

# The Erection and Installation of 2YA

## Comprehensive Survey of Equipment by Station Engineer

(By MR. J. M. BINGHAM, Assoc. M.I.R.E.)

The new broadcast station 2YA, just completed, marks another milestone in the progress of the Radio Broadcasting Company, Ltd. It is only a matter of eight months or so since the company decided to erect a high-power station in the neighbourhood of Wellington, and immediately following this decision the first matter to be given consideration was a selection of a suitable site for the transmitter. With this end in view a certain amount of exploration work was done before the present site on Mount Victoria was finally decided upon. There has been some criticism levelled against the company for having erected the new station in close proximity to Wellington city, but the selection of the present site was made only after due consideration had been given to the requirements of the type of station to be installed.

### Factors in Situation.

First and foremost was the question of "getaway." It was obvious that in a hilly location such as Wellington, it was not possible to place the station in a valley, owing to the screening effects of the surrounding hills. The station, therefore, had to be high up. Then there was the question of land-line communication. The studio from which the artists were to broadcast would be situated near the heart of the city, and in order to have the land-lines connecting the studio with the station as free as possible from interference and other defects, the distance had to be as short as possible. Then again it was inadvisable to use up val-

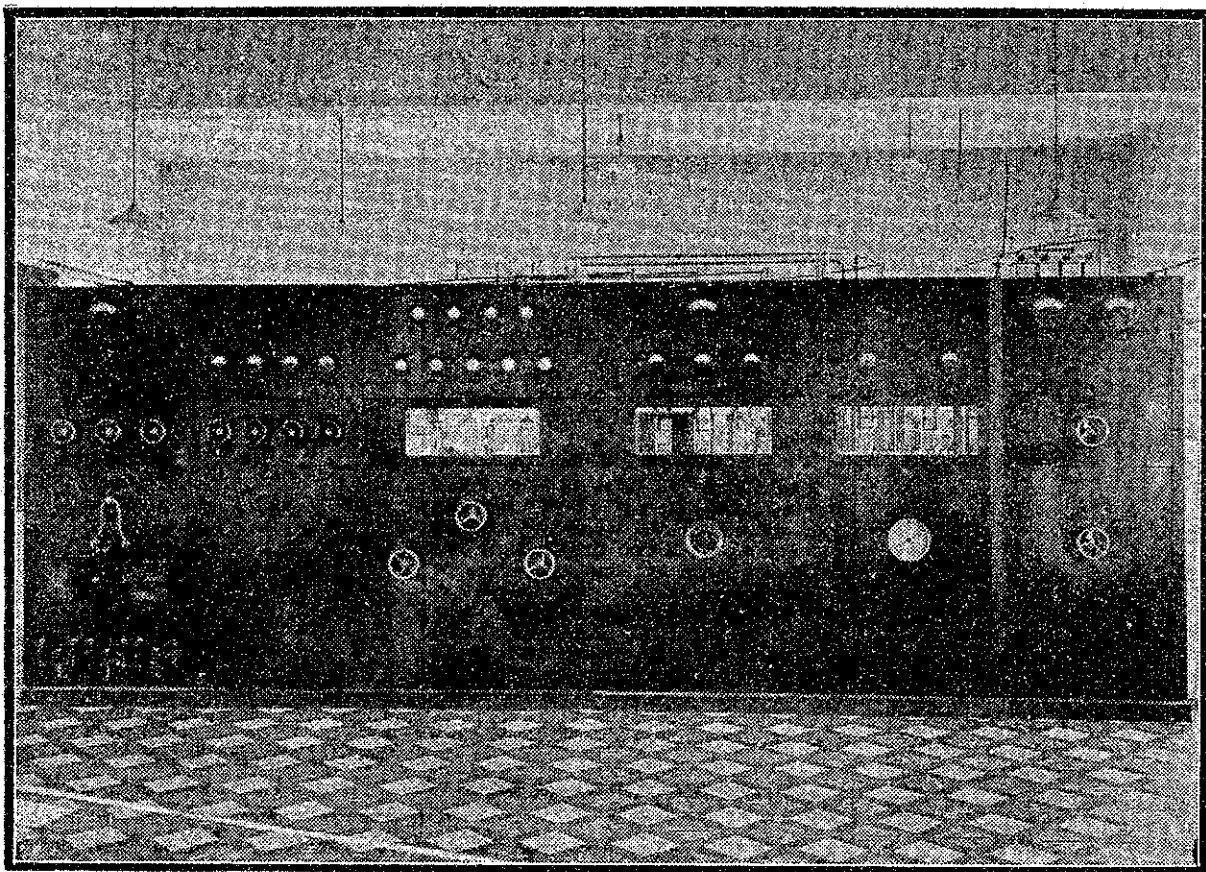


lues building sites and yet easy access had to be obtained from the city. Directional effects, water supply for the valves, and other details had to be looked into, and in all these respects the Mount Victoria site came nearest to the ideal.

Negotiations for purchase of the land required were immediately put in hand, levels were taken, and plans for the building were prepared. Excavations were made and the foundations for the

building were laid out approximately in the middle of the strip of land on the ridge of the hill. Anchor blocks were set in for the towers, which had previously been ordered, and which were to be similar to one of the towers at 3YA. Work proceeded apace, but when the building was partly completed it was found necessary to make alterations to the original design owing to the fact that certain details of the sizes of the equipment to be supplied were found to be incorrect. Meantime the equipment arrived, and in order to facilitate assembly a galvanised iron shed was erected and the equipment stored therein. About this same time the tower material arrived, and as the anchor blocks were already in position, the work of erecting the towers was also put in hand. This work

stand the hurricane conditions likely to be encountered in the exposed location of Mount Victoria. All tower material is of steel, hot galvanised and arrived in bundles drilled and marked ready for erection. The accuracy with which the tower manufacturers did their work can be gauged from the fact that both the towers fitted together like a mecano set without the necessity for drilling or drifting. The towers as completed stand 154 feet high from base to cap, and have a spread at the base of 28 feet. Each of the anchor blocks for the legs of the towers is designed for over 25 tons uplift, and as the towers themselves are designed to withstand a wind pressure of 120 miles per hour, together with an aerial pull of 1500lb., a value considerably in excess of anything likely to be encountered in



An interior view of the transmitting plant, showing some of the valves used.

had to be done piecemeal, as it was impossible to do any tower erection on windy days and windy days were more often the rule than the exception.

### Towers Very Satisfactory.

A word here about the towers may not be amiss. The towers supplied were manufactured by the Canadian Bridge Company, of Toronto, Canada, and were specially designed to with-

Wellington, the safety of the structures is practically assured.

While the towers and building were in the course of erection, the engineers were busy with the assembly of the various units of the radio equipment, and as soon as the building was ready the assembly work had reached a stage where the various units could be moved in and erected in position. A skid-way was constructed between the assembly shed and the main building, and one fine day all the equipment was moved in. The actual installation then commenced, and the whole of the work from the initial assembly to the final tuning up was done by the writer with one assistant.

### Adjusting the Plant.

When the power was first switched on, it was found that there were certain minor defects in various portions of the apparatus. These points were soon rectified, however, and the plant worked in a highly satisfactory manner. The transmitter equipment is located in a room approximately 25 feet by 30 feet, while a separate room 25 feet by 12 feet houses the various water pumping machinery, and motor generators for grid bias, high tension and filament lighting. The valves used in the transmitter are water cooled, and in connection with the water system is a series of radiators and expansion tank which are placed in a louvered house on the roof of the main building. All inter-unit wiring is in galvanised run conduit in ducts beneath the floor level. These ducts also contain the water supply pipes to the valves.

The aerial system consists of a 4-wire flat top T aerial with 200 feet top measurement and cage down lead. The wires in the top are spaced approximately seven feet and each terminates in a string of four 50,000 volt strain insulators. The lead-in comes through the roof almost immediately above the transmitter through a 110,000 volt lead-in bushing. No counterpoise is as yet erected, and although full provision was made for this arrangement in the original layout of the station, it is doubtful if its erection would increase the efficiency of the station in any way. The ground system, which consists of a fan-like arrangement of buried earth wires, has proved highly satisfactory, and on measurement it was found that the whole aerial-earth system had a radiation resistance of approximately 24 ohms at 420 metres.

### The Studio and Layout.

The studio from which the pro-

grammes are to be broadcast is situated in the city, a distance of approximately two miles from the transmitting station. The furnishings of the studio are described elsewhere, but apart from this there are many technical points which have to be taken into consideration. To facilitate the easy working of the programmes, it was considered necessary to have two studios, one large and one small, with facilities for changing from one to the other instantaneously. To do this, it was necessary to make certain structural alterations to the building. As now finished, the control room is placed between the small and large studios and the control operator has an uninterrupted view into both studios through large plate-glass windows. In the control room is placed the amplifying and monitoring equipment, by means of which the control operator has absolute control over the volume level of the signal to the station on the hill, as well as checking up apparatus for the purpose of comparing the actual item as put into the line with the same item as broadcast from the station. In the control room also is another panel for selecting the particular microphone in use or for changing over for announcements or to outside relays. The necessary batteries for this apparatus are contained in a small room in another part of the building, together with the charging arrangements.

The sounding properties of the two studios is a matter which also had to be considered. To obtain good quality reproduction, it is necessary to keep down the reverberation time, of the room to about one second. It must be remembered that reverberation is not echo. A small echo is desirable, as it gives a pleasant ring to the item and is

### 2YA'S OPENING

#### THE FIRST PROGRAMME

Right o'clock. Chimes—Wellington General Post Office Clock.  
Band March—"The Red Shield" (Gohin)—The Salvation Army Citadel Silver Band.

Official opening address by the Right Honourable J. G. Coates, Prime Minister of New Zealand.  
Soprano solo—"Laughing Song" (Manon Lescant, Auber)—Miss Myra Sawyer.

Address by the Postmaster General, the Honourable W. Nosworthy.  
Instrumental Trio (violin, piano, cello)—"Trio in B flat" (Schubert)—Miss Ava Symons, Messrs. Gordon Short and George Ellwood.

Address by His Worship the Mayor of Wellington, Mr. G. A. Troup.  
Bass solo—"Prologue from I. Paganini" (Leoncavallo)—Mr. W. W. Marshall.

Violin solo—"Ballade and Polkaise" (Vieuxtemps)—Mr. Leon Jules de Mauny.

Contralto solos—"The Silent Vale" (Stevenson), "Hills of Donegal" (Sanderson)—Miss Nora Greene.

Band selection—"The Army of the Brave" (Marshall)—The Salvation Army Citadel Silver Band.

Instrumental trio (violin, piano, cello)—"Theme and Variations" (Tchaikowsky)—Miss Ava Symons, Messrs. Gordon Short and George Ellwood.

Tenor solo—"The Old Spinnet" (Squire), "Passing By" (Turcell)—Mr. William Renshaw.

Band patrol—"Jamie's Patrol" (Sydney Dacre)—Wellington Municipal Tramways Band.

Maori songs—"Pokare Kare" (Maori), "Waiata Maori" (Alfred Hill)—Miss Christina Young (soloist) and Petone Maori Variety Entertainers.

Hawaiian Steel Guitar Trio—"Kamiki March" (Smith), "Hawaiian Islands March" (Smith)—Mr. J. W. Goer and Party.

Vocal duet—"Oh, Fairy Wand, Had I Thy Power" (Wallace)—Miss Myra Sawyer and Mr. W. Boardman.

Violin solo—"Necturne in E flat" (Chopin-Sarasate)—Mr. Leon Jules de Mauny.

Bass solo—"Aria from Ernani" (Verdi)—Signor Lucien Cesaroni.

Band selection—"Gems of Harmony" (Smith)—Wellington Municipal Tramways Band.

Contralto solos—"My Ain Folk" (Lemon), "The Night Nursery" (Arncliffe)—Miss Nora Greene.

Flute solo—"Bravura" (Lorenzo)—Signor A. P. Truda.

Bass solo—"The Calf of Gold" (Gounod)—Signor Lucien Cesaroni.

Band march—"Dawn of Freedom" (Rimmer)—Wellington Municipal Tramways Band.

GOD SAVE THE KING.

### "2YK CLOSING DOWN"

#### "GOOD-BYE, EVERYBODY!"

AN ADIEU TO LISTENERS.

Station 2YK, having played its part, gracefully bowed and retired from the Wellington radio stage on Wednesday evening last.

When the session concluded, the announcer, Mr. Drummond, on behalf of 2YK, bade farewell to the station's unseen audience. On behalf of the Broadcasting Company he thanked the artists who had so freely given of their talent. Many of the artists had come long distances, often in bad weather, so as not to break faith with the public. Though the station, owing to its inadequate transmitting plant, had not been able to do full justice to the artists, their efforts had been fully appreciated by the great majority of listeners. These artists had provided many enjoyable entertainments for the people, and on behalf of the company he thanked them for what they had done.

Mr. Drummond's remarks struck a responsive note among listeners, a number of whom rang up and expressed their appreciation of the way in which the staff had carried on, the many excellent entertainments provided (especially the studio concerts), and of the Wellington artists who had so generously given of their talents.

Mr. Drummond carried the flag of 2YK for eighteen months, and his announcing met with general approval. Listeners will be pleased to know that his voice will continue to be heard on the radio, for he will act as assistant announcer at 2YA. Mr. Drummond's vocation permits only of part-time employment at the station. As a graceful act and a tribute to his past services, Mr. Drummond was asked by the Broadcasting Company to carry through Saturday evening's official opening. It was a compliment which he had well earned, and it was an honour which he appreciated. Mr. Drummond was one of the first in Wellington to take up broadcasting. It was in 1920 that he first became interested, and he has been an enthusiast ever since. His experiences at transmitting stations from the time he sent out messages with a five-watt plant till he announced for a 5000-watt plant would fill a book.

"Everything was very distinct, the bagpipes especially. I am pretty Scotch myself, but I have always said that the bagpipes want to be heard from quite a long way off. Well, from here (North Auckland) to Christchurch is just about right when the pipes are about 50 yards from the microphone."—Extract from a correspondent's letter.

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U.D.L.

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