off." Bousa,
band;

12:35 p. in.—Vetatic recital.

1:05 p. in.—Organ recital.

1:06 p. in.—Organ recital.

1:05 p. in.—Organ recital.

1:05 p. in.—Organ recital.

1:05 p. in.—Official market report of Providence Bureau of Markets, Rhode Island Btate Department of Agriculture.

1:10 p. in.—Good gardening talk.

1:10 p. in.—Good gardening talk.

1:10 p. in.—Eastern League baseball game, broadcast from Kinsley Park, Providence Grays vs. Bridgeport.

6:00 p. in.—Providence Journal and Evening Bulletin news flashez.

6:05 p. in.—"Uncle Red," auspices Providence Bafety Council.

6:25 p. in.—"Uncle Red," auspices Providence Bafety Council.

6:25 p. in.—Black Derby orchestra.

7:11 p. in.—Amos 'n' Andy."

7:20 p. in.—Continuation of dinner dance.

7:30 p. in.—Continuation of dinner dance.

8:00 p. in.—Correct time.

8:01 p. in.—Musical program.

9:00 p. in.—Eastman Kodak Hour, Columbia.

10:00 p. in.—Eastman Kodak Hour, Columbia.

10:00 p. in.—Providence Journal and Evening Bulletin news flashes.

SATURDAY

"Women's institute program.

Monday

9:45 a m—Women's institute program conducted by June Abbott.

10:00 a. m—Blue Monday gloom chasers
10:30 a. m.—'Good Uroceries,' by Bally
11:03 a. m.—'Good Uroceries,' by Bally
11:05 a. m.—Time signals.
12:00 m.—Junior Asia Serenaders.
12:00 m.—Junior Asia Serenaders.
12:00 m.—Providence Journal and Evening Bulletin news flashes.
1:00 p. m—Official market report of Providence Bureau of Markets, Rhode Island State Department of Agriculture.
1:10 p. m.—Good gardening talk.
4:00 p. m.—Weather report.
6:00 p. m.—Providence Journal and Evening Bulletin news flashes.
6:01 p. m.—Providence Journal and Evening Bulletin news flashes.
1:10 m.—Port Arthur orchestra.
1:11 p. m.—'Amos 'N' Andv.''
1:12 p. m.—Information service.
1:13 p. m.—Gorect time.
1:14 p. m.—Good gardening talk.
1:15 p. m.—Instrumental program.
1:16 p. m.—Gorect time.
1:17 p. m.—Urothed Opera Company, Columbia.
1:18 p. m.—The Captivators, Columbia.

11.00 p. m.—Providence Journal and Evening Bulletin news flashes.

SATURDAY

9:45 a. m.—Women's institute conducted by June Abbott.
10:00 a. m.—Children's session.
11:00 a. m.—Musical program.
11:55 a. m.—Time signals
12:00 m.—Port Arthur orchestra.
11:00 p. m.—Providence Journal and Evening Bulletin news flashes.
10:05 p. m.—Weather report.
4:00 p. m.—Musical program.
4:30 p. m.—Weather report.
6:00 p. m.—Providence Journal and Evening Bulletin news flashes.
6:30 p. m.—Biltmore Hotel concert orchestra.
7:11 p. m.—"Amos 'N Andy."
7:20 p. m.—Continuation of Biltmore Hotel orchestra.
7:30 p. m.—Information service.
8:00 p. m.—Gorect time.
8:01 p. m.—Musical program.
9:00 p. m.—Mome musical program.
9:00 p. m.—Mome musical program.
10:00 p. m.—Dance music.
11:00 p. m.—Dance music.
11:00 p. m.—Dance music.
11:05 p. m.—Jinmy Walsh and his orchestra.
WJAR—THE OUTLET COMPANY—484

tra.

WJAR—THE OUTLET COMPANY—484

Today.

2.00 p. m.—Summer radio church, sponsored by the Federel Council of Churches, presenting Rhoda Arnold, soprano: Hazel Tuthill, contralto. Grant Kimbell, tenor: Ernest Naftzger, bass: George Vause, musical director "Every Morning Mercles New," "Glorious Things of Thea Are Spoken," "Thou Knowest, Lord," "Ioly, Holy, Holy, Lord Go dof Hosts." "The Church's One Foundation:" "We Prove Thea God." Dudley Buck:

"Thou Knowest, Lord," "Holy, Holy, Lord Go dof Hosts," "The Church's One Foundation:" "We Praise Thee, O God." Dulley Buck: "Redolce, Ye Pure in Heart," sermon, by Rev. John P Jockhison, pastor of the First Congregational Church, Manhattan, Ks.: "Awake, My Soul, Stretch Every Nerve." "O Be Joyful in the Lord, All Ye Lands," George W. Chadwick.

D. m —Sixty Musical Minutes, sponsered by the Federal Council of Churches in America, under the direction of George Shackley, featuring agroup of musicians from the New York Symphony and New York Philharmonic Orchestra, and a male quartet constiting of Fred Velticil, first Every, William Cruger, second tenor. John Quine, baritone, and Emerson Williams, bass: "The Top," Gillet, orchestra: "Recessional," de Koven, male quartet: volin selection, "Onaway, Awake Beloved," Coleridee-Taylor, tenor solo: "Norwegian Dance, Grieg, orchestra, "Shadow March," Protheroe, male quartet: "A New Heaven," Gaul, baritone solo. "Barcarole," Offenbach, orchestra: "Old Osken Bucket," male quartet. "Mother Machree," Oleott, tenor solo. "Somewhere a Voice is Calling," violin solo;

Most home-built radio sets nowadays | To test the variable condensers, attach are constructed on the "kit" principle. the wires to the terminals and turn Constructional details appearing in a the shaft. Any reading is an indication radio publication are followed, using of a short-circuit. Possibly the plates the actual makes of parts described and the builder has assurance of good re-sults and simple assembly when he the other wire to the corresponding set does this. It is certainly a good plan to test of plates, to be sure there is contact. It is certainly a good plan to test This gives a full voltage reading. When out your radio parts, however, before you get them all connected in the set. It is a quick matter to pre-test the carefully for any change in the read-

Easier to Make Sure That All Parts Are Well Construct-

ed Before Wiring Is Done.—B. Battery and

Voltmeter Needed for Work

Test Your Units Before You

ing, for sometimes contact is not per-fect at some points. Testing Coils.

Build New Radio Receiver

The radio frequency coils are tested touching the wires to the ends of the windings to note continuity (rull reading). Try the small primary windings

very simple. Just a "B" battery of 22½ or 45 volts and a voltmeter. One terminal of the battery is connected to a Transformers should be tested cloo Touch the wires to the primary ter-minals and you will note a reduced have long wires attached for test purposes. If these two wires are touched together, the meter will indicate the reading. On the secondary terminals the reading will be still less, but very noticeable just the same. The secondary has more turns of wire and a higher resistance. In testing filter chokes and filter coils of various kinds, higher voltage readings will be found, since these windings have larger wire and less resistance. Do not fall to test out carefully the power transformer. fully the power transformer, In testing the transformers, it is best

to also test between windings for a possible short-circuit. The meter should not read when tested in this way. Rheostats, filament resistors, switches and many other units can be easily tested in the same way. Bear in mind the fact that the higher the resistance of the unit the less will be the reading obtained. A high-resistance meter gives more satisfactory results than the ordinary "watch-case" type for these uses, though the latter will answer. Just

Test out all the small fixed condensers, too, in the same way. These will should be found where there is no conshow little if any momentary reading. tinuous metallic circuit.

units, and, after they are wired to-gether, the connecting wires make tests

difficult, and many wires have to be removed before a proper test can be made—in case the set doesn't function. The apparatus needed for the test is

terminal of the meter. The remaining

battery voltage. Likewise, if the two wires are touched to the terminals of some radio unit, through which there

is a metallic circuit, the meter will read. The full battery voltage may not be shown in all cases, as the resistance

of the unit may affect the reading.
First test out all the condensers, variable and fixed. As condensers do not

have a metallic circuit through them, you would not expect the voltmeter to register. However, in the case of large

condensers, as used in filter circuits, etc., there will be a momentary read-

ing as the condenser is charged up by

the battery. If there is a full voltage reading or a maintained reading when

the wires are touched to the terminals

of a condenser, there is a short-circuit

The Dial's Diary By the Trouble-Shooter

I don't suppose I'm likely to get anyone to agree with me, but too good a memory is rather an unfortunate thing when a radio owner starts trouble the last trouble he had and figure that De in —Correct time.

De in —Corne to the Pair." Columbia price.

De in —Correct time.

De in —Corne to the Pair." Columbia price.

De in —Correct time.

De in —Correct time. his latest grief 's of the same origin.

A good trouble-shooter must be able to forget. He has to start each search

Other times a remedy is found only after a long, hard search. This, too, is unfortunate because it makes a great impression on his mind. The remedy pops into his mind every time the set gives him trouble regardless of what that trouble is. He will even go so far as to reason along the lines which produced him the former remedy, and this reasoning may be all wrong for the

newer situation.

It's best to attack any new problem from an entirely fresh standpoint. It caves running up blind alleys and keeps one reminded of the fact that every trouble is different from it; predeces sors, even though this difference seem ingly may be slight.

"De Gospel Train," Burleigh, male quartet; "Screnade," Toselli, orchestra quartet; "Serenade," Toselli, orthograms, "Dedication," Franz, baritone solo; "Bird Songs at Eventide," Coates, male quartet.

6:00 p. m.—Weymouth Post American Legion Band, featuring musical program by the Stetson Shoe Company.

7:25 p. m.—Weather report.

7:30 p. m.—Capitol Theatre program.

9.00 p. m.—'Our Government,'' by David

Lawrence.
9:15 p. m.—Providence Journal and Evening Bulletin news flashes. Monday

11:15 a. m.—Austeal program.

11:15 a. m.—Radio household institute
1:05 p. m.—Providence Journal and
ning Bulletin news fiashes.

1:10 p. m.—Studio program.

1:30 p. m.—Weather report.

1:35 p. m.—Continuation of studio 1:35 p m.—Continuation of studio facgram.
7:15 p m.—Providence Journal and Evening Bulletin news finshes.
7:20 p. m.—Baseball scores.
7:25 p. m.—Weather report.
7:30 p. m.—Rhode Islanders dance band,
8:00 p. m.—O'Cedar shining hour.
8:30 p. m.—A and P. Gypsies.
9:30 p. m.—A and P. Gypsies.
9:30 p. m.—Hawaiian Island quintet.
10:30 p. m.—Pisk time to retire boys.
11:00 p. m.—Providence Journal and Evening Bulletin news flashes.
11:00 p. m.—Correct time.
11:05 p. m.—Baseball scores.

Tuesday

11:15 a.m.—Musical program.

11:15 a.m.—Radio household institute.

11:05 p.m.—Providence Journal and Evening Bulletin news flashes.

1:10 p.m.—Studio program.

1:30 p.m.—Weather report.

1:35 p.m.—Continuation of studio program. 6:45 p. m.—Providence Journal and Eve-

6:45 p. m.—Providence Journal and Evening Bulletin news flashes.
6 50 p. m.—Baseball scores.
6 55 p. m.—Weather report.
7:00 p. m.—Voters' service program.
7:30 p. m.—Soconyland sketches.
8:00 p. m.—Joe Williams, sports writer, will give his impression of Champion Gene Tunry and Challenger Tom Hechey, with incidental music.
8:30 p. m.—Seiberling singers.
9:00 p. m.—Eveready hour.
10:00 p. m.—Correct time.
10:30 p. m.—Correct time.
10:30 p. m.—Providence Journal and Evening Bulletin news flashes.

10.35 p. m —Baseball scores Wednesday 1:00 a. m.—Masical program. 1:15 a. m.—Radio household institute.

Continued on Page Ten.

Radio Questions and Answers

Radio Editor, Sunday Journal: Is a license required for transmitting?
P. H.
Providence.

(In the United States, a license is required for transmitting, but not for receiving. A license is required, first, for the transmitter itself, which must be correctly and sharply tuned to the assigned wave length, and second, for the person who is to operate the transmitter. The second license is, of course, the operator's license. It is not diffi-cult to obtain as far as the amateur grades are concerned.—Ed.)

Radio Editor, Sunday Journal: I am wondering if leather can be used for a cone speaker. I am building one, and would like to have your views on the subject. D. A. C. Cranston.

(There are certain grades of parchment-like leather, which make excellent virbrating surface for such speakers as you mention. Furthermore, in the case of some free-edge cones leather bands are used for suspension pur-

Radio Editor, Sunday Journal: What is the principle of the talking movies now being exploited??

Providence.
(Briefly, the idea is to combine the dealers and the aural presentations. The visual presentation is in the form of a motion picture, projected on the the form of a loud-speaker rendition of a sound record, either a photo-graphic record, included in the motion picture film itself, or a phonographic disc. In either event, both records must be kept in perfect step if the illusion

Radio Editor, Sunday Journal What advantage may be gained by using an electro-dynamic type of loudspeaker?

J. B. H. speaker?

is to be successful.—Ed.)

Pawtucket.
(The advantage is that this type can take the full power of the largest power amplifier without blasting. With its free or floating coil, swinging between two concentric pole pieces, the driving mechanism has full sway to reproduce the low notes with enormous volume, whereas in the electro-magnetic type the armature with just a very small clearance on either side to the pole pieces, cannot reproduce the loud, low, sustained notes without striking the pole pieces.-Ed.)

ANSWERS TO RADIO QUIZ The magnetic vibrating unit such as the headphone. The same unit attached to a cone or horn. The electro dynamic era in which the diaphragm is actuated by a moving coil.

2. Their tendency to skip a receiver

so that the station sending them appears to be silent to the particular radio listener. 3. That which treats of the force exerted by one current upon another.

4. Opinions differ. Usually it does not pick up as much energy, but less static. There are exceptions, especially where the existence of excessive station may seem to make an outdoor aerial nefficient. 5. Because their carrier waves travel so far there would be interference and

excessive heterodyning

Improving Tone of Conc. The tone from a cone speaker can be

improved by fastening the instrument to the beam of the ceiling. All cones' can thus be improved by increasing their vibrating surface, although the large sizes show the most gain. A beam ceiling is ideal as a means of making this addition, as it provides the necessary air space behind an open type cone and causes the ornamental beauty of the whole to be increased rather than detracted from. The hardwood floor of the room offers similar possibilities, to which the pedestal or base can be securely fastened; also mantel-piece, panel walls, or, in fact, any extended wood surface to which rigid acor more wood screws should be used to effect the connection, the mounting block or base of the speaker being held to the surface firmly.

9.45 p. m.—Same as WEAF. 10.45 p. m.—Weather forecast.

WTAG-WORCESTER-517.
6:00 p. m.—Same as WJAR.
7:00 p. m.—Baseball scores.
7:05 p. m.—Organ recital
7:30 p. m.—Studio program.
8:00 p. m.—Same as WEEI.
9:15 p. m.—Correct time
9:15 p. m.—News bulletin.

WTIC—HARTFORD—535.
6 00 p. m.—Same as WJAR.
7 00 p. m.—Same as WEAP.
7 25 p. m.—Baseball scores.
7 30 p. m.—Same as WJAR.
9:15 p. m.—'Sportograms.''

ocean to England."

more selective.

Reducing Summer Static. Excessive static in summer months can be reduced to a minimum by a

Place them about a foot off the ground, insulate well and connect to the ground terminal of the receiver.

WHEN YOUR RADIO FAILS!

Call Ga. 8640 Day or Nite

"THE RADIO DOCTOR"

counterpoise errangement instead the usual ground connection. Use at least four wires spaced two feet apart

The counterpoise often provides sharper tuning of the set.

SHORT WAVES

After Dark, Signals Travel Long Way Around World.

The Australians, conducting remark-

RADIO PROGRAMS

7:50 p. m.—Providence Journal and Evening Bulletin news flashes.
7:55 p. m.—Baseball scores and weather report.

8:00 p. m.—Edward Keenan, tenor, accompanied by Violette Marks.

8.15 p. m.—Gertrude Gardella, soprano soloist.

8.15 p. ni.—Gertrude Gatuena, Sopiano Soloist.
8.30 p. m.—Venetian nights.
9.30 p. m.—Ipana troubadors.
9.30 p. m.—Palmolive hour.
10:30 p. m.—Correct time.
10:30 p. m.—Providence Journal and Evening Bulletin news flashes.
10:35 p. m.—Baseball scores.
Thursday.
10:00 a. m.—Housewives Radio Exchange, a department conducted by Mrs. Wood on matters of household interest Questions submitted will be answered by radio.

11:00 a. m.—Musical program.

11:15 a. m.—Radio household institute.

1:05 p. m.—Providence Journal and Evening Bulletin news flashes.

1:10 p. m.—Studio program.

1:30 p. m.—Weather report.

1:35 p. m.—Continuation of studio program.

1:35 p. m.—Continuation of studio program.

7:15 p. m.—Providence Journal and Evening Bulletin news flashes.

7:20 p. m.—Baseball scores.

7:25 p. m.—Weather report.

7:30 p. m.—Convert comfort hour.

8:00 p. m.—Chiropractic Society of Rhode Island talk.

8:05 p. m.—S. S. Leviathan concert orchestra and collegiate orchestra, broadcasting through the courtesy of the management of the United States Lines.

9:00 p. m.—Ringside description of the

WBZ—SPRINGFIELD—333.

2:00 p. m.—Same as WJZ.
7:14 p. m.—Weather reports.
7:15 p. m.—Ensemble.
7:45 p. m.—Same as WJZ.
8:00 p. m.—Same as WJZ.
8:45 p. m.—Same as WJZ.
9:15 p. m.—Same as WJZ.
10:05 p. m.—Baseball and weather.

management of the United States
Lines.

9:00 p. m.—Ringside description of the
Gene Tunney-Tom Heeney championship bout direct from Yankee Stadium,
New York city, given by Phillips Carlin and Graham McNamee.

11:00 p. m.—Porvidence Journal and Evening Bulletin news flashes.

11:05 p. m.—Baseball scores.

Friday

10:00 a. m.—Housewives Radio Exchange, a
department conducted by Mrs. Wood
on matters of household interest.
Questions submitted will be answered
by radio.

a. m.—A. and P. Bureau of Home Economics.

Economics.

11.00 a. m.—Musical program.

11:15 a. m.—Radio household institute.

1:05 p. m.—Providence Journal and Evening Bulletin news flashes.

1:10 p. m.—Studio program.

1:30 p. m.—Weather report.

1:35 p. m.—Continuation of studio program.

WEAF—NEW YORK—492.

1:00 p. m.—An hour of chamber music with Darl Bethman, baritone
2:00 p. m.—Same as WJAR.
3:00 p. m.—Same as WJAR.
3:00 p. m.—Same as WJAR.
4:00 p. m.—Genla Zielinska, soprano, and Winifred Young Cornish, planist.
4:00 p. m.—National string orchestra with Earl Little, bass.
5:30 p. m.—Ballad singers.
6:00 p. m.—Same as WJAR.
7:00 p. m.—Same as WJAR.
7:02 p. m.—Baseball scores.
7:30 p. m.—Same as WJAR.
9:15 p. m.—Same as WJAR.
9:15 p. m.—Atwater Kent hour.
9:45 p. m.—Biblical drama.
10:15 p. m.—Organ recital
10:45 p. m.—Organ recital
10:45 p. m.—South Sca Islanders.

1:35 p. m.—Vectorinuation of studio pragram.

1:20 p. m.—Providence Journal and Evening Bulletin news flashes.

1:25 p. m.—Baseball scores.

1:25 p. m.—Weshell scores.

1:25 p. m.—Weshell scores.

1:25 p. m.—Weshell scores.

1:25 p. m.—Wesher report.

1:20 p. m.—Howard time.

1:20 p. m.—Automobile Club of Rhode Island talk.

1:25 p. m.—Musical program.

10:05 p. m.—Hovidence Journal and Evening Bulletin news flashes.

10:05 p. m.—Baseball scores.

10:05 p. m.—Musical program.

10:15 a. m.—Radio household institute.

1:05 p. m.—Providence Journal and Evening Bulletin news flashes.

11.15 a. m.—Radio household institute.

1:05 p. m.—Providence Journal and Evening Bulletin news flashes.

1.10 p. m.—Studio program.

1:30 p. m.—Weather report.

1:35 p. m.—Continuation of studio program.

1:35 p. m.—Continuation of studio program.

8:00 p. m.—Providence Journal and Evening Bulletin news fiashes.

8:05 p. m.—Basehall scores,

8:10 p. m.—Thomas Cross, tenor, accompanied by Violette Marks.

8:20 p. m.—Rhode Island Humane Education Society talk.

8:25 p. m.—Weather report.

8:30 p. m.—Correct time.

8:30 p. m.—Correct time.

8:30 p. m.—New York philharmonic-Symphony orchestra concert direct from the Lewisohn Stadium, New York city.

9:30 p. m.—Providence Journal and Evening Bulletin news fiashes.
9:35 p. m.—Baseball scores.

WFCI-FRANK CROOK, INC.-242

2:00 p. m.—Studio program.
6:00 p. m.—Studio program.
6:00 p. m.—Family hour.
7:00 p. m.—Baseball scores.
7:05 p. m.—To be announced.
Tuesday.
2:00 p. m.—Musical program.
6:00 p. m.—Family hour.
7:00 p. m.—Baseball scores.
7:05 p. h.—Briggs and Leonard,
mony twins.

7:05 p. m.—Briggs and Leonard, the narmony twins.

Wednesday.

2:00 p. m.—Studio program.

6:00 p. m.—Ernic and his Danceland Orchestra.

7:00 p. m.—Baseball scores.

7:05 p. m.—To be announced.

Thursday.

2:00 p. m.—Studio program.

6:00 p. m.—Family hour.

7:00 p. m.—Enseball scores.

7:05 p. m.—Exide Battery boys.

Friday.

2:00 p. m.—Musical program.

6:00 p. m.—Baseball scores.

7:05 p. m.—To be announced.

Saturday.

2:00 p. m.—Virginian Troubadours.

6:00 p. m.—Family hour.

7:00 p. m.—Baseball scores.

WLSI—LINCOLN STUDIOS, INC.—248.

6:30 p. m.—International Bible Students' program.

8:00 p. m.—Service from the Church of the Seventh Day Adventist.

Monday.

8:00 p. m.—Official market report of the Providence Bureau of Markets, Rhode Island State Department of Agriculture.

ture.

8:05 p. m.—Studio program.

Tucsday.

8:00 p. m.—Official market report of the Providence Bureau of Markets, Rhode Island State Department of Agriculture.

ture.
8:05 p. m.—New Victor releases.
Wednesday.
8:00 p. m.—Official market report of the
Providence Bureau of Markets, Rhode
Island State Department of Agriculture.

8.05 p. m.—Mrs. Marian Tetreau, astrologist and psycho-analyst.
8.20 p. m.—Movie Club with the Twilight
Hawaiian quintet.
9:00 p. m.—Prof. Franklin N. Strickland,
talk. Thursday.

8:00 p. m.—Official market report of the Providence Bureau of Markets, Rhode Island State Department of Agricul-ture

8:05 p. m.—Home hour. Blient. WCOT-CONN'S OLYMPIA-225

Today
1:30 p. m.—Organ recital.
2:15 p. m.—Address by Jacob Conn.
Monday
7:30 p. m.—Blanchard's Better Be Protected Hour.
8:30 p. m.—Studio program.
Tuesday
2:30 p. m.—Studio program.
7:30 p. m.—Olympia florist hour.
Wednesday
2:30 p. m.—Robert Fields, boy tenor and pianist.
7:30 p. m.—Moonlite Serenaders.

7.30 p. m.—Moonlite Serenaders 8:00 p. m.—Arthur Guilmet, tenor.

tenor.

Thursday
2:30 p. m.—Studio program.
7:30 p. m.—Olmpia radio
with Prof. Zangar. Friday 2:30 p. m.—Studio program

Anthracite Coal

Guaranteed best quality Pennsylvania Anthracite, equal to any sold in Providence, and at \$1.00 per ton less. White Ash Egg. \$14.75; Chestnut or Stove, \$15 per ton; Lehigh Egg. \$15.50; Chestnut or Stove, \$15.75; Pea. \$12; delivered in your cellar.

Bowen Coal Co. 86 WEYBOSSET ST. Studley Bldg. Gaspee 4378

Call DExter 2800 to start a Classified Ad working for you at once.

The second second of the

7:30 p. m .- Shadowland entertainers. Saturday

2.30 p. m.—Studio program.

7:30 p. m.—Rooney's Pionzer entertainers.

p. m.—Correct time. p. m.—Baseball scores.

WBAL—BALTIMORE—286.
7.30 p. m.—Concert orchestra.
8:45 p. m.—Same as WJZ.
9.15 p. m.—Same as WJZ.

WBSO—BABSON PARK—381. p. m.—Midnight ministry.

WCSH-PORTLAND-366.

10.30 a. m.—State Street Church service.

1:30 p. m.—Radio Parish Church.

2:30 p. m.—Same as WIAR.

4:00 p. m.—International Bible students

WEEI—BOSTON—448.

10.45 a. m.—Service from First Church of Christ Scientist.

5:30 p. m.—Sam Curtis radio chat.

6:00 p. m.—Same as WJAR.

7:00 p. m.—Was despatches

8:00 p. m.—Sager hour of hospitality.

9:00 p. m.—Masterpicce planist.

9:14 p. m.—Sessions chimes

9:15 p. m.—Same as WEAF

9:45 p. m.—Correct time

9:46 p. m.—Same as WEAF.

10:15 p. m.—Same as WEAF.

WFI-PHILADELPHIA-405.

10:20 a. m.—Service from Arch Street Me thodist Episcopal Church.
6.00 p. m.—Same as WJAR.
7:00 p. m.—Same WEAF.

WGBS-NEW YORK-349.

8.30 p. m.—String quartet. 9 00 p. m.—New Negro art theatre group 10:30 p. m.—Studio trio.

WGR-BUFFALO-303

flashes.

8:00 p. m.—Service from the Central Presbyterian Church.

and an extended the de sent trades and it

WGR-BUFFALU-503

10:45 a. m.—Service from Westmi
Presbyterian Church.

12:00 m.—Correct time and weather.

3:00 p. m.—Same as WJAR.

6:00 p. m.—Same as WJAR.

7:00 p. m.—Baseball scores and

m .- News dispatches

program.
6:00 p. m.—Same as WJAR.
9:00 p. m.—Same as WJAR.

6-25 p. m.—Baseondi scores, 6:30 p. m.—Ensemble. 7:00 p. m.—Correct time. 8:00 p. m.—Same as WJZ. 8:45 p. m.—Same as WJZ 9:15 p. m.—Same as WJZ. 10:15 p. m.—Baseball scores.

WHAM—ROCHESTER—280.
a. m.—Morning church service.
p. m.—Down melody lane.
p. m.—Priendly hour.
p. m.—Popular concert.
p. m.—Same as WJZ. EASTERN STATIONS KDKA—PITTSBURGH—316, a. m.—Church service, p. m.—Same as WJZ. p. m.—Correct time. p. m.—Same as WJZ. p. m.—Same as WJZ. p. m.—Same as WJZ.

3:30 p. m.—Popular content.
4 00 p. m.—Same as WJZ.
7:00 p. m.—Melodrama with
music.
7.45 p. m.—Same as WJZ.
8:15 p. m.—Music hour.
9:15 p. m.—Organ recital.
10:15 p. m.—Weather forecast.

WGY—SCHENECTADY—380.

11:00 a. m.—Service from First Presbyterian Church.

Church.

5:30 p. m.—Same as WEAF.

6:00 p. m.—Same as WJAR.

7:00 p. m.—Hans Barth, planist.

7:25 p. m.—Baseball scores.

7:30 p. m.—Same as WJAR.

9 00 p. m.—Same as WJAR.

9.15 p. m.—Same as WEAF.

9.45 p. m.—Correct time.

WHAP—NEW YORK—236.

m.—Sacred music
m.—Augusta E. Stetson, C. S. D.,
christian Science reading from the
ritings of Mary Baker Eddy
m.—Sibyl Marvin Huse, speaker,
m.—James P. B. Hyndman, speaker.

WHN—NEW YORK—396, m—Organ recital. . m.—Orchestra. m.—Orchestra. n.—American celebrity hour. 11.00 p. m.—Organ recital. 11.30 p. m.—Orchestra.

WIP—PHILADELPHIA—319, a m.—Service from Holy Trinity Church.

WJZ-NEW YORK-154

9:00 a m.—Children's hour.

1:00 p m.—Concert string orchestra.

2:00 p m.—Roxy and his gang

3:00 p. m.—Classic melody.

4:00 p. m.—Dr. Sockman's question hour.

5:00 p. m.—Twilight reverles.

6:00 p. m.—Taylor Buckley, baritone with string trio.

6:25 p. m.—Baseball scores and summary of programs. The great objective of the Austracently, H. P. Brown, the Australian Commonwealth postal director, who happened to be in London, listened in 6 25 p. in.—Baseball scores and summer of programs.
6:30 p. m.—Mme Lolita Cabera Ginsborg, concert planist.
7:00 p. m.—Correct time
7:00 p. m.—Correct time 6:30 p. m.—Mme Lolita Cabera Ginsborg, concert planist.
7:00 p. m.—Correct time
7:00 p. m.—Majorie Horton-and Cyril Pitts with string trio.
7:30 p m —Sonato, Mathide Harding and Arcadle Birkenholz.
8:00 p. m.—The Ticket-of-Leave Man.
8:45 p. m.—Whittall Anglo Persians
9:15 p. m.—Gorrect time.
10:15 p. m.—Correct time.
10:15 p. m.—National broadcasting and connect bureau hour.

Better results can be he superheterodyne when plate the oscillator tube is reduced. less, and Major Conder, general manager

concert bureau hour.

WOR-NEWARK-122. WOR—NEWARK—125.
3.00 p. m.—Same as WEAN.
4:00 p. m.—Same as WEAN
5:00 p. m.—Wickwire Spencer fences.
7:30 p. m.—Organ recital
8 00 p. m.—Same as WEAN.
10:00 p. m.—Same as WEAN.

WPAP—PALISADES—395. 9:00 a m.—Children's hour WPG-ATLANTIC CITY-278.
p m.—Creatore and his band and 3:30 p m.—Creatore and his band and Pauline Talma, soprano.
4:15 p m —Community vocal and instrumental recital.

5 15 p m.—Religious service 9 00 p m—News flashes and 9 00 p m—News tasties and baseoun scores.

9.10 p. m.—Breaking of waves
9.15 p. m.—Operatic concert
10.30 p. m.—Creatore and his band with Pauline Talma, soprano.

11.00 p. m.—Sunday evening musical.

WQAO—NEW YOR—395. m.—Calvary morning services m.—Inspiration hour 7:30 p. m.—Calvary evening services. WRC-WASHINGTON-160.

Former

Price

Sale

Price

No. 28

WRC—WASHINGTON—160.

1 00 p. m—Same as WEAF.
2.00 p m.—Same as WJAR.
3 00 p. m.—Same as WJAR.
4.00 p. m.—Studio program.
4:30 p. m.—Studio program.
5:00 p. m.—Same as WEAF.
6:00 p. m.—Service from Washington Cathedral
6:00 p. m.—Same as WJAR.
7:30 p. m.—Same as WJAR.
9:15 p. m.—Same as WJAR.
9:15 p. m.—Correct time.
9:15 p. m.—Same as WJAR. WILLIAM E. ARNOLD Expert Service and Repairs. Bat-teries charged and Radio Supplies. Trouble corrected or no charge.

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NAVY LENDS BYRD EXPERT ENGINEER

Research Laboratory Worker is Skilled in Airplane Communication.—Alded Commander in 1926

crossing the United States en route to England. Also that messages they sent from Melbourne early Monday morning reached London the Sunday night be-"The messages travel through the space of darkness over Asia to Europe," will go along in a different capacity the report said, "but it is interesting than when Byrd started for the North to note that as the other side of the Pole earth is in darkness at 5 b. m. Mel-

Hanson, who is one of the foremost aircraft radio experts in the country, had been pressed into service in 1926 by Byrd and was feverishly working aboard the Chantler at New York, but found it impossible to get the radio equipment in shape before the ship sailed. Time was too short to secure lians is to be the first to achieve Empire broadcasting. During a test re-

actually happened, but anyway Han-son disappeared about the hour of sailing and was not seen again until the vessel was well out to sea, when he was found sound asleep, explanation being made that he had suddenly become exhausted as a result of his in-

Better results can be had from a ing on the Byrd radio installation superheterodyne when plate voltage on which he barely managed to finish by the oscillator tube is reduced to the the time the Chantier reached Trodminimum practical value. Generally blen on the Norway coast. There he this value will be found between 30 left the ship and returned to his ofand 45 volts. The filament voltage of ficial duties at Washington.

The oscillator tube is critical as well.

The selection of Hanson to accom-

and many of the better-built super-heterodynes have incorporated in them prise inasmuch as he assisted in the provisions for varying the filament radio arrangements of the Navy-Mac-temperature of this tube. In making Millan Expedition in 1925, Wilkins Dethe adjustment of plate voltage and treit and Byrd Arctic expeditions, 1926, filament voltage it is best to juggle both controls until the optimum setting is secured. When properly adjusted, the receiver will be found to be more selective.

The first application of short waves justed, the receiver will be found to be to an airplane was a set built for Wilson, but leaven a dualitation of willings and the best of willings and the Byrd transatiantic flight in 1927.

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all standard makes of radio

Malcolm P. Hanson Will Be in Charge of Radio on Trip

ably successful tests, have discovered that their short waves are taking the long way around the world, thereby

bourne time, the wireless waves traverse the longer way round the world to reach London during the transmissions then and travel across the Pacific Ocean over America and the Atlantic

tensive work prior to departure.
Of course, the ship could not turn back so Hanson then continued work-

kins by Hanson, a duplicate of which

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Commander Byrd carried over the set to the task of turning off the set the switch. If the right-angle bracks Possibly Hanson's achievement of the nost popular interest was his designng an automatic wind-driven sending device which worked like a top and continually repeated the call letters "WTW" of Byrd's plane almost all the way across the Atlantic, excepting at

ships were able to take directional usually mounted on a porcelain or bearings and, to know the position of black fibre base. Fasten the clock down the position of the Byrd plane at all to a handy shelf or piece of board. A

with Secretary of the Navy Wilbur of the Bureau of Standards, detailed by the Commerce Department; Howard winds up the cord on its shaft. This allow Malcolm P. Hanson of the Naval F. Mason of Scattle, a short wave ex-Research Laboratory to accompany the in charge of radio communication of Byrd expedition to the South Pole as the Wilkins-Detroit expeditions, and engineer in charge of radio, the latter Lloyd K. Grenlie of Chicago, who was chief radio operator on the Byrd Arctic

RADIO ALARM CLOCKS

These Automatically Start or Stop Set

An ordinary alarm clock can be put to numbers of uses in connection with any radio set. For example, one man uses the radio morning exercises to get the family out of bed, and instead of having the unwelcome ding-dinging of the alarm bell, instead the family now opens its eyes to the "Good morning" of the gymnasium class leader. One man who uses such a scheme com-plained when he discovered that the broadcasting station operated an alarm broadcasting station operated an alarm clock and broadcast the bell's awaken-

In another case an alarm clock was

in case the owner forgot to do so. And is attached by one screw, it can be sometimes the housewife wants to be he used to turn the set off sure to catch the morning menus and recipes and sets the alarm for the correct starting of the program. And when some special feature is wanted, the folks won't forget about it if there is a clock set to turn on the set at the

for special signalling purposes.

It was constantly heard over a distance of about 1000 miles, and thus usually mounted on a porcelain or imes.

Hanson's big task with the Byrd block of wood or a small right-angle Antarctic Expedition will be to establish adequate radio communication between the exploring planes and the base and with the United States.

With him will be Lloyd V. Berkner of Washington. D. C. radio engineer.

When the alarm toos off the bell can be the real of the cord to the alarm toos. winds up the cord on its shaft. This

be used to turn the set off or to turn on.
The switch is inserted in the A battery circuit.

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