NZVRS BULLETIN

Vol 28 No 1 February 2007

HIMATANGI INTERNATIONAL TRANSMITTING STATION

HIMATANGI RADIO TRANSMITTING STATION - part 1

George King (ex Himatangi Radio)

INTRODUCTION
For some years prior to 1951 it was apparent to the New Zealand Post Office that a major radio transmitting station was required to connect the New Zealand national toll network directly to the northern hemisphere including London in particular. With Makara Radio Station, located near Wellington, as the main HF radio receiving station, the outgoing telegraph transmissions from New Zealand, had been shared between Wellington Radio Station atop Tinakori Hill and Musick Point radio station at Bucklands Beach in Auckland.

For outgoing radio-telephone calls, New Zealand was dependant on Australia for providing onward relay links to Britain via Sydney. The Wellington to Sydney radio-telephone link had been established from Wellington Radio, ZLW, in 1930.

A DECISION
It was finally resolved that a new major transmitting station was required employing radio transmitters of sufficient power to provide commercial quality radio-telephone and telegraph circuits direct to the United Kingdom and to other overseas countries as required. The location of a suitable transmitting site thereupon became a Departmental priority.

SITE REQUIREMENTS
It was recognised that the chosen site for such a station should provide:
a) At least one square mile of flat ground for a comprehensive array of directional aerials.
b) Freedom from any obstruction from surrounding hills in the interests of signal propagation.
c) Good soil conductivity for satisfactory signal propagation and electrical earthing.
d) Convenient access to the radio traffic centres in Wellington and to the New Zealand national toll network.
e) Land that could be purchased at reasonable cost.

An 830 acre site at Himatangi some 120 kilometres north of Wellington on New Zealand's State Highway One met all of these requirements and its purchase became the catalyst for the construction of the entire station. .

CONSTRUCTION PROGRAMME
A wide range of contracting work carried out between 1951 and 1953 saw the completion of the following building programme:
a) A new transmitting station building with a total floor area of 15000 square feet.
b) Ancillary buildings such as an aerial riggers workshop and vehicle garage, dangerous goods store, water reservoir, pump houses, air conditioning plant cooling tower and power transformer enclosure.
c) A housing settlement with seven houses to accommodate the Officer-in-Charge and technical staff. Four additional houses were later provided for an increase of technical staff.
d) An eight bedroom hostel for single residents with a built-in flat for a hostel manager. Six additional bedrooms were later provided for extra trainee staff.
(e) A water bore supply for the station and the settlement incorporating pump houses, storage tanks, water treatment plant, fire hydrant and fire trailer facilities.

The Main Transmitting Hall at Himatangi

TRANSMITTING STATION
Central to the entire complex was the main transmitter building of some 15000 square feet in which were provided the following facilities:
a) A main transmitter hall measuring 7,500 square feet to accommodate at least twelve transmitters varying in output power from four to fifty kilowatts.
b) An emergency power plant room housing four diesel driven engine/alternators and associated compressor and power switching equipment.
c) An air conditioning room with a plant of sufficient capacity to maintain the large transmitter hall at a temperature of 22 degrees Celsius at the required humidity level.
d) An administration, stores and workshop wing.
e) A copper shielded equipment room to protect sensitive low power transmission equipment used mostly at a point where the incoming circuits from the remote traffic terminals met the monitoring equipment and input lines to the various transmitters.
f) A radio instrument room completely lined with 26 swg securely earthed copper sheeting to facilitate staff working with sensitive test instruments while shielded from the effects of nearby radiated RF energy.

SCREENED ROOMS
The extensive copper screening in the low power transmission equipment (carrier) room and the instrument room extended over the ceilings, under the floors, over the windows (as mesh screens) and over the rear of the entrance doors - the mounting screws were also copper. By this means radio frequency energy from the adjacent high powered transmitters was prevented from interfering with the sensitive valve circuits of the carrier and instrument room equipment or causing rectification to occur between joints of dissimilar metals.

In 1966 the original instrument room was considerably extended, (as an addition to the transmitter building) to provide a separate "Drive Room" to house the transmitters' low power frequency generating and drive unit equipment and provide more instrument space for the maintenance staff. Due to the increasing cost of copper screening, the extension was lined with 22 swg securely earthed tinned steel sheeting which proved an effective barrier to any radio frequency interference from the adjacent high power transmitters.

AIR CONDITIONING SYSTEM

Because of the high voltages employed (up to 15,000 volts) in the larger of the radio transmitters it was essential that the air in the large transmitter hall be maintained at a temperature of 22 degrees Celsius with a low level of humidity. The design of the station building therefore incorporated a large plant capable of meeting this criteria. This plant comprised an oil fired boiler to supply heat as required to an air conditioning chamber through which outside air was fed into the transmitter hall.

A refrigeration plant with two large compressors supplied refrigerated air to this chamber for reducing the humidity in the transmitter hall as necessary. A large circulating fan forced outside air through the chamber and into the hall at approximately 11.000 cubic feet per minute, thus providing a protective environment for the high voltage transmitter equipment.

WATER COOLING PLANT

Also installed in the air conditioning room was the water cooling system for the 50 kilowatt transmitter employed on the London telegraph service. This plant comprised a 100 gallon storage tank of distilled water, a cooling radiator and two centrifugal pumps to circulate this cooling water at 20 gallons per minute around the driver stage and output valves of the transmitter, thereby preventing heat damage to these high power valves.

An adjacent water distillation plant supplied an adequate supply of very high quality distilled water for this high powered cooling requirement. As this cooling water was in direct contact wjth both the extended plate of each output valve and the porcelain insulation of the surrounding water jacket, its insulation resistance was required to be of an extremely high order, to allow this water to act as an insulator at a high tension voltage of up to 15.000 volts.

AERIAL INSTALLATIONS

Concurrent with this building programme was the installation of a comprehensive array of up to 30 transmitting aerials and associated feeder lines covering an area of some 700 acres. This extensive installation of outside plant involved nearly 100 Australian hardwood masts, each 74 feet tall (some weighing up to four tons) together with 650 smaller feeder line poles and at least 64 kilometres of wire.

This comprehensive installation of outside plant saw completion of the following transmitting aerials at Himatangi.

a) Ten "curtain" phased dipole arrays directed toward the United Kingdom for the London radiotelephone and telegraph services. These ten reversible arrays were allocated equally between the radiotelephone and telegraph services to London.

b) Four ..diamond" rhombic aerials directed on San Francisco for the San Francisco telegraph and Oakland, California radio-phone circuits.

c) Four rhombic aerials directed on Sydney for the Sydney radio-phone and telegraph services.

d) Four rhombic aerials directed on Melbourne for the Melbourne telegraph and radio picture (facsimile) services.

e) Two rhombics directed on Barbados in the Caribbean for the radio-telegraph link to London via the Barbados relay station (as required) The Barbados station retransmitted on to London the telegraph signals received from Himatangi to ensure a workable Wellington - Barbados - London high speed telegraph service.

f) Two rhombics directed on Fiji for the radio-telephone service to Suva.

g) Sets of omnidirectional cage quadrant aerials for the Maritime Mobile service to shipping, the Pacific Islands telegraph service and the Meteorological telegraph broadcasts.

h) Two V.H.F. (80 Mhz) rhombics for the V.H.F. radio link to the traffic terminals in Wellington via the repeater station on Colonial Knob (near Tawa Flat) and Mt. Albert in Wellington.

(i) A further rhombic aerial was provided as a later addition for the new radio-telegraph and radiophone service to Vancouver.

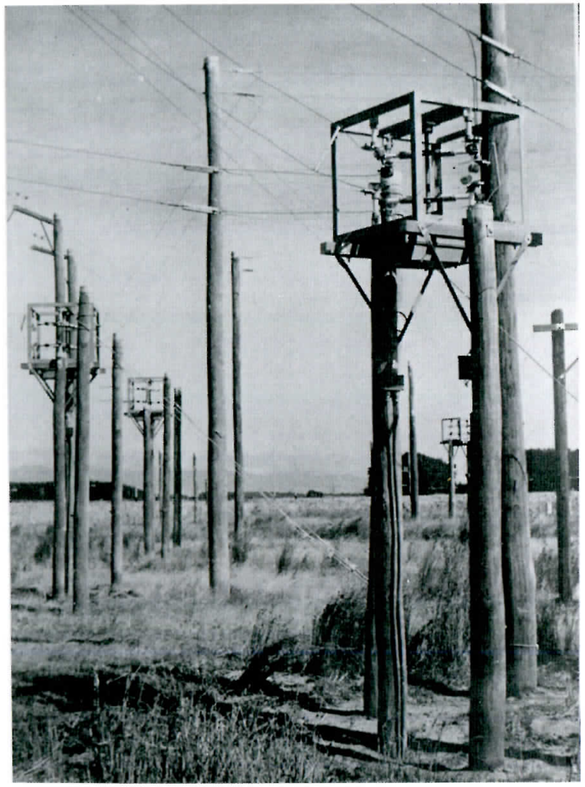
The high frequency rhombic aerials featured above were installed in pairs to provide for a frequency range of 4 - 22 MHz, that is, one rhombic covering 4 - 12MHz and the other 11 -22 MHz

AERIAL SWITCHING

Incorporated within this "aerial farm" was a total of twenty one electrically driven transmission line switches to facilitate specific aerials being connected to particular transmitters. Each of these motor driven feeder line switches was mounted out of doors on four stub poles and remotely controlled electrically via underground cables from an aerial switching console centrally located in the internal transmitter hall.

REVERSING SWITCHES.

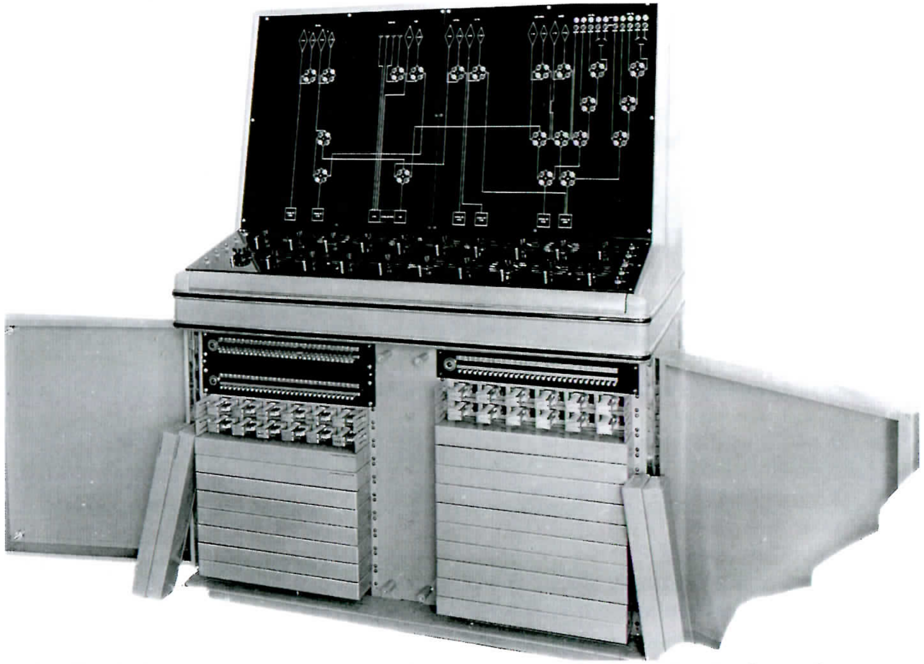
Mounted beneath each of the ten ..curtain" aerial arrays directed on the United Kingdom was a pole mounted motor driven reversing switch also remotely controlled electrically from the transmitter building. These switches allowed the direction of transmission from each aerial array to be controlled i.e. whether signals transmitted to London would be via the "short path" or the "long path".



Transmission line switches in the field

On the more usual northern route or "short path" the signals transmitted to London from Himatangi passed over the coast of Japan, crossed Siberia and the North Polar regions and the coastal regions of Norway. On the southern route or "long path" to London the outgoing transmissions crossed the South Polar regions and the coastal waters of South America and West

Africa.
The choice of which was the optimum signal path to London was governed by the ionospheric conditions prevailing at the time and the degree of global daylight or darkness encountered. Providing a commercial radio service direct to London was appreciably influenced by the fact that working frequencies chosen as optimum for the daylight section of the path were not necessarily optimum for the section in darkness.

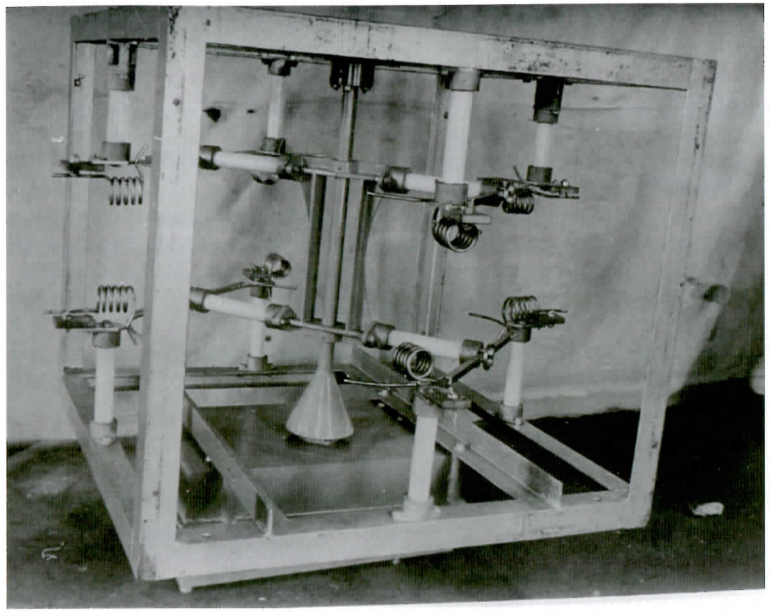


Aerial Switching Console -lower doors open to display relay logic equipment

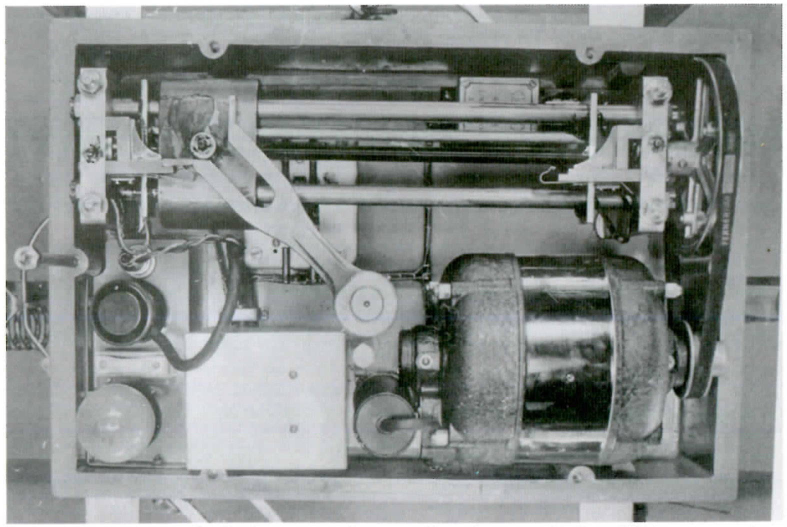
AERIAL SWITCHING CONSOLE
Centrally located in the long transmitter hall was the aerial switching console as shown in the opposite photograph. It provided for remote control via underground cables of the twenty one aerial switches and ten reversing switches mounted out of doors in association with the appropriate transmitting aerials.

The bakelite display panel on this console gave a schematic outline of the station's extensive aerial farm and transmitter feeder line routes via the remotely controlled motor driven feeder line switches. On the lower front panel of the console were the eleven position selector switches (one for each transmitter) which allowed for selection of the required aerial for the required transmission. Mechanical and electrical interlocking with the transmitter concerned, prevented any rotation of the feeder line switches after the particular transmitter was switched on and indicator lights showed the final "locked in" position of the relative aerial switches.

At each end of the front selector switch panel were five toggle switches which remotely controlled the direction of transmission ("short path" or "long path") of the ten reversible aerial arrays directed to the United Kingdom. This aerial switching console and the associated aerial switches in the field were designed and built in the N.Z.P.O. Radio Development Workshop in Wellington.



Close-up of an aerial switch showing the phosphor bronze contact arms and the insulating pillars supporting the contacts



Interior of the sealed box underneath the switch. This remote controlled mechanism moved the switch arms back and forwards through 90 degrees.

THE HIMATANGI RHOMBIC AERIALS

In the planning stages for Himatangi Radio Station the preferred type of directional antenna for the international point-to-point transmissions was the three-wire, highly directive, nonresonant "diamond" rhombic. The exception to this decision was the ten reversible "curtain" arrays directed on the United Kingdom.

As mentioned previously the rhombic aerials were installed in pairs to provide for a total frequency of 4 - 22 MHz, that is, one rhombic covering 4 - 12 and the other 11 - 22 MHz. By employing three wires (instead of one) in each leg of these rhombics, any matching impedance variations over the required frequency ranges were reduced to a minimum. Furthermore, the desired angle of radiation to the overseas reception points was more readily achieved by erecting these aerials at the appropriate height. The relative heights were 66 to 70 feet in the case of the Australian hardwood masts and 100 to 110 feet for the four lattice steel towers, where a low angle of radiation to Vancouver was required. The provision of 800 ohm resistive terminations at the forward end of each rhombic ensured that the highly directive radiation patterns were in a "forward" direction only.

The rhombic transmitting aerials at Himatangi were aligned on the Great Circle Map bearings to Sydney, Melbourne, Suva, San Francisco, Barbados and Vancouver.

NEWS FROM CHRISTCHURCH

Pete Ingram

Extraordinary applause to George King for his magnificent restoration of a much decayed 1927 Dacoma 5 domestic radio (NZVRS Bulletin, November of this year). On seeing pic #1, I would have viewed the CCC as the only possible way out in sensible recycling. But, in a first class article, he shows how such a project can come to an incredibly successful conclusion. Pics # 2 & #3 just want to make you reach out and touch the miracle.

Which is sort of what Sir Tim Wallis had done to his ex-RAF Hurricane fighter that came to a slippery end in the Russian tundra during WWII. It is claimed that only 5 percent of the original aircraft went back into the new airframe and I initially thought that perhaps it was hardly worth the effort - until I saw Keith Skilling carry out the test flight at Harewood. So with George King's masterpiece. Those with the effort, knowledge and skill are often deservingly rewarded.

David Chapple and Jim Lovell turned on another good VRS club evening at the Auburn Park clubrooms last week. As an almost confident novice, I went in for the valve quiz and came a bit of a crash - certainly not taking away the top prize of a bottle of wine - but never-the-less, a chocolate fish handed out by David to encourage future learning. Geoff did better than myself, but then, I understand, he will eat several valves for breakfast.

Austin and I had another "go" out the back of RPS today and soon we will be able to turn away from the months of sorting and storing of anything useful And after rechannelling some several thousand very secondhand capacitors into their correct drawers, it comes to mind, that we will need some sort of capacitor tester to legitimately enter these components into the ageing circuits that we hope to 'get at.' I have never seen such a machine and would not have a clue how it detects leakage or drastic breakdown. Any info or how to obtain such a unit and then operate it, is certainly welcome.

HIMATANGI RADIO TRANSMITTING STATION - part 2

George King (ex Himatangi Radio)

INTRODUCTION to Part 2.

With the completion of the building programme at Himatangi Radio Station in 1952, work then began on the installation of the radio transmitters ranging in output power from four to fifty kilowatts. This installation programme involved the following transmitters and their associated low power frequency generating and drive unit equipment.

UNITED KINGDOM RADIO-TELEGRAPH – TBC4 Transmitter

The transmitter installed for the high speed telegraph to London was the General Electric Co Type TBC4 which provided an output power of up to fifty kilowatts into any of the "curtain" aerial arrays at Himatangi directed on the United Kingdom. If adverse propagation conditions ruled otherwise it could be fed into a "diamond" rhombic aerial directed on the Barbados relay station in the Caribbean for re-transmission on to London.

The TBC4 occupied an extensive floor space and was the highest power transmitter installed at Himatangi Radio. It comprised five separate units (in five separate cabinets) including an auxiliary power supply, one kilowatt exciter or driver unit, a final RF amplifier stage, a main H.T. power supply and a high tension control unit. The auxiliary power supply provided H.T. voltages of 500, 1200 and 3000 volts D.C. for driving the adjacent one kilowatt exciter or driver stage. The exciter stage contained the crystal controlled oscillator, frequency multipliers and one kilowatt distilled water cooled amplifier valves. The output from this driver stage was fed into the third cabinet containing and final R.F. amplifier incorporating two large water cooled output valves supplying an output power of up to 50 kilowatts. The fourth cabinet contained the main power supply which could provide a direct current of 7.5 amps at 15000 volts for the final amplifier stage .The fifth cabinet contained the high tension contactor relays which switched in the main high tension transformer as required whenever the high tension button on the front panel was activated. This high power transmitter provided a high speed telegraph service to London at a keying speed of 150 words per minute (as either on-off or frequency shift morse) on a selection of frequencies up to 22 MHz.

ML893A OUTPUT VALVES for the TBC4

The two output valves in this transmitter were "Matchlett USA" Type ML893A. Both were distilled water cooled from the station's distillation plant and water pumping system feeding the valves water jackets as well as the hollow turns of the final tuning coil. Some idea of the powers involved are evident from the following statistics pertaining to each valve:-

Output valve type ML893A
Filament voltage 20 volts
Filament current 185 amperes
Filament power 3700 watts
Anode voltage 20,000 volts (max)
Power output 50 kilowatts.

The ML893A was first produced in 1945 as a water cooled output valve for high power radio transmitters providing output powers in the region of 50 kilowatts. At the time of installation in 1953 the cost of each ML893A valve to the New Zealand Post Office was 300 pounds (N.Z.).

UNITED KINGDOM RADIOTELEPHONE – STC DS13 Transmitter

The transmitter employed for the radiotelephone service to London was a Standard Telephones and Cables Limited (S.T.C.) Type DS13 with an output power of 40 kilowatts on radiated frequencies up to 22 MHz. If propagation conditions permitted the DS 13 could provide a telephone transmission direct to London on what then became known as the longest direct H.F. radiotelephone service in the world.

The final output valves of the DS13 transmitter, together with the final tuning coil were also water cooled by means of distilled water being pumped through the valve water jackets and the hollow turns of the final tuning coil. The heated water was returned to a cooling system at the rear of the transmitter comprising an air cooled radiator and forced air fan system. The supply voltages for the DS 13 were 6000 volts at 1.2 amperes for the four kilowatt driver stage and 11,000 volts as 6 amperes for the final amplifier stage.

Like the previous transmitter, this London telephone transmitter also occupied a considerable floor area as the internal units of transmitter equipment were all housed within a security locked "walk in" enclosure.

As a point of interest, the water distillation plant at Himatangi associated with the cooling systems of the two London transmitters was legally required to be registered as a STILL with the New Zealand Customs Department.

The five separate units of this London telegraph transmitter can be seen in the centre left of the above photograph showing the transmitter layout at Himatangi. In the immediate left foreground, adjacent to the control console, a major portion of the London radio-telephone transmitter can also be seen.

VANCOUVER RADIOTELEPHONE AND TELEGRAPH – Marconi HS51

The transmitter installed for the new radiotelegraph and telephone service to Vancouver in 1958 was the Marconi Type HS5l with a rated output of 32 kilowatts peak envelope power on single sideband. This transmitter also occupied a considerable floor area and required a separate automatic fire protected sealed room to house the transmitter's high current rectifiers and heavy duty power transformers.

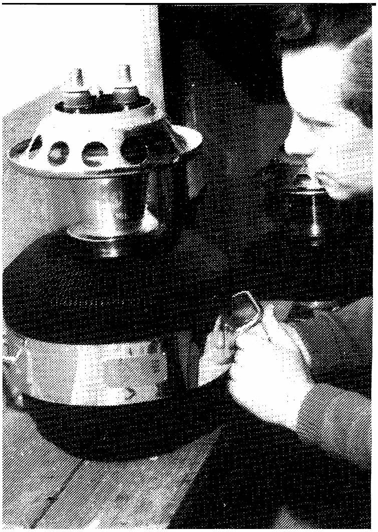
A notable feature of the HS5l transmitter was the final output valve Marconi Type BRI6l.

This impressive looking valve was a forced air-cooled transmitting triode fitted with a compact array of welded copper cooling fins and requiring forced air cooling at a volume of 20 cubic feet per minute. This air flow had to be started before the application of any supply voltage to the valve and continued for at least one minute after the supply voltages had been removed.

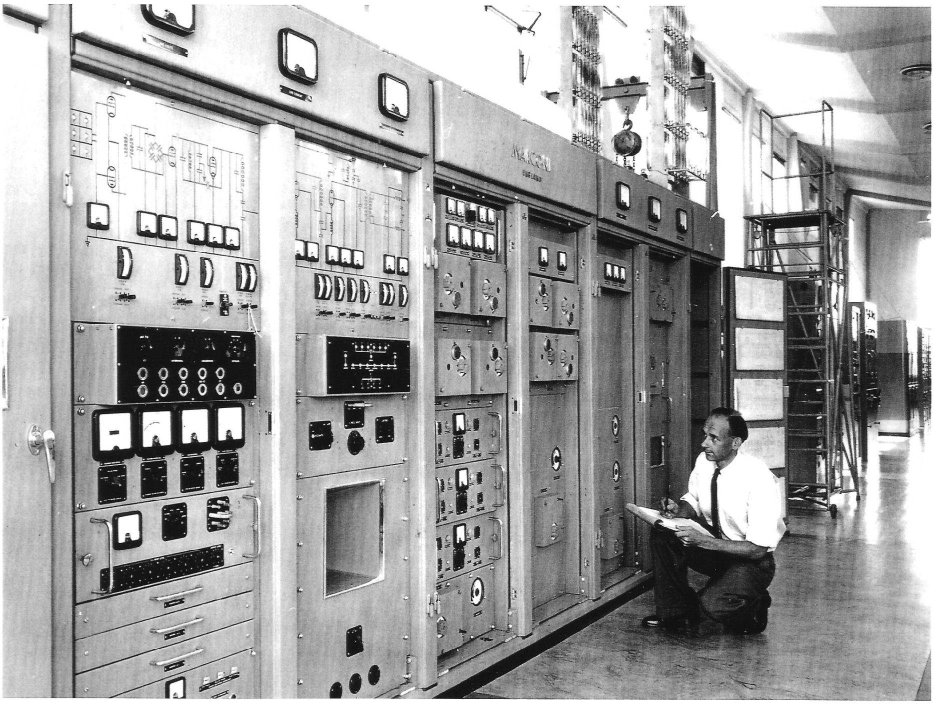
The operating conditions for the BR161 as an R.F. amplifier were as follows:

Marconi valve Type BR161
Filament voltage 9 volts
Filament current 175 amperes
Anode voltage 12000 Volts
Anode power 15 kilowatts
Valve weight 56lb (26 kg)

At no time during the switching on process was the filament current to exceed 450 amperes.



This photograph (left) shows a Himatangi staff member surveying the brilliant chrome of a BR161 valve.
The two filament connection studs are evident at the top of the valve, while the chromed upper heat sink provides the grid connection and the cooling fins clamp with the carrying handles becomes the anode connection.
The cost of a Marconi BR1616 valve to the New Zealand Post Office was 450 pounds (N.Z.)



The previous photograph shows the Marconi HS51 transmitter in operation while a staff member checks and records the transmitter meter readings to ensure that the various stages are operating within their specified limits. In the left foreground are the frequency multiplier stages which lead to the BR179 driver valve and final output (BRI61) stage.
Mounted atop the output stage are two racks of "dummy load" lamps into which the full high power output of the transmitter could be fed during line up or testing procedures when any "live" transmission was to be avoided.

HS51 TRANSMITTER (Cont' d.)
The multichannel output from this transmitter comprising two telephone channels on the upper sideband and multichannel telegraph on the lower sideband, was fed into the appropriate rhombic aerial directed on the Great Circle Map bearing to Vancouver ..
This new radio link to Vancouver in 1958 became the first stage in a more sustainable telephone and telegraph service to London comprising:-
(1) Himatangi to Vancouver via high frequency radio then
(2) across Canada via the Canadian microwave radio bearer system, then
(3) on to the United Kingdom (and London) via the trans - Atlantic submarine cable.

In the above photograph, station technicians are featured carrying out maintenance checks on an S.T.C. Type DS12 transmitter. While one staff member attends to the power supply contactors, the other technician checks the internals of one of the two 4.5 kilowatt R.F. "trucks" withdrawn on metal runners for maintenance purposes.

U.S.A. RADIOTELEPHONE

The transmitter installed for the telephone service to San Francisco was a Standard Telephones & Cable Ltd (S.T.C.) Type DS12 with an output power of 4.5 kilowatts over a frequency range of 4 to 27.5 MHz. The DS 12 incorporated two separately tuned radio frequency "trucks" fed from a common power supply to facilitate prompt frequency changing when required. The central portion of the total cabinet accommodated the transmitters' power supplies.

The R.F. output stages each employed an S.T.C. 5J180/E forced-air-cooled RF pentode valve providing 4.5 kilowatts of output power into the appropriate rhombic aerial directed on San Francisco.

Maximum ratings for the 5JI180E output valve were as follows:

Filament voltage 9 volts
Filament current 30 amperes
Anode voltage 6000 volts
Screen voltage 1500 volts
Anode current 2.5 amperes
Power output 5.75 kilowatts

AUSTRALIAN RADIOTELEPHONE

The transmitter installed for the telephone service to Sydney was of a similar make and model to that employed on the San Francisco service.

PHILIPS TRANSMITTERS

Three Philips transmitters were provided for the following services:-

(a) The Meteorological telegraph broadcasts to shipping and Pacific Islands
(b) The radiotelegraph traffic service to the Pacific Islands
(c) The radiotelegraph traffic service to shipping.

The Philips transmitters each comprised between three and five separate five kilowatt transmitters or "trucks" operating from a common power supply. Each individual transmitter provided an output power of 5 kilowatts throughout a frequency range of 4 to 25 MHz. In the relative photograph featuring the Himatangi Transmitting Hall, the three Philips transmitters can be seen in the far left comer.

R.C.A. TRANSMIITTERS

R.C.A. Type transmitters each providing 5 kilowatts of output power were utilised for:

(a) The U.S.A. radiotelegraph (machine printing) service to San Francisco
(b) The Australian radio picture (facsimile) service to Melbourne
(c) The Maritime Mobile H.F. telephony service to shipping.

These R.C.A. transmitters each covered a frequency range of 4 to 20 MHz.

MARCONI TRANSMITTER:-

A Marconi Type SWB-11 transmitter providing an output power of 7 kilowatts was utilised for the machine printing telegraph service to Melbourne.

HIMATANGI RADIO TRANSMITTING STATION - PART 3

Continuing from Part 2 by George King

The initial installation of radio transmitters at Himatangi (as outlines in Part 2) proved sufficient to cater for the traffic demands up until 1960. In that year New Zealand joined the International Telex-on-Radio network resulting in an increased demand for radiotelegraph channels and to Australia in particular. To cater for this requirement and further projected increases an additional two STC Type DS12 transmitters were provided for installation at Himatangi bringing to four the total number of DS12 units.

COMPAC CABLE

As was the case at Makara Radio Receiving Station, the event which was to have an appreciable effect on Himatangi Radio transmitting operations was the advent of the Compac Cable. The Sydney to Auckland section of the new Compac submarine cable came into service in June 1962 and by October 1963 it had been extended to Vancouver via Suva.

Responsibility for providing back-up services for the new cable fell on the transmitting facilities at Himatangi Radio as well as the receiving facilities at Makara Radio. The commissioning of the Compac Cable meant the loss to radio of the London, Sydney and Vancouver telephone circuits along with the San Francisco telegraph and the Melbourne radio picture circuits.

However this loss did not result in surplus radio transmitting equipment as under the terms of the Compac Agreement, radio was to provide a 50% back-up for the total number of channels handled by the new Cable. The consequent rapid increase in the volume of Cable traffic put a continuing demand on the radio transmitting facilities at Himatangi. Previous working radio frequencies needed to be kept "alive" with dual traffic so that they would be instantly available in the case of a Cable failure.

SERVICES UPGRADE

The high quality of the new Compac Cable telephone channels required that action be taken to increase the quality of the radio link circuits feeding into the Cable from the New Zealand national toll network. Resulting from this administrative decision, the following additional transmitting equipment was progressively installed at Himatangi:-

(a) Three Redifon 1.5 kilowatt independent sideband transmitters to provide single sideband working to the Chatham Islands in 1965 and an enhanced service to Raoul and Campbell Islands.

(b) Two 10 kilowatt Harris transmitters to provide a single sideband radiotelephone service to shipping. This installation included two Marconi quarter wave vertical lattice steel tower aerials for omnidirectional radiation on the Maritime Mobile frequencies to International shipping.

(c) Three of the four STC Type DS12 transmitters at Himatangi were re-allocated to provide single sideband services to the Pacific Islands.

(d) The 40 KW transmitter (previously London Telephone) was reallocated (under reduced (power to the Scott Base Antarctica radiotelephone circuit, thus providing an upgraded service between the New Zealand National toll network and Antarctica.

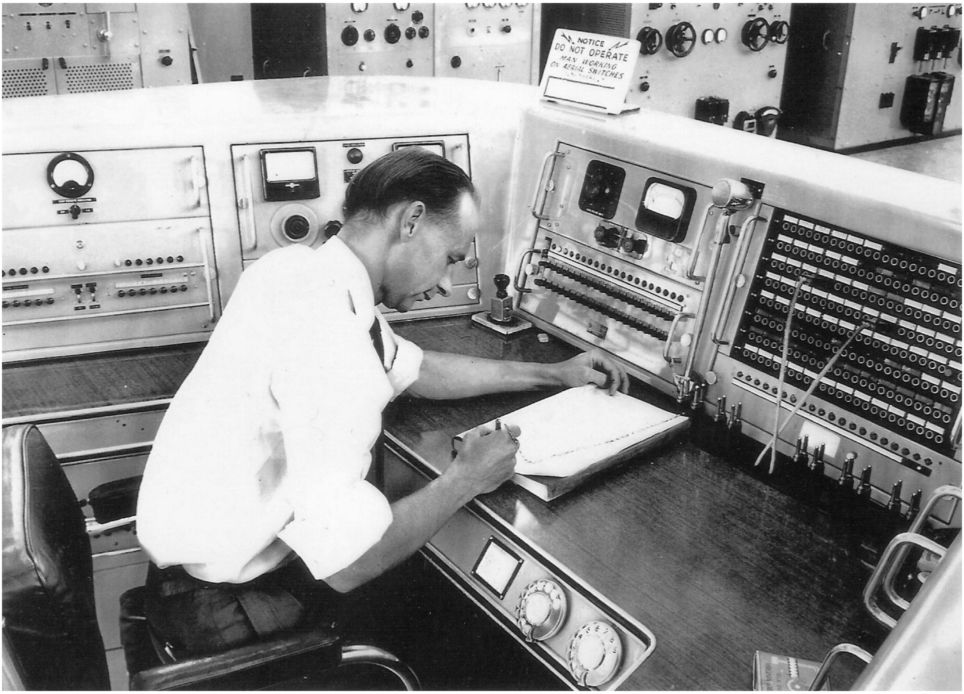
ANCILLARY EQUIPMENT AND PLANT

In addition to the range of radio transmitters (as previously described) the initial installation of internal plant and equipment at Himatangi Radio also included:-

(a) A control console centrally located in the main transmitter hall and

(b) emergency power plant engine alternators installed in the large engine and power switching room.

CONTROL CONSOLE
The operator's control console was installed in a central position in the transmitting hall adjacent to the two London telephone and telegraph transmitters. It allowed the operating technician to gain instant access to the input line of each of the various transmitters as well as a sample of the radio frequency output from each transmitter - an essential feature when it came to circuit assessment or any fault diagnosis.



The above photograph features the Himatangi Radio control console manned by a technician on shift duty. The jack field and drop cords allowed him access to the input traffic line to each transmitter while the adjacent volume indicator unit indicates the input level of signal from the particular remote traffic terminal.
The left hand units allow a sample of the radio frequency output from each transmitter to be monitored for transmission quality and level. Two telephone dials allowed him access to the remote traffic terminals in Wellington and to the local PABX telephone exchange, while all circuit events were recorded in the station log book using world wide Greenwich mean time.
In the background can be seen the individual cabinets of the 50 kilowatt London telegraph transmitter.

EMERGENCY POWER PLANTS
The heavy demand on mains power by the station equipment and plant demanded that emergency power plants were more than capable of meeting this load and any future increases in demand. To meet this requirement, two large engine alternators were installed in the Station's engine and power room. The engines were Mirrlees eight cylinder marine diesels each capable of producing a maximum of 396 horse power while the alternators could each supply 240 kilowatts of emergency power in the event of a mains power failure.

To ensure that the station equipment was free of any vibrations from these large engines when operating at 500 resolutions per minute, considerable precautions were taken in their initial installation. Each engine alternator unit was mounted on a large concrete block which in turn was mounted on a series of massive leaf springs installed below floor level. The resultant vibration free operation of the two Mirrlees engines was no doubt further assisted by the fact that the flywheel fitted to each engine was of substantial proportions.

The above photograph shows the layout of power plant in the large Engine and Power room at Himatangi. To the left are the power switching control panels where each change over switch controls a portion of the total heavy power demand.
To the right can be seen the nearer of the two Mirrlees eight cylinder diesel engine alternator units. In the right foreground appears the Lister quick-start diesel engine alternator which supplied prompt emergency power for the station's lighting circuits and specialized low power transmission equipment.

WAHINE STORM DAMAGE
April 10, 1968 was a day to remember at Himatangi Radio Station. It was the day that the Wahine storm finally hit the transmitting building at Himatangi after causing such havoc in Wellington. During that morning the continual increase in the wind velocity became a cause for concern among the staff as to what impending damage could be suffered by the station. Later in the morning we had the answer when the wind velocity increased to the stage where sections of the transmitting hall roofing were ripped away and sent crashing into aerial feeder wires to the north of the building. The accompanying very heavy rain caused water to enter the large ceiling cavity high above the Marconi Type HS-51 transmitter.
The build-up of water in the ceiling demanded urgent action. Several large tarpaulins were obtained on loan from the Shannon Railway Station and erected as a temporary roof cover when it was safe to

do so. The volume of water trapped in the ceiling was eventually drained out via deliberately punctured holes into containers clear of any transmitter equipment.
Following repairs to the broken aerial feeder lines, the affected services were restored to their normal transmitting equipment and a private contractor was engaged to replace the damaged sections of the station roofing.

OFFICIAL OPENING
Himatangi Radio Station was officially opened at a ceremony held at the station on November 9th, 1953 at 2 pm before on attendance of at least 500 people. Chairman on that occasion was Mr P.N. Cryer, the Director General of the New Zealand Post Office. Following his introductory remarks the official opening was performed by the then New Zealand Postmaster General the Hon. W.J. Broadfoot followed by a recording of the first radio-telephone conversation between Mr Broadfoot and the Right Hon. Earl de la Warr, Postmaster General, United Kingdom. Official guests also included Mr J. Malone, Chairman Overseas Telecommunications Commission (Australia), Sir Mathew Oram, Speaker of the House of Representatives and Mr. P.H.N. Freeth, Chairman of the New Zealand Press Association.

THE QUEEN'S MESSAGE
An important early assignment for the new Himatangi Radio Station was to be the relaying of the Queen's Christmas Day message to the Commonwealth during her visit to New Zealand in 1953. Queen Elizabeth was to broadcast from Auckland and be transmitted directly from Himatangi to London then re-transmitted on to countries throughout the Commonwealth.
This international radio-telephone commitment was successfully completed and provided tangible proof of the ability of Himatangi Radio Station to provide a commercial quality radio-telephone transmission to the United Kingdom.
In her Christmas Day message the Queen made mention of the grievous rail disaster which had occurred at Tangiwai on that Christmas Eve. The loss of life from this tragedy was finally verified as 151.

NEW TECHNOLOGY
A crucial event in the role of Himatangi Radio Transmitting Station was the opening of the new Satellite Earth Station at Warkworth, New Zealand in 1971. Working via the INTELSAT system of satellites Warkworth, New Zealand was in a position in 1987 to take over the major international radio circuits operating via Himatangi Radio Station. Shorter overseas transmissions from Himatangi to the Pacific Islands, Chatham Islands, Scott Base, Pitcairn and some shipping services were later transferred to either satellite operation, the New Zealand Navy station at Waiouru or Broadcast Communications Ltd.

END OF AN ERA
Being overtaken by new technology, the days of Himatangi Radio Transmitting Station came to an end operationally on the 30th September, 1993. All inside and outside plant and equipment was eventually dismantled and disposed of, including the two large Mirrlees diesel engine alternator units; one going to the Tokomaru Steam Museum and the other to Manawatu Hydraulics Ltd, Palmerston North.
The 800 acre block of station farm property, including the station buildings was sold to a local farmer to add to his existing holdings. The staff houses and single staff hostel were leased by Telecom to a local businessman for use as backpackers and rental housing accommodation.

The days of Himatangi Radio Transmitting Station were over.