

"SUPER-POWER" - 1925 STYLE

An article reprinted from Popular Radio, July 1925, titled "A Probable Solution of the Broadcasting Problem - SUPER-BROADCASTING."

Chapter 1

Broadcasting has grown in the past three years from the experimental work of a few scientifically-minded amateurs to the greatest medium of disseminating news, entertainment and education that the world has ever known.

Today there are 475 class A broadcasting stations in this country and 90 class B stations. The former broadcast on wavelengths ranging between 280 and 545 meters (1070 to 550 khz), and are required to have a minimum of 500 watts of power in the antenna. The latter operate on wavelengths between 200 and 280 meters (1500 to 1070 khz), and are limited to a maximum of 500 watts in the antenna. These two classes of stations total 565. Between them they cover the entire country.

The quality of the broadcast programs that are sent out from these stations varies to a marked degree. In those areas that are served by stations which are noted for the general excellence of their programs, the interest in radio has been developed to the benefit of the radio fan and to the profit of the radio dealer and manufacturer. As a consequence, the growth of radio has been in reality the direct reaction of the development of individual broadcasting stations. Those stations have been most successful that have given the best programs to the largest number of listeners.

In other words, the public interest in radio and the radio industry itself is dependent upon the maintenance of a higher standard of broadcast program, and the future of radio will be determined by the character of programs that will be furnished.

On the maintenance of broadcast programs the whole structure of the radio interests rests.

How shall this be accomplished?

In the answer to this question lies the problem of super-program building - the selection of those features of the broadest possible interest, of the best possible quality and of the greatest national import.

And here is where "superbroadcasting" enters the situation as a probable solution.

"Superbroadcasting" is the term that may be applied to what is, in effect, universal broadcasting; i.e., the broadcasting of those program features of outstanding excellence that may be received over the entire country or over the entire continent or, conceivably, over the entire world at the same moment. This may be attained in three ways, any one of which may be used separately or in combination.

These three ways may be summarized thus:

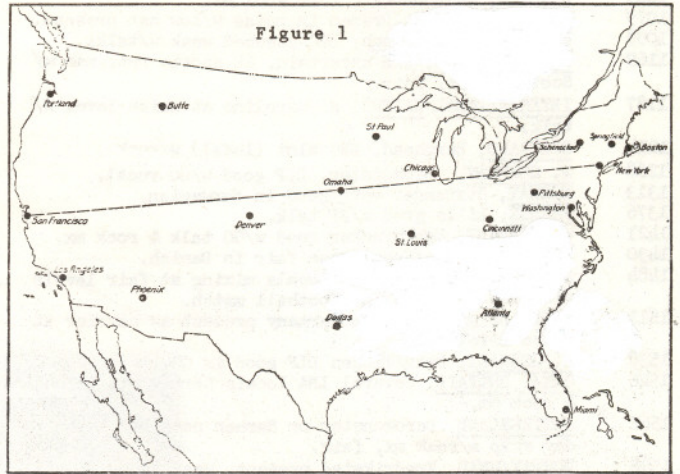
1. A small number of strategically located broadcasting stations that operate on "super-power" ranging from 5000 to 20,000 watts.
2. The linking together of broadcasting stations by wire, so that the same program may be sent out from them simultaneously.
3. The linking together of broadcasting stations by means of "relay stations," which pick up programs broadcast from other stations simultaneously on a short wavelength, say 90 meters (3300 khz), and re-broadcast them on a regular wavelength.

Let us consider for a moment the first of these methods, the super-power stations.

It has been estimated that fifteen or twenty super-power stations of 5000 watts or more could cover the whole of the United States with as many different programs (see Figure 1). This could be done in such a way that a listener in any part of the country, with a receiver of only medium sensitivity, could pick up that particular type of program or feature in which he was interested, and he could receive it with good volume and in pleasing quality.

This system of broadcasting would undoubtedly help to popularize a simple receiver (of not more than three or four tubes) which would be easy to tune (probably a single-control unit) and that would be a profitable instrument to sell at a price well within the reach of everybody's pocket. In fact, a receiver capable of receiving signals from a super-power station at a distance of 2000 or 3000 miles (3200 to 4800 km.) can be manufactured at a considerably lower cost to the ultimate consumer than the ordinary receivers sold today. At the same time, the manufacturers could incorporate in these simplified receivers an audio-frequency amplifier of much better quality than is used today, so that the reproduction of the program in the homes would be much more enjoyable than in even the most expensive of the receivers now in use.

A super-power station, however, if it is located in the midst of a large city, causes an undue amount of interference. This is especially true if the receivers now in general use are employed. To avoid this interference it



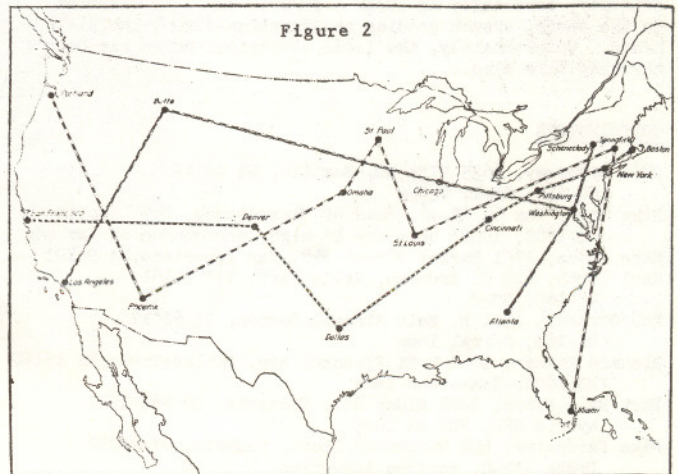
may become necessary to install and operate super-power stations outside of the crowded areas. No super-power station (in the writer's opinion) should be located in the center of a city or town. It should be built at a distance of fifteen or twenty miles (25 to 30 km.) from a congested district. It should be located at some place where there is nothing around them or up in the mountains on some high peak.

The studios for these stations would not, of course, be at such a distance from town, as it would be difficult to induce performers or lecturers to travel to them. The studio itself would be located in the most accessible part of the city or town, and would be connected to the transmitting station by telephone lines. In this way, the multitudes in the city would not have a broadcasting station of tremendous power "in their back yards," so to speak, and they would be able to tune it out with a receiver of only fair selectivity. But other broadcast listeners at great distances would be able to pick up these programs from this station although the nearer super-power stations might be transmitting at the same time.

Super-power stations now in operation in the United States includes stations KDKA at East Pittsburgh, Pa.; WBZ at Springfield, Mass.; WOC at Davenport, Ia.; KFI at Los Angeles, Cal.; WLW at Cincinnati, O.; WEAF at New York City; KGO at Oakland, Cal.; WGY at Schenectady, N.Y.; and WSB at Atlanta, Ga. These stations have an average power of 5000 watts with minimum and maximum powers ranging from 2500 watts to 50,000 watts in one or two cases.

By the second method of super-broadcasting, a number of local stations of low, medium or high power would all be connected to each other by means of special land wires - and all connected to a single broadcasting studio.

These separate stations, properly distributed around the whole country (see Figure 2) and each broadcasting the same program, could be received throughout the entire nation with the same type of simplified receiver as would be required to tune in the super-power stations. In other words, this second method of broadcasting would make it possible for any person in any part of the country to pick up a program originating at a distant point with a receiver that would not strain even the most modest pocketbook.



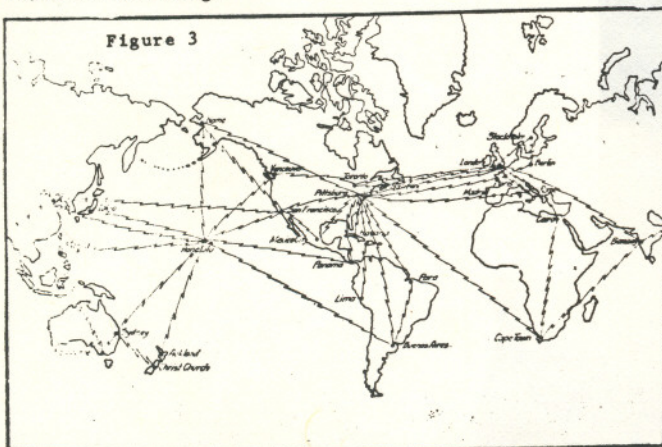
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This method, however, has a disadvantage in that it would make available at one particular time only a single program. This objection, however, could be overcome by using a series of interconnected low-power stations, with (say) one program from the east on one chain, another program from the western part of the country on another chain of stations, and so on.

But this method has one outstanding advantage; it would reduce local interference considerably over that obtained by the first method.

Of course, this second method is only applicable on one continent. It cannot be used for linking stations over large bodies of water, as it is necessary to run a high quality telephone line between every one of the stations to be connected in the chain.

The third method of super-broadcasting provides for the use of a short wave radio link between a number of well distributed transmitting stations of low, medium or high power, so that they all could re-broadcast on a higher wavelength the programs transmitted to them by the "mother" station on a short wave. Programs broadcast from these separate radio-linked stations, properly distributed throughout the whole country, or in fact, throughout the whole world (see Figure 3), each broadcasting the same program, could be received anywhere within the range of any one of these separate stations - and with the same type of simplified receiver already mentioned in connection with the other two methods of super-broadcasting. This latter method, however, has the added advantage that its service is available to any transmitting station at any place within the range of the short wave mother transmitter. It does not rely on expensive land lines for its operation and its apparatus and maintenance would not include these or their accompanying repair work. It would rely wholly upon short wave ether vibrations for the inter-connecting link between the local broadcaster and the mother station transmitting the original program. On the other hand, it might prove to be difficult to transmit to the whole world by this method on account of static conditions in any one vicinity. This condition, however, is ameliorated by the fact that static disturbances are very slight or almost totally absent on certain short wavelengths. It would probably assure the greatest range for super-broadcasting.



Any one of these three methods of broadcasting points a way to a practical solution of the national broadcasting problem. No one of these three systems would interfere in the least with the operation of our regular broadcasting as it is carried on today. There would be ample field for medium-powered local stations, of, say, 250 watts for the transmission of purely local news and items of local interest. These stations should be equipped with the best modulating apparatus obtainable, so that their programs will be reproduced in the receiving sets with as good quality as from the super-broadcasting stations. These local stations would fit in with either of the latter two plans, so that they too could broadcast national programs, when they are of sufficient importance to assure interest on the part of the local listeners.

It is quite possible that certain elements of all three of these schemes may be incorporated in the ultimate plan for world broadcasting. Such a plan might include the following:

(1) A number of super-power stations well distributed throughout every country of the world, and arranged so that no two adjacent super-power stations would be transmitting on approximate wavelengths.

(2) A number of local medium-powered stations in every large city (not more than four to a large city and, possibly, only one in small towns) all equipped so that they could be tied in with some national program by means of telephone wires.

(3) A small number of high-powered short-wave broadcasting stations (two or three to each nation) that might be used as relay stations across large bodies of water (such as the Atlantic and Pacific Oceans), to be used as an interconnecting link between the various national broadcasting chains.

(4) A comprehensive telephone land-wire link for every nation, which would be used for no other purpose than to supply national broadcasting programs to any client broadcasting station that would pay for the service.

When some such plan as this is put into effect and all of the broadcasting facilities of the nation, or of the whole world, are pooled, so to speak, the success of radio broadcasting will be reasonably assured.

And such a comprehensive broadcasting plan would tend not only to reduce the price of receiving apparatus but also to increase the quality of reception throughout any area at the same time cutting down the trouble from interference.

When these steps have been taken radio broadcasting will be available to practically every family in the world.

Tomorrow's Broadcasting We May See -

1. A small number of super-power broadcasting stations, located throughout the country and connected by telephone wires so that programs of national importance and of superlative quality may be broadcast simultaneously for the benefit of all.

2. These broadcasting stations authorized to collect toll charges for the rental of these stations for educational, publicity or other purposes, so that funds may be thus secured for their maintenance.

3. Manufacturers of radio sets, and manufacturers of parts that are required for radio sets, assessed on some fair and equitable basis so that those who profit from the sales of radio equipment may contribute toward the maintenance of the stations; (on this point there is much controversy).

4. These broadcasting stations operating under the direction of a representative group of public-spirited citizens of practical experience, acting under the supervision of the Secretary of Commerce.

5. The entire revenue derived by these broadcasting stations - which might conceivable amount to several million dollars a year - devoted exclusively to the maintenance of the stations and to the payment of the broadcasting artists and to the payment of proper royalties to the composers and authors whose work is thus published for the entertainment or for the instruction of all our people.

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