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RADIO
MAGAZINE

The Daily News

EVERY
MONDAY

SAN FRANCISCO, MONDAY, June 23, 1924

'SECRET' RADIO BEAM FOUND NAVY PLANS BIG EXHIBIT AT P. R. SHOW

STAR DISPLAY IS TO BE PUT ON BY UNCLE SAM

The United States navy will be a leading exhibitor at the Pacific Radio Exposition in the Civic Auditorium, Aug. 16 to 21 inclusive.

This was announced today by A. S. Lindstrom, chairman of the executive committee of the Pacific Radio Trade Ass'n, in charge of the show, following receipt of a communication from Rear Admiral E. Simpson, commandant of the 12th naval district.

Admiral Simpson notified Lindstrom that the navy's exhibit will comprise one 500-watt U. S. navy tube transmitting set, one 100-watt set and one complete shore station with radio compass equipment, including receiver. The exhibit will be in charge of a corps of uniformed radio operators and is expected to attract wide attention. Some of the apparatus has never before been given a public demonstration.

Among other things the exhibit will show how ships may be guided by radio through the thickest fogs.

Lindstrom also announced that space at the show has been sold out, and that there is a long list of additional applicants. He stated that plans for the affair are rapidly nearing completion and that the event will be the largest radio exposition ever held in the world.

Assisting Lindstrom are: P. L. Jensen, H. W. Dickow, C. C. Langevin and F. J. Cram.

London Engineers Discard 'B' Battery

NEA Service
LONDON, June 23.—By the use of a four-element tube, one with two grids, two radio engineers here have succeeded in obtaining good reception without the use of a "B" battery.

The investigators are George V. Dowling and Keith D. Rodgers. Their idea is the use of an extra grid close to the filament so that the electrons will be thrown at the plate with the same force as "B" battery power on a three-element tube pulls the electrons to the plate.

Marcel's Will Suffer Now, Flappers Taking Up Radio

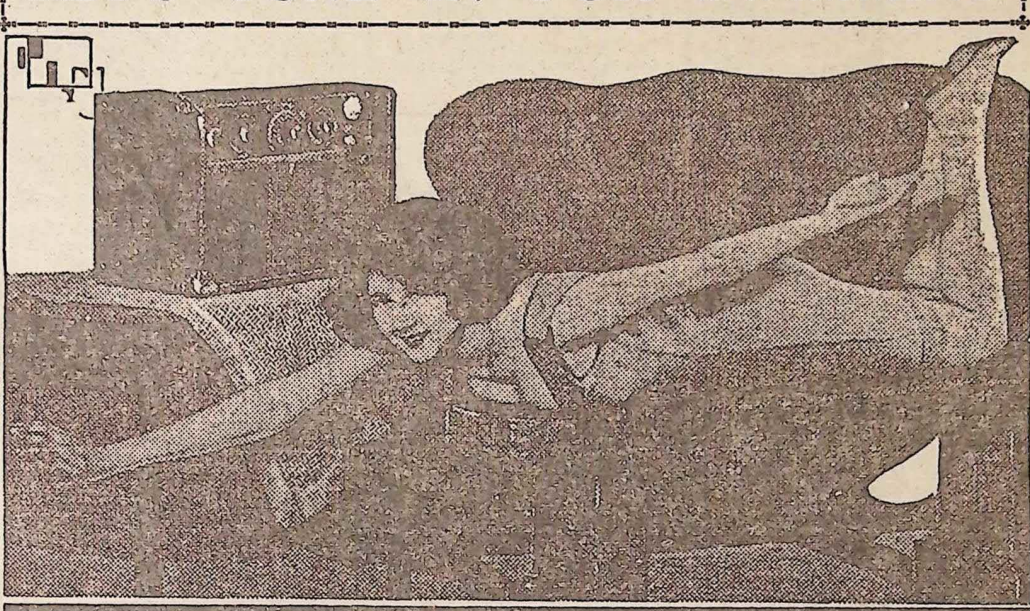
Powder, paint, wavy locks and plucked eyebrows may conceal the brain of a mechanical genius, in the opinion of Conrad Richter, San Francisco pioneer radio dealer.

Interest in marcel waves now is being replaced by interest in ether waves, he declares.

"It is not unusual for women to come in to buy radio parts for sets to be constructed by husbands or brothers," Richter said, "but it is rarely that a woman comes in to purchase equipment for a set to be constructed by herself."

"The other day two pretty flappers, who looked as if they might be interested in anything but radio, came in and asked for a number of radio parts. They said they wanted to build a set, and had a list of the items they wanted. Technical terms rolled off their tongues as glibly as if they were experts. Shown about the store, they appeared to be

LET'S TUNE IN FOR SWIMMING



When no one is around to scoff, and you long to show your talents at the beaches this summer, tune in for a radio swimming lesson. Several such have already been given throughout the country. Miss Ruth Dace of Chicago, shown here, believes in them to the point of assuming the realistic, but for the water.

FANS PAY BIG SUM TO R.C.A.

Gross income of the Radio Corp. of America rose from \$4,000,000 in 1921 to more than \$26,000,000 in 1923.

During 1923, it is estimated, the radio business went above the \$250,000,000 mark in total sales. Conservative estimates for 1924 put the total sales figure at \$400,000,000.

And this is only an "infant industry."

Boy Scouts Fans

Ninety-seven per cent of the 300,000 Boy Scouts in America are interested in radio, says El S. Martin, secretary of the editorial board of the Boy Scouts of America.

FOR EARLY RISERS

Station WOR, Newark, N. J., is beginning a daily series of morning exercises. Every morning at 7 early risers may tune in on a few setting-up exercises.

OAKDALE LAD IS LOCATED BY WIRELESS

Once again Radio has scored. This time by coming to the aid of authorities—and right in California, too.

Through the use of the ether patrol, Pat Willard, 13 years old, son of O. C. Willard of Oakdale, has been located.

Police found themselves without a clue when the boy disappeared with his father's automobile. A futile search was made for the lad in the vicinity of his home.

Then authorities thought of radio.

A message describing the missing boy was broadcast by Clayborn Schonhoff of Oakdale. The following morning word came from Roseburg, Ore., to the worried parents of the lad that he had been found there.

The boy had embarked on a journey to seek adventure, it was revealed.

His father, thankful for the good agency of radio, went to Oregon to get his son.

COPPER FIRMS THANK RADIO

The copper industry in the United States offers its thanks to radio. On the basis of an estimated total of 2,500,000 receiving sets in the country, radio apparatus has consumed 5,000,000 pounds of copper, says a report by the Copper and Brass Research Ass'n, New York.

In five years copper used is expected to total about 5,000,000 pounds annually.

Radio for Police

Now the Detroit police have three automobiles equipped with receiving apparatus, so that they may be in constant touch with headquarters. Detroit has its own police broadcasting station, KOP.

CHILDREN ENTERTAIN

Children will take part in radio broadcasting hereafter from WDAF, Kansas City. They will present a half-hour program every Tuesday.

NEW DEVICE PIERCES AIR LIKE BULLET

By NEA Service

LONDON, June 23.—All present radio methods may have to be readjusted if the directional radio beam invented by Signor Marconi, the Italian radio engineer, comes into use.

This is the belief of electrical engineers who have seen the marvelous results of experiments conducted here with the Marconi beam.

In a recent test, signals were successfully flashed between Cornwall, England, and Sydney, Australia. The voice was distinctly heard when transmitted along the beam, yet it was not broadcast, except along the straight line of the beam.

By this method, they point out, the transmitted voice would be semi-secret, confined to most of the stations within the line of the beam.

At the same time the low wave lengths, which will be the basis of the new system, will enable stations to transmit during daylight without being annoyed to a great extent by static.

Outdoor aeriels will be almost unnecessary, radio apparatus will become standardized to the transmission and reception of certain beams and wave lengths, fading will be eliminated, spark interference subdued, and broadcasting in general will be revolutionized.

Some of the engineers foresee a nation-wide, if not a world-wide, system of relaying broadcast programs by the beam system. The signals will be carried on wave lengths of about 15 or 20 meters, on extremely high frequencies.

They will be shot out direct to another broadcast station, which may in turn beam-broadcast to a third, or may transmit the program it receives as the stations do now, by the circular broadcast system.

Thus, with practically all present difficulties overcome, every part of the earth may be covered by radio through this system.

Shippers are asking restoration of the 450-meter wavelength for marine radio communication.

Catch Birds' Songs Over Ether Waves

Reports from England point to the adoption of radio as a means for catching the voices of song birds at their native haunts.

Recently British broadcast listeners were treated to just such entertainment when the manager of a station took the microphone into the woods, concealed it as motion picture operators do their cameras, and transmitted the music of the woods to the cities.

Adoption of this plan is suggested to American broadcasters by the American Radio Relay League.

World's Largest

What may be the world's largest radio transmitting plant is being built at Hillmorton, near Rugby, England. Sixteen masts, 820 feet high, will carry the antenna on a site of 960 acres. The plant is expected to effect communication with India and Australia.

S. F. Blind Man Builds Set, Erects Antennae

The outside world is to be brought to the home of the blind!

Radio is throwing open the door of a world of entertainment to the sightless!

Deprived of the pleasure movies may bring, attending concerts and theaters only at great inconvenience, and acquiring knowledge only by laborious efforts, the blind now enjoy some of the same advantages as their more fortunate fellows. Lectures on current topics, radio plays, educational programs, talks by prominent citizens, and the best in music are available merely by the turn of a wrist.

That the sense of hearing of the blind is more acute than that of normal persons, is well known. The blind can operate radio sets with as much ease as

the normal person. Once they learn to feel for the controls and become familiar with the mechanism, they often have an advantage in tuning in on stations, according to radio experts.

Blind folk, however, are not satisfied with receiving radio entertainment alone. Several members of the San Francisco Association for the Blind are constructing their own sets.

Anthony Cunha, 1239 Polk-st., is one of those who has built a crystal set. Cunha secured a piece of bakelite, and by the addition of binding posts, coils and a detector, constructed a successful set. Not satisfied with building his own radio, he has put up an antenna by himself. It is 50 feet high and 200 feet long. He now plans to construct a tube set.

The world of entertainment thus opened to the blind adds another achievement to the long list attributed to radio.

THIS WEEK'S AIR PROGRAMS

Monday, June 23

KPO-Hale Bros., San Francisco (423 Meters)

1 TO 2 P M—Rudy Selger's Fairmont Hotel Orchestra.
2:30 TO 3:30 P M—Lyric soprano solos, The Old Road; Mah Lindy Lou; Sybil Graves.

Trombone duet, Repeat Again; Robert Terrill and George Murton.
Mezzo-soprano solos, The Lass with the Delicate Air; Nina; Marion Graves.

Lyric soprano solos, La Scantia; April; As Through the Streets (from "La Boheme"); Esther Poll.
Trombone solo, At Dawning; Robert Terrill.

Soprano duets, Glorno D'Orrore "Semiramis"; Go, Pretty Rose; Marion Graves and Sybil Graves.
Soprano solos, A Picture; The False Prophet; Elgie; Esther Poll.

Trombone duet, Robert Terrill and George Murton.
Soprano duets, Gay Butterfly; La Golondrina (The Swallow); Marion Graves and Sybil Graves; accompanist, Mabel Jones.

4:30 TO 5:30 P M—Rudy Selger's Fairmont Hotel Orchestra.
5:30 TO 6:30 P M—Children's Hour. Stories by Big Brother of KPO, taken from the Book of Knowledge: Boy Scouts of America; The Young Hero; The Great Sights of Egypt.

Piano solos, To the Rising Sun; Marchetta; Ruth Larkin, 11-year-old pupil of Mrs. Louis Sacey.
7 TO 7:30 P M—Rudy Selger's Fairmont Hotel Orchestra.

8 TO 9 P M—Organ recital by Theodore J. Irwin, official organist, at the Wurliizer.
Wedding March (from "Fermors"); Prelude, C Sharp Minor; Idyll in D Flat; Air de Ballet; Symphony Pathetic, first movement, selected passages; Toccata in G; Chimes, melody; Serenade; light opera selection, "Blossom Time"; song melody, "I'll Sing These Songs of Araby"; Minuet in G.

9 TO 10 P M—Program under direction of Ruth May Friend; Mary Kestler Kerr, accompanist.
Contralto solos, I Heard You Go By; Cradle Song; Banjo Song; Mabel Nickerson Bailey.

Tenor solos, Finnish Lullaby; The Moon Drops Low; Ma Little Banjo; C. Albert Kulmann.
Soprano and contralto duet, By the Waters of Minnetonka; Ruth May Friend, Mabel Nickerson Bailey.

Soprano solos, O Had I Jubal's Lyre; The Young Rose; The Summer Wind; Atha Woodward.
Trio women's voices, When the Roses Bloom; Dreaming; Love's Old Sweet Song; Ruth May Friend, Betty Noble, Mabel Bailey.

Soprano solos, My Mother Bids Me Bind My Hair; The Sleep That Flits on Baby's Eyes; The Meadow Lark; The Vagrant Wind (by request); Ruth May Friend.

Soprano and baritone duet, Night Hymn at Sea.
10 TO 11 P M—E. Max Bradford's Versatile Band, playing in the Palace Hotel Rose Room Bowl.

KGO-General Electric Co., Oakland (312 Meters)
1:30 P M—New York Stock Exchange and United States weather bureau reports.

4 TO 5:30 P M—Concert orchestra of the Hotel St. Francis, San Francisco.
5:45 P M—Final reading, stock exchange and weather reports, and news items.

8 TO 10 P M—PART ONE
Vocal selection, Festival Te Deum in D flat; California Mixed Quartet. Violin solos, Josephine Holub.
Baritone solos (a) El Canto del Presidiario; (b) Ultima Rosa; Edilberto G. Anderson; Leslie Taylor, accompanist.

Vocal selections (a), Hall to the Chief; (b), Scotland Yet; C. MacDonald Double Male Quartet.
Duets for contralto and tenor (a), The Voyagers; (b), Over the Heather; Ruth Waterman and Carl Anderson.
Piano solos (a), Gopak; (b), Shadow Dance; Beatrice L. Sherwood.

Soprano solos (a), Parla; (b), Kathleen Mavourneen; Laura Broderick.
Vocal selections (a), The Hundred Pipers; (b), Who'll Be King but Charlie; C. MacDonald Double Male Quartet.

Violin solos, Josephine Holub.
Baritone solos (a), A Granada; (b), Engano; (c) Obstinat; Edilberto G. Anderson.
Vocal selection, Blue Danube Waltz, California Mixed Quartet.

Piano solos (a), Clair du Lune; (b), Prelude in C Sharp Minor; Beatrice L. Sherwood.

10 P M TO 1 A M—Hotel St. Francis Dance Orchestra, San Francisco.
KLX—Oakland Tribune (509 Meters)
3 TO 5 P M—Baseball.

7 TO 7:30 P M—News, weather, market bulletin.
DISTANT STATIONS
KFI—Earle C. Anthony, Inc., Los Angeles (469 Meters)
5 TO 5:30 P M—Evening Herald news bulletins.

5:30 TO 6 P M—Examiner news bulletins.
8 TO 9 P M—Evening Herald concert.
9 TO 10 P M—Examiner concert.
10 TO 11 P M—Ambassador Cocoon Grove Orchestra.

KGW—Morning Oregonian, Portland (492 Meters)
11:30 A M—Weather forecast.
3:30 P M—Literary program by Portland Library Ass'n.

7:15 P M—Police reports.
7:30 P M—Baseball scores, weather forecast and market reports.
8 TO 10 P M—Program of old songs by Beaux Arts Society.

WBAP—Fort Worth Star-Telegram, Fort Worth, Tex. (476 Meters)
9:30 TO 10:45 P M—Concert by the octet of old time fiddlers of Mineral Wells, Tex.; Cap Johnson directing.

KFOA—Rhodes Department Store, Seattle (455 Meters)
8:30 P M—Violin recital by Evelyn Heidenstrom and Russell Pohl, artist pupils of Arnold Krauss, concert master of the Seattle Civic Symphony Orchestra and one of the best known instructors in the northwest. Evangelina Hall, accompanist.

Tuesday, June 24

KPO-Hale Bros., San Francisco (423 Meters)

1 TO 2 P M—Rudy Selger's Fairmont Hotel Orchestra.
2:30 TO 3:30 P M—Organ recital by Theodore J. Irwin.

Fox trot, Go Your Way and I'll Go Mine; Minuet; Pulcinello; selection, popular melodies; musical comedy selection, Wildflower; musical selection, Raymonda; Chimes, melody; selection, old time songs; fox trot, Kokomo.

4:30 TO 5:30 P M—Rudy Selger's Fairmont Hotel Orchestra.
5:30 TO 6:30 P M—Children's Hour. Stories by Big Brother of KPO, taken from the Book of Knowledge: The Fight With the Dragon; The King's Three Questions; How the Elevators Work.

Piano solos, Etude Viennois (for the left hand alone); Minuet Antique; Mildred Shay, pupil of Miss Lorraine Ewing.

7 TO 7:30 P M—Rudy Selger's Fairmont Hotel Orchestra.
8 TO 10 P M—Program presented by Merrill & Merrill, musical merchandise brokers, Oakland.
Piano solos, Waltz, B Flat; Seiguidilla; Eva Garcia.

Soprano solo, Elegie; Mrs. Charles Stuart Ayres; flute obligato by William Nankervis; Mrs. Philip Ebberhart, accompanist.
Contralto and soprano duets, Passage Birds Farewell; I Would That My Love; Mrs. Floyd Collar, soprano; Edna Fisher Hall, contralto; Mrs. Philip Ebberhart, accompanist.

Saxophone solos, Where My Caravan Has Rested; And Yet; Charles Davis; Eva Garcia, accompanist; violin obligato by Arthur Garcia.
Soprano solos, Smiling Through; One Sweet Day; Mrs. Floyd Collar; flute obligato by Arthur Garcia; Eva Garcia, accompanist.

Cantilations, Joseph Swan White. Violin solos, Liebesfreud; Old Refrain; Arthur Garcia; Eva Garcia, accompanist.
Piano solos, Prelude in G Minor; La Jangleuse; Mrs. Philip Ebberhart, Contralto solos, Dawn; Trees; Edna Fisher Hall; Eva Garcia, accompanist.

Flute solos, Valse Bleue; Intermezzo from Cavalleria Rusticana; William Nankervis; Frances Gieloro, accompanist.
William Worthington, one of the directors of the Peninsula Studios, Inc., of San Mateo, will follow up his talk of last Tuesday with a talk on "The Motion Picture Camera and Photographing a Motion Picture."

Lyric baritone solos, A Banjo Song; Twilight; Merlyn Morse; Mrs. Philip Ebberhart, accompanist.
Soprano solos, A Spray of Roses; Passing By (by special request, sung to Honolulu); Mrs. John H. Merrill; Mrs. Philip Ebberhart, accompanist.

Piano solos, Romance in D; Mighty Like a Rose; Meleta Hutt.
Soprano solos, On Wings of Love; I Cannot Sing the Old Songs; Mrs. Charles Stuart Ayres; Mrs. Philip Ebberhart, accompanist.

Saxophone solos, Piggly Wiggle; Erics; Charles Davis; Eva Garcia, accompanist.
Soprano solos, Love Came Creeping Into My Heart; A Little Song; Mrs. Floyd Collar; Mrs. Philip Ebberhart, accompanist.

Violin solos, Ave Maria; Spanish Dance; Arthur Garcia; Eva Garcia, accompanist.
Cantilations, Joseph Swan White. Contralto solos, My Desire; Minnetonka; Edna Fisher Hall.
Baritone solos, Requiem; Morning; Merlyn Morse; Mrs. Philip Ebberhart, accompanist.

Soprano duet, Sing, Sing, Birds on the Wing; Mrs. Charles Stuart Ayres, Mrs. Floyd Collar.
10 TO 11 P M—E. Max Bradford's Versatile Band, playing in the Palace Hotel Rose Room Bowl.

KGO-General Electric Co., Oakland (312 Meters)
1:30 P M—New York Stock Exchange and United States weather bureau reports.

4 TO 5:30 P M—Concert orchestra of the Hotel St. Francis, San Francisco.
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5:30 TO 6 P M—Examiner news bulletins.
8 TO 9 P M—Evening Herald concert.
9 TO 10 P M—Examiner concert.
10 TO 11 P M—Ambassador Cocoon Grove Orchestra.

KGW—Morning Oregonian, Portland (492 Meters)
11:30 A M—Weather forecast.
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KUO

San Francisco Examiner—360 Meters

Daily Except Saturday and Sunday

9:05 A M—Weather forecast.

11:00 to 11:30 A M—Market reports.

3:30 P M—Financial and garden hint broadcast.

6:00 to 6:20 P M—Financial and garden hint broadcast.

6:40 P M—Weather forecast.

Saturday Only

9:05 A M—Weather forecast.

6:00 to 6:20 P M—Financial and garden hint broadcast.

6:40 P M—Weather forecast.

Sunday Only

9:05 A M—Weather forecast.

6:45 P M—Weather forecast.

Additional Friday

5:45 to 6:00 P M—Health bulletin.

forecast and market reports.
8 P M—Concert by Sieberling-Lucas Music Co.

KFI—Earle C. Anthony, Inc., Los Angeles (469 Meters)

5 TO 5:30 P M—Evening Herald news bulletins.

5:30 TO 6 P M—Examiner news bulletins.

6:45 TO 7:30 P M—Vocal concert.

8 TO 9 P M—Ambassador Cocoon Grove Orchestra.

9 TO 10 P M—Examiner concert.

10 TO 11 P M—Maud Reeves Bernard arranging concert.

WBAP—Fort Worth Star-Telegram, Fort Worth, Tex. (476 Meters)

9:30 TO 10:45 P M—92 program by J. C. Rutledge, reproducing the program given at the close of the Volunteer Fire Hall in Fort Worth.

KFSG—Angelus Temple, Los Angeles (278 Meters)

8 TO 9 P M—Great auditorium service; sermon by Almee Semple McPherson.

9 TO 10 P M—Gray Studio program, furnished by Swanee Jubilee Singers; Margaret Knox McCraw, contralto; Sierra Trio of Pasadena. "Evening Meditation."

10 TO 10:30 P M—Organ recital by Reid Brignall.

Wednesday, June 25

KPO-Hale Bros., San Francisco (423 Meters)

1 TO 2 P M—Rudy Selger's Fairmont Hotel Orchestra.

2:30 TO 3:30 P M—Program by the Trio Artistique.

Trio for violin, cello and piano, Hungarian Dance No. 2; Oriental; Trio Artistique. Feste G. Aspre, violin; Arthur Landesen, cello; Miss Lenore Ewald, piano.

Cello solos, Ballade; Elegie; Arthur Landesen; Miss Lenore Ewald at the piano.

Piano solos, Second Mazurka; Indian Lament; Miss Lenore Ewald.

Violin solos, One Hour of Love; Pale Moon; Feste G. Aspre; Miss Lenore Ewald at the piano.

Trios for violin, cello and piano, Scherzo; Celebre Menuet; Trio Artistique.

Jack Pait's Entella Cafe Orchestra.
4:30 TO 5:30 P M—Rudy Selger's Fairmont Hotel Orchestra.

5:30 TO 6:30 P M—Children's Hour. Stories by Big Brother of KPO, taken from the Book of Knowledge: Ships and Sailors of Our Navy; Answers to Questions; Hunters of the Wild.

Piano solos, Hide and Seek; Vena Willy, 11-year-old pupil of Mrs. Louis Sacey.

Spirit of Chivalry, Jane Smith, 10-year-old pupil of Mrs. Louis Sacey.

7 TO 7:30 P M—Rudy Selger's Fairmont Hotel Orchestra.

8 TO 11 P M—Talk, "Your Boy and Mine and the Smith-Hughes Act," by William T. Elzinga. E. Max Bradford's Versatile Band, playing in the Palace Hotel Rose Room Bowl. Intermission numbers arranged by the Morrison Music Co.

KGO-General Electric Co., Oakland (312 Meters)

1:30 P M—New York Stock Exchange and United States weather bureau reports.

3 P M—Short musical program. Address, "Creative Expression," by Wilda Wilson Church.

4 TO 5:30 P M—Concert Orchestra of the Hotel St. Francis, San Francisco.

5:45 P M—Final reading, stock exchange and weather reports, and news items.

KLX—Oakland Tribune (509 Meters)
3 TO 5 P M—Baseball.

7 TO 7:30 P M—News, weather, market bulletin.

8 TO 10:20 P M—Studio program, with music from the American Theater.

RADIO SPECIALS!!

Scientific Headset, 3000 ohms; fully guaranteed; world's greatest phone value; our price.....\$2.75

Brandes Loud Speaker, list price \$10.50; our price.....\$7.20

Brandes Superior Headset (matched tone); list price \$6; our price.....\$4.10

Brandes Superior Headset (matched tone); list price \$8; our price.....\$5.35

Burgess "B" Battery, 45 volts; No. 2306; list price \$5; our price.....\$3.15

Eveready "B" Battery, 45 volts; No. 767; list price \$6; our price.....\$3.40

Eveready "B" Battery, 22½ volts; No. 766; list price \$2.55; our price.....\$1.80

Fada 5-Tube Neutrodyne Receiver Knockdown Parts Complete (genuine) list price \$55; our price.....\$49.75

Shamrock Variometer (double duty); list price \$3.50; our price.....\$2.95

Shamrock Vario-Coupler; list price \$3.50; our price.....\$2.95

Pal Crystal Set, our price.....\$1.10

Single Headphone, unassembled, 1000 ohms; our price.....\$1.00

Manhattan (Genuine Bakelite) Variometer; list price \$6; our price.....\$3.95

43-Plate Vernier Condenser; list price \$4.50; our price.....\$2.85

25-Plate Vernier Condenser; list price \$4.00; our price.....\$2.85

I. S. COHEN'S SONS

1015 Market St., Near 6th

Mail orders filled the day received

Write or call for our prices.

ter, broadcast over private leased wires through KLLX.

Studio program arranged by the Wiley B. Allen Co. of Oakland:

Vocal duets (a), Venetian Boat Song; (b), Absent; Mrs. Chester Miller and Frances Barrett Jones.

Piano solos (a), Nocturne; (b), Buttery Etude, G Flat; Gladys Ivalle Wilson.

Soprano solos (a), Gavotte (from "Mignon"); (b), Habanera (from "Carmen"); Helene Strauss; Theodore Aydelotte, accompanist.

Cello solos (a), Arioso; (b), Chanson D'Amour; Margaret A. Vogel; Doris King, accompanist.

Vocal duets (a), The Fishers; (b) Come Sing to Me; Frances Barrett Jones and G. A. Jones.

Bass solos (a), In an Old Fashioned Town; (b), Eleanor; (c), Kathleen Song; Robert Roman; Luquear E. Elwell, accompanist.

Violin solos (a), Andante Cantabile; (b), Valse Bluet; Eleanor Parke Webber; Helen Y. Crawford, accompanist.

Tenor solos (a), Where My Caravan Has Rested; (b), By the Side of the Road; G. A. Jones.

Cello solos (a), Bourree; (b), Nocturne; Margaret A. Vogel; Doris King, accompanist.

Overture by American Theater Orchestra, Owen Sweeten director, broadcast direct from the theater through KLLX over private leased wires.

Soprano solos (a), Ma Li'l Batteau; (b), My Jean; Helene Strauss; Theodore Aydelotte, accompanist.

Vocal duets (a), Starlight Love; (b), My Boat Is Waiting for Thee; Mrs. Chester A. Miller and Frances B. Jones.

Piano solo, Scherzo in B Flat Minor, Gladys Ivalle Wilson.

Bass solos (a), Volga Boat Song; (b), The Horn; Robert Roman; Miss Luquear E. Elwell, accompanist.

Violin solos (a), Viennese Popular Song (old refrain); (b), From the Cane Brake; Eleanor Parke Webber; Helen Young Crawford, accompanist.

Vocal duets (a), Home to Our Mountains; (b), Gypsy Love Song; Frances Barrett Jones and G. A. Jones.

Organ recital broadcast from American Theater over private leased wires through KLLX. Clement Barker, organist.

DISTANT STATIONS

KHJ—Los Angeles Times, Los Angeles (395 Meters)

8 TO 10 P M—Program presented through the courtesy of Ray F. Chesley, Ford dealer at Bell, Cal. Dr. Mars Baumgardt.

10 TO 11 P M—Art Hickman's Dance Orchestra from the Biltmore Hotel.

KGW—Morning Oregonian, Portland (492 Meters)

11:30 A M—Weather forecast.

3:30 P M—Talk by Jeanette P. Cramer, home economics editor of the Oregonian.

7:15 P M—Police reports.

7:30 P M—Baseball scores, weather forecast and market reports.

8 P M—Concert by Elizabeth Reger, contralto, and Lucille Cummins, pianist.

10 P M—Dance music by George Olsen's Metropolitan Orchestra of the Hotel Portland. Intermission solos by Consuelo Allee, mezzo-soprano.

KFI—Earle C. Anthony, Inc., Los Angeles (469 Meters)

5 TO 5:30 P M—Evening Herald news bulletins.

5:30 TO 6 P M—Examiner news bulletins.

6:45 TO 7:30 P M—Nick Harris Detective Stories and concert.

8 TO 9 P M—Evening Herald concert.

9 TO 10 P M—Examiner concert.

10 TO 11 P M—Hollywoodland Orchestra.

11 TO 12 P M—Ambassador Cocoon Grove Orchestra.

WBAP—Fort Worth Star-Telegram, Fort Worth, Tex. (476 Meters)

9:30 TO 10:45 P M—Concert of dance music.

KFOA—Rhodes Department Store, Seattle (455 Meters)

8:30 P M—Dance music by Premier five-piece orchestra under direction of L. Nist.

Thursday, June 26

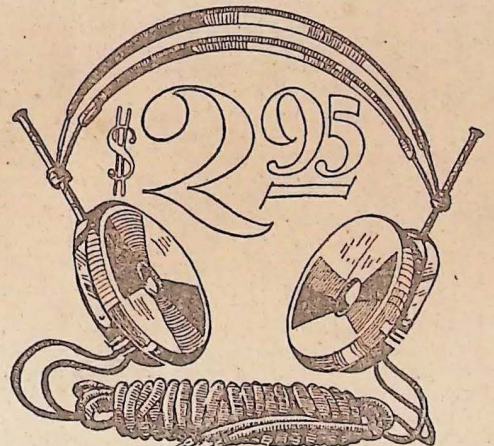
KPO-Hale Bros., San Francisco (423 Meters)

1 TO 2 P M—Rudy Selger's Fairmont Hotel Orchestra.

2:30 TO 3:30 P M—Program under the management of Emil Barth.

4:30 TO 5:30 P M—Rudy Selger's Fairmont Hotel Orchestra.

The Emporium Repeater Radio Phones



KANSAS STATE TO BROADCAST FARM COURSES

NEA Service Radio Editor
MANHATTAN, Kas., June 23.—The Kansas State Agricultural College is planning another step in the education of the rural public by radio.

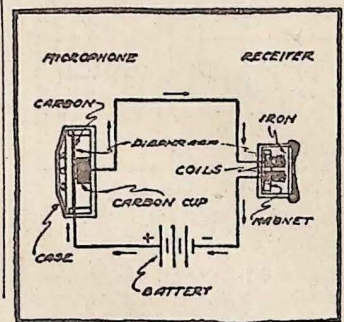
Forty courses, covering the fields of agriculture, general science, engineering and home economics, will be broadcast from the new 500-watt station to be erected soon on the campus.

Heretofore, the faculty of this institution had been conducting a radio extension course for farmers and others, through station KFKB, at Milford, Kas., 32 miles away. The lectures delivered in the auditorium of the college here were relayed to the studio of KFKB by direct line and broadcast out of there.

Now broadcasting will be direct and will cover the most comprehensive course of study ever transmitted by radio. In addition, enrollment of students will be made and graduating diplomas issued to those taking the courses and passing examinations.

The new courses are expected to start next fall. Contract for the new station will be let at once, say the officials in charge, so that it may be ready for the opening of the radio semester.

Perhaps you have come to think of a radio wave as an unbroken succession of waves or "peaks," all of the same height. This is true only when the broadcasting station is radiating waves without transmitting music or speech at the same time. A "code" station, using vacuum tubes for transmitting, radiates a steady wave like the unmodulated wave shown in an accompanying sketch. When the operator's key is pressed down, a few hundred thousand waves are sent forth, but when he raises the key and interrupts the oscillations of the transmitter the waves cease abruptly. The wave sent from a broadcasting station is not so uniform, however, because it is



changed in accordance with the lower frequency vibrations of music or of the voice.

A clearer idea of what "modulation" means may be had from a consideration of the ordinary microphone (or telephone transmitter) and the telephone receiver. The microphone consists of a carbon cup in the face of which there are a number of little cavities containing grains of carbon. A thin disc or diaphragm of carbon is placed very close to the cup, but not quite touching it. The intervening space is partly filled by the carbon grains. When sound waves strike the diaphragm it vibrates in unison with them, sometimes pressing close against the carbon grains and then loosening them again. This varies the resistance of the entire circuit and causes the current from battery to fluctuate—first being strong and then weak.

The receiver consists of two steel magnets wound with many hundred turns of fine wire. Just a fraction of an inch from the magnet an iron disc or diaphragm is mounted. The changes in the strength of the current cause the disc to vibrate and its vibrations are a faithful copy of those of the disc

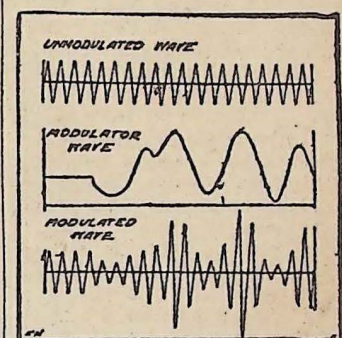
in the microphone. Thus, it is the function of the microphone to change the intensity or strength of the current. Similarly, it is the function of the radio microphone to change the intensity or strength of the radio waves.

The vibrations of the voice, and hence those of the current flowing through the microphone, are very much slower than the radio waves, which are oscillating perhaps at 750,000 every second. The frequencies which our ears can hear lie beneath about 10,000 per second, and anything higher is termed "radio frequency." Lower frequencies are known as "audible" or "audio" frequencies. Thus, the low frequency is superimposed upon the high frequency, the unmodulated wave and the modulator wave combining to produce a modulated wave.

Let us now outline the system of radio transmission and reception. First there is the microphone in the studio, then the modulator or the device by which the microphone current controls the radiated energy. Between the aerial and the ground is interposed the generator of the radio frequency oscillations or the radio frequency power source. At the

receiving end the scheme is reversed. First come the radio frequency circuits and the tuning devices, such as variable condensers and switches.

Next is the detector, which may be a crystal, as described in a recent lesson. Then comes the telephone receiver or the loud speaker, just as it does in the case of the simple telephone circuit. In place of the ordinary electric current which connects receiver and transmitter in the case of the landline telephone we must generate radio frequency currents, modulate them by our microphone and modulator and erect aerials for radiating and receiving the electromagnetic waves.



WEEK'S AIR PROGRAMS, CONTINUED

(Concluded From Page 2)

Hotel Portland, Intermission solos by Eulah Mitchell Carroll, pianist.

KFI—Earle C. Anthony, Inc., Los Angeles (469 Meters)

5 TO 5:30 P M—Evening Herald news bulletins.

5:30 TO 6 P M—Examiner news bulletins.

6:45 TO 7:30 P M—Y. M. C. A. concert and lecture.

8 TO 9 P M—Ambassador Hotel Concert Orchestra.

9 TO 10 P M—Examiner concert.

10 TO 11 P M—Harry Porter, baritone, and others.

WBAP—Fort Worth Star-Telegram, Fort Worth, Tex. (476 Meters)

9:30 TO 10:45 P M—Concert by a group of Fort Worth artists.

KFSG—Angelus Temple, Los Angeles (278 Meters)

8 TO 9 P M—Great baptismal service. "Scenes of River Jordan re-enacted." Sermon by Almee Semple McPherson.

9 TO 10 P M—Gray Studio program. Jennie M. Durkee, ukulele, guitar and banjo solos; Angelus Temple Choir, under direction of Gladwyn N. Nichols. Male quartet. "A Song of David."

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the Good Old Summertime; (c), Remembrances of the south; Swanee River, Massa's in the Cold, Cold Ground; Dixie, Old Black Joe, Old Kentucky Home; (d), Songs of 1918: Tipperary, Good-bye Broadway, Hello France, Long Way to Berlin, Over There, Long, Long Trail; (e), saxophone special: Roses of Picardy; (f), Songs of 1914: Before You Go (featuring by the National Broadcasters' Ass'n), Mandalay.

Soprano solos (a), One Fine Day (from "Madame Butterfly"); (b), Duna; Caroline Gilman. Music by the American Theater Orchestra, Owen Sweeten, director; broadcast through KFX over private leased wires, followed by vocal numbers by C. W. Collinswood, tenor, broadcast from the KFX studio.

Recitations and variations, Bob Valleau.

Contralto solo, My Heart at Thy Sweet Voice; Letty Collins.

Instrumental numbers (a), Zoe; (b), I Don't Want You to Cry Over Me; Johnson's Californians.

Piano solo, selected; Anita Welchart.

Contralto solo, Aria from "Sampson et Delilah," Letty Collins.

Organ recital broadcast from American Theater over private leased wires through KFX. Clement Barker, organist.

Popular dance selections, Johnson's Californians.

DISTANT STATIONS

KHJ—Los Angeles Times, Los Angeles (395 Meters)

8 TO 10 P M—Program presented through the courtesy of C. S. De lino, instructor of stringed instruments.

10 TO 11 P M—Art Hickman's Dance Orchestra from the Biltmore Hotel.

KGW—Morning Oregonian, Portland (492 Meters)

11:30 A M—Weather forecast.

3:30 P M—Lecture provided by Oregon Agricultural College.

7:15 P M—Police reports.

7:30 P M—Baseball scores, weather forecast and market reports.

10:30 P M—Hoot Owls.

KFI—Earle C. Anthony, Inc., Los Angeles (469 Meters)

5 TO 5:30 P M—Evening Herald news bulletins.

5:30 TO 6 P M—Examiner news bulletins.

6:45 TO 7:30 P M—Varied musical program.

8 TO 9 P M—Evening Herald concert.

9 TO 10 P M—Examiner concert.

10 TO 11 P M—Myra Belle Vickers' artist students.

11 TO 12 P M—Ambassador Coconut Grove Orchestra.

WBAP—Fort Worth Star-Telegram, Fort Worth, Tex. (476 Meters)

9:30 TO 10:45 P M—Old time fiddle concert presented by J. W. Rains.

KFOA—Rhodes Department Store, Seattle (455 Meters)

8:30 P M—Y. M. C. A. program of several groups of male quartet numbers, solo and instrument music.

A constructive talk concerning work

of the Y. M. C. A. by one of the leaders of the work in Seattle.

KFSG—Angelus Temple, Los Angeles (278 Meters)

8 TO 9 P M—Crusaders meeting. National address by Judge Carlos S. Hardy, justice superior court; Ada Lantz, soprano; Temple Silver Band. Evangelistic address by Almee Semple McPherson.

9 TO 10 P M—Gray Studio program, courtesy Mauda Reeves-Barnard and pupils. Angelus Temple Silver Band, under direction of Gladwyn Nichols. Good-night psalm.

Saturday, June 28

KFO—Hale Bros., San Francisco (423 Meters)

1 TO 2 P M—Rudy Seiger's Fairmont Hotel Orchestra.

2:30 TO 3:30 P M—Program under the management of Mme. Madge de Witt. Miss Isabell Nordlund, mezzo-soprano; R. F. Bradley, tenor; Miss Norma Jones, soprano; Miss Maxine Cox, pianist, and accompanist.

Soprano solos, Luigi Dal Caro Bene; Carry Me Back to Old Virginia; Isabell Nordlund.

Tenor solos, Lolita; Carme; R. F. Bradley.

Piano solos, Praeludium; Arabesque; Maxine Cox.

Soprano solos, The Brown Eyes of My Dushka; Oh, Sleep, Why Dost Thou Leave Me; Norma Jones.

Madrone de Witt.

3:30 TO 5:30 P M—Tea dansant. E. Max Bradfield's Versatile Band, playing in Palace Hotel Rose Room Bowl.

8 P M TO 12 M—Dance music by Art Weidner's Orchestra, playing at the Fairmont Hotel. KFO Trio during intermissions.

KGO—General Electric Co., Oakland (312 Meters)

12 NOON—New York Stock Exchange and United States weather bureau reports.

4 TO 5:30 P M—Concert Orchestra of the Hotel St. Francis, San Francisco.

8 TO 10 P M—Program furnished through the courtesy of City of Paris Dry Goods Co. of San Francisco.

Instrumental selections (a), To a Wild Rose; (b), Alkam Leaf; Lipschultz's String Quartet.

Vocal selections (a), Marcheta's Sister; (b), The World Loves a Lover; played and sung by the composer.

Address, Edward S. Rainey, secretary to Mayor James Rolph of San Francisco.

Violin solos (a), Ave Maria; (b), Spanish Dance; George Lipschultz.

Vocal selections (a), Somebody's Smile; (b), The Song You Were Singing; played and sung by the composer.

Instrumental selections (a), Scheherazade; (b), Serenade; Lipschultz's String Quartet.

Address, "My Impressions of America," Mohammed Barada, the Moroccan prince.

Piano solos, Baron Keyes.

Vocal selections (in French), Jacqueline Morrin, the French comedienne (courtesy California Theater).

Vocal selections, City of Paris Male Quartet.

Instrumental selections, Lipschultz's String Quartet.

Vocal selections, Jacqueline Morrin.

Violin solos, George Lipschultz.

Vocal selections, Baron Keyes.

Vocal selections, City of Paris Male Quartet.

10 P M TO 1 A M—Hotel St. Francis Dance Orchestra, San Francisco.

KLX—Oakland Tribune (509 Meters)

3 TO 5 P M—Baseball.

7 TO 7:30 P M—News, weather, market bulletin.

KRE—Berkeley Gazette, Berkeley (278 Meters)

8 P M TO 12 M—Claremont Hotel Dance Orchestra.

DISTANT STATIONS

KHJ—Los Angeles Times, Los Angeles (395 Meters)

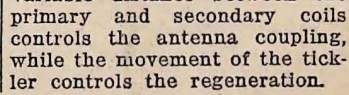
8 TO 10 P M—Program presented through the courtesy of Barker Bros., arranged by Claire Forbes Crane.

10 TO 11 P M—Art Hickman's Dance Orchestra from the Biltmore Hotel.

KGW—Morning Oregonian, Portland (492 Meters)

11:30 A M—Weather forecast.

TO SWAP—\$100 Columbia Grafo-nola, will trade for a radio st. Give good description.—Emile Price, 302 Maple-av. South San Francisco, Cal.



Sixty-five engineers were used to keep a land line open during a recent radio program broadcast through WDAF from a distant studio.

"Radio has been supposed to

themselves without radio, for the town council will not have the aerials mar the beauty of the resort. And there is a wonderful broadcasting station nearby!

Bathers at Bournemouth beach, England, must enjoy themselves without radio, for the town council will not have the aerials mar the beauty of the resort. And there is a wonderful broadcasting station nearby!