ALLOCATIONS NEARER

FM broadcasters question expert deductions on public need for shift "upstairs" — Television people content

● The much-mooted frequency allocations came at least a step nearer to solidifying as a result of the February-March hearing staged in Washington by the Federal Communications Commission; it is expected and predicted that the trial balloon, originally flown by FCC on January 15 in the form a "proposed allocation" of that portion of the spectrum between 10 kc and 30,000,000 kc. may be brought down to earth as official by early this month.

In the meantime, judging by the character of the briefs filed with the commission and the nature of the oral testimony written into the record by a considerable number of witnesses representing practically every spot for which frequencies had been requested as a result of the original Radio Technical Planning Board presentation, it appears unlikely that there will be any substantial differences between the proposed and the ultimate official allocations.

Fight FM move

As was to be expected, a great deal of the argument centered around the proposal to move FM "upstairs" from its present 42-50 mc spot to another between 84 and 102 mc. The FM people are dead set against the move, and collectively they have advanced many reasons why such a shift is undesirable. The television contingent, on the other hand, appears pretty well satisfied with their assignment, which is not greatly different from the main band they now occupy. A determined effort was made, though, by Joseph H. Ream, appearing in behalf of the Columbia Broadcasting System, to have FCC definitely designate that wideband UHF television is to be looked upon as the ultimate permanent service, and that present 6-mc services are but temporary. David B. Smith, speaking first for RTPB Panel 6 and later for Philco, offered that both concur completely with the proposed allocations and believe that FCC has done "a very satisfactory job."

Map tele stations

Television Broadcasters Association, represented by Wm. A. Roberts, of counsel, not only thought so well of the FCC apportionment as to "concur without equivocation," but presented a study to show how effective the Commission-proposed allocation might be. (See map.) Assuming service radii of 55 miles for Class A, 40 miles for Class B and 20 miles for Class C stations, the study shows that 112 of the first 140 principal marketing areas may have one or more television stations, representing a potential service to 98 million people. It shows further that 101 of the first 140 markets may have two or more stations serving 90 million people, 89 markets may have three or more stations serving 85 million people and 70 markets may have four or more stations serving approximately 75 million people. "Thus with 12 channels it is possible to give one or more television services to a large percentage of the population of the United States." The plan would permit a total of at least 398 stations.

In this connection it became evident early in the proceedings that both the television and the FM interests already are beginning to make sheep's eyes at the still unassigned 102-108 mc band at the top of the FM allocation. TBA points out that if this space could be added to the television band, it would be possible to increase that total of 398 television stations to a grand total of 464 stations.

As little as the FM people like the 84-102 mc band that FCC would give them, they nevertheless would like that extra six megacycles running up to 108 mc for there are those who hold that even with the 80 to 100 channels that would be available for commercial and noncommercial broadcasting there still would be hardly enough room when FM really gets to going good. For the most part, though, there seems no quarrel with space allotment.

Propagation battle

The real quarrel is with the proposed location of the band, and the FM people have marshalled a truly tremendous quantity of evidence in support of their argument

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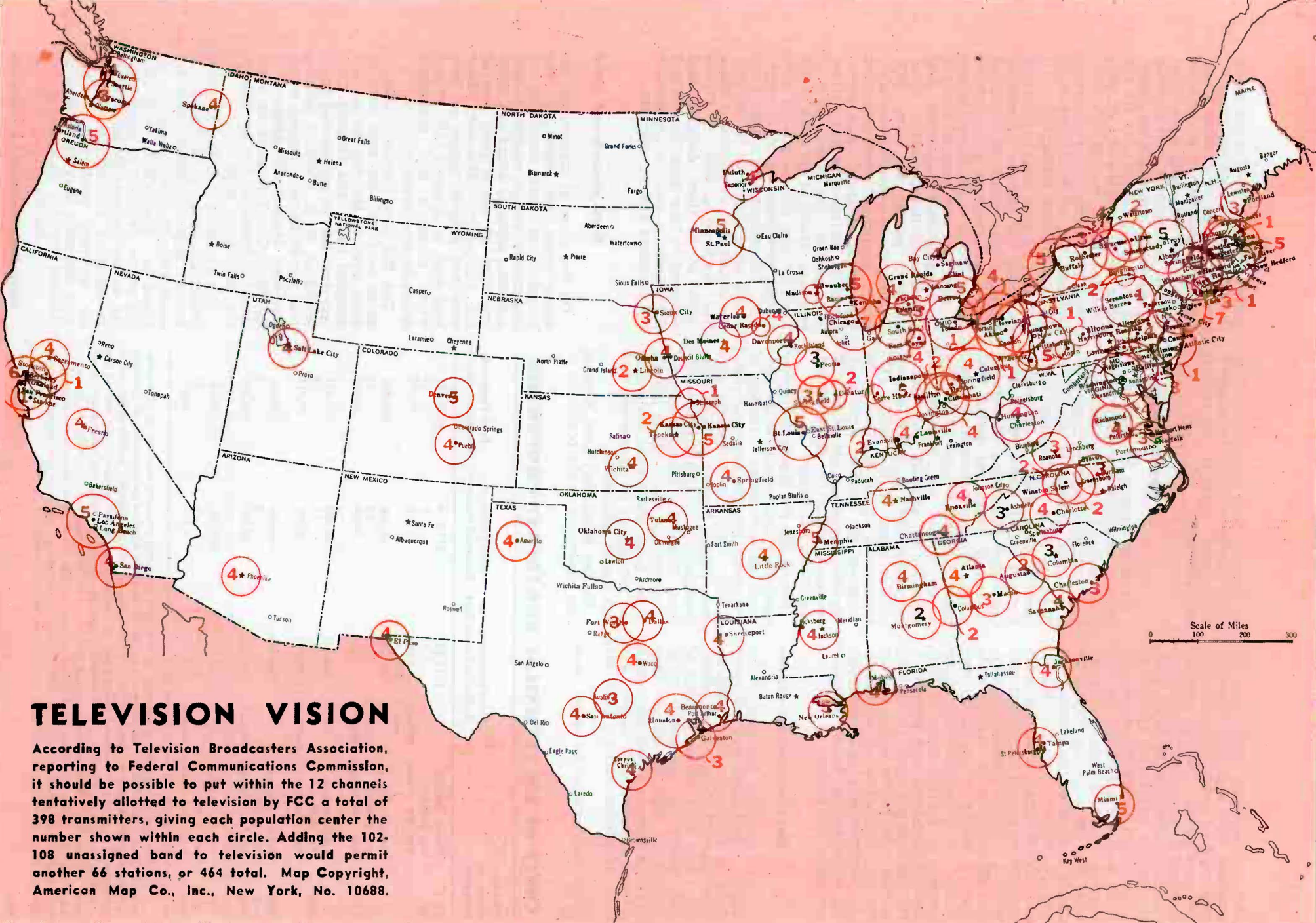
PRODUCTION OF FM RECEIVERS CAPABLE OF TUNING THE 42-50 MC BAND

Price Range (dollars)	FM Exclusively (units)	FM Exclusively (dollars)	FM-AM Combination (units)	FM-AM Combination (dollars)	FM Adaptors (units)	FM Adaptors (dollars)	Total (units)	Total (dollars)
Less than $50	975	$43,763	1,957	$87,086	13,916	$628,104	16,848	$758,953
$50 but less than $100	1,463	$98,468	72,336	$5,048,432	2,653	$162,600	76,452	$5,309,500
$100 but less than $150	2,736	$389,750	110,176	$13,108,838	150	$16,500	113,062	$13,515,088
$150 but less than $200	—	—	46,416	$8,258,632	—	—	46,416	$8,258,632
$200 and over	8,214	$2,835,000	134,763*	$45,405,890*	—	—	142,977	$48,240,890
Total†	13,388	$3,366,981	365,648*	$71,908,878*	16,719	$807,204	395,755*	$76,083,063*

Source of data: Compiled by Economics Division, Federal Communications Commission from responses to telegrams addressed to 101 manufacturers of radio receivers. *One manufacturer reported: "This includes a few sets for export but quantity is unknown." †Twenty-five companies reporting data.



TELEVISION VISION

According to Television Broadcasters Association, reporting to Federal Communications Commission, it should be possible to put within the 12 channels tentatively allotted to television by FCC a total of 398 transmitters, giving each population center the number shown within each circle. Adding the 102-108 unassigned band to television would permit another 66 stations, or 464 total. Map Copyright, American Map Co., Inc., New York, No. 10688.

that no good can come from the proposed shift and that changing may bring no end of harm if it does any good at all. The FCC rests its case and its choice on the evidence originally presented by K. A. Norton, who is very highly thought of as an expert on the propagation of radio waves, was formerly an FCC engineer, and is now connected with the office of the Combined Chiefs of Staff of the military. It will be remembered that Norton presented findings *tending to prove that FM service in its present spot would be far more subject to service interferences of various sorts than it would if operation were shifted to a considerably higher frequency. On the basis of Norton's deliberations and deductions, FCC accordingly made its decision and let it be known that a shift in FM frequencies was not only desirable but necessary as an engineering expedient to insure adequate service to the public.

Question Norton curves

It is here that the controversy wages. The Commission engineers claim to have a basis of fact on their side; FM broadcasters affirm that they have an equal basis of fact, backed by the testimony of experts, in their contention that Norton's findings do not agree with present knowledge, if, indeed, any such knowledge exists. They say it doesn't; that there has been little experience with the proposed band, and virtually no actual measurements.

*Electronic Industries for March, pages 86, 87.

Experts disagree

Major Armstrong has stated repeatedly that Norton's opinions are specious, and supports his argument with testimony from such acknowledged experts as Dr. H. H. Beverage, RCA Laboratories Associate Director, and Dr. Charles R. Burrows, NDRC Radio Propagation Committee Chairman. Norton, on the other hand, has stated that much of the information upon which his deductions have been made hinges on investigations made for the military and accordingly classified. In order to clear up this phase of the tangle, FCC arranged a closed meeting to be attended by Norton, Armstrong, Burrows, Beverage, Dr. Harlan T. Stetson of MIT, Dr. G. R. Picard, and Stewart L. Bailey.

Not all the FM broadcasters were completely antagonistic to the proposed move "upstairs." Leaders of the contingent that expressed satisfaction with the proposed move were Philco, Crosley, CBS, Cowles Broadcasting Co. and the Blue Network. Armstrong himself suggested a compromise move, say to the 48-66 mc band, though the suggestion did not appear to be received with any undue enthusiasm.

In the meantime there appears fair agreement on the possibility of building FM receivers to operate in the new band at not too great an increase in cost of existing kinds. Engineers opine that it will be more difficult and will take some time; costs, it is estimated, will increase by anywhere from $4 for the cheapest models to $30 or more for the better kind. C. M. Jansky, Jr., representing FMBI, put it this way: "We can overcome any engineering problems, but can do nothing about the transmission medium."

There has been some controversy regarding the number of existing FM sets that would be obsoleted under the proposed plan; broadcasters, too, have complained bitterly regarding the expense involved in changing their transmitters and antennas for the new band. In an effort to get at the facts, FCC polled some 101 receiver manufacturers regarding production and the figures obtained (and reproduced in an accompanying table) indicate that the actual total of receivers produced is quite a bit short of the half a million previously mentioned in many quarters. Supplementing this data, Philco permitted it to be put into the record that this company alone had produced a total of 171,994 units, all of them designed and equipped to tune both the AM and FM bands; it built no exclusively FM receivers and no adaptors.

COSTS OF FM TECHNICAL BROADCAST PROPERTIES

Effective Power (in kilowatts)		Total Transmitter and Radiating System Cost	Other Technical Broadcast Property*	Total Technical Broadcast Property
1.0 & less	Totals (dollars)	$285,567	$71,514	$357,081
	No. Stations	18	18	18
	Ave. Per Station (dollars)	15,865	3,973	19,838
1.1 to 3.0	Totals (dollars)	259,546	29,235	288,781
	No. Stations	12	12	12
	Ave. Per Station (dollars)	21,629	2,436	24,065
10.0	Totals dollars	486,663	60,164	546,827
	No. Stations	11	11	11
	Ave. Per Station (dollars)	44,242	5,469	49,712
10.1 and over	Totals (dollars)	616,155	144,493	730,648
	No. Stations	7	7	7
	Ave. Per Station (dollars)	88,022	16,356	104,378
All Power Groups	Totals (dollars)	1,647,931	275,406	1,923,337
	No. Stations	48	48	48
	Ave. Per Station (dollars)	34,332	5,738	40,070

Original and depreciated investment in technical broadcast property reported as of December 31, 1943, classified by effective power for 38 stations adjusted to represent 48 licensees and construction permit holders. Of the 53 FM licensees and construction permit holders as of December 31, 1943, 38 reported investments in technical broadcast property. Of the 15 not reporting, 5 (all construction permit holders) were known not to have any substantial investment and doubt exists as to the extent of investment for the remaining 10. However, estimates were used for these 10 which were based on the average investment reported by stations in the same power group. *Includes other technical transmitter property and technical studio equipment. Source of data: Compiled from annual financial reports of stations.

Seek unassigned band

On the score of transmitter revision costs (see table), it was brought out that rebuilding of transmitter, station equipment and antennas probably would cost about one-third of the original cost of the equipment. However, there were few definite figures on how long such work would take, if and when materials and manpower might become available.

The FM and television contingents were not the only ones to make eyes at the 102-108 mc unassigned band. The Forestry Conservation Service represented by its chairman, K. F. Williams, believes that the 44-78 mc allotment which has been temporarily assigned, is insufficient, and requests an additional 2 channels, 100 kc wide in the 102-108 mc band.

The facsimile people for whom Chairman John V. L. Hogan, of Panel 7, appeared, believes that A-4 modulation channels should be allotted in a spot which will permit the service "without as great a delay as will necessarily be involved in designing 470-780 mc receivers for quantity production." They urge, therefore, that FM stations be licensed for A-4 emission in the

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102-108 mc band, either to independent facsimile broadcasters or to licensees in the same area who also operate sound (A-3) broadcasting stations in the AM or FM bands.

The mobile services, represented by Panel 13 chairman Daniel E. Noble, believes that the 102-108 band "is ideally suited for mobile communication requirements," and that this 6 megacycles should be assigned to that service on the basis of public interest, convenience and necessity. Under the proposed allocations general mobile radio telephone service is given three bands —7 channels between 156 and 162 mc, for urban use; 12 channels between 40 and 42 mc and 12 channels between 30 and 40 mc, both for highway use.

Heating problems

The heating people, as represented by Alexander Senauke, chairman of RTPB Panel 12 on Industrial Heating Applications, believe that the three narrow channels alloted for both industrial and medical services, are insufficient. that the frequency tolerance of plus or minus .05 per cent is difficult, if not impossible of attainment and that no known method of shielding can be relied upon to eliminate interference; neither is crystal control considered to be a satisfactory solution of the interference problem. The brief points out that "if a wide band or bands are not made available, or the narrow channels recommended are pulled in to a width difficult to attain, the allocated frequencies will prove unattractive and most of the equipments built and used will be of the self-excited oscillator type operating on frequencies spread over the entire spectrum, with probable concentrations of fundamental or harmonic radiations within the frequency modulation, television, and possibly safety service bands."

Subscription radio, which received no allocation in the original proposal, insists that this service can be looked upon as having public interest and in support of that statement submitted many letters as the result of a survey, which was made. They have, accordingly, asked that FCC "set aside . . . a suitable number of channels for a new and additional system of radio broadcasting." Their plan, it may be remembered, is to sell service to subscribers and to prevent others from enjoying the service by superimposing a "pig's squeal" on the program. Subscribers' radio sets would be equipped with a filter allowing them to eliminate the squeal and hear the program without interference.