

FIG. 1. *Bird's-eye view of the multi-element curtain arrays at Sackville, New Brunswick.*

# CANADA'S LOUDEST VOICE

Reflecting the strength and virility of a young and powerful country, Canada's new voice has been made strong and clear by the application of the latest developments in broadcast engineering.



FIG. 2. This modern structure houses three RCA 50 KW transmitters—two Type 50-SW and one Type 50-D.

"The towers beside the River Tantramar are talking, and the sound of Canada's new voice is strong in the lands of Europe."

These were the poetic words CBC's Gerald Noxon used to describe Canada's entry into the field of international broadcasting. The towers to which he referred are those of CHTA, the CBC's shortwave station located on the Tantramar Marshes near Sackville, New Brunswick. And the "voice", of course, is the signal CHTA puts into Western Europe. Located some 500 miles nearer to Europe than U. S. stations—and, using a highly directional antenna, CHTA has often been reported by European listeners as the strongest station on the North American continent.

#### A DELUXE INSTALLATION

CHTA, which went on the air Christmas Day, 1944, is Canada's only shortwave broadcast station—but is certainly one of which all Canadians may well be proud. And they are! Some of them have called it "the best shortwave radio station in the world."

Remembering the installations at Bound Brook, Wayne, Dixon, Delano and San Francisco, this may seem like rather a broad claim; however, there is no question that it is one of the world's outstanding stations. The location is nearly ideal; the building is spacious, well designed, and of attractive appearance. The equipment is the very latest and very best throughout. The antennas follow the most advanced designs and are arranged in flexible and convenient manner. Even the sometimes neglected factors such as convenience and living quarters for personnel have been carefully considered.

#### IDEAL LOCATION

In planning a shortwave transmitter of this type, the location of the plant and its antenna is a matter of primary and vital importance. Three main points have to be considered: First, the site must be located in a part of the country enjoying the maximum freedom from magnetic conditions unfavorable to shortwave reception and transmission. Second, the site must be



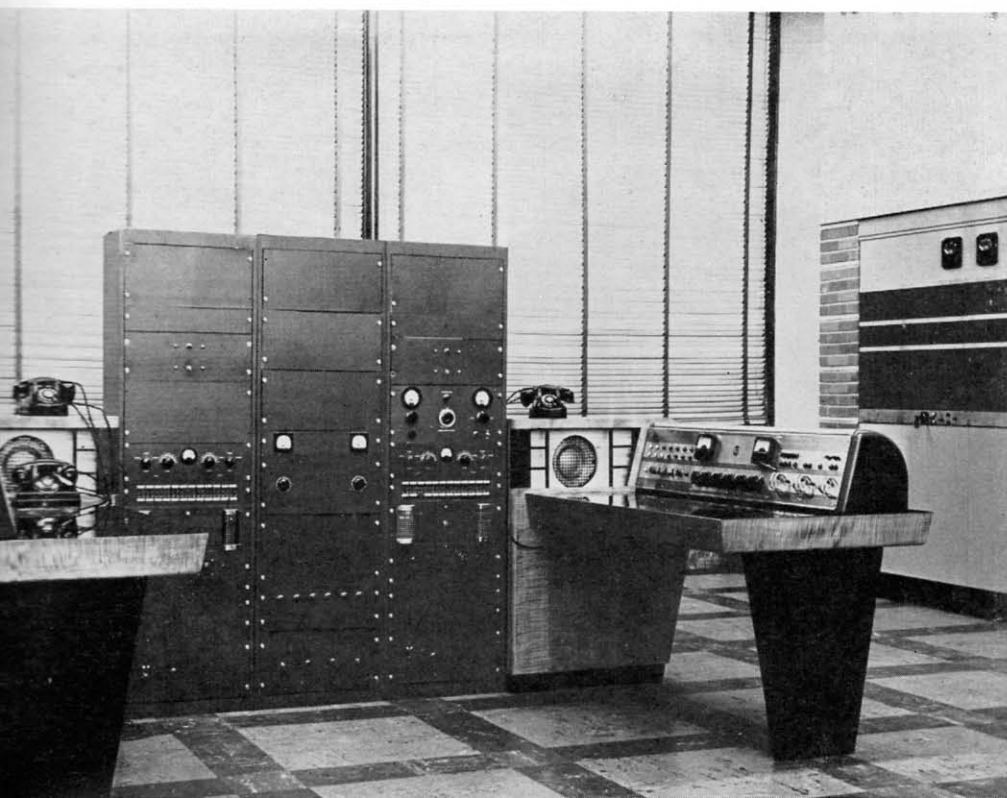


**FIG. 3.** On the mezzanine floor are two RCA 50-SW transmitters with monitoring, test and control equipment at center. On the lower floor is CBA'S standard band RCA Transmitter Type 50-D.

as near as possible along a great circle course to the area of the globe where the best and most reliable service is desired—in this case, Britain and Western Europe. Third, the local ground conditions should be favorable to the reflection of radio waves.

The marshlands near Sackville meet all three of these main requirements and the location was particularly suitable because the CBC already had a medium-wave transmitter (Station CBA)

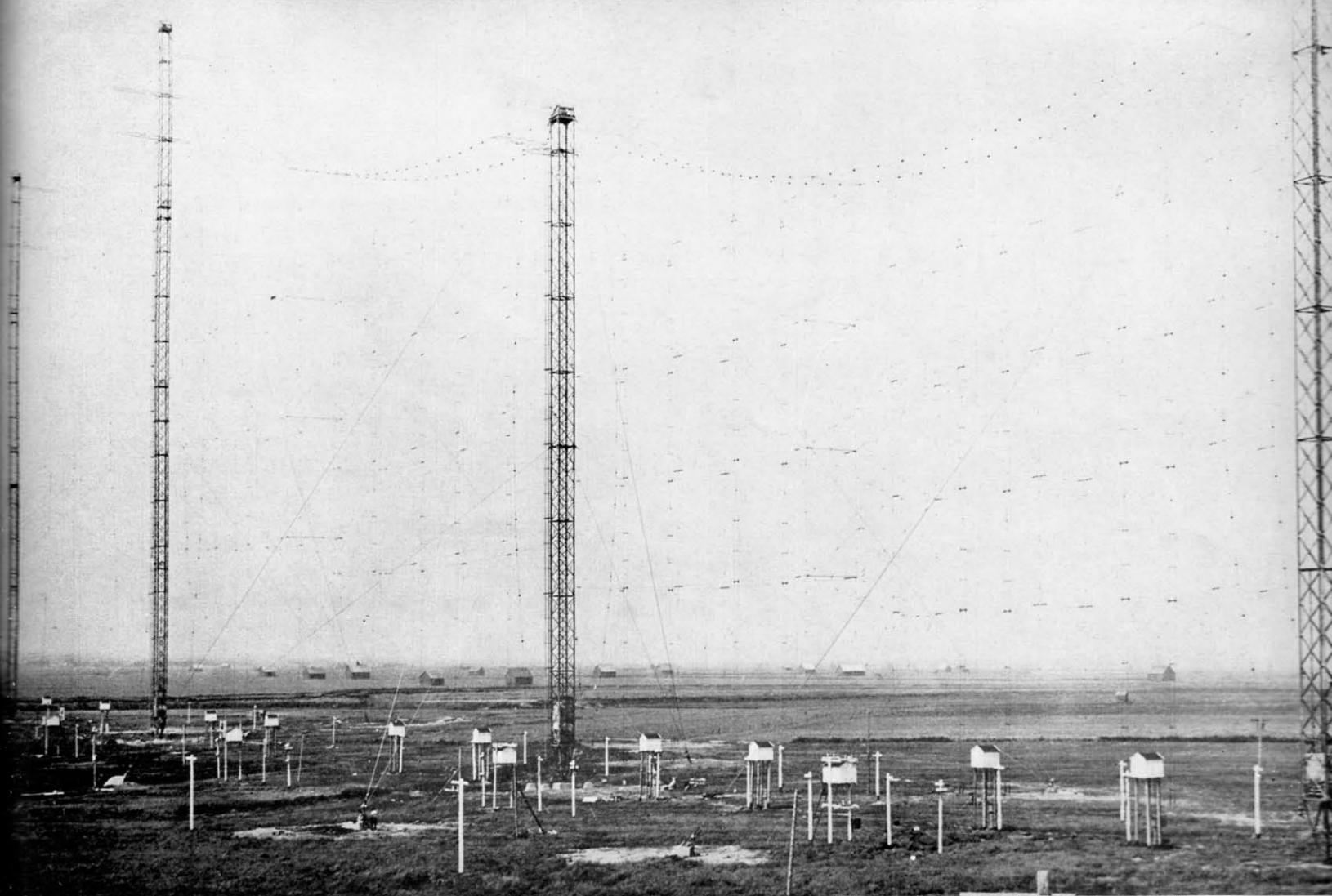
established there. Experienced personnel were already living in Sackville and it was clear that considerable economies in operating costs could be achieved by merging the new transmitter with the old one. For these reasons it was decided that Canada's short-wave transmitter should be built at Sackville, while the program and administrative setup was to be established in Montreal, a distance of 600 miles—the two units to be connected by telephone lines.



## MODERN BUILDING

When plans for CHTA were made, it was decided to erect the new building over the then existing CBA transmitter house, as only in this way could the normal and uninterrupted operation of the existing Standard Broadcast 50 KW transmitter be maintained. The Engineering Department, headed by G. W. Olive and his assisting engineers in this project—Messrs. D. G. McKinstry, Nicholls, Hayes, and Werry—went into a huddle and finally evolved the building shown in Figure 2. This building is of two-level construction—with ground floor and mezzanine. On the ground floor is the RCA 50-D transmitter, known to radio listeners in

**FIG. 4.** Close-up of operating consoles for the two 50-SW transmitters. Centered between the consoles are three racks containing audio, test and monitoring equipment.



**FIG. 5.** *The directional antennas include a high-gain array which directs a beam to Europe and, in reverse, to Central America and New Zealand, and smaller arrays directed to South America and Asia.*

the Maritimes as CBA. On the upper floor, facing each other and separated by approximately 60 feet of floor space, are the two high-frequency RCA MI-7330-A 50 KW S-W transmitters (see Figure 3). A room is also available in which to install an RCA MI-4750 7½ KW shortwave transmitter.

On the mezzanine floor, looking down on the CBA transmitter, are four offices occupied by (1) the regional engineer, H. M. Smith; (2) his secretary; (3) two supervisors, Messrs. Merrill Young and Meurillo Lapate; and (4) the operating staff. On this floor level, too, is located the master control room which handles all incoming programs, shortwave and standard broadcasts, as well as four announcer-operator control booths, one studio, and one recording control room.

An innovation in transmitter building design has been incorporated in this plant at Sackville. It is possible for visitors to walk around behind the transmitter enclosures and actually see these powerful transmitters in operation (Figure 8). Normally, this cannot be done without interrupting program service.

On the ground floor is the staff lounge. The CBC has provided all the comforts of home for its Sackville staff, including two showers and—in case of snow-ins—emergency sleeping quarters, complete with kitchenette, refrigerator, cook stove, etc. Also on this floor are the central registry office where all files and records are kept, and a shielded laboratory for measurements and general test. Two offices, occupied by the field engineers, a class



**FIG. 6.** *Front view of RCA Type 50-SW #2 with control console and audio rack at left.*





FIG. 7. G. W. Olive, Chief Engineer of The Canadian Broadcasting Corporation.

room and an up-to-date workshop, equipped to handle emergency repairs and general maintenance, complete this floor picture.

#### NEWEST TYPE EQUIPMENT

CHTA is completely RCA equipped—with the newest types of apparatus being used throughout. Chief items of the equipment are, of course, the two big shortwave transmitters. As previously mentioned, these are mounted on the mezzanine floor in facing positions with a space of about sixty feet between the front panels (see Figures 3 and 6). At the far end of the floor,

and centered between the transmitters, are three racks containing test and monitoring equipment. At the left and right sides of these racks are the transmitter control consoles. These consoles (Figure 4) contain all of the switching and monitoring controls for complete operation of the transmitters.

The transmitters at CHTA are standard RCA Type 50-SW Shortwave Broadcast Transmitters. Each of these transmitters includes a single modulator and a high-power rectifier (center panels) which may be switched to either of two power amplifiers. Each amplifier is capable of putting out 50 KW at any frequency from 6 mc to 21 mc. Provision of two amplifiers facilitates frequency changeover, since all r-f circuits can be adjusted on one unit while the other is in operation. Thus, changeover requires only the switching of modulation and high-power connections.

In addition to the two 50 KW shortwave transmitters there is, in the same building, the 50 KW standard-band transmitter of CBA. This is an RCA Type 50-D installed just before the war. The transmitter is on the lower level. The control console and the far left-corner of the transmitter can be seen in Figure 3. Besides these three 50 KW's, space has been left for an RCA 7½ shortwave transmitter to be added later this year.

#### HIGHLY-DIRECTIONAL ANTENNAS

CHTA has three antenna systems in operation at the present time. One is the high-gain array which is beamed toward Europe. It has approximately 11 db. gain and is sectionalized with curtain arrays for 17, 15, 11, 9, and 6 megacycle bands. 600 ohm transmission lines are used to feed all the arrays. These terminate in an antenna switch room located behind one of the transmitters. Remote operation is to be provided for reversing the radiator and reflector on each array and for slewing of the individual arrays. There are, in addition to this high-gain array, two medium-gain arrays directed to South America and South Africa. These operate on the same band of frequencies and can also be reversed and slewed.

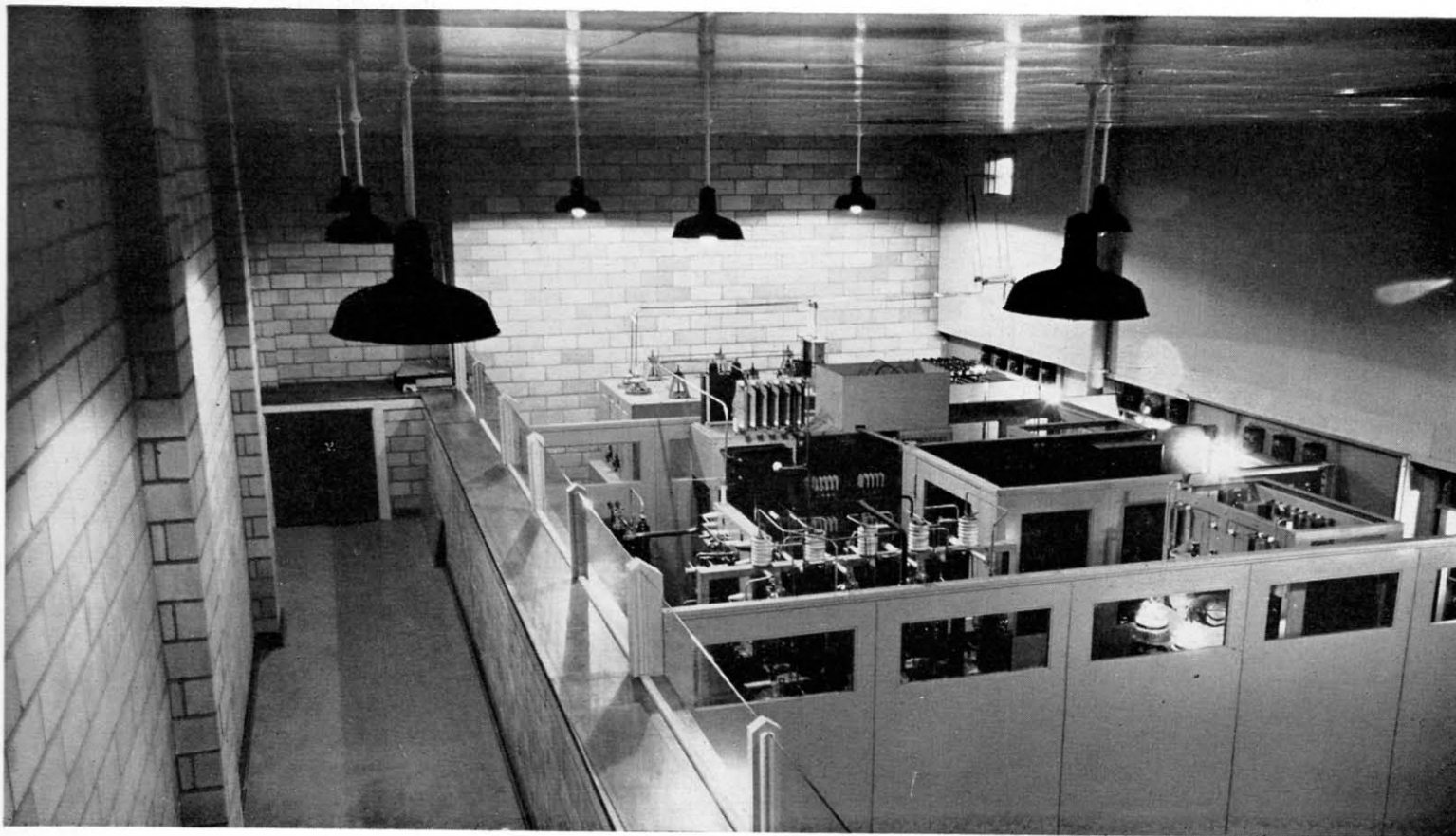


FIG. 8. Rear view of one of the RCA 50-SW Transmitters showing walkway for visitors.