Radio Bygones

Some readers may not be aware that there is a vintage radio magazine which is, quite unusually, produced as a commercial venture and which sets a very high standard of reporting and reproduction. Radio Bygones is edited by Mike Kenward and produced bi-monthly by Wimborne Publishing of 408 Wimborne Road East, Ferndown, Dorset BH22 9ND, England. It is a 36-40 page glossy stock A4 magazine with 4 sides of colour photographs - called Museum Pieces - on the front and rear covers. Each issue contains articles on radio restoration and repair, usually with excellent photographs, circuit diagrams and detailed descriptions. Histories of radio happenings and nostalgic memories also feature as does radio communication equipment, both civil and military.

Subscription can be made on-line or a sample issue ordered on their web page at <*www.radiobygones.co.uk*> via a secure on-line ordering facility or by post with your details. Visa and Amex credit cards are accepted. Cheques must be in pounds sterling. The subscription rate to New Zealand with airmail postage and waterproof wrapping is 24.50 pounds for one year, 47.00 pounds for two years.

A snippet from 1930

On March 11 the longest talking circuit on record was established when persons in Schenectady, New York talked with Rear Admiral Richard E Byrd at Dunedin, New Zealand after the Byrd expedition returned from the Antarctic.

The voices of the Schenectady speakers were carried direct to Dunedin by W2XAF, a short wave station of the General Electric Company.

The voice of Rear Admiral Byrd reached the United States through an elaborate hook-up which involved land wires, submarine cable, a long wave broadcast transmitter and a short wave transmitter From Dunedin the voice was carried by land wire and cable to Wellington, (New Zealand) a distance of 500 miles. At Wellington, station 2YA operating on 420 metres carried the voice 1200 miles to Sydney (Australia), where 2ME, the short wave station of Amalgamated Wireless Australasia Limited, rebroadcast the signal direct to the receiving laboratory of the General Electric Company, 8 miles outside of Schenectady, in Glenville, New York.

With acknowledgment to Practical Radio, Myer and Wostrel, 4th Edn, 1931.

DUNEDIN RADIO PIONEER

William Lalor Shiel was one of the pioneers of radio engineering in New Zealand . In 1924, with the callsign Z4AK, Lalor, together with Ralph Slade, Z4AG, became the first person to establish voice communication by radio between New Zealand and England. In 1926 he built a radio transmitter for the whaling ship "C A Larsen" which enabled this ship to communicate directly with Norway from New Zealand . During Kingsford Smith's historic flight from San Francisco to Brisbane, he helped to give radio directions to the pilot from Dunedin. A radio set constructed at the time for the Byrd Antarctic Expedition was capable of picking up practically any station in the world. Lalor Shiel himself ran the "B" class broadcast station 4ZL Dunedin and was the originator of the Electronics Institute of New Zealand.

Details from Break-In, Nov. 1961.

NEW ZEALAND VINTAGE RADIO SOCIETY INC.

Vol. 24 No. 4

November 2003

Radio In the Days of Adolf Hitler And the Third Reich

NEW ZEALAND VINTAGE RADIO SOCIETY INC.

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

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TREASURER: David Crozier, 154 Grey St, Onehunga. Ph 09-6365954or 0800-187161, email- dckh@pl.net Financial and membership matters are handled by the Treasurer. A list of members is available on application to the Treasurer with a self-addressed, stamped envelope.

LIBRARIAN, Ernie Hakanson, 17 Williamson Ave, Grey Lynn, Auckland. Ph 09/3766059. 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. Ph 07-5768733, email regmotion@xtra.co.nz

AUCKLAND MEETINGS will be held at the Horticultural Society Hall, 990 Great North Rd. (opposite Motion's Rd.).

Mon. 17th Nov. at 7.30p.m "Batteries"
Mon 15th Dec. at 7.30p.m-Auction sale
Mon 19th Jan. at 7.30p.m- Variety in "Hikers" Sets.

BAY OF PLENTY AREA MEETING
This meeting will be held at a time and place to be advised.

TARANAKI MEETING
The December Meeting will be held on Sunday the 14th and will be a pot luck tea hosted by Bill and Pat Campbell. Contact either Graham Lea, Phone 06-7585344 or Bill Campbell, phone 06-7532475..

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. Ph 04-4728788.

CHRISTCHURCH MEETINGS.
For details of meetings contact Jim Lovell, 41 Yardley St, Avonhead, Christchurch 8004. Ph 03-3427760

FROM THE EDITOR

At the suggestion of John Walker and with the kind permission of the Editor we reproduce a particularly interesting article recently published in Electronics World. Written by Jeremy Stevens, this article covers the history of domestic radio developments in Germany during the Hitler years and describes the author's restoration work on one of the "Folks Receivers" of that time.
Don Beswick has contributed an explanation of the intricacies involved in getting the oscillator to track with the RF input tuned circuits in a superhet. John Walker continues with details of one of his communications receivers and, inspired by our recent cover photo of the broadcasting tower on Mt Victoria Gordon Cooper reminisces on early Civil Aviation days in Wellington. My own contribution is an article on a signal generator which set a high standard from the 1930s through to the 50s.
An update of our journal index is included. It is appreciated that a full index is carried on our website but not every reader has the means of access to that listing.
Note that as the journal now comes to you in a clear plastic cover the Traditional "Marketplace" has been taken off the rear cover page.

NEW MEMBERS

Oliver K	Palmerston North
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Oliver J	Lower Hutt
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THE FOLLOWING BOOKS AND OTHER ITEMS ARE AVAILABLE TO NZ MEMBERS AT DISCOUNT PRICES

From NZVRS Secretary, 2 Levy Road, Glen Eden, Auckland. paul.woodcock@opus.co.nz
HALLICRAFTERS $36
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Packing and Postage - $5
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$1 each plus $2 P&P for up to 4 plugs.
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From NZVRS, P.O.Box 13873, Onehunga, Auckland 1006. office@nzvrs.pl.net
AUCKLAND RADIO - $30
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630V, Axial lead, Polyester Capacitors,
.1, .068, .047, .033, .01, .005, .001 uF.
1000V, Axial lead, Polyester Capacitors,
.082, .068, .018, .001 uF
All capacitors 50c each plus $2 P&P

Check first for availability. Please make out cheques to New Zealand Vintage Radio Society

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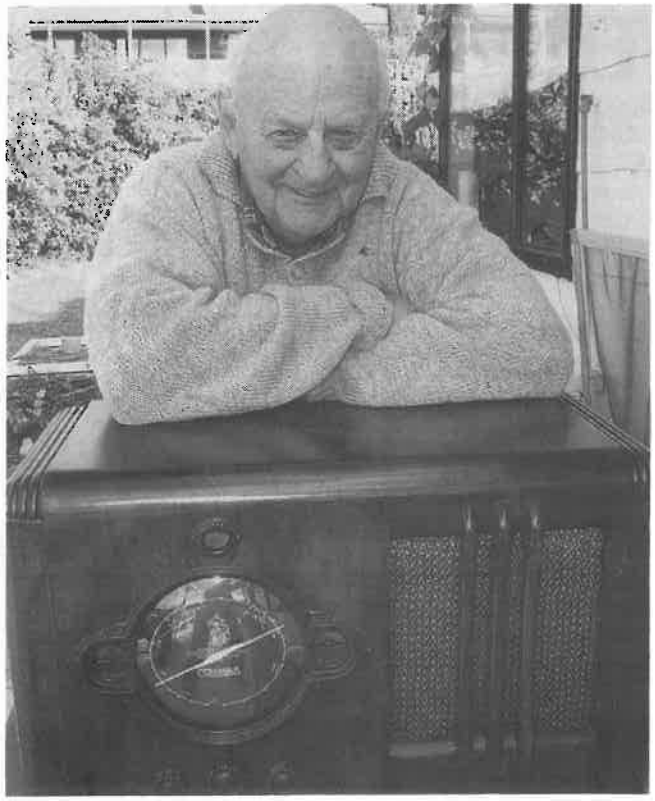
WITH THE COLLECTORS - FRANK STRETCH



When fingers get fatter and eyes grow dim, old valve radios are much easier to work on than their modern counterparts says Frank speaking from his Picton home.

Frank's passion for radios dates back to the time as a fascinated four year old he watched his father make a crystal set in a shoe box. His first mobile radio was in a Pinex box on his bicycle handlebars with a whip aerial at the back. An accident caused him to come off the bike and land on the radio, smashing it to pieces. That was when he started to restore them, he said.

During the war he was a Navy technician spending time in Korea. Back in NZ he started a radio electrical business in Blenheim in the 1950s, eventually concentrating on electrical work. But he continued radio collecting and restoring as a hobby. Frank's forte is old valve broadcast receivers, especially the Radio Corp brands - Columbus and Courtenay.

A visit to Franks collection of beautifully restored radios, 75% of them in working order belies the countless hours put in by Frank and friend, Sam Mills of Blenheim, in restoration of sets and cabinets. Some old timers have come from cowsheds where nesting birds and mice found a use for them. A deal of improvisation has been required to replace components now unavailable.

Frank donated many radios to Brayshaw Park a few years ago but his current collection has built up to 400 or so. The oldest is a 1929 Atwater Kent He dreams of establishing a radio museum in Picton and there is a possibility this could happen.

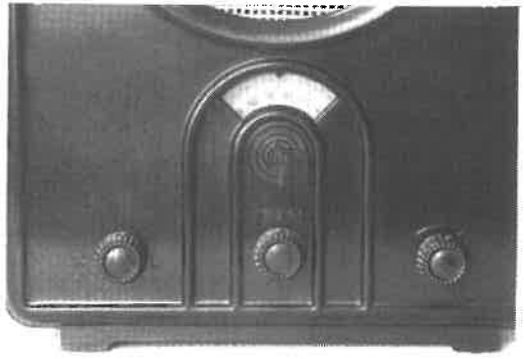
The above is a condensation of an article printed recently in the Marlborough Express and is presented here with their permission. The photo is by Dee Wilson.

German Propaganda Receivers of the Third Reich

This two part article, originally appeared in Electronics World of August 2003 and is reprinted with permission.

Comparing a valve radio receiver from the 40s to something from the present day you could be forgiven for wondering how on earth it worked at all. The designers in those days were a lot more innovative than you might think. Jeremy Stevens explains.

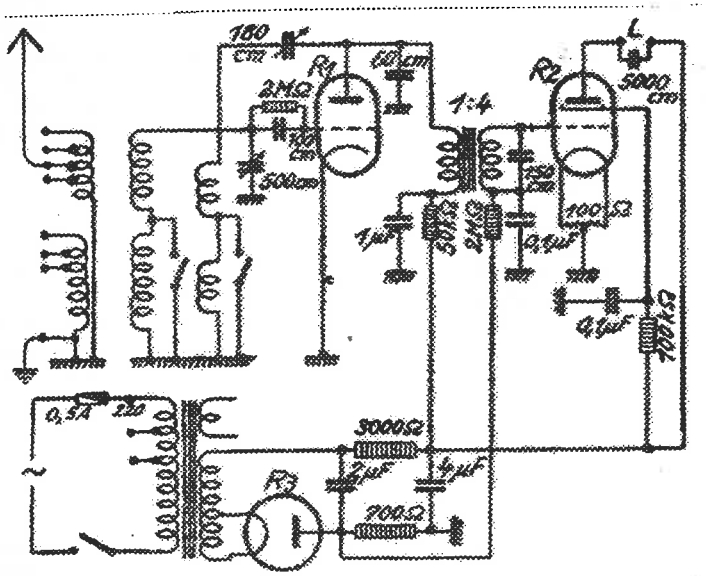
When as a child I first started dabbling in electronics during the 1960s, valves were ubiquitous in television sets and in the process of being displaced in radio receiver applications.. Undoubtedly I broke up a number of potential antiques as valve radio receivers had virtually no value at that time. I have more recently started collecting interesting examples of radio history and restoring them for daily use - much to the chagrin of my wife. Dealing with valves again instead of microprocessors can be therapeutic: the technology is stable and there is nothing new to learn other than to refresh one's memory of some of electronics' first principles. I first became aware of the German People's Radio (Volksempfanger) when an old friend of mine contacted me, he having been given a DKE38 to repair. The owner, a former soldier, brought it back to England after the war and I subsequently carried out some research on the subject for my friend and as a result developed an interest in these receivers. It was on a visit to the Techno-Classica exhibition in Essen, Germany, where I was browsing for classic car spares that I came across a pair of Volksempfanger for sale on one of the memorabilia stalls. Vol.ksempfanger are particularly conspicuous when on sale in Germany because the German eagle and swastika emblem is always covered (as dictated by law); this, paradoxically, draws attention to these receivers. Somewhat rashly I decided to make an offer for a VE301 and after some negotiation I became its owner.



Dial, controls and insignia on VE301

Historical Background

In January 1933 Hitler assumed the office of Chancellor of Germany. By March 1933 the first propaganda broadcasts had commenced having been organised by the Minister of Interior, Frick and SA member Hadamowsky. (After the war Frick was found guilty of war crimes at the Nuremburg trials and subsequently hanged). In April 1933 engineers from the Heinrich Hertz Institute under Prof. Leithauser commenced mapping the field strength of the main transmitters throughout Germany. This work established that reception of national stations could be achieved using a simple TRF receiver. Thus the concept of the Volksempfanger, a mass-produced cheap radio receiver for the reception of German State propaganda, was born.



In keeping with the limited sensitivity necessary to make reception of stations outside Germany difficult, the TRF design comprised just two stages, a first stage detector with reaction followed by an audio output stage as shown above The electrical circuit design of the receiver was by Otto Griesing His design used a triode first stage detector (REN904) and transformer coupling to the output valve (RES 164). A RGN354 half wave rectifier provided the HT supply. Its anode was returned to chassis via a 700.ohm resistor in order to provide back-bias for the directly heated output valve. The loudspeaker was a high impedance balanced- armature type directly driven from the output valve anode, thus negating the need for an output transformer. There were a number of aerial sockets connected to tags on the coupling coil, three for long wave and four for medium wave plus earth. The desired tap was selected in combination with adjustments to the tuning and reaction controls facilitating optimum coupling in line with the desired listening level and selectivity. The use of Litz wire in the RF coils was deemed sufficiently important to be mentioned in the technical description on the first page of the handbook..

Walter Maria Kersting (1889-1970) designed an emblem for the receiver comprising a silhouette of an eagle's head superimposed over five concentric rings, like ripples in a pool of water. The pace of development of this project was astonishingly fast, the VE301 was announced at the Berlin Radio Fair held in late August 1933. With typical German attention to detail the model number had a special significance as it commemorated the date that Hitler became Chancellor, 30 January 1933. A pre-production run of 100,000 units was prepared for sale at the exhibition, priced at RM76 and all the receivers were rapidly sold. Over the next few years and up to the outbreak of war, the price was to fall further. The sets were made in vast numbers and several variants were produced by a number of different manufacturers from 1933 to 1945. When war started in 1939 the larger radio manufacturers ceased domestic radio production, manufacturing military equipment instead. Limited production of Volksempfanger continued only in small companies. At this time it also became illegal to listen to foreign stations. This heinous crime was categorised as "moral self mutilation" and, if convicted, the miuimum term of imprisonment was 5 years. The maximum penalty was death!

Advertising Poster

AC and AC/DC sets were only available with Bakelite cases. Battery and DC only sets were supplied in wooden cases. The stark rectangular lines of the Bakelite case in particular reflected the architecture of the time.

The original VE30IW was an AC only set (suffix "W" stands for "Wechselstrom" i.e. "AC") and was produced up to about 1938. It had a distinctive round speaker aperture, centrally placed arched feature with a sector cut out to reveal a linearly engraved tuning scale (photo on page 5) and multiple aerial sockets on the left side of the case. Kersting's eagle emblem took pride of place in the centre of the arch. This receiver featured on a poster with the caption: "Ganz Deutschland h6rt den Fuhrer mit dem Volksempfanger" - "All Germany hears the Leader with the people's radio". In 1938 the "Reichsadler" replaced the eagle emblem. The Reichsadler was an eagle with outstretched wings and talons grasping a swastika, that familiar symbol of the Third Reich and ultimate evil.

The VE301G was a DC set (suffix "G" stands for "Gleichstrom" i.e."DC"). Whilst this retained the centra] arched tuning scale, the case was in wood with the front vertical edges rounded; The speaker aperture was square and divided with two closely spaced horizontal bars to leave the major part of the aperture at the bottom. The primary difference on this receiver was that the rectifier and mains transformer had been dispensed with. The valves were indirectly heated types REN1821 and RENS1823d. The heaters were wired in series with a dropper resistor and drew 180mA.

The two versions of the battery receiver, VE301B & VE301B2, also used the wooden case. The former used two REO34 triodes and a RES174d output valve. The latter used different valves (two KC1 triodes for detector and first stage audio amplifier and a KL1 pentode output valve. In both cases the 2V heaters were powered from an external lead-acid accumulator). Both sets were introduced in 1933 and the "B2" version lasted until 1938 but the "B" version was discontinued in 1934.

In 1935 the AC/DC version, VE301GW was launched. The mains transformer was replaced by a dropper resistor and the valve line up changed to VCI, VL1 and VY1. These valves had 55V, 50mA heaters. In 1931 the VE3OIWn was launched. The suffix "n" stood for neu or new. A front panel control to vary the aerial coupling and bandwidth was introduced to accompany the reaction control. This replaced the multiple aerial sockets - employed for the same purpose in earlier models. The first stage detector valve was changed from a triode to an AF7 pentode and the transformer coupling to the output valve replaced by a simple RC network.

In 1938 the VE301WnDyn was launched and represented the end of development as the model continued unchanged in production until 1944. There was also an AC/DC version (VE301dynGW) that used the same V series valves as in earlier models. The Bakelite case was changed substantially as it now incorporated a rectangular loudspeaker aperture with traditional illuminated glass tuning scale. This scale was calibrated in kHz for both MW & L W bands. A conventional moving coil loudspeaker with energised field replaced the balanced armature unit. The output transformer and ballast resistor (28k) were also carried on the loudspeaker frame. The rectifier was changed to a double diode (RGN1064), but was still used in half wave configuration with both anodes wired in parallel. None of the front panel controls were identified on this model (in common with the earlier wooden cased DC battery versions). The three aerial coupling taps and earth connection were at the rear of the set. Kersting's single eagle emblem was replaced by a pair of Third Reich eagles moulded into the case at each end of the tuning scale. In March 1938 German troops were welcomed into Austria as the two countries united under The Anschluss and the names of Austrian stations joined the exclusively German Reich stations on the tuning scale.

Also in 1938 a smaller, cheaper, receiver was introduced, the DKE38.. The DKE38 model name is short for "Deutsche Klein Empfanger (19)38". This receiver was available in AC/*DC* and battery variants. Also available in a Bakelite or wooden case, it was cheaper than the VE301 and featured a high impedance balanced armature loudspeaker and simple Bakelite tuning knob with engraved linear scale acting directly on the tuning capacitor. Capable of receiving MW and LW stations, an ingenious band switching method was employed, activated when the circular tuning dial was rotated past its 180° end position. The scale engraving was repeated in two colours, white for MW and red for LW. Volume and selectivity adjustment was by means of a front panel adjustable aerial coupling control as in the VE301Dyn. The version of the DKE38 for mains operation had just two valves with 55V heaters, a rectifier type VY2 and triode-pentode, type VCL11. It was nicknamed "Goebbels-Schnauze" - literally "Goebbels Snout or Mouthpiece" thus underlining the receivers' intended use as a propaganda instrument of the Third Reich. Small changes to the circuit design, primarily in the power supply, were made to the DKE38 in 1940 and 1944. There were two more propaganda receivers; a portable known as the "Deutsche Olympia" and a workplace set without an internal loudspeaker. The Olympia had the model designations DO36 & DO37 indicating the model years of 1936 & 1937 respectively. The Deutscbe Arbeitsfront Empfanger had the model designation DAF1011 and dated from 1935. As with the VE301, the model number had a special significance as it commemorated 10 November 1933 when an address by Hitler to workers in a Siemens factory was broadcast. Although a TRF design, the DAF1011 had both a RF stage and extra audio amplification to provide sufficient power for driving multiple external loudspeakers.

Photographs of the VE301W, VE301Dyn, DKE38 and DAF1011 are published in *Bakelite Radios - Robert Hawe.-1996* .

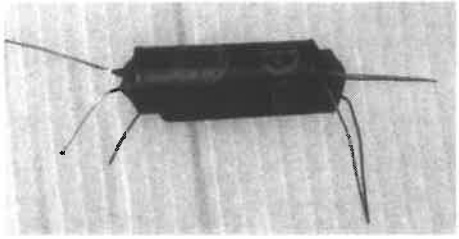
Initial Examination

At the time of purchase I was only able to ascertain that my VE301 receiver was complete, that the case was undamaged and that the manufacturer was Philips. Although clean, everything appeared original including the valves, mains lead and plug. The rubber wiring to the loudspeaker and loudspeaker mounted scale lamp was in a terminal state of decay.The valve line-up was as follows: Rectifier RGN1064, Output pentode (directly heated) RES164, (L416D) and RF detector pentode AFl. The valves were all made by Valvo and had 4V heaters. All the valves carried a warning that they were only to be used in a VE301 receiver!

Removal of the chassis was a little difficult because the control knob grub-screws had seized. They were freed by a judicious application of easing-oil. On AC/DC sets these screws are a potential source of electric shock as they can become live if the mains connections are reversed. The same can be true of the AC only sets if there is a fault in the insulation of the mains circuit. When the chassis was eventually removed the set's excellent overall condition was confirmed, only one repair was evident and that was the replacement of a smoothing capacitor. The replacement (dated 1946) has clearly failed as the pitch encapsulation had run out of the case.

An initial check of all the passive components revealed that as might be expected all the resistors measured higher than their claimed values but not sufficiently high to warrant replacement However, it was a different matter with the foil and electrolytic capacitors: all were leaky. I had assumed that as Philips made my receiver it dated from post. 1940, possibly 1942. However, the electrolytic capacitors gave a clue to the date of manufacture as all the original parts were dated October 1938. The capacitors were made by NSF and FRAKO and carried the emblem of the Third Reich (in common with just about every other major component in the receiver). Luckily, they were of a type of construction that rendered restoration possible. The capacitor element was housed in a cardboard tube sealed at the ends with pitch. It was a relatively easy matter to remove the complete element by placing the capacitor in an oven at 70°C for about half an hour to soften the pitch and then pushing on the end. Modern components are almost invariably smaller and can be placed inside the original case and sealed in place with the original pitch.

One of the capacitors was a multiple foil type, something I was not expecting to find. The single wound element was tapped giving values of 0.1uF+0.1uF+0.2uF with respect to a common ground terminal. It was slightly more cballenging to squeeze modem replacements into this item. .



Restored Multi-capacitor

Another surprise was the unit of capacitance printed on some of the smaller values manufactured by NSF, namely "cm". Some research revealed that "cm" was once used as the unit of capacitance! According to the Boscb Automotive Handbook 1uF=0.9x10^{6}cm and originates from the now defunct CGS system for electrostatic units where the Farad is defined as 9xl0^{6}cm. In other words a capacitor of value 1 cm is equivalent to 1.1IpF. This apparent anomaly results from the attempt to defme all units in terms of mass, length and time; only in the CGS system.

Part 2 continues with the author describing the operation of his own VK301 and the design of a preamp he constructed to allow use of a ferrite rod aerial - Ed

References

1. Robert Hawes, Gad Sassower, *Bakelite Radios,* ISBN 0-7858-0389-0
2. Catherine McDennott, *20th Century Design,* ISBN 1-85868-710-0
3. *ARRL Radio Amateurs' Handbook* (1968 edition)
4. *Bosch Autonwtive Handbook* (1952 German edition)
5. Christabel Bielenberg, *The Past is Myself;* ISBN 0-552-99065-5

Columbus Model 15

By Ian King

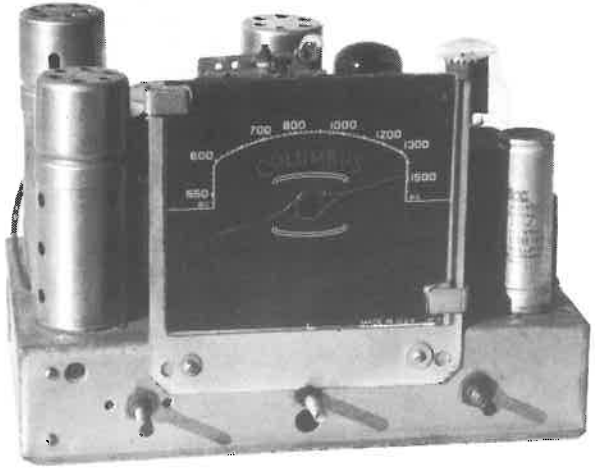
1937 was the introductory year of the Columbus brand name for R.C.N.Z., and the model 15 bearing the brand originally was marketed in 1935 under the Courtenay name.

Back biasing was replaced by cathode biasing, and iron cored aerial, oscillator and I.F. coils were introduced for the Columbus model.

The cabinetry is a simple but very attractive tombstone design of unusually small dimensions: 15" high, 7.75 " by 13" width.

In order to accommodate an 8" E.M. speaker, an inclined baffle board extending from front to rear of the cabinet was installed. This baffle created a box within a box effect which gives a pleasant, rounded sound worthy of that which one would expect from a much larger cabinet.

In 60 years of pursuing a strong interest in valve radios, I have never come across this model Columbus before, which would be a reasonable indicator of its rarity.



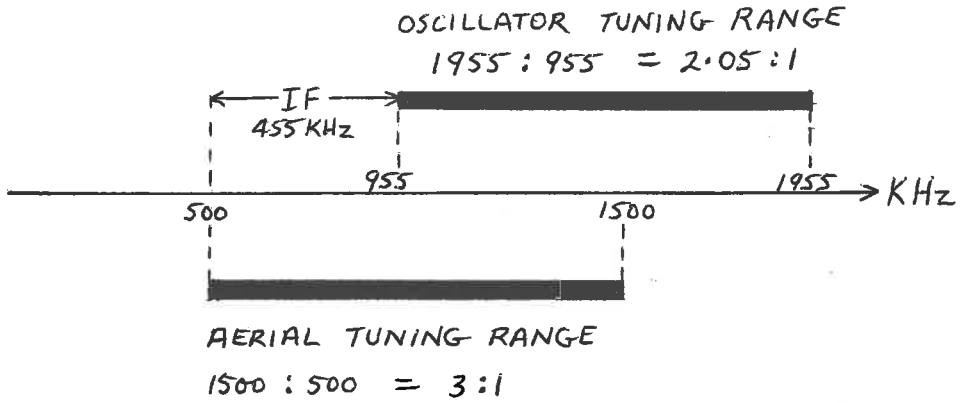
All in all, a most enjoyable restoration, which was heightened for me by gold lettering along the bottom of the glass dial scale which reads "MADE IN U.S.A." (Referring of course to the dial, not the chassis.

An interesting discovery indeed, and one which I would appreciate other NZVRS members' comments upon.

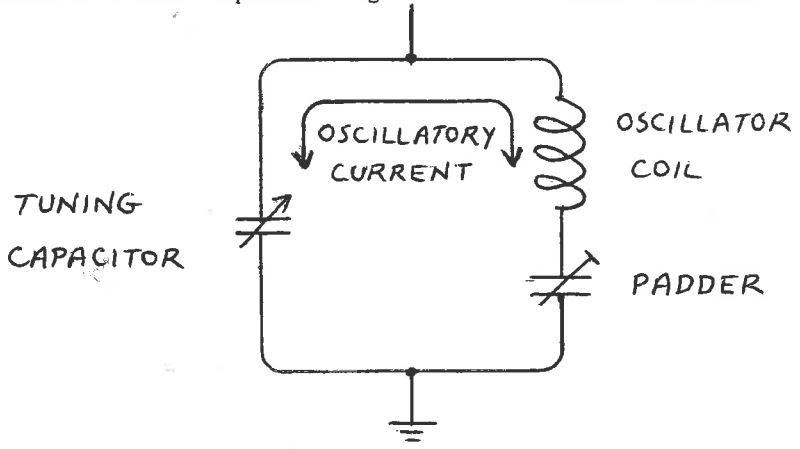
TUNING THE SUPERHET LOCAL OSCILLATOR.

Most readers will know that in a superhet the intermediate frequency (IF) is the difference between the local oscillator frequency and the signal frequency, and that the local oscillator frequency is usually higher than the signal frequency. What this means is that a set which tunes the broadcast band, 500 KHz - 1500 KHz in round figures, with an IF of 455 KHz requires a local oscillator that tunes from 955 KHz to 1955 KHz.

Some tuning gangs, as in the small Philips valve sets (brass plates in a solid aluminium frame) had one section with smaller plates and wider spacing to tune over the higher frequency range. In budget priced AC/DC sets it saved the cost of a padder. Other gangs with identical sections require a series capacitor, called a padder, in the oscillator circuit. The frequencies tuned by the aerial circuit and the oscillator circuit can be shown on a diagram.



The aerial section tunes from 500 to 1500 KHz, with a frequency ratio of 3 : 1, while the oscillator section tunes from 955 to 1955 KHz, with a frequency ratio of about 2 : 1, actually 2.05 : 1. So the problem is, how can we make the oscillator section of the two-gang capacitor tune over a 2 : 1 frequency range while the aerial section tunes over a 3 : 1 tuning range. The answer is to place a capacitor in series with the oscillator section to reduce both its capacitance and its effective capacitance swing. Let's look at the oscillator tuned circuit.



When viewed from the feed point at the top, the circuit appears to have two parallel arms, but for the oscillatory current this is a series circuit. In other words the oscillator coil resonates with the equivalent capacitance of the gang in series with the padder. The formula for the resonant frequency of a tuned circuit is $f = \frac{1}{2\pi\sqrt{LC}}$ or that f is proportional to $\frac{1}{\sqrt{C}}$

In words, frequency is inversely proportional to the square root of capacitance.
In this form it will tell us the frequency range when the capacitance range is known, but in this discussion we know the required frequency ranges, 3 : 1 and 2.05 : 1, and we want to find the corresponding capacitance ranges. We need to transpose the above formula to find C. We start by squaring both sides to eliminate the square root sign and then use rules of transposition which will give us $C = \frac{1}{4\pi^2 Lf^2}$ or that C is proportional to $\frac{1}{f^2}$

In words, capacitance is inversely proportional to the square of the frequency. The inverse relation means that the highest frequency is tuned when the capacitance is least, i.e. with the plates wide open, or unmeshed.

A few lines of algebra will show that the capacitance ratio $C_{max} : C_{min}$ is the square of the frequency ratio $f_{max} : f_{min}$. So if the frequency range is 3 : 1, the corresponding change in capacitance is 3^2 or 9 : 1. A typical broadcast capacitor has a capacitance swing of 50 - 450 pF which is a ratio of 9 : 1 as required. (Others may be 40 - 360 pF which is still 9 : 1).

For the oscillator section, the required frequency ratio was 2.05 : 1 and the corresponding capacitance ratio is 2.05^2 or 4.2 : 1.

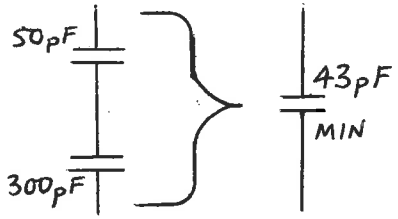
So the question becomes, how can we make a capacitor with a 9 : 1 capacitance swing look like one with a 4.2 : 1 capacitance swing. As you will realise, this is the function of the series capacitor. It requires a bit of trial and error with a slide rule or calculator but it can be shown that a series capacitance of 300 pF has the desired effect. In other words we place 300 pF in series with our 50 - 450 pF gang (usually in series with the earthy end of the oscillator coil).

Let us calculate the minimum effective capacitance, i.e. with 50 pF in series with 300 pF.

$$C_{total} = \frac{C_1 C_2}{C_1 + C_2} = \frac{50 \times 300}{50 + 300}$$

$$= \frac{50 \times 300}{350} = \frac{300}{7}$$

$$= 43 \text{ pF minimum}$$

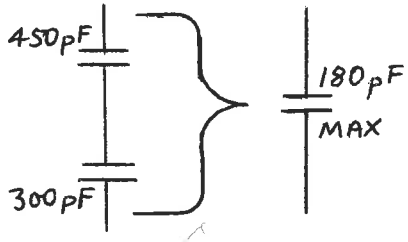


The maximum effective capacitance, i.e. with 450 pF in series with 300 pF is given by

$$C_{total} = \frac{450 \times 300}{450 + 300} = \frac{450 \times 300}{750}$$

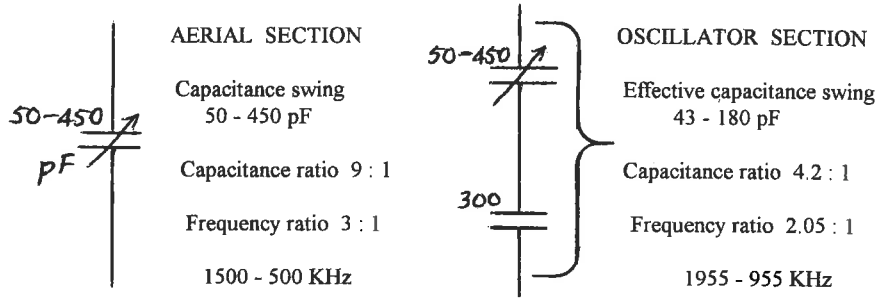
$$= \frac{900}{5}$$

$$= 180 \text{ pF maximum}$$



With the addition of a 300 pF series capacitor, the oscillator section of the gang now has an effective capacitance swing of 43 to 180 pF, and the ratio 180 : 43 is 4.2: 1 as required.

We can compare the two sections of the gang:



What we have seen is that the addition of a 300 pF series capacitor, or padder, converts the standard 50 - 450 pF gang into one with an effective swing of 43 - 180 pF in order to tune over the higher frequency range. The padder is usually adjustable, and there are trimmers across each section of the gang to minimise tracking errors. (The. error depends on how the capacitance changes with the rotation of the moving plates).

In practise one adjusts the padder at the low end of the band where it has the most effect. It brings 450 pF down to 180 pF which is 40% of its former value, but brings 50 pF down only to 43 pF which is 86% of its former value. The trimmers (3-30 pF) have the most effect at minimum capacitance, when the plates are wide open, typically 50 pF. They have practically no effect at the low end of the band where the plates are fully meshed, with capacitance of 450 pF

"The set for the Wife"
A Crystal Amplifier set for Company
Built for a few shillings-gives loud reception

There is a great demand for a cheap little set that will work a small loudspeaker within the town area of the local station. The crystal and single valve amplifier described here will give very clear loudspeaker reception within about 10 miles of the local broadcaster and telephone reception over a much greater distance. It is the ideal little set for the wife at home, as it requires little operating. We can recommend this little combination to all.

The above opening to a constructional article in the "NZ Radio Handbook" for December 1928 goes on to fully describe the set together with circuit diagram, parts list, panel and wiring layout. It even suggests that a semi-permanent crystal detector would be advisable.

In today's sophisticated world of Electronics a suggestion such as above would, I fear, receive a rather withering reply! -Ed

Index: Vols 20 -24

This index is arranged under key words (such as manufacturers names) which it is anticipated members will use when searching for information, The lower case letters after an entry refer to;

- c circuit schematic
- d description
- h historical details
- m maintenance details
- p photo or photos
- s specification

The reference/s at the end of the entry are to volume/ number/ page of article starting point.

Index by Subject

Index by Authors

TARANAKI VINTAGE WIRELESS GROUP

AUGUST MEETING 2003

This months meeting was held in the home of Brian & Sue Tipler at Stratford. After a quick hello we moved off to a location where Brian had arranged for us to be the lucky owners of some rather elderly radios and associated bits and pieces, some were well worn, others quite a bit of a bargain, there was a lot to sort through. The owner ran an auction, and at times the bidding was quite competitive. Needless to say we all came home happy and with a car full.

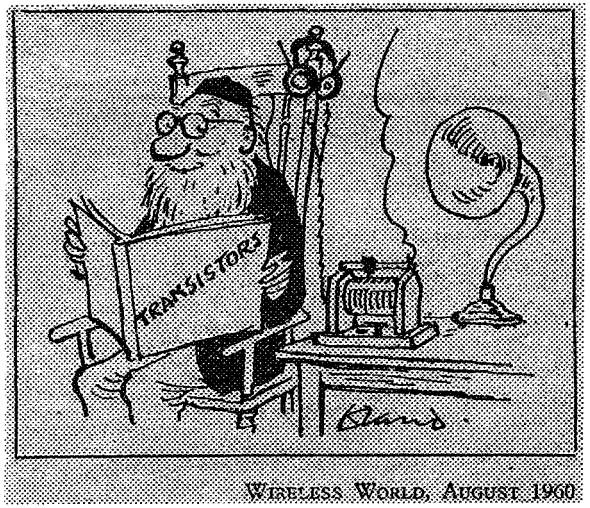
Suzie Lowe came with us and the rest of the Ladies under Sue Tipler's guidance went to Lavender Lane, a Stratford craft shop, then they did a tour of Stratford. I think the radio bits were nicer!

We travelled back to Brians and had afternoon tea with the Ladies, as usual, a really good spread.

During the afternoon tea, we decided to regularise our meeting time and date. This was set at the second Sunday in the even months of the year, this will also be for the Taranaki open weekend. Mark your diary for this event next year: February 7/8 2004. The 8th being the second Sunday.

Our December meeting will be on Sunday the 14th and will be a Pot Luck Tea hosted by Bill & Pat Campbell.

Contact either; Graeme Lea phone 06 758 ~5344, or, Bill Campbell phone 06 753 2475



WIRELESS WORLD, AUGUST 1960

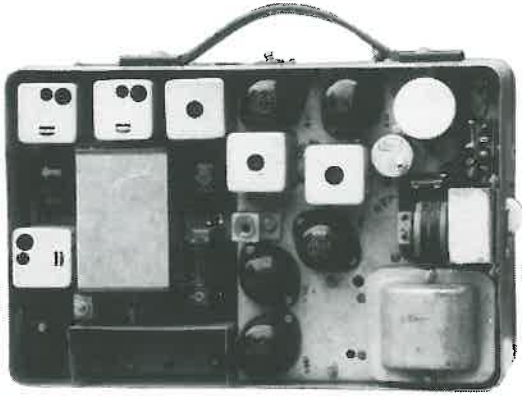
From my Collection: The Radione R-3 WWII German military Receiver

by John R L Walker

It appears that during WWII all the combatants had general coverage (typically 1.6 to 16MHz) short wave receivers available which were used for both military and general SW listening as a boost to troop's morale. For example the British had their Pye PCR-2, the Americans used a Hallicrafters S-39/R80 "Sky Ranger" whilst the Germans used the Radione Portable Receiver type R-3. The R-3 was also used for communications purposes in combination with transmitter Type RS20M. Some years ago an R-3 was offered to me from a deceased estate and then by the magic of amateur radio and a chance contact with Herbert DF9KN, a German radio amateur in Cologne, I was able to obtain a copy of the circuit. One of these sets featured in "*Das Boote*", a German film about WWII U-boats.

General design

The R-3 is built into a metal cabinet (350 x 240 x 175mm) using a most curious "chassis in a box" design so that when the front panel is removed it exposes the underside of the chassis. The photo below shows the set with the back cover removed exposing the upper side of the chassis. The switch at upper right is the input voltage. Only the tuning and AF gain controls are on the front panel; the rest being scattered around the top and right hand side which seems decidedly inconvenient.



The circuit

This is described more fully in the reference 1. Briefly it is a fairly conventional superhet covering 2.6 to 25.7 MHz in three bands. The all-metal valves are uncommon being the "so-called" footless octal (ref 2). made by Telefunken or Valvo and used in the following line-up:- RF amplifier (EF13), mixer (ECH11), IF amplifier (EF12), diode detector and AF amplifier ((EBC11), BFO (EBC11), output stage (EDD11) and rectifier (EZ11). The output stage is interesting in that it uses transformer coupling to an EDD11 twin power triode.

The R-3 is also unusual in that it can be operated from 120, 150, 190 or 220 V AC and, in addition includes a built-in vibrator power supply allowing portable operation from 24V DC.

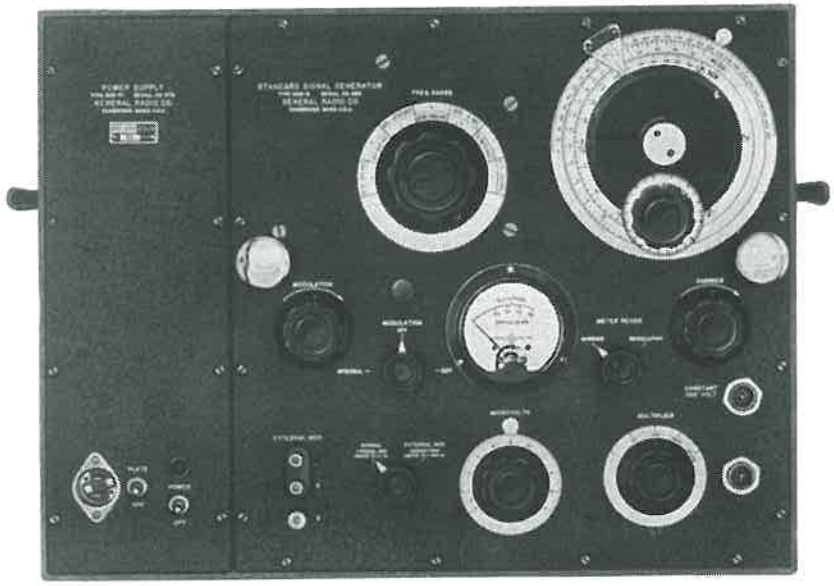
References

1. R. Koenig. *Radione Portable Receiver R3 and Transmitter RS20M*, Radio Bygones No.33 Feb/March 1995.
2. J W Stokes, *70 Years of Radio Tubes and Valves*, 1982, Vesta Press, New York.

Signal Generators I Have Known (part 2)

Reg Motion

In the early war years I joined Radio Section of the Post Office where we had a Supreme Modulated Oscillator for use in the radio workshop and in the Acceptance Testing Laboratory they sported two General Radio Type 805-B Signal Generators. While the workshop Modulated Oscillator was nothing to write about the GR instruments were something special. They were acknowledged by world experts as a top quality standard and I take my hat off to the Post Office radio engineers of the time who had convinced the administration to purchase such fine (and costly) instruments. Naturally they were only allowed to be used under the supervision of senior laboratory staff and did most of their work on the acceptance testing of the many communications receivers which Post Office Radio Section purchased for its own stations as well as for other Government departments and the Armed Services. Sensitivity, signal to noise and other test results determined with these instrument were never, to my knowledge, challenged by receiver suppliers, either here or overseas. At least one enterprising NZ receiver manufacturer honoured the design by copying many of its features in an instrument manufactured for use in their own receiver production



Front view of General Radio type 605-B Signal Generator

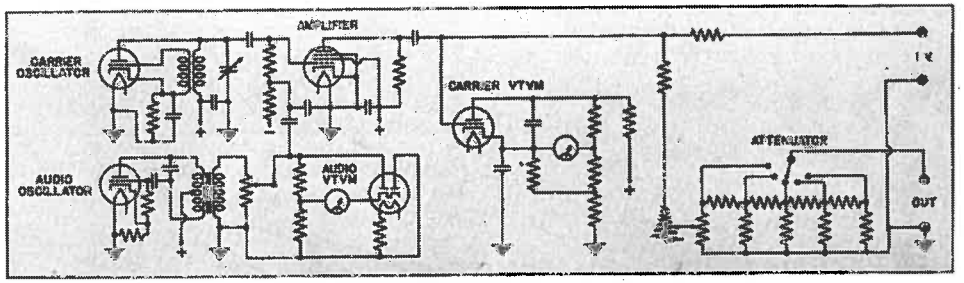
When one of the Radio Section 805-B signal generators was honourably discharged following 30 years of service I successfully tendered for it and it now resides in my own collection of General Radio and other test equipment. As received this instrument had been out of use for some years and constant adjustment had worn the geared dial drive to the point where it had lost its originally smooth movement but otherwise the generator was in quite good shape except for failure to operate on the lowest frequency range (10 to 30kHz). This range functioned again when I repaired a corroded litz wire connection on its coil. Notably, it was not necessary to

change any capacitors or other components. A full test then showed that it was still well within its original specified accuracy of frequency and output

One major change had been required during its working lifetime. When purchased from General Radio it had been fitted with their proprietary coaxial RF connectors and the mating coaxial output cables had been supplied. After 20 years or so, replacements for these cables had been difficult to obtain and the connector had to be changed to accommodate more modern cable. British Post Office style of connectors had been ingeniously fitted inside the large GR connectors to make satisfactory connection to locally produced cables.

The 805-B generator followed the usual General Radio Company design of prewar days in being built onto an aluminium front panel about 6mm thick which is screwed to the front of a handsome polished mahogany box with nickel plated carrying handles. Internal parts carrying RF energy are contained within metal cases for screening purposes and the interior of the wooden case is lined with copper foil to give further screening. The front panel has a hard black crocodile paint finish and wording is engraved directly onto the panel through the paint to expose the aluminium underneath thus making the lettering visible. Dials are of nickel plated brass with black engraved lettering

The General Radio practice of engraving lettering through the paint on their panels is fine as long as the instruments are maintained in a dry atmosphere but corrosion of the exposed aluminium occurs in damp conditions and leads to eventual obliteration of the lettering - a fate shared by many of the older GR items. Luckily my 805-B had been well looked after and the lettering is in excellent order.

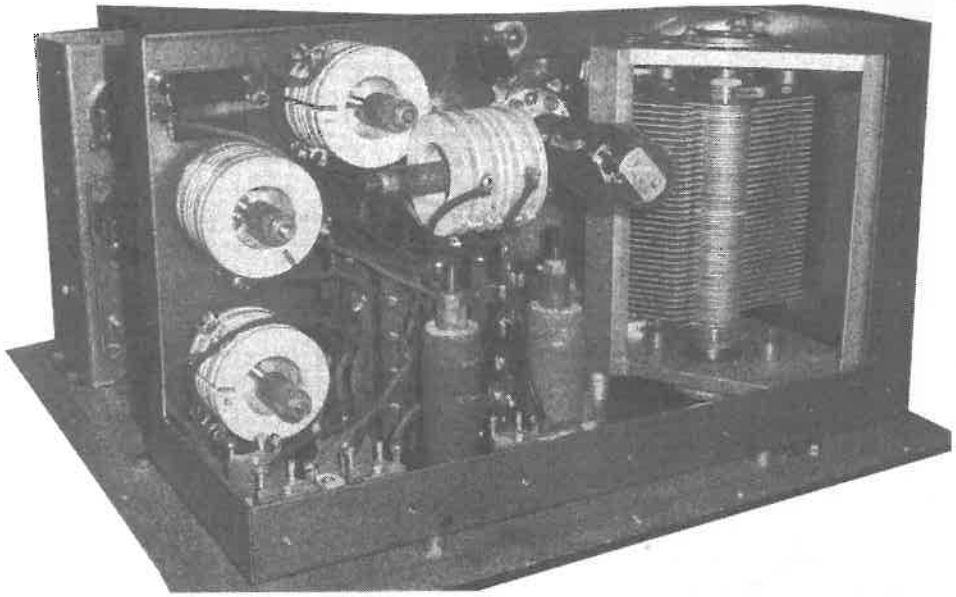


The above simplified schematic shows the general design which is fairly conventional. A tuned RF oscillator is followed with an untuned amplifier which is grid modulated when required by an internal 400 Hz audio frequency oscillator. The untuned amplifier output is metered and fed to an accurately calibrated attenuator as well as to a "high output" coaxial connector. The modulator stage is also metered and calibrated in terms of modulation percentage

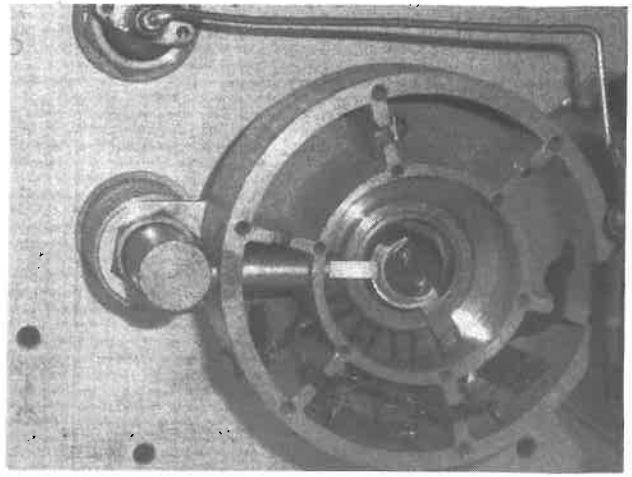
While the design is conventional its implementation is not. Great care has been taken in the mechanical design to ensure a very high standard of performance. Almost regardless of cost all major components have been custom built by the company to perform their function over a long period with a minimum of maintenance.

The RF oscillator section is shown below with outer cover removed . Note the coils wound on ceramic formers and the large wavechange switch which has a very positive detent ensuring

minimum frequency shift if a range is changed then restored. The massive 1000pF tuning capacitor has its rotor mounted on ball races and multiple wipers provide good contact with the slip rings on the rotor. Range trimming capacitors are air spaced ceramics accessible through removable plugs on the front panel.

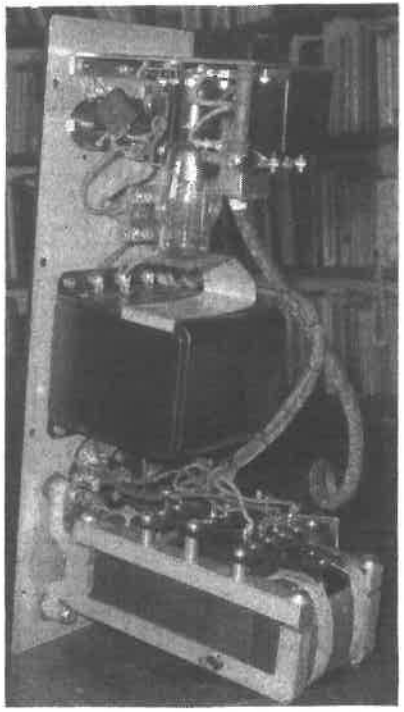


Pictured below is the cast aluminium attenuator box with cover plate removed. All attenuator resistors are wirewound on thin mica using two wires in parallel, one reversed in winding direction with respect to the other thus minimizing their overall inductance. This attenuator has a source impedance of 10 ohms which by today's standard is unusually low but allows it to be built out in external dummy antennas to any required value. This is especially important when measuring on sets designed for use at frequencies below 500kHz where the antennas used are verticals with low source impedance.



Drift of frequency or output level with changes in the power mains voltage are minimized by stabilising both the filament and plate voltages. This stabilisation is achieved by using a flux regulated power transformer (photo overleaf) which keeps the secondary voltage variation at a

small percentage of the primary voltage change over the range of 200 to 260 volts. The constant nature of the load on the power supply allows the use of this form of regulation.



Power supply (note transformer)

Provision is incorporated for sweeping the frequency of the output over a range for pass band checking with an oscilloscope. A removable cover on the front panel reveals a coaxial output jack into which a mechanically rotated variable capacitor may be plugged. Out of curiosity I have tried this method using a rather crude mechanical drive for the sweep capacitor but found it difficult to achieve pattern stability on the oscilloscope, obviously a better mechanical arrangement was called for.

Frequency calibration of the 805-B dial is direct up to its upper limit of 30 MHz. There is provision on the range changing switch to extend the instrument frequency range up to 50 MHz. but this range is not calibrated in frequency nor is the attenuator output calibration accurate.

Even today this instrument will perform adequately for measurements up to the limit of the HF range and down to its lower calibrated output level of 0.5 microvolts. I take my hat off to the General Radio team members who designed it 70 years or so ago.

A full schematic diagram is shown overleaf.

The 605-B in use. for receiver testing.

The GR type 583-A Audio Output Meter atop the signal generator is being used to measure the audio output of the receiver under test

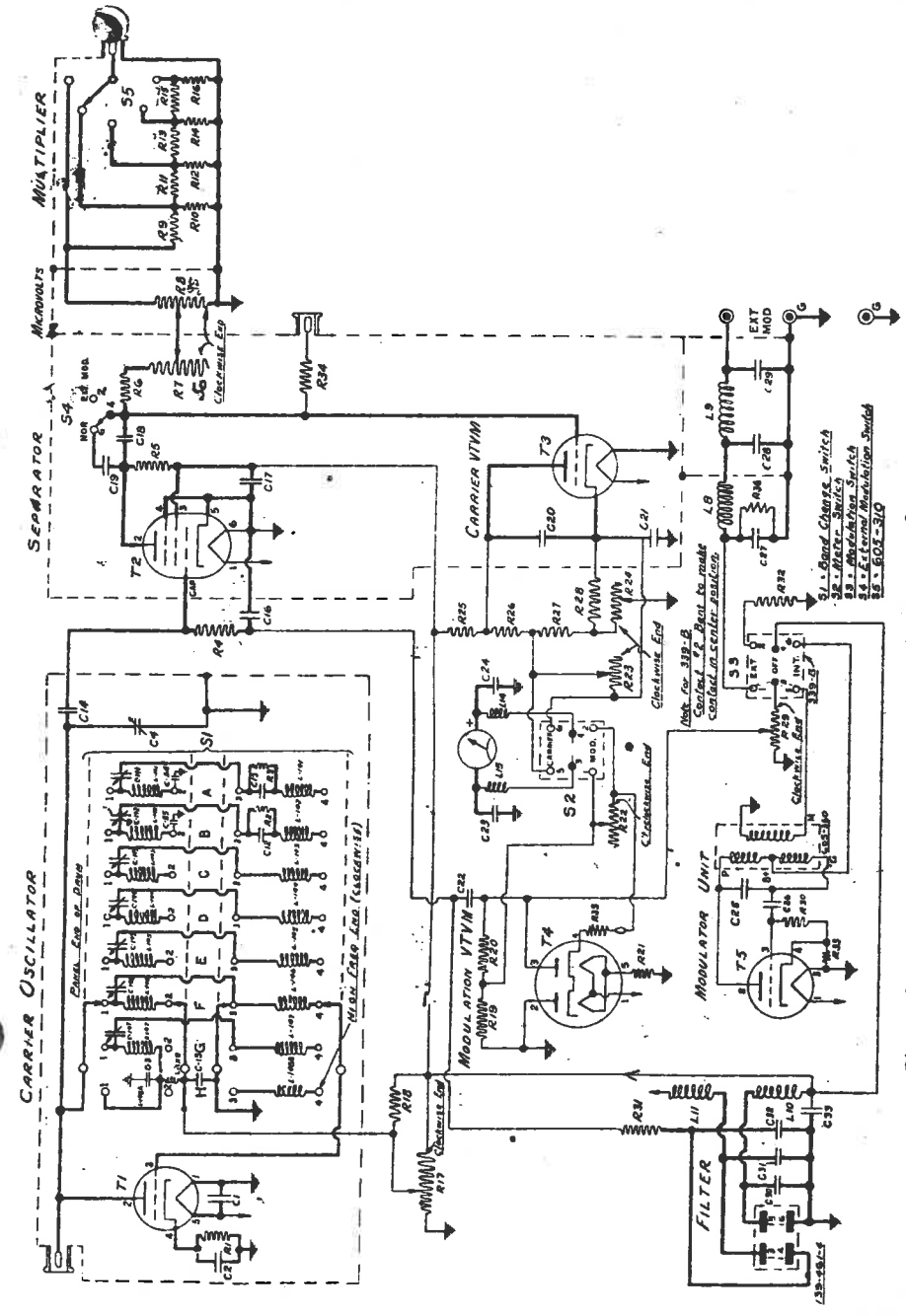


Figure 4. Wiring Diagram for Type 605-B Standard-Signal Generator

Fifty Years ago in Wellington.

Gordon Cooper

The photo of 2YA's transmitter building on Wellington's Mount Victoria. shown on the cover of a recent NZVRS Bulletin brought me some memories of a few months spent as a junior technician at Rongotai Airfield.

Certainly there have been changes to the scene shown on the cover of Bulletin Vol 23 No 1. One of the masts has gone. Housing has encroached on the eastern side of the Mount - at least up to the white fence seen in the picture. A public parking area and the William Byrd Memorial are now on the western side of the radio building, just out of the frame in the photo. But, enough of the present, let us go back fifty years.

In 1952 Rongotai airfield was a patch of grass and asphalt on the shores of Lyall Bay - certainly small by today's airfield standards. At the eastern end was the de Havilland factory, noted for the construction of Tiger Moths during World War 2, later to become the on-going temporary passenger terminal for the new Wellington Airport. At the western end, in behind the Kilbirnie tram barns, were the derelict remains of the 1940 New Zealand Centennial Exhibition.

Tramcars provided cheap and regular transport to Rongotai. From the Railway Station, one boarded a Seatoun tram and travelled out through Kilbirnie to a stop on Coutts Street right outside the terminal building. Next to this structure on the Lyall Bay side, was the control tower perched on a lattice frame, rather reminiscent of a small lighthouse. Access was by a ladder to a trapdoor in the floor of the control room. Radio maintenance was an interesting experience. I once helped to replace an RCA AR77 receiver, certainly a two man task.

Firstly, a rope was tied around the AR77. Eric, my companion climbed the ladder with the rope's loose end and knocked on the trapdoor. A muffled "OK" from above, then the sounds of moving furniture. The trapdoor opened upwards giving us a worm's eye view of the Air Traffic Controllers sitting on their desks, holding their chairs clear of the hole in the floor. Eric climbed through, then took tension on the rope. I followed slowly with the AR77 on my shoulder and with my hands alternately grabbing at ladder rungs and steadying the receiver. Once I was at trapdoor height, welcome hands took the weight from me and I could scramble through - to join those seated on desks so that the door could be closed. We removed the rope, changed the receivers over and then took the replaced AR77 down to ground level, a simple reverse of the first procedure. I was mighty glad that it was not an AR88 we were changing, they weigh as much as two or three AR77's.

Some readers may be wondering what Wellington's Rongotai Airfield has to do the top of Mount Victoria. I will explain. After 2YA moved to Titahi Bay, the Mt Victoria building continued as a transmitting station. 2YD was there for many years and Wellington's TV transmitter operated from Mt Vic' before the installation at Mt Kaukau, behind Khandallah. For a few years, Civil Aviation also had radio equipment at Mt Victoria and shared the building with the broadcasters. An MF beacon and a fairly basic distance measuring equipment, operating just above 200 MHz, had been installed for the guidance of aircraft in the area.

Fifty years ago, most Government organisations seemed to harbour doubts about the reliability of their radio equipment. Transmitters had to be checked every day with meter readings recorded, power standby plants run briefly, and aerials inspected - perhaps to ensure that they had not fallen down. So it was that on 1st January 1953, while the rest of New Zealand was on

holiday, I trudged along the track across the north face of Mt Victoria to check the radio navigational aids that served Rongotai Airfield.

If you look at the left side of the Bulletin cover picture, you can just see this track skirting a small bluff before disappearing behind the ridge. To save unlocking gates, we usually parked at the end of the public road and walked a hundred yards or so to the door. On this New Year's day I found a "body" lying across the track directly below the station. A young man, mid-twenties perhaps, flat on his back, eyes closed, a smear of blood on the side his face, and no signs of life. On a second look, perhaps he was breathing very faintly? An assault victim, or he may have fallen? I was not sure. He could need help. I stepped over him preparatory to kneeling down and trying to render some aid. As I did so, my shadow passed over his face. His eyes opened and he grunted. "Are you OK" I asked. His reply was unprintable, but left me in no doubt that I should go on my way and leave him in peace. On my way home half an hour later, I found that the "body" had gone. Not dead, only badly hung-over after a bout of seasonal revelry.

Broadcasting - were they NZBS or NZBC in 1953? - had the same regime of daily maintenance but took this a step further by having a Station Technician at Mt Victoria. At least he was there on weekdays, enjoying a quiet life with little to do. Errol Neal, one of my Civil Aviation colleagues, discovered how this broadcasting staff member used his some of his spare time.

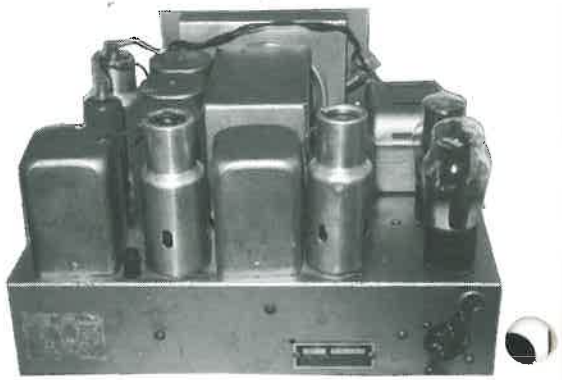
Errol was about halfway along the access track when he heard the station's standby power generator running. He hastened inside to see that all was well. Yes, all the equipment was normal but in the small kitchen he found the resident technician at the stove stirring a large steaming pot. Soup for lunch? Not likely, here was a brew of marmalade boiling merrily. Was the power off? Certainly not. The generator was only supplying power to the stove and had been cranked up to nearly 270 volts to hasten the cooking. And why was the battery testing hydrometer lying on the kitchen bench? "Oh, I add a drop of acid to each jar, it makes the marmalade much clearer."

Another installation associated with Rongotai was at Porirua, in the harbour beside the road to Titahi Bay. This had originally been a Radio Range station, one that gave directional guidance to those aircraft that had only very basic radio equipment. Overlapping radiated patterns of dots and dashes gave a continuous received tone when planes were 'on the beam'. By the 1950's the Porirua station had been downgraded to a simple beacon, one that required a radio compass in the aircraft. Although a seawall had been built around the five masts of the Radio Range, the tidal gates were in poor shape. Part of the site was flooded at high tide, and wet at all times. Any work on the outer masts or aerial tuning units required gumboots, or for some of us bare feet and shorts.

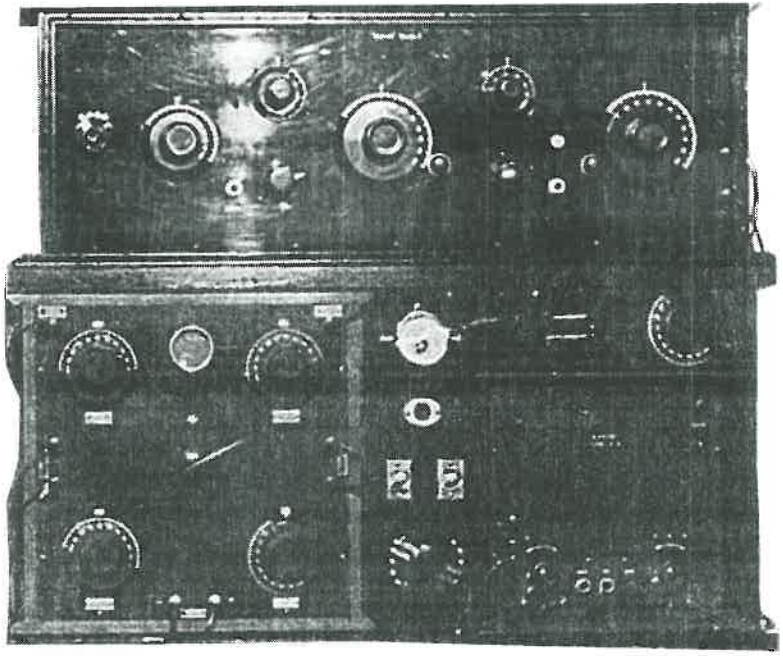
I left Rongotai a few weeks after the "body" incident to spend a training period with the Meteorological Office before a twenty-one month stint on Raoul Island. After this, three years at Invercargill, then more training at Marconis in England. When I finally returned to Rongotai to start installation of radar equipment for the new Wellington Aiport, new sites for the nav' aids were being created at Palmer Head, Newlands, and at the northern end of the new runway. The old control tower, the terminal building and many houses from Rongotai Terrace had been moved or demolished, replaced by a half finished landing strip.

With the arrival of solid state, the old valve powered equipment has disappeared. I wonder if they still have maintenance technicians and how often do they check their equipment?

COURIER type CC



COURIER CHASSIS



HEINZ SET

LETTERS TO THE EDITOR

Radio Museum

I am in the process of establishing a radio museum in Picton, after being lucky enough to have established a radio museum (mainly valve radios) at Drayshaw Park, Blenheim.
The Picton venture will start up with my donation of 150 Columbus and approximately 30 Courtenay radios. Is there another collector, out there, who has a similar collection, also anyone who is willing to exchange information or data on Radio Corp receivers?
Frank Stretch, 41 Scotland St, Picton 7372. email - Frank Stretch dknofflock@xtra.co.nz

Courier CC radio

A few months back the NZVRS librarian came to my assistance and found a circuit diagram for a Courier type CC radio that I had and was hoping to get going. The circuit, which was sent, was for an Ultimate but it was the exact circuit for the Courier.
I soon found out what components were missing and where the unattached wires belonged then after changing most of the capacitors the set is now going quite well although it probably needs a check on the alignment to sharpen it up a bit.
Included are a few photos to go with it for identification purposes. The odd thing out in the photo of the chassis is the ECH35 which replaced the 2A7 years ago. A 2V to 6V transformer was used for the filaments; there must have been a shortage of 2A7s back then to go to so much trouble to carry out that change. When I find a matching aluminium shield I will replace it with a glass 6K8. The condition of the chassis is original; I did polish up the valve shields. The cabinet has been refurbished but the grill cloth is original (it even withstood a washing).
This radio has for me a lot of sentimental value as it was the radio at home when I was a child in the 40s. radio was such a big part of our lives then, from first thing in the morning to late at night.
Albert Smith, 5 Lulworth Lane, Westmoreland, Christchurch 8003

Request for Identification

The picture (shown opposite) is of the radio receiver/s which my father (W E Heinz, 1899-1976) owned in 1922 (regretfully the quality of the original photo is very poor). The other picture (shown below left) is of my father's family and friends posed alongside the same radio in 1923 (my father is centre bottom). No batteries can be seen in either photo - possibly they were behind the lower lefthand panel. The horn speaker looks like an Amplion Dragon. The speaker in the box alongside of the set in the family photo may also have been a horn type.
I would appreciate hearing from anyone who may be able to identify the receiver or receivers in the pictures. Unfortunately the original set no longer exists.
W Heinz, 74 Beazley Avenue, Newlands, Wellington. Ph 04/4787475.

FROM THE LIBRARY

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

689 Asbestos Exposure and Radio Collecting. Explanation of the hazards. Antique Radio Classified, Feb 03, p31

690 Stromberg-Carlson 5V15 Amenities Receiver. Photos circuit, description, restoration. Antique Radio Classified, Feb 03, p32

691 Solid-State Audio Transformer Replacements and other tips. Descriptions, photos, circuits. The Old Timers Bulletin February 2003.p23

692 Metal-Glass tubes - Old and Not-so-Old. photos descriptions. The Old Timers Bulletin February 2003.p26

693 Did Marconi Receive Trans-Atlantic Signals in 2001? Discussion with circuitry. The Old Timers Bulletin February 2003.p40

694 Howard Lorenzen and the Origin of the Zenith Trans-Oceanic. photo, history. Canadian Vintage Radios Nov/Dec 2002, p4

695 A Low Cost Alternative to the 1L6 Tube. Using a modified 1R5 as replacement in the Zenith Trans-Oceanic. Canadian Vintage Radios Nov/Dec 2002, p11

696 Building a Solid-State Replacement for a "Vibrator" details, photos. Wellington Vintage Radio Newsletter, Feb 2003, p5

697 RCA's first TRF Receiver - The RCA 20. Photos, history, description, circuits. Radio Bygones No 81, Feb/Mar. 2003, p4

698 The Australian AR8 and AT5 Station. photos, history, circuit, description. Radio Bygones No 81, Feb/Mar. 2003, p20

699 The Airmec C.864 Receiver - part 2. physical design, photos, alignment, usage. Radio Bygones No 81, Feb/Mar. 2003, p26

700 The 1945 Hammarlund HQ-129X. photo, part circuit, description. OTB May 2003 p32

701 Some hints on cabinet refurbishing. down-to- earth notes. Wellington Newsletter April 2003, p8.

702 The Torn.E.b, German portable Batery operated receiver type 24b-305. photos description, circuit. Radio Bygones April/May 2003, p4

703 The Marconi Exhibition at Sandford Mill, Chelmsford. photos, description . Radio Bygones April/May 2003, p8

704 A wobulator Unit. simple design for home construction. covers .35 to .6 & 1 to 14 MHz. full constructional details.
Radio Bygones April/May 2003, p12

705 Restoring a Goblin S25 "Time Spot". photos, circuit, description.
Radio Bygones April/May 2003, p24

706 The AWA Radiolette model 500MY. photos, circuit, HRSA Radio Waves. April 2003, p8

707 The Braun BSK 239D. photo, circuit description. HRSA Radio Waves. April 2003, p16

708 The Super 5 Willsonia (S53). photos, circuit restoration details. HRSA Radio Waves. April 2003, p21

709 Wartime valve production by AWA Australia. history. HRSA Radio Waves. April 2003, p26

MARKETPLACE

Advertisements for the next issue must reach the editor by the 12th Jan 2004. 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

1932 L B Scott Catalogue No.7, Christchurch plus 1930 Thomas Ballinger Catalogue, Wellington, (these contain photos of parts, speakers, radios, etc) $25 the lot.
Johns Ltd Radio parts Catalogues Mar 27, Mar 28, April 29, April 30, May 31, April 33-34, May 38-39 (all contain over 60 pages), $15 each.
NZ Radio Mag. (bound together) from first edition May 26 to Dec 26. $40
Van Ashe Radio Co. catalogue 27/28. $30
AWA-Fisk-Radiola General Service bulletins, 1937. $30.
Riders Master Index (vols 1-15) $30
Citizens Radio Callbook – 1927. $45
Don Strange, Ph 09-8178611

WANTED

Cabinet (or untidy, not working complete set) for Atwater Kent model 708 or 808 radio. M Martin, PO Box 217, Glebe, NSW 2037, Australia. Phone 00612 9660 0008.

B-T heart-shaped Tuning Control for Bremer-Tully '6' radio. Buy or trade. Bill Collerton, 8 South Rd, Masterton. Ph 06-3782765.
The fixed IF, audio and power supply unit (427D) for a Collins aircraft receiver type 618F. Frank Stretch, 41 Scotland St, Picton 7372, Ph 03-5736999.

Transformer for winding output and power transformers. I am a beginner winder and a proper winding machine is necessary to achieve good consistent results.
Also want Nixie tubes for my collection. Any quantity, large or small will be gratefully considered. Andrew Parsons, 1/53 Park Road, Grafton, Auckland, Ph 09-3777833, Andrew@ihug.co.nz

5 copies Radio and Electronics dated between 1947/51, One copy of Radio and Hobbies in Australia, vol 1 No 1. All in good conditions, Offers to Dave Dawber, Ph 03-5472549, ddawber@paradise.net.nz

Pye HF25 Amplifier and HF25A Preamp. Condition does not matter as long as the units are complete. Would also like a copy of the circuit if available. Graeme Lea, 116 Cutfield Rd, New Plymouth. Ph 06-7585344, email grarich@paradise.net.nz

Circuit diagrams and any other service data for Sony TC 377 and Tascam (TEAC) model 32 stereo R-R tape recorder.
Also Break-In magazines, full or part years 1954 to 1968.
Also info to help identify these valves; Mullard ME1400 & AEI Ediswan 27MI.
Henry Devenport, 1782 Wharerata Rd, RD-2 Gisborne 3820. Ph 06-8628877.

Dial glass for Philips Radio type 200, also Philips Theatrette type V7A. Josef Earle, 5/458 West Coast Rd, Glen Eden,Auckland 1007. Ph 09-8187978

Appreciate getting photocopy of information on the General Radio type 1606A Impedance Bridge as given in the GR Experimenter Vol 30 No 1, June 1955. Reg Motion, 2A Hazel Tce, Tauranga. Ph 06-5768733.
regmotion@xtra.co.nz

Frequency Counter. Owen Young
Ph 09-378 4594,: oyoung@clear.net.nz