Television in France

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A note on the position of television in France during the war, and post-war prospects.

(Translated from the French)

AT the outbreak of war in September, 1939, the French Broadcasting Service was undertaking regular test transmissions of television, including direct studio programmes and films. The wavelength of the transmitter was 6.52 m. (46 Mc/s.), sound being radiated on a wavelength of 7.14 m. (42 Mc/s.).

The picture definition varied between 440 and 455 lines, interlaced, 50 frames per second. The aspect ratio was 5 : 4.

At that time several manufacturers were putting out regular test transmissions under slightly different conditions. La Cie des Compteurs (M. Barthelémy) used 450 lines, the B.T.-H. Company (under Marconi licence) had adopted 455 lines, and la Cie Grammont 441 lines (German standard).

Television during the Occupation

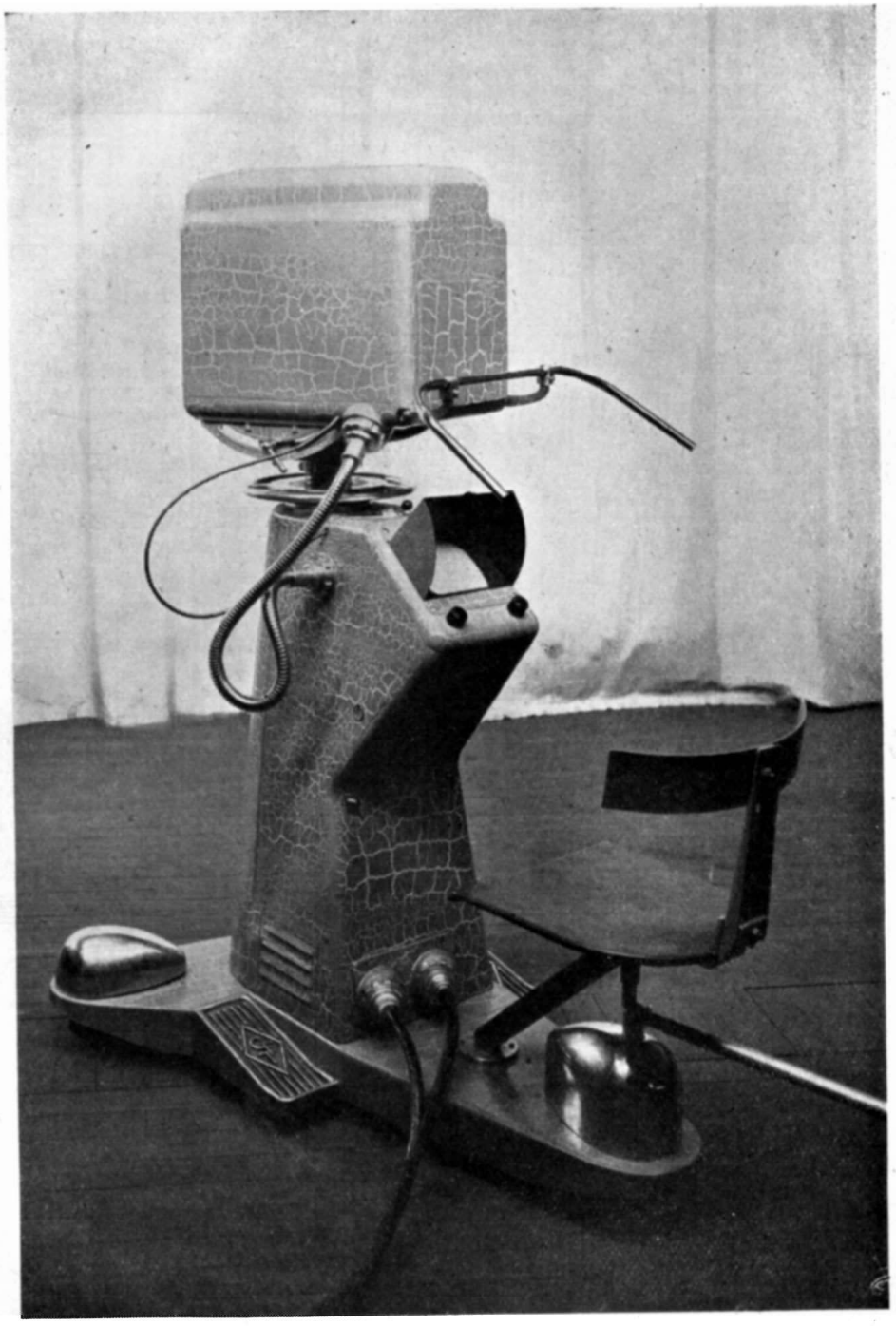
The declaration of war interrupted the experimental transmissions, which were only resumed in July, 1940, under German control. In 1943 the Vichy Government's Broadcasting Administration arranged with the German authorities to undertake television transmission in Paris on the German standard of 441 lines. The arrangements were in the hands of German and French technicians.

The original Eiffel Tower transmitter was used with some modifications, but the studios, which were formerly at the Ministry of Posts and Telegraphs, were replaced by new installations in the neighbourhood of "Magic City." The transmitting equipment was of German manufacture and supplied by A.E.G. and Telefunken, chiefly for Telecine.

The transmission was poor, and the synchronising varied considerably during the course of the transmission. The French public, both on moral and material grounds, did not take much interest in programmes under enemy control, but nevertheless this did allow certain manufacturers to develop receivers and undertake useful research.

On the liberation of Paris, the Germans dismantled and took away all the studio camera equipment but, doubtless from lack of time, left the Telecine transmitters. In general, the studio is almost intact. On the other hand, the Eiffel Tower transmitter was almost completely destroyed before the Germans left; the fragile apparatus was smashed, machines and cooling plant broken and the oil-filled transformers were punctured by bullets. Fortunately, they did not have time to blow up the aerial and feeder installation, although an explosive charge had been prepared for the purpose.

Now reconstruction has to be undertaken in common with the reconstruction of all the destroyed broadcasting stations. The Director



French television pick-up camera with electronic viewfinder.

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of French Broadcasting earnestly desires to see French television take a leading place in the world and every effort is being made to reach this goal. The installation of a large experimental television centre in Paris was commenced in 1944, but transmission so far has not been undertaken for military reasons.

At the time of writing it is certain that transmission will be made on the 1939 standard, *i.e.*, 441-455 lines, 50 frames per second interlaced. However, the results obtained in various research laboratories, and in particular by M. Barthelémy, suggest that the existing standard can be ultimately replaced by a definition of the order of 1,000 lines. The possible delay in putting this new system into operation is given in some quarters as two years. Certainly this would seem to be the minimum time having regard to the enormous industrial difficulties in France at the present moment.

The receivers acquired for the present television standard will not be suitable for the very high definition transmissions, and under the circumstances it does not seem reasonable to ask television viewers to acquire receivers at a high price which will only be serviceable for a short time before becoming valueless.

It has been proposed to make available receivers which will not be sold, but hired, at a cost which will vary according to the length of use. This seems to be a satisfactory and practical solution, which should encourage a satisfactory number of viewers. The present television standards are capable of producing excellent results and they allow constructors to study transmission problems, besides enabling viewers to form an opinion of the possibilities of television reception even under the present provisional conditions.

It is probable that the experimental transmission will be more or less limited to the Paris area. On the other hand, as soon as the new standard is introduced, the whole country will be covered if possible. The development of such a network will be gradual and will commence with the equipment of urban districts where the population density is greatest. The first programmes are planned to cover the towns of Lille, Lyons, Marseilles and Bordeaux.

The interlinking of the different stations will be accomplished by radio relay as adopted elsewhere. This seems to be the most practical method for the transmission of frequency bands of 10 to 20 Mc/s.

At the commencement, transmissions will be given three days a week with two programmes a day of 1½ hours' duration.

During the war, the research laboratories, prevented from pursuing work of industrial importance, devoted their time to technical work on a variety of subjects. This work was first of all concerned with the quality of the picture. Experiments have shown, in principle, that the ultimate definition is limited, not by electronic factors, but by the optical viewing conditions and the photographic characteristics of the film transmitted.

M. Barthelémy has already developed a transmitter and receiver capable of giving pictures with a definition greater than 1,000 lines corresponding to a frequency band of 15 Mc/s.

The investigation of very high definition pictures would give few results of interest if the pictures were affected by optical defects, such as distortion and irregularity of brightness and, above all, if they were not obsolutely stable. A stable picture of minimum definition is definitely preferable to a higher definition picture which is continually failing due to some fault in the synchronism.

The developments in transmission, particularly in the utilisation of steep-fronted waves, have contributed largely to the stability of the picture.

A pick-up tube, using slow electrons, termed the Isoscope, has been developed by M. Barthelémy and avoids the disadvantages of the Iconoscope besides permitting direct modulation of the carrier by light.

Reverting to an earlier idea, which was never put into practice with success, French inventors, such as M. P. Toulon, have suggested the use of large multi-cellular screens with the object of avoiding the use of projection tubes. Improvements in existing equipment have also been made, such as the production of cameras with electronic viewfinders, of which an example is shown in the figure.

With the great interest taken in the future of high definition, the possibilities of medium (450-line) definition should not be overlooked and the transmission of direct scenes and films can be studied with advantage.

Such is the general position of television in France at the present time and it is hoped to describe some of the more interesting research work carried out during the war in a later article.