

THIS map shows the distribution of the various broadcast stations comprising the radio "chains" or networks, and also the location of a hypothetical super-power station which might be constructed to cover the entire United States with a radio signal of unfailingly acceptable strength. Estimated on the basis of the 100-mile service area for which 50-kilowatt stations are rated (small shaded area), such a station would require about 11,000 kilowatts of power (on the "inverse square" rule) to cover the 1,500-mile radius indicated by the outside circle. With about 1,250 kilowatts it would cover a circle of 500 miles' radius, as indicated by the center circle. This is the order of power which supposedly would drown out all atmos-

pheric interference; but engineers are sceptical whether any transmitter, however powerful, can be guaranteed to do this.

The super-power station would be located approximately on the border line between the states of South Dakota and Minnesota, near the northwestern corner of Iowa.

Note that the Mountain Time zone of the country does not contain a single chain station. For the call letters of the stations in the four national networks see the end of this article, page 944. The small dots, not the symbols, indicate the cities where studios are located; though the transmitters are often some distance away.

What About the Future of Chain Broadcasting?

Will the Radio Networks Survive? Some Factors of the Problem
Considered from the Listeners' Standpoint

By Charles Magee Adams

CHANGE is, of course, as inevitable a consequence of existence as that proverbial team, death and taxes; a fact nowhere more obvious than in the field of radio. So swiftly has development followed development, that one technical practice or set of conditions has hardly become established before it has been superseded by something newer and better. But, in spite of our being accustomed to this process of constant evolution, as radio enthusiasts necessarily must be, it comes as considerable of a shock to discover that competent observers are now noting along the radio horizon signs that portend the supplanting of chain broadcasting by something newer and better.

Unlike so many other developments which have had their moment of the spotlight, and then passed off the stage, chain broadcasting has endured for four years—a longevity which has given it the rank of a near-permanent institution, as things in radio go. Moreover, it is at the present time just developing to the proportions which were promised from the beginning. Yet authorities, whose judgments are too keen to be dismissed lightly, recognize in recent developments along two diverse lines—those of higher-powered transmitters and those in the field of the phonograph—potentialities which, if realized, may well relegate chain broadcasting to a place on the radio shelf.

So it seems worth while to analyze the situation, not so much from the standpoint of the technician as from that of the listener—the ultimate consumer of broadcasting, and therefore the individual whose interests must be accorded first place.

THE MERITS OF THE SYSTEM

What are the advantages of chain broadcasting to the listener? The answer to this is, of course, obvious.

First, the network system has enabled the presentation of much superior programs; not only through distributing the cost of engaging better artists among many stations, instead of saddling it on only one, but also through making available to much of the country broadcasts of events of wide public interest. Second, it has made possible the enjoyment of these programs under conditions of local reception, as against DX.

Anyone who remembers the caliber of programs which were outstanding four or five years ago need not be told that the first result alone represents a genuine advance in broadcasting. But, it seems to me, the second is even more important from the listener's standpoint. The freedom from interference of all kinds which reception from a local station offers is generally recognized; and contact with listeners discloses the astonishing extent to which set owners, who once ranged far and wide in quest of entertainment, now limit the bulk of their listening to local stations, chiefly outlets of the

various chains, for this very reason of more satisfactory reception.

AND ITS DEMERITS

Next, what are the disadvantages of chain broadcasting? The first, and the most serious from the listener's standpoint, is occasioned by the difference in time between the various zones into which the country is divided.

To eastern listeners this appears a detail of small importance. But for those living elsewhere it constitutes a real problem, since practically all network programs originate in New York and are scheduled according to New York time.

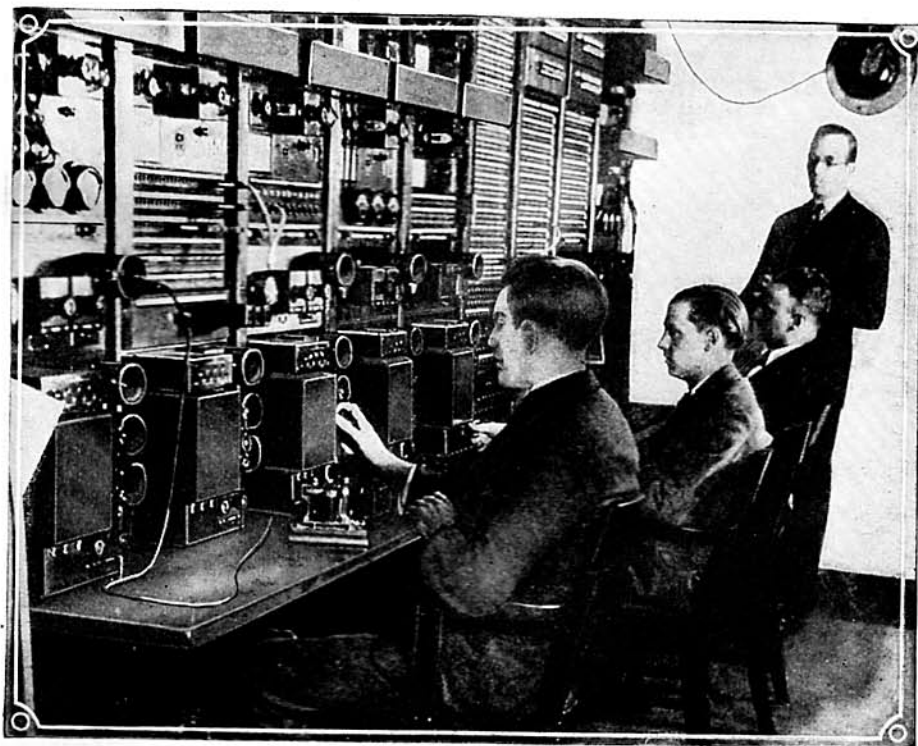
A difference of only one hour means an annoying conflict with the habits of listeners. For example, a chain program put on the air at 7:30 p. m. eastern time falls at 6:30 p. m. central time, when many listeners in the latter zone are not free to enjoy what is offered. A difference of two hours, as between eastern and mountain time, or eastern and central when the former is using daylight saving, entails a heavy loss in the western audience, unless the program is one of compelling interest; and the difference of three hours between the eastern and Pacific zones is such a prohibitive obstacle that the National Broadcasting Company has found it necessary to make its Orange network a separate unit, except for the airing of national events or daylight programs.

It is true, of course, that it has been possible to change the habits of listeners to some extent, by educating them to listen in at times to which they were not accustomed; and also to set programs at a compromise time acceptable to listeners in zones between which there is only an hour's difference. But a difference of two hours or more presents such complications that chain broadcasting cannot overcome the handicap, save in the few exceptions just noted, at least with key stations in New York; and the suggested solution of establishing a key station for each of the various zones would entail a sacrifice of the economy in artists' fees which the network system effects.

SECTIONAL OR NATIONAL PROGRAMS

The reference to event broadcasts leads naturally to a second disadvantage of the network method from the listener's standpoint—namely, its unwieldiness as regards programs with sectional interest.

Because they are designed first of all to serve the sponsors of commercial programs whose support makes them possible, the chains are organized on a scale as nearly national as practicable. From the standpoint of financing this is, of course, sound; and on the score of service to the listener it is also an advantage, particularly as far as broadcasts of national events are concerned. But, for material with only sectional interest, the network method discloses a serious weakness.



The WEAf control board, located at 195 Broadway, New York City, through which all the chain broadcasts over the "Red" network are distributed.

Land lines connecting the member stations are planned for service from a single key station, generally located in New York. No provision is made for breaking up the chain into regional units, served from lesser key stations, for the good reason that, under the conditions of national operation which usually prevail, this would be uneconomical. Such an arrangement makes the airing of programs with a sectional appeal practically prohibitive; a disadvantage which has become more and more apparent to listeners of late.

SMALLER TIE-UPS DESIRABLE

Football games are an apt example. With few exceptions, notably the Army-Navy contest, they are of interest chiefly to listeners living in the states or sections represented by the teams taking part. It is true that most of them are put on the air by single stations. But these, it will be noted, are rarely of sufficient power to serve properly the entire area in which listeners are interested, especially under the handicap of daylight transmission. If a few stations, selected to cover the territory, could be tied together for such a broadcast, the resultant service would be keenly appreciated by listeners. But existing chain facilities are, for the sound reasons just cited, not adapted to this purpose; and the leasing of lines for such a single event is, as a rule, too costly.

Many other events of interest to listeners in a section, larger than can be served by a single station of average power, could be mentioned—conventions, industrial gatherings, meetings of various kinds; and it is also true that many entertainment programs could be developed to a point of greater interest if aimed at simply a sectional audience. But, as chains are now constituted, what is put on the air must have a national appeal.

The question of whether chain broadcasting will survive accordingly resolves itself, from the listener's standpoint, to this: do

recent developments in higher-powered transmitters or phonograph technique offer possibilities that would eliminate the disadvantages of the network method, at the same time retaining its advantages?

SUPER-POWER TRANSMITTERS

First, as to higher-powered transmitters.

There is no question that a station with 50 or 100 kilowatts output, such as WJZ, WEA, or the new WGY, can command an audience which, for part of the time, compares favorably with that of a sizable chain system. Therefore, a station of this power as a substitute for a chain would make feasible the presentation of superior programs by high-class artists, the first advantage of the network method.

Further, it is equally clear that a few such stations properly placed could eliminate the difference in time handicap under which the networks now labor (assuming, of course, that each operated independently); and also that they would lend themselves well to the airing of material with special interest to listeners in their respective sections.

So, as a substitute for chain broadcasting, the higher-powered transmitter scores on three of four points. But on the fourth, that of service compared with local reception from a chain outlet, it falls short.

This is said with full respect for the fine results secured by those transmitters using 50 kilowatts or more. It is true that such stations have materially increased their service range by employing increased power. But it is also true that, as compared with that supplied by locals, the dependability of their service at any real distance has been considerably over-estimated in many quarters.

EFFECT OF DISTANCE

For example, the writer lives some 600 miles from WJZ and there are nights when this big station "comes in like a local," to use the stock phrase; but there are also

nights when it does not come in at all, because of static or other atmospheric obstacles. KDKA is about 200 miles away from my location, and at times this pioneer comes in better than local; but again there are times when it too does not come in at all.

The still more serious error in popular discussion of recent super-power developments, particularly with respect to WGY's 100-kilowatt set, is the assumption that doubling the power doubles the effective range. At the time WJZ's present equipment was installed, engineers explained that, because of the "square-root rule" which applies in such a case, it is necessary to increase the power four times in order to double the signal strength, which means 200, and not 100 kilowatts, is the next step in power increases, but one not expected in the near future.

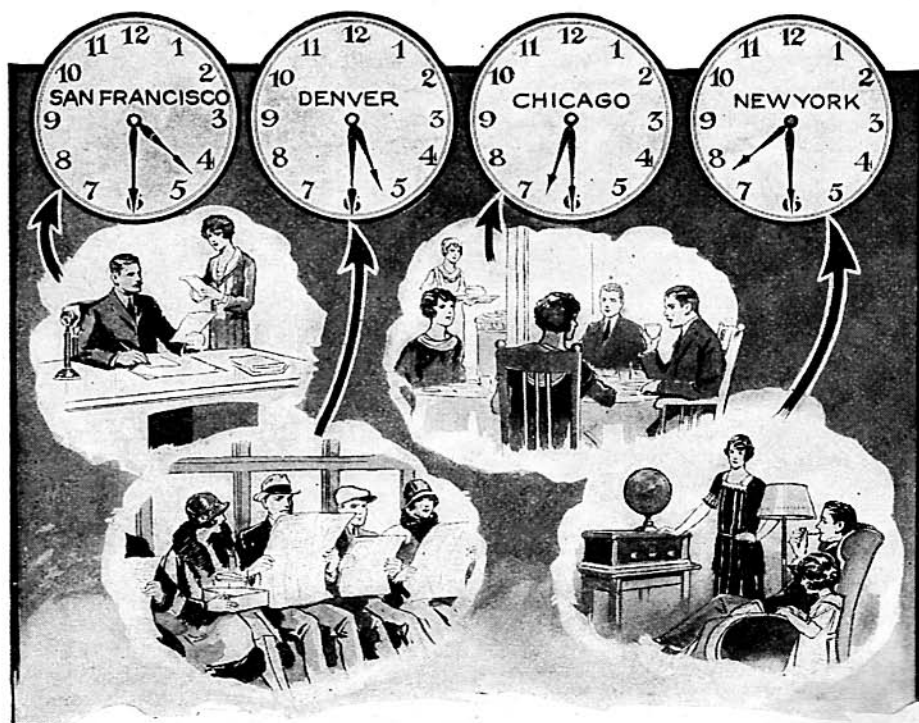
In the light of all this it should be clear that, gratifying as the results have been, recent developments in higher-powered transmitters do not offer any present or near-future substitute for chain broadcasting in the vital matter of dependable service over a territory even approximating that served by present networks; and further, that anything approaching a dependable nation-wide service from a single station is still only a hope; since a power of at least 1000 kilowatts and possibly as high as 10,000 would seemingly be required for this.

PERFECTION OF THE PHONOGRAPH

Next, as to the phonograph. It is pretty generally agreed that recent advances in the technique of recording and reproduction have reduced the loss in musical fidelity represented by this method, as against direct presentation, to an almost negligible quantity. In fact, the chief obstacle to the widespread acceptance of the phonograph as a source of broadcast entertainment at the present time seems to be the prejudice of listeners, carried over from the days when the shortcomings of the phonograph were manifold, and broadcasting emphasized rather than minimized them. This can obviously be overcome by proper education, plus some further technical refinements.

If, accordingly, chain programs were recorded and broadcast from records, instead of being carried over telephone lines from key stations (which has been suggested by competent authorities) it is clear that such a substitute arrangement would retain both the advantages of the network method—superior programs by superior artists, and dependable reception from local stations—at a cost that might be even less than that of the present method. In addition, such a system would eliminate one disadvantage of chain broadcasting, that of the difference in time, by making possible the airing of programs at an hour best adapted to the audience being served; and further, it would go far toward eliminating the second disadvantage, by enabling the presentation of programs with sectional interest.

But the phonograph falls short in the matter of national-event broadcasts, which have come to have such an important place in radio programs. It is inconceivable that listeners would relish an "embalmed" version of affairs like the reception to Colonel Lindbergh, championship fights, or political conventions. The interest of such events lies in their news value, and no recording could hope to equal their direct airing over network systems.



The man in New York has finished dinner and is settled down for his evening's radio entertainment before his fellow listeners further west are quite ready for a chain program; thus the latter must miss many good eastern programs.

CHAIN METHOD STILL BEST

So neither the higher-powered transmitter nor the modern phonograph proves to be a completely satisfactory substitute for chain broadcasting just now.

It may well be, of course, that a combination of the two will, in the not too distant future, supplant networks to a large extent.

Instead of being broadcast through a few score of stations linked by telephone lines, programs of the ordinary type may be recorded and transmitted by many locals, supplemented by a dozen or two truly super-power stations so placed as to supply regional service; and with chain facilities making possible the connecting of all for the airing of outstanding events. Such a

compromise arrangement would afford maximum service to the listener and, accordingly, is a possibility which can be anticipated with interest as developments take shape.

But, in the meantime, chain broadcasting as at present constituted seems certain not only to remain, but to continue its expansion, notwithstanding these promising substitutes.

The Advantages of the Broadcast Networks

By Dr. Alfred N. Goldsmith

NETWORK operation has been subject to much commendation and to some criticism. Its more enthusiastic supporters have seen in it the only effective means of serving the country as a whole with programs of the highest quality. Others, however, have expressed the fear that network broadcasting would tend to needlessly standardize operation of unified groups of powerful stations; and have doubted whether such a plan was socially desirable.

It would not be appropriate to consider here matters involving political controversy. It is assumed that if the radio listener is pleased by the excellent service which he gets from broadcast stations, the problems of governmental regulation of broadcasting will be greatly simplified and, in large part, automatically solved. After all, the fundamental aim of broadcasting is that the listener shall be pleased and instructed. Translated into more specific terms, this means that programs, of both the entertainment and educational varieties, must be radiated in such a way that practically every person in the United States can get clear, reliable reception with a certain reasonable amount of program choice.

ECONOMIC CONSIDERATIONS

Considering first the commercial aspects of sponsored programs (containing indirect advertising), it should be remembered that this is an age of nationally-distributed products. The great industries of the United States sell their products on a nation-wide scale and are interested in reaching the entire population as prospective purchasers.

The tendency towards the national distribution of products has extended even into the fields of art and literature. It has been found that musical and literary talent naturally gravitates to the larger cities; and that those so fortunate as to possess it in a high degree require correspondingly large financial returns for their efforts. Hence the best entertainment cannot be used to satisfy small groups of people having limited purchasing power.

Radio broadcasting employs artistic and other talent of which there is but a limited supply and that found only in relatively few parts of the country in readily available form. The purchasing power of the audience of an individual station is sometimes insufficient to justify the commercial sponsors of a program in using the best available talent.

Fortunately, network broadcasting by

groups of fairly high-power stations enables the obtaining of an audience of high purchasing power, such as will economically justify the finest possible programs utilizing the most capable (and generally expensive) performers. There is in addition a large class of non-commercial features which can reach the public nationally through network broadcasting or not at all.

On occasion it has been pointed out that commercial broadcasting is justified if the additional profits due to broadcasting, obtained by the sponsor organizations through the sale of their products to the audience of the broadcasting stations, are considerably larger than the cost of providing the programs given to such audiences. This important general principle at once leads to the conclusion that nationally-advertised products require national distribution of the finest possible programs, if an economic setup is hoped for.

TECHNICAL CONSIDERATIONS

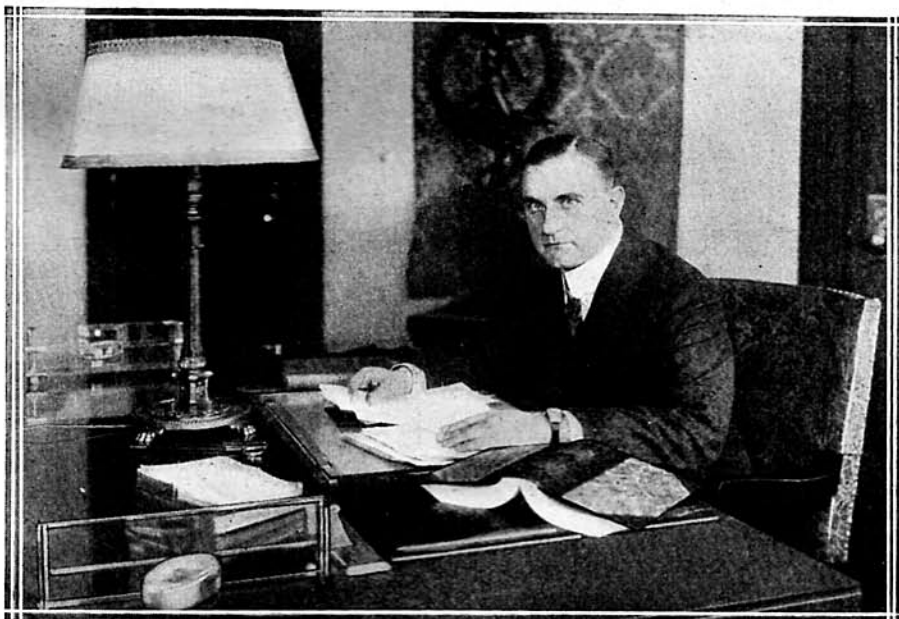
From time to time the suggestion has been made that, perhaps, the United States could be adequately covered by a very few extremely high-power broadcast stations. Without denying the ultimate possibility of

such an achievement, it is nevertheless a fact that it is not possible indefinitely to increase the reliably-reached audience of a broadcast station, by merely increasing the transmitting power, using any technical methods now available.

In the present state of our engineering knowledge, we do not know how to overcome marked fading or irregular fluctuation and distortion of signals, which effect begins to detract from the quality of the received program at distances between approximately 75 and 150 miles from the transmitting station.

If, accordingly, we aim at a 150-mile range as the greatest feasible service range now technically available, and use stations of 50 kilowatts or more to secure such a range (perhaps even going to powers as high as 1,000 kilowatts in certain special districts), we shall accomplish about all that can be expected of a single broadcast station, using present-day methods of transmission and serving listeners using existing methods of reception. In some cases the audience of such a station is not large enough to justify economically the best possible programs.

(Continued on page 942)



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