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765 Craggy Criggion Crumbles. History of a British VLF station for communication with submarines. Photos, descriptions. Radio Bygones, No.85 Oct/Nov 2003 p18

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768 Restoring the Philips AC QP 2515. Valve socket diagrams and other details. Wellington Newsletter Oct. 2003. p3

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770 Notes on Stringing Dial Cords. Wellington Newsletter Nov 2003. p 6

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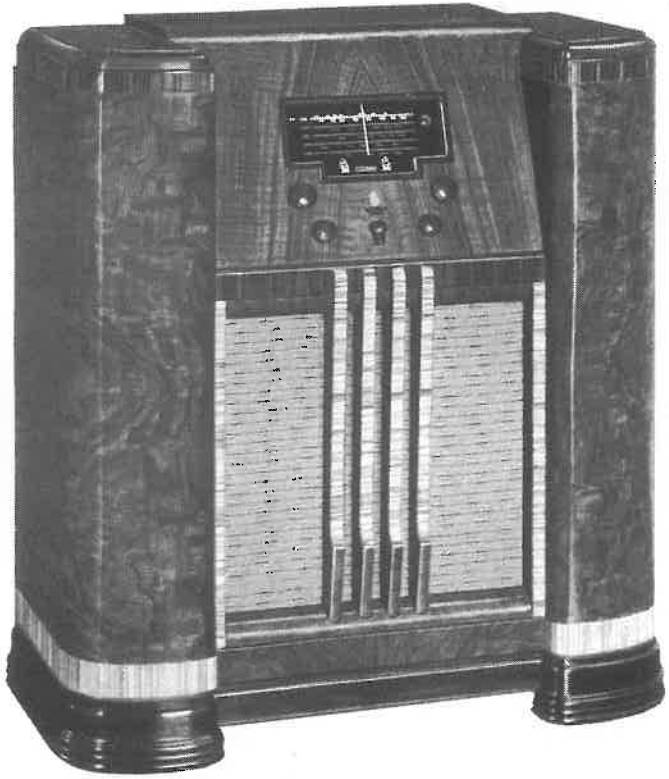
NEW ZEALAND VINTAGE RADIO SOCIETY INC.

Vol 25 No. 2 **May 2004**



COLUMBUS MODEL 75XA

(bandspread)

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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Web site - http://www.nzvrs.pl.net email address office@nzvrs.pl.net

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

SECRETARY: Paul Woodcock, 2 Levy Rd, Glen Eden, Auckland. Ph 09-818 4740.
Email: paul.woodcock@opus.co.nz
General correspondence, requests for purchase of books, badges and power cable are handled by the Secretary.

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FROM THE EDITOR

With Winter fast approaching it is time to think of projects to fill those long dark evenings. Perhaps a restoration of that classic receiver which has gathered dust in the corner for so long or a construction project which has been on the cards for some time may get started (even finished). Whatever, have an absorbing time and remember, high voltages lie within valved devices - we need our members!.

This issue contains some reading of the past together with an excellent project which will bring that valved battery portable back to life again. Radio Corp's claim of a world first is re-examined, the furore produced over "B" class stations in the 1930s is covered in picturesque language, Ian Sangster gives us a view of a little-known receiver, Dick Stevenson describes an early valve design and John Walker continues his series on his radio collection

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Stewart F	Australia
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ERNST ALEXANDERSON'S MASTERPIECE

S.K.Wallace

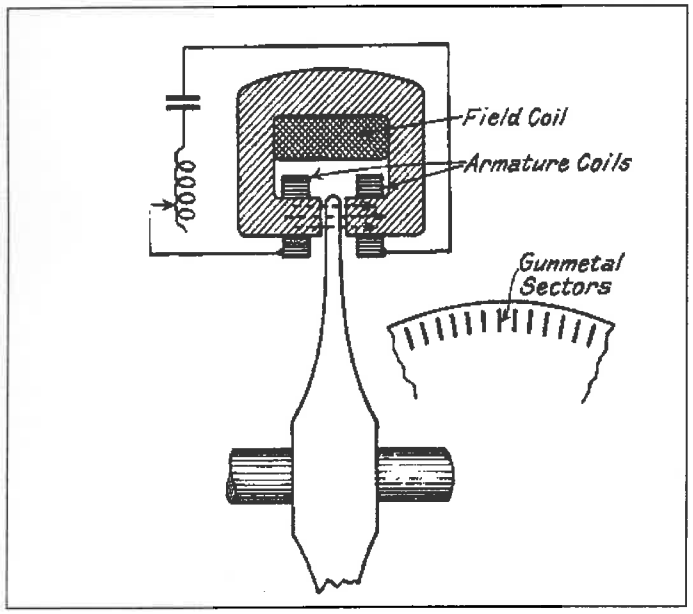
THE ALEXANDERSON ALTERNATOR

At the heart of Grimeton transmitting station , Sweden , is the Alexanderson Alternator , commissioned in 1924. It was one of twenty built by General Electric USA. Nearly eighty years later it is the last of its kind

In near perfect condition and full working order, this 500kW alternator produces a frequency of 16.7 kHz which is fed to a massive aerial system.

How does this electro-mechanical masterpiece work?

The frequency of an alternator is the product of rotation speed multiplied by pole pair number, so a high frequency alternator must run at a high speed and have a large number of pole pairs. The Alexanderson Alternator is an induction machine. Unlike conventional alternators, its rotor carries no coils, but is a thin metal disc with alternating sectors of iron and non-ferrous gun-metal . This type of rotor has a relatively low mass and wind resistance , so it can be driven at high speed by an electric motor. The diagram shows a coil assembly and rotor of the alternator. Field and armature coils are mounted on an iron yoke. The coil assemblies are arranged in a circle around the rotor . The magnetic flux produced by the field coils flows across the gap in the yoke, as indicated by the arrows. The magnetic field is stronger when iron is in the gap and weaker when the gunmetal is present. This produces a continually changing magnetic field , inducing alternating current into the armature coils. The transmitter is keyed for wireless telegraphy by interrupting the field coil power supply .



Sources:
NZVRS Bulletin. February 1998
Grimeton Web Site grimeton-radio@telia.se
Modern Radio Communication – J.H.Reyner -1940 - Pitman & Sons

RADIO CORP and the Claim of a "World First"

Reg Motion

While shortwave broadcasting is still popular around the world, today there are few listeners in the developed countries and the shortwave band is notable for its absence in modern radios of the popular type. Back in the 1930s and 40s, however, such listening was not only a novelty but also a valuable source of news independent of local press control, consequently few radios in the medium to high price range lacked a shortwave band or bands.

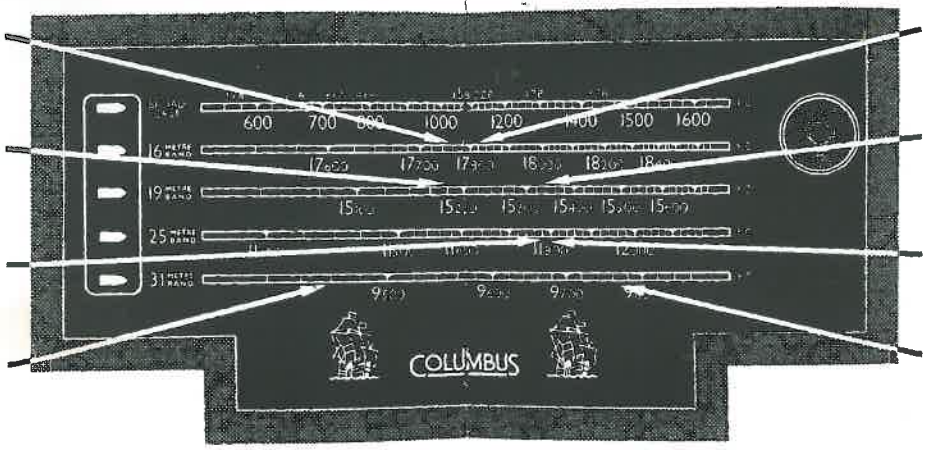
Tuning these radios on shortwave was a tricky business. Finding a particular station from its known frequency was impossible as each shortwave broadcast band occupied little more than about 2% of the total dial spread and holding a station once found required frequent retuning to compensate for the inevitable drift with temperature changes as the set warmed up,

Spreading the band by limiting the tuning range was a well-known technique in communications receivers but economical ways of doing this and achieving the necessary high frequency stability had precluded its use in popular radios.

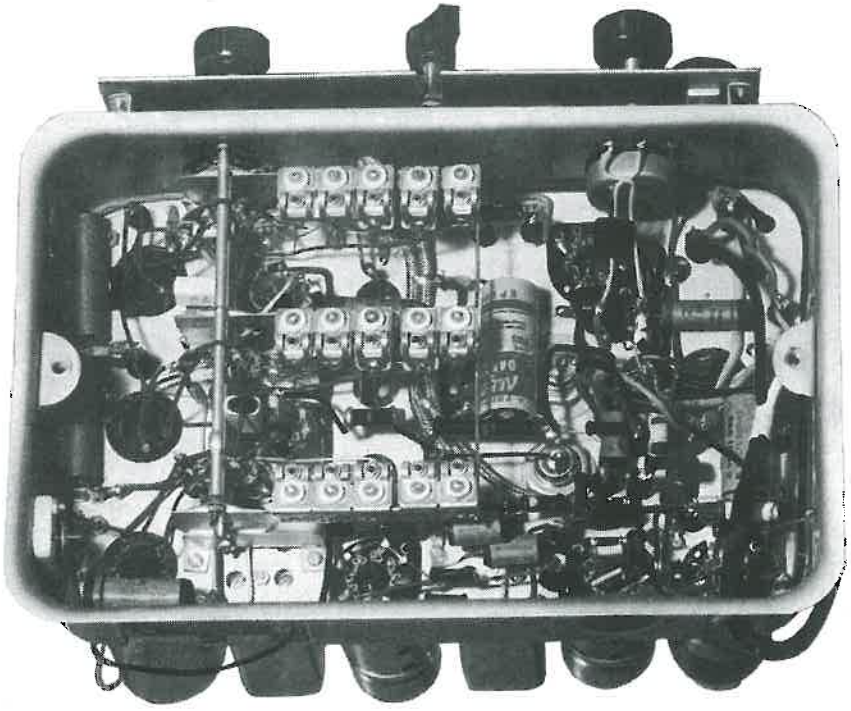
Undeterred, Radio Corporation of New Zealand successfully tackled the problem in 1939 and in 1940 produced the first of a series of models with four of the shortwave bands spread fully across a slide rule dial directly calibrated in frequency. In a booklet covering this receiver, their model 75, they explained the steps they had taken to overcome the stability problem as follows:

> **BEHIND** the apparent maze of parts in the Model 75 chassis is a story of unique and painstaking research by Columbus engineers.
>
> Ever since the introduction of shortwave listening, radio owners have had to accept the difficulty and instability of tuning to shortwave programmes as inevitable. The elimination of this defect has been a full-time problem for radio engineers the world over, but, prior to the successful research work of the Columbus laboratory, no practical method of overcoming it had been developed.
>
> It was generally recognised that the root of the trouble lay with the design of radio receivers and not with the shortwave stations, and experiments had proved that the dissipation of heat from the valves and transformers of the radio when it was running was the prime cause of the difficulty. The effect of rising temperature as the radio warmed up was to increase the electrical capacity of the component parts of the radio which, in turn, upset the stability of tuning.
>
> In the Columbus laboratory, work was begun on the selection of component parts which showed the minimum of capacity increase with rising temperature. Layout of parts was carefully studied to isolate any sensitive sections from sources of heat. Ultimately a stage was reached at which a very small increase in electrical capacity resulted from the warming-up of the radio.

THE CALIBRATED BANDSPREAD DIAL



Arrows point to the location of significant shortwave stations in 1940



Under Chassis View Of Model 75

Having achieved this, the engineers then turned to the complete elimination of capacity variation by the development of a technique which has become known as "temperature compensation."

One substance, titanium di-oxide, was known to possess the unique property of *losing* electrical capacity when its temperature was raised, and this fact was utilised to incorporate into the radio special condensers made of this substance with the aim of balancing their *loss* of capacity against the *gain* in capacity of the other components. Months of research, involving precise calculations, finally enabled a specification to be devised, in which the decrease in capacity of the titanium di-oxide condensers exactly cancelled out the increase in the other components. And so Model 75 was developed with perfect shortwave stability - **the first domestic radio of its type in the world.**

THE spirit which animates the Columbus laboratory to reach and surpass known standards of performance is amply seconded by the superb workmanship of the factory workshop. Years of production experience, plus a generous attitude towards technical advance, have given Columbus workshop engineers a fine assembly of modern industrial machinery and a mass of precision machine tools - which, as the accompanying illustrations demonstrate, are not inexpertly used.

It is by this insistence upon machine precision that the Columbus product is endowed with its enduring qualities.

In the final analysis, it is the durable permanence and precision of the workmanship which ensures a long and dependable life for the radio and, for its owner, freedom from the annoyance and expense of repairs and re-adjustments.

While there is no doubt that the model 75 was an unique development for New Zealand the words which I have underlined and emboldened in the Radio Corp text above were challenged in February 1992 by John Stokes and Peter Lankshear in a comprehensive article published in this journal. They pointed out that the RCA model HF2/HF4 produced in 1938 had a directly calibrated dial which spread the shortwave bands in the same manner as Model 75.

In the same booklet Radio Corp claimed that at the time of their own research:

> ...research of a similar nature was also being carried out in Canadian and United States Laboratories but it was not until March 1941 that the first accounts came to hand of the successful application of calibrated bandspread techniques in these countries.

Like John Stokes and Peter Lankshear, I find it difficult to believe that the engineers at Radio Corp were unaware of the earlier RCA development but knowing the calibre of the Radio Corp engineers concerned, I find it difficult to believe that these engineers would have deliberately made such a statement knowing it to be untrue.

New Zealand was on a war footing at the time of publication of the Radio Corp booklet and overseas mail deliveries were subject to long delays and losses by enemy action. News of the

RCA development could only have arrived by sea mail or by word of mouth from a visitor. Maybe this never occurred.

The critical part of a bandspread shortwave receiver is the high frequency oscillator which is required to achieve a very high degree of stability. In the design of their oscillator RCA used individual coils trimmed by magnetite cores for each shortwave band whereas Radio Corp used one standard short wave coil for all bands and switched in varying series and shunt capacitors as required to adjust the range of the tuning capacitor for each shortwave band.

Radio Corp relied on negative temperature coefficient capacitors to compensate for frequency drift with temperature change during receiver warm-up. The data I have on the RCA design does not mention use of NTC capacitors. Maybe the magnetite cores compensated for temperature change. RCA does point out in the alignment instructions for the electric tuning that a few minutes should be allowed after switch-on before setting the push-buttons which suggest that the eventual user may need to do the same before relying on the dial calibration. Since most members of the general public would expect to tune their receiver onto a station as soon as it was switched on the Radio Corp design may have had a significant advantage.

How stable was Model 75? My friend, Gordon Baker, has an early model 75 in original condition and I borrowed it to carry out some tests. These showed that the drift on any band was less than 2 kHz over a 45 minute period following switch-on from a cold start which is remarkable considering the age of the set and the fact that a high quality Atwater Kent receiver of the 1930s showed a 30 kHz drift at 18 MHz over the same period.

I have no idea of the frequency drift in the RCA design and would appreciate hearing from any reader who may have that set or knowledge of it.

I was also impressed with the stability of the Model 75. Tuning in a short wave station was no more difficult than a medium wave broadcast and the dial setting did not change after switching bands, or switching off then switching on again 24 hours later.

As regards the long term accuracy of the frequency calibration on the dial, there were discrepancies of up to 250 kHz in the dial readings from the actual frequencies of the signals being tuned. After 60+ years of domestic use and idle periods during which tweaking of the trimmer capacitors was probably carried out this is not unexpected. Possibly a reader may have direct experience of the long term stability of the frequency calibration on the dial of the model 75 and could give us the benefit of his or her observations.

I take my hat off to the ability of the model 75 design team.

Still the reason for the discrepancy in the "world first" claim remains a mystery.

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1. Colombus radio booklet on the Model 75 introduced by Sir Charles Statham - c1941
2. RCA MFG. CO., INC. models HF-2, HF-4, UL30. John F Rider publication RCA pages 9-4 to 9-10.
3. Private correspondence with Peter Lankshear.

"Stringing Dial Cord Drives"

Reprinted with acknowledgment to Wellington Vintage Radio Notes - November 2003

A task that most Radio Service personnel in the vintage years used to hate was stringing cord drives. Early sets tended to have some form of mechanical reduction drive, which enabled fine tuning to be carried out. There was often in addition a 'bandspread' control. This was a small, auxiliary tuning capacitor that moved the tuning a few kHz either side of the main setting. Subsequently large tuning scales with station names, rather than arbitrary log or degree marking, were introduced, bringing with them a whole new cat's-cradle of string technology. The waxed string used at the time is long gone. For replacement purposes white nylon cord of the type used for sail making can be purchased by the spool from boat chandlers in a variety of sizes. It's stronger and better than the original.

Restringing

Provided you plan the direction the cord has to travel, restringing a drive without instructions is not that difficult. With the gang fully closed, the pointer will be positioned at the low-frequency end of the dial. With this in mind, you have to visualise which way the cord will come off the tuning drum. Follow its direction onto the pulleys, considering the direction - left to right or top to bottom. The direction around the tuning knob shaft is important: it is most disconcerting to turn the knob clockwise and watch the pointer go from right to left. Finally, its journey around the remaining guides or pulleys and back on to the tuning drum has to be in the correct direction. Sometimes more than one cord is used. In this case life can be simpler.

There are many ways of stringing the same drive. The end test is: does the pointer track smoothly with the tuning knob following its direction? And when the end of the scale is reached will the cord stay in place if the knob is turned farther? It's no good setting up a drive if someone comes along, cranks it past the end stop and the whole lot then ends up as a tangle of string inside the set. What's required is enough slippage on the tuning spindle to prevent excessive pressure at scale end. At the same time there must be enough friction to propel the pointer and gang efficiently to their tuning points.

Cord thickness, the number of turns around the tuning shaft and system tension all matter. A bad fault is to allow cord turns to overlap when spooling. This will at best result .in a twang and pointer judder, at worst a total lock-up or dismounting of the drive. A small misalignment of the pulleys or too many turns around the drum can be the cause. Cord of the wrong gauge can be the problem, or maybe a wrong pulley direction has been chosen. As with most things in restoration work, patience is required.

Suggested procedure

My approach is to start with the gang fully open or closed, make a small loop in the cord, and attach the end to one of the tags on the tuning drum. If there isn't a tag, tie the cord to the locking screw on the drum shaft. Feed the cord thought the slot in the drum's groove, in the opposite direction it will be feeding off. Estimate how much cord will be required around the drum to reach the first pulley and go that way. Note that the cord has not yet been cut. Continue feeding the cord around the pulleys. Make two-three turns around the tuning shaft, in the correct direction. Continue around the rest of the pulleys, finally arriving at the tuning drum from the opposite direction. Again estimate the amount of cord that will be required.

At this point it's possible, gripping the cord and the edge of the drum in one hand and turning the tuning drive with the other, to see if everything is going in the right direction. If all is well, a spring is usually attached to the tuning drum and the end of the cord is fixed to it. When tying the cord to a spring, a small amount of tension is applied. The action of the drive can now

be checked from end to end. The final step is to attach the pointer - this may add a bit more tension *to* the system. Note that some makers fit the spring or another spring in the cord length.

I use the method described above where I have partial or no knowledge of how the dial is strung. Sometimes the old drive is in place but not working, or is hung loosely, broken. In such a case I try to copy the original arrangement. The best situation of all is where a plan of the cord drive exists, complete with directions and the turns around the shafts and drums.

When you are satisfied that the stringing works correctly, it's a good idea *to* put a small spot of glue on each knot, to prevent them coming loose. Note that later sets employ a solid, stepped pulley design. The purpose is to alter the gearing ratio between the stepped pulleys

The pointer will usually still be attached to either the cord or the scale pan. When it's totally missing, it is worth making one. A piece of 2.5mm copper wire, from a piece of twin and earth cable, formed into an L shape can easily be made to ride the string.

Modified Eddystone S.924 'Slab' Power Unit

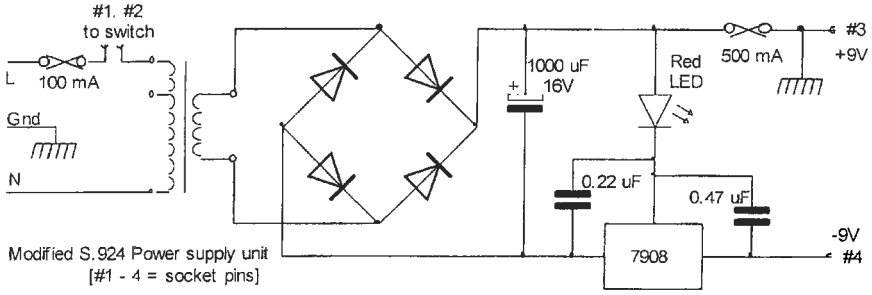
by John R L Walker ZL3IB.
E-mail; <staf169@ext.canterbury.ac.nz>

According to the Eddystone User Group's " *Ultimate Quick Reference Guide"* by Graeme Wormald G3GGL, the S.924 'Slab' Power Unit (a mains PSU) was available as an optional alternative to the 9V battery box normally supplied with the ECIO and EB35 series of transistor receivers. (NB the EB35 MkIII has a negative ground).

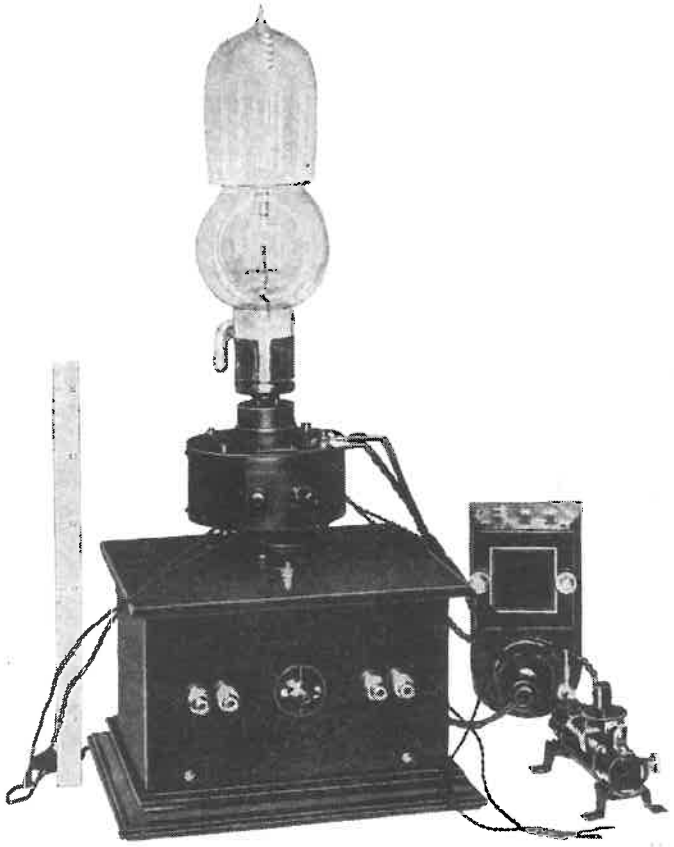
I have an ECIO Mk2 with an S.925 PSU and, at the risk of offending the purists, I like to have the dial lamps continuously ON so I modified my ECIO to have them in series directly across the 9V supply line; this gives a nice level of background light and the lamps last for ever!

In its original form the S.924 used a simple Zener diode regulator circuit which limited the current range for good regulation so I decided to upgrade the circuit to use a 7908 IC negative rail voltage regulator. This offers several advantages including better regulation over a wider range of current, plus temperature and overload protection.

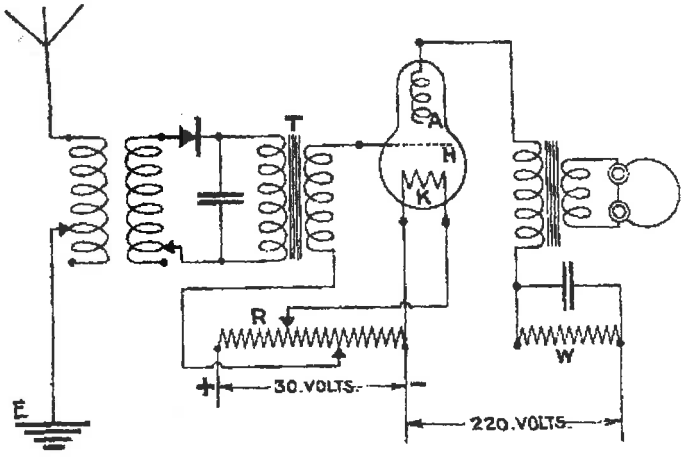
The circuit is shown below. The IC was bolted to the chassis and the other components were assembled on a small tag-board. Some readers may query the inclusion of the red LED but this is there to lift the output voltage from 8V to 9.2V; or you could use one or two diodes in series, or a voltage divider network. Yet another alternative is to use an LM337 variable regulator IC. Any IA bridge rectifier should be suitable.



This circuit could also be adapted by people who want to build their own mains PSU. In this case use a mains transformer giving around 12 - 15 V AC at 500 mA. For a negative ground system use a 7808 or an LM317 regulator IC.



Leiben Reisz valve mounted with necessary components.



Circuit of Radio receiver Using the Lieben Reisz Valve

THE LIEBEN-REISZ RELAY

Dick Stevenson

In 1904, Professor J .A. Fleming patented his "oscillation valve" and was the first to use a thermionic diode to detect "wireless oscillations".

It turned out to be reliable but not very sensitive, so experimenters looked for means to improve it. By using the same thermionic principle, Lee De Forest added a third electrode, a grid, and took out a patent in early 1907. He called it an audion and as gas was still present inside, there was enough ionic leakage to do without a grid-leak resistor and the result was quite a sensitive detector.

In Austria, about the same time as De Forest's invention, Robert von Lieben was searching for a way of amplifying long-distance telephone signals and produced a thermionic device containing a filament and two concentric anodes. Outside the glass envelope was an electro- magnet to which the input current was connected. The anodes contained a small hole where the electron beam was focused. A weak input to the electromagnet moved the beam, causing a difference in potential between the anodes and a sound in the headphones connected between them.

However De Forest's use of a grid was judged to be superior and a new valve was developed by von Lieben with the help of S. Strauss and E. Reisz. This was quite successful and, as it could amplify, was often called a "relay".

The glass envelope was quite large, about 30cm. long, and in the lower part was a substantial filament . This was made from about a metre of platinum strip covered with calcium and barium oxides and arranged in a zig-zag fashion. Already the German Arthur Wehnelt had discovered in 1903 that an oxide-covered filament copiously emitted electrons when heated.

About halfway, up the valve was a grid in the shape of an aluminium disc perforated by holes, 3.5mm in diameter. The anode was a spiral of wire, 2mm across. A steady potential of 30 volts was applied to the filament which glowed bright red and drew 2 amps while the anode operated at 220 volts and about 10 ma.

Amplification of about 30 times was easily achieved, but there was a fundamental flaw. Like De Forest and others before him, von Lieben believed that the presence of gas was necessary to carry the current across the valve. Indeed, he deliberately introduced mercury vapour at a low pressure of 0.001 mm. Such a "soft" valve needed very careful control of the currents flowing and was quite noisy in operation. Added to these was the bombarding of the negative filament by heavy positive ions damaging the oxide layer and shortening the life of the valve to less than 300 hours.

Further gas-filled valves were made by H. Round and G. W. White and during the first years of World War 1, were the only ones available. However they were difficult to make and very bulky and so were not suitable for rigorous front line operation. In 1915 a patent appeared for a smaller valve with a high vacuum and this "French valve" eventually became very popular. With improved vacuum pumps and the use of gas-removing "getters" the way ahead was shown for the development of the triode during the next ten years.

References: "Textbook on Wireless Telegraphy" by Rupert Stanley, 1917.
"History of the British Radio Valve to 1940" by K.R. Thrower, 1992.

A Self-Contained "67.5 volt B Battery for Portables

by Tony Maher

This article describes the construction of an AA battery powered 67 1/2 volt "battery". This new rechargeable "B battery" is slightly smaller than the original Eveready 467 battery and is the same weight. The substitute battery can be made in different voltages and can be powered from a wide variety of sources.

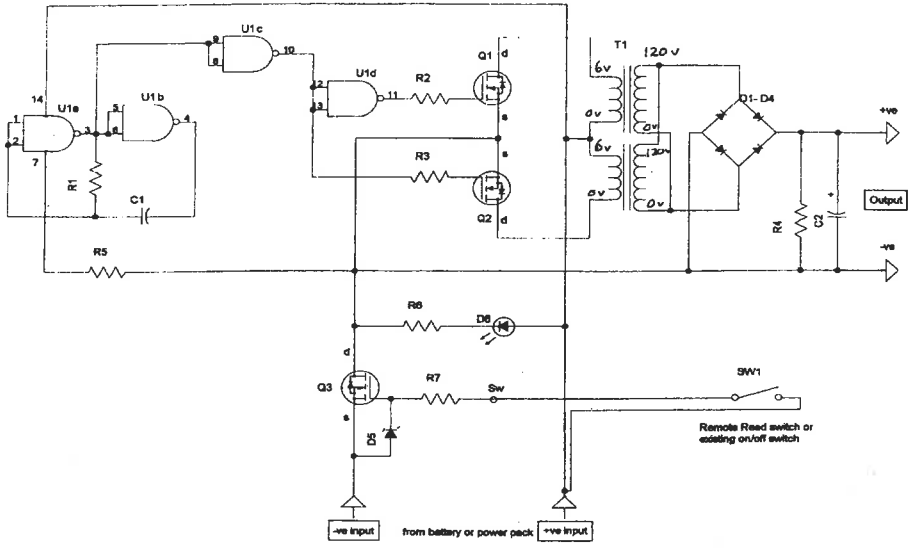
Warning: *this unit generates voltages which can in some circumstances be lethal Take all precautions*

The immediate forerunner of today's transistor portable was the Personal Portable of the late 1940's and early 1950's. Many of these were very attractive sets. They used miniature 7 pin valves and were powered by small Eveready 67 1/2 volt batteries, but they were expensive to buy and to run. With the advent of the transistor radio in the late 1950's they disappeared from common usage and sight. Today the small 67 1/2 volt batteries that powered these sets are no longer available and the collector has the choice of soldering together seven or eight 9 volt batteries or making a mains powered power supply. Neither choice is a good one. The first at about $30 to $40 a time is expensive, and the second takes away the portability which was one of the major attractions of these, the smallest valve receivers ever made. A year ago, during a visit to the hills around Melbourne, the writer obtained a small cream AWA Personal Portable Model 450-P made in 1948. This radio uses two D flashlight cells for its filament supply and a small 67 1/2 volt Eveready 467 battery for the B supply. D batteries are, of course, readily available but not so the B battery. This focused the author's mind on a suitable B battery replacement. I sought out on the internet a suitable design. I found many mains powered battery eliminator designs and a few suitable battery powered ones for portable use, but none that fitted inside the set in the place occupied by the original battery. The final effort was to design my own. This was not a simple task. I wanted a simple solution that did not involve metalwork or shielding, that was easy to make, cheap to build and run, and could, of course, happily coexist with and within a small valve portable radio. Switching regulators could be used but the author's experience of these in the past had shown him they were a potent source of Radio Frequency Interference (RFI). Cast aluminium boxes, filter chokes and miniature metalwork loomed on the horizon. Luckily the space requirement ruled out this approach. Once the switching regulator approach had been

discarded a 50 Hz inverter was considered. The lower frequency would make RFI problems much more manageable and ordinary power transformers could possibly be used.

Serendipity then entered the scene in the form of a magazine advertisement for "on special" 10VA toroidal power transformers. These were cheap at $10 and they had two 6 volt, and two 120 volt, windings. Toroids are efficient, small, and have very low external fields. I ordered two. Oh how I wish I'd ordered more, the price has now more than doubled This transformer forms the basis of the final design. Power is supplied from 4 or more AA NiMH batteries, depending on the output voltage required. Other power sources that can be, and have been, used include AA alkaline batteries, AA NiCad batteries, lead acid batteries, non-regulated voltage adjustable power packs, and regulated voltage adjustable power packs. Personal Portable radios were designed to operate over a wide B battery voltage range. Batteries were expensive and the radios were designed to extract the maximum amount from the battery before it was discarded.

Typically radios were designed to continue operating with B battery voltages 30% or more below their nominal voltage. This unit will continue to operate when the individual AA cells are below 1.0 volt. This corresponds to an output voltage of 40 volts. A set of four AA NiMH 1600maH rechargeable batteries will supply the B battery needs of the authors AWA 450-P Personal Portable (67 1/2 volts at 8.0ma) for nearly 10 hours at a B battery cost approaching zero (assuming of course you already have the batteries). The unit will give 15 hours or more of operation from a $2.50 set of Chinese made AA Alkaline batteries. The unit can be used with extra AAs as a 90 volt battery or as a 108 volt supply. With a switchable 1 amp plug pack it can be used as a variable bench supply.
Note 1: An Eveready Type 467 MiniMax 671/2 volt battery is 94 x 71 x 35mm. An Eveready Type 482 MiniMax 45 volt battery is 140 x 89 x 44mm.



CIRCUIT OF THE "B" BATTERY

Circuit operation.
2 parts of a Cmos 4011 quad nand gate U1a and U1b are used as a square wave oscillator. The frequency of the oscillator is not critical and is set by the capacitor C1 and the resistor R1. Another nand gate U1c is used as a buffer between the oscillator and the gate of a Mosfet Q2. The last nand gate of the 4011 U1d is used to supply an inverted signal to the gate of another Mosfet Q1.When its gate is driven positive by the buffered output of the oscillator each Mosfet in turn passes current through it's portion of the primary of transformer T1. The transformer steps up the voltage and supplies it to a bridge rectifier D1-D4 and filter capacitor C2. Because the voltage from the transformer is a square wave, with only a small time between each half cycle, there is little ripple on the output and only a small filter capacitor C1 is required. R4 discharges the capacitor C1 in the event of there being no load connected.

The toroidal transformer has two 6 volt windings which are connected in series. These are driven by the Mosfets. It also has two 120 volt windings which are connected in parallel. Resistors R2 and R3 perform a number of roles and should be located as close as possible to the gates of their respective Mosfets. Their first role is ensure that one Mosfet is off before the other turns on. They do this in conjunction with the gate to source capacitance of each Mosfet by slowing the rise and fall times of the square wave which is fed to each Mosfet. They also minimize the amount of RFI generated and prevent high frequency oscillations from occurring in the gate circuit. Resistor R5 prevents destruction of the 4011 IC in the event of the battery being connected the wrong way around. R6 and D6 provide a Power on light for the unit.

Q3 acts as an on/off switch. It enables the unit to be turned on and off by a small current. A normal toggle switch can be used in its place but it is often desirable to have switching performed by small low current contacts. Low current reed switches can be fitted to doors lids etc. so that the unit turns on automatically when a door or lid is opened. Reed switches would stick if used to directly switch the current required by the unit. D5 and R7 are used to protect the gate of the Mosfet from being damaged by static. Experienced readers will have noted that this circuit is very similar to that of the Vibrator power supplies long used for battery operated radios and car radios. The plug-in vibrator unit is replaced by the 4011 and the two Mosfets. The 4011 oscillator acts as a replacement for the vibrator's reed and the 2 Mosfets act as the vibrator's contacts. The author is currently adapting this design to act as a plug-in vibrator replacement.

Mechanical construction
The unit is built around the toroidal power transformer. The power transformer is designed for printed circuit mounting and advantage is taken of this to mount a small fibreglass matrix or printed circuit board to the pins of the transformer. All components are in turn mounted on this board. The battery pack is fastened to the flat side of the transformer with double sided carpet tape or Scotch VHB tape or similar. Clear 1.6mm thick polycarbonate plastic is cold folded into a U to create the correct size envelope for the "battery" and to provide insulation. This envelope is held in place with a 3/16" countersunk screw which passes into the central mounting hole of the transformer. Please refer to the photo.

Assembly
A printed circuit board has been designed for the unit. This is a small board and the tracks on it are likewise small. You will need a suitable soldering iron with a suitable tip. A Scope or similar high wattage soldering iron will not do. A 25 watt or temperature controlled iron with a small tip is required. Insert components in the position shown on the drawing. Insert Mosfets last. Leave Mosfet leads at maximum length. Refer to the photo as necessary. All diodes and all resistors are

mounted vertically because of limited space. Observe the way each component is fitted in the photo and copy. Test pins are fitted on the perimeter of the board and the input, output and switch leads are soldered to these pins. Note: One switch lead shares a common pin with the + input lead. There are four wire links on the board. One link runs along the top of the IC. The other three links are on the copper side of the printed circuit board. Join pads labelled A to A, B to B, C to C and D to D.

Testing

Warning: this unit generates voltages which can in some circumstances be lethal. Take all precautions. Care should be taken with the wiring to ensure it is as per the circuit diagram. Great care should be taken to avoid shorts and dry joints. Buy new glasses if necessary. Visually check and check again.

Is the polarity of the electrolytic capacitor correct?

Is the IC or one of the Mosfets around the wrong way?

Note the Mosfets. One is reversed in orientation to the others.

Are the 4 diodes the correct way around?

Does the bar on the zener go to the outer edge of the board?

Do you have the correct resistors in the correct places?

Check your colour codes.

Make sure the transformer is the right way around. 6 volt windings should be near the Mosfets.

Make sure each individual AA cell is correctly inserted in the battery holder.

Make sure the battery pack is connected with the correct polarity.

The unit will withstand polarity reversals of short duration but don't leave the battery reversed for minutes rather than seconds.

The author has constructed 6 units and all worked first up so it's not too hard.

The good news is that it's pretty difficult to permanently damage any of the parts... but...stand by for the emails from those who "succeed".

If you have a voltmeter or DVM select the 200 volt range and connect it across the output. Fit the batteries and briefly touch the battery connector to the battery pack terminals. Voltage should immediately appear.

If not inspect and inspect again.

WARNING: If you are fitting the unit to a battery powered portable take great care with the battery plugs particularly if you do not have the original batteries.

Many portables had combined A and B batteries, others had separate plugs. Colour codes on battery plugs can be different to what one would expect. Using a DVM on the ohms range check the battery plug and locate the filaments. **If** the filaments are in a series chain remove a valve to confirm you have the right leads.

If in doubt don't connect the unit but trace the wiring instead. The polarity of the A battery is important. If no sound is heard, or if only a brief burst is heard, try reversing the two A battery leads. My hope is that by using this design and future ones we can wake these beautiful little sets from their long sleep and once again freely use them as the portables their designers intended, and at a running cost much lower than ever before possible.

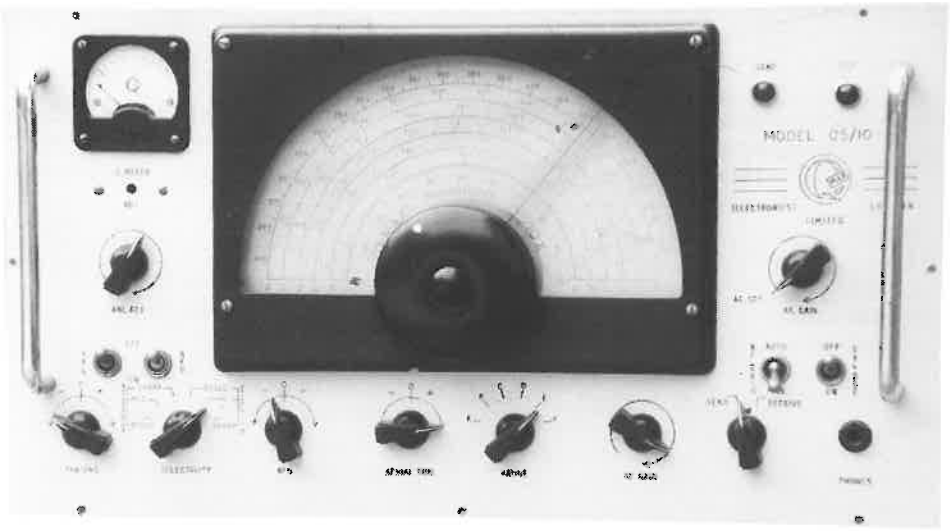
all correspondence will be entered into.

email to tmaher@detection.com.au or send a stamped self addressed envelope to Tony Maher 31 Barossa Ave, Vermont South Vic, Australia 3133.

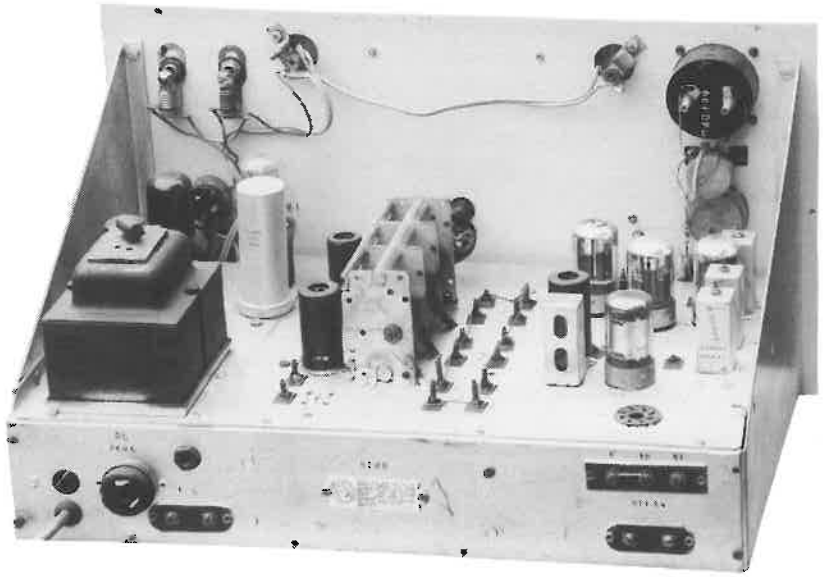
Editor's Note: This article first appeared in the April 2001 issue of "Radio Waves", the offical publication of The Historical Radio Society of Australia and is reprinted here in a form modified to suit this bulletin. Text and illustrations are as in the original..

PARTS LIST

C1 Capacitor 330nfd MKT type
C2 Capacitor 100mfd 160 volt small
or Capacitor 47mfd 250 volt small
D1 - D4 Diode 1N4007
D5 Zener Diode 1N965 15 volt
D6 5mm Red led of reasonable brightness
Q1 - Q3 Mosfet MPT3055E
R1 Resistor 15k ohm 1/4 watt
R2 - R3 Resistor 100k ohm 1/4 watt
R4 Resistor 470k ohm 1/4 watt
R5 Resistor 100 ohm 1/4 watt
R6 Resistor 1k ohm 1/4 watt
R7 Resistor 10k ohm 1/4 watt
SW1 Reed switch normally closed type.
This is used as an on/off switch for the unit.
A small Dip or microswitch can also be used.
An existing B battery switch on the radio can also be rewired to perform the function.
The existing B battery wire from the switch should be directly connected to the +ve output of the unit.
WARNING. Take care when rewiring an existing switch. Do not under any circumstances connect the output of the unit to the A battery or filament circuit. Valves will be destroyed if this occurs.
T1 Toroidal Transformer 10VA Powertran M4312
Two 6 volt windings plus two 120 volt windings.
Available from Altronics Perth or Elstronics Christchurch.
U1 IC Cmos 4011BP
Also the following hardware:
Battery holder suitable for 4 AA batteries (or more if higher voltages are required.)
Doublesided tape or suitable glue for mounting the battery holder to the transformer.
Polycarbonate or similar insulating material for forming into a U shape to insulate and protect unit.
3/16" screw for mounting same to transformer
Suitable Nickel Metal Hydride, alkaline, Nicad or lead acid batteries.
A printed circuit board for the unit has been designed and is available from the author.



Q-max G5/10X front view. Note slow motion Muirhead dial drive commonly found on laboratory instruments

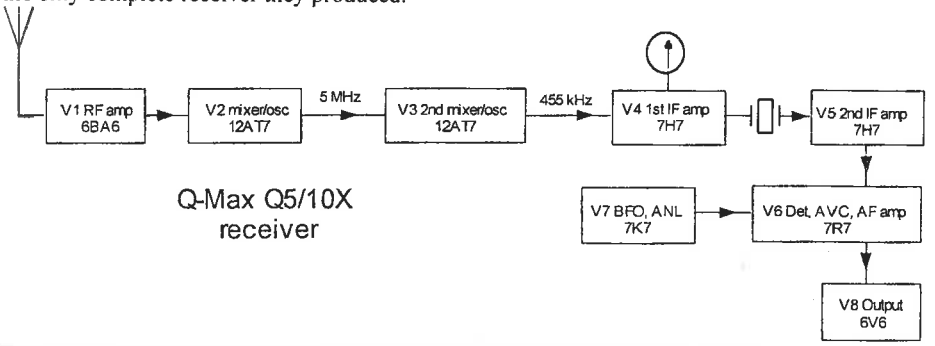


Q-Max G5/10X rear view. Note bizarre array of different valve types

From my collection. The Q-Max G5/10X communications receiver.

by John R L Walker ZL3IB
Email; staf169@it.canterbury.ac.nz

The British firm of Q-Max (Electronics) Ltd. was active from the late 1940s onwards offering a range of radio components, such as coil assemblies etc, for the home constructor. Their G5/l OX was a ten valve, amateur bands only, double conversion superhet and. as far as I am aware, was the only complete receiver they produced.



Q-Max Q5/10X receiver

The circuit was unusual and used a low-noise RF pentode stage followed by a twin triode mixer-oscillator which changed the incoming frequency to the first IF at 5 MHz. This was followed by a second twin triode mixer-oscillator which converted this to the second IF at 455kHz feeding a crystal filter providing six degrees of selectivity and thence to a second IF amplifier. From here the signal went to a double diode pentode which served as detector, A VC and first AF amplifier and then to the power amplifier. Another double triode served as BFO and automatic noise limiter. A 150V stabilised HT rail supplies the local oscillators and first IF screen. A crystal calibrator was available as an optional extra.

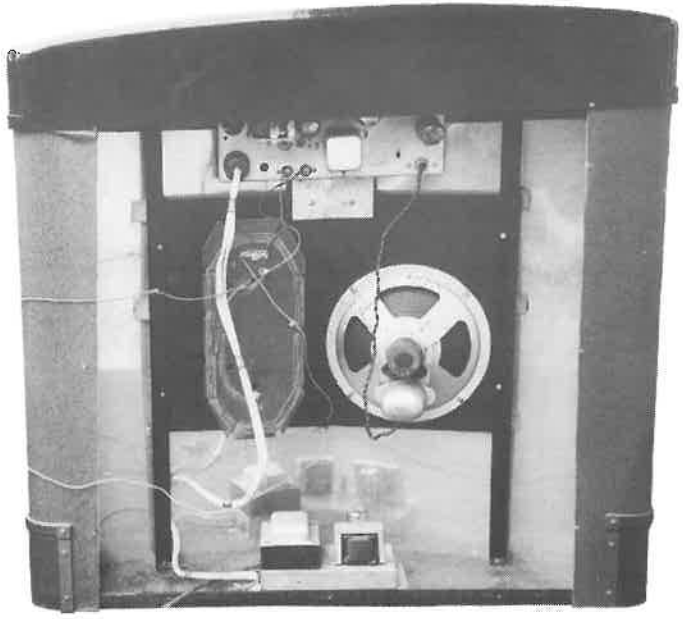
Mechanically the design of the set is quite robust and features a 50:1 Muirhead planetary reduction drive. However in my opinion the layout and choice or valves is appalling. For example, for reasons unknown the designers elected to use a weird and wonderful mixture of seven and nine-pin miniature valves, uncommon loctal types and octal based valves. Worse still, some evil-minded genius arranged that the six-wafer, six-position, selectivity switch was placed directly under several valve and IF transformer bases thus ensuring that service access to these was a major headache! I have struggled long and hard to get this set to work, let alone back to anything approaching claimed performance.

Valve Line-up

VI RF amplifier	6BA6	V6	Det. AVC, AF amp 7R7 (D.D. pentode)
V2 1st mixer	12A T7/ECC81	V7	ANL and BFO 7K7 (double triode)
V3 2nd mixer	12AT7/ECC81	V8	Power output stage 6V6
V4 1st IF stage	7H7 (RF pentode)	V9	Rectifier 5Z4
V5 Crystal filter stage	7H7	VI0	Stabiliser VRI50

Specifications Sensitivity; I uV provides 1.5W output or better on all bands
S/N ratio; 1 uV provides a 15dB S/N or better on all bands
Ranges; 1.8 - 2.0, 3.5 - 4.0, 7.0 - 7.4,14.0 - 14.4,20.95 - 21.5, 28 - 30.0 MHz

The 5WO looking down on the dial



Internal view; rear panel removed to show separate power supply with interconnecting cable to upper RF chassis

THE AKRAD WO SERIES

By Ian Sangster

I always admired the WO series console which George Askey used to have in his home and some time later I was able to acquire a Pacific branded one for myself. Recently I had time to get my version up and running. My set was a 5WO whereas the one pictured in *More Golden Age* was a 6WO. Ernie Hakanson supplied me with both circuits for study.

The 5WO has the following valve line up, 7S7 converter, 7B7 i.f., 7C6 detector and first audio, 7C5 audio output with a 7Y4 rectifier. In the case of the 6WO a 7B7 radio frequency stage is added. Both circuit diagrams date from September 1950 and are drawn by E.W.G.

I read through the Akrad article Rod Osbourne wrote in the NZVRS Bulletin then consulted some of our members in Waihi to find that E.W.G. was Ted Grant who still lives in Waihi. I phoned Ted with some questions about the origins of the design.

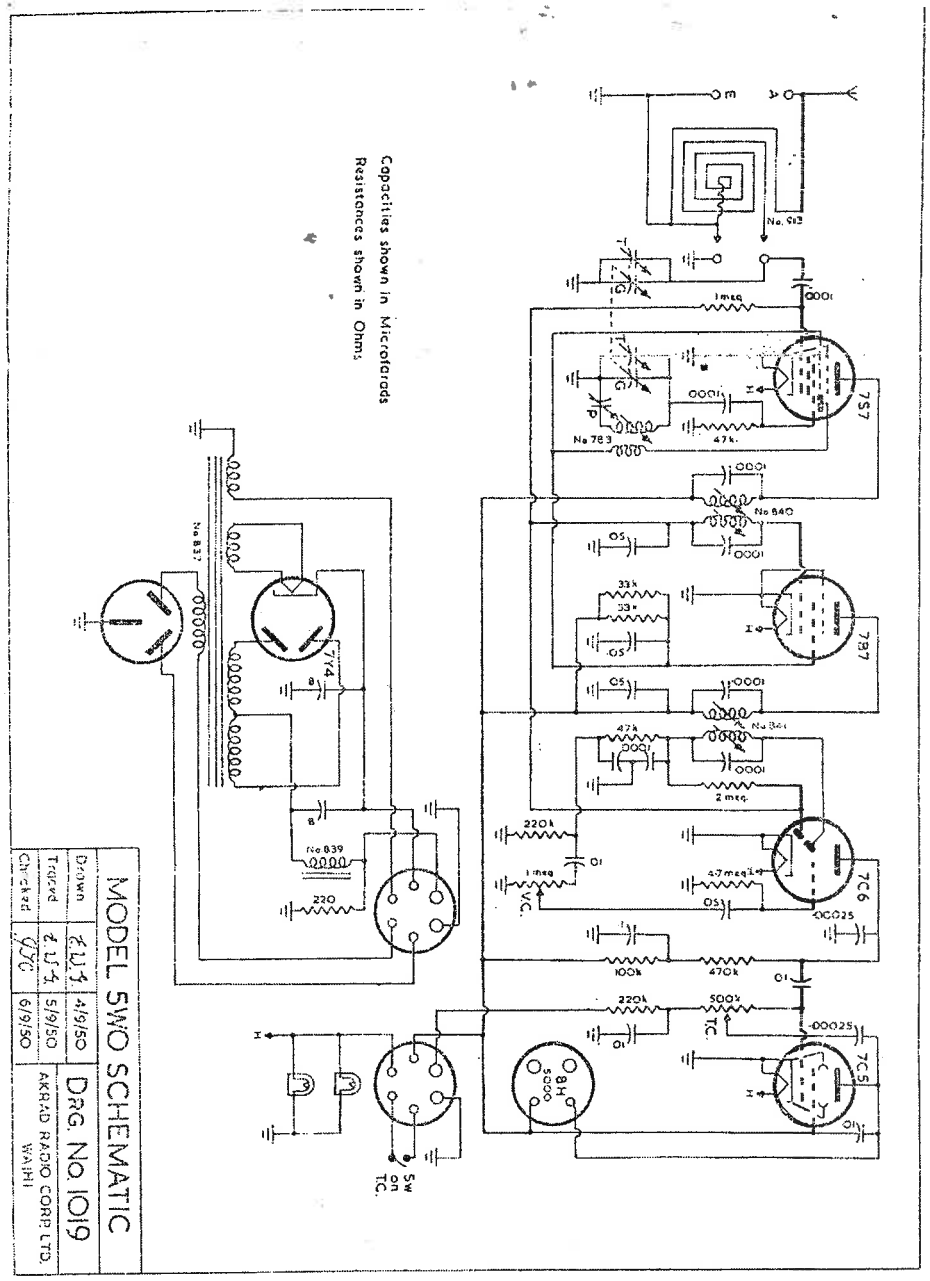
Ted thinks that the source of the large bakelite moulding which forms the top of the cabinet was Australia, which could mean that a similar set was manufactured in that country, and the tooling from a previous production run was used. Maybe one of our Australian readers can supply details. I have never seen any advertising for the Akrad set in New Zealand so I asked Ted what it's original model name was. He thinks it was known as the *Flying wing*.

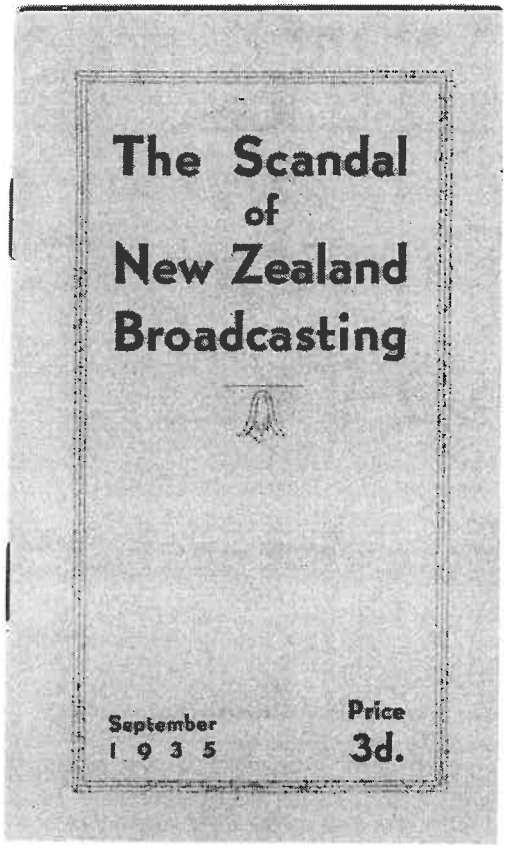
The construction of the set is unusual, in that it is crowned by a large 30" wide by 4.5" high bakelite moulding in mottled brown, the central body is alloy sheet bent to form the wing shape and open at the rear. This alloy sheet is clad with brown rexine type fabric and at the base of the alloy body is a 4" high protective kick strip. The base is a wooden board and the open space at the rear is closed by a sheet of oil tempered hardboard, carrying the model number plate.

Inside there are two light metal angles running from top to bottom. At their middle region they carry a plywood board which forms the baffle for the offset Rola 8H permanent magnet speaker as well as a frame loop aerial. At the top of this board a metal plate supports the rear of the vertically hanging radio chassis. The weighty power supply components are on a separate chassis mounted down on the baseboard, for a lower centre of gravity.

The set performs well and makes an unusual looking console which does not take up a large floor area.

The circuit diagram is shown overleaf





One of George Askey's last acts was to send me two booklets, published in 1935, with the thought that their contents, which are unlikely to be documented elsewhere, may be of interest to readers of this journal. The contents of the first booklet are recorded below. The second booklet (More Scandal) published in 1935, gives further similar argument plus a record of the responses of the political parties of the time to a survey of their opinions on control of broadcasting.
Today it is hard to appreciate the intense public feeling over radio broadcasting policy in the early 1930s - a policy which led to the jamming of the B class station, 1ZB, on the eve of the 1935 election ("The Radio Years" Patrick Day- 1994, Pages 204-208) and undoubtedly contributed to the downfall of the Government at that election. - Ed.

Foreword.

This Booklet is issued because it is the only possible method by which Listeners may be informed of the true position regarding Radio in New Zealand.

It is a well known fact that the Press of this Dominion, taken as a whole, is opposed to B Stations, because it regards the service Radio is capable of rendering as a real threat to the Press monopoly in the matter both of advertising and the disseminating of news. This publication aims at no other purpose than to enlighten the public as to the TRUE facts of a SCANDALOUS position. While it is well established that the Friendly Road is non-political and non-partisan, the Executive of the IZB Radio Club, in co-operation with other Clubs throughout New Zealand, feel that with the threatened extinction of "B" Stations they are justified in taking very drastic measures to fight this onslaught upon their liberty.

LISTENERS!

These facts are presented with a view to exposing the failure of the authorities to allow the natural development of the greatest scientific discovery of the 20th century, and to indicate the

sinister motives underlying the present policy of muzzling the microphone and endeavouring to withhold from New Zealanders their birthright of freedom.

Unfortunately the full facts can never be printed, for obvious reasons, but we trust that you will read BETWEEN the lines as well as ON them. Many things have been done (which are well known to those who have been associated with this cause) that clearly indicate a betrayal of the people's rights

This Freedom!!

We live in a country where the freedom of the individual has been boasted of with some pride; but an analysis of the facts will clearly show that talk of "Freedom" is absolute hypocrisy. This not only applies to the subject of broadcasting; but of necessity we must confine our remarks to this sphere. Radio broadcasting should be a possession of the people, but it has been made the tool. of a monopoly: the broadcast spoken word is being treated very much as was the printed or written word centuries ago.

OUR LIBERTIES THREATENED. Freedom of the Air banned by the Authorities.

The present policy of censorship of the air constitutes the greatest threat to our democracy since the days of Magna Carta. One of the requisites of real freedom in a democratic state is giving to ALL the opportunity of forming their own opinions--but what exactly has happened in New Zealand to-day? There are at present two main channels through which expressions of opinion should be conveyed - the *PRESS* and the *MICROPHONE.*

If one has a message for the people. and an endeavour is made to transmit that message through the PRESS. what happens? If it does not suit the policy of the particular paper, the message is either: BANNED altogether or extracts presented in such a manner as to render it of no effect.

Very few newspapers print news without some bias; few comment on it with freedom from prejudice. Most of their controllers aim first, last, and all the time at making profits. and for that they cannot be blamed. but a public which allows its Press to be a commercial industry must not complain if the ethics and the practice of newspapers resemble those of public houses or auction marts. But the effect of it on the public mind is disastrous to the working of true democracy.

It is readily to be seen that anyone who wishes to use this medium must either conform to the policy of the Press or for ever hold his peace. On the other hand. if one seeks to make known his message through the second channel, the MICROPHONE, he will meet with an even greater repression. This time the muzzle is imposed DELIBERATELY by those responsible for the broadcasting regulations of the country.

None has been free from this unwarranted interference with the people's right. Even religious broadcasts have in some instances been banned. From time to time promises have been made that the ridiculous restrictions imposed upon controversial matters would be revised. In March last, the Postmaster-General. discussing the question of controversial broadcasts, said; "The Board will be freer in that respect than the Department now is under the regulations." Instead of this promise being fulfilled THE GAG HAS BEEN TIGHTENED STILL FURTHER. As a clear instance of this, we quote a paragraph from a letter received by "B" Stations from the New Zealand Broadcasting Board;- "Candidates for political honours at the next General Election are not to be permitted to broadcast from any station in ANY CAPACITY after the 30th June next.

An exception may be made in the case of a person holding the position of Mayor, provided that he speaks in his mayoral capacity and does not deal with politics."

The real meaning of this imposition will be understood when we state that if Uncle Scrim had been persuaded to offer his services as a political candidate, then, under this regulation, he would not be permitted to conduct his daily devotional service which has brought comfort to countless thousands of people. As a matter of fact, he would not be allowed to repeat the Lord's Prayer over the microphone without contravening the Radio Regulations. and yet Messrs. Forbes and Coates were to be exempt from this regulation, as witness the fact that the Civic Reception to them in Wellington was broadcast (?), the Board thus breaking its own regulation. showing favouritism to the Government, and glaringly: exposing their partiality.

This TRAVESTY OF JUSTICE is so wicked that we feel the public of this Dominion will, as British subjects, be substantially behind us when we demand the IMMEDIATE REMOVAL of this ban on the freedom of the air. The public life of our nation is founded on freedom. It took a long struggle to establish the right of free speech - the right of a man to utter his own uncensored thought: but THE PRESENT ORGANISED CONSPIRACY OF SILENCE' FOR THE BENEFIT OF SECTIONAL INTERESTS IN THE COMMUNITY IS A MENACE AND A CHALLENGE TO THAT FREEDOM.. The FEAR of the New Zealand authorities to allow freedom of the air has made this country a laughing stock. In other countries, including Australia, where absolute freedom of the air is permitted, there have been no disastrous consequences-no revolutions- no bloodshed-no disloyalty to the Throne, because the people have been given the opportunity to hear both sides of a controversy and to decide a case on its merits.

The injustice perpetrated by the Board has roused such an intense feeling of anger that it would occasion no surprise if the Board retracted its "ban". If this is done. the public must not be deluded into thinking that such retraction represents a change of policy. It would represent a superficial change of tactics, but the wolf of intolerance would still remain under the skin.

Election Broadcasts.

There have been some references in the Press lately to the effect that radio speeches may possibly be permitted during the forthcoming election campaign. Listeners must not confuse these statements with the main issues already referred to above. If the Broadcasting Board. at the request of the Government, permits some such arrangement, it will merely be a *temporary* removal of the ban in respect of politics only a policy of expediency due to the fact that Messrs.Forbes and Coates themselves at their CIVIC Reception in Wellington recently were denied by an indignant public that freedom of speech which THEY HAVE DENIED TO OTHERS. The Broadcasting Board is reported to be "seeking a formula" for party representation over the air. It is stated that one of their difficulties is due to the fact that minorities will insist on being heard! This is the very essence of our complaint. Why should not the minority opinion be heard? The minority of today may be the majority of to-morrow, and if that minority has a message for the benefit of the people, why in a democratic country should its delivery be restricted?

The endeavour to work out a formula on the basis of the present party representation in Parliament is futile and is bound to create injustice and lead to haggling and niggardly concession. Can anyone say that the present strength of the parties is an accurate reflex of the feeling of the electors today? What about the Opposition: and what about the Independents? Are they not entitled to a hearing? What about new parties that are not represented in Parliament at all? There is only ONE formula that will satisfactorily meet the position - absolute freedom of speech, within the bounds of decency. EVERY OTHER FORMULA WILL DO INJUSTICE TO SOMEONE.

We might add that this is the policy adopted throughout Australia and in practically every other country in the world where a Mussolini or a Hitler does not dictate what the people shall hear and think.

Advertising.

THE ONLY WAY TO MAINTAIN A FREE AND INDEPENDENT BROADCASTING SERVICE IN NEW ZEALAND IS TO ALLOW THE "B" STATIONS A SOURCE OF REVENUE. By abolishing sponsored programmes, the Government of this country has deliberately robbed the B Stations of the slender opportunity they had of earning revenue. As the result of ceaseless newspaper propaganda over a lengthy period, there has been built up psychologically a certain antipathy to the idea of advertising over the air. This feeling exists only in the minds of those who have allowed themselves to be influenced by the Press, without giving sufficient thought to the REASONS for such propaganda. Let us logically examine the position in its true perspective. Why do advertisers in practically all parts of the world pay large sums for radio advertisements? Obviously, because they have discovered that these advertisements produce results - more customers and more trade. This in itself is conclusive evidence that in spite of what we are told by the newspapers, the people DO listen to advertising on the air. And *why* do they listen? Because it is accompanied by SUCH excellent programmes that the majority of listeners feel it is no hardship to hear them. It is in the interests of the advertisers themselves to know just where to draw the line, and the fact that they derive such great trade advantages from radio advertising is *proof positive* that there is NOT the objection to radio advertising that the papers would have us believe. What they say is only the EXCUSE, but *the REASON for the Press propaganda against Radio advertising is simply the fact that they believe it would cut deeply into their own, revenue.* Under our competitive system of today the Press cannot be blamed for their hostility to radio advertising, but they must be prepared to face this competition by honest methods and cease their present endeavour to gull the people into an opinion antagonistic to radio advertising. Armed with these facts, listeners will henceforth be able to assess newspaper comments on radio advertising at their true value, and to understand the motive actuating their hostile criticism. In any case, should a listener not desire to hear these programmes, his remedy is to tune them out. None of his privileges will be sacrificed thereby, for *his* license fee is paid for the upkeep of the *National Service* in which there are no advertisements, and to which he can tune in. We are convinced that THE ONLY SATISFACTORY METHOD of providing adequate coverage in broadcasting services in New Zealand is to openly acknowledge the necessity for the "B" Stations, and permit them to earn revenue from advertising. To illustrate what freedom in the use of advertising would do *for* New Zealand listeners, we point out that in *Sydney alone* the B Stations spend more annually in providing programmes for listeners than the *total* revenue of the N .Z. Broadcasting Board! ! !

The Fallacy of the B.B.C. Model.

Listeners have been told repeatedly by the Postmaster-General (Hon. Adam Hamilton) that the broadcasting policy in New Zealand follows the British Broadcasting Corporation, and that as there are no "B" Stations in Great Britain, there is no necessity to grant any rights to them in New Zealand. There could be no more convincing exposure of this fallacious argument than by a comparison side by side of the conditions existing in each of the two countries. A short study of the following facts will indicate the stupidity of even attempting to imitate the B.B.C. policy.

	GREAT BRITAIN.	NEW ZEALAND.
Approximate No. of Licensees.	7,000,000	160,000
Approx. Revenue.	£3,500,000	£200,000
Talent Available for Programmes.	Unlimited for all practical purposes, and generous use of their funds to encourage English and European artists of the first quality.	A scarcity of local talent due to small population, and a lack of encouragement by the Broadcasting Authorities of the talent that *is* available.
Alternative Programmes.	In addition to the B.B.C. National and Regional Programmes, there are dozens of high powered European Stations within a radius of two or three hundred miles providing superlative programmes.	In addition to the mediocre National Programmes, the "B" STATIONS are the only available alternatives within a radius of 1,200 miles; AND their existence is threatened by harassing restrictions and copyright difficulties; AND THEY ARE NOT ALLOWED TO EARN THEIR OWN REVENUE to provide listeners with alternative programmes.

No one reading of this comparison can fail to realise that in endeavouring to "follow the B.B.C." we are merely chasing shadows. The country to which New Zealand conditions approximate more than any other country in the world is Australia - sparsely populated and with limited revenue. To answer the New Zealand Government's policy of driving the "B" Stations out of existence, we quote these extracts from the Report of an Australian Royal Commission in 1933, under the chairmanship of Mr. Justice Owen, C.B.E.:-

"Broadcasting in Australia apparently differs from that in all other countries. There are National (non-profit earning) stations operating side by side with 46 B Class Stations which are carried on for profit, **each class supplemental to and NECESSARY to the other,"**

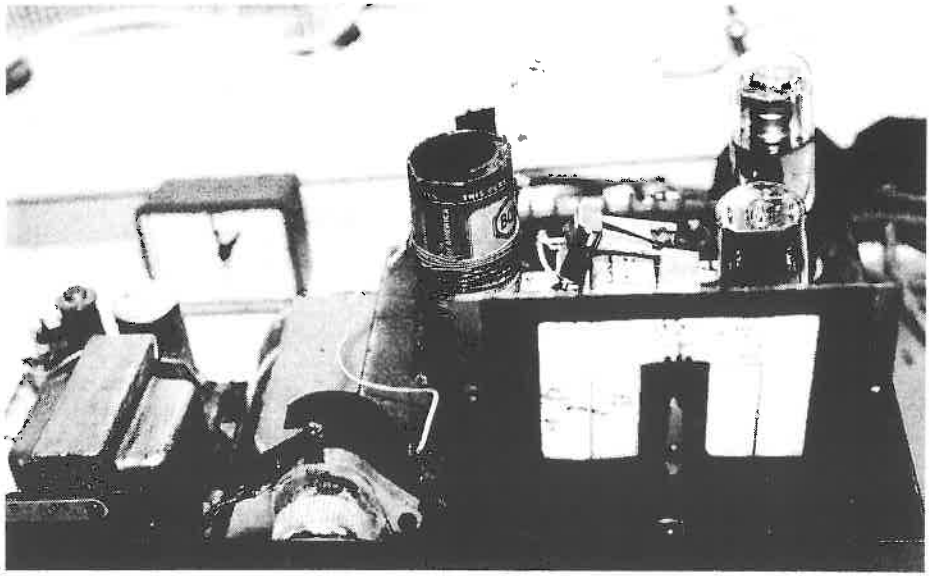
"It may be said that there are too many B Class Stations, but in the opinion of the Australian Broadcasting Commission, the 'B' Stations are now and will be for some time to come a necessary adjunct to the National Stations"

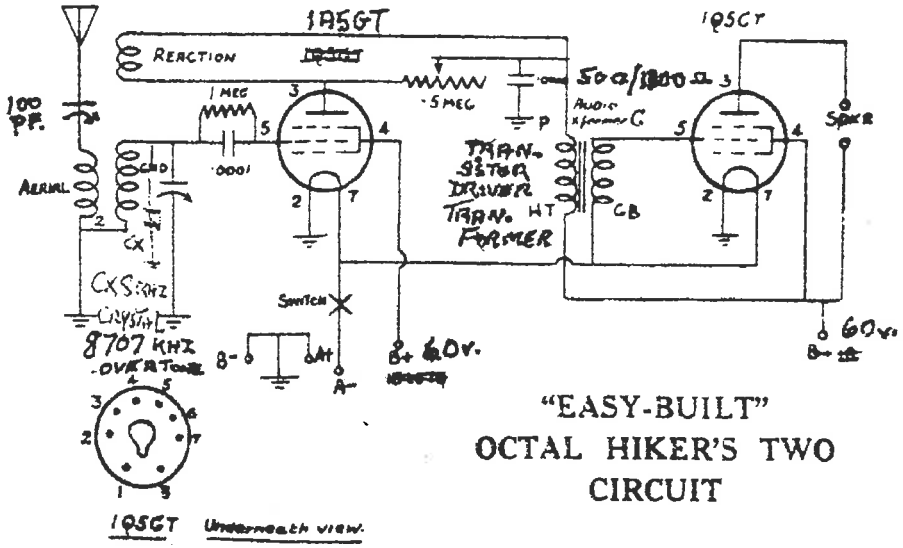
"To have the 'B' Stations giving additional music and entertainment is a definite service to the public"

"The 'B' Class Stations undoubtedly have in the past assisted materially in increasing the revenue which comes from listeners' licenses. **If these Stations had not been operating, far fewer licenses would have been taken out."**

The above are only a few selected extracts from the learned Judge's Report, but they are sufficient to expose the humbug of our Government's policy of "following the B.B.C."

That the Commission's findings were justified is proved by the fact that since the publication of the Report, many *additional* licenses have been granted to "B" Stations in the' Commonwealth.





"EASY-BUILT"
OCTAL HIKER'S TWO
CIRCUIT

Mike Edward's effort for his grandson (see letter opposite)

LETTERS TO THE EDITOR

NZVRS Bulletin

For those of us out of Auckland the bulletin is the sole contact with the NZVRS. It is a professional looking publication and a good read. It compares well with other club magazines which I get. It must take a lot of work to put together. So congratulations to the writers and editor and keep it up!

In particular I enjoy the articles about restoration. These articles are a very important resource especially for those of us who don't have the experience of John Stokes to call on. American and English books are all very well but their advice is not always relevant - especially concerning terms and where to buy bits or substitute parts.

Also the NZVRS has an interest in ensuring that its members know how to carry out sensitive and effective restorations - I have seen a few butchered sets whose owner was probably well-meaning but didn't have a clue what he was doing. We owe it to future owners of our collections (Bill Farmer once said to me "You're just taking care of it for the next bloke")

And thinking of John Stokes and other "silent keys" (silent soldering irons?) there is another reason to encourage the old hands to share their experiences with us (slightly) younger ones - and it is a selfish reason. Genuine Kiwi experience and expertise is disappearing every day. We need to get as much as possible on paper - not just servicing expertise but also stories about what life was like in the days of valve radio. Easy for me to say, I know.

Hugh Hanna, Christchurch

A Set for the Grandson

This I thought might be nostalgic to old constructor's who had memories of the Hikers One series.

My grandson came up during the school holidays and asked me what a valve radio looked like so I said "what say we make one".

Going through old radio mags we came across the 1950s Lamphouse Annual describing the "Easy built" Octal Hikers Two and out came the junk box to find some of the needed parts.

Shown opposite is the circuit basically which we built with a few alterations due to unavailability of parts. I used a driver transformer from an old transistor set for the audio interstage, an old used cake tin for a chassis - substituted valves 1A5GT as oscillator and 1Q5GT as output to 2000 ohm headphones. I found an old "B" eliminator for HT of 65 volts and two AA cells in parallel for "A" supply. See picture opposite.
I placed an 8 MHz overtone crystal across the tank circuit and this holds regeneration rock steady on stations.

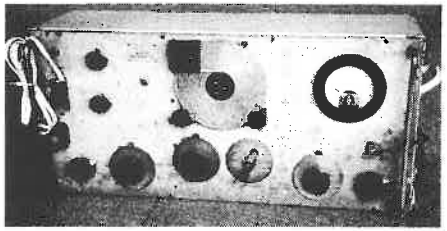
We logged stations from 10 to 17.5 MHz including Radio Madrid, All India Radio, BBC, VOA, Radio Australia, HCTB Ecuador and Guam.

Mike F Edwards, Waiuku.

Old Signal Generator

I've just had come into my possession the Marconi Signal Generator No. 1, WY No. 0062., pictured below.
I would appreciate knowing more about it; e.g. date made, specs etc. It has 4 Mazda valves but couldn't see the type numbers. It has been owned all its life by Fosters Radio Shop in Christchurch.

Paul Burt, Christchurch.



MARKETPLACE

Advertisements for the next issue must reach the editor by the 17th July 2004. Ads must be either hand printed, typed on a separate page or emailed. No verbal or phone ads. Remember to include your name, address and phone number. There is no charge for ads but the NZVRS is not responsible for transactions between members. Address ads to Reg Motion, 2A Hazel Terrace, Tauranga. New Zealand or email regmotion@xtra.co.nz

AVAILABLE

Following books, all hard-backed
1992 ARRL Handbook $20; Basic Colour Television-Cole-3 parts-1983 $20; Colour Television Servicing-King-1973 $15; Practical Radio & Television- Quarrington-$30: Transistor Radio Handbook-Earnshaw-1962 $10: QST Sept/June 1928 $15; QST July/Dec 1928 $15; QST July/Dec 1929 $15; Modern Radio Servicing-Ghirardi-1935 $25: Ditto $25; Electrical Installations-Molloy-1945 $10; Electrical Engineering-Slingo-Brook-1900 $20; Telegraphy-Herbert-1918 $20; I.C.S.-reference library-1922 $20; Magnetic Tape Recording-Spratt-1958 $20; Colour Television, Pal system-Patchett-1967 $20; C.A.T.V. Engineering Systems-Rheinfelder-1970 $10; Wonders of Modern Electricity-Gibson-1914 $10;
Servicing Superheterodynes -Rider-1914 $10; Electric Lighting & Power Distribution-Perren/Maycock-1894 $10; Outline of Wireless-Stranger (slight damage)-1932 $10; Magnetism & Electricity- Jamieson-1914 $10; Television Engineering pocket book-Hawker1954-$10; Audels Home Appliance Service Guide-Anderson-1954 $10: Colour Television Explained-Holm-1963 $5; Antenna Design Explained-W3FQJ-1970 $5; Hawkins Electrical Guide-10 vols-Audel-1924 $30; Admiralty Handbook Wireless Telegraphy-vol 1- 1938 $20; Vol 2 $20; Vacuum Tubes-Bucher-1918 $10; Modern Electrical Practice-MacLean-vol 4 only-1908 $10; RSGB Radio Communication Handbook-1938 $20; Magnetic Recording-Begum-1949 $10; Radio Handbook-Orr-1972 $20; Modern Electronic Communications-Miller-1983 $10; Cyclopedia American Technical Society-Vol VI & IV-1905 $20; Outline of Wireless-Stranger-1931 $20; Radio Engineering Handbook-Henney-1941 $20; ditto-1935 $20; Repairing Video Games-Goodman-1978 $5; Drakes Cyclopedia of Radio & Electronics-Manly-1929 $15; Television Servicing Handbook-King-195 $10; Diodes & Transistors-Fontaine-1963 $10; Electrical Technology-Cotton-1924 $10; Magnetism & Electricity-Radley-1936 $10; Typical Oscilloscope Circuitry-Tektronix-1961 $10; Colour Television Theory-Hutson $10; RSGB Radio Communication Handbook-1976 $15; Radio and Elect. Notes for Wireless Operators; Electricity- Ferguson-1882 $50; Magneto Repairs-Cassell-1920 $5; Small Dynamos-Cassell-1920 (no cover) free; Beginners Guide to Radio-Camm-1955 $5; Electrical Notes for Wireless Operators-1939 $10; Radio Transmitters, Learning Code-1925 $5; Radio Servicing-Patchett-1957 $5; Radio Constructors Guide-Read-1935 $5; Small Accumulators for Students & Amateurs $5; Electronic Novelties-Bradley-1956 $5; Test Gear for Amateurs $5; Complete Electrical Data Sheets $5; Radio Servicing Simplified-1934 $5; Electricity & Magnetism-Lambert/Andrew-1938 $5; Intro to Electricity & Radio- Turney-1943 $5; Theory of Electricity-Cumming-1885 $30; Basic Electronics for Navy Personnel-1962 $5.
Bill Lambie 73 Poole St., Motueka. Ph o3/5284189.

Signal Generator, Marconi Instruments Standard No. 1, WY 0062, weight approx 20 - 25 kg. Open to offers. Paul Burt, Christchurch, Ph 03/332157.

Late 1950s Radiogram, in solid mahogany mirror-finish two-door cabinet 900x900x450 with cabriole legs, no borer. "Q" 4 valve Broadcast tuner by Alsec NZ. Audiomaster Preamp-selector W & N Electronics, London, type 11a. Power Amp, pushpull EL34 also by Audiomaster. "Connoisseur" turntable.

Speakers, 3 way, 4", 10"(suspension perished), 12" Wharfedales in separate matching gold metal grille mahogany unit, 900x800x300. Offers please. Maurie Challinor, Ph 09/8275133. email mauriechallinor@actrix.co.nz

WANTED

Valve Comms Receiver of the boat anchor variety, esp. Hallicrafters, Hammarlund or Eddystone. Top $ paid for good working examples but any condition OK. Greg Cooney, Phone 04/9398525 or email greg@oldradios.co.nz

Eddystone 770U Mk2 UHF Receiver. Jeff King, 45 Roberta Drive, Christchurch 8002, Ph 03/3325446 evenings or email vortex6066@yahoo.com.au

Valves- ECH42, EAF41, EBC41, EZ40, EL41 for Pye Mantel DW - must be emission tested. M Edwards, 47 Martyn St., Waiuku 1852. Ph 09/2356903.

Circuit for "Palec multi tester" ser/mod no. MT61167. Manual/circuit for Radio Pty Ltd "Supertester" mos/ser no.1883. Gulbransen mod. 7j cabinet. Any info for Jennings "univox' mod j6 electric organ. Any Ux226 or 26 valves. Phone Daniel Hockey, 09/2357402 evenings.

Small Philips shield for the front of the "Philette Model 540". Graeme Lea, 116 Cutfield Rd, New Plymouth. Ph 06/7585344

Gernsback Radio Library No. 1 Radio Analysers and How to use Them. Must be 1st and/or 2nd printing only. Good price paid. Ernie Hakanson, 17 Williamson Ave, Grey Lynn, Auckland. Ph 09/3766059.

Circuit diagram for Hung Chang model 5505 oscilloscope. Reg Motion, 2A Hazel Tce, Tauranga. Ph 07 5768733. email regmotion@xtra.co.nz

FROM THE LIBRARY

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

755 The Bush EBS 64. Photos, circuit, description, restoration details . HRSA Radio Waves, Oct. 2003. p4

756 MN26 Compass Receiver Conversion. Photos, description, modification details. HRSA Radio Waves, Oct. 2003. p12

757 A Capacitance Leakage Tester. Constructional article. HRSA Radio Waves, Oct. 2003. p16

758 The Bush Church Aid Society Radio Network. Historical, Photos, description. HRSA Radio Waves, Oct. 2003. p27

759 The Astor "Football". Photos, description, circuit. HRSA Radio Waves, Oct. 2003. p33

760 The Wireless Set No. 22. WW2 British Transceiver. Photos, description, circuits. HRSA Radio Waves, Oct. 2003. p35

761 The Perils of Radio Shipping. Safe ways of packing radios for shipment. Canadian Vintage Radios, Sept/Oct 2003 p 6

762 Calibrator, Crystal No.7. Photo, circuit, description. History. Radio Bygones, No.85 Oct/Nov 2003 p4

763 Portable Radio Cabinet Repairs and Restoration. Methods for repair of light wooden cabinets. Radio Bygones, No.85 Oct/Nov 2003 p9

764 The rise and fall of the Valve HiFi Amplifier. Historical, circuitry, Photos,