FROM THE LIBRARY (cont.)

901 The Best of British; the Marconiphone 561. Extensive photos and description. BVWS Bulletin, Summer 2005, p4.

902 B is for Bush. History of Bush Radio with photos of some of the models produced. BVWS Bulletin, Summer 2005, p12

903 Loud? Speaker Crystal Sets. Examination of the problems and results. BVWS Bulletin, Summer 2005, p14

904 Positive Feedback. Some uses made of positive feedback with diagrams and explanations. BVWS Bulletin, Summer 2005, p18

905 Rebuilding a Murphy A242. Photos, circuit diagram and restoration details. BVWS Bulletin, Summer 2005, p21

906 The 5 Series. Eddystone receivers, photos, circuit diagram of model 504, descriptions.. Radio Bygones, June/July 2005, p6

907 The Wavemeter, Class C. Photos, description, history, basic circuit. Radio Bygones, June/July 2005, p10

908 The Intelligence Corp Museum at Chicksands. Photos, description of some exhibits including the 10 rotor Enigma machine. Radio Bygones, June/July 2005, p20

909 Getting on 40 metres - 1929 style. Hartley oscillator using type 210 or equivalent. Photos, Constructional details. AWA Journal July 2005, p28

910 Fault Diagnosis Without Test Gear. AWA Journal July 2005, p33

911 World War II Radiosonde Gear. Photos, description. AWA Journal July 2005, p41

913 Repairing a 1940 Howard Communication Receiver model 437. description, photo, circuit diagram. AWA Journal July 2005, p46

914 About That second Diode...(in double diode valves) Explanation, usage, schematics, theory AWA Journal July 2005, p58

915 A Tale of Two Radiolas. R51 and R81. photos, schematics. Description. HRSA Radio Waves, July 2005, p10

916 The AWA Radio Model 1548-MA. Photos, description, schematic. HRSA Radio Waves, July 2005, p18

917 Restoring a Breville 730. Photos, schematic, description of restoration. HRSA Radio Waves, July 2005, p25

918 An Electronic Choke Replacement. Schematic. Photos, constructional details. HRSA Radio Waves, July 2005, p31

919 Front Panel Labels and Dials. Design and Restoration. Using a Home computer and a graphics application (like Photoshop Elements, A$200) . Photos, detailed description of methods. HRSA Radio Waves, July 2005, p35.

940 Why 6.3 Volts? History. Schematics, explanations. Wellington Vintage Radio Notes. June 2005 p3

941 Quad II Output Transformer: Mystery Solved ?. Schematic of transformer secondaries interconnection including resistor. Wellington Vintage Radio Notes. June 2005 p7

NZVRS BULLETIN

Vol 27 No. 2 **May 2006**

THE FIRST AUSTRALIAN FLYING DOCTOR SERVICE

Alf Traeger with the original "Pedal Radio" November 1928

NEW ZEALAND VINTAGE RADIO SOCIETY INC.

A non-profit organisation devoted to the preservation of early radio equipment and associated historical information.

Postal address - P.O.Box 13 873, Onehunga, Auckland 1006.
Web site - http://www.nzvrs.pl.net email address office@nzvrs.pl.net

PRESIDENT: Ian Sangster, 75 Anawata Rd, Piha, R.D, New Lynn, Auckland 1250. Ph 09/814 9597.
Email: sangsfam@clear.net.nz

SECRETARY: Paul Woodcock, 2 Levy Rd, Glen Eden, Auckland. Ph 09/8184740
Email: paul.woodcock@opus.co.nz
General correspondence, requests for purchase of books, badges and power cable are handled by the Secretary.

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LIBRARIAN, Ernie Hakanson, 17 Williamson Ave, Grey Lynn, Auckland. Ph 09/376 6059. Requests for circuit diagrams, books and magazines (for personal use only) are handled by the Librarian at a small charge. Back numbers of most NZVRS bulletins are also available from the Librarian at $3.00 each for Vols 1 to 10 and $4.00 for issues from Vol 11 onwards. Cheques to be made out to NZVRS.

NZVRS BULLETIN is published quarterly in the months of February, May, August and November. Opinions expressed by writers are not necessarily those of the Society.
Contributions should be sent to the
EDITOR,
Reg Motion, 2A Hazel Terrace, Tauranga. 07/576 8733, email: regmotion@xtra.co.nz

AUCKLAND MEETINGS will be held at the Horticultural Society Hall, 990 Great North Rd. (opposite Motion's Rd.).
Mon. May 15 at 7.30pm. TV Nite. Bring sets, tubes, stories etc.
Mon. June 19 at 7.30pm. Auction Nite.
Mon. July 17 at 7.30pm Valve Nite. Bring specials for identification, codes, repair, rejuvenation and stories.

BAY OF PLENTY AREA MEETING
Date and venue of the next meeting will be advised

TARANAKI AREA MEETING
Our meetings are held on the second Sunday of the months of February, April, June, August, October and December. Visitors are most welcome; contact either Bill Campbell, 06/7532475 or Graeme Lea, 06/7585344

WELLINGTON MEETINGS
are held typically from 1pm on the second Sunday of every month at Tireti Hall, Te Pene Ave, Titahi Bay. For details contact Bob Hatton, 40 Rose St, Wadestown. 04/472 8788.

CHRISTCHURCH MEETINGS.
For details of meetings contact Jim Lovell, 41 Yardley St, Avonhead, Christchurch 8004.Ph 03/342 7760

NEW MEMBERS

BRINTON J	AUCKLAND
BEAUFOY P	MURUPARA
COUSINS B	BLENHEIM
BARTRUM B	CHRISTCHURCH
HART A	CHRISTCHURCH

FROM THE EDITOR

During February my wife and I had the pleasure of attending a very well organized weekend meeting of NZVRS members and their partners in Taranaki. Activities began on Saturday at Graeme and Sheila Lea's place, New Plymouth, where we viewed video of Donald Laing's collection then lunch was provided there.

In the afternoon we visited Tarrie and Maureen Martin at Inglewood to view Tarrie's collection, have afternoon tea and chat. The evening saw us at Sam and Suzie Lowe's residence where the ladies had arranged an excellent sit-down dinner (photos on page 4). Following dinner we visited a modern multi-screen cinema where Sam had arranged for us to inspect the projection room equipment - quite an eye-opener.

On Sunday morning we visited the communication museum at Kent Rd. then were given lunch at Brian and Sue Tipler's place in Stratford before departing for home.

On 4th and 5th March Bay of Plenty group organized a similar weekend which was also well attended in spite of the short notice. My wife and I entertained the group for afternoon tea at our place where I had arranged an audio demonstration followed by a video show of television production in UK about 1960. That evening dinner was at a local restaurant - an opportunity for much talk.

On Sunday Rod and Sue Osborne entertained at their home where Rod had set up a collection of interesting radio items for sale. Lunch was provided by Donnella and Gordon Baker at Hinewa Rd. where talk centered around the effects of a recent disastrous flood on their house.

Attendees at both meets came from as far afield as Wellington and Auckland and at all venues there was, of course, a viewing of collections and much talk about them. It was a pleasure to see the number of member's partners who attended and their obvious interest in each others activities. Such meetings do much to personalize our hobby.

An article sent to me from the UK describes a lagging interest in TV there and an increasing interest in Radio as a means of entertainment. Table model sets are appearing on the market enclosed in attractive wooden cabinets and are selling for as much as 395 pounds. Maybe we are at the beginning of a revival of an era!

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TARANAKI OPEN WEEKEND

Dinner at
Sam and Suzie Lowe's
Residence

Group of
members outside
Brian and Sue
Tipler's place
At Stratford.

THE FIRST AUSTRALIAN FLYING DOCTOR SERVICE RADIOS

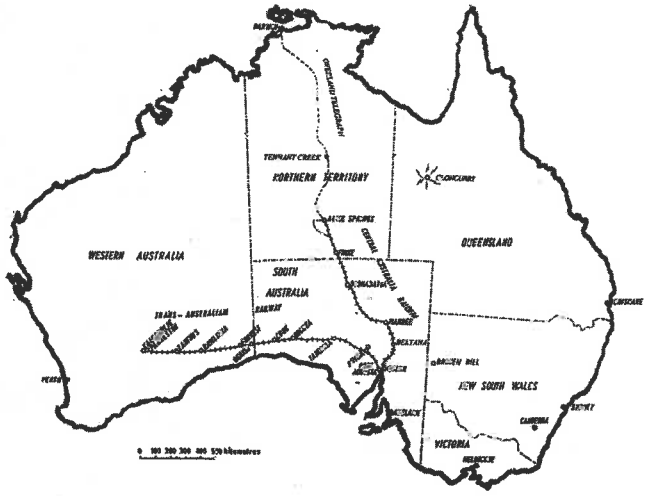
Rodney Champness

SETTING THE SCENE

In the August 1999 issue of the Bulletin, an article was published on the development of radio in the Australian Flying Doctor Service - or as it is officially known today the "Royal Flying Doctor Service". If available, a re-read of that article would be of advantage before reading this article any further. In this article I am concentrating on the development of the early transmitters and receivers. Some of the information in this article is slightly different to the original article due to access to additional material and enlightening discussions since then with the few remaining old hands still alive.

The arid outback of Australia (5,000,000 square kilometres) covers around two thirds of the continent. Governments took very little interest in the centre of Australia as they could see very little use for this remote land in which there were few people, no discernible value and almost no votes. In 1872 the overland telegraph linking Port Augusta in South Australia and (Port) Darwin in the Northern Territory was completed. Its purpose was to connect Australia with the rest of the world, in particular our motherland, England.

In 1877 a railway between Port Augusta and Darwin was commenced. It reached Oodnadatta in outback South Australia in 1891 and terminated there until it eventually reached Stuart (Alice Springs) in southern Northern Territory in 1929. It reached Darwin in 2004 - 127 years later. It became known as "*The Ghan*" after the cameleers of the late 1800s and early 1900s who provided much needed transport in that period. The road to Alice Springs was sealed in 1987 - 125 years after the first crossing of the centre of Australia.



Neither the telegraph or the railway were put in place for the few people who resided in the outback. They were intended as a conduit for the flow of goods and passengers between southern and northern Australia. That they provided facilities for the outback battlers was a bonus.

In 1911 the Reverend John Flynn became a padre with the Presbyterian Church at Beltana in outback South Australia. He soon came to realise that the scattered people within his huge parish were very disadvantaged compared to people who lived in the cities and more populous rural areas. They had no ready access to the sparse medical facilities in the outback. They might have to travel for a week or more over rough tracks in the back of a horse drawn jinker or

similar, to obtain medical assistance. The patient may have died by this time. They had no way of summoning aid, they had a very lonely life with rare contact with others, and they had no educational facilities. Some regions of New Zealand are sparsely populated but the outback of Australia is much more so. For example, on a trip (1999) in outback Western Australia my wife and I stayed at a caravan park and counting the owners, the four of us were the only people for 200 kilometres, and there are more isolated areas than this.

Flynn took up the challenge of providing better facilities for these remote people. He could see that ready access to medical aid was necessary, as well as speedy transport to access that aid, a swift means of calling for the aid, a means to overcome the loneliness of isolation and facilities to obtain an education. This was a huge task and over the years his drive has caused these problems to largely be solved. However, in this article I am only concentrating on the development of rapid communications.

The telephone system was quite impractical in the outback where a line may need to run for 200 kilometres between subscribers. The performance over such a distance would have been extremely poor and the reliability of the lines would have been so poor that the service would most likely to be unusable in an emergency. By 1919, Flynn saw that wireless (radio) communications could provide the much needed vehicle for summoning aid in emergencies. He encouraged radio experimenters to develop a suitable radio to provide this facility. Many tried over a period of several years but he was continually told "Not yet, and when it does come it will need to be in morse code". Radio Broadcasting in Australia only officially started on 23/11/1923.

THE PORTABLE WIRELESS TRANSCEIVER SPECIFICATIONS

By 1925 Flynn had become quite frustrated by the lack of progress in radio communications. He and a few close radio friends had set down specifications that a portable transmitter/receiver needed to meet.

The specifications were that the set must:-

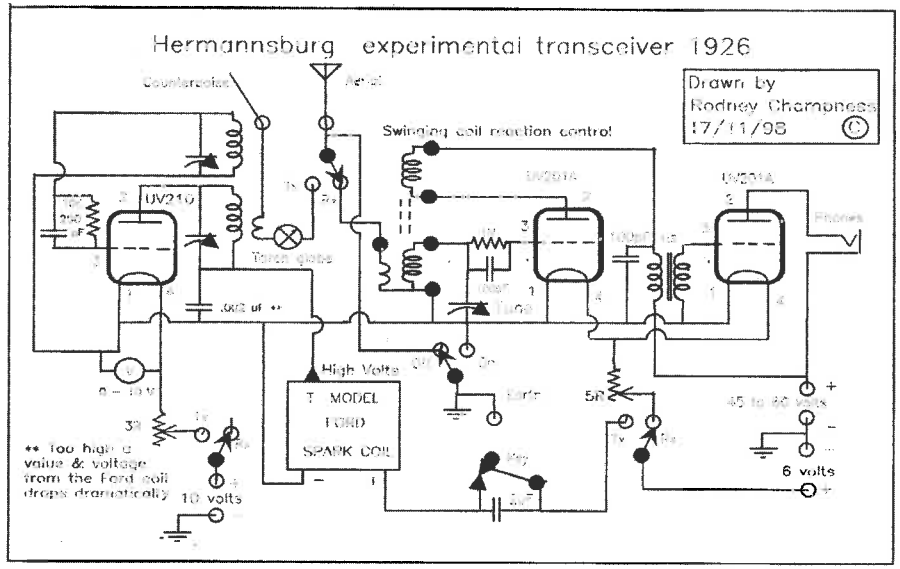
1. *be compact and weigh no more than 56 pounds (25 kKg),*
2. *be able to withstand rough treatment,*
3. *be portable,*
4. *be able to be used away from electrical power (most places in the outback only had kerosene lamps and few could afford a car),*
5. *operate on the lower short wave bands,*
6. *have a transmission range of at least 300 miles (486 km,*
7. *be simple enough that a farm hand could operate it on transmit and receive, even if a receiver had never been seen before, let alone a TRANSMITTER,*
8. *operate on morse code (CW), and if possible voice (AM),*
9. *remain on the same wavelength (frequency) as other transmitters in the network,*
10. *be simple to maintain by travelling padres and the like, and*
11. *cost less than £50 ($100). A lot of money in 1925.*

Quite a list!

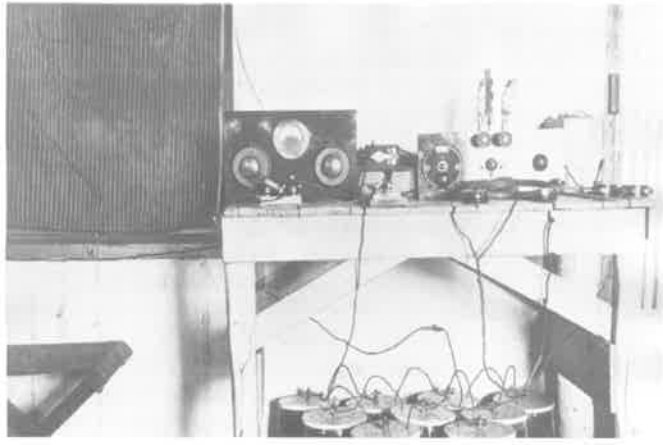
Today, these specifications would be easily met, but not in the early 1920s when wireless was very much in its infancy. Wireless experimenters (amateur radio operators) shook their heads as they could not see such a set being available for many years, if at all. Flynn was persistent and in 1925 he and a George Towns ventured into the outback to test a variety of receivers and transmitters that they built in Adelaide, with help from Harry Kauper, radio station 5CL's engineer.

THE EXPERIMENTS OF 1925 AND 1926

The experiments proved that a morse code transmitter would be practical in the long term. Methods of supplying the necessary electrical power were a major problem and needed significant development, as did means to ensure that the transmitter stayed on the same spot on the receiver dial at all times. The receiver looked like it needed little development other than to use lower current drain valves - which were starting to come onto the market.



Following these experiments, Flynn asked Kauper to build three transmitters and receivers to try in further tests in 1926. The test locations were to be at the Hermannsburg Lutheran Aboriginal Mission (west of Alice Springs), the Arltunga Police Station (east of Alice Springs), with the third set as a spare. The base station located in Stuart (Alice Springs), consisted of an AM base station supplied by Amalgamated Wireless Australasia (AWA). Each test location was less than 160 kilometres from Stuart. Alf Traeger, of future "*pedal radio*" fame, installed the three stations.



A photo of the experimental out-stations is shown above.

The 1926 tests proved that communications were quite satisfactory over these distances, in fact all three stations could communicate with each other at night. The wavelength used was around 85 to 89 metres (3.4 to 3.5 MHz). There were a number of problems to solve however. The Edison primary battery system used to supply power to the stations was extremely heavy (nearly half a tonne), expensive and used copper and zinc electrodes with the corrosive chemical - caustic soda as the electrolyte. The equipment, although it proved reasonably reliable, used too much electrical power, the transmitter was not stable enough in frequency and the receiver used a 45 volt dry battery which would go flat over a period of time due to electrical leakage. High voltage dry batteries did not have a long shelf life in 1926.

After these tests, Flynn gave Traeger (with help from his mentor Kauper) the task of researching and building portable radio transceivers for the outback. Much had been learnt from the two trips into the outback about what worked and what may work with some extra research. However, there were some problems for which no immediate solution could be seen.

DEVELOPING THE FIRST "*PEDAL RADIO*" TRANSCEIVER

Over a period of two years and many, many experiments Kauper and Traeger came up with a prototype that fulfilled most of the criteria that had originally been promulgated.

Methods of powering the portable transceiver had exercised the minds of Traeger and Kauper. This was probably the most vexing problem that had to be solved for the transceiver to be a viable entity. Traeger had built a number of generators over several years and these had proven to be of high quality. He experimented with electrical generators wound by hand but decided after many experiments that turning the handle and trying to operate a transmitter at the same time was impractical. He eventually came up with a pedal powered high voltage generator that would provide enough energy to power the plate circuits of a low powered transmitter.

The thoriated tungsten filaments of the valves used up to that time used too much electrical energy to be considered for the transceiver. The advent of valves with a Barium Oxide (or similar oxides) coating on the filaments meant that they emitted much greater quantities of electrons for the same electrical heating energy as the thoriated tungsten filaments. The result being that much lower filament voltages and currents were needed to draw the same current through a valve. This was the significant advancement in valve design that heralded the breakthrough that Kauper and Traeger needed to keep filament power usage down to a manageable level.

There was considerable concern about the service life of dry batteries in a humid environment. 45 and 60 volt dry batteries had a relatively short shelf life in humid environments like Cloncurry in North Western Queensland where the first flying doctor service was to be established. The Philips A141 space charge tetrode came onto the market in 1925. One of Kauper's friends imported several of these valves to try out in a receiver. They required between 2 and 20 volts on the plate which largely overcame the problem of the shelf life of dry batteries.

A receiver was developed using two of these valves, one as a regenerative detector and the other as a transformer coupled audio output stage. It was powered by two 4.5 volt batteries in series giving a total of 9 volts high tension. It was not a high gain receiver but appeared to work well enough to be able to receive stations within the expected range of the proposed Cloncurry radio base station.

Listening to the wireless/radio was quite a ritual in those early days. People in the cities and larger rural areas had a number of radio stations in the 550 to 1500 kHz range to tune to for entertainment.

Flynn, Traeger and Kauper could see that it would be desirable to have the facility to listen to normal AM broadcasts as well as the flying doctor service. It would help to alleviate some of the loneliness suffered by the people in the outback and get people used to operating a receiver. Very little extra work was required to wind a coil for the broadcast band as well as the short wave band that the flying doctor service would use. To make sure that none of the two coils were mislaid, the short wave and the broadcast coils were wound onto opposite ends of the same former. To change from broadcast band to short-wave, only required pulling the coil out of the set, up ending it and putting it back into the set. This arrangement can be seen in the photograph at left of the inside of the set. Note the transmitter valve is missing in this photograph. The tuning range of the short wave coil is unknown, but was probably 1.5 to 3 MHz or 2 to 4 MHz.

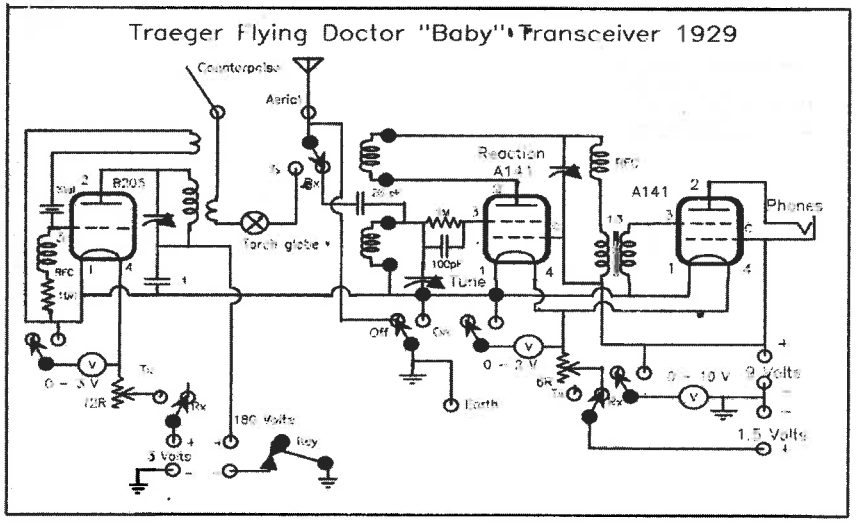
The Philips B205 audio output valve came onto the market in 1926. It required much less filament current and voltage than the valves used in the Hermannsburg transmitter and this was selected to be the oscillator cum output valve in the transmitter. With around 180 volts from the pedal generator on its plate, it could provide between 1 and 1.5 watts radio frequency output.

The valve filaments were powered by dry batteries. The receiver valves were powered by a 1.5 volt dry battery and the transmitter valve via two no. 6 telephone cells in series. A rheostat was used to adjust the voltage to two volts for the B205 transmitter valve.

Both Kauper and Traeger had experimented successfully with crystal control of their amateur radio transmitters. They reasoned correctly that crystal control of the transmitter frequency was necessary to maintain all the projected low powered out stations on the one frequency. They now had a crystal controlled transmitter using the Philips B205 valve that met Flynn's requirements.

It was often thought in Australia that the pedal generator powered all of the "*pedal radio*", but this was not so. There were several reasons why only the transmitter HT was supplied by the generator. (1) It would be a tiring job pedalling for up to an hour at a time, (2) the electrical noise from the generator would have drowned out the signal from Cloncurry, (3) variations in speed of pedalling would create voltage variations to the receiver which would cause its performance and operation to vary dramatically, and (4) the winding of a multi-section armature to supply all the different voltages would have been extremely difficult to do and costly. Hence low voltage dry batteries were used in areas where electrical leakage was not a significant problem.

This was the "*pedal radio*" profile. And would you believe the cost was £33 ($66) well below the maximum target cost of £50. A circuit of the first pedal radio is included to show how simple this innovative set was. No original circuits of this set remain, but using all the information at my disposal, I have drawn up a circuit, which I believe is very close to the original.



Naturally the Postmaster General's Department (PMG) was involved in the allocation of licences and a frequency for the fledgling radio network. The initial frequency was 2230 kHz.

This article, as well as the original article in the August 1999 issue, is but a short precis of some aspects of the development of radio communications in the outback of Australia. For those who want to know more, you may care to read my book on the subject "*Outback Radio - from Flynn to Satellites*".

BOOK REVIEW "OUTBACK RADIO - From Flynn To Satellite" Reg Motion

Rodney's above précis of the early days in outback communications is greatly expanded in his book and is followed with a detailed history of the development of communications for the Royal Flying Doctor Service and the ancillary benefits it gave the settlers concerned.

His descriptions with photos and circuit diagrams of the equipment involved are very complete and I was particularly impressed with the effort he went to in manufacturing and field testing some of the early designs to establish the authenticity of published performance claims

The book is soft covered and has 188 pages of high quality A4 size paper and is available to NZVRS members from NZVRS, P.O. Box 13873 Onehunga, Auckland 1132 at NZ$55+ $5 P &P.

I have no hesitation in recommending it and predict that it will keep you engrossed from start to finish.

MAKARA RADIO RECEIVING STATION Part 3 (Final)

George King

FREQUENCY MEASUREMENT

INTRODUCTION

By 1955 the original General Radio Corp. frequency measuring equipment at Makara was being overtaken by service demands requiring a faster measuring service within a tighter frequency tolerance. In that year a new Makara standard of frequency and associated measuring system employing digital techniques was installed

A NEW FREQUENCY STANDARD

The new 100 kHz frequency standard was accommodated in a small temperature controlled room built within the concrete walls of the station basement and designed as a separate entity from the rest of the station foundations.

Installed within this environmentally protected room, were three small equipment racks each containing a temperature controlled highly accurate 100 kHz quartz oscillator unit. The provision of three primary oscillators enabled the inter-comparison of their individual accuracies to provide the ultimate in 100 kHz accuracy (a maximum deviation of 6 parts in 100.000.000 over a period of one year) for use in the associated measuring equipment. These three oscillators were powered from the station battery supply to ensure a "no-break" operation.

CINTEL CHRONOMETER

Mounted in two racks situated adjacent to the frequency measuring console (described below) was the decimal counter-chronometer equipment. This comprised a series of frequency divider units providing 1 Hz output pulses from the 100 kHz input frequency supplied from the new local frequency standard.

The CINTEL chronometer could give a direct read-out of the time interval in milliseconds between a "starting" pulse from the National Bureau of standards station WWV in Washington and an appropriate "stop" pulse derived from the Makara standard. This time interval read-out allowed any consequent time/frequency deviation in the primary oscillators to be accurately plotted and compensated for. Care had to be taken however to observe and account for any periodical change in the radio path between Washington and Wellington which could introduce a sudden variation of twenty milliseconds in the chronometer read-out

FREQUENCY MEASDURING CONSOLE

The new frequency measuring equipment was installed within an operator's console unit, all designed and built in the N.Z.P.O. Radio Development Workshop in Wellington East. Within this console unit were installed:

(a) Two Redifon Type R50M search receivers each covering a frequency range of 14 kHz to 30 MHz.

(b) A comparator or transfer oscillator for obtaining a zero beat with the received radio signal prior to the measurement of that specific frequency.

~ A frequency divider chain fed from the 100 kHz primary standard of frequency to control the opening time of an electronic gating unit.

(d) A frequency counter chain to provide a direct read-out of the measured frequency on a series of visual counter display panels.

CONSOLE OPERATION

The above photograph depicts the new frequency measuring console in operation. A staff member is tuning the micrometer adjustment of the comparator or transfer oscillator to obtain a zero beat with the received radio signal. The final frequency of the transfer oscillator as determined by the counter units was then displayed on a series of six neon indicator panels plus two moving coil meters mounted directly above the transfer oscillator unit.

EQUIPMENT SUMMARY

REDIFON RECEIVER

Although the Redifon Type R50M receivers each incorporated two RF and two IF stages their overall sensitivity figure was not of a high order above a frequency of 10 MHz. They were nevertheless an ideal choice of receiver for this particular application in that the entire search frequency range was covered in a single receiver. Being built to British Naval specifications their mechanical and electrical reliability could not be faulted and their weight was a testament to their rigid design and construction.

DIVIDER/COUNTER UNITS

The frequency divider and counter units each employed four Type 12AT7 double-triode valves in a decade divider configuration. This meant that the individual plate currents of each 12AT7 needed to be balanced for reliable operation of the counter units and visual display indicators. As commercially available valves did not always meet this requirement, it was finally necessary to arrange a supply of more expensive 12AT7s with balanced plate currents to provide prompt and accurate frequency measuring.

COMPAC CABLE

In June 1962 the Auckland to Sydney section of the new COMPAC submarine Telephone Cable linking Vancouver, Suva, Auckland and Sydney came into service. With the completion of COMPAC in October 1963, responsibility for providing standby receiving services for the cable fell considerably on the existing radio facilities at Makara Radio.

The advent of the Cable meant the loss to the Cable of the London, Vancouver and Sydney radiotelephone circuits together with the San Francisco telegraph and the Melbourne radio-picture circuits. This loss however, was more than offset by the COMPAC Agreement that radio was to provide a 50% backup for the number of circuits handled by the Cable. Furthermore, the high quality of the new Cable circuits required that the quality of the backup radio channels be of a high order as was also required of the radio link circuits feeding into the New Zealand toll network and eventually into the Cable.

RADIO SERVICES UPGRADE

With these requirements in mind, it was decided by the Administration to:

(a) Convert the Chatham Island radio telephone circuit to single sideband working in 1965
(b) Convert the Maritime Mobile radio telephone service, used for shipping, to single sideband
(c) Provide a single sideband radio service to the Pacific Islands
(d) Convert the Pacific Islands telegraph (morse) circuits to frequency-shift keying
(e) Provide composite working where possible for combined telephone and telegraph circuits on multi-channel radio transmissions.

The implementation of these requirements saw the following additional receiving equipment being progressively installed at Makara Radio:

6 Eddystone Model 730/6 receivers as earlier replacements for the ageing Type CSR5s
4 Marconi Type HR24/MST dual diversity independent sideband receivers
6 Harris Type RF550 independent sideband receivers.

These units, together with a new Cubic Communications search receiver comprised the final purchases of new receiving equipment for installation at Makara Radio Station.

In the right foreground of the photograph opposite the Marconi HR11 and HR13 receivers can be seen being employed on the radio telegraph transmissions from San Francisco and Sydney.

THE NON-TECHNICAL ASPECTS OF MAKARA RADIO

ACCESS ROAD and WATER SUPPLY

In the establishment of Makara Radio Station and housing settlement, in 1944 advantage was taken by the Government of two existing facilities namely:

(a) an access road already provided from the Makara Valley road to the Fort Opau gun battery site constructed during wartime on the Makara heights overlooking Cook Strait.

(b) a 30.000 gallon water reservoir and pumping plant system provided for the Fort personnel.

FORT OPAU

The Fort Opau coastal battery comprised two six inch guns for coastal defence together with a radar direction-finding unit for guidance of the guns, a powerhouse, barracks, command post and observation post. Fort Opau was commissioned in 1942, but as the Japanese invasion scare receded it was finally decommissioned in 1944, the year that Makara Radio Station became operational.

The Opau water pumping plant located adjacent to a small concrete dam in the Opau stream (running into Opau Bay) was retained as station plant. The existing water reservoir reticulation was extended to the receiving station and to a new 20.000 gallon reservoir overlooking the station settlement. This total water supply proved entirely adequate in the years ahead including the requirements for fire protection.

STATION LAND

To safeguard the Makara Radio and Quartz Hill receiving sites from all types of electrical interference the original Government purchase of the desired land amounted to 1448 acres. When a further 1000 acres became available this too was purchased whereupon the Post Office's long term land responsibility became 2448 acres.

FARMING OPERATIONS

To benefit the land and allow unimpeded access to station aerials agreement was later reached with the then Lands & Survey Department to farm the available land area as a Post Office farm. A Farm Manager was appointed with a station house provided for him and his family in the housing settlement. Field officers were appointed by Lands & Survey to liaise with the Farm Manager and a Post Office farm account was established by the Director General to cover operations.

Early operations included the eradication of approximately 1000 acres of scrub and the installation of some twelve miles of new fencing. Where practical, aerial topdressing was employed to enrich the farmable acreage prior to the farm being stocked with a selection of sheep and cattle chosen by the Field Officers. The subsequent expansion in numbers of sheep, in particular, necessitated a new shearing shed and shearers' quarters also being provided.

SOIL CONSERVATION PROJECT

The Agriculture Department's Wellington office later sought agreement with the Post Office to set up a soil erosion project on the Quartz Hill area of the station property to measure the affects of the farming operations on water run-off and erosion of the Makara type of soil. Two houses were accordingly provided in the station settlement for Agriculture Department staff along with a small soil testing laboratory. From here the test results on soil moisture content and temperatures at various levels below the surface were sent to the Agriculture Department's Soil Conservation Section in Wellington. This information was to provide a long-term guide as to the best type of treatment to safeguard hillside pasture land and consequent levels of stock grazing both at the Makara Radio Station farm and on a Dominion wide basis

STAFF ACCOMMODATION

The initial accommodation provided in 1944 for the NZPO. staff at Makara comprised three houses for the following original technical staff:

House No. 1	A.F. Smith (officer in charge)
House No. 2	G. Askey
House No. 3	E.J. Paton

Houses at Makara

Four houses were also provided for the N.Z. Broadcasting Service along with an access road to their new receiving site on the Quartz Hill section of the Station property. Post Office house No. 3 was later occupied by S.M. Thompson on a transfer from Suva Aeradio. Messrs Smith, Askey and Thompson thereupon became the Administration and senior technical staff for some years. Additional staff requirements could not be provided for until the imminent completion of the new hostel for single residents and accommodation for domestic staff.

By 1957 the original housing settlement had expanded to a total of sixteen houses allocated as follows:

N .Z. Post Office	9	Agriculture Dept.	2
N.Z. Broadcasting Service	4	Lands & Survey Dept	1

In addition, the hostel accommodation for Post Office and Broadcasting Service single staff had been increased to 12 bedrooms by means of a temporary extension to the original bedroom wing. In 1963 a new two storey block of 20 bedrooms was completed as a replacement for this extension and to provide accommodation for extra trainee staff (photo opposite).

Two additional new houses were later provided for the Lands & Survey Department. These additions completed the final extent of the Makara Radio housing settlement.

NEW TECHNOLOGY

With the advent of new technology in the form of new generation submarine telephone cables such as COMP AC in 1962, T ASMAN in 1976 and ANZCAN in 1984 the role of our international Post Office radio stations was about to change. The crucial event was the opening of the new satellite earth station at Warkworth in 1971 with a further addition and second dish antenna being installed in 1984. By 1973 Warkworth, New Zealand had become one of 600 earth stations world wide working via a global system of communication satellites.

Working via the INTELSAT system of satellites, Warkworth was then able to take over a number of the existing international radio circuits to and from New Zealand. The last of these radio circuits incoming to Makara were transferred to Warkworth and the satellite system in 1987. Shorter overseas circuits such as those from the Pacific Islands, Chathams, Pitcairn, Scott Base and some shipping services were eventually transferred to either satellite operation or to other communication establishments such as Broadcast Communications Limited (BCL) and the New Zealand Navy station at Waiouru.

THE END OF AN ERA

Being overtaken by new technology of the type featured in the opposite photograph depicting the No. I and No. 3 dish antennas at Warkworth Satellite Earth Station, Makara Radio Station which has been in operation since 1944 became silent. Post Office staff affected by this closure were offered alternative positions in other Radio Technician establishments, while all internal and external radio plant and equipment was eventually dismantled and disposed of.

The days of Makara Radio Receiving Station came to an end on the 30th September, 1993. It was indeed the end of an era.

TRIODE & CATHODE RAY TUBE DISPLAY UNIT.

Rod Osborne

This was an interesting educational unit made in the 1950's by the Amalgamated Wireless Valve Company of Australia (AWV).

It was designed to show the operation and characteristics of triodes and cathode ray tubes.

To enable them to construct this unit, AWV manufactured a special triode, type AV25, and also a matching CRT tube.

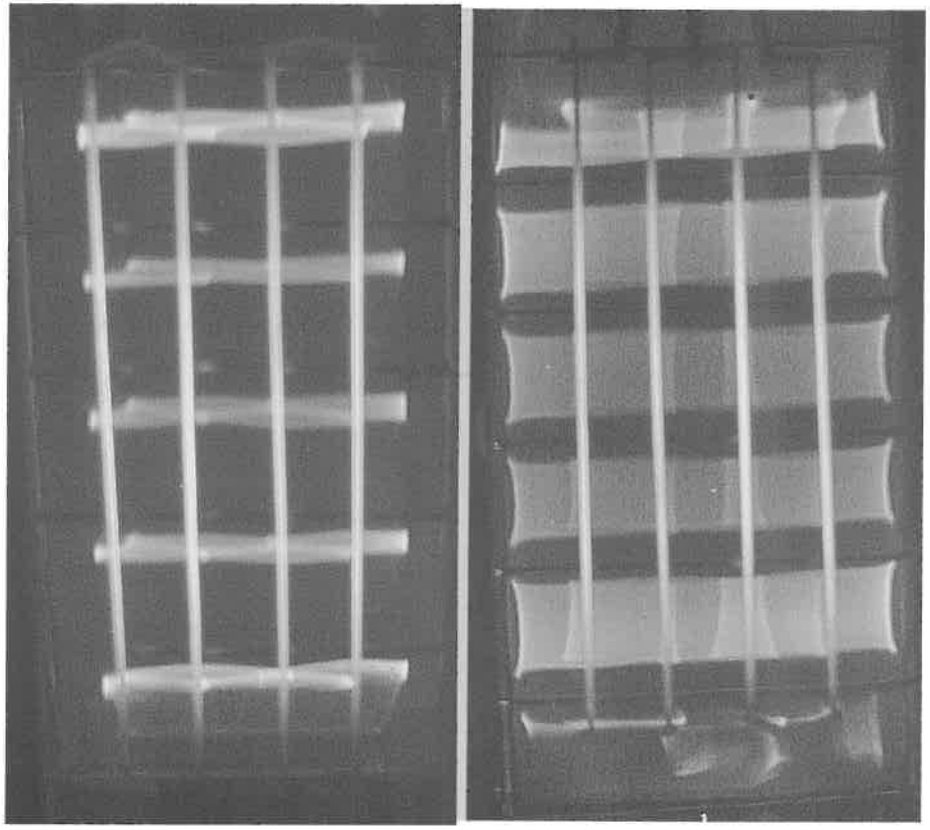
AWV TRIODE AND CATHODE RAY TUBE DISPLAY UNIT

The AWV AV25 Demonstration Triode.

This was a simple open construction triode intended for educational use.

Clearly visible were the vertical oxide coated filament strands, the ladder like grid and the large flat plate. The plate was coated with a phosphor which fluoresced green under electron bombardment. Variations in grid voltage produced changes in the pattern of the electrons striking the plate and this could easily be seen by the variations in the amount of green phosphor glowing on the plate. The open construction of the valve, although not typical of a commercial valve, showed the relative position of the filament, grid and plate.

There was also a socket to connect a meter to read these variations in plate current



In the above pictures the vertical lines are the red filament wires and the horizontal lines are the green fluorescent areas on the plate. The picture on the left shows the effect of high negative voltage and the picture on the right shows less negative voltage and therefore more green florescence.
(*Regrettably the pictures can only be shown here in black and white. Ed.*)

The AWV CRT Tube.

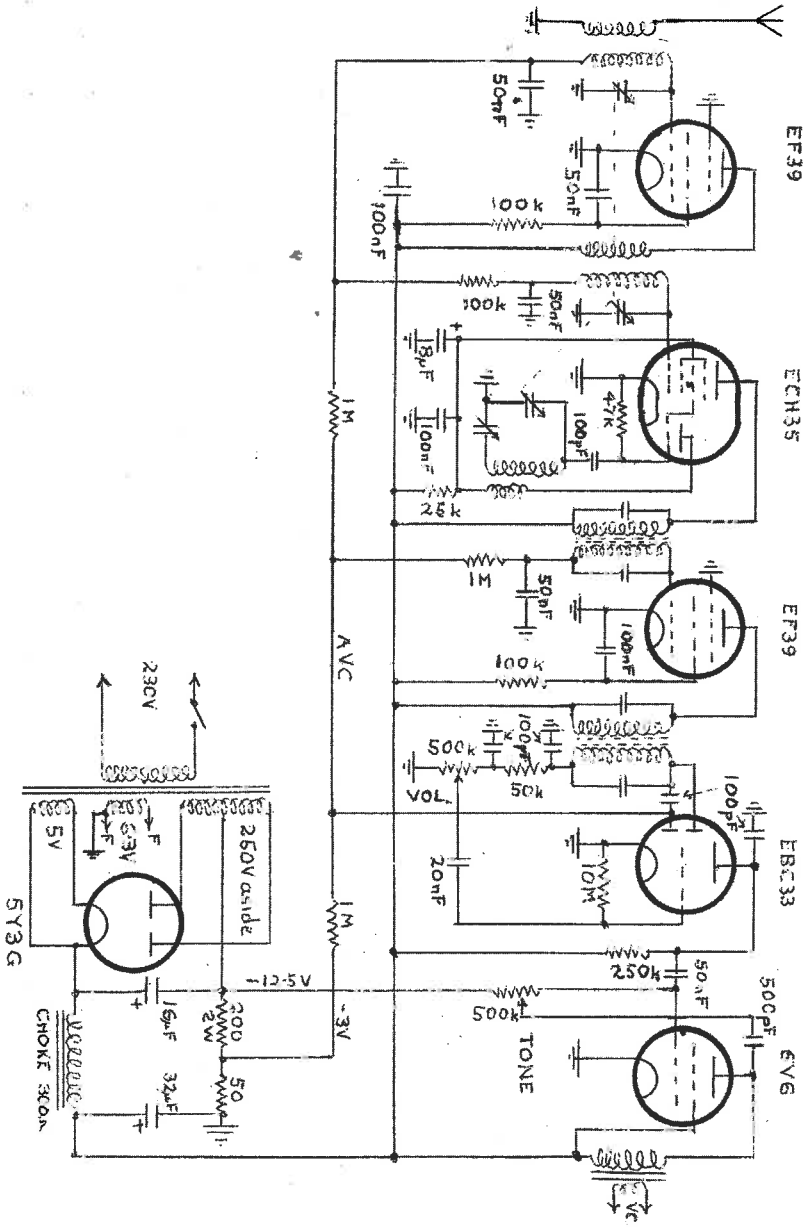
This tube was made to show the effect of the electron beam striking the coated anode and causing it to fluoresce, as has already been shown in the triode, and also to show the deflection caused by negative or positive charged plates placed beside the path of the electron beam. It can also show deflection caused by magnetic fields in the path of the beam. This magnetic deflection effect is exactly how the picture tube in a TV set works.

The unit was a very successful tool for AWV teachers and the interesting picture (above) appeared in the book by James Sinclair "Uniting a Nation" showing students receiving instruction on this unit at the Port Moresby Technicians Training School, New Guinea.

EDDYSTONE USER GROUP TO CLOSE DOWN

Dedicated website to replace it

Chris Pettitt advises us that with Graeme Wormald's well-earned retirement at age 70 this group is to close down with publication of its last letter in April this year. Taking it's place will be a dedicated website www.eddystoneusergroup.org.uk where everyone will be able to access the mass of information the EUG has built up over the years. This will eventually include copies of the newsletters and supplements, the histories of the group and Company, personalities, picture libraries, forums etc. Most of this information will be freely available to those who require it.



CUSTOM BUILT RADIO - CIRCUIT DIAGRAM

DESIGN FOR A CUSTOM BUILT RADIO

Cedric Sutherland

About 1948, when I was working for a well known radio firm in Wanganui, a customer asked me to build him a six valve superhet which he was going to install in his own design of cabinet. For some reason I decided to use as few components as possible, perhaps because I had seen some circuitry in a magazine which appealed to me, so I set about the job and finished up with a receiver in which all the cathodes were grounded. This, I'm sure, was not unique at the time but I had not seen any commercial chassis with this format.

The interesting outcome was that the circuit performed exceptionally well, and I was surprised at this because the valve lineup was standard for those days. I could have used American octal valves but decided to use Philips octal instead. As far as I am concerned this would not have made the difference but others may disagree with me on this point.

Since that day I have never seen, nor constructed any more sets of this type until recently, when I decided to rebuild two battery receivers of about 1940's vintage into AC operated units. I used the same circuitry I had used back in 1948 with admirable results which caused me to wonder about the merits of this design.

There is no doubt that grounding cathodes removes any problems caused by heater cathode leakage, which can affect the electron stream. It did occur to me that with fixed bias all round, the fluctuating currents in the respective valves would have less effect on their bias voltage thus stabilizing their operation. However the important part of this circuitry (reproduced opposite) is the omission of a number of components, which reduces the complexity and also the likelihood of servicing problems. Over the years I have noted that some designers seem to make their equipment as complicated as possible, even to the present day, which of course is market driven. Oh, for the simple life!

Anyone contemplating a rebuild or even a conversion will find the grounded cathode approach is simple and effective.

Any AC valve series from the old 2.5 volt through to octal and noval etc will be quite OK to use in this way.

First things first though. Before fitting the power transformer if rebuilding, check that the secondary windings are putting out the correct voltages, The HT winding must be the same voltage both sides of the centre tap. This will save you a lot of strife if found to be faulty afterwards.

When the set is completed, the first thing to do is check for dry joints and mistakes in the wiring, then check with an ohmmeter to make sure that the HT line resistance to ground is high enough. Around 100,000 ohms would be fine unless it is necessary to use a voltage divider supply to the screens when allowance must be made accordingly. Power up with, preferably, a series lamp as outlined in the November 05 bulletin. This avoids serious problems caused by wiring and other errors. (A 60 watt lamp should glow dimly)

A point to be noted when using Philips series octal valves is that the screens of the RF and IF valves should be series fed with 100 k resisters, unlike the American valves, *6KTs* etc, which can be fed from a voltage divider off the HT rail.

The power transformer should be in the region of 250V AC or so each side, so as to give about 270V DC on the HT rail. The H T voltage is not that critical, in case you were wondering, except that you must keep the plate and screen voltages under the rated maximum for the respective valves.

Other points to watch are;
Shield all sensitive audio leads, e.g. around the volume control and grid of the first audio valve.

Make sure all signal leads to the R.F and I.F valves are as short as possible, usually by orienting the coupling transformers to achieve this.

Return all bypass capacitors to earth at the point where the cathode of the relevant stage is earthed.

Put the power switch on the tone control rather than the volume control to avoid AC hum getting into the audio circuits. Some manufacturers never learned this trick.

Make sure one side of the heater wiring is grounded.

If using glass RF valves, these must be shielded, including the first audio.

Most importantly, never use imperfect capacitors as audio coupling or AGC bypass condensers, always use brand new polyester if you can. With wax impregnated ones leakage is inevitable.

It should be noted that if the bias voltage is too low, the first suspect is the output valve, as it draws the major portion of the current. Low emission in this valve will alter the bias voltage.

A signal generator is essential for alignment. If you do not have one, I'm sure one can be borrowed from a friend for a day or two. The main reason is that it is impossible to align the I F stages without a generator. The other circuits can be done without one, but using a generator is best. (Note that a large majority of IF's are around 465kHz, except for early 30's chassis, which may be 175 kHz.)

Do not use any old resisters or capacitors if you can avoid them, but if you are sure resisters have not gone higher in value or capacitors have no leakage then they will work O.K.

To check a capacitor easily if you do not have a capacitor tester, you can apply a D.C voltage of about 300 V to one end and measure from the other end to ground to see if there is any voltage on a 20,000 ohm/V multimeter. Always set the meter to high voltage range first in case of capacitor breakdown or high leakage, and then switch down to, say, 3 volt range to see if any leakage. If more than, say, a quarter of a volt, discard the capacitor. Remember always that an open circuit capacitor has no leakage!

It goes without saying that good soldering is essential in all radio work. A lot of effort can be wasted by poor soldering, so if you are not experienced in this skill it pays to do some practice on things like soldering to tag strips and valve sockets. (NOT IN THE CHASSIS). Use good quality resin cored solder and make sure that what you are soldering is free of dirt, grease and most essential, corrosion. Articles that are old can form an oxide, which will make soldering hard or impossible. Scrape the corrosion off before you start, and make sure the iron is hot enough. You can't solder with an iron that is too cold, or too low a wattage.

Finally, I believe that this grounded cathode circuitry always works better than anything else, and I will be interested to hear from anyone who believes differently! Best of luck

ALTERNATIVE VALVE SERIES YOU CAN USE

RF	Mixer	IF	Det/1st Audio	Output	Rectifier
EF39	ECH35	EF39	EBC33	EL33	EZ40
6K7	6K8	6K7	6Q7	6V6/6F6	80
7B7	7S7	7B7	7C6	7C5	7Y4
EF89	ECH81	EF89	EBC81	EL84	EZ81
6SK7	6SA7	6SK7	6SQ7	6V6	5Y3GT
6BA6	6BE6	6BA6	6AV6	6AQ5	6X4
58	2A7	58	2A6	2A5	80

NOTE that in using any of these alternative valves it will be necessary to ensure that the correct voltages are supplied to electrodes (consult the valve data handbooks), also that the components such as the valve sockets, oscillator coil, output transformer and power transformer are suitable for use with the selected valve.

THE WESTON STANDARD CELL - A LITTLE KNOWN DEVICE

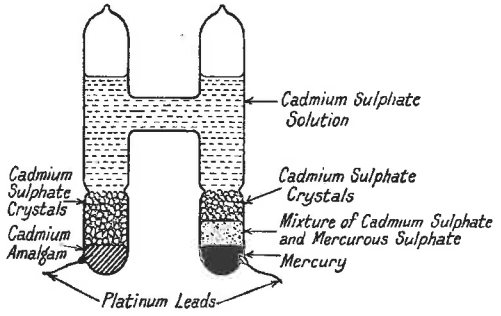


FIG. 2.9. WESTON STANDARD CELL

This remarkable cell patented by Weston in 1892 will deliver a constant e.m.f. of 1.01859 volts at 20^0 C and retains this accuracy for many years provided no appreciable current is drawn from it.

Prior to about 1970 this cell formed the Primary Standard of Voltage and as such it was usually immersed in a temperature controlled oil bath and protected from vibration. Measurements using them were made by methods which drew negligible current from the standard.

LONG DISTANCE TELEVISION

Experiences of an enthusiast in Britain forty years ago

Dick Stevenson

During the early 1960s the magazine "Television" began to feature a section dealing with DXTV, i.e. the reception of long-distance programmes from other countries. For a number of years local channels, especially those on VHF, had been disrupted, often in summer, prompting a notice
"Do not adjust your set, programmes are being affected by continental interference".

Enthusiasts and DXers were becoming interested in resolving the "interference" and the magazine started to give advice and were reprinting typical test-cards. In those days most European TV stations would broadcast a test-card for long periods, and a knowledge of these was very useful for identification. Evidently an ionised layer, the "E-layer", about 100 km up in the ionosphere, would reflect VHF frequencies, sometimes as far as 1600kms, causing "Sporadic E" reception and especially active during sunspot maxima.

As a newly arrived Kiwi I was fascinated by UK TV and began to revive old sets. In a teaching post I was soon known to pupils and their parents as a willing recipient of discarded TV's especially as new sets were appearing on the market capable of receiving the commercial stations on Band 3. In fact, for some years I never had to buy a set at all.

Wanting to try DXTV, I looked at one of my donated sets and found that it could easily be tuned through Band 1 (about 6m wavelength) by adjusting a very accessible thread-mounted slug in the oscillator coil. I soon extended this to the top of the set and by means of a suitable knob was able to check out any Sporadic E activity. Actually I found that I could tune down to the 4 metre band and receive occasional amateur transmissions.

I was able to pick up pictures from all over Europe aided by a directional aerial in the attic. pointing mainly to the south-west. Next I made a pre-amplifier from an old turret tuner, bypassing the local oscillator and using the first stage, a high-gain triode and the coils to provide a useful boost to the signals. This triode had to be put in series with the filament chain and the AC/DC arrangement meant a live chassis. Once I visited the home of a colleague and noticed that one of the knobs on their TV had broken. To change channels, a handy pair of a pliers was used and as far as I know no one in the family was electrocuted! On one occasion I picked up, direct from Russia, an annual parade of armaments. Enormous ballistic missiles and industrial might were in full view. On a happier occasion in 1966 I saw, also direct from Russia, a re-run of the play when Britain won the European Football Cup

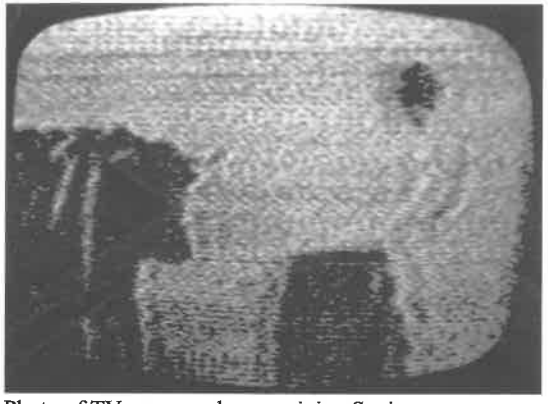


Photo of TV screen when receiving Spain

The signals I received certainly lived up to their name as being very sporadic. The E-layer is rather discontinuous and the reflections would fade away and then reappear with the strength of a local station, so that on occasion I was able to obtain reasonable photographs off the screen. The TV standard in Europe was the CCIR at 625 lines and the modulation was negative, (a standard also used in New Zealand). British sets used 405 lines and positive modulation, so a few modifications were necessary. The line (horizontal) control could be advanced in frequency from 10kHz to 15kHz and the robust valve circuits rarely complained. The modulation was easily changed from positive to negative by reversing the second detector diode.

Eventually the urge to receive Band 3 became overpowering and I travelled down to a vast warehouse at Stepney Green near the Thames. I was met by a large number of TV's, mostly operating, and I finally chose one that had been professionally converted to a turret tuner. I had hoped that the TV could be delivered, but on hearing of my address the proprietors mentioned that their journey home would go right past my door. As it was near closing time they obligingly offered to give me and my set a lift. I enjoyed two channels for a time although eventually the advertisements began to pall, a situation not unknown in New Zealand today!

Another donated set was a Bush which had "flywheel synchronisation". In areas of marginal reception synchronising impulses could drop out and this set would cleverly maintain the scanning frequencies for several seconds until the signal was stronger. Such a system I thought would be ideal for DX, so I made the necessary modifications which fortunately did not disturb the flywheel effect. The difference was dramatic as the pictures remained much steadier as the set did its stuff with the synchronisation.

This Bush set had full coverage of the VHF channels so I thought I would investigate "tropospheric propagation". This phenomenon occurs over shorter distances and affects higher VHF and UHF transmissions. I had little success in London, although on one occasion I picked up France which was still wedded to 891 lines. By juggling the line-hold control I obtained two pictures side-by-side and these lasted for some time in typical tropospheric fashion. Much later, when I was living in Suffolk and most British sets had gone over to UHF and 625 lines, I picked up a Dutch test-card which persisted for several hours.

About this time the BBC had decided on colour transmissions and at the same time to upgrade the system to 625 lines on UHF and with FM sound. For a while there were switchable dual-standard sets to cover both 405 and 625 lines and experiments had already been done with the three existing colour systems. The original American standard, NTSC, was rather sensitive to phase changes, hence the nickname "Never Twice the Same Colour". The French developed their own system, SECAM, a "System Essentially Contrary to the American Method" while Britain and Australasia adopted the PAL system, "Peace At Last"!

My DXTV observations rather languished after that, as I was taking up a post in another country. On my return to the UK. I found that Britain and some other countries had abandoned the TV Bands 1 and 3, so Sporadic E reception was curtailed. The advent of colour, satellites and digital transmission would mean more complex sets and aerials so the days of simple TVDX seemed to be over. Nevertheless, as a postscript, I might add that a strong sunspot maximum is expected at the end of 2007 and some TV and FM radio by Sporadic E from Australia and the Pacific might be detectable in New Zealand. A TV or radio with a continuously variable coverage of Bands 1, 2 and 3 is really needed (often found in portables) as well as a good outside aerial.

Above. **Overall Winner - Bryan Powell**
At right. **Phil McGechie- winner of the Certificate of Merit for best Design.**

Above. **Absentee entry, Peter Lankshear's beautifully constructed set - winner of the Certificate of Merit for best Execution.**
At right. **Murray Stevenson with his set which won the Certificate of Merit for best Performance. This was the only entry not using a type 49 valve; it used a 1Q5GT.**

AGM 2006

Design and Execution Judges,
Tom Duxbury(at rear) **and Ross Paton**

Performance Judges,
Reg Motion (at rear) **and Ralph Boshier**

Bill Farmer

The Annual General Meeting this year saw a good attendance of members from Auckland and throughout the North Island.

Not surprisingly, in view of their excellent performance, the existing committee was re-elected without change.

The draft financial report was accepted. (copy enclosed with this bulletin) and membership fees are to remain the same.

Apart from the usual table sale in the morning and the afternoon auction there was great interest in the judging and results of the Hikers One contest. There were ten entries and points were given to each entrant for each of three separate evaluations: Design, Execution and Performance. A certificate was awarded to the winner in each of these evaluations with the overall prize being decided on the total of points for the three evaluations.

There were two other significant happenings. Long-time member, Bill Farmer, who was present was congratulated on achieving the grand old age of 92 and at the auction, one item, a 1933 table model Atwater Kent, fetched $570, a record price for this event.

1920s-Era Radio Building Blocks

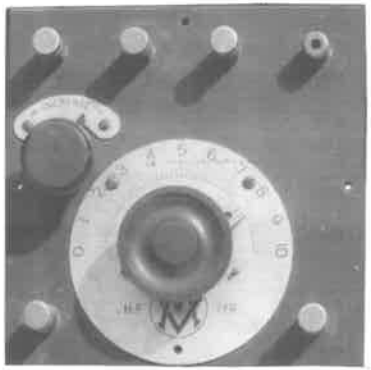
John Walker

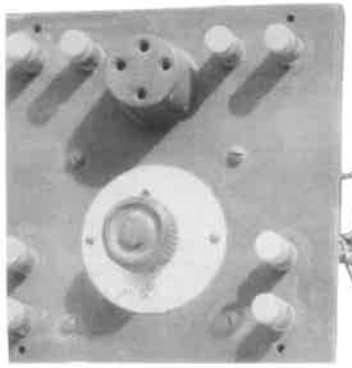
In the course of a recent radio club 'Junk Sale' I chanced upon a box of obviously very ancient radio components. At first glance they looked like De Forest "Interpanel" or "ExpansePX" (p150 in '*Golden Age of Radio*" by John Stokes) units but closer inspection revealed them most likely to be of British origin. To date I have not been able to find out anything more about these panel units and I hope that somewhere there is a *Bulletin* reader who can shed light on these mysterious objects.

As far as I can ascertain the original De Forest "Interpanel" units were designed as a sort of "radio-building blocks" which could be externally interconnected to end up with a TRF radio receiver with chosen degree of complexity; ie one or two stage of RF and/or AF amplification, etc.

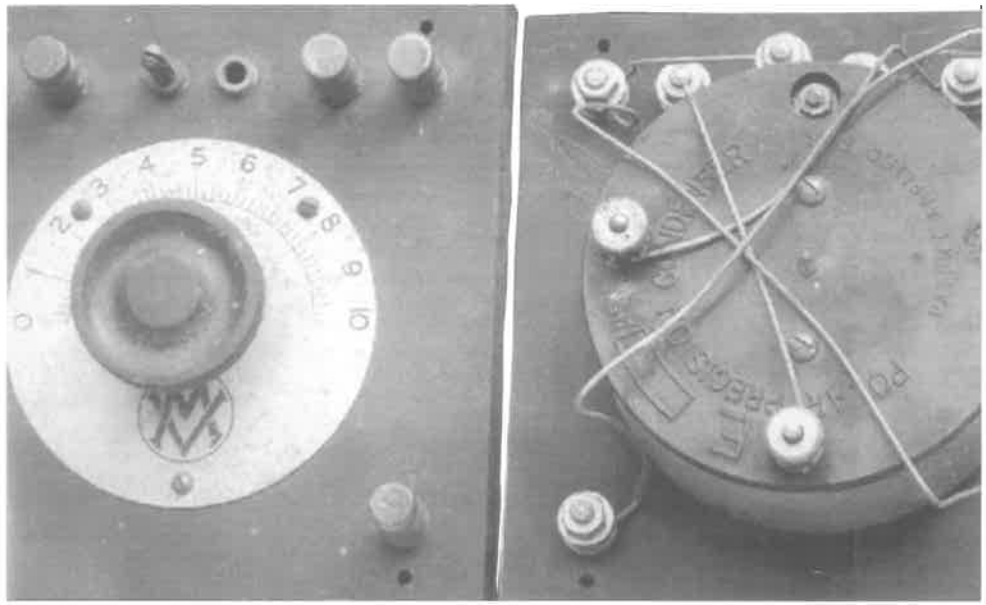
The black Bakelite panel units shown in the photographs have an array of terminals to allow one to do just this so, for example, one could couple the variometer panel to the variable capacitor or to a crystal or valve detector and so on. Although they are almost certainly of UK-origin there is no maker's name visible but the dial scales bear a distinctive VM (or MV ?) logo as shown in Photo 1; also they use British B4A four-pin valve bases. My ex-junk sale lot included the following panels;

Variometer;(front and rear views)
This comprised three coils; one of which rotated inside the main coil whilst the other could be swung nearer or closer to the main coil to vary the degree of coupling.





Rheostat and Amplifier panel;
(front and rear views) The basic unit was simply a hefty wirewound variable resistor to control the filament voltage but in addition one panel unit also had an intervalve transformer added to make it into an audio amplifier.



Variable condenser; (front and rear views) This was labelled as a Polar™ Precision Variable Condenser and also allowed for variable-coupling "basket"-type coils to be added.

Calibrated dial with trademark.
(Apologies for poor quality but the aluminium dial is rather corroded).

So, to conclude, I look forward to finding out more about these weird and wonderful relics of a bygone radio era.

John R L Walker ZL3IB
Email <staf169@ext.canterbury.ac.nz>

N.B. I would be happy to pass these items on to a good home in exchange for a donation to NZART branch 56 funds.

ITEMS AVAILABLE TO NZ MEMBERS

Please make out cheques to New Zealand Vintage Radio Society

From NZVRS Secretary, 2 Levy Road, Glen Eden, Auckland.
paul.woodcock@opus.co.nz

Ivory 3 pin Power Plugs
$1 each plus $2 P&P for up to 4 plugs.

Club Badges. $5 each plus 50c P&P

From NZVRS, P.O. Box 13873, Onehunga, Auckland 1006.
office@nzvrs.pl.net

Fahnestock clips 50c each, 11 for $6.00 posted

Power Cable, (3 core brown fabric covered). 10 m $8+$4 P&P

Black Sleeving Braid 2x1.5m $4+$5 P&P

Dial Lamps, 6.3V, 0.15A, #40 screw & #47 bayonet. 50c each plus $1 P&P

Nylon Dial Cord, 10 meters at $5 incl. P&P

Residual Current Detectors $15 + $5 P&P

Books:
Tube Lore,
Outback Radio, From Flynn to Satellite
Antique Radio Restoration Guide,
The Taming of Distance,
Golden Age of Radio in the Home,
More Golden Age of Radio in the Home,
Zenith Transoceanic Radio
and Hallicrafters.

See http://www.nzvrs.pl.net or enquire direct for price and availability

MARKETPLACE

Advertisements for the next issue must reach the editor by the 15th Julyl 2006. Ads must be either hand printed, typed on a separate page or emailed. No verbal or phone ads. Remember to include your name, address and phone number. There is no charge for ads but the NZVRS is not responsible for transactions between members. Address ads to Reg Motion, 2A Hazel Terrace, Tauranga, New Zealand or email regmotion@xtra.co.nz

AVAILABLE

Q meter, valve type in metal cabinet. Frequency, 50kHz to 50 MHz. Capacity, 30pF to 450pF. Dawe Instruments, London. Rare. $150. Trevor McDonald, 50 Tirimoana Rd., Te Atatu, Auckland. Ph 09/8362023

Plain unprinted valve cartons - Small and GT $10 per 100, Medium, $12 per 100, Large $18 per 100. All plus postage. Any amount supplied. Paul Burt, 44 Hasting St West, Christchurch 8002. Ph 03/9607158, Fax 03/9814016. Email dawn.lloyd@paradise.net.nz

Some spare chassis looking for a new home, complete with valves, all free plus postage (N.I. $10 - $15: S.I. $5 - $10) HMV 5401 portable plus parts, MGA,p110 Ultimate RJ plus parts, GAR,p87. Cromwell 617R. Empire 117 (Westco Products). Philco 738, 7 valve loctal. Escort 518. HMV 467D, MGAp109. Gulbransen 6255, MGAp102. Paul Burt, 44 Hastings St., West Christchurch 8002. Ph 03/9607158 Email dawn.lloyd@paradise.net.nz

WANTED

Set of knobs for Pilot 393B, all except the tuning knob (3 knobs).
Roy Arbman, 2 Given St., Havelock North.
Ph. 06/8773461.

Circuit or information on a Philco type 722, Ser. 3463 Dual-wave receiver, circa 1945. It is NZ made but uses many USA Philco parts, ie IFs, coils, tuning gang, can electrolytics and paper capacitors. It has a NZ made 6" EM Rola speaker which is labelled "Philco". The output valve, which is missing, is either a 41 or 42 and receives its bias with a voltage divider across the speaker field coil. The rectifier is an 84 valve, equivalent to a 6X5.
Also NZ Pye PZ60 dial glass undamaged or complete set, any condition as long as dial glass is OK, Contact Murray Stevenson, 33 Birdwood Rd., Swanson, Auckland 1008. Ph 09/8334907.

Six inch EM Zenith speaker in reasonable order. Will pay cash for it or swap with a 10 inch EM Zenith Also1 or 2 6Q7G valves if anyone can spare them.
Bill Meiklejohn, 19 Paramount Pde., Tikipunga, Whangarei. Ph 09/4595044.

To borrow or copy. Instruction/service manual for a Japan Radio JRC NRD-1EH communication receiver Please contact John Walker, ZL3IB, ph 03/3489084. email staf169@ext.canterbury.ac.nz

Circuit diagram and any info for Wright 555 valve amateur transmitter and VFO5 external VFO. Two small knobs for Eddystone 770R Mk. 1 (or 750) and manual to borrow for copying. Knob for Bell General 'La Fayette', GAR p41. Manual or circuit diagram for Marconi TF937/1, Signal Generator.
Henry Devenport, 1782 Wharerata Road, R.D.2, Gisborne. Ph 06/8628877.
Email zl2hy@clear.net.nz

FROM THE LIBRARY

The following are titles and key points from articles published in other vintage radio magazines received by the NZVRS Library. Photocopies of these articles are available to members at $1 each from our Librarian, Ernie Hakanson, 17 Williamson Ave, Grey Lynn, Auckland Ph 09/3766059

894 Granger Associates (Australia) the Company and its Products. History, photos, circuit of model 175-5. HRSA Radio Waves April 2005, p8

895 The Cossor Melodymaker. 1929 kitset. Description, photos, circuit. HRSA Radio Waves April 2005, p21

896 The Glories of 1920s Radio - Eighty Years on. Richard Begbie's collection, history, photos. HRSA Radio Waves April 2005, p30

897 Quad Output Transformer: Inner Secrets Revealed.. Presence of a little known resistor in the OPT of a Quad II amplifier. Wellington Vintage Radio Newsletter February 2005 p4.

898 Resistance Line Cord and Ballast Tube Replacement. Two alternatives described. Antique Radio Classified March 2005, p12

899 Early Christchurch. Photos and description of radio installations and equipment. 3AC masts and aerial. Wellington Vintage Radio Newsletter March 2005 p3

900 German Amateurs in WW2. The Sebold Scam and the "Amateur" Beacons (part2). Radio Bygones April/May 2005, p10

(continued overpage)