Scanning our past from The Netherlands : the coronation of Queen Elizabeth II and the early days of Eurovision

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Scanning Our Past from The Netherlands

The Coronation of Queen Elizabeth II and the Early Days of Eurovision

Televising the coronation of Queen Elizabeth II (see Fig. 1) on June 2, 1953, now 50 years ago, not only highlighted the start of pan-European cooperation with regards to the exchange of TV programs, but was also instrumental in achieving a better understanding among European peoples.

Several years earlier, in 1947, Marcel Bezençon, the director of Radio Lausanne, had proposed to the United Nations Educational, Scientific, and Cultural Organization (UNESCO) the draft constitution of an international organization for radio and TV broadcasting. At that time, TV standards had been developed in Europe that differed from the earlier-implemented U.S. standards, mainly due to the difference in the electrical power frequency in Europe (50 Hz) compared with the 60-Hz power grid in the United States and some other countries. In addition, European TV standards also incorporated some further refinements of TV performance approaches by taking advantage of later innovations in technology.

I. SYSTEMS

In the U.K., a 405-line scanning system was in existence; in France, TV transmission was based on 441- and 819-line scanning standards, while 625 lines per picture was favored by most other European countries as a result of attempts to unify standards by the Comité Consultatif International des Radiocommunications (CCIR) [this organization is also currently called the International Telecommunication Union on Radiomatters (ITU-R)]. Clearly, this diversity was a technical challenge with regards to the prospect of eventually sharing television programming among the various European nations.

However, cultural exchanges in television programming were underway. Already by mid-1952 a first official TV “program week” between London and Paris took place—a bold experiment at that time, where viewers in Britain and France simultaneously watched a whole week of programs televised from Paris. The audiences of that era seemed pleased with this experiment.

However, this experiment required a long chain of microwave TV relays, including a link across the English Channel (which is only one hop) and a scanning frequency

Fig. 1. Queen Elizabeth of Great Britain, shown in a photograph taken in 1953 prior to the coronation, taken in the green drawing room of Buckingham Palace. (Portrait by Baron, issued by Camera Press Ltd., Russell Court, London, U.K.; courtesy of IEE Archives, London, U.K.)

conversion system between the 819-line scanning and 411-line systems in France and the 405-line system in the U.K. This conversion system was developed by the French Radio Television (RTF) organization. It was a real triline system.

On a previous occasion—the centennial commemoration of the first cable connection between France and the U.K.—a British Broadcasting Corporation (BBC) mobile television unit was shipped to Calais on the French side of the Channel, where it televised programs, which were relayed according to the British 405-line standard on a microwave link to the existing British TV network. While the viewers of the existing British network could enjoy this small leap over the Channel, French viewers could not yet see these programs;

Fig. 2. Map of northern Europe television transmission plan, which shows the parts of the provisional European television network that was set up for the coronation. (Map based on one appearing in *Philips Technical Review*, vol. 15, May 1954.)

the important and noteworthy achievement on that particular occasion was clearly in getting the pictures across the English Channel by the use of microwave transmission.

II. CORONATION TV TECHNOLOGY

The idea of bringing live video of the coronation to the European continent was a significant technological undertaking of great significance. Extending the existing cooperation by televising the coronation events in the U.K. in 1953 not only to France but also to Belgium, the Netherlands, and West Germany (see Fig. 2) became an international television linkup on a scale never before attempted. It raised a lot of interest, but it also introduced some political discussions in France and, in particular, in Belgium, a country in between the 819-line system in the South (France) and 625-line countries in the north (the Netherlands and West Germany). For the country of Belgium, this was indeed a technological dilemma of the first order.

Fig. 3. This is an interior photograph of the Breda trailer. In the foreground at left is a line and raster frequency generator for the 625-line system; further back is the line inverter; and at the extreme rear are the control receivers operating at 405 lines and 625 lines respectively. (*Philips Technical Review*, vol. 15, May/June 1953).

Fig. 4. Schematic diagram of the optical line-converter that transforms 405 lines to 625 lines. C is the cathode ray tube for the 405-line system; I is the iconoscope for the 625-line system; $f_r = 25$ Hz; $f_{L1} = 25 \times 405 = 10.125$ Hz; and $f_{L2} = 25 \times 625 = 15.625$ Hz. (Philips Technical Review, vol. 15, May 1954).

Belgium had not yet decided on their basic system and was using a 625-line system for the Flemish areas of their country and an 819-line system for the Walloon areas. This would complicate things. For that reason, the TV signals for the 405 lines were conveyed through northern France and via Brussels and Antwerp in Belgium to Breda in the Netherlands, where the TV signals were converted to 625 lines and relayed further to Hamburg, West Germany and back to Belgium for distribution to the TV networks of these countries.

III. DIFFERENT SYSTEMS

The diverse frequencies of European power grids in various countries had also to be considered. As the 50-Hz electric distribution mains in the U.K. and the continent were not coupled, a special 50-Hz signal from the U.K. had to be sent separately to allow correct synchronization of the television signals. In France, the conversion from 405 to 819 lines took place in Paris. To implement this ingenious temporary network, microwave equipment on 9 GHz was used that eventually would be installed as part of the successive regional TV networks in the different continental countries.

The temporary relay station at Breda, the Netherlands, made use of the local church tower with the famous onion-shaped top, where, after a climb of many steps, the technicians operated the microwave relay and the routing equipment, while the line converters were located in a van at the base of the tower (see Fig. 3).

In Britain, the coronation day events were broadcast from the BBC's five high-power television transmitters and three low-power stations, specially installed in time for the occasion, and watched by approximately 20 million viewers. In Europe, an estimated audience of some 2 million people also watched these scenes televised directly from London to the Continent. Other countries had to wait for the arrival of a special plane carrying loads of films to experience any television coverage of the event.

IV. OPTICAL LINE CONVERSION

For the critical line conversion, the optical principle (see Fig. 4) was chosen, in which an optical picture is displayed by a picture tube and viewed by a television camera. The charm of this simple solution is that the intermediate picture can be observed independently in order to optimize the scanning by the image iconoscope. The conversion in principle can be performed without much loss of resolution and gradation. However, the analog character of the conversion introduced practical problems caused by the difference in speed for both writing and scanning operations. By choosing long-lasting persistence phosphors in the picture tube, this problem could be eliminated. Spot wobbling equalized the differences in the varying distances of both writing and scanning lines; clamping restored the black level of the newly scanned lines. The line converter was developed by the Philips Research Labs.

Television technology in Europe has evolved a great deal since the coronation of Queen Elizabeth, but many believe that this day in June just 50 years ago was an important milestone in highlighting the potential of television technology as an important medium to transcend European borders, as well as cultures.

Today, with the firmly established use of communications satellites, the age of instantaneous global video is well embedded in our cultures; but let us not forget those who have paved the way with their dedicated work in solving technological challenges of the past one problem at a time.

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