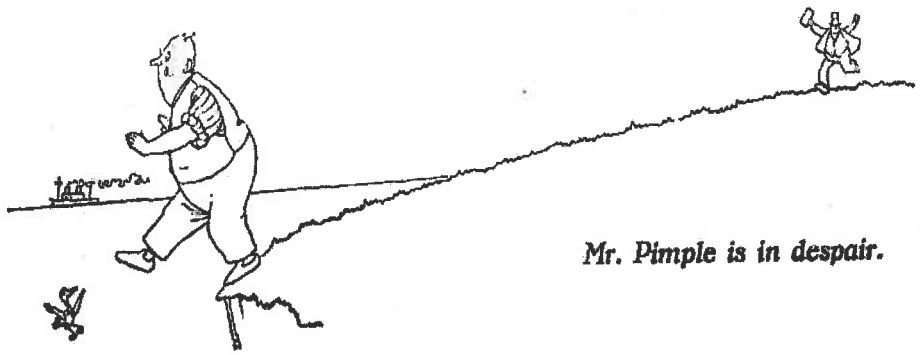
The Editor's Plight

The Editor pondered and scratched his head
The night was advanced, his family in bed,
But another edition must get to the press
And the copy he had was one heck of a mess;
He'd appealed and threatened to all little avail,
He'd even tried coaxing some copy by (e)mail;
With a bit of response from a couple he'd admit
Who had sent up some news that made quite a hit.
But generally speaking 'tis getting tougher and tougher,
When the going should be easier, it was just getting rougher;
Where were the bods within the concern
To whom a fellow could easily turn?
There must be some good things for us to use
But to ask for a story was to ask for abuse,
And it wasn't (just) this edition that worried the man,
It was for the future issues he'd hoped to plan.
There seemed no solution, not even a clue,
Except an appeal to everyone, and 'specially YOU.

This ditty I just couldn't resist – its from "Broadcast" (December1950) the Staff Magazine of Radio (1936) Ltd – with some minor alterations or updates. It suggests that the plight of the editor is universal and has been around for some considerable time. It will probably not go away overnight. Ed.



Mr. Pimple is in despair.

Perhaps Mr Pimple is an editor too, and there in the background is some last minute copy – but will it reach him in time?

NZVRS BULLETIN

Vol 29 No 4 **November 2008**

New Zealand's Army Educational Wireless No. 2

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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NZVRS LIBRARY
The NZVRS librarian is Ross Paton with assistance from Bruce Churcher. There is a lot of work to do before full member service is restored but requests may be forwarded to the NZVRS office (postal address at the top of this page) or Email; library@nzvrs.pl.net

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, letters, etc can be sent to:

THE EDITORIAL TEAM,
Ian Sangster, 75 Anawhata Rd, R.D.2. New Lynn 0772 or
David Crozier, P.O. Box 13873, Onehunga, Auckland 1643. Email: nzvrs@pl.net

A Calendar of Events is listed on our website at www.nzvrs.pl.net/aaa/calendar

AUCKLAND MEETINGS are held at the Horticultural Society Hall, 990 Great North Road (opposite Motions Road.) Western Springs.
Nov: Monday 17 at 7.30pm. Smaller Radios "Shoebox or less" size.
Sunday 23 November: Field trip to Musick Point. Bring a picnic, tour starts 1.30pm.
Dec: Monday 15 at 7.30pm Final Auction Night for 2008
Jan: Monday 19 at 7.30pm Mullard and others valve production techniques (an audio visual experience).

BAY OF PLENTY AREA MEETINGS
Date and venue of the next meeting yet to be advised.

TARANAKI AREA 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, Phone 06-753 2475 or Graeme Lea, 06-758 5344

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. Phone: 04-472 8788.

CHRISTCHURCH MEETINGS are held on the first Tuesday of odd months at the Christchurch West Radio Clubrooms "Auburn Park", 333 Riccarton Road.
For further details contact Jim Lovell, 41 Yardley St, Avonhead, Christchurch 8004. Phone 03-342 7760

EDITORIAL

The end of the year seems racing down on us and with that comes subscription renewal time again. The NZVRS subscription year is the same as the calendar year and there is a discount for early paying NZ members. I hope you feel it is reasonable value for money, but if you think we could improve things a bit, do feel free to give some feedback. Otherwise we will continue to do things "our way" and that might not be quite "your way" of thinking.
There is a "Filed Trip" notice insert with this bulletin, for a tour of Musick Point Radio Station on Sunday 23 November. It's a delightful spot (rain or shine) and well worth the trip and perhaps consider packing a picnic lunch or arvo tea if the weather looks good.
There is a bit of mixed bag this issue – I think it suggests we print whatever we get but perhaps a more positive view could be the world's your oyster – send us a suggestion and who knows what might happen!
Very best wishes for the coming year to all,
Cheers, David Crozier

NEW MEMBERS:

T Collins	**Christchurch**
J Pye	**Upper Hutt**
R Cleaver	**Oamaru**
S Clark	**Unitied Kingdom**
M Saville	**Hamilton**

Cover Picture:

A New Zealand manufactured AEW2 discovered in California. (An Armed Forces Morale Receiver). See the item and query on page 10.

CONTENTS

NZVRS Bulletin
P.O. Box 13 873, Onehunga,
Auckland 1643
Email: nzvrs@pl.net

Items are always appreciated for possible publication in the NZVRS Bulletin, however copy may be edited to fit selected space. Clear pictures are welcome and text should be of large font, simple style and preferably unformatted. Clear handwritten text is usually OK but may be subject to interpretation. Some items may be held over until similar or additional material can be collated.

Southern Soundings

from Pete Ingram

Well, in an effort to prevent our branch's coffers from overflowing, Jim Lovell ordered up a minibus on the firm and we took off to Timaru on the 2nd August to visit Alan Brehaut and tour his private museum. It was certainly an eye opener. Alan's father retailed Douglas motorbikes during the 1920s before getting involved in the developing market for domestic radios. But there is far more to the collection than just these two subjects. On entering his building (definitely not a shed), one is illuminated by a beautiful gallery of ornate hanging coloured glass kerosene lanterns, then the line of motorbikes leading to a fascinating miniature train collection.

In the main hall, there is a 'bank' of 19th century musical consoles, all serviceable and ready to go on air and an array of pianola combinations, one actually playing a violin with some skill.

It would take a long essay to describe Alan's astounding collection. But let's make mention of the radio display before moving on to branch happenings. Undoubtedly, he has the largest gathering of horn speakers one will ever see and in an avenue that leads to a wall of radios. This section starts off with a mint 1924 Atwater Kent 'breadboard' Model 9A with a spare 3 valve AF amplifier unit alongside, complete with sales carton. Then an array of further Atwater Kents, shining Gilfillans and odd Stewart Warners through the 1920s to finally reach a rare 1936 mirrored Sparton Model 557 that reflects the viewing visitor. And to climax the afternoon, Alan's wife Lorna, put on a superb afternoon tea for us before we regretfully had to return to Christchurch. It was a wonderful day out.

September's challenge issued by the branch executive was to bring and show the most elderly or mysterious electrical item in one's home collection and so it was a pretty mixed bag;

Geoff Edwards - an interesting 1925 five valve 'Altona' initially supplied by Johns Ltd of Auckland.

Albert Smith - what would appear to be a decorative Victorian wall mounted insect electrocuter, merely turned out to be a circa 1910 carbon crushing domestic light dimmer, the labelled instructions giving the tolerances of operation as a very limited range of 'candlepower' availability.

Paul Burt - items that one dreams about, a 1934 Fisk Radiolette 28 ('Empire State') in a grained ivory cabinet and its later and taller cousin, a black Fisk Radiolette 35 from 1936.

John Walker - another mouth watering item from his heavy metal collection; 1935 National HRO.

Neil Johnson – winner of the mystery section with a brass bound something or other from perhaps the 1890s. Apply power, then stand well back and listen for the clacking of relays and watch the bouncing of a spring mounted metal ball.

David Dywer - had trouble finding his contribution which was deep down in one his pockets. It turned out to be a neat little glass encased neutralising condenser out of a circa 1926 'Ferrodyne.'

Jim Lovell - a small battery operated electric motor that he swears was a legitimate childhood purchase from W&Ts and definitely was not pinched from his school's science laboratory during the 1940s. Also a 1930 book of radio explanations by 'Pictron', later to be known to us as F.J. Camm.

Pete Ingram - a 1917, 500 volt Megger built for carriage by a suffering apprentice and a CV1098 air-blown triode standing 19 inches tall in its Pyrex skirt, but yet to feel the tickle of hot electrons. It was intended for a World War II RAP coastal 'Chain Home (low)' radar installation but somehow escaped.

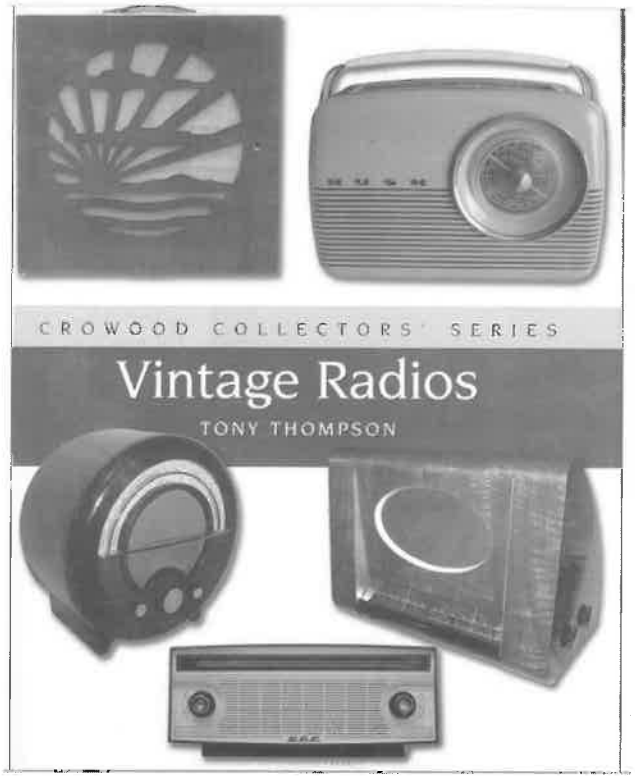
David Searle spoke energetically and clearly on a project that he hopes will soon involve Canterbury region branches of the NZART. It is mostly a workshop programme to encourage youngsters into radio subjects that will lead them on to gaining an Amateur Foundation License and so bring new members into the association. Good luck and future success with operation 'Buildathon', David! *[Hopefully something developing for NZVRS members as well. Ed]*

Finally, a mystery still to be revealed to us, is that what is left in our coffers at the end of August is a greater amount than what it was at the commencement of the month - ie before we went off on our Timaru jolly. It could be that a few more country outings may be coming up if we get that sort of a result!

New Book: "Vintage Radios" By Tony Thompson

Reviewed by John Walker ZL3IB

The Crowood Press, 2007, Hardback, 208 pages. ISBN: 978 1 86126 949 2, List Price £stg19.95
(less online via second-hand book sellers if you are lucky! Ed)



The book tells the collector, and the armchair wireless enthusiast, everything he or she needs to know about classic radios from the 1920s to the end of the 1960s. All the important UK makes and models are discussed, and the author also covers buying and selling, care and restoration, and many other topics including some European and American radios and radio-related ephemera. Illustrated with 450 colour photographs, this is the perfect collector's companion to the fascinating topic.

Since the 1920s the radio set has been an important part of most people's lives. In the thirties and forties the "wireless" was an important piece of furniture and a potent symbol of status; beautifully made floor-standing and table-top sets in veneered wood and trendy Bakelite became the focal points of living rooms up and down the land. After WW2 the emphasis began to change towards portability, and the change from valves to transistors in the 1960s transformed the radio into a more useful but far less interesting object.

The book starts with a short but interesting history of the development of broadcasting followed by a chapter devoted to the radios of the 1920s. This is followed by interesting sections on the developments in set design and construction, loudspeaker design and other aspects. The author also provides a thorough discussion of the changes in cabinet design and construction from wood veneer through to "Bakelite" but mostly with a UK background.

Chapters devoted to technical topics cover the basic principles only and this book does not discuss circuitry or electronic repairs in any detail. However it does have comprehensive coverage of how to repair and restore all types of cabinets, including plastic cabinets.

Collectors of UK sets will enjoy the chapter covering the rise and fall of many well-known UK brand names; there are also shorter sections on European and USA radio firms. The section on the German WW2 "People's Receivers" is particularly interesting.

So, if you collect UK radios this book is a "must have", otherwise it is still a worthwhile read for the NZ collector. I was fortunate in being able to borrow a copy from the Christchurch City library.

Letters, Correspondence, Corrections & Feedback;

From: Jack Whittaker

I have just been reading the August 2008 NZVRS Bulletin with great interest. It is a wonderful issue.

The article on the ARC5 receivers is very interesting, and I dreamily wonder if perhaps my earlier comments on the Command Receivers may have possibly helped to rejuvenate interest in them. Well, - it would be nice to think so, but the article by Ron Badman is great. It is very comprehensive and will have been a big effort on his part. It is all food for thought, contemplation and nostalgia. That is what I think the hobby is all about, and this will have surely rekindled interest in these receivers. Ron's comment about the modifications was all very interesting. My experience in trying a twin triode mixer/converter (a 6F8G, with a separate oscillator) in communication receiver format, led to discarding it, due to lack of stage gain. The 1st RF amplifier used was a VR65/SP61. But that was in the 1940s. Times and needs change.

I have been surprised to learn that the concept of these "command" receivers dates back to 1934, and that they were the creation of Dr Frederick H Drake, chief designer at Aircraft Radio Corporation. The Designs were finalised in 1936/7. At least 1,450,000 receivers and transmitters were manufactured before the war ended in 1945. A truly amazing effort.

This information was obtained from the Kurrajong Radio Museum website www.vk2bv.org/museum. *[Also see item in this bulletin. Ed]*

The museum website is very interesting and has information on large number of items of historical radio interest. The 'Gibson Girl' is one of them, and the IFF receivers - lots of interesting material .

The article on Synchronous AM Detection was also most interesting. This also gives food for thought and reflection on many aspects of this system. An article in Radio and Electronics, April 1948 is also on this subject, has one circuit using a 6AC7 / EF50 and an ECH35.

I recall that around the 1970s, Fred Johnson produced an article using an IC in the NZART magazine, 'Break-In'. I wonder if anyone has a copy of that article? It could perhaps spawn another construction project for club members?

I do wonder about some aspects of the transistor version by Doug Edwards being at IF frequencies. This could be just the ticket for quieter shortwave reception of signals, but with the IF restrictions in bandwidth of most receivers at 455khz, the result I imagine could be less than ideal; that AM reception at broadcast band frequencies would have a problem with loss of the higher audio frequencies.

Though unfortunately so many AM stations now have become 'talk-back radio', there still may be uses for the 'Synchrodyne' tuner / detection system, such as demonstrating receivers/ amplifiers using a mini transmitter such as Peter Lankshear's "Mate" page 95 'Discovering Vintage Radio' by Peter Lankshear, published by Electronics Australia. *[Also published in NZVRS bulletin 04-2 (Aug 1983 page 10) or see a copy at* www.nzvrs.pl.net/ccc/minimitter.pdf *Ed]*

There are so many interesting aspects to this vintage radio hobby, learning more about just so many aspects of this part of history can be never-ending. Perhaps it could be an idea for the Bulletin to include a section to encourage discussion on whatever topic has been in recent bulletins, to keep the created interest going?

jack_whittaker@hotmail.com

Correction:

Greetings, I read the Bulletin with interest each issue. I would like to correct one item on page 12, third paragraph. *[Trans-Tasman radio 1908]*

The commonwealth Government of Australia was situated in Melbourne until 1927, so the mention of Canberra is incorrect.

Cheers, Rodney Champness

Dear Editor,

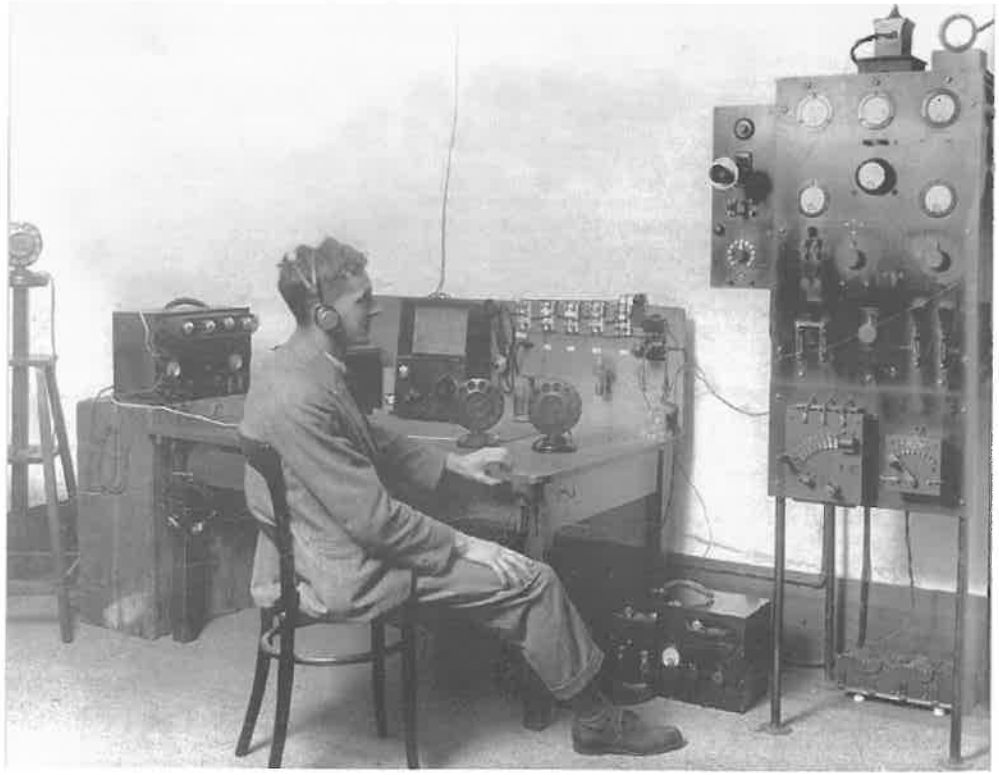
We spied this fully functional "Wurlitzer" in Frits & Debbies "Purple Rain" collection shop on Princess Street in Dunedin recently. We chatted about radio collecting, this and that while Debbie played a tune or two for us on this old box.

They have been offered truly princely sums for the "Wurlitzer", but it is for show only. Frits even had his own little radio collection out back. He would dearly like someone locally to do the odd repair or replace the odd tube for them.

I consider the event worth a mention as not often one comes across a Juke Box out there.

Rex Handcock, Murchison.

Below is a picture of William Percy Higgins at the 1YA transmitter (and microphones) circa 1924 when located in the Scots Hall, Symonds Street, Auckland. A follow on of the Nov 2007 item about 1YA and WJ Truscott. *[The sets and microphones of the era suggest some improvements during the probable 2 years since starting on a shoe string budget. Ed]* Pix ATL F49009



Letter From Australia from Jack Whittaker

A few lines for your interest with comments about the Kurrajong Museum and the HRSA gathering in Canberra:
We have recently been to the HRSA get-together in Canberra and also visited Ian O'Toole at the Kurrajong Radio Museum en route to ACT. The museum apparently uses the web site http://www.vk2bv.org/museum/ *[a good site for past military gear with great pictures and definite Australian flavour. Ed]* which was prepared by a member of the Waverly Club, but I believe all Museum operations are independent of that club.

That Kurrajong visit was great and what a nice guy Ian is. He has apparently been a teacher for 40 years before getting into the 'museum business'. His knowledge of such a vast range of radio related topics is wide indeed. We only had a couple of hours there, which was really quite inadequate, but it was most enjoyable. It is well worth a visit for vintage radio enthusiasts.
The equipment on display appears to be in operational working order, which is rather amazing, as this must have entailed a countless hours of work and research.

The demonstrations by Ian were all presented in a faultless and masterly manner, including a basic regenerative receiver in operation (a display aimed for groups and school pupils), a broadcasting studio reel to reel tape recording producing a remarkably high quality of reproduction, VHF communications receivers for aviation, HF receivers demonstrating WWV type time control etc, plus a vintage video of Radiotron valve production, AWA, and the manufacturing of aviation instruments. I feel sure that Australia has certainly done a lot to contribute to Radio and technology in more ways than many of us often realise, and the museum displays certainly show us glimpses of the progress in past years.

The majority of the display is of commercial and military equipment. There is a ZCl MkII which I think was obtained from UK, as Australia did not have or use the ZCl. They do not have a Mkl model. (Perhaps someone in NZ could help Ian ?). There is a limited selection of Australian domestic receivers to show the progress of the development in that area too.

At the museum, a recording was played of an old 'Dad & Dave' programme and it was pointed out that the voice of "Mum" could be Julia Gillard. Interesting!
Enclosed is a brochure about the Kurrajong Radio Museum which could be of interest to anyone contemplating a visit. See opposite.

In Canberra it was fine and around 26 °C when we arrived on Saturday but Sunday was about 11 °C with rain and hail, which was not very nice for Nancy to have a look at the Floriade display while the HRSA event progressed.
On Sunday at the display and sales gathering there was a film crew from the ABC "Collectors" programme there, along with host Andy Muirhead. Perhaps we will see something of their filming efforts on ABC TV some day.

All the Best for now
Sincerely, Jack

Editor's note: The Kurrajong Radio Museum is located about 50kms north west of Sydney in the Kurrajong Hills. The museum is normally open weekends (Saturday and Sunday) 10am – 5pm. Admission is $10 adults and $5 children. There are a range of interactive activities and amazing collections of Australian and military radio sets and history.
My limited attempts at reproducing the colourful flier are opposite.

AEW2 discovered in California

from Art Lebermann, W6REQ

I hope that someone in the NZVRS group may be able to help me? I recently purchased a small WW2 vintage "morale" receiver. The dial of this receiver is marked "Armed Forces Radio Service" and "AEW2 NZ". It's a 5-tube, 110 Volt AC set, covering only the AM broadcast band. I've attached some photos. Does anyone have info on this set and a schematic?
I purchased the set from an antique dealer, at a local "antique fair". It was part of an estate liquidation, so we'll probably never know its history. As the San Francisco Bay area has close ties to the Pacific, I'd guess that someone (a GI or Merchant Marine?) may have brought the radio home with him when he returned to the States. The condition of the carry strap is near mint. The overall condition of the set is very good – just some dirt and dust on the chassis. I need to replace the AC power cord, and check the tubes. When that's done, I'll power it up on my variable AC bench supply. With a little luck, it won't need much restoration. Art.

AEW2 complete with carry strap – as recently found. (above).

Some comments so far have been:
The set has been identified as an "Army Educational Wireless No. 2" [as an aside the No.1 was a dual band set that had a shortwave range as well as the broadcast].
Bill Farmer had said in the past he had worked on making these sets in the 1940's but had never again seen any. (He was probably the transformer winder or maker, but we can never be sure as Bill passed away last year.)

The metalwork was likely made by Westco Products (an Auckland manufacturer of specialised radio hardware of the day, run by a slightly eccentric manger G A Chadwick who liked Westinghouse Appliances and wanted to use the name but had to settle on "Westonhouse Radio Ltd" instead, the parent arm of Westco Products). Westco products were produced from 1947 - 1955, it was out of business by 1957.
As another aside there is a similarity to Ultimate radio products of the day, GA Wooller was the owner / manager and as a leader in industry at that time was soon seconded into the Ministry of Supply during WW2 (or at least by 1942).

The front knobs are common on Radio Corporation (NZ) Ltd sets of the 1940's - 1947 models seem to favour them most, but this may have been an excess or available stock issue.

The dial pointer looks to have a cut off lower portion to make it single ended. The shape was common as a dual ended pointer (eg on more circular dials).

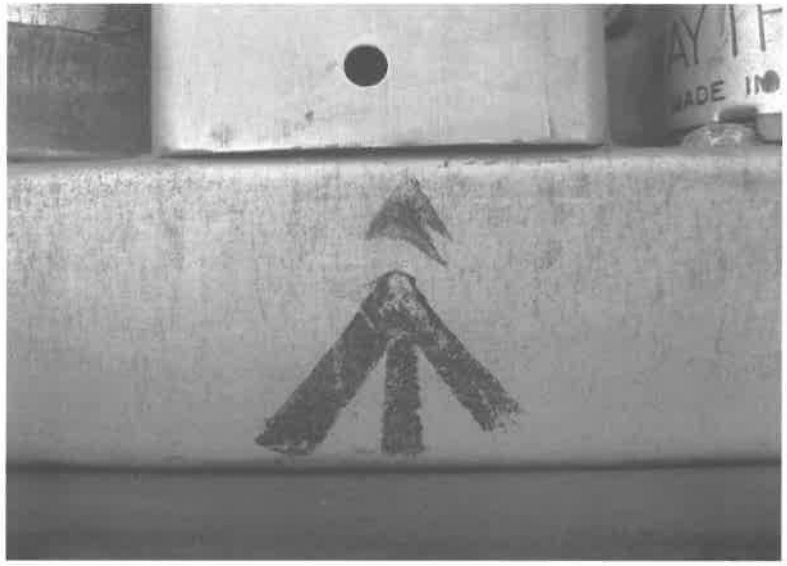
The frequency range goes much higher than the normal NZ sets of the day, a top range of 1800 kcs was well beyond the normal NZ station list (stopping at 1500 for the various NZ regional community radio stations).

And as previously mentioned NZ was 230 volts ac, not 110 as provided for your set.

Production numbers would likely have been small, well less than 4,000 (and more likely about 1,000) although the serial number seems relatively high at 3305.

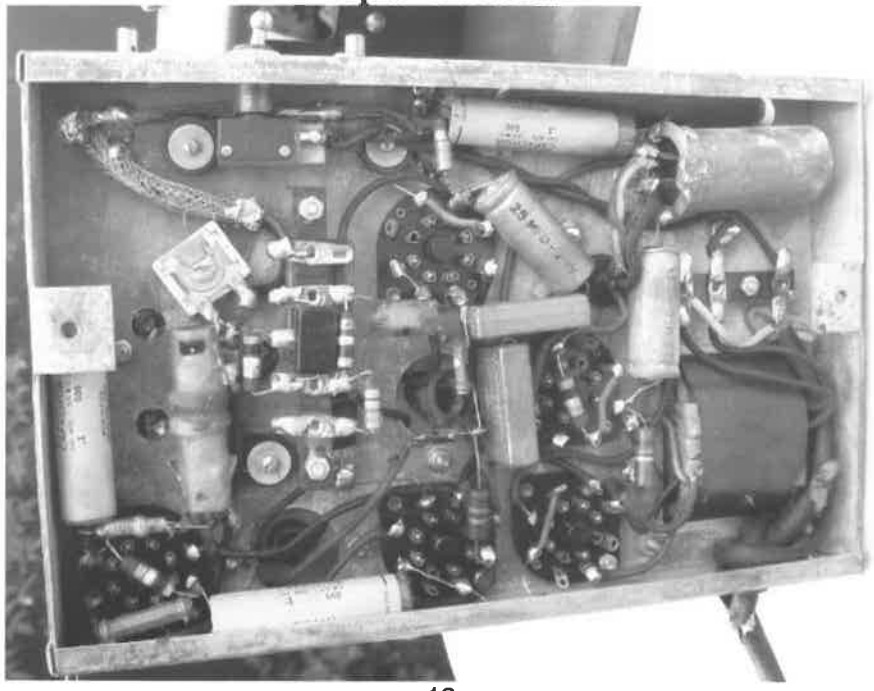
Art is a member of the California Historical Radio Society and the Antique Wireless Association. Any information you might have regarding this or these sets – even to correct or add to the small pool as above would be gratefully received by the editor and duly forwarded to Art.

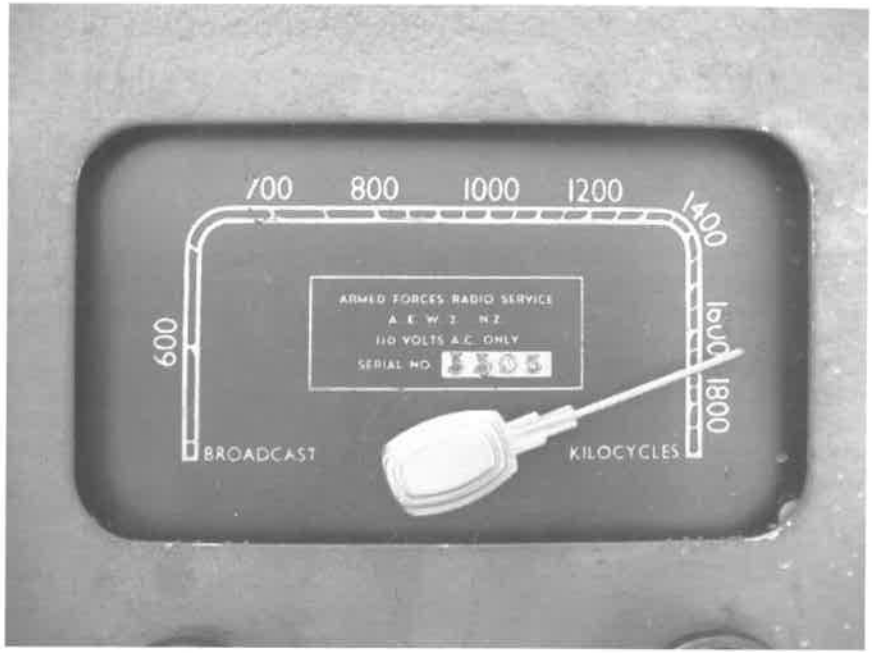
Pictures of the same set follow on the next two pages.



The only markings on the rear chassis.

Top and bottom





Dial and Back

Mullard Company Starts Valve Production Again

The following is quoted from the website of Tech Tube Valves; www.techtubevalves.com

"Brief Mullard History

It was in late 1919 that the Z Electric Lamp Company of Southfields run by Captain Stanley R. Mullard collapsed. The very next year Captain Mullard set up the Mullard Radio Valve Company Limited. In 1924 still wanting to expand as the valve demand continued to grow, Captain Mullard sold half his shares to NV Philips Gloeilampenfabriken of Eindhoven Netherlands. In 1938 work commenced on what was to become the largest valve assembly works in the world. At it's peak in 1954 the Blackburn Mullard site was manufacturing 500,000 valves per day. By 1961 gas and electricity generation had been installed to make the site independent of the local town supplies. In 1938 the workfoce was a lowly 28 people, by 1945 around 3000 people in total were employed at the Blackburn Mullard site alone and by 1962 over 6200 people were employed in Blackburn and the various feeder factories supplying raw materials and sub-components to the valve works.

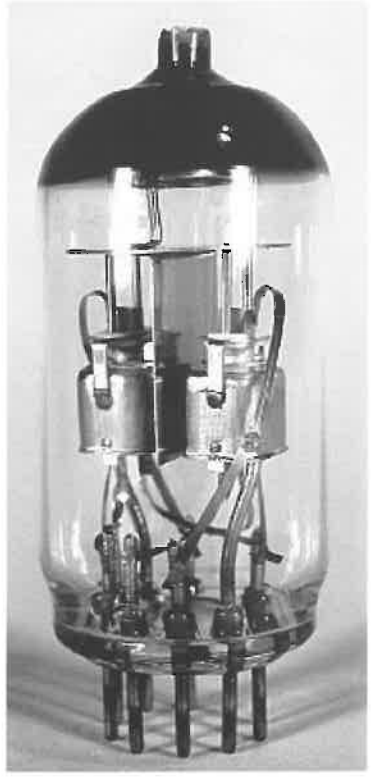
There were five main feeder factories set-up to support Blackburn. In 1949 and 51 two factories were set-up in Fleetwood, 1953 saw a factory in Rawtenstall and in 1954 a factory in Lytham and a final factory in Southport were opened.

Sadly with the demise of the valve at the hands of the transistor by 1984 all these factories had closed or moved to other activities. But now, with renewed interest in analogue devices, the former Mullard site at Blackburn will once again produce thermionic valves for radio and audio amplification as one of it's key product lines. Valve production begins at the Blackburn site in September 2008 under the new name of Blackburn MicroTech Solutions.

Blackburn MicroTech Solutions (BMS) has been formed from the former Philips Components organisation that itself started life as the Mullard Radio Valve Company Limited in 1938.

BMS is located on the original Mullard Valve site at Blackburn, England. Since the death of the valve for popular use following the invention of the transistor, the former Mullard site has continued to develop and manufacture key components for the cathode ray tube industry. One such key component being the thermionic cathode.

The Blackburn factory used to be at the forefront of the valve industry when "Mullard" valves came off the factory line from the 1940's through to the 1980's. These days, we are no longer able to use the "Mullard" name as the brand is owned by a third party, however with the launch of the TechTube brand, the proud heritage and tradition that is associated with the factory will be revived."



E813CC (ECC83 equivalent) see opposite

The E813CC has the same electrical performance as the ECC83. Variability in performance however is reduced to ±10%. Also they offer a 10 year life, planar valve design, CRT cathode proven technology (and hence the different look!), but the usual 6.3V filament driving voltage and B9A pin base.

Other valve products are the E812CC and E811CC (equivalents of the former ECC82 and ECC81 Mullard valves).

On their website is also a YouTube style video of early Mullard valve production that we hope to show as a feature of the January NZVRS meeting in Auckland.

The Remler 88 and Other Early High Fidelity Efforts By John Eckland

The Remler 88, shown below, is a wood tombstone radio introduced for the 1935 model year. It features a 2-way divided speaker system with a properly designed crossover. This speaker system is shown in Figures 2. The low frequency speaker is a Jensen X series, leather-edged 8-incher. The tweeter is a 2-cell horn manufactured by Remler. It appears similar in construction to a Jensen "Q" series horn used in the Zenith Stratosphere. Both speakers are of field-coil excitation. The tweeter uses a 1-inch, aluminum dome diaphragm.

The radio chassis features a 15-watt, all-triode, fixed bias, push-pull, class A amplifier using Type 2A3 tubes. The 2A3s are preceded by a 6A6 push-pull driver, preceded by a 6A6 input stage and conventional proportionally fed phase inverter.

The 10-tube chassis features a 2-position selectivity control - broadcast normal and high fidelity. The amplifier is fully R-C coupled; there are no interstage transformers. It uses the new metal tubes in the tuner section. The speaker grille fretwork is cut out to allow the 2-cell horn to emanate highs, unimpeded in a crossfire, left to right pattern. The radio chassis and speaker are shown in Figure 2.

Figure 1 right.
A Remler Model 88, a hi-fi, 10-tube radio from 1935. It featured a 2-way speaker system and a 15-watt, push-pull output stage using Type 2A3 tubes.

Restoration and test

I spent two weeks at a leisurely pace in restoring the radio chassis which had been subject to a large amount of sloppy repair work over the years. All of the usual capacitors and resistors were replaced. The coils were removed for inspection and the band-switch needed some repair. The amplifier and rectifier tubes were weak and were replaced with new ones. Finally, the whole set was given a thorough cleaning.

After restoring the set, I can report, that it plays great and does not exhibit any boominess of bass. The treble is clean and articulated. With the selectivity switch in broadcast "normal" position, all frequencies are channeled to the 8-inch speaker. Also a shunt-type treble control is in circuit.

In the broadcast "high fidelity" position, the treble shunt control is disconnected. The tweeter is now connected and series, low-pass, filter chokes are inserted into the plate leads of the output transformer, thus channeling the bass frequencies to what is now an 8-inch woofer. The result is a 2-way system.

The leather edge on the 8-inch woofer makes the cone very compliant or loosely suspended, making for a nice faithful reproduction. When the radio is operated in the high fidelity position, the addition of the tweeter gives a wonderful presence to the reproduction.

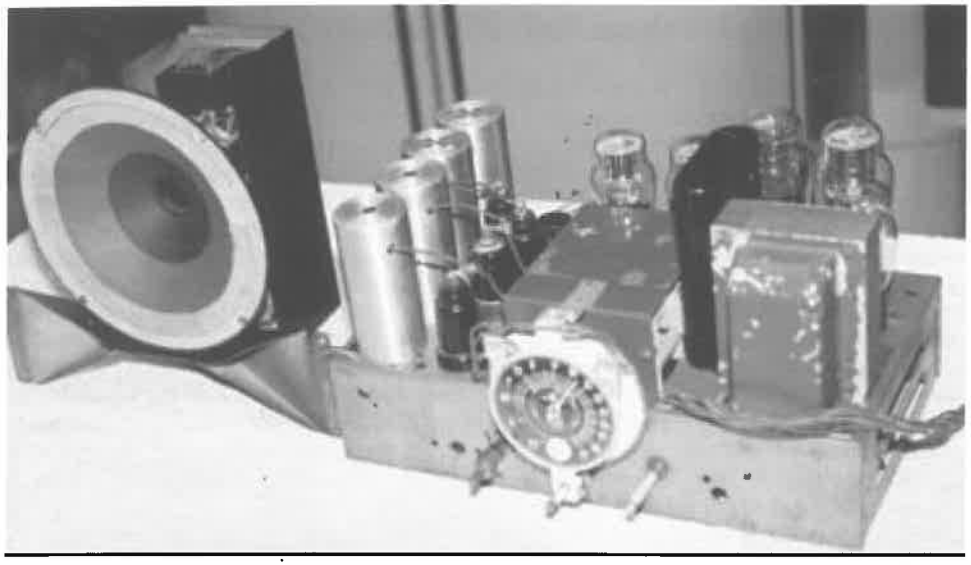


Figure 2. The 10-inch chassis and 2-way speaker system used in the Remler Model 88. The black object between the variable capacitor shield and the power transformer is a Bakelite encased electrolytic capacitor block. The capacitor's case is also a Remler product. Remler had an elaborate Bakelite molding facility, and in 1933, the company made the first Bakelite cabinet radios on the West Coast.

Other Table Models

Remler is one of very few manufacturers to employ the Type 2A3 in a deluxe table model set. I once encountered a very Art Deco tombstone radio made by Lafayette at the AWA meet years ago that appeared to use a pair of Type 2A3s. Philco favored the use of triode connected Type 42s in a push-pull, extended Class A amp in its Model 16B and later tombstones. Zenith followed along similar lines. Its Model 9S30 set for 1936 featured triode-connected 6F6s.

A West Coast (USA) radio manufacturer, namely Packard-Bell of Los Angeles, came out with a large sideways-oriented table radio in 1937 called the Model 50 HIFI. This radio has to be the most powerful table model ever made, in that it uses push-pull type 6L6 tubes in beam pentode mode and operates them at maximum-rated potentials! With approximately 25 watts of power channeled into a necessarily heavy-duty Rola 8 inch electro-dynamic speaker, this set has great sound.

The Zenith Model 10S130 tombstone radio of 1937 also uses push-pull, pentode connected tube Types 6L6s or 6F6s; however, in terms of power output, the Packard Bell will blow it out of the water!

More on Early High Fidelity Efforts

It was a slow and arduous process to improve the fidelity of audio and radio equipment. By the early 1930s, the quality of broadcasting stations was improving steadily. AM stations were spaced ten kilocycles apart, and fidelity was very good, especially with live music from hotel dance orchestras. Some of the larger radio manufacturers featured sets with several speakers to help reproduce the wider range of sound. There was a trend toward making sets with same or dissimilar sized speakers, usually wired in parallel.

In 1927, Zenith Radio Corp. of Chicago made a high-end set called the "Zenith Spanish." It used TRF amplification for the front end, grid leak detection, and single-ended audio amplification, all conventional for the times. It is the earliest radio set to use a multitude of five loudspeakers that appear to be a combination of moving-coil and possibly moving armature loudspeakers. The list price of the Zenith Spanish was $2,500, enough to buy a substantial house at that time.

In the early 1930s, radio manufacturers offered certain deluxe models featuring multiple speakers. A 1931 Majestic used a 12-inch "Super Colotura" low frequency speaker coupled with an early Jensen 8-inch high frequency PM speaker. Zenith sets used twin 10-inch speakers, mounted in such a way as to disperse the highs in a crossfire manner. Philco used a 10-inch, and an 8-inch speaker in a baffle board, set at an incline to direct highs at the listeners' ears. E.H. Scott used twin speakers in the 1932 Allwave Deluxe set. Virtually all speaker compartments were "open backed."

In late 1934, when the 1935 model radio sets were introduced, great strides in the improvement of fidelity took place. Zenith Radio Corp. abandoned the use of power pentodes, in recognition of the attributes of power triodes in the debut of the 25-tube Zenith Stratosphere. This radio set listed at $750 in the depths of the Depression, enough to buy a small house in Los Angeles. It features all-triode amplification of high power magnitude on the order of 50 watts RMS -- more than ten times the power of the average console radio of the time.

The Stratosphere also features variable selectivity, accomplished by mechanically changing the coupling of the coils of the IF transformers with a dual-lobe camshaft. The speaker system is fully divided with a properly designed crossover at 3,500 cycles. It utilizes two of the newly introduced Jensen A-12 woofers and a Jensen "Q" series horn tweeter.

The next high fidelity radio introduced at about the same time would be the E.H. Scott Allwave 23 Imperial. The Scott 23 also has variable selectivity and a divided speaker system using a Magnavox 12-inch speaker and two Jensen 5-inch cone type tweeters crossed over at 2 Kc.

Philco had a high fidelity model radio featuring switched variable selectivity, a 15-watt triode amplifier using Type 6A3 tubes and a single 10-inch full range speaker of special design of English origin.

The one thing these radios have in common is that they are all rather large in size and they are mostly housed in consoled cabinets. I had not been aware of any self-contained, high fidelity radios available in a table model cabinet; that is, until I happened across the Remler Model 88.

John Eckland, P.O. Box 1731, Palo Alto, CA 94302-1731 John is a long time radio collector.

"No sorry, John went to the radio sale this morning to get rid of a couple of things that were cluttering up the place. Oh, but wait - I think I hear his truck arriving now."

A NØUJR classic.

Radio New Zealand International 60th Anniversary 1948-2008

On Monday 27 September, the Dominion Day holiday in 1948, New Zealand's first international short-wave service to Australia and the South Pacific from two low powered war surplus transmitters located near Wellington was launched by the then Prime Minister Peter Fraser. It took the name 'Radio New Zealand' and was part of the New Zealand Broadcasting Service (NZBS). One transmitter beamed to the eastern Australian states, the other to the Pacific, the 2YA domestic programme with a special evening programme. Although there were world wide reception reports, range was generally limited to 3000 miles.

The network has had a chequered history but, sixty years on, is stronger than ever, broadcasting today as Radio New Zealand International, an award winning, internationally recognised service, providing an essential link between New Zealand and its Pacific neighbours.

Today Radio New Zealand International is widely heard across the Pacific and into South East Asia. Eighteen Pacific radio stations re-broadcast Radio New Zealand International material each day and the service is available through digital and analogue short-wave, and via the internet.

In 2007 Radio New Zealand International won the prestigious International Radio Station of the Year Award at the Association for International Broadcasting (AIB) Media Excellence Awards in London. The station was praised for its ability and clarity of vision to deliver something that's valued by audiences throughout the region.

"From humble beginnings using two second hand transmitters US military transmitters left behind after the Second World War, see picture, the station has grown to become a significant international broadcaster using shortwave, digital and analogue technology which allows us to play a vital role in increasing understanding and awareness of New Zealand's role in the Pacific."

Old RNZI TX:

Private commercial stations 2ZW Wellington, 3ZC Christchurch and 4ZM Dunedin were also early shortwave broadcasters. *[Additional info appreciated. Ed]*

RNZI's growing popularity with partner stations across the Pacific some 60 years later demonstrates how this small shortwave station from the South Pacific has quietly gone about targeting its niche audience yet with popularity amongst shortwave listeners worldwide that belies its small resource base and regional focus.

ZL3 AND ZL4 NOW ON AIR

After carrying out tests for some few weeks beforehand, the New Zealand Broadcasting Service short wave stations, ZL3 on 11.78 mc and ZL4 on 15.28 mc took the air with regular programmes on New Zealand's Dominion Day, September 27. Both the above stations were heard at very good strength and should provide some interesting programmes for short wave listeners in many countries.

THE NZBS sent out an attractive folder prior to the stations taking the air and as the information they give is of general interest, we are reprinting some extracts.

Radio New Zealand aims to provide a service for the New Zealand Dependencies in the Pacific and for the Trust territory of Western Samoa, and at the same time to offer a programme of interest to listeners in other parts of the world. The transmissions, to start with, will be limited to two hours daily—6.0 pm to 7.0 pm Eastern Australian time.

Tests indicate that Radio New Zealand will be received with good strength in the Pacific Islands to the north of New Zealand and in Australia, and to a lesser degree in New Guinea, the Netherlands East Indies, Malaya, India, or, in short in the Middle and Far East. Reception in other parts of the world will be improved when new aerial arrays are constructed.

The policy of the short wave division is to provide a programme with maximum entertainment value. Approximately three quarters of the time on the air will be given to musical programmes; talks and news sessions will be brief.

New Zealand is a small country — the latest census figure shows the population as less than one and three-quarter million—and we are conscious that we can claim few world famous musicians. However, New Zealanders have a healthy interest in music and the standard of performance will allow us to present many New Zealand artists from Radio New Zealand. Then, most visitors to this country find the music of the Maori people, with its strong melodic line, interesting and unusually pleasant to listen to, and some of the Maori mythology is good radio fare. So, the songs and stories of the Maori race will be heard at times from our studios.

Broadcasting in New Zealand is a State function, and the programmes for Radio New Zealand are prepared by the Short Wave Division of the New Zealand Broadcasting Service.

The studios of Radio New Zealand are at 38 The Terrace, Wellington, the capital city of New Zealand. They can be linked with all the medium wave broadcasting stations in New Zealand so that programmes originating in any part of the country may be available to overseas listeners.

The two transmitters used by the Short Wave Division are at Titahi Bay, some 17 miles from Wellington. Each transmitter has a radiated energy of 7½ kw. They employ high level modulation, using 2-250R type valves as class B modulators and 2-250R type valves as the final modulated RF stage. They cover a frequency range of 6 to 22 mc and a change in frequency can be made in less than two minutes.

As the initial programme service is primarily intended for Australia and the Pacific, all the present aerials are designed for a total beam width of 60 degrees. The majority of the aerials consist of two tier, two-bay, .5 wavelength long horizontal radiating elements with reflectors. The earlier aerials have the radiating elements spaced .5 wavelength in the vertical plane while the later steerable beams for the Pacific service are designed with a vertical spacing of .7 wavelength. All radiating elements consist of a three wire centre-fed Kraus structure."

During the test period, Radio New Zealand was also using ZL2 on 9.51 mc but at the opening of their service, they only used ZL3 and ZL4. Other channels assigned to this station are ZL1 on 6.03 mc, ZL5 on 17.77 mc, and ZL6 on 25.6 mc.

Material from various websites including the Radio Heritage Foundation at www.radioheritage.net and Radio New Zealand International. www.rnzi.com.

General Radio comes to Bell Radio Television Corporation

In the Feb 2005 Bulletin (Vol 26 No. 1) there is an item about the General Radios manufactured in New Zealand by Bell Radio and Television Corporation. Cliff Maxwell (one of the attendees) has provided the following photograph showing some of the senior staff members of both Bell and General Radio at a dinner held to celebrate the manufacture and launch of the General Radio products onto the New Zealand market in June 1962. The staff members identified at the dinner are as follows;

Seated from far right to centre;

1) Al Bell, Chairman, Bell Radio Television Corporation and Precision Pressed Products
2) Lou Reindler, General Manager, Bell Radio Television Corporation
3) George Whiterod, General Secretary, Bell Radio Television Corporation
4) Cliff Belling, Production Manager, Precision Pressed Products
5) Len Stockwell, Production Manager, Bell Radio Television
6) Bob McNamara, Manager, Precision Pressed Products
7) Waiter (standing)
8) Cliff Maxwell, Chief Engineer, Bell Radio Television Corporation (head and eyes, at far end)

Seated from far left to centre;

1) Alex Wazniac, Purchasing Manager, Bell Radio Television Corporation
2) Bell Radio Sales Manager (name not recalled)
3) Mr Terasaki, Overseas Sales Liaison Manager, General Radio of Japan
4) Mr Kono, Sales Manager, General Radio of Japan
5) Mr Yau, Chairman, General Radio of Japan

Precision Pressed Products was an associated company of Bell Radio Television Corporation and manufactured all the metalwork required by Bell to produce all the Bell and General products.

Some Stories about Wellington Radio ZLW

from the website of Jamie Pye (ZL2NN and daughter Elsa Kelly)
See: www.pyenet.co.nz/familytrees/zlw-history

When ZLW began service in July 1911 it was New Zealand's first "Official" Radio Station. Spark transmitting equipment had been installed in the clock tower on top of the General Post Office, Wellington, among the clock's workings. The clock tower itself was used of as the antenna support.

The opening celebration on 26 July 1911 appeared to be an internal function within the Post Office - no press were invited, nor was there any statement issued. Putting the radio station in an existing Post Office building would have saved expense and enabled the existence of the station to be kept under wraps. The Evening Post, the day after the opening, had a seven and a half line advertisement stating: "wireless messages can now be accepted for transmission by the Post Office". The statement gave nothing away and went without press comment. Interesting that in 1908, there had already been a well-reported telegraphic exchange of greetings between ships, one in Wellington harbour, another at Port Jackson (Sydney, Australia), and a third acting as a repeater at sea. *[See previous Bulletin item Vol 29 No.3.Ed]*

Above: The General Post Office in 1907 Customhouse Quay, Wellington. ATL Collection

On July 27, the day after the official opening of Wellington Radio, the RMS Ruahine arrived from London with a wireless telegraph installation fitted. All three Wellington newspapers made much of the Ruahine thus becoming the first New Zealand Co's vessel to be so equipped. The operators in the Post Office tower had now begun their great adventure and, in the words of an official report, they successfully carried out radio communication at night over a normal range of 600 miles and greater.

The sharing arrangement lasted a year; the clock tower proved to be a poor radio site especially for reception. There was considerable disturbance from the clock itself and the electric tramway that ran past the building. Also the station had great difficulty in both transmitting and receiving in some directions and a gradual loss of signals to shorter ranges, generally due to the effects of the high hills surrounding Wellington.

The normal hours of operating were from 8.00 am to midnight, 16 hours of which only one was unaccompanied by quarter hour chimes and booming hour bell. For that one hour at night, conditions were usually perfect. It was, therefore, all the more irritating to lose communication with ships from the west as generally these ships were picked up a few miles off the Australian coast. They could be held in contact to a point rather less than one day's steaming from the Port of Wellington where the signals then deflected from their true course at such an angle that Wellington Radio was unable to receive them. There was little else that could be done with the equipment that was available at the time. The station would have to move.

Wellington Radio was moved from the GPO clock tower to Tinakori Hill, on October 14, 1912. This was no low-key affair but an occasion for sunlight, bunting and competition between the eminent

speechmakers of the day. Wellington's wind blessed the opening with a 70 miles an hour gale as measured by the first official recording of the new anemometer.

The most distinctive parts of the layout were the twin masts of Oregon pine, 150 feet in height that dominated the site. The new station, far removed from chimes, tramcars and other noises of the city, had the even greater advantage of its height, 985 feet above sea level, and an unshadowed 360° view of the world.

Left and Below; Wellington Radio 1912 showing the Oregon pine mast

Within a few hours of opening, the station had uninterrupted communication with stations at Sydney, Melbourne and Hobart, with Suva at a range of 1500 miles, and with a number of ships at sea at distances of well over 1000 miles. Macquarie Islands, as well as many other stations, remarked on Wellington Radio's greatly improved signal.

Interior of Mount Etako (also known as Tinakori Hill) station, Wellington Radio, circa 1912.

The 1912 Post Office report indicated that since the station was opened on 26th July, 1911, seven months ago, the number of messages handled; 746; number of words; 7951; revenue; £303. In addition, there are approximately twenty–four free messages relating to shipping and twelve free weather reports received each month. The Wellington radio station has successfully signalled a message to a ship 960 miles out, and on one occasion received a message from the S.S. Ulimaroa when that vessel was one day out from Hobart, approximately 1150 miles distant from Wellington.

On the 13 May 1926, a series of "cyclonic gusts" took the aerial mast down. "Immediate expedients were put into operation to maintain the traffic, though only in a limited sense, whereby an aerial was at once erected to enable the station to communicate with Awarua and Auckland, which in turn took

up the traffic which in normal circumstances is conducted at the Tinakori Hill Station. Temporary masts were erected today, and will serve until a new structure is obtained."
The collapse of the tower had come as a surprise to the officers of the Telegraph Engineers' Department. As it was, the wind came in cyclonic gusts and gradually broke down the fastening of the tower. The structure itself was apparently undamaged by the wind, but the fall completely wrecked it. The tower weighed about four tons.
In addition to wrecking the tower of the Tinakori Hill wireless station, "the gale also broke the telegraph line by which the daily official time signals are sent from the Kelburn Observatory to be transmitted by wireless for the benefit of ships at sea. The signals, which go out daily at 10.30 am and on Tuesdays and Fridays at 8.30 pm, could not be sent yesterday but the line has since been repaired."

The mast, designed as a self-supporting structure, and unstayed, was about 150 feet in height. It supported four wires, stretched out at an angle to form an umbrella aerial. The crash of the falling structure was heard in the city.

Visitors came to view the wireless wreck by the tram load; "To take advantage of the beautiful windless and cloudless day, many hundreds of people yesterday afternoon climbed to the top of Mount Etako, on the Tinakori Hills, to inspect the ruins of the wireless mast which was blown down in the heavy northerly gale of last week. From the time the trams commenced running in the afternoon until after sunset a steady stream of people passed though Northland and up the steep slopes of the hill. The day being ideal for walking, many of the people came along the ridge of the Tinakori Hills to Wadestown, taking the tram from there back to the city. "It's an ill wind that blows nobody any good," but the gale of last Wednesday must have been directly responsible for blowing a good many pounds into the coffers of the tramway department yesterday–at any rate so far as the Northland and Wadestown sections of the tramway system were concerned."

The first trans–Tasman telephone call was inaugurated with a brief conversation on November 25, 1930, between Native Affairs Minister Sir Apirana Ngata and acting Australian Prime Minister James Fenton, using apparatus at Wellington Radio.

In 1930 radio signal propagation experiments were conducted during the October solar eclipse in the South Pacific. This was a collaborative exercise of the NZ Post Office in conjunction with the DSIR, whereby the signal strengths of various "official" stations were monitored during the progress of the eclipse. The stations included:-
Apia Radio ZMA, 850 metres, 100 watts;
Suva Radio VRP, 800 metres, 5000 watts;
Apia Radio ZMA, 52 metres 500 watts;
Wellington Radio ZLW, 51 metres 5000 watts;
Papeete Radio FPB, 40 metres 200 watts;
Papeete Radio FPB, 24 metres 200 watts;
Apia Radio ZMA, 19 metres 1500 watts;
Wellington Radio ZLW, 19 metres 500 watts.

The receiving stations interested in the experiment were numerous and were dotted around the Pacific and New Zealand. The tests included observations on long waves (11,500 metres), on medium wave–lengths (850 and 800 metres), and on short waves (52 to 16 metres). The transmission paths lay in the Pacific Ocean region, and in the majority of cases crossed the line of totality of the eclipse. The measurement of signal strength was based on the method of aural estimation. The signals received during the eclipse were compared with those recorded at similar times of the day preceding and following respectively. Experienced coast station operators working with frequencies used by them daily, and using receivers with which they were thoroughly familiar

made the principal observations. Essentially the same equipment was used before, during and after the eclipse to attempt some consistency of measurement.

The following results were indicated:
Long waves; the Ruby-New Zealand transmission had a definite increase in strength occurred during the eclipse period.
On the 850 and 800 metre medium wave lengths a partial return to night time conditions as shown for transmission distances lying between 600 and 1200 miles. This effect was noticeable whether the transmission path actually crossed the line of totality or not. The maximum change in the signal strength occurred approximately at the time of minimum eclipse but some cases recorded a lag of up to thirty minutes between the two phenomena.
In general, no eclipse effect was observed on short waves, except in certain cases on a wave length of 53 metres, when a partial return to night time conditions was definitely indicted. In this case also the maximum effect on signal strength either coincided with or lagged slightly behind the maximum of the eclipse at a point midway between transmitter and receiver.

On the 16 September 1931 the inaugural radio telephone call took place between England and New Zealand when the Governor-General (Lord Bledisloe) of New Zealand was called by a Correspondent of the "Evening News" in London

"I had put a call to Lord Bledisloe, Governor-General of the Dominion of New Zealand from my Office at the Evening News in London. The time is 6 a.m. Three minutes afterwards the telephone bell rang and on lifting the receiver, I was told that I was "through".
"Hello", came a cheery voice, as clear and plain as though it was coming from a local London call.
"Is that the Evening News London"?
"Yes" I replied. "Is that Lord Bledisloe?"
"It is," he said. "Good afternoon."
"Good morning," I answered, and we both laughed.
"I had forgotten the difference in the time for a moment," said the Governor-General. "It is about 4.30 p.m. here." .....

"And so the new radio-telephone service between England and her furthest Dominion, New Zealand, was inaugurated. My call was the first public call made either from this country (England) or New Zealand. It is the longest direct telephone service in the world, and only one other station was used in the transmission–that at Sydney, Australia. The distance is about 12 000 miles."

Comments were made on the cost of calls at NZ £6 15s for three minutes [effectively $560 per 3 minute today, or $187 per minute, inflation adjusted using the NZ Reserve Banks inflation calculator at www.rbnz.govt.nz/statistics/0135595.html]
Incidentally, the initial charge for a call to Australia was £1 a minute [about $85 today]. The New Zealand–United Kingdom calling rate was lowered in 1935 to NZ £5 2 shillings [approx $520 today] per three minutes [ie reduced to $173 per minute today's rate]. Also, it was necessary to book these calls as they could only be transmitted between 2am and 6am (NZ time) to the UK.

In 1934 the Rangitiki cleared London's docks en route for New Zealand. Wellington Radio talked to the ship by short wave wireless ever since the vessel turned down the Thames. All through the voyage to New Zealand the Rangitiki received and gave weather information, and exchanged radiograms for people on board. But by 1936 it became possible to also call the Awatea, the Union Steamship Company's prestige passenger liner, and to have overseas calls "scrambled" by speech inverters for secrecy.

In June 1939 the wooden masts at ZLW were replaced by six steel masts.

To quote Reg Motion "In the late 1930s the "powers that be" decided to replace the then wooden masts with towers. These they imported from Milliken Co in USA but failed to notice that the maximum wind velocity these towers were designed for was 90 mph (144 kph). The towers were duly erected and stood for a little while then some keeled over in a Wellington gale (panic stations when the second tower collapsed).

A hurried conference and it was decided to guy the remaining towers using guys with heavy springs in them to keep the guys taut. The inevitable happened – these towers just buckled at the lower section and sat down still upright but much shorter.

Sanity prevailed at that point and then MOW was asked to design suitable towers which they did using no steel section less than 0.25 inches in thickness. The Milliken towers used 0.125 steel and their cross braces actually bent when a rigger stood in the middle of them – undoubtedly they were OK for amateurs in the less windy States of the good old USA. Interesting that the MOW towers were still standing when ZLW was decommissioned."

In April 1948 the Receiving Office for Wellington Radio is planned.

August 1956 ZLW gets trees planted and a new house for the caretaker.
"The post and telegraph Department have in hand an extensive tree–planting scheme for this area, provision having been made for putting in of several thousand trees. Already about 100 pohutukawa trees have been planted. A number of other trees are also in, and all around the station are holes, several thousand of them, waiting to receive other trees as they come to hand. Something like 5000 trees, a large proportion of them flowering gums which in later years perhaps may coax the Tui to sing in their branches, are to be planted this season, and it is hoped to have others available for next year. The success of certain trees in the Botanical gardens and at the Karori Reservoir has been largely used as a guide in the selection of those for the top of Tinakori Hill. Not only are the young trees being planted around ZLW, but a nursery is also being prepared in a slight depression with a view to rearing trees under conditions similar to those prevailing further up the hill so that they will be hardy young specimens when the time comes for them to be planted out." Etc

Similarly "A very solid residence for the caretaker, who at present time lives at Melrose, is being built on the hill. When this building is completed it will be a stout snug home from which will be seen probably the finest panoramic view of Wellington it is possible to get. Since the solid and compact stone building on the ridge was completed in 1912, radio development has demanded considerably more space, with the result that the original building is now used solely to house the transmission apparatus, while lower down the hillside is another building larger in size which provides spacious and comfortable accommodation for the staff of the receiving and traffic–clearing section of the station. In this building beds are provided so that if it is a very stormy night when operators go off duty, or for other reasons, they may spend the night there."

"Through shifts throughout the 24 hours of the day, regular contact is maintained with the islands in the southern Pacific and the Chatham Islands, and since the establishment of the air services by Union Airways and Cook Strait Airways the station has fulfilled this important function.
The transmitting apparatus is something which anyone interested in radio would find a joy to inspect. There are something like 15 transmitters in the building on the ridge of the hill. Both buildings are stoutly constructed and they need to be, for it can blow very fiercely in these parts."

Six new towers at ZLW in 1963.
The mast, which is the first of six which are to be erected in a row along the ridge, will be 155 feet high. It weighs 10 tons. Another mast is being assembled on the hill and the parts for the other four are being made in the workshops of the contractors. The task of hoisting the completed mast to the upright position is a difficult one, and cannot be undertaken if there is a wind of more than 25 miles an hour. It is carried out with the use of an electric winch and flexible steel hawsers.

Then in 1968: Radio is still used; satellites have not taken over radio communication.
"In these days of global television links through orbiting satellites, conventional steam radio has been thrust into a back seat but it is still the basic means of international communication.
Just how important it remains can be judged by visiting Wellington Radio, the complex of weatherboard buildings and nissen huts dominated by a 160 foot steel mast on Mount Wakefield, better known as Tinakori Hill.
Traffic handled by Wellington Radio is immense. In 1967, 69,900 messages were handled. In addition to an internal service relaying earlier reports during the summer period of high fire risk. Wellington Radio is one three stations in New Zealand–one is at Auckland and the other is at Awarua, near Bluff–which form the hub of a communication centre responsible for one of eight sectors in a world network.
When a British ship crosses a sector boundary line it must notify the responsible centre of its position and give certain other information, including weather conditions. Thereafter, if in an appropriate sector, it listens to four–hourly messages transmitted from Wellington Radio.
Although vessels sailing under other than British flags are not bound to contact the sector centre the majority do as a matter of course. To assist in plotting positions and as a means of easy reference in an emergency, Wellington Radio has a large operations map to which metallic markers are a attached and moved, using the information supplied in the bulletins.
The superintendent of Wellington Radio (Mr J F Ryan) said that on an average day the map would be dotted with about 30 markers. But the map, which forms a spectacular focal point in the transmitter room, it is not essential.
Operators have a set of procedures to follow, depending on the location of the ship. This mainly involves beginning the train of events, which leads to an air-sea rescue operation."
Then on April 10, 1968, ZLW received the first SOS from the stricken Wahine, when 51 died after the ship foundered in Wellington harbour.

Dismantling of the six steel towers; six towers were felled in May 1975 by 40 territorial soldiers from the 6th field squadron of the Royal New Zealand Engineers, using explosives.

The first qualified woman radio operator in New Zealand was Marie Hurst.

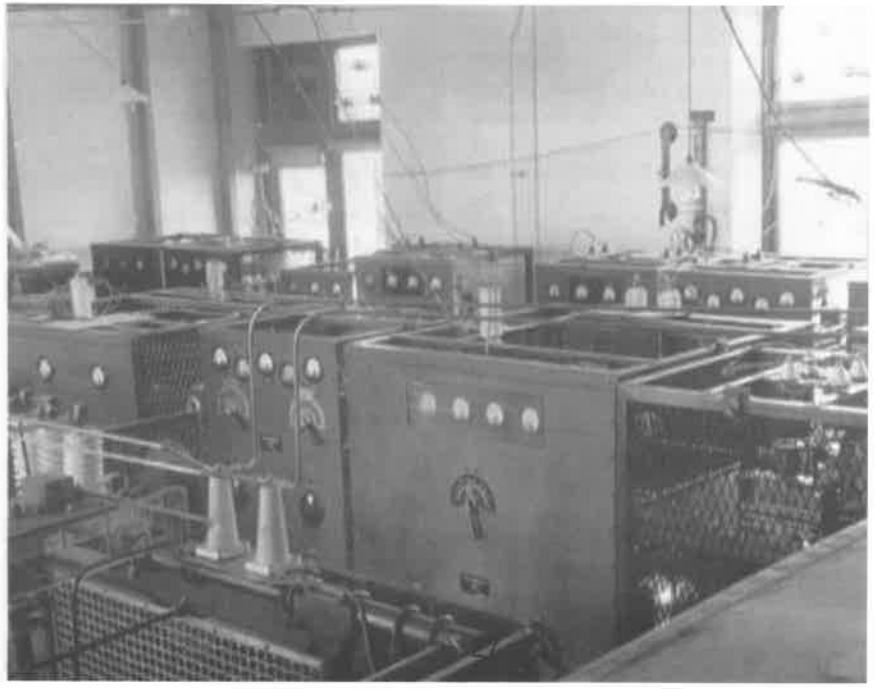
One of her reported comments were about being "rather hesitant about going to the Chatham Islands, where they have yet to install adequate facilities for woman radio operators" – I wonder if she never got there?

Finally from a Dominion interview with George Askey;
"We loved our job's". Mr Askey reminisced. "During the war we had problems at night on the dogwatch, we had to have a password. There were armed sentries there and you could get shot." Mr Askey recalls secret war messages being relayed between New Zealand, Australia and the United States, army and navy. All messages were in Morse, the diplomatic ones encoded. And the Morse was not this modern dots and dashes stuff, but marks and spaces. He also recalls desperate midnight sprints, tripping and falling, down the track into Northland to catch the last tram home. Today? Maritime services are now in the tender care of private company BCL, based at Avalon, with a remote controlled station in Taupo. Most sophisticated communication was now the realm of satellites!"

Left – as it is today.

cell phone antenna on left, pagers central and tower on right.

Below: The equipment at ZLW in 1937. "What a lethal looking lot - if you are not cooked by the RF energy you would be zapped by the exposed high tension supplies." JP.

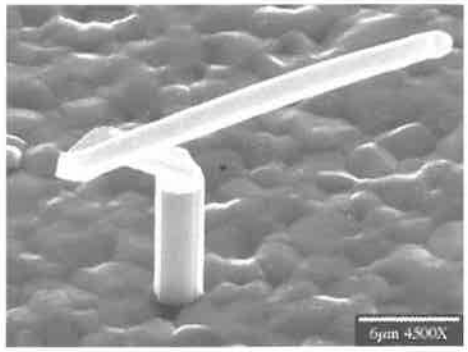


Within a whisker of failure – "Lead Free Solder" Woes

Removing lead from solder may seem a good idea environmentally, but the resulting microscopic growths or "tin whiskers" that can grow from pure metal finishes can be much more problematic. The following comments come from a variety of web sources and Wikipedia is a good start:

The logic seemed simple. Removing lead from petrol has brought clear environmental health benefits; by taking an intelligence reducing chemical out of the atmosphere. Removing lead from solder (normally a 37% lead, 63% tin alloy) used from plumbing to circuit boards, was an obvious next step to prevent it leaching into ground water from dumped items in landfills. [Lead pipes and products have also been suggested as one of the problems of the falling Roman Empire.]

But without lead, tin behaves oddly. Left alone, tin (like gold, zinc, cadmium, indium, and antimony) spontaneously grows microscopic metallic strands (called whiskers) away from the base layer. If these conductive strands grow far enough to touch another current-carrying component, they can cause a short circuit or malfunction. They can also break, fall off and create problems elsewhere, if only for a temporary period until they are dislodged again.



Above: "Metallic Grass"

A tin whisker is a strand of pure metal that grows as a crystalline structure from the surface of near pure tin coatings. It is typically only several microns in diameter, but sometimes up to 10 microns. Tin whiskers grow to several millimetres in length, occasionally to 10 mm in rare instances, and diameters up to 10 microns, but more commonly 2.

A tin whisker can be seen with the naked eye only when struck by light at just the right angle. It may grow straight, kinked, hooked, forked or spiralled, have a resistance of about 50 ohms per cm and may carry tens of milliamps before fusing and vaporizing. Rarely does only a single whisker grow from a suitable surface. Surfaces capable of producing whiskers produce dozens, hundreds, or even thousands of individual whiskers such as in the case of metal covers.

Metal whiskers were first recorded about 1946, when the cadmium-coated plates of variable capacitors sprouted whiskers long enough to short adjacent plates. From then until the 1960s, numerous research papers were published on the subject. Generally they concluded that;

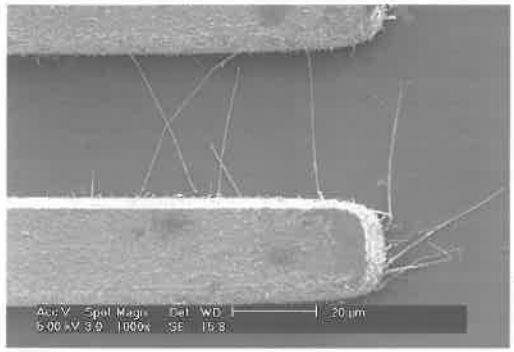
- Each whisker was a single filament stack of individual crystals, growing up from the base and not out from the tip.
- Whiskers can grow at normal temperatures and humidity, and even in a vacuum.
- Whiskers can grow from both solid metals and deposited coatings, as is common on copper.
- Whisker growth rates varied, but whiskers grew most quickly when the host metal was exposed to stress; caused by anything from heating and cooling, to the physical stress of mounting.
- Whiskers grew straight, bent, kinked, or in any combination within the same whisker "colony."
- Whiskers at times grew toward a differential voltage but appeared unaffected by magnetism.
- Whiskers are sharp enough to push through other coatings, including insulation materials.

- Whiskers can stop growing as suddenly as they start, or continue indefinitely.
- Whisker prevention can be achieved by alloying the tin finish with 3%–10% of lead.

For the next 45 years, tin whiskers were generally unheard of, since manufacturers of electronic components used a tin-lead alloy as the final component coating. This combination worked well in the electronics industry since it took solder well and was compatible with the rosin-core 60/40 tin-lead solder then used throughout the industry. Alternative lead replacing solders have been developed, but each has its own drawback – cost, temperature or toxicity to name a few. Present 'military specifications' and medical specs allow lead in tin coatings on components as an interim measure to ensure continued component reliability.

Still to date, the most cost-efficient, trouble-free whisker mitigation method remains the 45-year-old practice of using a tin-lead alloy as the final coating on components, cases and leads.

Tin whiskers can grow from washers, nuts, screws, and other mechanical hardware used in the construction of devices. In larger sites of forced air-cooled equipment, these small conductive whiskers can be re-circulated throughout the equipment as they are too small for normal filtration capture. For more than 40 years, the Tin Research Institute has recommended the use of a nonconductive brush attachment on the vacuum hose as a simple means of component cleaning.



Left: Tin whiskers growing on a tin-plated copper lead-frame commonly used in the manufacture integrated circuits after 3 years of ambient storage.

Below: Lower portion solder dip verses upper plated tin whisker growth. The soft lead mix solder inhibits the growth of tin whiskers.

Metallic whiskers can affect the propagation rate of pulses in radio or fast digital circuits where the whiskers can act like miniature antennas, affecting the circuit impedance and causing reflections, changing the pulse shapes.

In higher powered equipment, a short circuiting metal whisker can form an ionized plasma that is capable of seriously increasing the damaging effect of the initial short circuit or at least the area of damage.

As the growth rate for whiskers is unpredictable, it is a serious reliability concern as components pass initial testing but problems can spontaneously appear when least expected later in the product's life.

Metallic whisker formation mechanisms are complex phenomena. I will keep using lead based solders for a while yet – with suitable ventilation of course!

Footnote: Metallic dendrites show a fern or snowflake like pattern that propagates along the surface, whereas whiskers protrude out of the surface. Dendritic formation involves the dissolution of the metal atoms in moisture and then their redistribution on the surface under the influence of an electric field, such as when the device is biased eg silver migration in silvered mica capacitors.

MARKETPLACE

Advertisements for the next bulletin should reach the editor by the 15th of the prior month. These must be neatly hand printed, typed or printed on a separate page, posted to the NZVRS (for details see page 2) or emailed to **nzvrs@pl.net**

Please - no verbal or telephoned adverts, also don't forget to include some contact details; eg postal, telephone & email if applicable. There is no charge for members' adverts but please remember that the NZVRS is not responsible for any transactions between members.

AVAILABLE

Valve Cartons – plain and unprinted flat packs

- Small & GT size $12 per 100
- Medium size $15 per 100
- Large size $25 per 100

Plus post and package per order.
Contact: Paul Burt, 44 Hastings St West, Christchurch 8002.
Tel: 03 - 960 7158, Fax 03 - 981 4016
Email: dawn.lloyd@clear.net.nz [please note new email address]

NZVRS CAPACITORS order via Gerry Billman, 30A Rowan Rd. Epsom, Auckland 1023. Email: billman@ihug.co.nz
Tel: 09 - 625 6568
Metal polyester film, axial leads, (µF):

0.01	630 Volts	50 cents each
0.022	630 Volts	50 cents each
0.033	630 Volts	50 cents each
0.05	630 Volts	50 cents each
0.1	630 Volts	50 cents each
0.22	630 Volts	50 cents each
0.33	630 Volts	50 cents each
1uF	630 Volts	$1.50 each

Electrolytic capacitors, polarized, axial

10µF	450 Volts	$1.00 each
22µF	450 Volts	$1.50 each
40µF	450 Volts	$3.00 each
47uF	450 Volts	$3.50 each
100µF	450 Volts	$5.00 each

Please add $3.50 per order for post and package or contact Gerry for a postal rate.

FOR SALE:

Two GEC (UK) Type BC5543 Receivers (Miniature valves), Good condition. Slide Rule Dial. Long. Medium, Shortwave and Bandspread Shortwave. Manufactured in the early 1960's. Can send copy of manual for full details.
Peter Le Quesne ZL4TCC. 23 Oriel Place. Napier 4112. Phone: 06 843 8212.
Email; paleq@clear.net.nz

WANTED

Taylor 45c valve tester wanted for parts.
Sam Lowe ph. 06 753 6693
Email: samlowe@clear.net.nz

~~Wanted 1 AEI CS5/A/A, **(CV103)** VHF Silicon Diode *(approx 20 x 6 mm picture below Ed).* Used in a Marconi TF 955A/5 series of VHF Signal Generators.~~
~~Peter Le Quesne ZL4TCC. 23 Oriel Place. Napier 4112. Phone 06 843 8212.~~
~~Email; paleq@clear.net.nz~~

Sorry item has been sourced.

I'm looking for a **band selector switch for a zenith** 7-s-232at export model radio. The US version of this switch isn't compatible as we have tried to fit one. The serial number is: 85-128 if anyone could help it would be greatly appreciated
Brett Hamilton, Email: signs@wave.co.nz

Parts for **Majestic 331** cathedral, ref. GAR pg 107 & NZVRS Vol 15 No 2, pg 10;

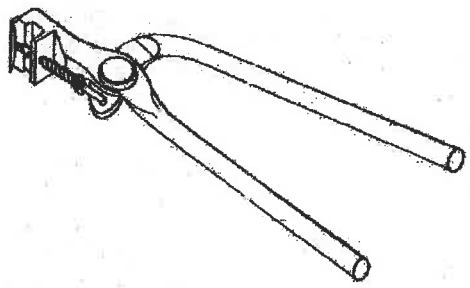
- Knobs. Three wooden with carved Eagle motif, two small, one large.
- Speaker & output transformer. 6 1/2" dia, model G-23-A or similar. Field = 970ohms. Output to suit a 59, pentode wired.
- 2nd IF transformer: 1 1/2" dia can, centre tapped secondary (5 leads in total).

Roy Bassett-Burr Tel: (04) 938-9838 (hm)
Email: royb@nz1.ibm.com

Wanted Continued:

Ivory / Cream Bandswitch knob for a Bush DAC90-A (its the one on the side of the set)
This is missing from a cream set, the main piece is 32mm dia and has a 1/4" shaft. There is a lever on the top. Once this is complete all I want is the Black version!! Then I will have the 3 types. Picture below of black version. All costs covered.
Please call Bill Campbell 06.753.2475 or Email billcampbell@clear.net.nz

To buy or borrow short term - **special pliers** for removing retaining springs to coil units in Hammarlund SP-600 receiver. Picture below.
Also Band-change knob for SP-600
Contact: Stu Stidolph, 3/15 Gebbie Road, Taradale, Napier 4112. Tel: 06-844 5591 or Email: stustid@paradise.net.nz



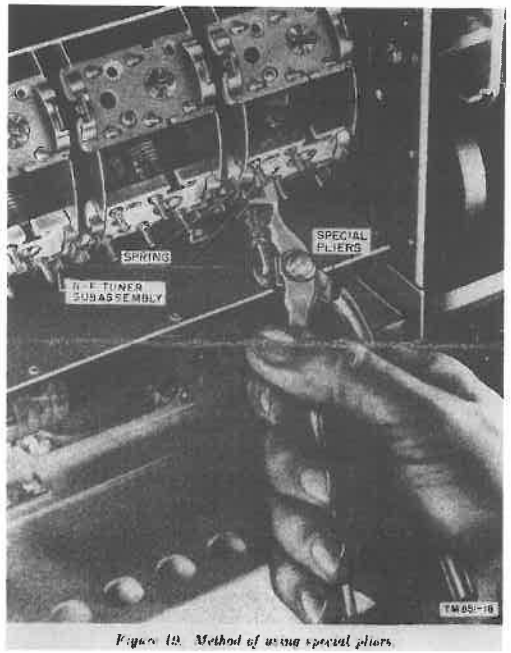


Figure 13. Method of using special pliers.

Use of the Hammarlund "special pliers"

I am requiring a magic eye escutcheon for a Columbus Model 84,
Contact: Kerry Pedersen, Tel: 07-884 4438, Email: kerryandjoy@kol.co.nz.

Circuit and Service Data for PYE PF91 amplifier and PF91A pre-amplifier. Even circuits only would be appreciated. Happy to reimburse expenses.
Kevin Hayes, 183 Ripponvale Road, RD2. CROMWELL 9384. Tel: 03 445 0201
Email: kjhayes@xtra.co.nz

I am looking for someone to work on an old Rockola juke box that I have at home in Mt Eden. It's a Rockola 25th anniversary special. It's in really good general condition, but has not been played for some time. It does play - but is choosing it's own records! I have schematics for it also.
Contact: Helen Eccles Tel: 09-377.4454
Email: helen@eccles.co.nz