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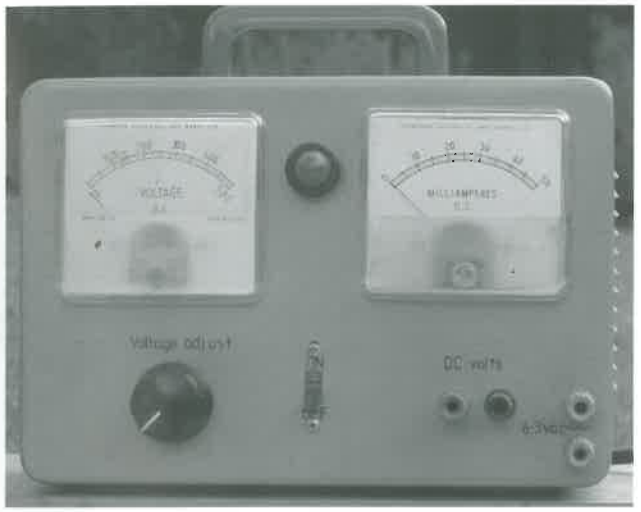
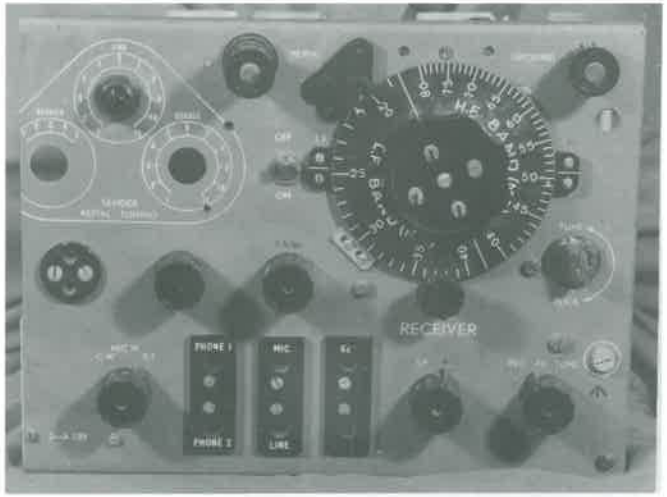
NZVRS BULLETIN

Vol 27 No 4 **November 2006**



BUILD A REGULATED POWER SUPPLY

SALVAGE THE RECEIVER FROM A ZC1



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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Contributions should be sent to the
EDITOR,
Reg Motion, 2A Hazel Terrace, Tauranga. 07/576 8733, email: regmotion@xtra.co.nz

AUCKLAND MEETINGS will be held at the Horticultural Society Hall, 990 Great North Rd. (opposite Motion's Rd.).
Mon. 20 Nov. at 7.30pm. Collier and Beale night. Bring your sets and queries.
Mon. 18 Dec at 7.30pm. Auction nite.
Mon. 15 Jan at 7.30pm Henderson Transmitting Hall.

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

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

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

CHRISTCHURCH MEETINGS Will be held at the Christchurch West Radio Club rooms "Auburn Park", 333 Riccarton Rd. on:
Tues. 6 March at 7.30pm.

For further details contact Jim Lovell, 41 Yardley St, Avonhead, Christchurch 8004.Ph 03/342 7760

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FROM THE EDITOR

While the Summer break is, for many, a chance to get to the beach and other outdoor recreations there will be members who relish the chance to spend an uninterrupted time at their favourite hobby. In this issue I can recommend a close read of John Walker's article on regulated power supplies. Having such an item in the workshop makes it easy to power up a valved battery set or to conduct experiments with valve circuitry. My own regulated power supplies gets quite a lot of use,

With this issue is the usual subscription renewal notice plus a request to advise our Treasurer of your new NZ Post area code number so that he can update his records and ensure that future issues of the bulletin reach you promptly and in a satisfactory manner.

Regrettably, we are out of stock of the book "Antique Radio Restoration Guides.

Included in the next issue will be the first part of an article on the history of the High Frequency Transmitting Station set up at Himatangi by the NZPO for operation with communications administrations in other countries. George King is well advanced in writing this up for us.

We wish you a pleasant Xmas Holiday.

NEW MEMBERS

COOP, Colin	Auckland
HARRIS, Paul	Auckland
DAVOREN, Basil	Gisborne
STIDOLPH, Stuart	Napier

CONTENTS

LETTERS TO THE EDITOR

Midwest Radios

Jack Whittaker's article in the August issue of the NZVRS bulletin was most interesting. I was born in Otautau, Southland and after WW11 settled in Invercargill and was employed by an electrical company called Parkinsons Ltd on radio servicing.

We did have a Midwest radio which came in for repairs. This happened about 1948 so my memory is a little vague on the details of this radio but I do remember one amazing thing about this set. It had one valve which had the filament connected but no other connections on the socket the terminals of which had no solder on them. I believe the set had 12 valves but was a more or less standard circuit of a six valve set so we could only conclude the valve in question was simply to help increase the valve count. Strange but true.

Ted Baker ,VK2ABW ex ZL4AW.

Westco

I was clearing out some old photographs when the enclosed took my eye. At the time it was taken I was working for Westco Products and had been sent to Christchurch to relieve the branch manager, Wally Green, while he was on a sales trip around the South Island.

The photo is of Westco's Christchurch branch taken by myself at the time...the year 1953. I am sorry I cannot find the address of the branch as none of the old invoices have shown this detail. The following year I was appointed branch manager at Wellington and had the job of setting up the branch at No. 31 Marjoribank St. Perhaps one of our Christchurch members can remember the address of the Christchurch branch.

Cliff Maxwell, Auckland

Dennis Cobb

Greetings. I know NZVRS members are interested in the history of things related to radio. I recently acquired a really nice commercial-military transceiver built in 1987, and in learning all about it from a few limited sources, I discovered that the designer was apparently a New Zealander! There are some pictures of this Transworld Corp. Wl00 radio at wyvw.casa.cp.nzJ *equipltx!T* ransworld/tw *1001* gallery *I*

It is well known that Lester Earnshaw, of 1960's Earnshaw 9 A Phasing Exciter fame, went off to the USA designed military gear and also the ATLAS range of transceivers then, more recently, the Kachina KC-50S, but it appears that another Kiwi, Dennis Cobb, did the same!

All I know at present is that he came from Rotorua, and spent some time there designing and installing TV repeaters in the early days of television. He later worked for Transworld, where he designed much of their military gear, including the transceiver I have (a Transworld TWl00). I don't know if he was also involved in the earlier TW gear ,such as the TWC-5, but I have heard that at one time this simple transceiver was made under licence here in NZ. Once again, I don't know if there is a connection. I understand that Denis died a few years ago, so I can't track him down directly (as I did at one point with Lester, who is still alive and living in Arizona).

Do any of your readers know anything about Dennis Cobb, or know where I might find out? What really intrigues me is a certain similarity in the design concepts of the 1980's TWl00 and Lester's late 1970's ATLAS 210. With such a similar work history, I wonder if they ever met or worked together?

Murray Greenman, ZL1BPU

A RESTORATION CHALLENGE

George King

Some years ago I was presented with the badly damaged remains of an old battery receiver in the belief that I could perhaps bring it back to life.

It had been found beneath a pile of rotting wood in an old wood shed in the Masterton district. The original cabinet had long since gone (possibly chopped up for firewood) and the chassis was in a sorry state. The damage sustained by the remains of this set was as follows:

(a) The front panel was broken in half and the section containing the fourth dial and tuning condenser had been smashed off by the weight of firewood and had disappeared.

(b) The three vernier dials left had suffered water damage completely ruining their internal scales.

(c) The remains of the front panel had become discoloured and warped to the stage where only a few of the original logo letters were barely discernable.

(d) The wooden baseboard of the chassis had deteriorated to the stage where a number of the mounting screws had pulled out and disappeared.

(e) Only one of the three coils was still intact - the RF and detector coils had been completely crushed by the weight of firewood.

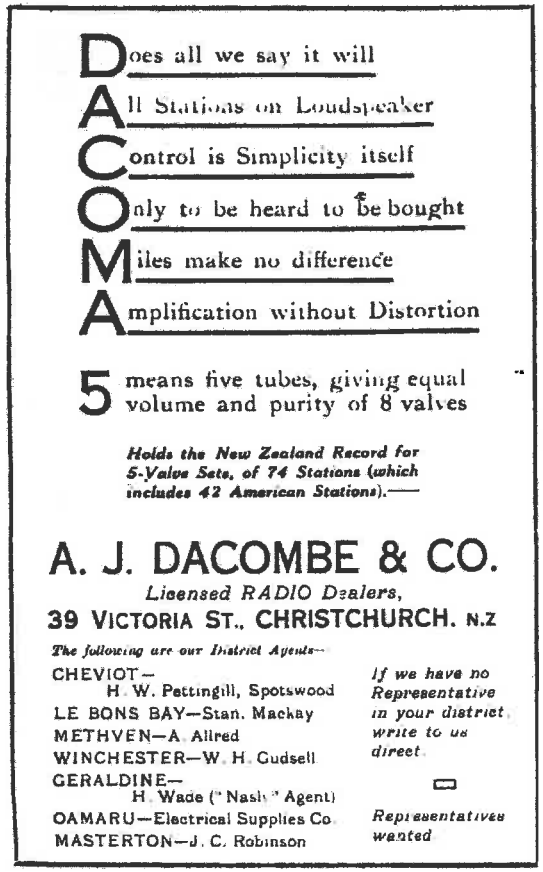
(f) The two audio interstage transformers were completely rusted and a section of the associated square wiring and terminal strip had disappeared.

(g) There was no sign of the original 01A valves or bases and water leakage had caused the bakelite tubular valve sockets to swell considerably.

WHAT WAS IT?

The first challenge was to identify this set, as the faded remains of the original logo gave no immediate clue as to the make. As my own records could not provide the answer, I enlisted the aid of my old friend the late George Askey of Christchurch who possessed an extensive vintage library. Following some excellent detective work he came up with the fact that the receiver was originally a "Dacoma 5" manufactured by A.J. Dacombe & Co. of Christchurch in 1926. Furthermore he was not aware of any other example of this set still in existence.

THE CHALLENGE WAS ON!!!



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OAMARU—Electrical Supplies Co.
MASTERTON—J. C. Robinson

If we have no Representative in your district write to us direct.

Representatives wanted

(Advert alongside is from Scott's Radio Handbook of Nov. 1927)

FRONT PANEL AND BASEBOARD

A local joiner provided an exact replica of the rimu baseboard to which linseed oil was applied to give the appropriate appearance. As a replacement black bakelite front panel could not be obtained at the time, I approached a local Power Board who could only supply a brown equivalent. A Palmerston North firm cemented a sheet of black laminate to each side of this panel of a shade to match the original. Black laquer was then applied to the visible brown around the edges of the final product, resulting in a composite panel as near as practicable in appearance to that of the original.

TUNING CONDENSERS

With the front panel drilled and attached to the baseboard, assembling of the components could begin. The remains of the three New York Coil Co. tuning condensers had previously been dismantled and cleaned by Don Laing of Eketahuna so I was saved that task. I was unable to locate a fourth New York Coil Co. condenser (to replace the missing one) but an almost identical equivalent proved to be a Gilfillan item. This fourth variable condenser provided capacitive reaction for the detector stage along similar lines to that employed in the five valve Browning Drake.

DIALS

As mentioned previously the original scales were severely affected by water leakage and required a complete replacement. I had an exact type of vernier dial to replace the missing one and laser photocopies of its scale provided replacements for the damaged scales on the remaining dials.

COILS

Complete replacement of the Aerial, RF and Detector coils was necessary due to extensive damage. Bill Farmer in Auckland kindly supplied new 3 inch diameter coil formers and the necessary cotton covered wire for new coils. The remains of the aerial coil confirmed the grid windings to be 60 turns while the primary windings were each wound inside a circular slot in a wooden disc mounted across the top of each coil former. These two wooden disc coil formers and internal windings were still intact.

As the original green shade of cotton covered wire was not available, I resorted to painting the rewound white cotton covered windings with Stevens green ink to preserve the original appearance. Carefully applied with a pencil brush this proved to be a worthwhile solution.

In an effort to offset any inductive coupling between the coils, they had originally been mounted up off the baseboard on bakelite support stays, tilted to an angle at which the coil windings were not in the same plane. This method of mounting unshielded coils was already being employed in some other makes of battery sets.

VALVE SOCKETS & RHEOSTATS

As previously mentioned, sustained water damage had caused the Type 01A bakelite tubular valve sockets to swell considerably causing any 01A to become loose in these sockets. Fitting a brass spacer within the sockets effectively held the valves in their correct position and the soiled sockets responded to an abrasive polish.

As only one of the three filament rheostats were still serviceable, the late George Askey once again came to the rescue with new replacements. The soiled fronts of the rheostat and vernier dial knobs were restored by applying black enamel in a circular motion toward the centre of each with a finger cloth. When properly dry the application of an abrasive cutter restored the original finish. The white indicator arrows on the rheostat knobs were brought to their original appearance with white PVA paint and a very thin pencil brush.

WIRING

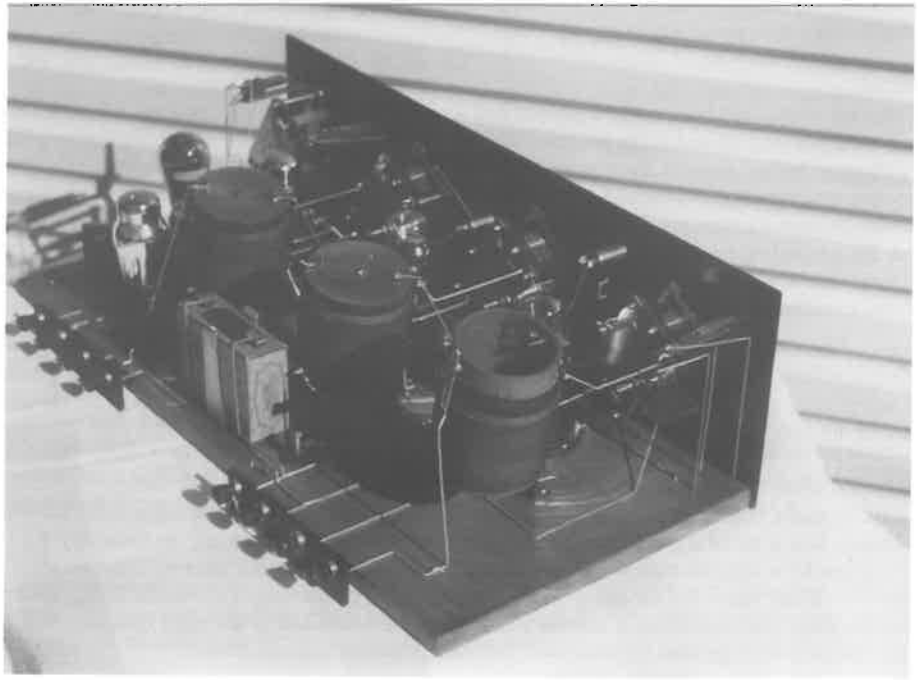
The original wiring had been badly damaged and a portion was completely missing. It was the rigid square wire type and affixed to the baseboard as necessary by very small staples. Care had originally been taken to follow straight lines and right angle bends with this bare wire although almost one metre was now missing. As I could not procure any replacement square wire at the time, it became necessary to manufacture my own using a reel of 60 amp fuse wire obtained from a local Power Board. By unwinding a portion of this wire at a time and very slowly dragging it across the tang of a workshop vice while beating it with a small hammer at each quarter of a turn, I was eventually able to produce sufficient of the missing square wire.

As most of the original midget staples affixing the wiring to the wooden baseboard were either rusty or missing it was necessary to manufacture replacements. Cutting the heads off small panel pins at a very sharp angle and bending them into small staples proved to be an ideal solution. With the aid of a magnifying glass it was easy to verify the position of missing staples.

AUDIO TRANSFORMERS and BIAS BATTERY

It took almost a year to procure two audio transformers of the original dimensions and a substitute bias battery was a bit of a challenge. The original bias battery was obviously an Eveready 4.5 volt held in place by a suitable clamp which was still intact.. As luck would have it, I had an identical battery which had been flat for many years. After carefully removing the outside lining from the battery internals and cementing it around a thin plywood box made to the right dimensions, I was finally able to insert a smaller Eveready 4.5 volt battery within this assembly.

THE COMPLETELY RESTORED "DACOMBA 5" RECEIVER



NEUTRALISING CONDENSERS

One of the Dacoma's two original neutralising condensers had at some stage been uplifted by someone else, necessitating the manufacture of a replacement. These unique type of condensers comprised two separated brass rods within a glass tube over which a sliding brass sleeve was the means of providing a variable capacity. The assembly was supported between two brass terminals mounted on a bakelite strip.

The Glass Blowing Laboratory at Massey University was the only place able to supply me with an exact replica of the original glass tube for my manufacture of the required condenser unit. The black bakelite base supporting the assembly was manufactured from the broken remains of the front panel.

FRONT PANEL LOGO

A screen printing firm in Levin went to some length to reproduce the original "Dacoma 5" logo in its exact colour and style on the new front panel. The wording featured gold lettering within a red frame.

CABINET

Producing a replica of the missing cabinet was the final challenge as the style of the original was unknown. Information eventually came to light that a son of Albert Dacombe was living in retirement on the Kapiti Coast and after making contact with him, I managed to obtain the information I was seeking as to his father's original radio cabinet. Acting on this information, a local joiner supplied a replica of the original robust style of solid oak cabinet..

CONCLUSION

With the correct voltages applied to the restored "Dacoma 5", its overall performance was on a par with the 5 valve "Browning Drake" after which it had been patterned to some degree. The variable grid leak (adjustable from the tront panel) together with the capacitive reaction (adjustable by the fourth tuning dial) allowed good control of the detector sensitivity and neutralising of the two R.F. stages proved to be a smooth operation.

Variable aerial coupling was achieved by manually adjusting the portion of the "Aerial" coil within the "Grid" coil winding of the first R.F. stage. A combination of locking screws and adjustable sliders allowed the Aerial coil to be locked into the correct position.

The photographs on the previous page show the completed receiver following a somewhat demanding but enjoyable restoration. Working into a Ferranti horn speaker, the Dacoma 5 now occupies a prominent position in my collection.

APPENDIX.

Dacombe & Co. became licensed Radio Dealers at 39 Victoria St, Christchurch and first produced the "Dacoma 5" in 1926. They soon had district agents for this set from Oamaru to Masterton, but by 1929 had ceased production due to competition from other commercially produced battery receivers and the new electric sets.

Albert Dacombe later became involved in the successful production of model aeroplane engines.

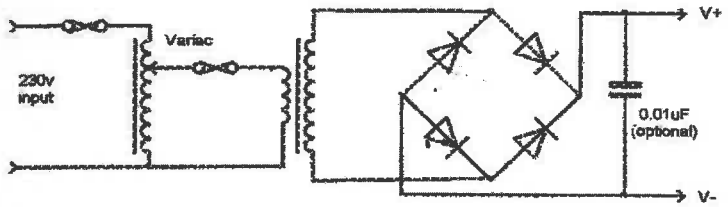


Fig.1 Adjustable power supply using a variable transformer

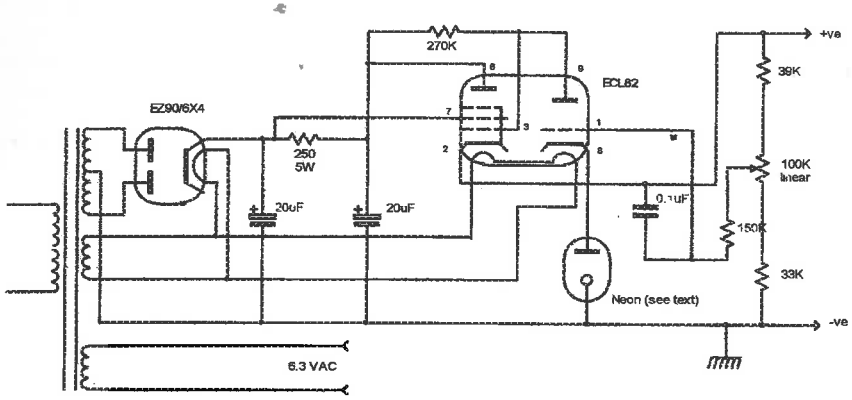


Fig.2 Simple bench power supply for 100 - 300V, 40 mA output

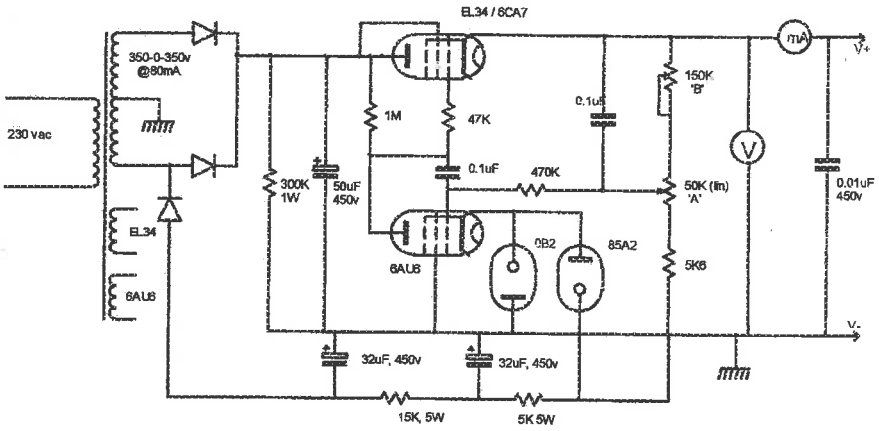


Fig.3 Laboratory power supply for 0 - 350V 50mA output.
Control A adjusts the output voltage while control B sets zero volts when A is fully counter-clockwise

Regulated power supplies for the work bench

Simple, regulated 100-300 volt supplies

John R L Walker, ZL3IB

(This article first appeared in Break-In as part 2 of a series [1] on regulated power supplies)

Nowadays regulated power supplies for low voltages (0-36V) are simple to make with transistors and/or modern IC regulators[2] but solid state PSUs for higher (+100) voltages become much more complicated and beyond the realm of the average home constructor. Sophisticated high voltage, solid-state, regulatable power supplies are available, at a price, and are commonly used in many research laboratories, including my own, for biochemical separations by electrophoresis, etc. However I do a lot of restoration work with valve-type communication receivers and I wanted a simple, and inexpensive adjustable high-voltage power supply unit for my home workshop. The units described below have served my needs admirably.

WARNING; High Voltages are involved in these circuits, take care!!
They could be lethal!!

Possibly the simplest, and a very effective method, of obtaining a variable high, or low, voltage is by using a variable transformer (Variac™) to feed a second transformer whose output is fed into a bridge rectifier as shown in Figure 1. A low value (0.01 μF), high voltage capacitor may be included across the bridge output to suppress voltage spikes. This simple system is still used in some types of 0-2000V laboratory power supply units. .

Regulated outputs up to 400V, at currents from 30-300mA, are readily obtained by using valve regulator circuits and a very simple design is shown in Figure 2. This minimal circuit needs only one ECL82 triode-pentode valve (ex B&W TV). NE-1 can be an 0B2, 85A2, VR105, or an ordinary small neon indicator lamp without its series resistor. In my unit the power transformer is rated at 280-0-280V @60mA and was salvaged from an old valve radio. Electrolytic capacitors should have working voltages at least 25% higher than the DC voltage of the circuit (use 350 or 450 volts DC working types). This unit has proved to be most useful over the past few years; for example I use it to check and revitalise high voltage electrolytic capacitors before installation. *Note of caution; do not be tempted to use the 6.3V winding feeding the filament of the ECL82 for any other purposes, it could be quite a few volts above ground potential!!*

A brief outline of the background theory is as follows[3]. The pentode V_1 functions as a variable resistor whose value is changed by its bias voltage. As the output voltage tends to decrease the grid voltage of V_2 also decreases but its cathode is maintained at a constant positive potential above ground by the neon stabiliser. Consequently, reducing the grid voltage on V_2 is equivalent to increasing the net negative grid-to-cathode voltage so the anode current I_2 will decrease making the anode of V_2 more positive. But, since the grid of V_1 is DC-coupled to the anode of V_2, this will reduce the effective negative bias on the grid of V1 and its anode-to-cathode voltage will decrease, thus tending to restore the output voltage back to its original value. The circuit may be considered as a DC amplifier with negative voltage feedback.

This basic design using a voltage reference plus amplifier plus regulator tube can easily be extended for heavier current loads. Ideally the regulator valve should have a high mutual conductance and low anode impedance and special-purpose valves, such as the 12E1 and 6AS7/6080, were developed for this role. Nevertheless, triode-connected types 6L6, 6Y6, 807 and EL37 can work well here. In days of yore power supply units of this type were used widely to provide regulated screen and bias supplies in higher power amateur transmitters. Circuits can be found in earlier (pre-1980) editions of the ARRL and RSGB Handbooks, etc. A disadvantage of this circuit arrangement is that its output cannot go below about 80-100V.

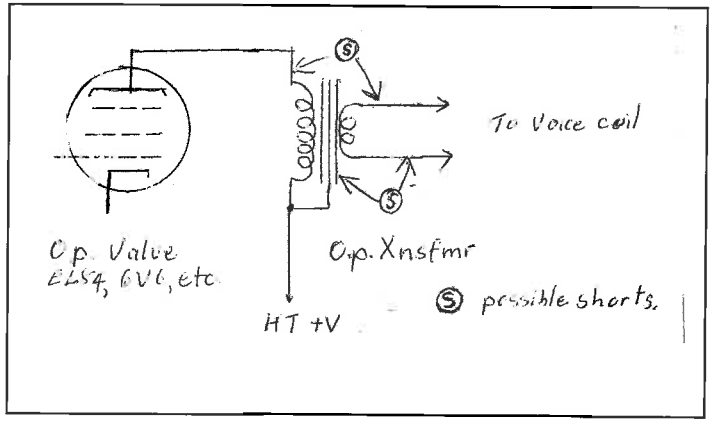
If you need a more sophisticated laboratory power supply unit, able to regulate down to zero volts then you will need to provide an additional negative rail at about -150 to -250V. A circuit for this type of power supply is given in Figure 3 and such a 0-350V, 50mA, unit has served well in my laboratory for many years.

References

1 *Break-In*, p10, June 1997
2 *Break-In*, p8, Aug, 1997
3 Hawker, Pat, G3VA. *Amateur Radio Techniques*, 7th edition, 1980, p245.
4 *RSGB Radio Communication Handbook*, 4th edition, 1968, pp 17.14 - 17.17

A SAFETY HINT

Murray Stevenson



Recently I received a shock off the extension speaker terminals at the rear of a chassis. These terminals were at voice coil impedance but neither side of the low impedance secondary of the output transformer was earthed. The transformer was of the potted (Rola) type and a low resistance had developed between either the primary and secondary of the transformer or between the live core laminations and the secondary.

A high voltage like this on extension speaker leads could be dangerous where the extension speaker is located in a damp room or garage. To ensure that this does not happen make sure that one side of the secondary is earthed at the chassis of the set.

POST OFFICE RADIO DEPOT, HAMILTON - part 2

Ken Graham

The Hamilton Radio Depot service area covered the Coromandel peninsular in the east as far south as the main highway crossing between Matamata and Tauranga. From Matamata south to enclose Tokoroa, down the west side of Lake Taupo to National Park and across to Awakino on the West Coast. In the west from Awakino north to Waikato Heads and across to Thames.

In late 1960 in time for Christmas, which if nothing else, goes to prove that nothing changes, we completed a VHF 48 channel Marconi link between Hamilton and Paeroa. The radio side of this installation was carried out by Ken Graham and the late Bill Palmer, who was on loan from Rotorua. There had been problems with the original direct path due to refraction, the result of using what in reality was a water path. A repeater on Waiti Rd, just a few kilometres north of Tahuna was commissioned with great success. The link became quite literally a mish-mash of bits and pieces with 110Mhz equipment on the path from Hamilton to Waiti Rd. and 80Mhz from Waiti Rd. to Paeroa. Thus 1960 ended on a high note with something in the order of 200 lines direct between Auckland and Wellington in place of 46 and the Paeroa -Waihi area had a much improved service. Previously it was often necessary to book toll calls with an operator up to a day ahead: today the populace would probably revolt at such a procedure.

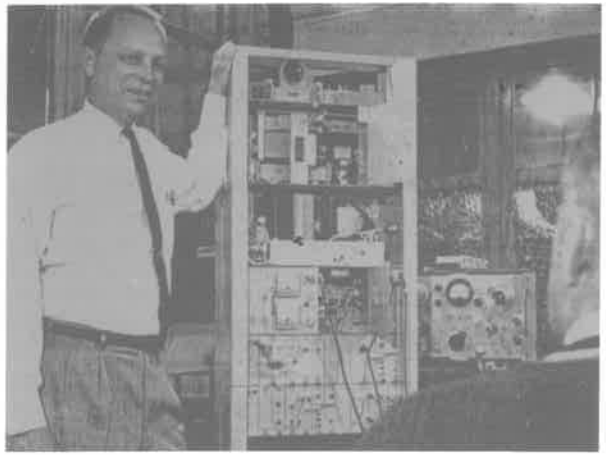
The growth of the VHF radio telephone services was steady and met the needs of the community more than the coffers of the Post Office. The site at Pukemore east of Huntly cost in the vicinity of £50,000 which may or may not seem a lot but when viewed in relation to my salary of £615 per annum at that time - yes, it was most expensive. Then again perhaps people such as I were merely paid a fraction of our worth. One must smile though, for even in the sixties there was talk of disposing of this mobile service.

As with Pukemore, Sanatorium Hill at Cambridge was first established using a standard linesman's bathhouse. This sounds rather exotic with visions of pastel shades for the decor,. gold taps and a plentiful supply of hot water. Such was not the case as these huts were about 2 x 1.5 metres of unlined corrugated iron that were used in old style construction camps when lines staff were working on major projects.

In 1965 the construction of permanent buildings at Sanatorium Hill and Kaimai allowed the replacement of the now overloaded and barely adequate Hamilton - Rotorua 48 channel Marconi radio with a 600 channel system. Following experience with the fully valved Hamilton-New Plymouth-Palmerston North microwave system the Post Office called tenders for a microwave system which was to be as fully transistorized as possible and which was to meet the CCIR standard for transmission performance with full demodulation at each station. Such an approach was considered radical at that time and the fledgling Lenkurt company in USA provided the only tender which complied - with the exception of receiver local oscillator and transmitter output tube the Lenkurt type 76 system was fully solid state. This tender was accepted with the understanding that spare components for card repair would be available to the P.O. for at least the expected 15 year life span.

In addition to the upgrade to Rotorua, provision was also made to upgrade services to Tauranga and thereby the East Coast. The Kaimai site was chosen for its path access to Sanatorium Hill, Tauranga and Mt. Ngongataha. Original planning was for this link to extend via Manawahe south west of

Te Puke to Whakatane but this was eventually dropped in favour of co-axial cable. This was also the last microwave link to use rigid waveguide in the run from equipment to aerial, a move that was looked upon with a certain amount of suspicion at the time but proved to be beneficial on all counts.



Lenkurt Engineer, Alan Walker, conducting a course on the type 76 microwave equipment

Within a short time the microwave network was extended to Auckland via Maungakawa, Hunua and Quins Rd. to Airedale St. and with the completion of the radio link from Palmerston North to Wellington, a backup to the cables Auckland to Hamilton and Palmerston North to Wellington had been achieved. It should be mentioned that STC made the original survey of a link between Auckland and Wellington and considered the central plateau area as being unsuitable as a path for high capacity cable. This took into account the very unstable nature of extensive areas of papa rock and or pumice that are both prone to slippage and erosion when disturbed.

Staff Training

The Depot grew over the years to include the training of staff on a national basis in the operational do's and don't's of Lenkurt equipment both 76 and 778 versions. In 1969 we took over the module repair functions of all Lenkurt Radio from Wellington along with the North Island service of AWA and Philips country sets. In a similar way Hamilton became the North Island depot for the restoration of microwave aerials in the case of emergencies, along with the responsibility to maintain these. In the South Island, Christchurch Radio Depot was responsible.

Bob Meyer, system engineer at Hamilton discusses the proposed system with Jack Skurr, project engineer, and Frank Edkins from Rotorua.

Training

In earlier times travelling was quite literally a pain in the butt. No fancy flights in the sky. Whether the reason for travel was training or to do essential restoration work, *NZ.* Rail was the approved carrier. Schooling for radio techs took place in part of what was the Trentham Army camp that also doubled as a Post Office accommodation centre for many of the department's staff who worked in Wellington. The school instructor was a radio technician attached to Wellington East on a type of secondment. As well it was normal to have a technician of lesser experience as an assistant for many of the schools held. All radio trainees were expected to spend some time at Radio Section headquarters in Wellington East Post Office building where they were moved around between sections as a part of their education. So going to a school meant being handed a return, second-class rail ticket to Wellington. Arriving on the morning the school started it was a mad dash from the express to the Wellington Railway dining room for a quick breakfast then a leap on a unit heading to Trentham before staggering down the road with one's baggage, to the school. According to the instructor we were always late, which, considering the dismal surroundings would have been a bonus. Schools were, in most cases, of six weeks duration and the only escape was to go to Wellington on a Friday night. The mass-produced meals served up at Trentham would never have won any medals so the first thing to do in town was to have a decent meal. After that it was pretty much a wander around the big smoke, grab a couple of books to read over the weekend and head back to Trentham. I would have to say that I must have learnt a few things at Trentham but for the life of me am unable to quote specifics. The cups of coffee and hot buttered toast down at the YMCA were a memorable part of life that did a lot to hold body and soul together. As with most schools there was arguably more value in meeting people from other stations or depots and swapping notes. Then again I never really had a liking for school anyway.

The less formal training was strictly on the job. Over the years many people have expressed amazement at a radio depot having a lathe and welding equipment. This was not unusual as radio technicians were required to be proficient in welding and lathe practice since much of what we serviced was a 'one off' or had been manufactured at Radio Section in Wellington. In other words the whole section was very much a 'stand alone' section of the NZPO. The unfortunate side of this was the feeling held by many other groups that radio people were a pretty strange lot that were not to be trusted. With the advent of Telecom, Radio Section was buried forever and this "U" turn saw the end of radio depots and sadly the farewell of many very capable people.

There was an equipment school set up in Palmerston North in 1960 to train and assist in the repair of STC 600 channel link equipment. Later, training on GTE Morelli-Lenkurt was also at this school. Eventually the old radio schools at Trentham were abandoned in favour of courses run by Technical Institutes.

Demise

Times have changed and as I write the necessity for main-line microwave systems has gone, to be replaced by fibre optic technology that in some ways is inferior as regards interference to service through mechanical damage but is so far ahead in cost per line that comparisons are superfluous. So as I said previously there was a golden age but it has gone forever in the span of 30 years. New-age technology and a management to match have combined to make radio depots a thing of the past and I cannot help but wonder whether we are perhaps the poorer.

The vast majority of radio technicians have left or been forced out of the company because of what they were, in the main an innovative free-thinking group who have no real place in the Telecom of today. As Telecom moves to a goal of centralized fix, expertise is vanishing at an even greater rate spurred on by the race for greater profit. For the customer the future holds great promise of being

able to work from home, never having the need to step outside to be a part of society. This is a product of the high quality, cheap communications now available.

But all good stories are about people and what they achieved and Hamilton Radio Depot is one of these stories. Wally Holland, who retired as District Engineer Hamilton, contributed much in earlier days. His wife was responsible for the trees and garden at Newcastle Road Depot. Wally was the one who always rang to say that he had a visitor and that he would be up in an hour to say hello, recognising that we were all in this together.

Notables

Rex Beechey First Technician, who laid many of the foundation stones and set the seal on the importance of the Depot.

Ron Berry Second Chief, a true diplomat and an excellent technician who instilled very high standards in his staff and should have been here longer than he was.

George Quigg Third Chief, whom his wife said was the most logical person she ever knew. George expected a lot but gave a great deal as well as doing his fair share of rides in the night to far off places. Staff were lucky that George was so respected in the service as he was largely responsible for the radio staff stand-by system that served the department and public so well.

RaJph Fisher Fourth Chief, from New Plymouth, whose main purpose was to keep the ship heading in the right direction.

Ian Borrie Fifth Chief, who came to Hamilton via New Plymouth. Ian took the reins at a very difficult time of change when nobody really knew what to expect with the advent of Telecom. In the end it happened in much the way as staff expected and radio as an entity was at an end, as was the Radio Depot.

Several members of the Hamilton Radio staff have served overseas on secondment and to the best of my knowledge this is the complete list.

A.M.Babbington	Antarctic; Pitcairn Island	E.B.Hurley	Campbell Island, Chathams
R.E.Berry	Western Samoa, Rarotonga	R.A.Joblin	Antarctic
T.M.Bevan	New Hebrides	P.B.Leaper	Campbell Island, Raoul
RaoulR.F.Borrie	Rarotonga	P.Murray	Rarotonga
R.G.Fisher	Rarotonga	J.M.O'Donoghue	Antarctic
A.L.C.Gibbons	Rarotonga	G.L.Lynch	Campbell Island, Chathams
M.RC.Goldsmith	Antarctic	N.S.McGibbon	Fiji
K.H.Graham	Western Samoa	P.S.Purves	Antarctic
C. V.Reeve	Niue Island	A.M.Hardie	Rarotonga
K.E.Hart	New Hebrides, Fiji	R.C.Williams	Chathams, Rarotonga
R.I. Tyler	Niue Island		

Remote Hamilton Radio Sites

To the best of my knowledge the list below accurately shows the out-stations that were the responsibility of the Hamilton Radio Depot. The year denotes the time the station was first used as a revenue earner. As time has gone by most stations have become multi-purpose, so the indication of use I have made, refers to the original justification. Sadly most early records were destroyed upon the demise of the NZPO.

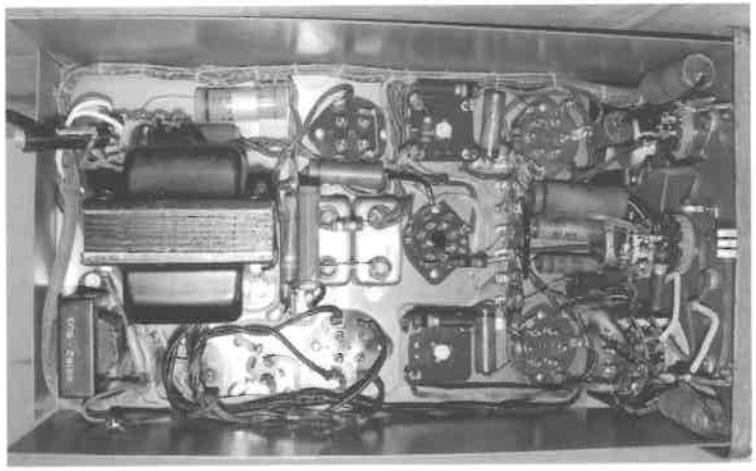
1955	Tower Hill VHF Lake Road Hamilton
1958	Newcastle Rd, Hamilton 48 channel to Rotorua
1959	Bennet St, Paeroa 48 channel to Hamilton, 1959 Microwave in 1973
1960	Eight Mile Junction Te Kuiti microwave, Newcastle Rd. Hamilton microwave Taumatamaire, Awakino microwave, Te Kawa microwave, Waiti Rd., Tahuna 48 channel
1961	Pukemore VHF, Sanatorium Hill VHF
1964	Maungakawa VHF Tin shed special.
1965	Dey St. VHF Trigger Station, Kaimai microwave, Sanatorium Hill, microwave Maungakawa microwave
1971	H.T.C. Cam St. Hamilton V.H.F. trigger
1974	Te Uku VHF Linesmans Tool Box Special
1975	Matangia VHF
1976	Kakatarahe solar powered VHF, Thames coast
1977	Thames 24 channel- Coromandel
1978	Coromandel 24 channel, Whakamaru VHF.
1981	Mount Te Aroha microwave, Waihi exchange microwave
1984	Pukekura microwave, Pukepoto microwave, Ranginui microwave Waimarino microwave, Taumaranui microwave
1985	Coromandel microwave, Kawhia microwave, Omahu microwave, Puriri microwave Raglan microwave, Tairua microwave, Tairua Lookout Microwave, Te Uku microwave, Tokatea microwave
1988	Huntly microwave, Pukemore microwave, Putararu microwave, Tokoroa 24 channel UHF
1989	Ruru microwave T.V.3 Link, Matiere microwave
1990	Karapiro Dam microwave, National Park microwave Cellular Link, Peachgrove Road microwave (Peachgrove-Pukekura- Karapiro)
1992	Nihoniho (Ohura) microwave, Opito Bay microwave Cellular Link, Taumaranui Cell site microwave, Taumaranui Exchange Cellular Link

People will say this or that has been missed out, for example, I have made no mention of the many Multi Access systems. Or for that matter the 96 country set links we were responsible for maintaining. The truth is that it is too much for my typing finger and the point where the Radio Depot died is a little grey anyway. The future was determined by the actions of Telecom in splitting the depot in three directions, namely, Bearers, Logistic Repair and Mobile Radio. And indeed the physical splitting of the Depot also added to the isolation of people, as did the differing working conditions. Many of the services we cared for in the past are now looked after by staff physically closer to the problem which has some merit, but spares and test equipment are now the greatest challenge.

Radio people I know would simply shrug their shoulders and say nobody wanted to know because it costs money. As the longest serving member of the Depot I have many memories of the people who made it all happen. Yes, I helped a few people and will never deny that many helped me as well, for life was very much a team experience. As in all walks of life there were good times and bad, happy and sad, times of real achievement and satisfaction that will remain with those people, for these times were their success.

Above - Interior of RCA Oscillograph. Note the clean simple layout

View under the chassis



Both the above views were taken before any components were changed. Unfortunately these monochrome views do not do justice to the brilliant colouring of the original

The RCA 155 Cathode-Ray Oscillograph

Graeme Lea

This old oscilloscope was acquired some eight or nine years ago and was just put to one side as a potential later project. It was turned on at the time but I was unable to move the image from the lower left area of the screen.

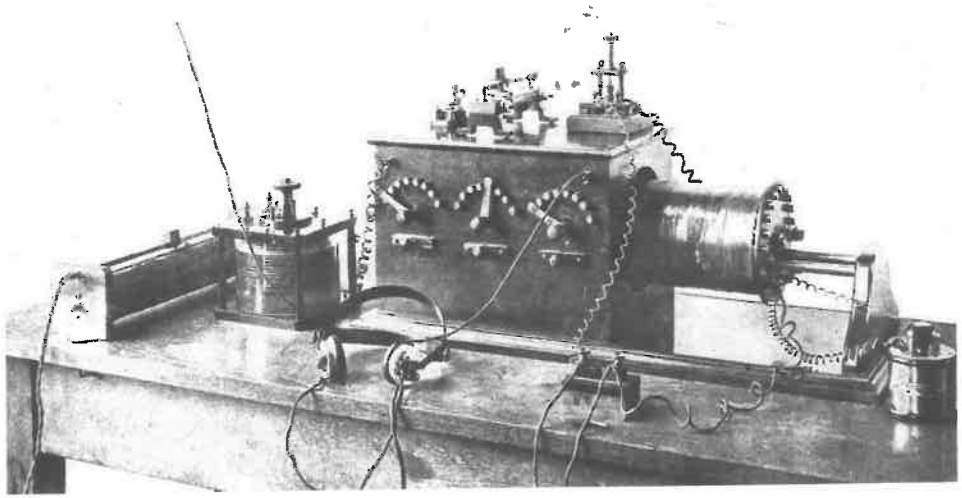
Several things about the unit's condition were noted at the time - namely that the mains lead would need to be replaced with better routing and restraint as well as replacing the broken fuse holder. One positive was that nothing was missing or damaged beyond repair.

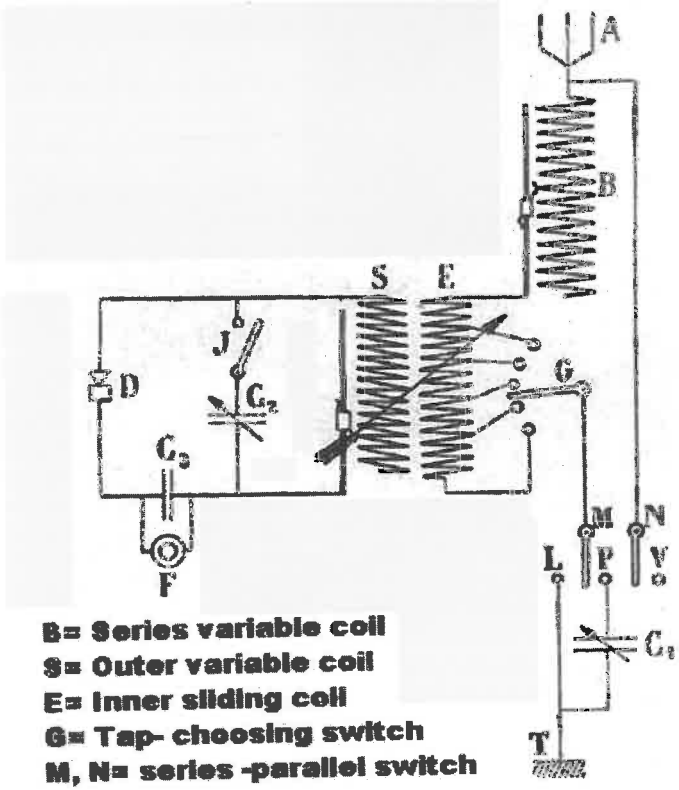
Once I decided to start the project it was obvious that I would need a circuit diagram so that the value of any new components would be correct. A copy of the original manual was obtained from "Manualman" in the USA at minimal cost and this included the required-circuit diagram.

One of the first things undertaken was to clean the front panel and all the 11 knobs. Eight of the knobs came off without any problem but, three were decidedly stubborn and I resorted to soaking the grub screws in some CRC 5-56, which worked a treat. The front panel was given a clean as were the knobs. Rust inhibiter has been applied to all relevant spots and a decision was made not to repaint the cabinet. Just leave all the dings of 70 years there for all to see (and admire).

When the cabinet was removed it was seen that all the chassis (inside & outside) and the inside of the cabinet were painted in a lovely copper colour and then a lacquer of some sort has been applied so that everything looks and is in beautiful original condition. All the paper capacitors have been replaced and several resistors that were way out of spec. have been replaced as well. Finding a suitable replacement fuse-holder proved to be quite a problem as the mounting hole was just 1/2" in diameter whereas most modern ones are about 5/8". It's probably five months since I made up and fitted the new mains lead and since then it has sat on the bench unplugged and untried until yesterday.

Using the variac and with one hand in my pocket, the voltage was gradually increased until at about 180 volts a dull red was seen on the filament of the 6C5. Then over the space of about another 30 minutes the voltage was gradually bought up to around 230 until an image appeared on the screen. With no signal applied to the input terminals the image was of no relevance but I was able to move that image using the horizontal and vertical centering controls as well as adjust the focus by altering the relevant control.





TUNERS AND CALL SIGNS.

Dick Stevenson

When it was established that radio waves could be generated by the discharge of an electrical spark, so forming a means of communication, it was soon found that the operation of one transmitter would interfere with another. A method of tuning or syntony was developed and patented by Oliver Lodge in 1897 and it was discovered to be most efficient if used in both the transmitting and receiving circuits. Marconi converted this into a practical system and the method was adopted by the Royal Navy and by other fixed stations around the world.

It was then believed that the longest wavelengths would penetrate the furthest, so very elaborate tuners were made, sometimes with enough inductance to tune to wavelengths of 25,000 metres or a frequency of 12 kHz! Numerous tappings on the coils were needed to cover such a wide range, obtained by several multi-contact switches.

A receiver during the first few years of the twentieth century would have an enormous tuner of complex construction, leading to a coherer, magnetic or a crystal detector. At the time, RF amplification was not possible, so aerial systems had to be very large, to resonate with the long wavelengths and to pick up as many microvolts as possible. The photograph opposite, from Rupert Stanley's well-known book, shows just such a complex and sizeable tuner leading to a small perikon (two crystal) detector on top. A description reads "The primary is 8 inches in diameter and $8^1/_2$ inches long, and wound with gauge 20 wire; the secondary is 8 inches long and 6 inches in diameter, wound with 26 gauge wire and sliding on brass rails into the primary." This tuner apparently covered up to about a wavelength of 3,000 metres and in order to receive the then British station at Clifden in the west of Ireland (on 5500 metres), an extra inductance had to be added and the tuning condenser changed to 0.008 mfd!

Call-signs for stations, if used at all, were at first chosen by personal whim, but in Berlin in 1906 there was an International Wireless Telegraphy Convention which assigned the first official letter combinations. European countries did well out of these allocations, especially Britain and its possessions which was given a lavish 16 codes. After 1918 certain countries disappeared, like Austria-Hungary, while the growing empire of the USSR absorbed many hitherto independent countries in Eastern Europe and Asia.

Although domestic and world-wide broadcasting used many of these call-signs at first, (four letter calls starting with **W** or **K** are still used in broadcasting in the USA), the tendency has been to name the country, like the BBC, VOA, Radio Australia, Radio New Zealand and All India Radio. It has been left mainly to the radio amateurs to preserve the call-signs, although their greatly increasing numbers have forced many changes to the system. Today, allocations are in charge of the Geneva based ITU (International Telecommunication Union).

Originally amateurs used a number, often referring to their local geographical region, plus some letters, but intercontinental working soon made country prefixes necessary. At first there was **A** = Australia, **B** = Belgium. **C** = Canada etc. but this was rapidly inadequate and "intermediate prefixes" were used for a few years. These were lower case and tended to be grouped by continents, i.e. **N** = North America, so **NU** = USA, and **NC** = Canada. Europe was **E**, giving **EG** for Great Britain and **EF** for France. Down this way, **0** = Oceania, so Australia was **OA** and New Zealand was **OZ** !

Amateurs were sometimes early broadcasters, so the first stations were also known by a number plus two letters such as in Britain with 2LO for London and 5IT for Birmingham. These numbers had no geographical meaning. The same system was used in New Zealand, but the numbers were

related to the four main centres, giving for example such stations as 1YA, 2ZB, 3ZR and 4YO. Nevertheless by 1928, amateurs finally adopted the original country call-signs, or at least the first two letters, but kept their numbers and following letters.

In 1906, the British Empire was given **B, CA, CO, EI, G, LS, M, OA, OC, VP, VT, VY, XE, XT, Y** and **Z**, but after the independence of most of its possessions, Britain was left with **G, M, ZB, ZN, ZQ** and gained the number 2. Amateurs in Britain, used **G** + a number + letters for many years, so it was quite a change when the **G** + numbers prefix ran out and a new letter, **M**, had to be adopted during the last decade. The number 2 is now used in Britain as a prefix for novice operators and has attracted many keen young amateurs.

New Zealand was originally given **VL** and **VM**, but the present call-sign **ZL** + a geographical number is lasting well with our smaller population. In the USA the enormous number of amateurs soon exhausted **W** and **K** and a second letter was added. In addition they have been allocated **AA** to **AL** while the letter **N**, at first used for government stations is now also used by amateurs.

References:

'Textbook on Wireless Telegraphy" by Rupert Stanley, 1914.
"L'Amateur de T. S. F." by Joseph Roussel, 1922.

An American farmer, about 1921, tunes his crystal set to obtain the latest commodity prices. An indication of the usefulness and entertainment that could be received at the beginning of broadcasting

HALVING THE ZC1 !!

Don Beswick

Occasionally one finds at a ham junk sale a ZC1 transceiver in which the transmitter has been butchered, even to the extent of having had part of the chassis cut away, but with a receiver section that is still restorable. One option is to dismantle it completely for parts, whereas this project makes use of the receiver while discarding what is left of the transmitter and power supply. Although a licence is required to put a ZCI transmitter on the air, a ZC $^1/_2$ is quite suitable for those without licences who want a mains operated 80 metre and 40 metre receiver.

CONVERSION OF ZCl TO ZC $^1/_2$

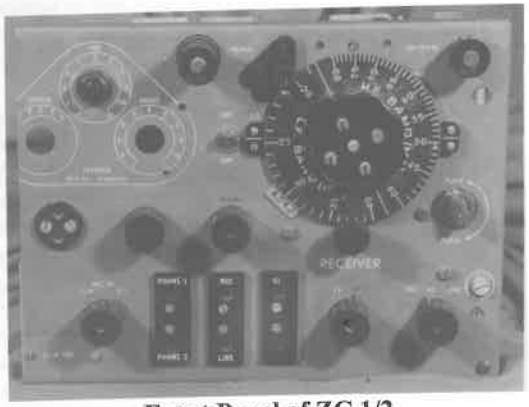
The basic aim is to leave intact as much of the receiver as possible while discarding all of the wiring and metalwork of the transmitter and vibrator power supply. The point where the chassis and panel were cut was chosen to give a straight vertical edge on the left hand side of the panel, i.e. without cutting across any holes on the front panel, and to make the resulting chassis area just large enough to accommodate a 60mA power transformer, rectifier valve, and speaker transformer. The only cosmetic changes to the right hand half of the front panel are that the CRASH LIMITER switch becomes a MAINS ON/OFF switch and the NET-NORMAL-REMOTE switch is removed, then the REC. VOLUME control is transferred to this position. After the cutting operation the left side of the chassis will be open and will have the wiring exposed, but the partition originally separating the power supply and transmitter sections can be removed from the discarded section of the chassis and fitted to the left side of the ZC$^1/_2$ chassis. Careful drilling is required with a pilot drill because the flanges on the partition are only narrow. The original filter choke (or the modulation choke, which has more inductance) is mounted on ZC1 standoff pillars on the inside of this partition. The two lugs on the choke should have their excess length cut off, and a strip of paxolin should be placed under the choke to prevent the lugs touching the metalwork.

The power supply in the prototype was a 280V aside 60mA power transformer, and this transformer together with the rectifier valve (6X5GT) and output transformer were mounted on the chassis. The centre tap of the secondary, i.e. the HT negative, is not earthed but goes to earth through 390 ohms in series with 47 ohms and is bypassed with a 47uF @ 50 Volt electrolytic. This gives two back-bias voltages of about -25V and -2.5V which correspond to the voltages across the volume control when used as an RF gain control in the MCW and CW positions. In the RT position it is connected as a standard audio volume control. All of the valve heaters are rewired for 6V operation, and since the heaters were in series-parallel across 12 V then one side of some valve heaters were already earthed. The output valve is a 6V6GT with cathode bias (330ohms) and uses the socket formerly used by the 6U7G output valve. The output of the speaker transformer can be fed to either the LINE socket or the two PHONE sockets on the front panel.

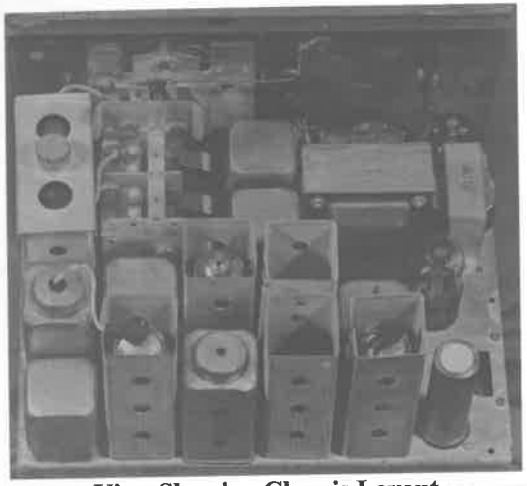
THE CONVERSION PROCESS:

1. Disconnect and remove the vibrator power supply, filter choke, electrolytic can capacitor with its paxolin mounting plate, wiring and tagstrips from the original chassis. .

2. Remove the transmitter tuning dial, remove the two rods which support the side plates at the top, remove the keying relay, then disconnect and remove the exciter unit. (Don't throw it away - you might wake up in the middle of the night and need to generate some RF).



Front Panel of ZC 1/2



View Showing Chassis Layout

LINE socket. Remove the 0.02uF capacitor from behind the MIC-LINE socket. Remove the microphone feed from the CW-MCW-RT switch. The volume control is fitted in place of the NET-NORMAL-REMOTE switch.

8. Remove headphone transformer and crash limiter rectifier, also modulation choke and metal side plates which enclosed the exciter unit. The crash limiter switch becomes the mains switch, and the wires should be sleeved at the solder lugs.

At right:Under chassis view showing filter choke mounted on partition

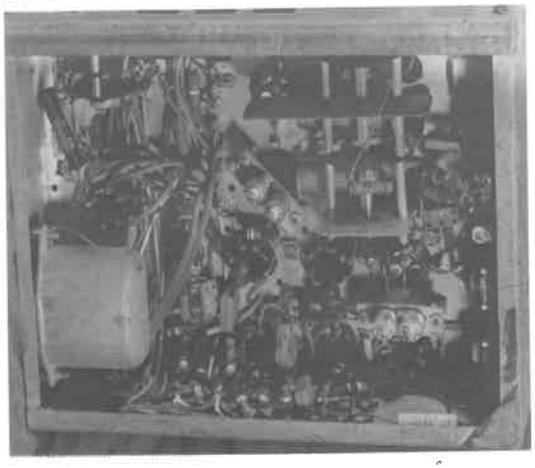
3. Remove the aerial loading coil and associated leads, also the tagstrip below it which carried a 25uF electrolytic.

4. Remove the aerial changeover relay and associated wiring.

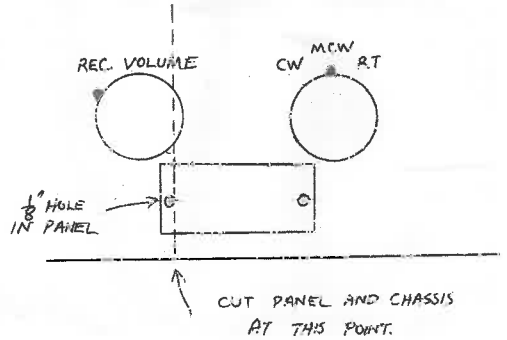
5. Remove the final tank coils, associated wiring and tagstrips.

6. Remove the wiring of modulator valve, RF output valve and speech amplifier, including the 20 ohm wirewound resistor in series with its heater (R21A). The speech amplifier socket can be left in the chassis and used to hold a spare valve (to preserve the original appearance), while the modulator valve socket will be used for the rectifier valve. Remove the long rod which passes along the inside of the right hand side of the chassis. This gives more access to the sockets of VIA and VIB (6U7G and 6K8GT) and the microphone transformer at the right rear of the chassis. Disconnect the microphone transformer. It can be left in position to fill up the hole in the chassis, and the wires can be cut back to the harness if it is still intact.

7. Disconnect and remove the NET-NORMAL-REMOTE switch and remove the 200 ohm and 1000 ohm resistors and single lug tagstrip from behind the MIC-



9. By this time the left hand side of the chassis should be stripped bare and the wiring loom can be held out of the way. At this point the front panel and chassis can be cut with a hacksaw. Use a square for marking out, and cut as shown on the diagram. You will need to cut from top and bottom of the panel and from front and back of the main chassis. As an alternative, you can remove the front panel completely and cut it separately. Although it takes additional effort to remove, it makes the cutting job much easier and there is less risk of the hacksaw blade going off course during the cut. (I have tried both ways and the second method is definitely easier from the metalwork point of view). File off any rough edges and fit the partition at the left side of the chassis.

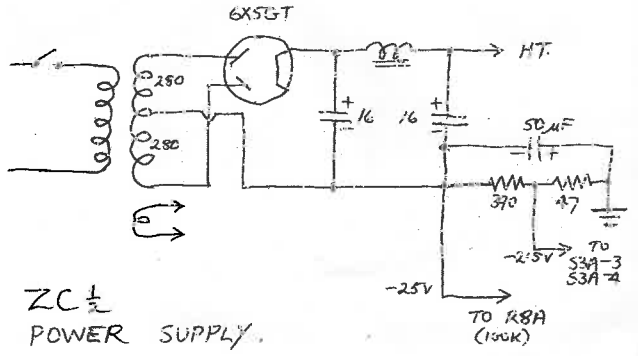


10. If the heater wiring is intact, then the valve heaters can be rewired as follows:
V2A (6K8GT) Remove wire from pin 7 and transfer to pin 2 (6V heater interconnection). Connect pin 7 to earth.
VIB (6U7G IF Amp) Remove wire from pin 2 and transfer to pin 7 (6V heater interconnection). Connect pin 2 to earth.
V1C (6V6GT output) - originally 6U7G output - Remove wire from pin 2 and transfer to pin 7 (6V heater interconnection). Connect pin 2 to earth.

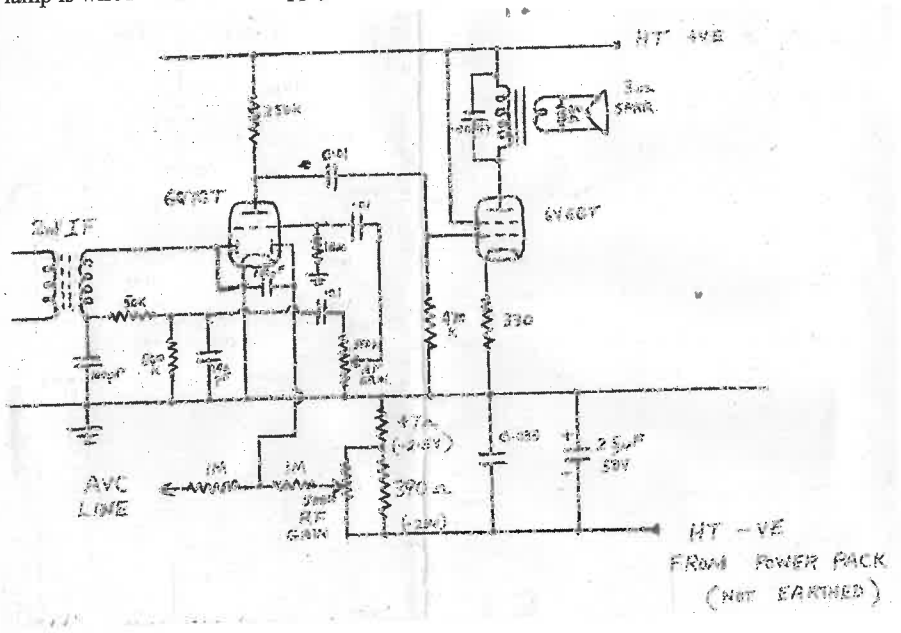
11. The cathodes and suppressor grids of the RF and IF valves are connected to earth so that C6A and CI4A are no longer required. They can be replaced by wire links, although it is neater to run earth wires directly to the sockets.

12. One end of the 10 Megohm grid resistor for the 6Q7GT is now connected to earth. There is an earth lug near one end of the tagstrip.

13. Fit and wire up a 60mA power transformer, 280 Volts aside, or similar. Fit and wire up the output transformer (speaker transformer). Fit a paxolin mounting plate and dual electrolytic can in the hole next to the BFO valve. The original electrolytic (of WW11 vintage) should be discarded. The HT negative goes to the single lug tagstrip behind the CW-MCW-RT switch and from this lug connect a 390 ohm 5 watt resistor in series with 47 ohms to earth. The series pair should be bypassed with a 47 uF electrolytic. The resistors in series with the BFO control R6B(220K) and R8C (100K) are mounted under the chassis.



A tagstrip is required for anchoring the power flex and looping to the mains switch then connecting the other end of the transformer primary. Drill a hole at the left rear edge of the chassis for the power cord, 3/8 of an inch or metric equivalent. A large panel lamp can be fitted in one of the holes formerly associated with the aerial tuner. The top hole (FINE tuning) is the most convenient. The panel lamp is wired to the heater supply.



MODIFICATIONS TO THE DETECTOR CIRCUIT

The CW-MCW-RT switch (not shown above) connects the 500k volume control into the circuit as either an AF gain control or an RF gain control in the positions shown

CONCLUSION

In use the operating voltages should be similar to those in. the original receiver, and when operated the ZC $^1/_2$ has the same feel as the original ZC 1.

This project has been carried out twice, quite a few years ago, and the first effort was shown to some of the Wellington amateurs. They just shook their heads and one of them said "ZC half yair - and only Don Beswick would do a thing like that."!

Reprinted with acknowledgement to the Wellington Vintage Radio Notes of June this year and to PRACTICAL WIRELESS of November 1962 (following the introduction of FM in UK).

VINTAGE MODEL OR FM TUNER?

E Dexter

The writer has followed the lively discussion regarding "Vintage Models" in the past months with considerable interest. Having a considerable practical and theoretical experience on this subject, it is felt desirable to add a finalising word to this interesting discussion.

What is Good Tone ?

There can be only one real criterion for good tone, and that is to obtain reproduction as close to the original as possible.

The person taking this question at all seriously should therefore first of all visit (a) an opera, (b) a symphony concert and (c) a jazz concert, and listen very carefully and very critically to the general frequency balances, and tonal pictures involved in reality. He will notice several things then apart from the condition for distortion-free reproduction, which are all too often forgotten in the design of electronic music-reproduction installations. The two most important of these are the reverberation - its time and its frequency-selection, i.e. the 'acoustics' of the listening room and the geometric dimensions of the sound source, which are normally very large in any concert orchestra, etc., and *some attempt* must be made to imitate these dimensions in the home-installation if lifelike reproduction is required. Thus at least two loudspeakers are needed, well separated from each other- preferably at least two yards apart. 'If those are fed with stereo-signals in the conventional way, so much the better, but this is by no means essential, as surprisingly great improvements result from proper use of a normal "mono" signal in such an arrangement - and present-day radio programmes are still "mono" anyway!

Acoustic Influence.

The dimensions of most domestic rooms being quite small, and the reverberation of these selecting very often the higher frequencies (with average surfaces, furnishings, etc.), the result of operating an amplifier with true balanced bass and treble response, such as is possible only from modern FM transmission, easily leads to the accumulation of considerable treble-energy as standing-waves, etc., in the room, leading to "screeching" in' the ears of the listener, which is naturally unpleasant. Furthermore, such conditions can even overload the human ear, giving crossmodulation products of bass and treble within the ear, which are felt as real distortion.

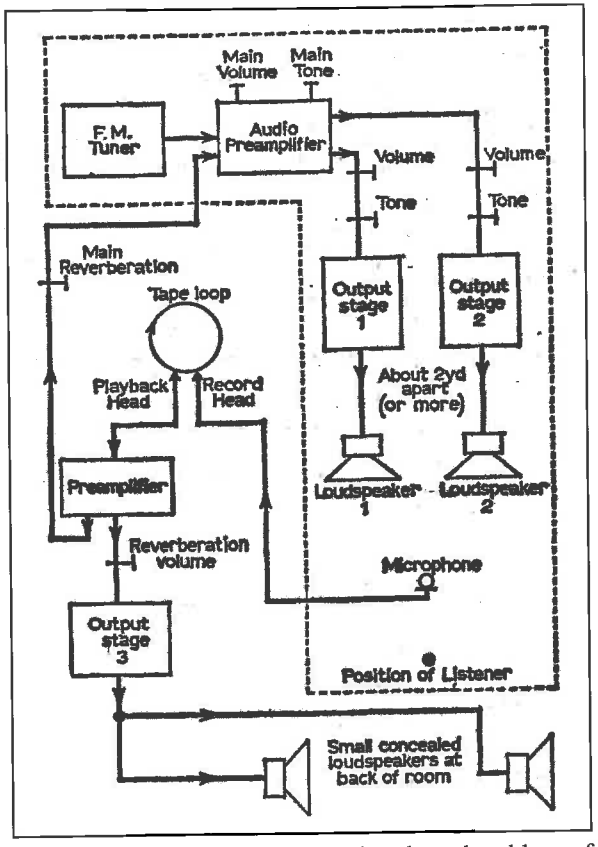
On account of these facts, an old vintage set giving ample bass response, and virtually no treble (because such "sets are generally fully incapable of real treble response, AM transmissions not containing such anyway, for reasons already explained by other writers) *naturally sounds far more pleasant* in such domestic rooms than a poorly-installed and acoustically mismatched, but otherwise superb VHF FM hi-fi installation. In this sense, the writer fully agrees with the vintage model supporters, though he nevertheless feels they are missing something! There is a world of difference between a "'pleasant" tone and "good" tone in the sense defined above. "Good" tone is naturally pleasant, but "pleasant" tone need not be "good" in all cases. Those vintage-model owners who do not believe this should make a comparison between a live concert in the concert hall and the reproduction of the same or a similar transmission on their sets. Both will sound pleasant, but the. live performance will certainly give the better enjoyment and make the vintage model owner think and wonder whether his set really is the best possible after all

Geometric-Dimensional Improvements In Domestic Rooms.

If full-frequency range reproduction in a domestic room is to sound natural, i.e. a balanced natural reproduction of all frequencies from about 30c/s to at least 15kc/s, the geometric size of the sound source *must* be increased, to avoid danger of the screeching-effect already mentioned, which invariably sends the owner running to turn down the treble-control, or to condemn the set!

The simplest, cheapest and most effective method discovered and used by the writer is to give his audio amplifier two identical but fully separate output stages. These are fed from a common pre-amplifier stage or stages, with the tone controls and volume controls, an independent set of controls for each output stage, between this pre-amp and the respective output stages.

The one output stage feeds a good loudspeaker, as large as possible, in the cabinet of the set and the other output stage feeds a good large extension loudspeaker at least two yards away in the same room. Positioning the loudspeakers as for stereo, relative to the listener, gives very good results. Volume controls and tone controls for the two channels are individually adjusted for 'the best "apparent size" of the sound-source, maximum brilliance, and general best acoustic match to the qualities of the room. Both loudspeakers should handle all frequencies to some extent, but the one should be. a little stronger on bass, and the other a little stronger on treble, which tends to give the impression of separation in space between various of musical instruments. Performance is certainly not identical to the concert-hall and also certainly not equal to true stereo, yet it is *a vast* improvement, on a simple one-speaker install1ation and is probably essential in that it represents the bare minimum of extra equipment necessary to make proper use of VHF FM, doing justice to such transmissions.



Reverberation

There are various methods open to the experimenter to increase the reverberation of his listening room, to imitate the concert hall to a small extent. The best is the use of electrodynamic torsional transducer elements within his amplifier, a recent development just coming on to the market. Another method capable of success if carefully dimensioned is to use a microphone situated within the listening room, feeding its output into the same amplifier at a level below that causing self-oscillation over the resulting acoustic loop. The quality of this method is improved if the signal picked up by the microphone is fed to a tape-recorder head situated close to a playback-head, a short closed loop of tape running continuously between the two heads. The signal from the playback-head is then fed at, a suitable small level back into the main amplifier. The reverberation time-constant is set by altering the separation of the record and playback heads, the tape-loop speed, or both. Note that *very small* reverberation effects are fully sufficient. Particular caution is needed not to overdo the matter in time or intensity, as otherwise ringing signals result. A stage further is the addition of another amplifier channel for the delayed signal from the playback head, so that apart from feeding this into the main amplifier it can, at the same time, be fed *alone* to some additional small loudspeakers *concealed (*psychologically important); Listeners must not be able to see these further loudspeakers) at the rear of the room behind the listeners.

Note that, although this arrangement may sound complicated, it in fact uses very straightforward and inexpensive items, which can all be home-built at a most reasonable cost by the handy experimenter. The many volume and tone controls can in fact be pre-sets within the cabinet of the amplifier, and all amplifier channels included in the one cabinet. As external controls need only appear *combined* volume and tone controls, and possibly a reverberation-intensity control. Even the two-head tape-loop transducer can be built permanently into the cabinet, as it does not normally need further attention.

Psychological Factor.

It must be remembered that such an installation will give a tone quality which is already *extremely* lifelike, especially in spatial dimensions. It will overpower the listener, *demanding* his attention. This is, of course, exactly what one desires when listening properly to music, yet can prove irritating if one is not really intending to listen, but just want a "background-din" for what one is otherwise doing. In that case, the vintage-receiver type of tone again scores and is to be recommended. It is primarily a brilliant natural treble response coupled with adequate bass-balance, which psychologically demands our attention. Bass alone does not share this property, and thus strong bass lift together with strong treble-cut (vintage-model tone) does not force us to listen - one can even carry on a conversation with other listeners at the same time! Maybe some vintage-set owners like this facility, preferring such social possibilities to intensive music-enjoyment. That is a matter of personal taste.

A further example bearing out this point is afforded by the jukeboxes appearing at so many public places of entertainment. These invariably boom bass, and cut treble, even though "hi-fi" may be written on them in large letters! This is "vintage-model" tone, not hi-fi and is of course essentia1 in such places of public entertainment, for true hi-fi would render all other activities impossible, the, sounds demanding the full attention of the listener.

Resonances

A final point to be touched on briefly is the question of loudspeaker and cabinet resonances, The cabinet must be properly designed acoustically and the loudspeaker resonances should be damped out by using output stages with exceedingly low output impedances reflected across the loudspeaker. Using special transistor-circuits it is possible to get high power at high power-efficiency into ordinary speakers yet having output impedances ten times lower than the speaker impedance. This effectively short-circuits the loudspeaker as far as any signals not present in the electrical input are concerned. It should be possible with such output stages. to make the bass strong yet crisp and clear, free of all 'hooting', 'thumping' and resonances.

The writer then goes on to discuss the effects of misalignment on audio distortion in AM and FM receivers concluding that a misaligned FM set can give severe audio distortion whereas AM sets do not suffer from this problem. Thus, he considers that the tone of vintage receivers is likely to be considerably better , taken as a whole, than an incorrectly operated VHF FM installation - Ed.

ITEMS AVAILABLE TO NZ MEMBERS

Please make out cheques to New Zealand Vintage Radio Society

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

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

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

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

Capacitors - a large range is available - see http:www.nzvrs.pl.net

Fahnestock clips 50c each, 11 for $6.00 posted

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

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

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

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

Residual Current Detectors $15 + $5 ,P&P

Books:
Tube Lore,
Swift and Sure
Outback Radio, From Flynn to Satellite
Gentlemen on Imperial Service
The Taming of Distance,
Golden Age of Radio in the Home,
More Golden Age of Radio in the Home,
See http://www.nzvrs.pl.net or enquire direct for price and availability

MARKETPLACE

Advertisements for the next issue must reach the editor by the 13th Jan. 2007. 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

Plain unprinted valve cartons - Small and GT $12 per 100, Medium, $15 per 100, Large $25 per 100. All plus postage. Any amount supplied. (regrettably, owing to changes in my work contacts I have had to raise my prices - I thank all those who have supported me in the past and hope that this will continue) Paul Burt, 44 Hasting St West, Christchurch 8002. Ph 03/9607158, Fax 03/9814016.
Email dawn.lloyd@paradise.net.nz

Q Meter - Dawe Instruments of London. Valve model in metal cabinet, frequency range - 50kHz to 50 MHz, Capacity - 30pF to 450 pF. Very rare, offers.
Barlow-Wadley XCR-30 receiver, 0 - 30 MHz with instructions and circuit - $150.
Trevor McDonald, 50 Tirimoana Rd, Te Atatu, Auckland. 09/8362023.

Due to pressure on shack space I wish to dispose of some of my collection of valve receivers. Available for sale are: BC348, Canadian Army R103, Hallicrafters WR600, National SW-54, and NC-121, Trio JR300S/Lafayette HA350, Heathkit (UK) RG-1. John Walker, Ph 03/3489084 or email zl3ib@nzart.org.nz for more details.

WANTED

Two HiFi Beacon output transformers (+/- 1dB from 20 Hz to 20 kHz - working or not). Required to practice my winding skills on. Andrew Parsons, 70B Palmerston St, Hamilton. Ph 07/8382259. email Andrewp@ihug.co.nz

BC348J, N or Q model, WW-II aircraft receiver for restoration, also a BC-348 28V dynamotor for same. Stu, F3/15 Gebbies Road, Taradale Napier 4112. email stustid@paradise.net.nz Ph 06/8445591.

Circuit Diagram for Ekco model U153 receiver. Dave Dawber, 5A Mules St, Stoke, Nelson. Ph. 03/5472549. email ddawber@paradise.net.nz

Radio Corp of NZ Columbus model 35 receiver - model with RF front end and magic eye, restored or otherwise even spare parts and service data. Contact Peter Lee, Ph. 09/8189128 or email family.lee@xtra.co.nz

Circuit schematic/s for Sharp VZ-3000 radiogram with vertical playing record player also any service data, block diagrams etc. Reg Motion, 2A Hazel Terrace, Tauranga 3110. Ph. 07/5768733, email regmotion@xtra.co.nz

Membership

Occasionally, I get asked by friends "How do I become a member". Often, I do not have an application form available so, in case, you have the same difficulty, I have made a reduced copy of the form for your use (See back page of this issue).

Editor

FROM THE LIBRARY

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

960 Codes used in the Coast-Watchers. With explanations and tables. HRSA October 2005, p14

970 A 2 Volt Battery for Farm Radios. Using a specially built regulator to reduce 3 volt from rechargeable D cells to 2 volts, circuit, description and photos. HRSA October 2005, p19

971 Creating Replacement Control Knobs. Methods of making moulds for knobs and casting compounds to use. Radio Bygones Oct/Nov 2005, p10

972 Bearley Radio Receiving Station. Description with photos. Radio Bygones Oct/Nov 2005, p16

973 Quad 405 Solid-state Amplifier. Description, photos, schematic, servicing tips. Radio Bygones Oct/Nov 2005, p21

974 Receiver type R1545. description, circuit diagram, photos. Radio Bygones Oct/Nov 2005, p26

975 Eddystone at Sea. Eddystone 670 and 870 described with photos. Radio Bygones Christmas 2005, p3

976 The Marconi CR100 HF Communications Receiver. Description, photos, schematics, alignment procedures, performance figures. Radio Bygones Christmas 2005, p8