Radio News

October, 1936

The Mad Scramble For TELEVISION PRIVILEGE Threatens Amateurs

The complicated status of television today is envisioned by a careful survey of the testimony presented recently before the Federal Communications Commission at an informal hearing on the allocation of frequencies in the ultra-high frequency range. The need for standardization without creating monopoly and allowing freedom of future development is stressed

By the Television Reporter

THE recent informal ultra-high-frequency hearings before the Federal Communications Commission in Washington brought many contradictory viewpoints from the various claimants for television privileges on the ultra-short bands. And the indications are that the battle for the high-frequency channels will be bitter indeed at future *formal* hearings if the forthcoming testimony follows the trend established at the *informal* gabfests.

Virtually every branch of the industry was represented by legal and technical experts. If the hearings served any purpose at all, it was the releasing of hitherto hidden objectives. Because so many of these objectives clash, it must be recognized that a mad scramble for the legalized attachment of ultra-high frequencies by many "interests" is now under way. The next big blast from the various fronts can be expected in October when further FCC hearings will be conducted.

Television Stressed

Television was the central focus of the outstanding points in the testimony with some experts seeking delay in public application of the new art and others demanding the immediate start of visual transmissions, with amateurs and experimenters being given the opportunity of sharing in the progress of sight broadcasting.

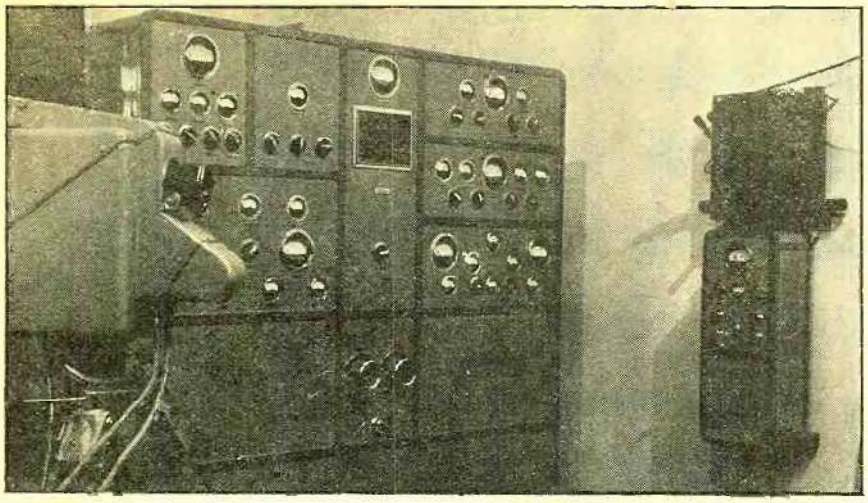
Amidst all this testimony, some of which was fair and open and much more of which was strongly biased and obviously designed to pull the wool over the eyes of the Commission members, the danger loomed of amateurs losing the 5-meter band. It would be irony, indeed, to snatch away these ultra-low channels from the non-commercial radio enthusiasts who, without personal profit, have really developed them and discovered their practical utility. This most emphatically must never be allowed, as the 5-meter band is becoming of greater and greater importance to the amateur.

AMERICA WANTS TELEVISION NOW!

As an indication of the average American's interest in television it may be stated that anywhere there is a public demonstration and they are few and far between, the citizens of this country are always on hand in large numbers to take a first "look-see". The scene, below, is a demonstration, on June 4th, 1936, of the first Don Lee Broadcasting System's television service.

Near or Far?

Is television near or far? If you want your answer from the testimony at Washington, it is paradoxically both near *and* far! It is obvious that some individual broadcasters and manufacturers *base their often contradictory viewpoints on their own welfare, seeking to delay television if it means greater gains in the longer run, or to*



HIGH-DEFINITION SYSTEM

As an illustration of European Television development this picture of the Soviet cathode-ray television transmitter with a picture detail of 70,000 picture elements is published. It was built under the direction of V. L. Kreitser, Engineer of the All Union Scientific Research Institute for regular service in that country.

hasten it if they desire to get what they can while they can.

Can the delay be used to set up a monopoly in the art? We point out that *there is danger of this happening!* There are after all, broadcasters, manufacturers, patent pools, television companies, amateurs and, of course, the huge radio public to take into consideration, and whatever is done must be carefully considered if no serious errors are to be made in the Commission's decision.

Monopoly is the vital issue. Lee Ellmaker, President of RADIO NEWS, points this out in the boxed editorial accompanying this article. "We must however warn," he states, "that we should not let television fall into the hands of two corporations as has radio broadcasting."

Let All Participate

From the individual and smaller television experimenters comes the cogent plea that anyone who is developing television should have a *full chance*. There should be a release of data, equipment and facilities for amateur as well as commercial participation. The amateur's claim is necessarily strong and weighty with his Government because, in the scramble for the tiny waves, he must be permitted to hold his present facilities in addition to having a hand in future radio progress, a hand that he has always willingly offered to his Government and the radio art in general. The amateur cannot possibly be suspected of any "monopoly"; he is simply interested in radio progress and improvements, and should be guaranteed a future chance to add his knowledge to solving radio's problems.

American radio executives have frequently pointed out that this country has equalled or surpassed, in laboratory development, any television achievements of foreign nations. Even the Soviet and Japanese as well as the British, German, French and Italian equipment bears striking resemblance to the Farnsworth and Zworykin apparatus, at least in outward appearance if not in performance. The point is that England, Germany, Russia, France and other countries are bringing their television systems out into the open, with public participation, while the U. S. A. thus far is keeping its sight broadcasting achievements behind closed doors. Much of the American delay is caused by individual manufacturers and broadcasters who hold that television must be perfected before it is launched. *We suspect that the delay may be incidental to efforts to grab control of the television industry before it is born.*

America's supremacy in sound broadcasting and reception is an acknowledged fact. Other nations gauge their radio progress in terms of how many years they are behind the U. S. A. Now, must America yield this position of scientific and industrial prestige to satisfy the whims of certain individual firms? Shall these firms risk for the entire industry a secondary world rating for American television?

A Basic Television Standard

ENGINEERS of the radio industry have reached an agreement on the basic factors of development for television. This is to be commended.

The Communications Commission may well follow the advice of James M. Skinner, Chairman of the Radio Manufacturers Association, when he asked that regulations be adopted which will lead to a single technical standard of television transmissions so that one set may take advantage of all methods licensed to broadcast.

It is only natural to believe that a policy of give and take had to be assumed by the factors of this new industry. In doing this, however, we must be careful that the harmony among natural competitors in this field does not extend to the point where there will not be free competition in the development of television and the sale of sets in the future.

We must further warn that we should not let television fall into the hands of two corporations as has radio broadcasting. Rather than do this, we would even accept the principle that the air waves for television be conserved by the government and that programs be provided by license fees rather than commercial broadcasts.

LEE ELLMAKER, Publisher,
RADIO NEWS.

The Manufacturers Angle

It has been said that America might profit by the mistakes other countries will make in television and that a belated start here will lead to ultimate greater gains. But this theory's weakness lies in the fact that there may not be any mistakes made abroad and that the pioneer television nations will benefit by immediate gains. And, even if there are errors, the opportunity of benefiting by them will first be accorded the television nations making them.

The highlight of the Radio Manufacturers Association television proposals as set forth by James M. Skinner, President of Philco and chairman of the RMA Special Committee on Television, was his basic 5-point program "for the successful development of television in the public interest. The summary of the plan follows:

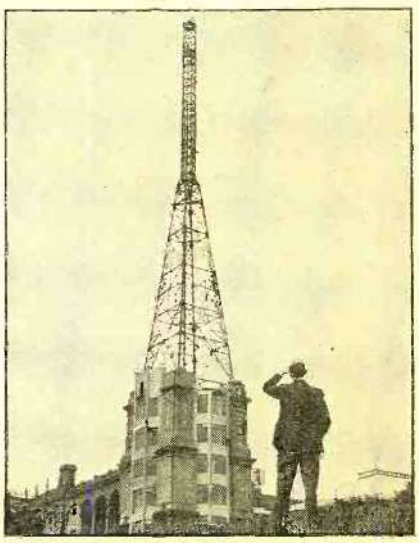
"1. Establishment of a single set of television standards for the United States so that all receivers shall be capable of receiving the signals of all transmitters.

"2. Development of pictures free from distortion and blur, approaching ultimately the distinctness and clarity obtainable in home movies.

"3. Provision for services giving as near nationwide (Turn to page 247)

A NEW HEIGHT IN BRITISH TELEVISION TRANSMISSION

This is London's newest television landmark. The television aerial mast at Alexandra Palace is 600 feet above sea level and it is from this point of vantage that the London Television Service is being inaugurated.



The Television Scramble

(*Continued from page 202*)

coverage as possible, so that the benefits of television may be available to all sections of the country.

"4. Provision for a choice of programs, that is simultaneous broadcasting of more than one television program in as many localities as possible, to avoid monopoly and to provide variety of educational and entertainment features.

"5. Lowest possible receiver cost and easiest possible tuning, to stimulate domestic installations of television receivers, both of which are best achieved by allocating for television as nearly a continuous band in the air waves as possible."

There were some controversial statements in Skinner's testimony. For example, he held that, while it is not possible at present to determine precisely what the selling price of a television receiver will be, it will most likely "cost less than the average motor car." This might, in the public mind, convey the thought that television must necessarily be expensive if its cost is compared to automobiles, even with the prefix of "less than." And a further remark of Skinner's that most of the industry does not agree with, is that "Commercial television must be born full grown."

While some of Skinner's points are well placed from the industrial angle, the indication of possible future claiming of the amateur 56-60 megacycle band is made clear. But Skinner shrewdly commends the amateur's contributions to radio. His remarks on this phase follow:

The most valuable part of the spectrum for television starts at 42 megacycles. At this frequency a given amount of broadcasting power provides the greatest signal intensity in the surrounding territory. The RMA Television Committee report will request therefore a television band extending from 42 to 90 megacycles.

"From 56 to 60 megacycles, there is a band allocated to amateurs. RMA recognizes the service the amateurs have contributed to radio development and their importance to the nation in providing a reserve of trained radio operators in times of emergency. RMA will therefore not request these frequencies for television unless it is found by the Commission that this band is not urgently needed by the amateurs, or is not especially well suited for amateur work. If so, another desirable television channel could be provided from 54 to 60 megacycles and a highly desirable continuous television band would result."

When asked to express his views on the aforegoing, Laurence M. Cockaday, Editor of RADIO NEWS, made the following statement: "There is no real necessity for even considering the confiscation of the 56 to 60-megacycle amateur band and reallocating this band for television. The RMA Television Committee's report containing the requests for television band from 42 to 90 megacycles on the basis that a "continuous" television band would be highly desirable will not hold water. RMA's statement that they will not request these frequencies for television unless it is found by the Commission that the band is not urgently needed for amateurs or is not especially well suited for amateur work, is merely a thin veil thrown over the strong presentations made by television interests for these particular frequencies that the amateurs have opened up so successfully. And the statement that the most valuable part of the spectrum for television starts at 42 megacycles is not even worth considering. In fact, it is my own opinion that the frequencies from 42 to 56 megacycles would serve a much more useful purpose if they were allocated for high-fidelity, ultra-short-wave sound broadcasting. The television bands, themselves, could then start at 60 megacycles (or higher) and extend continuously to as high a frequency as found desirable in future experimental practice and this band could be made "continuous" leaving the 56 to 60 megacycle band for the amateurs where it is proving so successful as a local and, during the summer, a DX band.

"This latter point brings up another consideration, where the low-frequency end of the proposed RMA television spectrum might prove an actual hazard for permanent, successful television operation. The reason for going to high frequencies for television, in the first place, is to escape the troubles accompanying interference between the ground waves and the sky waves in lower-frequency transmission. It has been proven conclusively this summer that even as high as 60 megacycles there are at various times in the year strong sky-wave signals making possible 5-meter transmissions at distances of 1000 to 1500 miles. At these periods of time television signals would be distorted on these frequencies and interference between television transmissions of various cities a number of thousands of miles apart would be experienced."

Mr. Cockaday suggested that still higher frequencies than 60 megacycles should be used where there will be no possibility of sky wave effects. He also states that the Federal Communications Commission cannot conscientiously decide that the 5-meter band is *not urgently needed by the amateurs or is not especially well suited for amateur work when around a city like New York alone there are over a thousand licensed amateurs using this band day and night.* Certainly it seems logical that the Commission could not say it *wasn't useful to the amateurs* and then turn it over to to television interests as the *most valuable part of the television spectrum.* It looks as though the RMA lacks the nerve to come right out and say they want the amateur band for television and to throw out the amateur—but that is what they mean alright!

The president of RCA, David Sarnoff, got his customary top billing at the informal engineering conference. And no one apparently begrudged a spotlight being aimed at him because all concerned were anxious to know the course his company intends taking in the new art. His utterances, if they were for a change, revealing, could give almost everyone else in the looming television industry an idea of what FCC hearings and legal battles lie ahead in the fight for an equitable allotment of visual frequencies.

But when the squire of Radio City came out with one of his typical statements: "Technically, television is an accomplished fact, although it is not yet ready commercially," it was apparent that RCA still was trying to *hold television on the shelf!* But other recent television activities of the company indicate that it is *making both plans and strides for its commercial affiliation with the new art!*

Sarnoff set forth a seven-point summary of his suggestions, the first four points of which, relative to the ultra-short allocations, are herewith presented:

"1. Because of the rapid strides of the radio art, advance reservations of frequencies should be made by the Federal Communications Commission to meet the needs of future services, such

as television, facsimile and high-frequency broadcasting. This will enable these achievements of radio to give their greatest possible public service as soon as developed, instead of compelling them to contest with older services for adequate space in the spectrum.

"2. *Except for experimental purposes, no allocations to individual applicants should be made in these reserved frequencies until actual public service is possible. No one should be permitted to reserve frequency space for future use and then let it remain idle while others carry the burden of development.*

"3. *In allotting frequencies the greatest economy and usefulness of the available channels should be promoted by requiring, so far as feasible, the multiple use of frequencies.*

"4. *In determining precedence in the allocation of frequencies, consideration should be given to services on the basis of their comparative importance to the public, the urgency of the tasks to be performed, and the requirements of the public to be served. Radio has made possible outstanding progress in mass communication. Ample allocation should be made for the greatest use of this public service for the broadcasting of sight as well as of sound, nationally and internationally.*"

With this official viewpoint of RCA on record, one can compare its plan for delaying the entire industry with its own current progress. Its $1,000,000 experimental field program has begun. The Empire State station, *established in 1931,* is providing programs for the company's own receivers. The Radio City television studio on the third floor of the NBC building is already in use, the A.T. & T. coaxial cable between Philadelphia and New York is nearing completion (although its use, by Government order, is not confined exclusively to RCA), and the company is busily aligning the interest of manufacturing licensees and broadcast stations.

Licensees of RCA were shown the company's television progress at a confidential New York demonstration which was followed by a banquet. Although *sotto voce,* the RCA message to the licensees by Sarnoff, Harbord, Schairer and other executives, was a well-aimed sales spiel. And, in Chicago, at the convention of the National Association of Broadcasters, I. R. Baker, chief of transmitter sales of RCA, made the announcement that high-fidelity television will be thrown open to inspection of broadcasters in New York in September.

It is also significant and interesting to note that RCA has been busy turning out television publications, although most of them are not for public distribution. Among three recent issues were: "Preliminary Specifications of Test Equipment Suitable for Television Research Development," "Licensee Bulletin LB 370: RCA Television System and 1936 Field Test Plan" and a 452-page volume entitled "Television," a compilation of technical papers delivered in the past by company engineers. Only the last named publication will be made available to the public, it was said, at a possible cost of $2.

So, apparently, RCA is looking out for its own share of the new field's returns. How about other firms getting the same opportunity? That's a question that comes to the fore.

Samuel E. Darby, Jr., appearing for eleven independent radio receiving set manufacturers—American Bosch, Philco, Zenith, Crosley, Sears Roebuck, Montgomery Ward, Emerson, Stromberg-Carlson, Motorola, Stewart Warner and Spartan—severely criticized the RCA patent pool.

"When, to use the words of Mr. Skinner," he declared, "television is born full-grown, it will be born with a full-grown levy of tribute of millions of dollars a year by RCA although RCA may not actually own a patent that bears directly on television, and solely because of radio patents in its pool by means of which approximately 50 million dollars have already been levied on and collected from the public.

"The Commission which will grant licenses in the new portion of the spectrum will have to consider the record of those who apply for channels.

"And I respectfully submit that the Commission should not be a party, in the assignment of frequencies, to the expansion of a monopoly that has already exacted a toll from the American public of approximately 50 million dollars and that holds forth the possibility of exacting as great or a greater amount from the public in the field of television."

Philo T. Farnsworth, of the Farnsworth Television Corporation, insisted that amateurs participate in television's development.

"It is our belief," he said that television offers no more difficulty to amateur receiving set builders than did radio in 1921 and 1922."

He took issue with other testimony that television must be born a finished service.

Farnsworth is one television inventor who has always been anxious for an early public start of visual transmissions. Just a few weeks after his testimony, there was set for hearing before the FCC his application for a construction permit for a new visual station on the 42-56 and 60-86 megacycle bands. The proposed site is Springfield, Pa.

The Don Lee Broadcasting System, of Los Angeles, and the DeForest Television Corporation, of Hollywood, were in accord with Farnsworth's views that television is virtually ready for the public and should be introduced soon on an experimental basis. The Don Lee firm is already, since June 4th, 1936, presenting regularly-scheduled programs of high-definition television films being utilized at the start.

Ralph A. Clark, of the Television Corporation of America, also favored early public participation. "During the past year," he said, "we have monitored and made transmissions in the high-frequency spectrum between 30 and 300 megacycles An average of 6 hours daily was spent doing this. Much of this experimentation was done in conjunction with the editors of RADIO NEWS. Mr. Cockaday suggests that television will ultimately use frequencies higher than 60-120 megacycles, due to the occasional detrimental sky-wave effects at lower frequencies." Clark assailed the idea advanced by Sarnoff, Skinner and William S. Paley—CBS president—that the cost of television is "excessive." "The cost," Clark said, "according to our most careful estimates is not $500,000! Nor is it one-tenth of that sum. Nor will the cost of a high-definition television receiving set with a high-fidelity, all-wave radio set be the price of a low-price automobile. Rather, it will probably cost the public the price of two ordinary radios."

Clark later added: "We are opposed to the idea of introducing television 'full-blown,' as one speaker here has put it. This is not the way radio was developed. Only by constant change and experience in actual amateur and commercial operation did it reach its present high standard." Clark also stressed that the amateur bands must be left "untouched."

Thus, the case was presented by the

various parties concerned. There will be much deliberation. But the scramble for television high-frequencies is definitely on. The Fall hearings should tell the story of the course the FCC decides television must take. And keeping in mind that there are *Courts* to offset a prescribed *course*, it can be expected that there will be plenty of legal action down the ultra-short field. Let's hope it will speed television!

A 5-10-20 Meter Super

(*Continued from page 206*)

did not run much greater than that sufficient to offset losses and give some useful gain per stage. As you will note by inspection of the circuit diagram in Figure 1, the second, third and fourth t.r.f. stages have the grid leads tapped down about two-thirds on the secondaries or grid sides of the transformers. The tuning condensers are across all of the turns of each coil. Tapping down on the secondaries also gives a better impedance match to the grids of the tubes. This procedure was not adopted in the first stage as we wished to get as high a signal voltage as possible on the grids of the first tubes.

Further inspection of the diagram will show that a crystal filter can be switched into the circuit between the second and third stages if its use appears desirable. The fourth stage is so designed as to make available a small amount of regeneration. This makes possible a further increase in selectivity of the t.r.f. portion of the receiver and can be utilized as a beat oscillator.

It was found after actually testing out the receiver that very good reception results could be obtained solely with the use of this t.r.f. portion. This combination can be made use of by turning switch No. 2 which puts the audio circuit of the National 1-10 unit directly after the first detector. It might be well to point out here that the audio circuit of the 1-10 unit is the only audio circuit of the receiver and is used as the audio portion in the various combinations in which this receiver can be operated. Headphone operation may be had in any combination of this receiver by plugging into the phone jack.

While this receiver is intended to be used with well-designed antennas, we find on test that a foot of wire on one of the antenna jacks was sufficient to bring in perfectly audible signals from Europe or Argentine, using only the tuned-frequency portion of the receiver. Naturally if there is much QRM, more selectivity is required than can possibly be obtained in the t.r.f. stages, although in this particular combination the selectivity is really quite remarkable, even without the use of the crystal. However, making use of the regeneration available in the fourth stage, the selectivity can be greatly increased even though we use only the t.r.f. portion of the receiver.

The normal way of operating the 20-meter portion of this receiver, for maximum sensitivity and selectivity, makes use of two frequency changers. Referring to both the main circuit in Figure 1 and block diagram Figure 17, it will be apparent that the frequency is changed in the first mixer, D1, to frequencies in the range between 1500 and 1900 kc. In mixer D2, the frequency is again changed to a band between 700 and 1100 kc. The signal is then amplified in tube V8 and rectified in tube V9.

It should be particularly noted that this receiver uses fixed oscillator frequencies for