

# The California Theatre Radio Station

The DeForest radiofone station operated at the California Theatre, in San Francisco, by the Moorhead Laboratories, Inc., of that city, which is the exclusive distributor of the DeForest Company on the Pacific Coast, has been in operation for over a year and it is that a description of same will be found of interest to the readers of RADIO NEWS.

The California Theatre is the largest motion picture house in San Francisco, and is one of three controlled by the Famous Players-Lasky Corporation, the other two being the Imperial and Portola Theatres. A fourth, the Granada, is now under process of construction.

The station was installed early in 1920, thru the courtesy of Directors Roth and Pardington, of the "Big 3" Theatres, and is located in a concrete room in the fly galleries of the theatre. The antenna is fixed on the tower of the Humboldt Bank Building, directly adjoining the theatre.

The transmitting set consists of the standard DeForest 1 kw. radiofone set with additional loading inductance so as to obtain the working wave-length of 1,260 meters. The call letter of this station is 6XC. The antenna current varies from four to five amperes, according to the amount of input energy. Ordinarily, less than a half kilowatt is used for transmission. As the set is essentially an experimental one, various transmitting circuits of the DeForest Company have been tried out. The circuit in use at present is one developed by the engineers of the Moorhead Laboratories, for which patents have been applied. The receiving set is of the standard DeForest type.

For best results in receiving from the California Theatre, the following ultra honeycomb coils should be used: Primary—DL 200, with series condenser on moderate antenna; secondary—DL 200; tickler—DL 150.

In connection with the transmission of music, several interesting methods have been developed thru experimentation. For collecting and transmitting the music from the Theatre's Symphony Orchestra of 50 pieces, a large Magnavox horn is suspended in the fly galleries in such a position as to be clear of the side "drops." At the small

Here is Big Jack, better known under the name of Dempsey, listening in to the radiofone music. He was stung by the bug and is taking lessons in radio now.

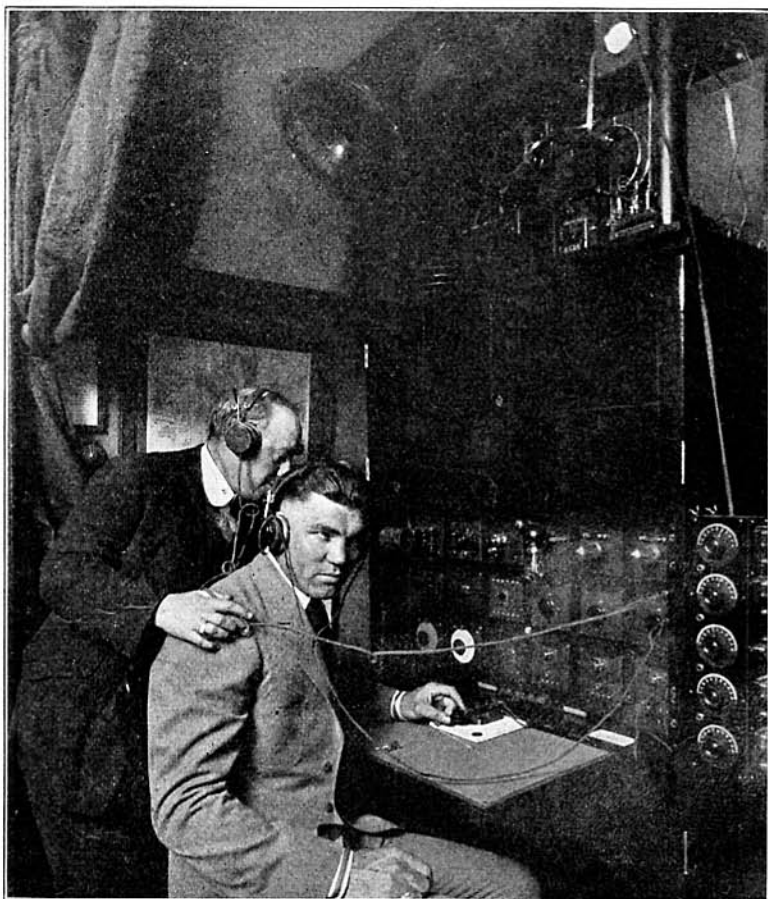


Photo Underwood & Underwood.

end of the horn, a Kellogg microphone transmitter is mounted in a vertical position. From here the usual wires are led to the radio modulating circuit. For the transmission of fonograf records, several devices have been used. One is a standard Magnavox fonograf microphone, consisting of a microphone mounted at the end of the usual fonograf tone-arm. Another method developed by the Moorhead Laboratories is to utilize the steel needle holder so as to

bear directly on the microfone diafram in place of the usual fonograf diafram.

For special concerts, which are frequently given, a sound proof room in the basement of the theatre is utilized. For small chamber or instrumental music, a Magnavox horn similar to the one suspended in the fly galleries is utilized, but for vocal selections Kellogg desk transmitters are used by each singer. By placing the singers with their backs to the grand piano used for accompaniment, enough of the sound intensity from the piano is obtained thru the singers' microfones so as to obtain a proper blending of the voices and piano.

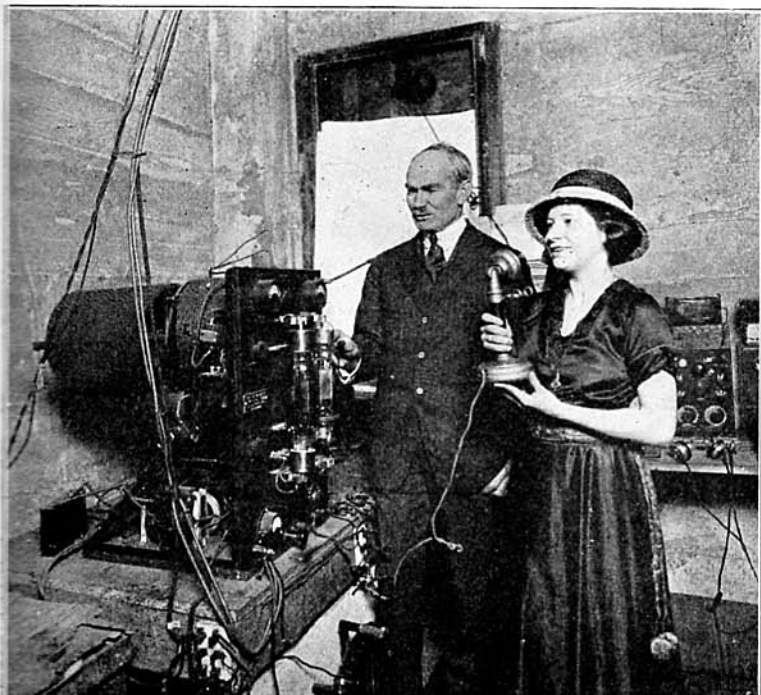
Harp solos by Miss Jay Clark, piano solos by Mr. Hans Hanke and vocal solos by Miss Mary White, Miss Ruth Williams, and Mr. Ford Rush, of the California Theatre, and Madam Frieda Hempel and Forrest Lamont, stars of the Chicago Grand Opera Company, have been the big features of the special concerts.

The regular concerts, consisting of the Herman Heller Orchestra music and fonograf records, are sent out at 4:00, 7:15, and 9:00 P. M. on week days, lasting for at least one-half hour. Special vocal and instrumental concerts are sent out at 9:00 P. M. on Wednesdays, and a special Sunday concert given by the Herman Heller Orchestra is sent out from 11:00 A. M. until noon.

The transmission of music from the DeForest station at the California Theatre has developed from an experimental standpoint to a worthwhile contribution to the musical progress of the city, and receiving sets for the reception of this music alone have been installed at clubs, hospitals, hotels, and many private homes since the inauguration of this service.

The accompanying fotograf shows Dr. Lee DeForest, inventor of the audion, at the radio set, and Miss Mary White singing

(Continued on page 907)



This fotograf shows Miss Mary White singing at the radiofone station of the California Theatre, with Dr. DeForest, whose company installed the set. Note the extra inductance fixed behind the panel to tune up to 1,260 meters.

by every experimenter who has any respect for his fones. When it is considered that the fones are liable to be demagnetized or burnt out by their employment in the high voltage plate circuits, its use will be apparent. In addition to this it only takes one jolt thru the top of your dome from an earthen headband to convince you of the "splendid isolation" afforded by the use of a telephone transformer. The constructional details with the exception of the secondary winding are similar to the intervalve pattern. This winding consists of 20,000 turns of No. 36 B. & S. enamel wire, tapt at 5,000, and 12,500 turns respectively, giving a range of secondary impedances to cover all fones from the humble 75 ohm "proletariat" to the Baldwin Mica Diafram "bourgeoisie." The following table will give the reader an idea of the approximate resistances and inductances of the windings of both transformers.

| Transformer.                             | Primary Resis. | Primary Ind. | Secondary Resis. | Secondary Ind. |
|--|----------------|--------------|------------------|----------------|
| Intervalve                               | 4000 $\omega$  | 21.3H        | 18400 $\omega$   | 177H           |
| Telephone                                | 4000 $\omega$  | 20.7H        | 580 $\omega$     | 1.23H          |
| Actual Bridge Measurements at 800 cycles |                |              | 1550 $\omega$    | 7.70H          |
|  |                |              | 2800 $\omega$    | 19.4H          |

When the telephone transformer is used in an audion circuit, it is absolutely essential that it be shunted by a small fixed or variable condenser, so as to pass the radio frequency component of the plate current which previously passed thru the small condenser formed by the fone cords.

According to some "near experts" the winding should possess high ohmic resistance, thereby combining a resistance coupling effect with the transformer action. This resistance may be useful in radio frequency transformers to prevent the winding oscillating at its natural frequency, but in the pattern under consideration any undue ohmic resistance merely gives rise to losses which obey the familiar CR law. It should be particularly understood that it is ampere turns alone which transfer the energy from one circuit to another.

### The California Theatre Radio Station

(Continued from page 857)

over the set on the occasion of one of the special concerts.

The station is operated under the direction of Lieut. Ellery W. Stone, general manager of the Moorhead Laboratories, Mr. B. F. McNamee, chief engineer, and Mr. J. E. Squires, operator of the station.

### Atmospheric Conditions in The Tropics

(Continued from page 867)

nothing, in my estimation, which will tend to make a person more nervous, than attempting to read weak signals thru very heavy static, as it requires great concentration of the mind, which is very hard upon the nervous system.

If one should "listen in," during one of those ugly tropical thunderstorms, I guarantee you would think you were at the battle of Liège or in a boiler factory. If you are not convinced, let me say, honestly, I have heard static four feet from the fones during one of those storms. It is absolutely impossible to read signals 50 miles away. How can one possibly work with such unbelievable interference! What a joy it would be to eliminate this.

## "The Promised Land"— YOUR OPPORTUNITY

"The Promised Land" is the name professional operators have given to the New York Central Radio Station of the Radio Corporation of America on Long Island, which, when completed, will be the largest and most powerful radio station in the world.

This immense station which is now in course of erection, is a striking example of the great opportunity radio offers you for a successful, secure future. It will be equipped to work simultaneously with five other nations in widely separated and distant parts of the world and will be epoch-making in the field of international communication.

A large number of trained men will be required for its operation and maintenance. A position at this station is the height of every operator's ambition, for it means unlimited opportunity to succeed and progress to higher, more responsible and better paying positions in the radio industry. So far as opportunity goes the successful future of these men is assured.

### HOW ABOUT YOU?

Right now, today, radio offers you big opportunities—if you are properly trained. Radio companies need trained executives, engineers, draftsmen, operators and mechanics. Hundreds of positions in the ever-broadening field—from ship operator to general manager—are open to you, if you have the required training. The Radio Institute of America will give you this training, as it has to thousands of others. If you cannot come to the Institute, the instruction will come to you—to your home.

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#### What Our Former Students Are Doing

Mr. H. Payne, former student, now Assistant Treasurer of the Radio Corporation of America.

Walter E. Wood, Superintendent in charge of the powerful trans-oceanic radio station at Chatham, Mass.

Irving Ellingham has a greatly prized position in his assignment as radio operator on Vincent Astor's yacht "Cristina."

Raymond Blanqui, although only 20 years old, is now a high salaried operator in trans-oceanic service.

Watson Sidney, Manager of the office of the Radio Corporation of America, Savannah, Ga.

Harry Sadenwater, assistant in research in the world-famed radio laboratories of the General Electric Company.

E. N. Pickerell, manager of the Radio Corporation's shore station for the port of New York.

Lee L. Manly, assistant superintendent of the Maintenance Department of the Radio Corporation.

William S. Fitzpatrick, Assistant Marine Superintendent.

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#### What the Man Who Employs the Operators Says:—

Radio Institute of America, New York.

Gentlemen—I have known the Radio Institute of America so long and so favorably under its present title and its earlier name, Marconi Institute, that it is difficult for me to conceive that anyone can think of instruction in radio without instantly recognizing its leadership. When employing operators, your students are given preference because several thousand of them have proven their ability to me over a long period of years.

Sincerely yours,  
(Signed) J. B. DUFFY,  
Superintendent, Eastern Division, Radio Corporation of America

The Radio Institute of America has been an established and successful institution for over fifteen years. The year round average attendance in its classrooms is now 298 students per month. It has trained over 6,000 men, 95% of whom have successfully engaged in this new branch of science and industry. You, too, can be successful in this new field if you properly train yourself by means of the Home Study Course of the Institute. Radio offers an unlimited opportunity for future advancement—why not take advantage of it. Write for our booklet and further details.—NOW.

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## RADIO INSTITUTE OF AMERICA

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