

REPORT ON UHF-TV

OFFICIAL ATTITUDE OF THE FCC TOWARD UHF TELEVISION, AS REFLECTED IN A SPEECH BY CHAIRMAN COY AT BRIDGEPORT UHF-TV DEMONSTRATION

SINCE December 30, 1949, Bridgeport UHF-TV station KC2XAK has been on the air, rebroadcasting programs picked up by microwave link from WNBC New York. This experimental station was planned to approximate as closely as possible a commercial outlet, even to the extent that the installation was laid out for operation with only two engineers in attendance. Receivers converted for UHF reception were placed in homes at various locations in the Bridgeport area, and extensive field tests were begun.

It is common knowledge that reports on this installation have been highly encouraging.¹ Yet, applicants for TV broadcasting licenses have consistently ignored the wide-open spaces of UHF and have deluged FCC offices with applications for VHF assignments, despite the fact that the FCC allocation plan provides for only 170 more VHF stations in 118 cities of 50,000 population or more.²

Reason for the Meeting:

When 64 member-companies of RTMA demonstrated UHF converter units at Bridgeport last July, results were so impressive that a proposal was made to take UHF equipment to broadcasters around the country, so that they could see for themselves that "UHF is not the Antarctic of the radio spectrum." This was considered seriously, but was shown to be too expensive and time-consuming. Instead, RCA-NBC arranged a UHF seminar at Bridgeport for broadcasters and broadcast engineers.

On Sept. 12, the day of the meeting, FCC Chairman Wayne Coy was the principal speaker at a luncheon in the Hotel Barnum. This was followed by a comparative demonstration of reception on VHF channel 4 and UHF frequencies of 530 and 850 mc. Technical discussions were given by C. M. Sinnett, J. E. Young, and P. J. Herbst of RCA, and Raymond F. Guy of NBC.

Effect of New Stations:

Frank Folsom, president of RCA, opened the meeting with a short speech, significant parts of which are quoted:

"We of RCA are happy to be showing you today the first television station in

¹"Bridgeport UHF Test Results," by Raymond F. Guy, *RADIO COMMUNICATION* May, 1950.

²"After the TV Show—A Leg Jam," by Roy Allison, *RADIO COMMUNICATION* August, 1951.



NEW BRITISH TV TOWER

GREAT BRITAIN'S third television station, at Holme Moss, will begin operation on October 12. This site is close to Huddersfield in Yorkshire, at an elevation of 1,700 ft. The 750-ft. mast shown above is topped by a 2-bay antenna which handles effective radiated powers of 45 kw, video and 12 kw, sound. Programs transmitted will be the same as those from the Alexandra Palace and Salford Coldfield stations, and will be carried to Holme Moss by coaxial cable.

the United States to transmit, on an experimental basis, regular daily programs at ultra-high frequencies. This is a tremendous field we are working in. Television has been, and will continue to be, the nation's fastest-growing industry . . . I think it is big not just because of its sales potential but because, with television, we can see history happen. Last week, for example, we watched in our own living rooms as delegates of 52 nations participated in the Japanese Peace Treaty Conference . . . Yes, the opening of coast-to-coast television is a major step forward in the development of a nationwide television service.

"But when you come right down to it, the East-West microwave link is only part of the story. Another equally important chapter is yet to be told. And

it will be headed with three simple letters—UHF.

"To you and me UHF stands for Ultra-High-Frequency . . . But to the American public it [means] something much more understandable . . . an opportunity for every community in America to enjoy the pleasures of television.

"In cold figures, the opening up of new . . . channels in the UHF band will shortly mean the addition of nearly 2,000 new television stations . . . Together with the new stations proposed for the present VHF band, this will mean the building of a nationwide television network of nearly 3,000 stations.

"I don't think that I am being overly optimistic when I predict that within a short time after these . . . stations become realities, there could be 50 million television sets in the United States . . . nearly every community in America not only [having] television, but with station facilities that will permit them to originate their own programs."

Necessity for UHF-TV:

Following Mr. Folsom's introductory remarks, FCC Chairman Wayne Coy took the floor. His speech was extemporaneous, and no stenographic transcript was made. However, because Mr. Coy's words were obviously of vital interest not only to broadcasters but to all sections of the industry, they will be reconstructed with as much detail as possible from notes made at the time.

First, Mr. Coy indicated that he wanted to convince station managers and their representatives of the very real advantages of UHF for television. If he could so convince them, he said, it would considerably shorten the time required to inaugurate nationwide television service.

So sold on UHF is he personally, Mr. Coy stated, that he would like to see all TV in the UHF range. In fact, he has proposed this, but has been outvoted by other members of the Commission. However, he is firmly convinced that the ultimate home of TV will be in the UHF band.

The reasons for this statement are apparent when the history of VHF-TV is reviewed, said Mr. Coy. Before the war, 18 VHF channels were allocated for television. In the 1945 reallocation, 5 of these were deleted for mobile services, while other such services were to share

the remaining 13 channels with TV on a non-interfering basis. This proved impossible of accomplishment, so channel 1 was deleted and given to the mobile services for their exclusive use. Mr. Coy thought that this was not quite a fair settlement, and indicated that the needs of the mobile services are so pressing that this reallocation was not the final answer. Unless engineers can develop mobile radio equipment capable of operating on still narrower channels, he said, and do it quickly, television will have a vociferous opponent for VHF frequencies. He thought that such devices would probably not be available soon enough to relieve the increasing congestion in the mobile services.

Another reason for fostering UHF-TV, Mr. Coy said, is that it is manifestly impossible to have a truly competitive television service employing VHF alone. Originally, allocations were such as to provide at least 180-mile separations between stations on the same channel. Applications were so numerous that the FCC yielded to supposedly well-informed opinion and began making co-channel assignments at 150-mile intervals. The resulting interference caused the freeze which began in September, 1948, and is not yet ended. It is evident that 12 channels are not enough for a comprehensive and competitive TV broadcasting system.

The FCC, Chairman Coy stated, believes firmly in the efficacy of competition in building healthy and prosperous communication services. He cited the 2,300 audio broadcasting stations in the Country as an example of the results of this policy. By utilizing the UHF band, plus the present 12-channel, 72-mc. segment of the VHF band, almost 3,000 TV stations can be accommodated. This should provide adequate possibilities for healthy competition, not only among the stations themselves, but with the other forms of entertainment media. He also stressed that the FCC would be vigilant against the formation of monopolies in radio communication.

Competition and Progress:

Mr. Coy is convinced that comparative demonstrations of UHF and VHF performance have shown conclusively that manufacturers have enough technical know-how in both transmitter and receiver design for UHF, so that the FCC is now justified in allocating UHF for commercial television.

There is more room for improvement in UHF techniques — but this goes for VHF also, he remarked. There has been continuing progress in receiver design for the past 20 years. Much of this has been in the last 18 months, it will be noted, when manufacturers with large invest-

ments in tools for receiver fabrication have been confronted with the problem of extending receiver markets. This is, of course, beneficial to the public — but, he asked, why hadn't the public been considered before?

In its proposed initial allocations for UHF-TV, the FCC has taken into account manufacturing problems such as suppression of oscillator radiation and image response. Thus, it is planned to separate UHF stations in the same city by 6 channels. This should result in facilitating the design and production of satisfactory UHF receivers and converters, at lower prices. It should be noted that this plan of allocation was not for the benefit of the manufacturers, but for the public interest. By making receivers as inexpensive as possible, the expansion of TV service will be hastened considerably.

Mr. Coy said that he had never been able to understand why manufacturers have not shared this concern for the public, since good, inexpensive receivers will create wider markets. He doubted that any manufacturer had appeared during the recent allocations proceedings to seek wider spacing between UHF channel assignments. There was surprisingly little concern for the public's benefit among both broadcasters and manufacturers. As a rule, he said, broadcasters were interested in means to reduce interference, especially by reducing the number of licenses granted, but only after they had their licenses.

Quality on UHF:

The chairman was of the opinion that the quality of reception from the two Bridgeport UHF transmitters is excellent. Perhaps the performance is not quite equal to the best now obtainable on VHF, but it was evident that UHF is "not a lemon, as some have inferred." With respect to ignition interference, noise, and diathermy vulnerability, it is better than VHF. He said that in downtown New Haven, about 16 miles from the KC2XAK transmitter, reception was equal to that from the New Haven VHF station and suggested that all those too timid to venture into UHF should see this for themselves.

Power Limitations:

Mr. Coy pointed out that as frequency is increased, the 5,000-microvolt contour is extended further from the transmitting antenna. However, receiver input requirements increase disproportionately.

In order to equalize the coverage areas, a UHF station must have an effective radiated power 10 times that of a station in the lower VHF band, or 3 to 4 times the power of a high-band VHF station.

There are no limitations on maximum

UHF power contemplated at present, he said. Power limitations will be necessary only when transmitters 10 times as powerful as present VHF transmitters are produced.

Conclusion:

Chairman Coy reiterated that the VHF channels are not adequate to provide a suitable competitive television system, or even a single outlet in each city of over 50,000 population. All the UHF band must be employed eventually. Of all present applicants for TV licenses, he said, two-thirds to three-fourths will have to accept UHF assignments or go without.

Equipment Maintenance:

At the conclusion of Chairman Coy's speech, Mr. Folsom introduced Dr. C. B. Jolliffe, vice-president and technical director of RCA. He spoke of the Corporation's research work on UHF, and said, in part, "Since December 30, 1949, we have operated this station on a regular schedule . . . And I'd like to point this out: the maintenance of this station has not been any more difficult or complicated than [that of] a standard VHF television station.

"The engineers of NBC and the RCA Service Company have made a careful survey of propagation and reception throughout the Bridgeport area, and recordings have been made at relatively great distances from the station. Our tests have showed that reception on UHF can be just as clear and stable as on VHF. In some instances, it is even better."

And it was better on the occasion of this demonstration. In the comparative tests that followed the talks, the two UHF receivers were unaffected, even with reduced signal inputs, by automobiles passing in the street below. On the other hand, the picture on the VHF set was occasionally broken by the ignition interference.

Differences in picture quality and resolution, if any, were not discernible a few feet away from the receivers. The converters employed were not much larger than a cigar box, and seemed to be fairly simple affairs.

Broadcasters Must Act:

This very impressive demonstration confirmed Mr. Coy's contention that broadcasters may, in their generally futile insistence upon entering TV via VHF channels, lose the opportunity to get in on the ground floor when the FCC begins issuing CP's again. As a matter of fact, if they delay too long they may find that all the UHF channels available in their localities have been applied for by less short-sighted individuals.