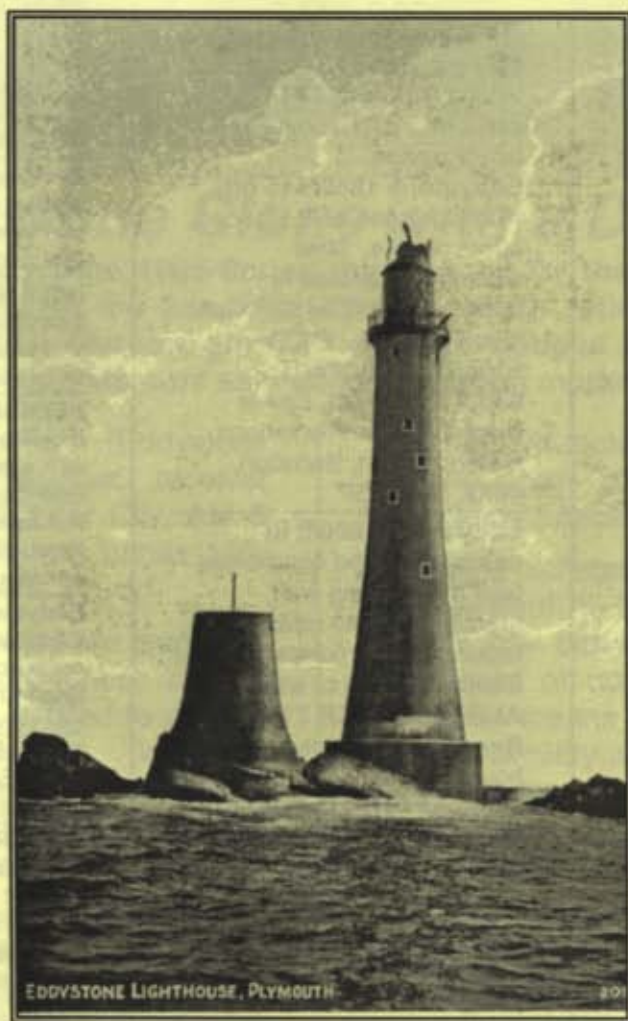


# Lighthouse

Founded 1990

The Magazine of the  
Eddystone User Group

Issue 80, August 2003



“Smeaton’s Stump” and the  
Eddystone Light,  
from an early C20th Postcard

## EDDYSTONE USER GROUP

A non-profit-making group for Eddystone Radio Enthusiasts  
Founded in 1990 by  
Ted Moore  
Issue 80, August 2003

### Membership Details:-

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(or €30

banknotes)

Rest of World: £23

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transceiver. Call Ted Moore on

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## Chris's Column

Now it is the Summer issue and we have had nice spell of very warm weather and the ex-Eddystone employees have Stan's bash to look forward to at the end of the month. Cheques for the fighting fund continue to roll in and as the table shows we have a really respectable amount of money to invest in some new PC equipment. Some of the items on the list include a bigger flat-screen monitor, scanner and laser printer. Graeme tells me he has been struggling with formatting the newsletter with Word and has been getting help from Peter Lankshear (in NZ). He thinks he has it cracked. I don't think Word was ever really designed to be a top flight Desk Top Publishing Software so it does struggle a bit with a typical Lighthouse. Any way a further thanks to those of you who have contributed. It is very much appreciated. We will keep the fund open for a little longer.

### PC FIGHTING FUND

Roger Bunney	£10	G.P. Stancey	£10
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Terry Hart	£10	Anon	£20
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Peter Hamblett	£10	John Townsend	£20
John Holroyd	£50	Jim Kyle	£21
David Cady	£10		
		Total (19/7/03)	£1231

VHF NFD has come and gone and my local club had an enjoyable weekend although it does seem to get harder each year to get people to volunteer for things and none of us are getting any younger. I ought to be worried that I am beginning to sound like my father used to, but it does seem to me that younger and more fitter members are less interested in the hard work and prefer the lighter duties such as switching the laptops on.

The introduction of the M3 licence has not been without controversy. I am for anything that gets or keeps people in the hobby and any M3's I have heard on HF have shown themselves to be good operators. I read on the internet that the Morse test has been abandoned and that B and A licensees now have the same privileges. Some will be offended by this but I think it was inevitable after the introduction of the M3 licence. The important thing to me is to get people interested and active in this hobby because I do believe that without a strong constituency of radio amateurs, commercial pressures will continue to want to take privileges away from us. Anyway I hope you enjoy your Lighthouse, I am sure you will and I look forward to the next time.

*73 de Chris GØEYO*  
*Patron -Eddystone User Group*

# Letter from South Porcupine

By David W Whiting

Over the past six months we have had much ongoing and absorbing comment about the Eddystone 830-series ("The Jewel in the Crown"). In our last issue (#79, June 2003) David wrote for us a very interesting piece on the 830/4 in Canadian Govt service. This month he fills us in with his afterthoughts . . .

Dear Graeme,

Received my June 'Lighthouse' today, and just wanted to send along this note regarding my input on the CDN 830/4 receiver.

First of all, TYVM for tidying up my English composition to make the article more readable, although I've never seen the word 'surveylance' (page 30) for surveillance, which is commonly used in N. America. HIHI Maybe our American friends will be wondering about that one. *(Actually, David, it's an old Bewdley way of spelling it (!). Has anybody noticed that 'Bewdley' is derived from Norman French? Have a go and anybody who gets the original meaning correct will get a special mention. -- Graeme.)*

I guess the town name 'South Porcupine' is a bit strange. It was apparently the name of one of the original gold mining camps (along with Porcupine and several others) in the big Timmins gold mining area.

We just live here because it's now just a suburb of Timmins, and my XYL is still working at Timmins airport. I'm originally from the Sherbrooke, Lennoxville, area of Quebec. (Now there's some good old English names you can sink your teeth into HIHI!).

Enclosed is one of my old homebrew QSL cards from 1964 when I first got

my ham licence (I was then in the process of studying for my 2<sup>nd</sup> Class PMG).

DAVID W. WHITING, LENNOXVILLE QUEBEC, CANADA	
VE2BTW	
QSL	
QSO WITH _____	ON _____ AT _____
MODE _____	UR SIG _____ ANT _____
RX _____	TX _____
REMARKS _____	

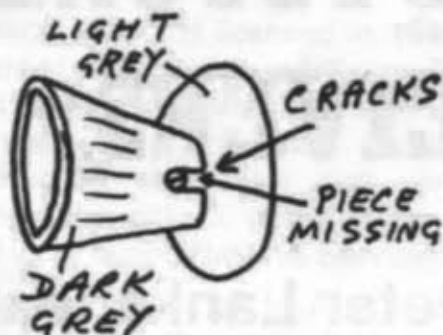
My only other comments are on the 830/4 spares kit and the control knobs cracks.

The spares kit contained quite a bit more than the dial cord and a few spare knobs. After thinking about it for a while I remember there were two spare aluminium can electrolytics and two green porcelain-covered resistors (140 ohms for the power supply surge limiters), two small electrolytics, a spare set of dial lamp bulbs and fuses as well as the dial cord and knobs and a few more items I can't recall.

I don't remember there being any valves, though. But we'd got hundreds of thousands of our own so they probably weren't needed.

The control knob cracks were a very minor thing and I never heard anyone

else even mention it. Perhaps no-one else but me (a receiver fanatic) ever noticed. I just thought it strange for brand-new merchandise to have an imperfection like this, unimportant though it may have been.



The knob that probably first caught my attention had two cracks and the piece of dark grey plastic between the cracks had fallen out and disappeared. That made me look at the other knobs and check out other 830/4s (all basically new).

I think 50% of the knobs I looked at had at least one crack, with a few having two cracks (as shown above). Nothing serious, but it made me wonder why (especially as I owned a 940 with identical-looking knobs).

As the receivers were all from the same batch with probably even more or less consecutive serial numbers, the knobs were maybe made that way too and localised more or less to that production run of receivers.

Maybe the plastic hardened too much and became too brittle, or maybe too much pressure was used to assemble the two-tone knobs themselves. Maybe some feedback will explain all!

**I would like** to see some articles appear from users of the 880, 850/2/4, and the newer 1830, 1837/38 and 1650 receivers in commercial or marine service, and the old 730/4 in Army service. There must be some more retired R.O.s out there with

experience of these and other Eddystone models!

Thanks again, Graeme, and I will try to respond to any queries or questions or whatever that might turn up, perhaps from other 830-series users in other parts of the world.

*(David then goes on to say that he doesn't necessarily expect any of this to be printed in 'Lighthouse' and that it's mainly for my info and database, in case anyone ever asks.*

*Let me say that 'Lighthouse' IS my database and such letters are the very stuff of it.*

*Come on anybody, can you fill in David's request for User's Experience, please. — Graeme)*

More from Graeme:- My own observations of about 100 of these 830/940/840C knobs is that I've only ever seen one crack such as David describes.

I have, however, seen some identical cracks on the larger but contemporary knobs from a 670C/1 (Mimco 'Elettra', see QRG/3 page 29).

*Tom Toth, G4ORF writes to say . . .*

*" . . . it is very unusual, but in my official line of duty I have seen cracked control knobs on a number of occasions and thought to share my ideas:-*

*Most of the cracks occurred on knobs that had a thin (1-2 mm) outer plastic material on a brass centre portion. Some plastics are known to shrink with ageing, metal doesn't. Knobs with a substantial plastic body, e.g. the early grey ones on the EC10 didn't seem to suffer the same fate.*

Last word from Graeme: The word from the ex-Bath Tub chaps is that it was due to shrinkage of the plastic provoked by the hole. The 'collet' type of knob was adopted afterwards. ♣



# **LOUDSPEAKERS for EDDYSTONE RECEIVERS**

**By Peter Lankshear**

*Engineer, NZBC, (Retired)*

**Ever wondered why valved communications receivers, including Eddystone, frequently don't have built-in loudspeakers?**

**Back in the early and mid 1920's when short-wave transmissions, and Eddystone receivers, had their beginnings, transmissions were primarily used for communications which meant Morse code.**

Headphones were generally used and were, in fact, preferred. In any event early short-wave receivers were small regenerative types with limited audio gain and ability to drive speakers.

Another very good reason for not using a loudspeaker in these receivers was microphony. The vanes of tuning capacitors, and battery valves, especially the early types when used as regenerating detectors, were extremely sensitive to vibration. The sound from a speaker in close proximity to the receiver internals was sufficient to set up acoustic feedback.

By the early 1930's the microphony problem was significantly reduced by the use of indirectly heated valves and rigid construction, but it was still rare for a communications receiver to have an integral loudspeaker, for they were

not always wanted.

One can imagine the chaos in a major installation if each receiver had its speaker operating.

Commercial communications receivers generally had the capability to drive loudspeakers if required, but the choice lay with the user, and moving coil speakers were not always a first choice.

Magnetic technology was limited, using very large and expensive steel permanent magnets or, more often, speakers had an energised field and separate power supply.

Photographs of ham installations taken during the 1930's sometimes show a National HRO or Hammarlund PRO connected to an old horn speaker pensioned off from domestic service,

which would have been quite adequate for the job.

By the late 1930's advancing permanent magnet technology had made suitable P.M. speakers readily available. But communications receivers remained generally speakerless, and when after 1946, Stratton & Co. commenced building their Post War communications receivers they followed convention and with an eye on the tax man did not provide integral speakers.

This tax avoidance ploy did not convince His Majesty's revenue gatherers but proved to be an advantage for purchasers in New Zealand which had, at the time, very heavy import tariff protection for broadcast receivers. But after much argument, the tax gatherers were persuaded that speakerless Eddystones were not for entertainment! (*In the UK tax exemption came with the presence of a BFO rather than the absence of a speaker* – Graeme.) With the introduction of the 750 and full width dials, front mounted speakers would have been less practical, although the little 870 and the 840-670-series did have speakers at the side, not always the best location.

Owners of some of the earlier receivers with "half moon" dials, (640, 740, 840 etc.) will have noticed speaker recesses moulded into the rear of the front panels. These are likely to have originated from the panel originally being designed for the high performance broadcast receiver model 556 with twin 3" speakers.

However, the vacant holes in these panels assist in the ventilation of their cabinets and consequently, I would be reluctant to fill them with speakers.

As shown in last year's "Q.R.G.", Strattons provided optional external

speakers in enclosures. Most common were the round diecast type with louvres matching those on the receiver cabinets.

These came in two sizes, fitted with 5" or 3.5" speakers. Later there was a square steel cabinet with a 5" unit and a novelty for the 670 cabin receiver, a pillow speaker only 1" thick.

Finally there were two types of plinth speaker enclosures, designed to lift the front of the receiver and fitted with elliptical speakers.

However, it is likely that most Eddystone receivers were connected to speakers supplied by their owners, - no doubt a very heterogeneous lot.

My own collection is likely to be typical. Eddystone speakers include a pair of 5" diecast enclosures and a plinth unit. As well, there are three 8" speakers; a Rola, a Philips inverted speaker with the magnet in front of the voice coil, and a Goodmans "Axiette" all mounted in small wooden cabinets originally from extension speakers;. Finally there is a high quality free standing speaker unit made by AWA!

I guess that if my Eddystones were part of a working rather than a hobby installation they would be connected to a selector switch with one or two speakers only.

Many Eddystone receivers are likely to be acquired accompanied by a speaker, but if not, suitable units should not be hard to find. The once popular domestic extension speakers are ideal as they come with ready made enclosures of suitable size.

These units often had a volume control which should be disconnected, as should any transformers. An obvious source of speaker units is unwanted receivers or televisions, but some sort of enclosure is likely to be needed.

Communications receivers are not

normally associated with high audio quality, and small speakers with a relatively restricted audio range are generally adequate.

However, Eddystone receivers have well designed audio amplifiers and can if desired, be coupled to wide range speakers. Especially good audio systems are in the bigger receivers, such as the 680 and 940, with push pull output stages and negative feedback.

This brings us to the question of speakers' impedances, which, are rated in ohms. In the valve era, domestic radio speakers ranged from a nominal 2.5 ohms to about 4 ohms.

High quality units were generally 15-16 ohms although there were a few 8 -12 ohm models. The advent of the transistorised output stage saw 8 ohms become more widely used.

However, a speaker's impedance varies enormously over the audio range and is least around 250-400 Hz where its rating is generally quoted. Although a speaker may have a specified impedance of 2.5 ohms, it may well measure 15 ohms at 10kHz and even more at the cone resonance frequency which is typically around 100 Hz or a bit lower.

As a rule of thumb, a speaker's nominal impedance can be estimated by adding 10 -20% to the resistance of the voice coil as measured with a test meter.

The audio system of a valve receiver is analogous to the transmission of a car. The output valve stage is equivalent to the engine, the output transformer to the gearbox and the speaker to the road wheels. Just as the wheels cannot be directly coupled to the engine, so a transformer is required between the valves and the speaker. To carry the analogy further, just as a given set of road conditions requires

the correct gear ratio, so the output transformer requires a specific turns ratio for a receiver to develop full audio power. Fortunately though, for the type of service generally expected of them, Eddystone receivers have surplus audio power and some mismatching from the standard 2.5 ohms is not too serious. Certainly any speaker below 5 ohms should not present any problems. Using higher impedance speakers does restrict the power output capability a bit, but unless you wish to fill an auditorium, this is unlikely to be a problem.

Receivers with push pull output stages have negative feedback, which increases tolerance to feeding 8 and 15 ohm speakers. Single output valve models without feedback may lack a bit of bass, but if the sound is satisfactory, feel free to go ahead - you won't damage anything.

Purists may wish to improve matching by paralleling two high impedance speakers but another way is to use a simple home made auto-transformer.

Procure a small transformer, preferably with the windings on a plastic former, and some 24 SWG wire (Larger transformers could accommodate 22G wire). Dismantle the transformer and strip the windings off the former. Now wind on neatly, about 200 turns, tapping the winding at the half way point.

Reassemble the transformer. Note that the core originally may not have been interleaved but it should be now.

You now have a matching auto transformer with a 4:1 impedance ratio. (Note, not 2:1) The tap and one end of the winding are connected to the receiver, whilst the start and finish of the winding are connected to the 8 - 15 ohm speaker.





# The Classic Eddystone Appearance



Graeme Wormald G3GGL  
Patent Office research by Peter Carney

When the first new Eddystone (*S.556*) appeared after World War Two it bore absolutely no resemblance to anything previously produced by the company.

It was a fashion which was to set the style for almost 30 years. Quite frankly, Eddystone sets were never the same before or after this 'Golden Age'. But where did it come from? Research among the files of the Patent Office has produced this embryo of 1944, recognisably the leader of the pack which we so avidly hunt.

By April 1944, Stratton's would have completed their batch of VHF duplex radio-telephones, used so successfully on the D-Day landings. George Laughton, the chairman of the board (who knew nothing of radio), would be asking Harold Cox, technical director, what plans he had for post-war production. It was widely believed that peace in Europe would come before the end of the year. Harold put on his thinking-cap and came up with what led to the classic design of all time. Patent No 577,443. Check it out on the coil-box of your 640/740/840/940 etc., etc. . . .



Harold N. Cox



George A. Laughton



## PATENT SPECIFICATION

*Application Date: April 27, 1944. No 7943/44*

*Complete Specification Left: April 27, 1945*

*Complete Specification Accepted: May 17, 1946.*

### PROVISIONAL SPECIFICATION

#### Improvements relating to Radio Apparatus and Electric Test Equipment

We, GEORGE ABE LAUGHTON, of North Rookery, Lowsonford, Henley-in-Arden, Warwickshire, and HAROLD NORMAN COX, of 25, Broad Lane, Kings Heath, Birmingham 14, both British subjects, do hereby declare the nature of this invention to be as follows:-

The invention relates to radio receiving and transmitting sets and to test equipment and concerns a construction of those sets which has the object of rendering them more stable mechanically and offering advantages of easy access and convenience in handling for inspection and attention or replacements.

In accordance with the invention we form the front panel of the set as a rigid die-cast plate which forms the foundation member on which everything else is built. The plate is suitably ribbed at the back give it the desired strength and it can be cast with the necessary openings for the passage through it to the front of spindles or other control means for the manipulation of the variable instruments mounted on the back which enable the tuning of the set to be effected. It may be cast with recesses, attachments lugs, bracket projections, or like means for the attachment to the back of it of the various valves, transformers, condensers and other attachment means for such instruments. The plate is also cast with a rebated edge or equivalent locating means into or against which a case of suitable metal can be accurately fitted and secured. The "chassis" of the set which is built on the

back of the said cast plate and contains on this foundation member all the instruments and parts, can thus be enclosed and screened, and if provision for snapping engagement is made, its fitting and attachment can be very rapidly effected.

On the cast plate which forms the rigid front panel, strong hand grip rails are provided. It is well-known to provide handles on the front panels of radio apparatus, but we provide grip rails spaced from and parallel with the front of the panel and of a length sufficient to form firm support feet on to which the panel, with the instrument chassis complete, can be inverted for giving access to the various components on the chassis.

One method of providing for the quick attachment and removal of the enclosing and screening metal case which is fitted onto the rebated face of the cast plate, is to provide say two screw bolts with half round heads projecting at the rear most part of the rigid plate. In corresponding positions in the back of the case spring wire catches are provided to snap over the heads of the screw bolts. It is preferred to employ a lever operated release means as in Patent 437,124

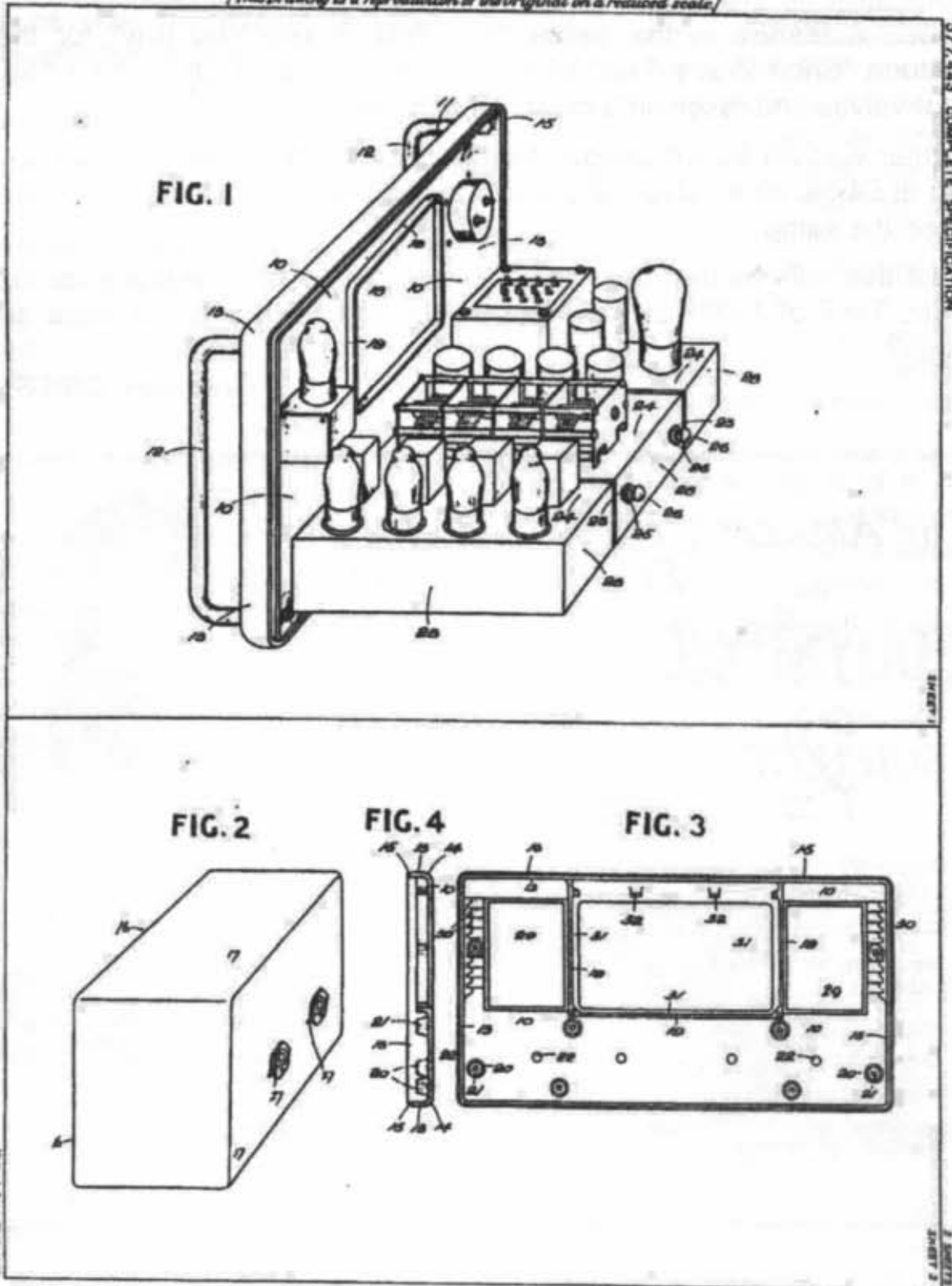
The invention provides one rigid foundation and true surface on which the whole of the components of the set can be accurately line up and rapidly fitted. It avoids a great deal of the hand fitting which often has to be done owing to difficulties of alignment where a component has to be secured between an

attached part of the back of a panel and a bracket or part attached to a second support.

BARKER, BRETTEL & DUNCAN,  
Chartered Patent Agents,  
75 & 77 Colmore Row,  
Birmingham 3.

Dated this 15<sup>th</sup> day of April, 1944.

*[This Drawing is a reproduction of the Original on a reduced scale.]*



# SEEING DOUBLE

The renowned radio constructors' journal "Wireless Magazine" for the month of August 1931 (*a healthy 104 pages*) carried two items of interest to the Eddystone enthusiast.

One was a feature in the series "We Test Before You Buy" for the Eddystone "Short Wave Two" kit set (*shown opposite*). It cost £3 19s. without valves and received a clean bill of health.

The other was an advert (*below*) for the Eddystone "Scientific 2" kit set, priced at £4 5s. plus valves. We could be forgiven for thinking they were one and the same . . .

At least this tells us that the "Short Wave Two" is not the same as the "Atlantic Two" of 1927, as has been suggested. But why the extra six shillings?

Graeme - G3GGL

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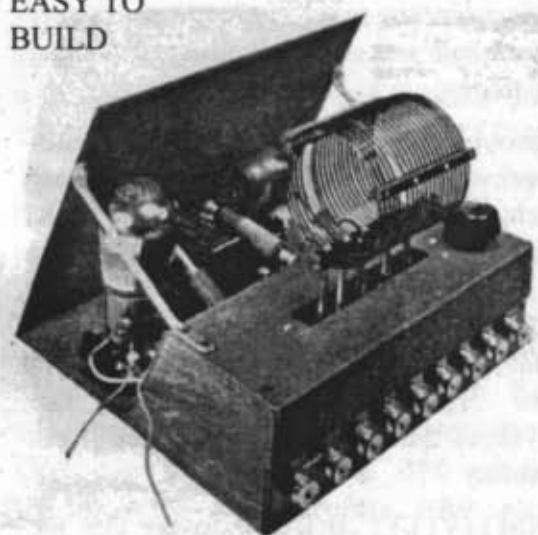
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## EDDYSTONE SHORT-WAVE TWO (KIT SET)

EASY TO  
BUILD



*Construction of this set is an easy matter for all listeners.*

**MAKER:** Stratton & Co., Ltd

**PRICE:** £3 19s. This is the total cost of the components listed by the makers and includes a special aluminium chassis which can be bought separately for 18s. 6d., drilled complete with coil stand, end pieces, brackets and terminal blocks.

Included also are three short wave coils, No D1, price 5s.; No. D3A, price 5s. 6d.; and D4, price 6s. 6d. The constructional details and the blueprint can be obtained, price 6d. from the makers.

**POWER SUPPLY:** The above price does not include the batteries needed to work this set. If the makers recommended pentode power valve is used, we suggest that double-capacity high-tension batteries are advisable, although the maximum voltage need be only 100 volts. A 2-volt accumulator and a 9-volt grid-bias battery are also required.

**POWER CONSUMPTION:** With the pentode valve slightly over-biased we found the total anode-current consumption taken from the high-tension battery was 10

milliamperes. With a small power valve in place of the pentode, this was reduced to 7 milliamperes, with, of course, some loss in volume.

**VALVE COMBINATION:** As might be expected, the valve combination comprises a leaky-grid detector transformer coupled to the pentode output valve. We note from the circuit diagram, supplied with the set, that the modified Reinartz system of reaction is employed.

The short-wave coil is tuned by a .00025-microfarad variable condenser, connected in series with the reaction coil across the anode of the detector valve and earth.

A special short-wave high-frequency choke is inserted between the anode of the detector and the primary winding of the low-frequency transformer.

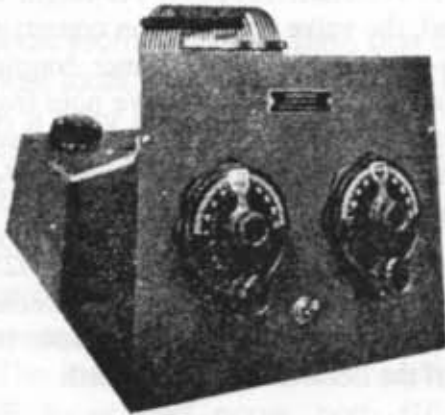
We note that the makers have coupled the aerial to the grid end of the short-wave tuning coil through a small midget variable condenser and not by means of an aperiodic coil, as is normally done. During tests the .00001-microfarad condenser in the aerial lead was found to provide a very efficient coupling. There were no blind spots over the tuning range of each coil and reaction was readily obtained on all the short wavelengths.

The grid condenser has a capacity of .0003 microfarad and the grid leak has a resistance of 3 megohms. The grid leak is taken to the negative side of the filament of the detector valve, and not the positive side. The result is very smooth reaction and apparently there is no loss of sensitivity.

**CONTROLS:** We were supplied with a completely assembled Eddystone short-wave chassis. From this we were able to appreciate the excellent layout of the

controls and of the other components. A very short study of the chassis proves that the makers are fully aware of all the design needs for short-wave work.

Thus the coil unit, for tuning and reaction, is mounted on a platform at the back of the chassis, well clear of the metal panel and controls. Near the holder for the short-wave coils is the knob of the midget coupling condenser.



The control panel is arranged "on the slope". The slow-motion dials for the tuning and reaction condensers are fitted with extension spindles and the tuning and reaction condensers are actually underneath the coil unit – well away from hand-capacity effects. The whole layout is notable for the shortness of all the connecting wires.

Apart from the two slow-motion dials for tuning and reaction, and the knob for varying the aerial coupling, the only other control is an on-off switch mounted in the centre of the control panel.

The two slow-motion dials are divided into degrees from 0 to 180. Such detailed divisioning is essential for short-wave work, where between every two adjacent degrees one finds probably two or three stations.

In estimating the efficiency of short-wave controls we have to bear in mind that the greatest need is for delicate adjustment of tuning and reaction condensers and that the

sensitivity depends almost entirely upon the smoothness of reaction.

Handling the controls of the Eddystone chassis soon convinced us that all these points have been carefully watched by the makers. We could detect no appreciable backlash in the movement of the slow-motion dials and consequently very critical adjustments could be made.

By providing a short, low-resistance earth we prevented any sign of hand-capacity effects when operating the dials. On withdrawing the hand from these controls the station remained tuned-in and did not disappear in the annoying way so commonly experienced in short-wave work. In fact, for a two-valver this Eddystone set is delightfully free from instability.

**SENSITIVITY:** It is true to say that the sensitivity of a short-wave set can be measured most fairly by the operator's skill. In other words there is no limit to the range of reception or to the number of short-wave stations capable of being heard.

During our first evening with the Eddystone short-wave chassis we tuned in the American broadcasting station 2AXD at 77 degrees on the tuning dial, using the smallest of the three coils. This 20-metre relay of WGY, Schenectady, came in at very great phone strength.

As a matter of fact we were able to work a loud-speaker at moderate volume in our subsequent reception of this station. The smallest coil tunes from about 15 to 36 metres, so one could get the 32-metre American broadcasting station 2XAF at the top end of the tuning scale.

During tests we found 2XAF was strongly received with the middle coil in circuit. This coil tunes from 27 to 55 metres and we got 2XAF at 52.5 degrees on the dial. Just above it was OXY, a Danish relay that came in at great strength. At 52 degrees we found Zeesen, received so strongly that it worked a loud-speaker. ♣

# Some More Suggestions for Servicing Valve Receivers

By Gerald Stancey G3MCK

As a new boy to the EUG may I say how impressed I am with 'Lighthouse' and may I be permitted to make some additions to Peter Lankshear's excellent articles published in last year's issues.

## Voltage Measurements

I believe that it is essential that the initial voltage measurements should be made in the same manner that they were originally made for the manual. Remember that you are not actually measuring voltages: you are seeing whether you get the same reading as those that were given in the manual. If your readings do not agree with the manual then there is something wrong with that stage. Even if they do agree with the manual there may still be something wrong with that stage!

The Eddystone manuals quote the sensitivity, in ohms per volt (opv), of the meter that was used. This is not really sufficient; you also need to know the voltage range on which the reading was taken. For example, a reading of 95v could have been taken on either the 100v or 150v range of a multimeter.

Depending on which range is used the same voltage can give different readings. Perhaps some member of EUG could tell us exactly what meters were used by Eddystone and the workshop standard procedure that was followed when it came to selecting voltage ranges.

*(Note from Graeme: I have spoken to Bill Cooke, former chief engineer at Eddystone and who worked there*

*from 1935 to 1984. He tells me that during this period many different meters were used. The Avominor with a 3 mA movement (330 opv), the Model 40 with a 1mA movement (1,000 opv) and the Model 8 with a 50 micro-amp movement (20,000 opv). The range used is always the lowest range to accommodate the voltage – i.e. the 250 volt range to read 150 volts. A variation of 10% is allowed unless otherwise specified.)*

By itself a DVM (digital volt-meter) is very unlikely to provide the correct results. This is because it will not load the circuit to the same extent that an un-sensitive analogue meter does.

There are two solutions to this problem. Firstly acquire or make a voltmeter of the sort that was originally used. Making a meter is not hard as you are only seeking to emulate the DC voltage ranges.

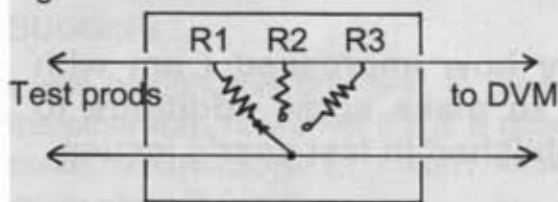
The second solution is to make an interface that will enable your DVM to emulate a 1,000 opv voltmeter. To do this simply shunt the input with a resistor of the required value. For example if you wish it to emulate the 10v range of a 1,000 opv meter then the value of the shunt resistor will be 10K ohms.

The shunt(s) can either be haywired with croc clips or built into a nice box

with rotary switch, see figure 1.

Use your DVM to select suitable shunt resistors from standard values or make them from series/parallel combinations of standard values.

Figure 1



Select R1, R2, R3, etc., to suit meter sensitivity and range desired.

Let us assume your voltages do not agree with those given in the manual. The next stage is to do a current balance round the valve. This means measuring all the currents flowing into and out of the valve. The sum of the inflowing currents should equal those flowing out. They won't and here you will have to use your judgement to decide whether the difference is due to experimental error or is an indication of something being wrong.

I prefer not to unsolder leads so I measure the appropriate resistors *in situ*. Then from the voltage drop across the resistor I calculate the current flowing through it. Care is needed as the measured value of the resistor may not be its actual value.

For example a screen dropper may be effectively shunted by an HT to earth bleeder and a leaky by-pass capacitor. In this case the measured value of the resistor will be lower than that given in the manual and this may give a clue as to where the fault lies. If in doubt unsolder one end of the resistor.

Even if the measured voltages agree with those given in the manual it may be helpful to do a current balance. Little bits of information taken by themselves may be of no use but when

considered with other little bits of information may solve the problem.

### Transformer replacement

Peter is right; if a mains transformer has gone then it may be uneconomic to replace it but don't lose heart. Why not make an external powerpack? Granted it won't look as nice but at least you would be able to use the receiver, and in my cluttered shack it would take a hawk-eyed visitor to spot the external unit.

If the output transformer has gone and no replacement of any sort can be found, then modify the set for headphones only.

*(Note here from Graeme:- I have successfully used a 230v to 6v mains transformer as a replacement match for a 3-ohm speaker, or a 12v for an 8-ohm speaker. The little 6 watt ones sold by Maplin, etc. will do nicely.)*

We all have different views but surely a reversible modification that is well documented and results in a working Eddystone must be better than a scrapped or non-working set. The important thing is that the modification can be reversed at some future time.

### Signal generators

Again, Peter is right; the frequency calibration of the bog-standard serviceman's signal generator is not good enough for setting dial calibration. For this I use a crystal oscillator and 100kHz, 1MHz and 3.5MHz crystals. Most HF tracking points seem to be 100kHz multiples and the other frequencies are helpful in deciding which 100kHz harmonic I am listening to.

After setting the local oscillator I find that using the signal generator is satisfactory. Before acquiring a signal generator I satisfactorily aligned front

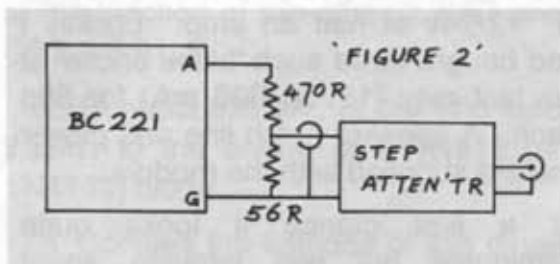


ends using these crystal oscillators. Many times just dangling a bit of wire from the receiver aerial terminal near the crystal oscillator has given a satisfactory signal in the receiver. At other times I have haywired a resistance network between the receiver and the crystal oscillator to give the first RF stage a more meaningful feed impedance.

If starting from scratch I would now build a crystal calibrator to perform this job. Traditionally calibrators were often based on a 1MHz crystal and gave 100kHz and 10kHz pips. For this purpose 10kHz pips are probably not needed and 1MHz pips are probably too close for positive identification on the higher ranges of a receiver.

I would suggest that a unit based on a 4MHz crystal giving 4MHz, 1MHz and 100kHz pips would be more appropriate. However, on second thoughts, chips are so cheap, why not add the 10kHz facility as well!

The BC221 is an excellent tool and its accuracy is likely to be more than adequate for use in servicing many HF receivers. The manual gives a maximum error of 0.049% at 2MHz and 0.034% at 4MHz. These figures assume that all the errors are additive and also take no account of the various ways in which errors can be reduced. Allowing for these an error of no worse than 0.02% seems more realistic.



Having the official calibration book is helpful but not essential as self calibration (to at least the same accuracy) is quite feasible. The original calibration was done by linear interpolation between, I believe, 50kHz check points. This can be emulated by using a good digital frequency meter or a 100kHz crystal sub-standard.

If a 100 kHz sub-standard is used it is convenient to calibrate the fifth harmonic of the BC221 as this will give check points every 20kHz. Mental arithmetic will give dial readings every 1kHz. Even if you don't have a 100kHz sub-standard, the internal 1MHz crystal will enable you to effect a very reasonable calibration, as apart from the quoted frequency check points many others are audible.

To effect full calibration could be time-consuming. However the effort can be reduced by using a computer to do all the calculation. Partial calibration by hand is feasible as it is unlikely that many people will want to have a complete calibration book. For example it took me about half an hour to calibrate my BC221 over the range 3.5 – 3.8MHz using 1940 techniques, i.e. log tables.

A useful adjunct is a matching attenuator and step attenuator, see figure 2. This allows the BC221 to act as a signal generator with a 50 ohm output. The output of my BC221 is fairly constant over the full 2 – 4MHz range and virtually constant over 100kHz segments.

### Summary

I suggest that a basic servicing kit should consist of a reasonable DVM with an interface box to enable it to simulate a low-resistance analogue meter; also a crystal calibrator giving 4MHz, 1MHz and 100kHz pips. ♣

# The E.U.G. Sunday Net and Digital Signal Processing

Graeme Wormald G3GGL

The saga of man-made (and other) QRN, that is to say 'static' interference of a more or less continual nature, has featured highly in recent issues of 'Lighthouse'.

Answers to the problem have focused on patent receiving aerials of every description; in particular small and active aerials.

These all have one thing in common; they're not much use for transmitting! Fair enough, I say, most of us (even the licensed hams, which constitute about half our membership) spend most of our time listening.

I must admit that I rarely go on the air these days other than by special arrangement or on the E.U.G. "First Sunday Net". (10.00 local UK time, 3695 kc/s).

But this net is frequently troubled by QRN, some of which we track down and some we don't.

My transmitting aerial is a full-wave 80-metre co-ax fed horizontal loop (275 ft of wire) at a height of about 20 ft, with my bungalow sitting in the middle. It goes within 3 ft of a telephone line and 6 ft from a lamp-post. It gets out well on ALL bands but is susceptible to QRN.

Now my rig is a Trio TS-530S of about 1982 vintage. I bought it new for £500 and I wouldn't swap it for all the tea in China. It has the best of all worlds for me. Digital frequency readout to 100 cycles, phase locked stability, valve PA with pi-coupler, good speech processor, tuned Rx front end and IF shift. No menus or push-button bells.

Just the job.

But of late my eye has been catching the advertisers' blurb of DSP or digital signal processing. Now this means very little to me; I passed my C & G in 1949 and ceased working as a broadcast engineer in 1960. The reasons are pretty obvious. I never managed to convert from being a self-trained valve technician to a 'modern' solid state boffin. And as for the digital! Well I can count up to ten on my fingers. Just.

So I make no pretence whatever of understanding all this DSP stuff but I warmed to the claims made for it.

I then started asking about it from EUG members on the net. They were sceptical and told me to use a directional phased aerial to get rid of it. I didn't understand a word of that, either, and it didn't sound at all "Trio-friendly".

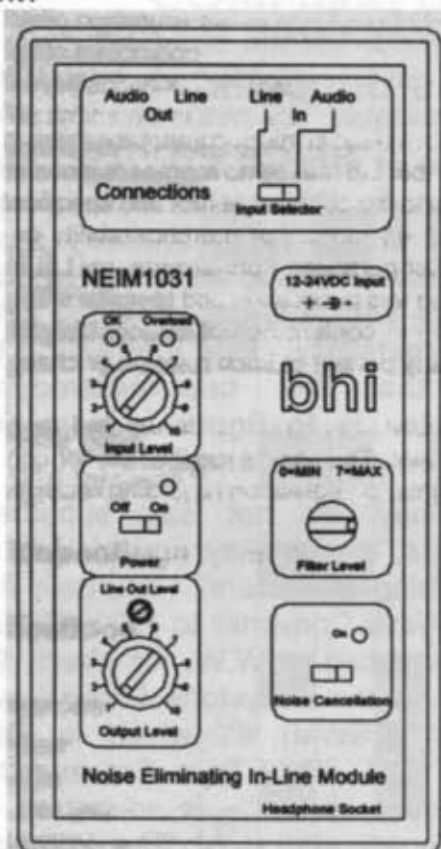
So last month I broke the piggy-bank and lashed out on one of these 'add-on' Noise Eliminating Modules. The latest from 'bhi', Type NEIM 1031 – (and most expensive!)

It goes between the rig and the speaker. I have the Trio SP-230 matching speaker unit so it was easy. The filter module requires a DC source of 12-24v at half an amp. Luckily I had bought three such 'black bricks' at the last rally (18v at 600 mA) for 50p each. A speaker patch line and power line are supplied with the module..

At a first glance it looks quite formidable but two minutes spent studying the details soon reveal all.

I won't bore you with going through them but believe me, they're easy!

I can hear you all shuffling. Does it work?



**The bhi NEIM 1031 Noise Eliminating In-Line Module**  
(7"x3"x1" – 18 cm x 7 cm x 3 cm)

To start with I wasn't quite sure. The problem is that you have to find a signal hidden by noise which you can't quite read! Easier said than done.

The first thing you notice is that when you switch it into circuit on an 'empty' spot, any QRN 'frying' disappears. It is replaced by a rather odd 'ethereal' sound. Imagine holding your head over a very deep wishing well with water about 100 ft below. The trickle of water gives a faint musical background with little plinky noises. One press reviewer called them 'audio artefacts'! This I didn't understand; my description is more graphic!

When you tune to a voice signal it comes through quite clearly (assuming

you've followed the simple instructions for lining-up).

When you switch the filter 'out' the result will be quite outstanding or not very much, depending on the ratio of signal to QRN.

But the proof of the pudding was presented on last Sunday's (6<sup>th</sup> July) E.U.G. Net.

The 80m band was very lacklustre and our controller, Chris, G3XFE down in Watford (north London), who usually swamps the UK, was quite a modest signal. What was more of a problem was that he wasn't receiving members very well. In fact, he couldn't hear some of them.

Now I'm 100 miles or so north-west of him and therefore, by definition, closer to most of them, I was hearing them better. The inference is that near vertical incidence was working quite well but that 'longer' skip wasn't (but let's not go into the technicalities of the ionosphere just now!).

The fact remains that I had a steady background QRN of about S3-4, so signals of S5+ were no problem at all. But after about an hour some signals were getting down to S3; especially Ron, M3URU with his 10 watts on Hadrian's wall.

And this is where we started to sort the analogues from the digits.

**With the DSP filter switched 'in' I could read him. With it switched 'out' I couldn't. So there you are, it works.**

Other features: It reduces steady heterodynes from S9 to S1, but takes about 2 seconds to do it. This means that it is still OK on CW.

Music is often degraded on short-waves and this filter makes it worse! It isn't recommended for music.

**Price £129.95 Phone 0870 240 7258**

# Letter from Tønsberg

Our Norwegian Correspondent, Tor Marthinsen, continues his roundup of early Eddystone receivers.

This month we have "Tor's Supersix"

Hello Graeme,

From the title you may have figured out that this is going to be about the Eddystone superhets, those made before the war. The superheterodyne principle is usually attributed to the American scientist E.H. Armstrong and dates back to 1918.

In the year 1926, when you find the 'Eddystone Twin' in the 'Wireless World' list of available receivers, there are mentioned no less than six British manufacturers of superhet receivers with valves numbering from six to eight, and prices ranging from £32 5s. (receiver only) to 150 guineas! (£165). Quite expensive to buy, difficult to handle, difficult to avoid sideband clipping and expensive to run.

So they were not very popular. Much blame must be put on the valves available, triodes only, and the patent position, where you had to pay royalty for each valveholder in the set.

This was soon to change, 1931 is the turning point. In the guide to the radio Exhibition in 1932 one can read:

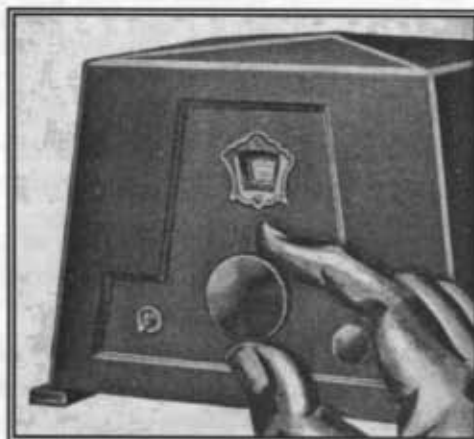
**"The superheterodyne forms one of the most interesting classes of receiver this year, and its rise to popularity has been so rapid that there are now few firms who are not showing at least one model . . ."**

So how does Eddystone fit into this – the earliest reference I have found is from W.W. for September 16<sup>th</sup> 1931 where they say:

**"Interest in short-wave reception seems to be growing, and**

the firm of Stratton & Co., Ltd., who have made this rather specialised branch of the radio industry their particular concern, are to be well to the fore with a wider range of sets than previously. It is interesting to note that the superheterodyne principle is to figure in some of their new productions."

Now they do not say superheterodynes, maybe they are thinking of the coming converters? You date the Short Wave Converter to 1931 (QRG), it is described in W.W. for March 9<sup>th</sup> 1932 and the Eddystone Short Wave Manual (ESWM) #1 which is also dated 1932. (Note from Graeme: the Converter – below – is advertised in the January edition of "The Wireless Magazine", out in December 1931.)



**'Add-On' Short Wave Converter, 1931. To use with existing M.W. receiver as I.F. amplifier.**

In the Exhibition in August 1932 there is mention of another converter, this time the 7 metre converter as shown in ESWM #1.

However, in the August 25<sup>th</sup> 1933 issue of W.W. there is no doubt. In the stand-to-stand report from the Exhibition that year they say:

**"One of the most interesting of the new Eddystone sets is the six-valve superheterodyne, A.C. operated and covering the short- and medium-wave ranges only. A modern horizontal cabinet contains an energised speaker."**

This is the earliest description that I know of about a complete superheterodyne by Eddystone. The dating can be confusing, this receiver might have been ready shortly after the 1932 Exhibition, on the other hand, it may have been only a lab model in '33, to have something to show to the visitors (*note from Graeme: rather like the model 680 in 1947 and the 770M at the 1951 Radio Exhibition, neither of which ever came to anything - see QRG*). My W.W. volumes are mainly without adverts so there are still possibilities for future investigators to prove or disprove this.

In the stand-to-stand report from the August 24<sup>th</sup> 1934 issue of W.W. the name of this receiver is given, and we get a little more information:

**"The new Super Six, in its teak cabinet, is essentially an overseas or colonial model. This A.C. superheterodyne, designed to cover wavelengths between 13 and 550 metres in four ranges, embodies a Westector for detection and A.V.C., and is wavelength calibrated on all ranges".**

The Westector rectifier was a copper-oxide device, introduced by the Westinghouse Brake & Saxby Signal Co. They are given the full treatment in an article in W.W. for March 3<sup>rd</sup> 1933, they could pass a maximum of 0.25 mA. The W.4 was designed for a maximum of 24 volts peak, the W6

could handle up to 36 volts. There were also full-wave types, the W.M.24 and W.M.26.

The "Super Six" was probably the first Eddystone receiver to have a directly calibrated scale.

Next on the list is another entry from the W.W., this time in the stand-to-stand report from the 1935 Exhibition as featured in the August 16<sup>th</sup> issue where we can read:

**" . . . also a new six-valve superheterodyne covering 13.5 to 550 metres in four bands. It is AC operated and costs £33."**

This sounds like an improved 'Super Six' and is probably as described in the company Blue Prints (BP) 252-253 dated 10-4-35.

So there you have it, Graeme, one superheterodyne each year '33, '34, and '35. Maybe the pernickety ones will insist on this being three receivers! You could differentiate between them:-

1933 model: Uncalibrated scale (?)

1934 model: Calibrated scale,  
Westector signal diode.

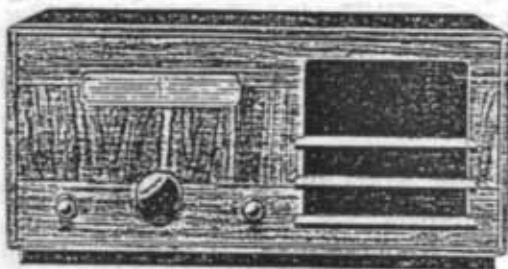
1935 model: Calibrated scale, TDD4  
as triode/double signal diode.

There is an interesting entry in ESWM #2 from the autumn of 1934, where you find the 'six valve Short Wave Superheterodyne Receiver'. This sounds so much like the 'Super Six' that I believe it to be a kit version of the set. There is one big difference, the kit does not cover the medium wave band but has four switched ranges 13-68 meters. Now the coils and switching gear were already wired when you bought this kit, to make life a little easier I reckon.

An interesting fact is that all these receivers were for A.C. only, even the kit version. With so much effort from Stratton, are you sure that there are no

pictures, leaflets, adverts or suchlike resting at the bottom of your filing cabinet describing a 'Super Six'? Dig deep, Graeme! (See *Post Script below*)

Take a deep breath here, Graeme, here is some guesswork on my part: The Super Six comes in a teak cabinet, horizontal style, built-in speaker. The size of the kit version is the same as the size of a 'Kilodyne Four' of 1935. The 'Sphinx' of 1934 is essentially a 'Kilodyne Four' with waveband switching. So perhaps the 'Super Six' used the same cabinet as the 'Sphinx'!



**Eddystone Sphinx**

The kit from the E.S.W.M. #2 appears in improved form in the E.S.W.M. #3 of 1936. Here we find a pair of superheterodynes, this time they call them '5 valve S.W. Super-Heterodyne Receiver'. Now since the A.C. version did not have a built-in power supply it is really a six-valve set! An interesting thing is that there is more RADIO in these 5-valvers than in the 'Super Six' with six valves!

There is another receiver from 1935, in the W.W. issue for August 9<sup>th</sup> we have the following entry:

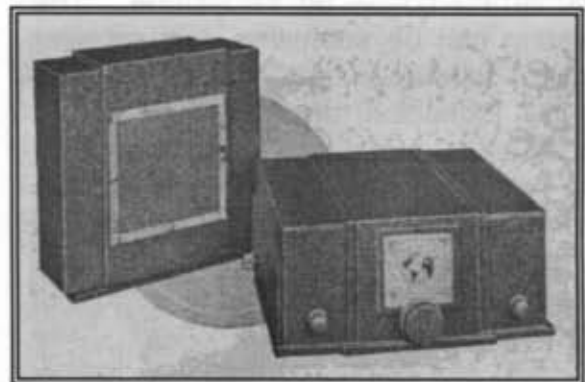
“ . . . . An Eddystone superheterodyne for operation on the 5-metre band is also announced.”

This receiver is well described in the EUSW Guide (Eddystone Ultra Short Wave), Ted has sent me a proper circuit diagram adhering very closely to

this, dated 1937/838. This was probably a kit-model only.

So you see, Graeme, there are quite a few sets of the superheterodyne style out before the 'All World Eight' of 1936, which you claim is Stratton's first.

The 'All World Eight' and family are very exciting receivers. The price for the L.P.C. of £45 was for a complete receiver, so perhaps this included the loudspeaker as well. (*The L.P.C. was an AW8 with a BFO in place of one of the push-pull output stages*)



**Eddystone All World Eight**

The next in line is the E.R.A.7 And 21 guineas works out at £22 1s.



**Eddystone E.R.A.7**

I know the next one, the E.C.R., my receiver is dated to January 1938 (Serial No. AP3). The price of £45

included the loudspeaker type 1134. This information comes from a 'Practical and Amateur Wireless' issue dated April 15<sup>th</sup> 1939 (now 'Practical Wireless').

So that's that, isn't it? Not quite, you also have a most exciting entry in E.W.S.M. #4 of 1938, the 9 valve 'Amateur Communication Receiver'. Would be nice to recognise this one at a rally, Graeme, and know that you'd seen it previously in the QRG? Not very likely, I think!

And yes, I've not forgotten, the 'Scientific Five'. Suppose this was a tropadyne receiver with five triodes! Seriously, I've never seen this receiver mentioned in the literature. Perhaps it does not exist?

As for the war years I have nothing to add, so this instalment is the last dealing with Eddystone receivers from 1925 to 1945.

## **Postscriptum**

**By Graeme**

Not having the benefit of Tor's copies of the pre-war Wireless World I have to use what's available to me when composing QRG.

The history of Eddystone during the Stratton years is one of over-enthusiasm in many areas. As late as 1947 and 1951 two substantial receivers were announced at the Radio Show and reported in the Wireless World with photographs. In the event they had to go back to the drawing board and re-appeared much later in different forms and with different names (the '680' became the 680/2' but was marketed as the 'New 680' and the '770M' became the '770R').

This was due to over-enthusiasm on the part of the famous Eddystone duo, Arthur Edwards G6XJ, (Sales Director)

and Harold Cox (Technical Director).

It was their job to 'justify' the continued existence of the 'wireless department' in a family company whose main source of income was the 'Woolworth department'. Eddystone Radio had always been an odd-ball in the Stratton-Laughton empire.

The pre-war years have always held mystery due to the destruction of the company's factories and records by enemy action in the 1940 blitz.

Not only this, but as manufacturers of special short-wave components they had to encourage sales of these as well as their own factory made sets. This was done in the thirties mainly by the publication of four Short Wave guides and one Ultra Short Wave Guide.

If a set was never marketed as a factory-built model, or a fully-presented (and advertised) kit, then I have not included it in QRG. (The 1938 "Improved Everyman" was my most serious mistake!)

Now, concerning these slightly mysterious pre-1936 superhets, I phoned Bill Cooke, GWØION. Bill joined Stratton & Co in 1935, at the age of 16, as a technical apprentice. By 1947 he was the company's chief engineer so I reckoned if anybody could remember the "Super Six" he would.

He burst out laughing fit to rupture my eardrum. The company's biggest failure of the early thirties, he said. Yes, it was built into a "Sphinx" case, but he doubts if more than a dozen or so were actually made.

Stratton's were always about to make a big breakthrough with it but they never did. Harold Cox knocked the project on the head and the "All World Eight" became the success that the "Super Six" never was. ♣

## E.U.G. CROSSWORD NEWS

**More Apologies Needed: Second Warning Given!**

**Ten Entries; Five Correct**

When I was 35 years old I went through the usual male mid-life crisis and underwent an aptitude test (for the second time in my life). The result was that the expert who analysed me said he thought I was very well-matched to the job I was doing, which was that of transmission controller in the Midlands ITV centre. He also said that I was quite versatile in my aptitudes and should have no problems in my working life.

Then he added one corollary: "But never, ever, get involved with office work. It doesn't suit you and you'll be sure to make a mess of it." I think he was talking about running this crossword puzzle . . .

My grovelling apologies go to Geoff Steedman MØBGS and Brian Blake G3JOS. Their correct entries for the last puzzle were discovered in an alien folder long after the June Lighthouse went to print. Sorry chaps.

Now to look at Crossword No 14. Five of you had near misses. There was absolutely no common factor between them, so I won't bother trying to point it out!

Here's the Roll of Honour:-

**Roger Bracey, G4BZI, of Crewe**

**Mike Maxey, G8CTJ, of Burbage**

**Jack Read of Nantwich**

**Anthony Richards, GW4RYK, of**

**Montgomery**

**Geoff Steedman, MØBGS, of Leeds**

I see that three of them were among last month's winners (and earlier) but several regulars slipped up this time (getting over-confident?).

So now lets get down to the answers for Crossword Number 14 (unlucky for some):-

ACROSS; 1) All Wave Four. 7) Ambit;  
8) Triode. 9) RKO. 10) Pulse.  
12) Ferric. 15) Re-dust 18) Audio.  
20) Pam. 21) Miller. 22) Ex-rig.  
28) Design stage.

DOWN; 1) Abampere. 2) Label CD  
3) Actress. 4) EHT off. 5) Oliver.  
6) Rads. 11) Scroggie. 13) Enamels.  
14) Red area. 16) U-bolts.  
17) Top rag. 19) Bird.

Last evening I had a long chat on the phone with Collin, G4HNN, our wizard puzzle-master. As you know, I have run out of 'new' prizes (it being the custom to send a 'token' prize to every entrant so as to encourage entries).

We considered the possibility of 'resting' the feature for a period, but Colin said he enjoyed compiling them. Each one gives him a couple of days' distraction.

Now I know that I enjoy having the privilege of doing the puzzle before it is published, and we have a handful of regulars who obviously enjoy it.

Colin suggested a 'token' single prize of a 'fiver' for the winner who succeeds in being drawn out of the hat.

Our Patron, Chris, suggested that the option of a CD-Rom of one's choice be offered in lieu, if desired. (Back numbers of Lighthouse, any batch of six, or QRG/3). So there you have it, let us know how you feel about it. The roll of honour of all correct answers will still be published.

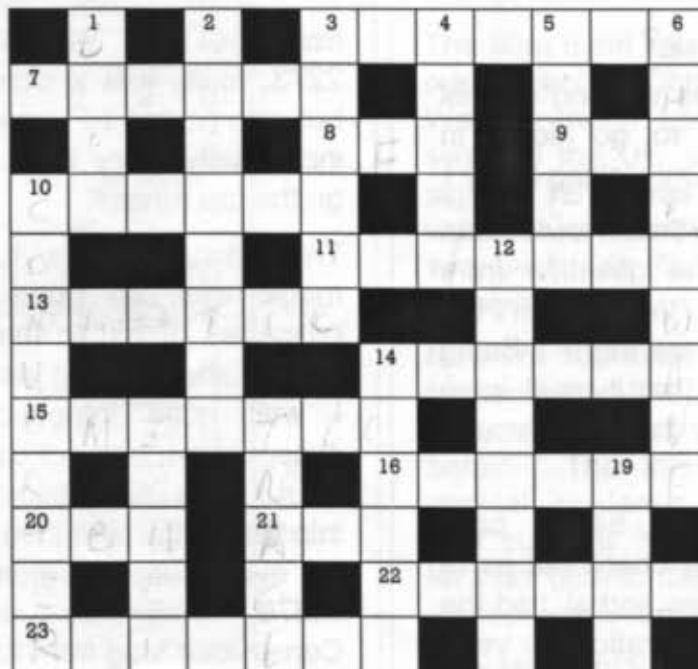
Vy 73, GRAEME G3GGL ♣



# E.U.G. PRIZE CROSSWORD No 15

COMPILED by COLIN CRABB G4HNNH

Photocopy or write out the answers so as not to spoil your copy. Send to Graeme Wormald at 15, Sabrina Drive, Bewdley, Worcestershire DY12 2RJ, England, to arrive not later than 25<sup>th</sup> September. See previous page for further details. Don't forget to include your name!!



## ACROSS

- 3) The US radio firm who were the first to incorporate high performance bandpass filters in amateur receivers (specifically the 75A3 & 75A4) (7)
- 7) Mains operated set in dangerous electrical condition (6)
- 8) Ostensibly, an automatic knob twiddler (3 abb.)
- 9) Bravo, for revealing a classic multimeter (3)
- 10) Illegal conversions to 10 metre amateur rigs (2,4 abb.)
- 11) Paint additive (7)
- 13) Sounds like this IC (numbered zero) is primarily intended for use in maritime equipment (6 abb.)
- 14) Oddly, a tin pa screening can is covered in a type of verdigris (6)

15) Possibly, re-trim T filter network in low impedance o/p stage to indicate which transistor connection is used (7)

18) Royal Electrical & Mechanical Engineers, e.g. Reme revamped to proceed (6)

20) Family of digital IC's that require a supply voltage of between 4.75 and 5.25v dc. (3 abb.)

21) W.W.2 army girl (3 abb.)

22) The answer button on your calculator (6)

23) Incandescent glow (3,4)

## DOWN

1) Aunt's on the air (4 abb.)

2) The condition of the roast is governed by this basic cooker control (8)

3) Type of high efficiency rf amp. Used in cw & am

transmitters (5,1)

4) Essential oscillator for superhets (5)

5) The "double superhet principle" avoids ----- frequency problems in receivers that require a low if (5)

6 and 10) An add-on unit once popular with swl's lacking hf facilities (5-4, 9)

12) ----- electricity, an early term (now obsolete) for "positive" electricity, so called because certain materials, such as glass, could become positively charged by friction (8)

14) Trimmer (3-3)

16) Infra-red light emitting diode (2,3 abb.)

17) Single beam oscilloscope display (5)

19) Girls, with posh accent (4)

# Ted's MailBox

## A Review of Mail and Happenings

By Ted Moore, G7AIR, Founder of EUG

### A HANGOVER OR . . . ?

. . . or maybe he was working out his notice and wanted to go down in Company History ? Only joking really !

The fact is that for yonks now I have had to deal with the question from owners of the 840C, "Why doesn't the Magic Eye work on my set ?" Being charitable I assume that it must have been something silly that got through Quality Testing.

I have had countless 840Cs pass through my hands, all check out as re components and wiring and all had the same problem - no operation (or very, very, minimal operation) of the DM70. Even feeding what would be considered by many as an S9 + umpteen dbs in from a signal generator had little effect.

Once way back when I was in Morocco I had a pal who worked at the Consulate General in Tangiers, he took delivery of a new 840C - a month later he was begging me to tell him what was wrong, but I couldn't! I simply suggested sending it back under guarantee, but never heard the outcome of that suggestion.

Once, in a conversation with Geoff Woodburn, I put the question to him. He looked squarely at me and said 'just treat it as a pilot light'.

So what is wrong with the circuit ? A clue came recently when I got home

from the NEC with a MIMCO type 2273, really just a clone of the 670A but with limited HF coverage, giving it, incidentally, very nice bandspreading on the top ranges.

This 'clone' had a fully functioning magic eye, so good that on loud passages of music the bar was fully extinguished leaving just the green dot. I was quite intrigued, also a bit exasperated, and got on the landline to 'GGL. His suggestion was to delve into the matter and then tell everybody, he even supplied a write-up on the DM70 from an ancient Radio Constructor Mag from April 1969.

This was quite enlightening and really did put the operating conditions of this magic eye valve into perspective.

As the nomenclature indicates it is a type designed for battery operation in portables of that era using a 1.4 volts LT and 90 volts HT supply. The article goes on to state that the valve can be used on mains sets if an anode dropper is utilised. However, and this caught my eye, when used on 90 volts supply a 10 volts negative supply on the grid is sufficient to fully extinguish the 'green bar'. The use of an anode dropper with extra HT causes anode volts to increase as the anode current decreases due to negative grid voltage derived from the signal. The end result of this is that a grid voltage of 34 volts is now required for full extinction of the

green bar.

This would prevail if an anode dropper of 1.8 MΩ was used with an HT supply of 250 volts.

I digested these facts whilst pondering the circuit of the 670A and comparing it with that of my 'clone', which turned out to be exactly as per the schematic bar the tuned circuits values.

Trying my 840C with the circuit modified to match that of the 670A got me some small movement but nowhere near enough and so I went back to the 840C schematic and began doodling on a sheet of paper. The end result of this exercise is that I now have a fully functioning magic eye on both of my 840Cs and no unalterable mods have been done. Just a few wiring changes and the addition of a 100KΩ resistor and a 1N918 diode. The results defy all of my expectations and make my 840Cs so much more functional. A friend has tried it out on his 840C and says he is 'chuffed' - so here goes.

You MUST first ensure that all the components such as resistors and condensers are AOK as otherwise you will be trying to camouflage another fault. Get the schematic for the 840C on your bench, open up the set and put it upside down and then identify the components concerned. Read on:-

1. Dis the 2.2MΩ which feeds the DM70 grid from the point where it goes to the junction of the other 2.2MΩ and C56, a 0.01μF.

2. Connect this end of the grid feed 2.2MΩ to the anode of a 1N918 (or 1N4148) diode.

3. Connect the cathode of this diode to pin 3 of V3 (the junction of the two 470KΩ resistors).

4. Put a 100 pF from the junction of the diode anode and the 2.2MΩ grid feed resistor, connect the other end of the 100pF to earth (chassis).

5. Change the 470KΩ anode load of the DM70 from 470KΩ to 100KΩ - mine only had about 37 volts on the anode under no signal conditions.

6. You might - if you feel up to it - give the secondary of the IF a tweak as the new 100pF is now in series with the original 20pF via the diode. This is not really necessary.

7. Now try it, and be amazed. As I was, amazed but happy to have a working DM70.

A fact which has come out of this effort is that there is a variant of the Mullard DM70 which has not pins but wires about 1½ inches long for soldering into the circuit, the one I was given is marked clearly DM70a. Let me know your results please, but hopefully several of you will have tried it out before the Lighthouse appears.

Graeme, 'GGL, has done so and apart having found an error in my description above (since corrected) his works okay. We both think that what we now have is a voltage doubler feeding the DM70 grid, but we are willing to be corrected upon this point by anybody more skilled. At the time of sending this off to 'GGL for editing I have knowledge of eleven EUGers besides myself and 'GGL who are happy with the mod.

*(Note from Graeme: I have done exactly what Ted says and the dc voltage on the grid of the DM70 (on an S9 signal) is increased from 4 to 7 volts. It MUST be a voltage doubler! But the odd thing is that it now contains demodulated audio - which*

*the AGC line doesn't, hence the flickering in step with the modulation.)*

### **MIMCOs LISTING**

Okay, so I am now making some progress with this with input from others besides my own data. I shall just deal with badge engineered sets made for MIMCO and Marconi for now although another list for sets made by Eddystone for other Companies will come along later. I have even seen an 1837 bearing a RACAL logo badge and only mentioning Eddystone on the Model/Serial number label on the rear panel!

Please do write in to either 'GGL or myself with any info you may have re sets manufactured by Eddystone but badged otherwise. I need info such as valve lineup, frequency coverage, Marconi/MIMCO model/type number and any serial number plus case type and colour.

The latest acquisition here is my present to myself for my seventieth birthday, bought from down in deepest Surrey, thanks for the coffee John.

The item in question is a Marconi CW/AM/SSB drive unit for the Marconi marine transmitter type H.1030. I was a bit dubious at the outset but then a close look and it was indeed a product of the Bath Tub. Then a bit of sleuthing got me a date from an electrolytic in the power supply unit, this plus the fact that the display uses Nixie tubes and these came out I believe in the sixties and disappeared overnight almost when LEDs came out at the end of that decade.

Next came some delving into the Blueprint Register from the Factory, this covers from the '30s to the '70s and was apparently rescued from one

of the firebombed factories during the blitz. I found what I needed within the date-span I had. It seems that this unit was BP1156 with the Spec; Number S.937 of the 9th February 1965. Another one to add to my list although this one to my knowledge never did bear a lighthouse logo - nor did my 'almost' 670A, the 2273A.

So just a reminder of what we know so far, we have the following numbers, info on some but not all;-

2273A, 2245A & B, 2232A & B, 881,881/1,/2 & /3, 3873A, 2244A & B, 810, 2294A - that for MIMCOs. For Marconi we have the HR100, HR101, H2310, H2311 H1030 (but here I think only the drive unit was by Eddystone, not the PA unit), and the H5011.

Anything to add to the above will be welcome. *(Especially the circuit diagram of the MIMICO Type 2245A, one of which I have here - Graeme.)*

### **RAMAC?**

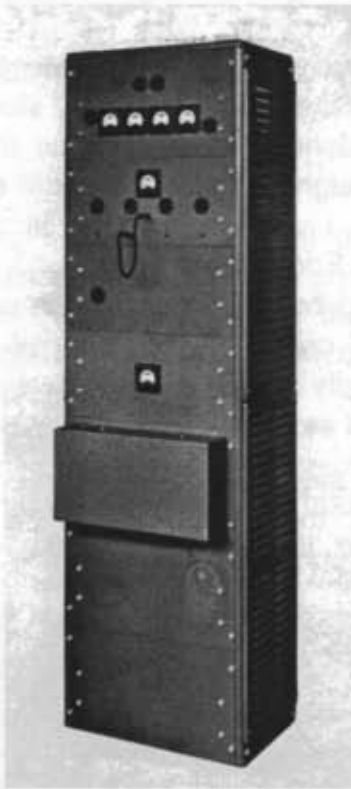
Who or what was or is RAMAC ? During my delving into the Blueprint Register I came across the following entry for the 10th of October 1965.

BP1175 - RAMAC SSB Receiver, USB only. Not a word more so what was it? Can anybody help me out with this conundrum, please.

### **THE MODEL 215 TRANSMITTER**

The Register contains a wealth of info on the various versions of this 5 foot 6 inch rack mount Transmitter and the various authorities for whom it was supplied and often modified to suit. I had a couple of line drawings, copies of the blueprints, showing the general layout, circuit and wiring. I now have a full set of schematics on A4 plus the original negatives for these, courtesy

of 'GGL. I also have a photocopy of the S215 with a quoted Air Ministry Nomenclature and the note that three were supplied to the A.M for full evaluation. A letter from an EUGer tells me that into the '70s one was on display at Biggin Hill, having previously been used for Air Traffic Control.



**S.215 100W VHF AM Tx**

Since I also have letters from an ex RAF firecrew that the 440/450 were fitted to their Leyland fire tenders in, he thinks, about 1947-8. So that appears to clinch the matter. Of course a lot of gear did get moved from one armed service to another in the post war period. Some of the Admiralty 440/450s that went over on 'D' day ended up in Army hands. (*Note from Graeme, they were used as 'intercoms' for the army Ten Set, 6cm multi-channel cross-channel radio telephones. They were called W.S.57 by the army.*) My own brother recognised from photos in the Stratton manual that the 440/450s were the

gear they rescued from LCTs (or was it LTCs ?) and used on land after establishing communications posts in from the beach. (*Note from Graeme: they were LCTs – Landing Craft, Tank!*)

### **ITCHY FEET**

I have that feeling again and so I am busy planning and arranging the logistics for another trip up to Arran to climb Goat Fell Mountain again, maybe even a slight diversion to climb Ben More too !

Not with the same Eddystone though, no favouritism here, it will probably be either my 1002 or my 40A both of which can be battery operated and have whip aerials so no reel of aerial wire will be needed this time. It will probably be a matter of finding which will fit in my largest rucksack leaving room for the necessary fodder. Both weigh a 'bit' more than the EC10 but then I am used to it now, older and wiser as they say ! More after the event, plus photos to prove it.

### **WILL-O'-THE-WISP**

I had this 640 to sort out last week, a fairly simple fault when discovered but as it was only there occasionally, well it took me a good three days. It appeared several times as a rough AC ripple on the audio signal but when I powered down to remove the case, Hey Presto - no fault.

When I tested the electrolytics in situ they seemed okay and it was only when in desperation that I resolved to whip them out and try others that I caught the Will-o'-the-Wisp.

The soldered joint on the negative tag looked to be perfect but in actuality it hardly ever made good contact as there appeared to be a layer of brown

flux between the blob of solder and the tag, there was no need to swap the condensers as a good hot iron and some fresh solder did the trick. I did the other tags too - just in case. No further problems.

### BUGGING?

I was brought this briefcase to repair the other day, now even if it is a good make, a SAMSONITE, I don't know much about 'fixing' them.

Anyway it transpires that what I was being asked to fix was the mini tape recorder fitted in the base of the case. The mike operated by picking up the audio via a tiny hole in the bottom of the case so that if you put it flat on the desk in front of you the chap opposite would be talking straight at the mike.

It turned out to be pretty simple, corrosion on the negative battery spring, from a leaky battery no doubt. The mike was extraordinarily sensitive and the mini-cassette gave almost two hours of speech quality recording. No mystery about the present owner though - he had bought it for 'two ones' at the local car-boot market. I am now on the lookout for an Eddystone with a built in mini-bug.

### STAND UP, THE 670 !

Well yes, which one is it ? Cutting short my sailing weekend - to the accompaniment of a bit of grief from my friend and her daughter - I wended my way to Bewdley for what turned out to be a fantastic day out organised by 'GGL and his XYL. Now my leisure days tend to be VERRRY energetic, like sailing, cycling, or climbing mountains. It was a real treat to be accorded a day of leisure as practised by others, older than I (well you are so, 'GGL !). A visit to the 1940's weekend

celebrations at Kidderminster station including a return trip to Bridgnorth on the Severn Valley Steam Railway. The only jarring note being the Boche military types parading up and down as if they owned the place. Now why didn't some of those enterprisingly dressed Brits arrest these aliens and shoot them ?

Well anyway my return home was accomplished in a somewhat slow and stately fashion, slow because the car was weighted down and stately because I was carrying no less than SEVEN Eddystones. One 640, three 358s and two (?) PSUs for same, two sets of coils for same, and three purportedly 670s. Boot, back seats and front seat full.

Now I say purportedly three 670s because they turn out to be quite different upon close examination.



### Model S.670 or not?

What we call the 'A' type case from the manner in which I classified them when I made my first list some ten years back actually has a number of variations. Some front panels have the red enamelled logo top centre of the panel, others have the word EDDYSTONE cast into the front panel as with the 640.

I now have one 670 with a cast front panel with twin cast flutings on either side of the enamelled logo as with

most of the MIMCO types, so three sets with three different front panels. Two of the 670s (?) have 659 scale glasses, one has a glass saying nowt except Eddystone Radio. Two say 659/670 in the inset top left of the scale back plate and one just says 670 in large figures, but only the latter one with the Eddystone Radio glass says 670 on the rear Model/Serial Plate. The other two with 659 glasses have the Model place left blank on the rear panel plate.

Even more intriguing the two with 659 glasses and no model number have octal sized chassis holes with B8G valveholders mounted across them. Only the third with the 670 on the Model plate actually has B8G sized holes in the chassis. As does my own 670. Under chassis construction is different, very different in all three sets recently received.

One has all bolt-on metal can decoupler condensers all over, one has all cardboard tube condensers and the third has most of the latter but with some bolt on type condensers on the psu chassis. This one has a different type rectifier too, smaller diameter but 50% longer, all these differences are definitely factory original despite there being many later mods done on two of the sets.

1 - 659/670 dial inset, Serial EZ0169, Model NIL, Cast logo.

2 - 659/670 dial inset, Serial CB1744, Model NIL, Enamel logo.

3 - 670 dial inset, Serial CC2716, Model S670, Enamel logo.

Anyway one is working already, one is working but needs TLC as yet, one is to be kept for spares as the front panel has a Big Hole in it like as if hit by a

50mm cannon shell.

Funny to my mind is that those two simply do not say that they are Model 670 ANYWHERE at all, but do say - on the glass - that they are Model 659.

Yes I know the 659 is an octal type AC only set. But are these classed as a halfway point between the one and the other, or what? I think (go on shoot me for saying this) that the 659/670 is a separate set !!!

### THE 640

This appears to have been modded according to one of the multitude of articles carried in the 40s/50s by the SWM. It now has a small 1½" x 1½" meter in the top left corner of the scale, behind the glass. Also a red indicator light in the top right corner of the scale. The meter was apparently to be a built-in S meter but it was not sensitive enough for the job and so a mini pcb of strip board has been added with a transistor to drive the meter, it is not yet connected in circuit, ditto the indicator - not connected. The set was a bit deaf when powered up but seemed to be aligned okay so a bit more investigation showed that the feed from the IFT to the In/Out crystal filter switch was a beautiful example of a dry joint, resoldering this brought the 640 back to its usual potency. *(Editor's note: I'm sorry about this little spuriousity in the RH column. I can't make it go away!!)*

As for the 358s, they remain untouched having had but a cursory examination, a much later task! The two PSUs are NOT both for the 358s. 'GGL gave me the first clue by saying one had a six volt heater supply whilst the other had a twelve volt heater supply. What 358 had twelve volt heaters? Then the penny dropped. A little bit of delving through my manuals

and I discovered it was a mains psu for the receiver of the 440/450 combination. The picture in the manual fitted my PSU too, it is in the Admiralty version of the manual not the civvy Strattons version. Both PSUs are dismantled and need much work done so they - like the 358s - will remain in the shed for some time.

### A MANGLED EB35

A short journey to visit John one of our almost local EUGers and I came away with a very poorly EB35. It had been very kindly offered for spares and at first it looked as though that is what would happen.

Externally it is very nice, elegant was the word one of my lady friends called it. The inside was a different story, the VHF tuner had gone, both RF and IF/AF pcbs had been gutted of the majority of their components although some had been replaced - badly - with 1 watt resistors, oversize for the pcb of course, and some new e'lytics, again very oversize and some wrongly soldered in with reverse polarity too.



Even worse the three FM IFTs were missing and some attempt had been made to wire in the 4 position push switch bank of an EC10. Luckily no holes had yet been made in the finger plate. Why do this to an otherwise nice set I shall never understand. If the previous owner had wanted an

EC10 then why not advertise to do a swap ? The way some folks 'minds' work astonishes me. But my thanks to John for the donation.

I am thinking along the lines of a complete re-build if I can get a suitable Mullard vhf tuner and the three IFTs, although it may be possible that some Philips type IFTs will fit the holes. Another alternative would be to go the TOKO way as others have done. Any bits for an EB35 or EB35 II would be welcomed here.

### JIM'S 1001

As per my ad in the last issue I am still in need of a tuning gang for the repair of this 1001, also the small flexible coupler to suit. A fair price will be paid plus postage. The set was damaged in the post when the untethered tuning condenser broke loose from the only thing holding it in, the flexible coupler. The vanes were part opened and so by frequent banging about in the hands of the 'posties'the vanes are all bent about, the coupler in three bits and the pcb is badly scored. This latter bit can easily be fixed, will have been by the time you read this, just need the tuning gang, PLEASE. It is a funny one too.

### LAUGH ?

I felt more like crying, not laughing. I have been offered an Eddystone, or what used to be, 670C which has so many mods that it bears little resemblance to the original set. Four more toggle switches have sprouted on the front panel with the phones socket moved to the very centre between and below the large Range & Tune knobs, a hole in the top of the case fitted with a rubber grommet now sprouts a very thick and long whip. Only two core mains lead wired directly in, and a length of wire terminated in



one of those he-man sized croc clips as used for battery chargers or jump leads has been welded to the side of the case. To make things worse he wanted £80 for this abortion which he admitted did not work well, with the added comment that "someone like you can soon have it up and running". The smoothie approach did not work this time and I said 'No Thanks'. Will they never learn?

### GOAT FELL RE-VISITED

Well I did it! This time not only did I carry an Eddystone to the top and USE it but I also carried a sleeping bag etc; and spent the WHOLE NIGHT up there. Wonderfully exhilarating is the only way to describe it.

I set off from home at about 17:00 and drove up to Ardrossan overnight to get the first ferry over the next a.m.

It was about 10:00 a.m when I had got off the boat on Arran and bought some fodder and bottled H<sub>2</sub>O. My plan had been to simply reconnoitre that day but as I had had some snooze time overnight and on the boat over I felt pretty fresh and so I set off up Goat Fell, the highest peak in Southern Scotland, at about 1230. Nice climbing weather too, cool breeze, not too hot a sun, and not even a hint of the morning mist that had completely hidden the peak when I first glimpsed it from the boat.

Why on earth does an EC10 II appear to be so much heavier than the original EC10? It really did though and 'GGL says it must be because of the added meter with it's heavy magnet !!!

Of course this was to be an 'overnighter' and so I also carried extra fodder, the obligatory flask of coffee, my sleeping bag and a foam pad.

Pretty well laden, but I made it. This time I went from Glen Sannox, shorter but steeper. As the target was a peak over half a mile up in the air I guess that three hours with a midway stop wasn't bad at all for a wrinkle like me.

There were others up there when I arrived but they soon departed leaving me in solitary control. Sorry, except for Corky the resident crow who ekes out a fair living on the handouts from idiot climbers like me. I made the usual calls to 'GGL etc; to inform him of my arrival and then set up my EC10 II with it's long, long doublet. Reception up there is unbelievably quiet and apart from a few crackles from a distant and as yet invisible storm I had a whale of a time finding more local radio DX than one can imagine.

By 2000 I had had my fill of this and decided to fill my belly so it was bread and butter with a tin of mackerel in brine. Corky was insistent upon having his share of both, he also likes bits of Milky Way and Mars Bar. Whilst I was having this I saw a flight of three 'copters going by some way below me from East to West and disappearing in to dusk so it was evidently headed for Northern Ireland.

Snooze time was just after dark and it was still dry and warmish out of the prevailing wind. My 'bivvy' was about thirty feet down from the summit in a niche between two ginormous boulders, the bottom of the sleeping bag and pad inside a large heavy duty bin bag with another bag ready to pull over my top half if it rained, this wasn't needed though.

It is not silent up there at night, no way. The many squeaks from tiny mammals one of which woke me at about 03:00 by running around on top of my bag.

There were also unexplained thuds and groans and considering that the nearest inhabitation must have been three miles distant I could clearly make out some conversation - a woman yelling at 'him' to put the car in the garage before the rain came, and others.

I was awake at dawn, about 04:30, crystal clear still and not really cold out of the wind. Corky thought it was breakfast time, so I got up and had my last coffee with biscuits and water. Then there was time for an early morning play with the EC10 II, I heard the AFRTS outlet on medium wave at Keflavik (near Reykjavik in Iceland) and some East Coast USA broadcast stations.

Time to pack up and I did so with regret, vowing to be back again. Somehow an alien without his flying saucer had attached himself to me, smallish - about 12 inches high in a gold lamé suit and big black eyes. Anyway he came home with me. My trip back to civilisation was done in thick mist and as the strap on my rucksack had torn away from the fabric on one side I was carrying a very unbalanced load - no damage to the EC10 II thankfully.

Maybe my next rucksack will be large enough for the 40A - if only I could manage an Orion ! No photos yet but you will see them in next issue, the slave-driving Editor/Publisher wants his 'copy' NOW, PRONTO, TOUTE DE SUITE and the Chemist cannot oblige before Tuesday!!!

#### R.I.A.T.

Thanks to a benevolent pal in the RAF, and for services rendered, I was given a pair of Complimentary tickets to the Royal International Air Tattoo at RAF

Fairford. Well of course the spare one went to 'GGL.

I had to set off at 04:30 to get there for opening at 07:30, 'GGL had only to set off at 06:00. We made contact at 07:30 by mobile when we arrived at the car park and that was it. Didn't meet up at all until about 11:00 as our two mobiles declined to talk to each other - talk about modern technology ! Anyway I stumbled across him having a sit down adjacent to the runway and we had some time together then I set off on a mission of my own. I made it too. I got my invitation to go on board and be shown around the Air-Sea Rescue Nimrod, lovely plane it is too. Ageing somewhat now but one can still see its Comet airliner ancestry. Now whenever I listen to them talking back to RAF Kinloss Search & Rescue I shall be able to picture the plane itself.

'GGL and I never did get back together again. Considering the thousands of folk there at RIAT it was a miracle that we ever did meet up as he came in from the north and I from the east. Still we are both in agreement that it was a wonderful day out, not to have been missed - thanks to the RAF guys. *(And thanks, Ted, for passing the ticket over, it was an absolutely splendid day, even if we did lose each other! The sight of the Royal Jordanian Air Force piper, in full dress uniform complete with 'tea towel' headgear, playing 'Scotland the Brave' will stay with me forever! - 'GGL).*

**All the Best to all of you, from TED, G7AIR, and don't forget, you can reach me at:-21, Prince Street, Wisbech, Cambs. PE13 2AY or phone 01945 467 356 landline or 07957 951 998 mobile.**

# Letter from Gwent



*by Ian Evans*

**Ian sent us the postcard of our favourite Lighthouse which adorns our front page this month. He also sent us a picture with the Eddystone 888A which he writes about.**

Dear Graeme,

Hello! I thought I'd drop you a quick line after reading about Chris Morgan's drifting 888A in Lighthouse 79. My 888A also drifted a bit, although not as much as Chris's, but the idea of being able to improve matters merely by changing a few valves was most appealing to me as this is about as far as my electronic skills extend.

So, I popped in a new 6BE6, a 5Z4G and a VR150/30. Well, I'm happy to say there has been a noticeable improvement, especially after about 45 to 60 minutes warm-up.

I changed the 5Z4G because when I bought the set about a year ago it had a small black metal KRC 5Z4 there instead. The new VR150/30 is a dumpy little Zaeux, which is about half the size of the nice bottle-shaped Brimar; it also has fewer pins but seems to work just fine giving off that nice purple glow.

I had one nasty moment while listening to two senior operators on 40 metres this afternoon. The signal suddenly leapt down the band a few kilohertz. "Hello!!" I thought. All was well however as it turned out that the

sudden QSY was due to the gentleman in question joggling the tuning knob on his rig while trying to read the meter with his magnifying glass!

After reading about the 'cooked' mains transfo on a 750 in July's Practical Wireless I decided to check the fuse in my set. It turned out to be a 1A 350V quick-blow type instead of the prescribed 250mA mag-nickel. I've asked Dave Simmons to have a look for one for me, in the meantime I've put in a 250mA 500V quick-blow which I hope is an improvement (Yes!) My 888A is rarely on for more than 4 or 5 hours.

I've managed to put up about 26 ft of wire in our teeny-weeny back garden which seems to work better than my longer indoor wire. No ATU, I just use the trimmer under the bonnet. I hope to be able to hear everyone on next month's Eddystone net.

Well, I shall not take up any more of your valuable time as I'm sure you must be a busy man. Thank you for all your work on Lighthouse, the QRG and the EUG, it's all greatly appreciated.

*Not at all, Ian, it's my pleasure. ♣*

# Letter from Ontario

By Brian Cauthery, VE3DFC



Brian is one of our good friends and a regular contributor to "Lighthouse" This month he writes to us about the Canadian 'Special' 830/4 – the one which covers the LF NDBs and aeronautical radio 'ranges'. He answers some of Joe LeKostaj's questions (I suggest you re-read Joe at this point!) We have had a series of items about this most favourite classic model and Brian continues with his contribution.

I thought that Joe LeKostaj's (K9LA) write-up on the 830/4 was excellent. (*Lighthouse issue 78, April, 2003, page 19*) With my two 830/4s, one had the problem of inability to turn the audio down to silence.

I cured that with a few new components and an alcohol rinse of the volume control track. USE ONLY 99% ALCOHOL, NONE OF THAT 70% STUFF DESIGNED FOR BABIES' BOTTOMS!

*(Note from Graeme about the above fault: John Gomer, G8UNZ, tells me that replacing the two electrolytics (C110 & C111) in the cathode circuit of the first LF stage will go a long way to reduce this problem. They are 10mfd (12V) and 25mfd (25V) respectively).*

Now the plate on the 830's rump. One of mine has the same plate. I think it was an RCAF (*Royal Canadian Air Force*) identification system. I draw this conclusion from the colour of the plate background.

My scruffy 830/4 which is a stunning electronic performer belonged to the RCMP (*Royal Canadian Mounted Police*) counter intelligence and has no plate.

The plate on my other 830 is identical to that on Joe's except that the Serial Number is 48. I have asked about 25 hams if they know of the plate and especially the way to interpret CRC/CRA.

At this point I should tell you that my RCA CR91A (the last of the AR88 series) has a sticker with the same nomenclature except that it reads "Type CRC/CRA-01" and "RCA Radio Corporation Inc., Montreal." Since RCA is 01, the CRC/CRA program began in the very early 1950s or even late 1940s.

However, nobody I asked had the definite identification for the CRC/CRA, other than Dave, VE3ORP, who is one of the leading lights at the Military Communications Museum in Kingston, Ontario.

He thought that CRC is "Communication Research Centre". I have a problem with that. I am sure that the CRC/CRA are the initials in English and French of the organisation which authored the plate and CRC *en français* would be "Centre Recherches Communication"

BUT the word "Centre" was not used in Quebec French 40 years ago in the

sense of a BUSINESS CENTRE, it would have been used in the geographic or geometric interpretation.

After a discussion with Louis VE2AJ we concluded that the word "Agence" was the most probable translation in the early 1960s for the English word "Centre". That suits the "A" of CRA, but in grammatically correct French, it would be ARC . . . . . we are not at the answer yet!

Now the Modification Label. It is stuck on all of the communications, repair and maintenance equipment used by the RCAF.

Modification #1 relative to the 830/4 is the installation of the chrome-plated spring-loaded toggle switch to operate the Crystal Calibrator in place of the black plastic push-button on the other 830's. (As described by Graeme in the February Issue of Lighthouse! - No77, page 26.)

I will keep going on this plate matter, somebody must know. After all, it's only four decades old and they're not yet all in the hereafter!



## Re Chris Morgan's Product Detector instability . . . (from June, p.41)

Graeme asked for suggestions and so here are some faults which I have met, albeit rarely, which may have been the cause.

By Alan Robinson

- 1) Low emission or the valve gone soft, the valve struggling to maintain oscillations.
- 2) Corrosion of the valve pins/socket, causing high resistance or leaky variacap diode type connections.
- 3) External tracking between pins and across top of socket, caused by contamination.
- 4) Internal tracking between pins. In some long-used valves I have noticed a dark film-like deposit in the base area, similar to that seen in a used light bulb. When measuring the resistance between pins, instead of the expected infinity, I get an erratic high resistance.
- 5) Faulty spot-welds in the valve structure, or more likely faulty welds to the pins. The faults may be visible through a magnifier.

- 6) Valve top-cap connectors can become corroded and brittle, and the connection between the top-cap and the electrode can become intermittent.

Before switching on a set which has not been used for some time, or whose history is unknown, it is worth checking the valve pins and sockets, as well as switches etc., for cleanliness, but I expect I'm teaching grandmothers to suck eggs . . .

**NOT AT ALL, ALAN. HOW MANY OF US, HOWEVER TIME-SERVED, CAN PUT HAND ON HEART AND SAY WE ALWAYS CHECK THESE LITTLE DETAILS? WE WANT TO SEE IF THE SET WORKS AND THEN, IF WE FIND IT BEHAVING ODDLY, BLAME THE DESIGNER!**



# RADIO RAMBLINGS

*Gottings from my Notebook*



By  
Graeme  
Wormald  
G3GGL

Bewdley, July 2003

Once again it's summer greetings time; I find myself sweating in what is going to turn out to be England's best summer for a century (honest). It looks as if the wise woman in the market is going to be proved correct. North Worcestershire is blessed with a mild climate; comparable with Kent, the garden of England, according to my record books.

## EDDYSTONE on CAMPBELL ISLAND

EUGer Angus Vickery has just returned our copy of "Campbell Island" which you will remember featured the use of Eddystone 680X receivers in the 1950s in New Zealand's sub-Antarctica. Angus writes:-

**"It is a wonderful read; I felt that I was with the author on the Island. George Poppleton was an ideal leader for this task, not only being *au fait* with engineering matters but including an interest in the flora and fauna, assisting with the cooking and implementing a sensitive man-management approach to the team"**

As reported in our February issue, George passed away just before Christmas at the age of 80. We have had a memorial card from his widow, Hera. She writes that: **"The article in Lighthouse was the last he read of his beloved Campbell, as he was in hospital then, thanks for that."**

We had featured George's book in our

Christmas Issue in an article by Peter le Quesne, ZL4TCC, who kindly sent us a copy for members to read. If anybody wishes to borrow it please let me know in Bewdley. The only cost is the postage.

## VALETE MORSE

As I write, news has come that the Morse test is no longer a requirement and that all full Class B licensees become full Class A, but retaining their call signs.

I suspect that many of the current 'M3' calls will disappear and return as G8/6/7/1 and M1! No offence to the newer holders of M3 licences, it's merely human nature. *(They get an extra 400 watts!)*

But speaking of human nature, I don't recall the G2 plus threes (and the Gx plus twos) being looked down on in 1946 when the new licensing arrangement started.

Just to remind members, pre-war hams didn't have any technical exams to pass, but presented a list of proposed experiments and a letter from 'a person of standing' proclaiming their suitability! The Morse test was, of course, mandatory. As most pre-war hams couldn't afford a phone transmitter this was a sensible requirement.

Our Patron Chris Pettitt, GØEYO, is quite right when he says we must encourage interest in our hobby to

retain our bands. (and recover the old 40 metre band which we in Europe lost during the cold war; America and Asia still have it, 7,000 – 7,300). The latest WRC-03 pronouncement is that we'll get back an extra 100 kc/s in 2009! Mmmmm.

When I was first licensed in 1949 the number of licensees in UK was 7,000. Not many considering that a countless number of young men had been trained in electronics and wireless telegraphy only 5 years earlier (and still were during National Service).

Could this rather low take-up be due to the fact that the use of Morse was compulsory for the first 12 months? Telephony was strictly forbidden. This 'onerous' requirement was lifted in 1955; I don't recall anybody complaining about that!

### EDDYSTONE STEAMS AGAIN

Members will recall that Bill Cooke, GWØION, former chief engineer and MD of Eddystone Radio is also a steam railway buff, and that on his desk at the Bath Tub resided a model of the famous Southern Railway locomotive *Eddystone*. (It still does, but on his desk at home!)

Built in 1946, No 34028 was scrapped in 1964. In 1986 it was acquired for restoration by the Southern Pacific Rescue Group. Following a lengthy 'wheels up' re-build it is expected to be in steam before the end of this year on the Swanage Railway.

Many thanks Bill, for a copy of "Steam Railway" magazine which goes into the greatest technical detail. ". . . most of the motion was original . . . but new crinolines had to be made." Really?

### THOSE QUASI-LOGARITHMIC RF GAIN CONTROLS

Most post-war valve Eddystones used a rather curious semi-log wire-wound pot for the RF/IF gain control. This

isn't made clear in the handbooks and if you replace one with a normal 10k wire-wound it has the effect of a 'switch'.

That is to say that all the control is in the last 1/20<sup>th</sup> of a turn. Very off-putting and no help at all to CW and SSB users.

We covered this in detail some time ago so I won't start drawing pictures, but merely say that the 'log' effect was created by dividing the track into thirds and making each section about ten times the resistance of its neighbour. (70 ohms : 700 ohms ; 9,230 ohms)

Think about it and it will become clear!

Now such pots are not around any longer and in the search for a practical replacement Ross Paton in NZ has sent me a copy of the 'Hints and Kinks' column from a QST of the early 1960s:

**"If it is desired to make a log taper control out of a linear potentiometer, then place a resistor, half the value of the pot, between the wiper terminal and one end of the pot."**

This is a very nifty idea, but after juggling with calculator and AVO I find that the log effect is nowhere near sufficient to produce a suitable RF gain variation in the set.

Unless anybody can come up with another bright idea I fear that the best advice I can offer is to use a 1k w/w linear pot in place of the original 'special' 10k. Pad it out with a 10k one watt fixed resistor in series to simulate the original. (It's within the 10% tolerance!).

This may seem eccentric but when you consider that 99% of an Eddystone's RF gain usage is in that section of the pot that covers 770 ohms it doesn't sound so daft.

The rest of the 9,230 ohms is for reducing CW signals that are

emanating from the chap next door. I personally don't listen to the chap next door on CW (or anything else, for that matter) and I shouldn't think many other members do, either.

### A CASE OF MISTAKEN IDENTITY

I had a phone call from a non-member last week. "Can you help?" he said, "I need to know the type of valve in the output of the 770R. The set's quite dead."

Now the output stage in a 770R is a pair of push-pull EL91s, if memory serves me, so I told him that and asked him how he knew that two valves had failed together.

After a slight hesitation said he could see the number 'something /30' on it and that it was very soft, glowing purple. I explained his mistake but he replied that he was very experienced in valve sets, being a retired service engineer. Oh dear!

### STRATTON LIVES ON

Last week I decided to replace my bathroom hair-comb. It had lost nearly as many teeth as me. Our local pharmacist had a box-full of those tortoise-shell celluloid combs which go back forever. They were in transparent cellophane sleeves with no name on them.

When I got home and unwrapped it I noticed a little gold smudge on one side, and there, invisible to the naked eye, was the logo:



*Micro-photo of comb*

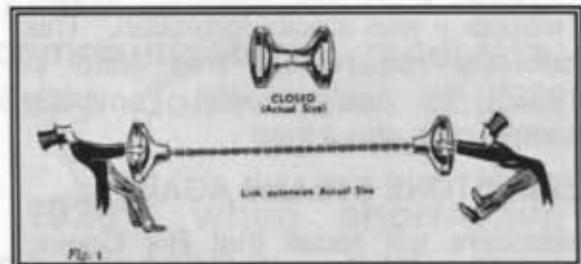
Compare it with this logo taken from

the Eddystone letterhead of the late nineteen fifties.



### Letterhead logo from the late '50s

I wonder if we shall see a resurgence of Stratton non-radio collectibles? I know I have acquired a pair of patent Stratton "Expanda" cuff links. These were invented by Ernest Peet, a toolroom manager at the Bath Tub. By 1960 over a million had been sold.



***Wearing the "Expanda" cufflinks you could pull up your sleeves for washing without unbuttoning them!***

I also have a beautiful little 'gold' pencil and notebook case for milady's handbag, with the same logo.

### AUTUMN NVCF

Several members have enquired about the Autumn Vintage Communications Fair at the NEC, Birmingham. **This takes place on SUNDAY 28<sup>th</sup> SEPTEMBER, 2003.**

Jonathan Hill, who started this popular event over ten years ago, writes:-

"I am pleased to announce that the National Vintage Communications Fair will have a new organiser as from the 28<sup>th</sup> September 2003 show. The British Vintage Wireless Society (BVWS) will take over from that date and they have pledged to make sure that the show you know and love continues to be a world-class event." ♣



# Which Eddystone do you recommend?

Graeme Wormald G3GGL

Since I've been editing 'Lighthouse' this is a question which crops up time and again. It has just come from Greg, who asks "I don't have an Eddystone at present, what do you recommend? My main interest is World Band Listening."

'World Band Listening' is the modern term for Short-wave Broadcast listening, which is still 99% A.M. This is the sort of listening which appeals to many and is the least critical form of H.F. receiving.

Having said that, this is one of the reasons that I produced "The Quick Reference Guide" or QRG for short. Every member has been sent the latest copy (2002); it goes out the moment a new subscription arrives.

So to save a lot of boring repetition I will assume that readers have their copies to hand. In fact, unless you've got a memory like an elephant it's virtually impossible to study the nature of Eddystone without it to hand! If you've lost your copy just tape 3 Pound coins to a cornflake packet and send to me STATING IF YOU WOULD LIKE IT IN HARD COPY OR CD-ROM. Overseas members do the same with a \$5 or €5 bill or equivalent in your own currency.

At this stage I think we would agree that we are talking about the golden age of Eddystone valve receivers, which began in 1946 and ended in 1973. Otherwise I would say 'Order a brand new Model 6200; it will be the best!' But at something approaching £3K I don't think that's what we're talking about.

By the same token, the first 'serious' transistorised HF Model, the EC958

series doesn't come into my purview. It may be a cracker of a set but just look at the descriptions on page 45!

48 transistors, 53 diodes and 42 ics . . . not a beginners set. In fact, not anybody's set unless they are a whizzkid with solid state. Remember these models are now up to 34 years old.

No; I'm talking about the more basic receivers that we can all understand and, if necessary, service with a minimum of instruments.

There's not too much point in recommending a set that only comes up once in a blue moon, either. So using that criterion the first set that we see in QRG is the famous S.640, the one we OAPs used to ogle in the local ham radio shop, but few schoolboys could ever afford it (even though it did come down to £27.10s in 1948 – still about £1,000 at today's values).

Now although it has a lot going for it, and you can still find them, it's not my favourite. The two-pointer electrical bandspread system needs a crystal calibrator to set up. You need to set the band-spread at zero then tune the bandset to the nearest band-edge you wish to tune. A fiddly business. The crystal filter and BFO serve no purpose for broadcast listening, and it needs a separate speaker. And the drive cords are hell to replace!

Now as Eddystone made about 100 other sets over this period I don't propose to analyse them in such detail! It would be a whole new book, called the 'Eddystone User's Guide', and I'm not ready for this yet.

So I'll repeat my slogan, just to silence those clever clogs who think they know better: "A deaf Eddystone is a sick Eddystone". All Eddystone general coverage valve sets make exceedingly worthwhile SW broadcast receivers. Even the S.640, it's just not the best for our enquirer.

So where do we go next? To the famous S.670 series, which some big-mouths deride as being 'just flashy domestic sets'. Mmm. Just look at page 28/9 and consider that these first class sets were made from 1948 to 1967, a twenty year span. They don't have a BFO or a crystal filter but they do have a built-in 6½ins speaker.

Take the first 1948 version; classic good looks, and just read what this happy customer in Canada wrote: **"A year ago I bought one of your fine Eddystone '670' Marine Receivers. It's a really first class radio and we have nothing to touch it on this side of the Atlantic."**

A flashy domestic set? I don't think so. Any of the series would be quite suitable.

Next comes the S.840 series. Almost identical in specification it was actually aimed at the radio ham because it has a BFO, but it achieved cult status because of that. My model 840C belonged to the chief engineer of the Anglo-Iranian Oil Company and I don't think he could read Morse!

Read Pages 31/32 for details and then consider this report from USA:-

**"Let me congratulate you on the performance of the Model 840A which I purchased some time ago.**

**It is by far one of the best radios I have ever owned. My experience is with Philips, Bush, Megatone and Hallicrafters, but none compare with Eddystones. For myself I can say it is one of the best and finest radios ever built. My radios from now onward will bear the symbol "Eddystone".**

These testimonials, by the way, come from many hundreds in the Stratton scrap-book of users' letters.

The last of the 'self-contained' models is the baby 870/870A (pages 34/35). Modest though they may be they give a splendid account of themselves:

**"My little Eddystone 870 is at least 100% better than anything I've previously owned, including Zenith and Hallicrafters."**

All these 'universal' AC/DC sets are derided by the Philistines, but they are the best such in the world. My practical suggestion is that you consider running them from a 230/110v transformer. This will reduce the heating by many watts!

Of the rest you are likely to come across, the 680X, the 750, 940 and the 730/4 are all good professional models and you will be happy with them.

The 830-series is the very best. But they are in demand, you may not be the first in the queue.

What about the early transistor models? I hear you saying. Yes, by all means consider the EC10 and its derivatives, the EB35/6/7 (pages 40-42). The EC10 (Mks I & II) are the most prolific Eddystones. But, quite frankly, I think that the early germanium transistors used were not up to much. Second best. Whereas the valves used in the other sets were the top of the tree.

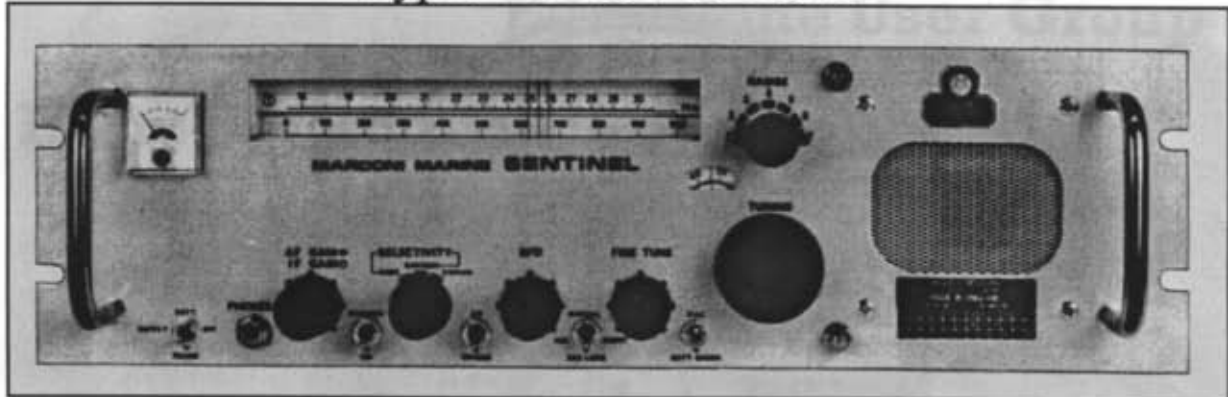
As for the other, rarer sets; check in QRG if you find one. ♣

MARCONI INTERNATIONAL MARINE COMPANY

# 'SENTINEL'

RESERVE MARINE RECEIVER

Types EC1004 & 1004A



## ***An Eddystone Clone with a Difference***

Of all the Eddystone Type 1000-Series this was by far the most professional and it was also one of the few 'MIMCO' sets which retained its Eddystone nomenclature whilst in Marconi guise. (*It was also badged as Redifon, ITT, and Hagenuk.*) This is what Marconi said about the latest model in 1977:-

The MIMCO 'Sentinel' (Eddystone Model 1004A) is a compact receiver with reception facilities for CW, AM & SSB transmissions in the bands 150-535kHz and 1.6-30MHz.

Seven frequency ranges are employed and an integral pre-tuned crystal-controlled converter is fitted to provide instantaneous selection of the International Distress and Calling Channel (2182kHz) for emergency watch-keeping at sea. (Shown above).

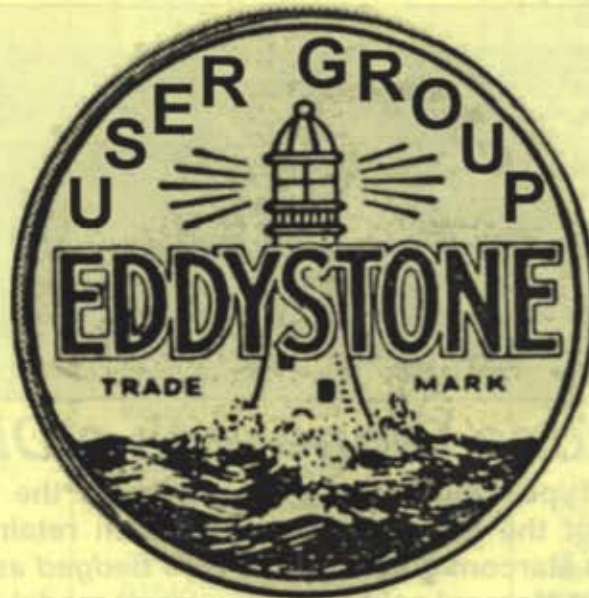
Model 1004 (approved version) also has provision for high-stability crystal controlled operation on up to ten channels in the band above 1.6MHz.

The receiver is specifically designed for maritime applications and is approved by the British Ministry of Posts and telecommunications as a 'reserve' receiver for use on ships. It has a standard 483mm (19in) panel and is directly suitable for installation in

any standard racking unit or equipment housing which complies with the UK Post Office Specification.

Operating voltage can be taken from any standard 40-60Hz AC supply or a 12V or 24V battery, changeover from one mode of operation to the other being by means of a panel control. Internal circuitry is isolated from frame to permit use with all forms of DC supply irrespective of earthing arrangements.

A single conversion circuit arrangement is employed using an intermediate frequency of 720kHz with selectable bandwidth. All normal communication features are provided including manual/AGC switching and standby facility, variable BFO and meter. The input circuit is protected and can be interrupted with a relay when using the receiver with an associated transmitter. ♣



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