

### NATIONAL BROADCAST IS BIG ACHIEVEMENT

MEANS WIDESPREAD WORK

**Telephone Lines All Over the Country Affected; Employees Kept Busy, Tied to Seconds**

When practically the entire United States, on occasion, becomes a single audience and listens to the same radio speaker or program, a great engineering achievement is accomplished. Chain broadcasting is made possible by means of the Long Distance telephone lines in this country. The telephone circuits used for transmitting programs to radio broadcasting stations, however, differ from ordinary local and Long Distance lines, in that the transmission takes place only in one direction, namely, from the microphone to the different radio stations.

**Requirements Severe**  
Requirements for the transmission of program material are much more severe than for the transmission of ordinary speech such as is required in a local or Long Distance call. In the case of program transmission, circuits capable of transmitting satisfactorily a wide band of frequencies, that is, a wide pitch range, such as from 100 to over 4,000 cycles per second are usually considered necessary. In addition, the circuit must be capable of handling a wide range of volume so that when the volume is low, the program will not be marred by the presence of extraneous noise. Of course, all special circuits used for radio broadcasting must also function harmoniously with the other circuits of the telephone plant.

**Handling the Circuits**  
Most of the chain broadcasting circuits now operating throughout the country were constructed to meet these requirements. When a regular telephone circuit is to be used for program transmission, it is necessary to remove part of the equipment and apparatus normally connected with the circuit and to install special equipment instead. For example, the equipment removed includes the normally required equipment that permit the simultaneous operation of telegraph and telephone service on the same wires. If this were not done, the very low pitches such as 100 cycles per second would not be transmitted satisfactorily.

Special electrical arrangements which are called "equalizers" are used to make the lengths of cable, equally efficient through the frequency band transmitted. Thus, substantially uniform transmission over the wide range of low, medium and high pitches is secured. On long circuits vacuum tube amplifiers are necessary at intervals, and serve the same purpose as the repeaters that are used in ordinary long distance telephone connections.

**Must Be Tested**  
All circuits thus used must be tested regularly and observed continuously. Special measuring equipment is provided for such testing and observation, and during operation high quality loud speakers are connected so that any fault in the transmission can be instantly detected. Thus, at the control rooms in New York and Chicago, for example, and at other testing points when many stations are linked together in chain broadcasting, the loud speakers are employed to keep constant check on the quality of the transmission. There is one of these for each broadcasting chain whose program is being transmitted.

**Instant Action Required**  
In addition to the loud speaker observations, the men in charge of the program transmission receive reports from numerous points through which the circuits pass as to how the program is being received at each point. Thus, in case of any irregularity in the program transmission, instant action can be taken to locate the difficulty and, if possible, to remedy it. In case such difficulty, however, is sufficiently serious to actually interfere with the program, the comprehensive knowledge on the part of the control operators of the different Long Distance open wire and cable routes throughout their territory enables them to obtain, quickly, suitable alternative circuits over which the program may be satisfactorily transmitted. It is at the test boards that these changes in circuit routes are made.

**Nation-wide Hook-ups**  
All toll circuits throughout the Bell System are tested thoroughly and carefully at frequent intervals, as part of their regular maintenance. Before a very important broadcast, however, these lines may be checked or patrolled as an added precaution and any necessary adjustment made. Linemen in this way make sure that there is no incipient trouble which is likely to interfere with the sending of the program. Linemen, of course, are always located at strategic points, ready to make quick repairs, in case of emergency, to Long Distance circuits.

In spite of the fact that 275 of our noble sports are running and walking across the continent, you can't persuade many of the girls to walk to dances.

### COSTUME EFFECTS IN SPRING ENSEMBLES

Notes on New Paris Fashions in Magazine of Interest at This Time

Costume effects in spring ensembles are the most striking note seen in the early spring showings of the most prominent Paris fashion houses, according to Florence Buschard, correspondent of the Woman's Home Companion in the French capital.

No matter whether the outfit is for sports wear, afternoon or evening, Parisiennes are buying at the same time coats and dresses that bear a modish relation to each other. The sweater costume continues in popularity but with new glory and, with the new waterproof coats which have come into being with the increasing popularity of motoring, give an added note of charm to the seasonal displays.

The spring coats are mostly unlined or have linings which repeat the note of the frock's material. The silhouettes are slender except when the cape models are used, when they flare broadly in the back. There are more hints of irregular coat hems to conform with the irregular dress hemlines. For evening ensembles the problem is solved by shorter coats, sometimes no more than mere jackets.

More formality and more femininity in fashion are established facts. The irregular hemline which made its entrance through the evening robe, is now so dominant in evening frocks that the straight hem seems almost old-fashioned. Evening frocks are more picturesque than they have been in many years, bright and shining as they are in lace and other sparkling materials and trimmings.

Scarfs and kerchiefs are another continuance of an old custom. This year they have become an integral part of the dress on many occasions. They are the old scarf collar and the knotted sash in new forms, as for example the kerchief sash which swaths the hips and is tied either in front or at the side, pirate fashion.

### NEW YORK GRADUATES MOSTLY ARE TEACHERS

Of the graduates of New York State normal schools and teachers' colleges in the past six years, it is known that 94.25 per cent taught the year after graduation, and that 96.42 per cent of those who taught were employed in the schools of the State studies, those who were unable to find positions, those who failed to report their movements, and those who married or died.

There is a widespread feeling that too many laws are being passed, but most folks have a few more pet measures that they want to put on the statute books.

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### MUSIC SUPERVISORS' CONFERENCE APRIL 15

High Schools of Country to Be Represented at Important Sessions

With a week of gala music, entertainment, and instruction of every kind, the biennial meeting of the Music Supervisors' national conference will be held with its headquarters at the Stevens hotel beginning April 15. Approximately five thousand are expected from all over the United States.

Morning, afternoon, and evening are filled with educational addresses, round table dinners, and concerts and banquets galore.

Among the high spots of the week will be a concert by the Chicago Bach Chorus Sunday, April 15, and the a capella choir of the Northwestern university on Tuesday at 1:30 p. m., and at 8 at the Orchestra hall.

Probably the most important and interesting to high school students will be a concert given by members of Chicago high schools. The best in music from all the glee clubs will be given.

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**Our Panama Canal and The Bell Telephone**

AMERICANS point with pride to the Panama Canal as one of the great engineering achievements of all time—and they are quite entitled to do so.

The Panama Canal cost \$375,000,000. This is a vast sum, but is not as great as the amount which will be spent this year alone by the Bell Telephone System for new plant and equipment.

The total investment in the Bell Telephone System is now more than three billions of dollars. It took forty-one years after the telephone was invented to build up the first billion dollars in Bell System plant investment. The second billion was added only six years later and it required only four years more to add the third billion. At the present rate of increase the fourth billion will be added in less than three years. These figures indicate the tremendous forward strides being made in telephony. They show as nothing else could the way in which the Bell System is meeting its obligation to the American people to give them the best and most complete telephone service possible.

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