

Lighthouse

Founded 1990

The Magazine of the
Eddystone User Group

Issue 88, December 2004



Christmas at the Eddystone Light 1904

From an old Postcard

EDDYSTONE USER GROUP

A non-profit-making Group for Eddystone Radio Enthusiasts.

Founded in 1990 by
Ted Moore, G7AIR

Issue 87, October 2004

Membership details:-

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Wanted: Female Jones Plug sockets for 730/830 rear panel connectors. Brian Cauthery, VE3DFC, 19150 Hwy 10, R.R.#1, Caledon, Ontario, L0N 1C0, Canada.

Wanted: T5 Audio Filter for Eddystone 888 (same as 730/4) by South African member Barry Jackson ZS2H. Contact my brother Glen Jackson at 7, Scythe Way, Colchester, Essex, CO3 4SJ. Tel: 01206 543 3665 with details.

Wanted: Eddystone 940 also Codar AT5 transmitter. Call Chris MØHMR on 01453 832 725.

Wanted: case for 830/940 series; also case for 670C/840C/EB34, Call Ted, G7AiR, on 01945 467 356.

Wanted: Support strip (plinth) for EA12 Call Bill GMØKMG, 0141 562 4571

Wanted: mains transformer for 770R Richard Lorrison, 19 Nant y Felin, Hollyhead, Anglesey LL65 2TQ

Wanted: copy of handbook for c.1959 Panda Cub valve AM Tx. Graeme G3GGL details opposite

EXCHANGE:Eddystone EC10A2/1 with mains psu and original handbook for W.H.Y. Rx. e-mail me at Geoff1932@blueyonder.co.uk

Exchange: coil set for Eddystone Modulation Meter (See QRG p.57) for set of knobs for Mimco 2232a (alias Eddystone 670C). call Tony Hall GØMQG on 01603 744 197

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details on opposite page.

Chris's Column

Welcome to another bumper packed issue of "Lighthouse". First let me start by wishing all readers and their families a very Merry Christmas. I hope you are able to enjoy the holiday and relax in your own good fortune, whilst perhaps giving some thought to others less fortunate.

Reading and talking to Ted about his exploits on the ham bands with the Orion 5000, reminded me of how we came to produce the QSL card which featured that model.

My memory is not as good as some more notable past MD's but I believe we launched the Orion 5000 in the summer of 1985. Marconi used occasionally to hold representatives' seminars, where they would invite their representatives and distributors from around the world to a hotel or conference centre for a weekend of seminars. These were all designed to motivate them to go and get more business.

Traditionally these occurred every couple of years and were usually attached to some international conference; either telecoms or broadcasting.

They were often well attended with some 50 or 60 delegates and when Marconi were feeling generous, wives too were invited. In 1985 I had been in the MD's chair for only a year and I got the word that we at Eddystone would be expected play our part and mount a

seminar and display of equipment as part of the Representatives' Conference.

That year it was not aligned to an exhibition but was a stand-alone affair to be held at a conference centre at Essex University. It was the first weekend in July, the height of summer and was a Wimbledon weekend.

I seem to remember copious Pimm's being served . . .

Keen to make a big impression, as it was very easy to be dwarfed by other larger and more successful divisions in the group, we decided that we would steal the show!!.

A brave thing to do in hindsight, given my newness in the post. But as they say there is nothing like the enthusiasm of youth!! I got together with the salesmen and some of the other managers and we decided that we would send down a display which covered three topics.

Our receivers (notably the 1650), our broadcast transmitters, and the Orion. With the exception of the transmitters I wanted working kit that we could set



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up in the seminar room and divide our audience into three groups so that each could get the feel of the equipment and ask questions of the experts.

This was achieved and we even crystallised up the Orion on ham bands so that we could demonstrate it with live contacts.

I persuaded Dale G3XBY to give up his VHF NFD weekend to man the Orion stand (quite some sacrifice I realised later given his position in the team that usually wins VHF NFD).

We printed some QSL cards for the contacts and congratulated ourselves on making a big impression with the delegates and our own management.

However on the Saturday during the afternoon social gathering (plenty of Pimms) we almost went too far.

One of our salesmen had a keen interest in flying model planes, so we arranged for him to send up one of his larger models with a huge banner proclaiming Eddystone Radio to buzz the delegates whilst they were enjoying their drinks.

The audience loved it. The management (or some of them) thought it was an adventure too far and were a bit disapproving. But the delegates certainly remembered Eddystone Radio at that conference.

I don't think we were ever invited to another one!

Enjoy your read,

Chris Pettitt

GØEYO, Patron

RADIO RAMBLINGS

Gottings from my Notebook



By
*Graeme
Wormald
G3GGL*

Bewdley, December 2004

Here I go again wishing you all a very splendid Christmas and the most prosperous of New Years, together with the very Best of Health with which to enjoy it all.

Actually I am cheating rather, putting a December dateline at the head of "Ramblings" because I've started writing this in November. But what with the usual seasonal delays and talk of postal strikes I'm trying to get ahead of the clock and get to the printers early.

A LITTLE PAPER-WORK

This is just a few words to try and tidy up my office work. Members may recall that I was once given an aptitude test to determine my suitability for work in the broadcasting industry.

It was revealed that I was eminently suitable for that discipline, and several other practical arts. But as an afterthought the analyst mentioned that I should avoid office work, as I was temperamentally unsuited to it.

What he was trying to say (politely) was that I'm an untidy devil and tend to get my paperwork in a muddle. He was quite right, actually. I do.

So where is this leading?

Probably the greatest office work I've ever tackled is managing E.U.G. It's not that I don't like doing it (although I do prefer the rest of it!), but there are a couple of areas where members could help. Here goes . . .

I send out renewal reminders which are difficult to overlook. I rubber stamp the envelopes so members know what's coming. I keep a special file in which to place the renewals when they return so that I can update my members' database.

And what happens? Some members (I'm not saying which, I don't wish to cause embarrassment) – some members carefully cut off the little strip at the bottom where you put your name and address. They then return it with their remittance. I then enter the missive in my day book (thank goodness) and promptly lose the sliver of paper.

Please, PLEASE, send the sheet back chaps (and madam) complete and whole, so that I can spot it in my muddle! Thank you everybody.

The other matter is in the question of finance. To the best of my knowledge all my references tell you all to make out cheques (checks to our cousins) to the Eddystone User Group. E.U.G. will do. The bank will take them.

But what they will not take are cheques made out to "Graeme Wormald". You'd be amazed how many times I've been embarrassed at the counter by bank tellers who are trained to spot these flaws.

I have to take them home, enter them into my own personal paying-in book, make out a personal cheque to E.U.G. and enter that into E.U.G.'s paying-in book. Then I go back to the bank and

try again. It all works quite well in the end but it does make my personal accounts look odd. It's a good job that xyl Eda, (who keeps all our domestic accounts), realises that I'm not really paying all this money to E.U.G.!

OK; preaching over for this week.

VISITORS FROM ZL

Last weekend Bewdley was privileged to receive a flying visit from Peter le Quesne, ZL4TCC and his xyl Anne from the antipodes. Napier, New Zealand, to be precise.

They are in the process of travelling round the world East to West and were just about half-way (well, they would be, wouldn't they!). They had also paid a visit to the Channel Isles which the le Quesnes left over a century ago.



Peter ZL4TCC & XYL Anne le Quesne with Feline Friend

Peter, who is a former electric power transmission engineer, now runs a technical book import/export business, both new and second-hand.

He has acquired the library of Jack Parminter, ZL2OU, who featured in our "Lighthouse" article on page 28/9 in the April 2004 issue ("**A Pause for Thought**"). This included Jack's station logs from 1936 to 1977 plus a set of pre-war QSL cards for my inspection and delectation.

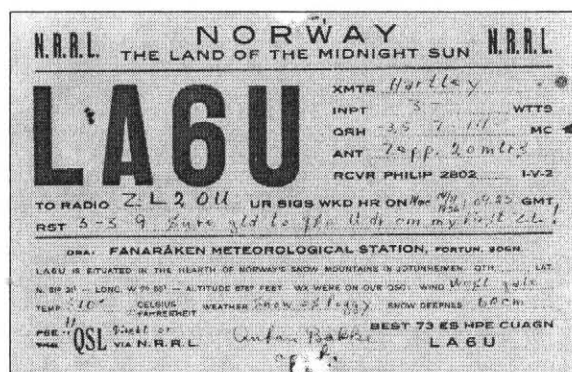
Now many of you will have noticed my old-fashioned and rather jingoistic insistence on calling a "Hertz" a "cycle". Now this is perfectly

reasonable. *Chacun à son goût*, as they say across the water.

But now I must take to task all those who insist that the UK was out of step with the world and must start to use the alien Hertz to the exclusion of the customary and ancient word "cycle"; a word which is self-evident by its Greek root.

They tell me that the term "Hertz" – which is the name of the German professor of physics who demonstrated in the laboratory the nature of radio waves – is to be substituted at all times for the unit of cycles per second,

Now if it were true and everybody else used the term "hertz" it would show up as an historic record on these vintage QSL cards from 1936. Well it doesn't! Picked at random are the following cards and it is perfectly clear from the format that they were using the term "cycles" as in MC for *megacycles*.



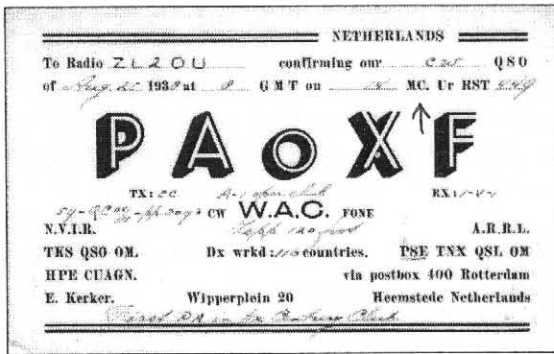
On the third line down it says clearly

QRH – 3.5 – 7 – 14 – MC

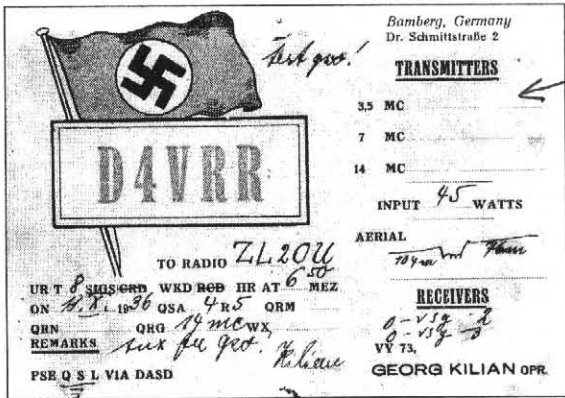
The card also reports an RST of 339 on a 1—V—2 'straight' receiver (CW, of course) with a Tx input of 3 watts and a location at 'Fortun' in the heart of the snow mountains in Jotunheimen at an altitude of 6787 feet. Note that; megacycles and feet! (*In Norway!*)

Another interesting card from the Netherlands (PAØXF) gives a report of

449 using a 1 - V - 1 (3 valve straight) receiver. The item "14 MC" is quite clear on line 2.



Another interesting report comes from D4VRR which again clearly shows a



list of Transmitters all operating on frequencies of 3.5 MC, 7 MC, and 14 MC. Unfortunately the red printing of their details has faded to a mere smudge. The report is 458 on 11th October 1936 on a 0 - V - 2 (3 valve straight) receiver. And that's from the land of Heinrich Hertz himself! It's all an EC plot to get radio hams to bow down to petty change.

I rest my case!

Thank you, Peter, for providing the evidence.

STOP PRESS! After this feature was written news came from Peter via e-mail in Sweden. Whilst disembarking from the Turku ferry Peter's xyl, Anne was pushed over by unruly passengers. They

trampled on her then pushed a pram over her head. She was admitted to Stockholm Hospital and is under treatment for head and other injuries. Their round-the-world trip has been abandoned and if Anne is well enough they will be flying home as this issue goes to press.

On behalf of all the members of EUG I wish Anne the speediest recovery and express disgust at such outrageous behaviour. Members with e-mail facilities may send their messages of goodwill direct to them at << Pleq_tbc@clear.net.nz >>

AM UPDATE

Having given details of the de facto AM Channels in everyday use on the Eighty-Metre Band I must give myself correction. ("In Consideration of Amplitude Modulation", page 42, October Issue).

I received an e-mail from Colin Guy, G4DDi, Editor of the Vintage & Military A.R.S. (VeeMars). Colin continues:-

"Presently, VMARS hold their Saturday AM controlled net on 3615 from 8.30 am (local) usually controlled by G4GEN. This was moved a couple of years ago from 3625 because several members suffered QRM from the local goggleboxes (3625 is an exact harmonic of the line frequency).

"They also have a "discussion net" on Friday at 7.30 pm SSB on 3620+/- QRM.

"3625 is used as a 'de facto' AM frequency and has been for many years. The "Boatanchor" group pop up there later on Saturday morning, and usually several VMARS members join them after the main controlled net.

"As far as I'm aware MWARS doesn't hold an organised net at present.

"Also, the KW Group hold a net at 10

am Sundays on 3620 +/- QRM.

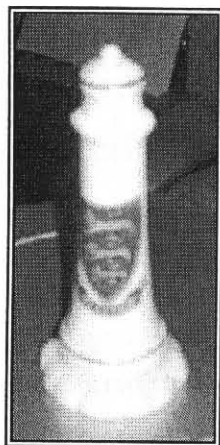
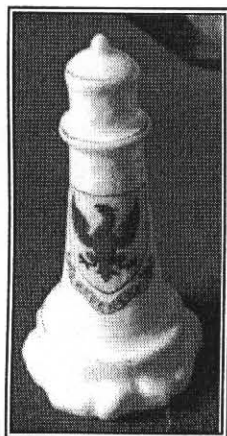
"I like the idea of the "Third Sunday" net and "sponsoring" a design for an AM rig – why not make it a construction contest like Chas. Miller does in Radiophile?"

Thank you, Guy for updating us here and I'm giving every thought to a simple AM rig design. See "In Consideration of AM" in this month's Issue.

MORE e-Bay MANIA

Readers will recall some slightly caustic comments in last month's issue of Lighthouse concerning my weakness for collecting the *other* kinds of lighthouse.

Well, I'm pleased to say that they are still appearing on the 'Eddystone' finder and my total has now grown from the unlucky 13 of last month to a healthy nineteen.



For readers unacquainted with these historical little collectors' items I reproduce a couple above. They are about 4 ins. high and carry beautifully coloured 'arms' of the town in which they were originally sold.

I'm told that the origin of these curiosities was when the famous china porcelain manufacturer, W.H.Goss, noted the great popularity of bicycle-riding among the newly emergent

middle-classes. He correctly foresaw a demand for small but elegant souvenirs for these new age travellers to take home for their friends.

The Eddystone Light, having been rebuilt in 1882 was famous for its flowing grace. Other miniature artefacts included classical items from Rome and, a little later, battleships, tanks and aeroplanes.

These small objects were produced by the million and copied by every manufacturer in the five towns. The craze lasted into the 1920s and then faded away.

SERVICING FACILITIES

You will have read elsewhere in this bumper seasonal issue of "Lighthouse" the feature on restoring an Eddystone 830/7, rightly called the "Jewel in the Crown" of Eddystone valve receivers. It has been written by one of our members, Graham Gosling, the proprietor of "East Coast Wireless".

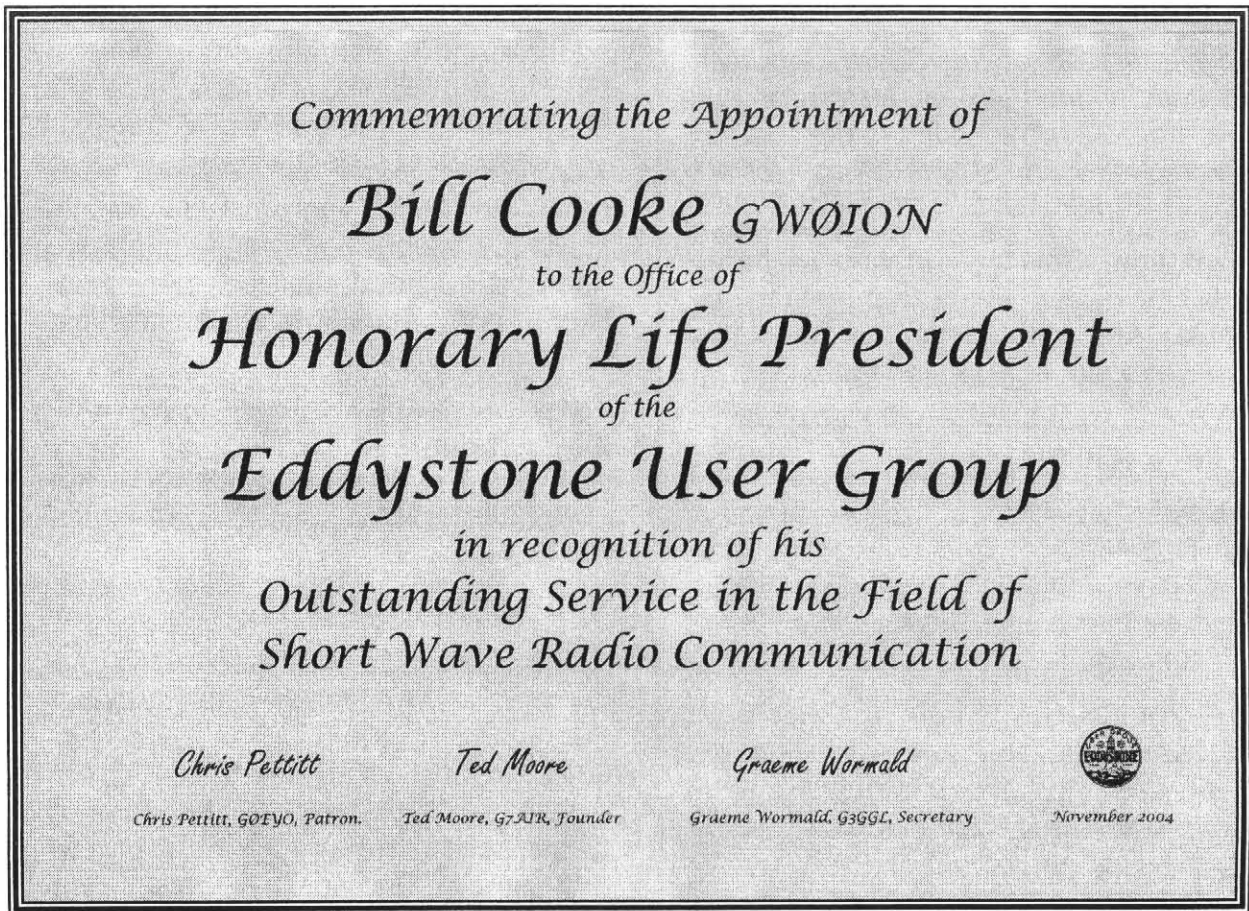
Graeme is an extremely experienced and well-qualified servicer of vintage radios and I'm very pleased to see that he is now offering his services to our members.

Over the years I've had many people ask me where this sort of work can be done professionally and I've had to say "I don't know". Few of the usual "old wireless repairers" would touch anything like an Eddystone.

You will see Graham's full page advert elsewhere in this issue and I commend his services to those members without the facility or the know-how to do this sort of highly skilled work.

In the meantime, may I again wish you all a very Merry Christmas and a healthy, happy and prosperous New Year!

By 73 de Graeme, G3GGL



Copy of the Parchment presented to Bill Cooke on the occasion of his 85th Birthday.

Bill Cooke Remembers

Our long-term members will recall, from our feature "The Cooke Report" which ran for a year and a half in the "E.U.G. Newsletter" during the late 1990s, that our new President has a fund of anecdotes and recollections which span most of the 20th Century. These cover two distinct spheres: first of all with Eddystone before the war and then after it until he finally retired as Managing Director in 1984. But in 1939 the shadow of war cast itself across the world and Bill found himself (along with many other young radio men) in the R.A.F.'s mysterious world of "A.M.E.S."

These were the initials of "Air Ministry Experimental Station" and mean nothing unless you were involved. In fact it was a cover name for R.D.F. (Radio Direction Finding) which later became "RADAR" when the U.S. came into the war.

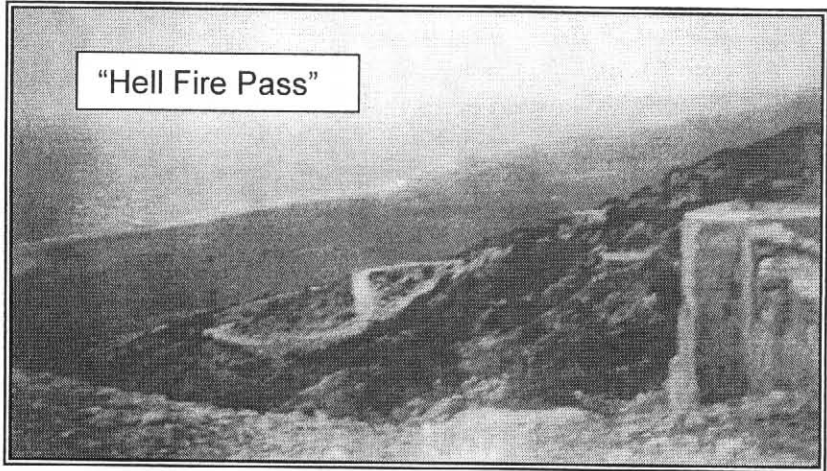
After working on C.H. or "Chain Home", Britain's network of stations which saved the Battle of Britain, Bill found himself on a troopship bound for North Africa. He arrived early in 1941 and was to spend most of the war there. He recalls one incident . . .

“THIS is the story of a young pilot rescued by Radar in the North African Desert in World War Two and I was there!

“I was stationed at 846 AMES south of Tobruk and then moved to Appolonia via Halfya Pass (Hell Fire Pass). We had to set up a station west of Derna in the Green Mountains about 2,500 ft up. This gave a clear scan across the Mediterranean to Crete. Conditions were very different from the Desert with plenty of snow at times.

“One day we were requested to take over a photo recce. Spitfire (P.R.U.) which had been shot up. There was damage to the airframe and injury to the pilot. He couldn't see the ground and there was concern about fuel shortage.

“We had been given the grid reference but at first we were unable to see an echo. Then the operator on the range and direction tube noticed an echo at short range and became suspicious. He was right! It was a second trace



echo and it was the Spitfire!

“The controller contacted the Pilot on V.H.F. R/T (Amplitude Mod on 121.5 mc/s emergency channel, just the same as today). He was flying about 3,000 ft above heavy cloud and hadn't a clue where he was.

“It was decided not to bring him in across the Mountains but to guide him east towards Benghazi, round the Green Mountains then south into the desert.

“The pilot was then told to lose height and descend through the clouds on instruments. He was astonished and delighted to break through above plenty of flat open sand for a pancake landing.

“Some weeks later after his recovery he visited the station and was amazed at the set-up. He'd never seen a G.C.I. (Ground Controlled Interception) before with a small staff of about 35 men.

“Regretfully Rommel was soon in action with the Afrika Korps to replace all Mussolini's men that we had captured. He drove us back to El Alamein and we had to start all over again!

“I hope readers find this interesting; it all seems such a long time ago now!”



All the best, *Bill*

AT LAST!

FORTY METRES RE-BORN

BY GRAEME WORMALD G3GGL

READERS WILL RECALL that for the past few issues of "Lighthouse" I have been reporting on the vicissitudes of the proposed extension to that old hams' favourite, the Forty Metre Band. First of all it was reported that it would be extended in 2009! Then it was suggested that it would come in October 2004. Then the whole thing went vague but then Ofcom (the new title of our licensing authority) announced a one-month consultation period to commence on 23rd September.

Licensed amateurs were invited to make representation on the proposal to extend the band from 7100 to 7200 kHz, in writing or by e-mail, to arrive not later than 23rd October. This notice missed the October RadCom but was picked up by VeeMars (Vintage and Military Amateur Radio Society) and circulated to members, of which I am one.

I shot off an e-mail congratulating Ofcom on their initiative and urging them to consider the restoration of the whole band, that is the old band of 7000-7300kHz, as soon as practicable.

A prompt acknowledgement was received.

My simple mind decided that as Ofcom were only just going through the consultation procedure the chance of an early release was marginal, to say the least.

You may imagine my surprise when, on Wednesday 27th October, only four days after the last date for consultation, I had an e-mail from Colin Guy, G4DDI, Editor of VeeMars Newsletter. He advised me that Ofcom had posted the Notice of Variation on their website, releasing the new band at 01.00 hrs on Sunday 31st October.

We both agreed that we would be operating AM on the new band on the first day. It's essential that we fun-loving dinosaurs establish a campsite

on the band before it's flattened by the black boxes (no disrespect, but we *are* licensed to do it!)

I was on the band at 9.10 on the Sunday morning and made no less than nineteen contacts, including Ted, operating GW3EUG/P from the Great Orme, on the VeeMars *de facto* AM spot, 7143 kc/s (I'm sorry; I shall always give AM frequencies in good old English kilocycles).

The rig in use here was the Eddystone 730/4 harnessed to a KW "Vanguard", the whole vintage being around 1960. The aerial was my usual big horizontal 240 ft loop.

All signals were S9+, most of them end-stopping on the 730. All except one, that is. Geoff, MØBGS, up there in Leeds was noticeably down at S8 (!) Silly really, but with all the rest end-stopping it did show.

I then had the bright idea to switch over to the 66 ft doublet, which by another name is a Forty Metre dipole,

only fed with resonant line instead of co-ax. A quick tweak to null the SWR and there was Geoff end-stopping like the rest. Another lesson learned, I think. (A straight dipole takes some beating!)

I continued on the band with ever-increasing nostalgia, having quite forgotten that when copying AM from a VFO-controlled valve Tx you always keep your hand on the main tuning control. As it wanders the odd hundred or two cycles during an over you gently rock the tuning and at the same time fend off the adjacent channel splatter.

The 730/4 (and its similar Eddystone brothers) have a variable bandwidth which is quite different in shape from a modern crystal lattice. This latter has much steeper sides, which tend to slam in as you tweak the tuning. The L/C combination is much more tractable and satisfying to use.

Another bonus was the cathode-follower output facility on the 730 (a trap valve, we used to call it in early television broadcasting). This gives a 75Ω output at 450 kc/s which you can feed straight to the station oscilloscope through several feet of co-ax without affecting the Rx.

The result is some pretty pictures of classic AM wave-forms. But what is more to the point this gives an extra parameter on which to report. One station came through with a very mediocre signal for an end-stopping carrier. I was able to advise him that his modulation was a mere ten percent. This soon increased when he turned up the wick on his modulator.

I know I'm being old-fashioned, but you get so much more satisfaction from doing things you understand.

One unfortunate station had to go off the air when his Heathkit DX-100, unused for decades, started to emit

smoke through the cooling grills. An hour later he was back on the net, having done an effective repair job. Now there are very few hams could do that with a black box! (I know, you're going to say that black boxes don't emit smoke . . .).

The net continued for about an hour after I left it. But when I checked back at 2pm it was full of broadcast stations. We do, of course, share it on a secondary basis. This gives me hope that the next hundred kc/s will be released to put us on a par with the rest of the world.

Speaking of broadcasting stations, I had an interesting missive arrive a few days later. It was an envelope addressed thus:-

Mr. "Graham"
Amateur Radio Station "G 3 LIMA"
c/o G.P.O. (local) for destination
address.

Bewdley
Worcestershire W.M.

It had a second class stamp on it and I won't hear a word said against the Post Office! (*When did they stop being the GPO? 1980?*)

But more was to be revealed when I opened it. It contained a DX-Club proforma listener's report, suitably filled in with all my "programme" details including "strength five" and a SINPO report of 54455 "in the 41 meter band".

The penny dropped! I had been ear-wigged by a B/cast SWL searching the band on his AM Rx, just like all we old-timers did before SSB ruled the air-waves. Needless to say my QSL card was sent winging back to Ken in Bedworth by the next post.

Well, I for one will be giving Ken and his ilk something to listen to on the "41 meter band" besides the Moscow World Service.



Ted's MailBox

A Review of Mail and Happenings

By Ted Moore G7AIR, Founder of EUG

Elephants in the Family ?

I wish I had one ! My memory is so bad that an elephant would be worth its upkeep if it could remember things for me.

Still, EUGer Ron Hall has no such problems as he recalled my asking re those Heater/Kathode so-called booster or rejuvenator circuits from last year.

Then he came up with a circuit and sent it to me. Many thanks Ron, looks like some experiments are on the list to see if it works on valves too, after all what are CRTs but BIG valves ?

Wrong Number

Methinks some folk have got EUG all wrong, seriously wrong. I was contacted by land-line the other week by this chappie who wanted me to supply him with a full set of turret coils for a 770R, plus a new scale plate.

He ended his soliloquy by saying no need to charge VAT as he was VAT registered!

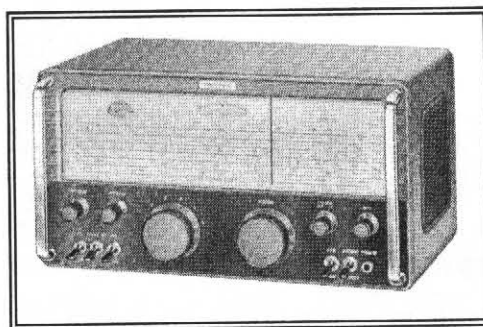
I had hardly spoken a word so far since I was a bit flabbergasted but I now pointed out that we - EUG that is - are not a business supplying new, or used spares to dealers or anybody for that matter.

He then snapped back that he had been told that we could supply Eddystone spares. A pity to disappoint

him but I did say that between ourselves if we had odd bits available then we did pass them around, but that was all. How did he come by his info ? Another dealer at a rally!

My 960

Progress is being made, in so far as I have got to the point where I have located the point at which the zenored supply is being almost shorted to chassis, and have removed most of the components necessary to get to this location.



Eddystone Type 960

The first solid state model

One of the problems with these sets is that they are built up from the chassis in layers and to get to the layer next to the chassis entails major surgery.

Obviously somebody had begun this task and given up because some components had been resoldered, some had been replaced, and a rather rough repair to wiring had been attempted unsuccessfully. More later,

when hopefully it will be singing. All good fun.

I.O.M EUGer

Having contacted our one member on the island I was asked to collect and deliver for him whilst over there, an 840C. Frank seemed happy with his new toy and as I gave him a handbook too he can start playing immediately.

I hope he makes it the first of a future collection. One advantage of these models is that for the arthritic fingers of us wrinklies the controls are sufficiently 'man-sized' for us to use them comfortably, unlike modern black boxes.

MF Marine Band

Is alive and well ! Seriously so as several of us have discovered. Even 'GGL from his landlocked 'hole in the ground' QTH has heard Humber Coastguard. I know Geoff has heard some too up in Leeds. Myself I have a growing list of 'Stations Heard' on the Marine MF Band, part of what we used to call the Trawler Band.

Far from being a dead channel the Distress and Calling Channel of 2182 Kc/s is very much used, both AM and USB. Our Eighty metre band - still a 'shared band' - has no fewer than TWENTY marine channels listed within it's limits.

Of these I have logged traffic in English, Spanish, French, Portugese and Italian on ELEVEN of them.

It is a nice thought that our own UK Coastguard still use AM on 2182. Apart from such as Yarmouth, and Humber Coastguard, others around the UK and Irish Republic can be heard on a daily basis.

Ostend Radio is on throughout the

day and night, evenings bring in Lyngby Radio, Rogaland Radio, Las Palmas (Canaries), Santa Maria (Azores), Bergen, Vardoe, Scheveningen, and if you have a good ærial and good ears then you may well hear Gander Marine on 2182 Kc/s.

I once heard what I believe was Haifa Radio at about 0500 our time but cannot yet confirm it. I have heard Humber Coastguard on 3738 trying to broadcast a 'securité' message to all ships whilst a couple of amateurs blather away on 3740. We are supposed to keep clear of these channels and not cause them QRM !

Try some of these channels one evening, 3610, 3617, 3629, 3630, 3631, 3632, 3638, 3645, 3652, 3655, 3666, 3673, 3681, 3684, 3722, 3738, 3750, 3778, 3795.

I am not saying all are active but leave your Rx on 2182 for a start. And many do not use the 'recommended' USB mode but real OFAM !

I have not mentioned the Top Band channels which are still being used by many coasters from Scandinavia and what used to be the Eastern Bloc countries. Yes Marine MF is alive and well - if you can beat the man made noise.

Any horizontal random wire which is well up and away from domestic QRM should bring in a fair few marine signals. I bet that Ostend, Scheveningen, and Rogaland will be amongst the first overseas stations you hear. Humber Coastguard will almost certainly be your first UK catch.

Late at night or early a.m will be best for the Dx. I have used my Marlin 1560 fed by a random wire some twenty feet up and about forty feet long, I have used my 40A when

portable at Gedney Drove End, on the Great Orme, and on Snaefell (heard Belfast and Tromso from there), using my eighty metres dipole.

O.F.A.M

There is a world-wide revival of this mode, Old Fashioned Amplitude Modulation. Listen to those Yankee Kilowatts having a net on twenty metres using OFAM with near Broadcast quality; listen to our own UK based vintage and military nets with remarkably clear AM using in many cases WWII gear and carbon microphones. As 'GGL said the other week - Sideband certainly grates on the ears after a spell listening to AM.

On some of the tests we do prior to the EUGnet it has been the case that OFAM signals were getting through better than the later LSB signals, sometimes too it has been the opposite !

No accounting for the quirks of the Ionosphere. 'GGL and I, plus one or two other EUGers are thinking of starting an AM only EUGnet on - possibly - the THIRD Sunday of the month.

A bit lower down the band though where one usually finds the other AM nets. Any feedback re interest in this should be channelled via 'GGL or myself. I might even be able to get another 'club' callsign just for AM - investigations are afoot already !

Go on dig out that '50s gear, use your 840C or 940 or whatever and let us get it going. Graeme says his 730/4 works wonders on 80m AM.

40 metres on AM

The release of the extra 100 Kc/s on this band seemed a good enough

excuse for 'GGL and others to start up an 40 metre AM net, grabbing a channel before others did !

Since I was just down the road I decided to nip up the Great Orme and try it for myself. The first suggested frequency of 7160 had some contesters yakking away AND a QRO BC station just up a bit in frequency.

It turned out that BBC W/S was still using this channel !!! Next 7143 was tried and here the VMARS AMers and some of us EUGers finally settled. It was not without problems but I seemed to be getting everybody okay and those who did give me a report seemed to get me OK.

Strongest signal by far for me was MØBGS, Geoff, with 'GGL coming a near second. I had cut and fine tuned a wire dipole for 7150 but was using it as a straight horizontal dipole fed direct from the TX with no ATU.

Both Geoff and Graeme were good readable signals on my 40A monitor receiver with just the THREE FOOT WHIP. The AM signals seem to blot out most of the sideband chatter, and at one point I heard an Italian AM station calling in.

Conclusion ? I still find 80 less frenetic and much more user friendly, so much so that I am putting together a horizontal Delta loop using my three telescopic poles so that it will be at 18 feet, plus the mountain height.

Thor Spoke Loudly

The last weekend of October saw me in Wisbech and we had what must have been the loudest and most violent electrical storm I have experienced for many years in the UK.

Shows you how bad, the BBC Peterboro' relay station was OTA for 4-

5 days. One Tv viewer a few miles distant from my QTH had a strike on his chimney mounted aerial with the result that Hi-Fi, Tv, Video etc were wrecked.

When the riggers came to fit a new aerial they showed us the remains of a vapourised aluminium Tv aerial. I left next a.m for North Wales and had some snow on top of the Orme !

That 3rd Sunday net saw me setting up my 40 metres dipole in thick cloud without almost nil visibility. What price global warming after this year's WX ?

Type 7AL.AP.W7943A.RAF

Quite a mouthful isn't it ? Not having the facilities of the old Bletchley Park Code/decode staff I turned to 'GGL.

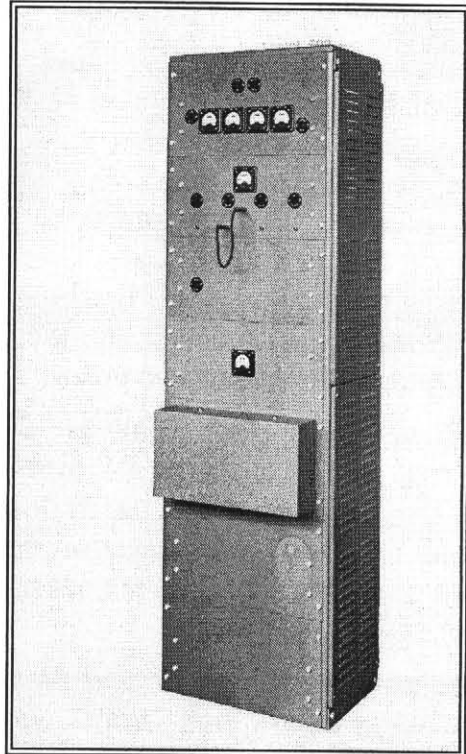
You see this is stencilled on the side of what remains of a transmitter, 6 foot rack mount, which I first heard about more than a year ago. The information is a bit sparse but seemingly from recollections of the chap who has it, this was used as an air to ground transmitter during the latter years of the war (WW II).

It was VHF of course in what is now the Civil Air Band. Much chasing after it's present whereabouts tracked parts of it down to the garage of this chap who whilst knowing nothing of it himself has it from a friend that it was still in situ at Biggin Hill in the '50s.

It weighed so much complete that when the time came for it to be removed it was dismantled unit by unit. Of course it weighed a lot ! We are talking of the Stratton S.215B which according to my factory manual weighed just a few pounds under a QUARTER of a TON, avoirdupois that is. None of your fancy continental

tonnes.

As yet I don't know just what I am getting, but have plans to go down and collect it soon. I have to be prepared for the fact that it is not all there, but am also banking on being able to locate other bits using the 'old boy network' which has got me to this point.



Stratton S.215 VHF Tx

I guess that it is a big advantage having not only an original factory handbook but also the original photos as used by Strattons for sales purposes, not just external views but also internal of each separate chassis. I also have the blueprints and negatives of each schematic. Just need the transmitter now.

Seeing the size of those mains transformers and chokes (fourteen in all) then it is easy to comprehend why it tips the scales at a quarter of a ton.

I will just quote a little from the factory handbook dated January 1946 -

"Extensively and successfully used by the Admiralty and the War Office during the War". Not a word about the RAF though is there ? It does say that the basic S.215 covered from 75 to 135 Mc/s with plug-in coils but that other versions enabled a total coverage of from 40 to 150 Mc/s. Watch this space.

Great Orme AGAIN !

Well yes, this time for the First Sunday EUGnet of November. I actually had almost a week up there (North Wales silly, not the Great Orme). The Sunday morning was overcast, my head in the clouds so to speak. I was up there by 0730 and had my horizontal resonant dipole up about 18 feet using my three telescopic poles.

With such weather I decided not to use an external setup on a picnic table, instead the gear was set up in the Volvo with one half back seat down to act as an operating table whilst I sat on the other seat alongside.

Nice and comfy with fodder and flask at hand. Power was from two paralleled car batteries with a third on hand 'in case'. The exception being the EC10 II which had its own internal battery pack, like the 'always there' 40A.

The dipole is so well tuned that it gives less than 1.5:1 swr over most of the 80 metres band - works a treat too on 20 metres ! No ATU is needed so that either the Orion 5000 or the Alinco DX77 work directly into the dipole and both load up well.

I had become fed up with the idiosyncratic behaviour of my dipole when fed via an ATU. It seemed that the ground underfoot affected loading so much that at times I was lucky to get 20 watts up the feeder. Best

results were on the river bank which was flooded every high tide, worst results were on the barely covered rock surface on Snaefell.

I was on the air, listening anyway, by 0800 and tried my usual hunt for NDBs, then QAPed a bit on 40 before going onto 80 metres. G4BXD was first on but there was QRM and so I had to move a bit.

Then we got 'GGL, and Chris 'XFE and that was the start of a successful AM forerunner to the EUGnet on LSB. Ben, G4BXD, was using one of his new acquisitions, a Chinese military pack-set, vintage Korean War. It was running an output of 2 watts AM from an end-fed aerial in Kidderminster and was coming into the Great Orme at S9!

It is strange to hear folks mentioning QSB so often when I rarely seem to be bothered by it, whether on the sea-level location or on a mountain top. It has been explained to me that simple long-wires tend to be more QSB sensitive than balanced dipoles but I find this hard to swallow.

On that point, if you can get up a decent length of random wire then there is nothing - bar laziness - stopping you from putting up a balanced doublet, even if non-resonant it will have a definite noise advantage over a random wire.

And co-ax is simply NOT the best choice for feeder. Ordinary twin plastic mains lead will cancel out noise better than co-ax.

Remember that co-ax lead is only GOOD if it sees the correct load at both ends, be it 50 or 72 or whatever. A bad match at either end and the stuff is VERY LOSSY.

We had a total of ten plus myself on the net this time, not bad going. I do

know that one EUGer has finally equipped himself with a KW2000E recently and hopes to be on soon, right Dougie ??? CU soon.

There were several visitors on this morning net apart from a couple of local sheep I had two visiting amateurs and a group of walkers who marvelled at the strength of signal from 'GGL 'so very far away' as one put it.

My usual visit from the Naafi wagon was very welcome as it was a bit nippy up there on the Orme. Whilst operating it was nice being able to consume a late hot breakfast, not a lot of leftovers for the seagulls.

The December EUGnet will be from below the East lighthouse at Guys Head at the mouth of the River Nene, truly a sea-level location and very handy being just a few minutes from home.

Big Brother really is out there !

I have read in SWM recently that the new legislation regarding bugging and surveillance empowers many government agencies to bug us, follow us and otherwise keep an active surveillance on us by other means.

We all know that such as MI5, MI6, the police, the DSS, GCHQ can use the legal power they have to bug us or follow us but it appears that there are many such groups or departments who can do the same.

This information is no secret and is all in the public domain, can you imagine that you might be under surveillance by a squad from the Egg Marketing Inspectorate (are you really boiling your eggs for the requisite 3 minutes?), how about the Environment Agency (did you drop that piece of chocolate

wrapper in the Lakes National Park?)

Have you done anything to warrant having a bug placed in your home by operatives from the Local Council (did you upset the bin men last week?). This all leaves me a little bit bemused and I think I shall start sweeping my house for bugs on a regular basis. I don't own a scanner so they cannot get me for that !

Orion 5000, Update

I decided to fit the necessary components to enable use of one of the six channels on AM. Quasi AM really as it is simply one sideband with some percentage of carrier re-inserted before transmission. The manual details this very comprehensively and the pcbs have the necessary component locations marked and drilled so it simply meant collecting the components and fitting a few links.

The result was fine, it worked well and using the mains psu I got about 100 watts output into a dummy load, looked okay on the scope too and the reports said it sounded fine. There has to be a caveat though. I must either leave it that way or remove the links and revert to SSB, no way, or place to fit a suitable changeover switch to use on portable location. I am undecided as yet which way to leave it.

On SSB I can load up to well over 130 watts and despite being 'rock-bound' (on a mountain?) it is a very handy 'no-frills' rig to take with me. I do find the 'clarifier' range to be a bit limited but have not yet managed to increase it from the @ +/- 100 c/s despite trying several different varactor diodes. Help would be appreciated here.

S.358X

The one I have in good working order

was recently put through it's paces before being loaned out for an exhibition. Only a static, none working exhibit but all the same I was glad I did check it out because a peculiar fault had developed since it was last used (some 3-4 weeks).

When you are changing coil packs you turn off the HT, or you SHOULD do so. In this case I quickly realised that the HT switch had not done its job and that the HT was still on when I unplugged a coil pack.

Soon enough I discovered that the toggle switch was not 'toggling'. A few drops of switch cleaner and some 'toggling' back and forth freed up the mechanism and it resumed normal operation.

This is not something one can reasonably complain about as all of these components are well past their 'sell-by' date. The manufacturer of these items would hardly expect his components to be still in regular use 60 years later, after many, many hours of use.

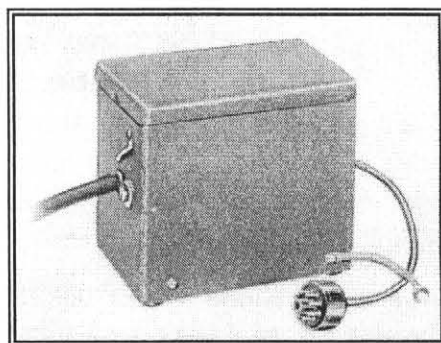
I recall a complaint from one user that the bearings in his 640 tuning gang were seized up. How he could consider this to be evidence of poor manufacture I don't understand. Try telling Ford that the gearbox of your 1947 Popular had failed and it was due to poor manufacture !

SIX Volts DC

For portable operation I have a total of five car batteries which I carry around with me when I go /P. Two are usually paralleled for operating my Alinco or Orion.

Two are needed in series to give me 24 volts for the 1560 Marlin, and one is a spare 'in case'. What my problem

was, how to use my Eddystone 6 volts vibrator pack model S.687 to power a 740 when /P.



Eddystone 6v. vibrator psu for 740.

I tried several local dealers but no go until I 'phoned a place which specialised in classic car restoration. When I explained my need his reply was 'how many do you want', only one as it happened, but thanks to him I now have a 75 Ah six volter which works nicely.

The S.687 has been refurbished since I got it from 'GGL, it had some noise on the output as it relies a lot on the smoothing of the receiver it is connected to.

I took the liberty of adding an extra electrolytic and what was much more necessary a bleeder resistance across HT output. This was thought unnecessary by Strattons but that HT goes sky-high off load.

Using it with my 740 gives me one more set to take out with me. The 740 is a much ignored model, it gives a very good account of itself with only a modest ærial and I know one EUGer (Jim !) who would not part with his. Expect to hear of it and maybe see it in future photos of EUGnet operations.

Navtex, Wefax, etc;

Thanks to MØBGS I now have the

ability to view on screen or print out these and a number of other modes. There are just so many different modes of operation available these days that the one limiting factor, as usual, is time.

A lot of fun can be had printing out weather maps, watching RTTY news agency broadcasts - yes many countries do still utilise this format, possible cost for a poor country is a factor.

I got over the paper for hard copy problem when a neighbour mentioned that the small company where she worked had a stock of unwanted rolls of printer paper. They were mine for the asking, freeing up some needed shelf space I was told.

I have found that a dot matrix printer is the easiest to use and have bought an Epson LX850. I do lack a handbook for it though, can anybody help? I can copy and return promptly.

VHF Dxing

I know that some EUGers like Dxing VHF local radio stations and was amazed at the tally notched up by Mike. He uses a variety of receivers from a vintage Bush set on through an EB35 and a 990R.

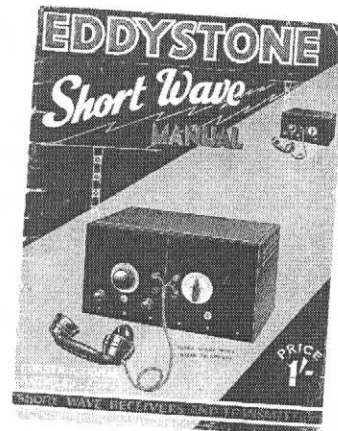
Using one of my 990Rs I recently tried this out from atop the Great Orme. For those of you who know this location I operate from the grass parking area behind the cable car terminus as this gives me a clear over water path to the North and the East, although our 80 metres signals mostly go straight up. On VHF I was able to log the Manx VHF station 'Energy' on 98.6, some dozen or so commercial local stations from Scotland and Northern Ireland, and several from the Republic.

What did surprise me most was having good clear reception of KLFM from kings Lynn on 96.7, this is a low power station which I listen to from my home QTH in Wisbech.

If you live near to the Orme then it might be worth taking your 990R up there and run it from the car battery via the cigar outlet. I had no VHF aerial remember and was simply coupling my inverted V dipole into the 990R, a proper VHF aerial would be far better.

I would like to try one of my 1990R receivers up there with a small FM beam which could be hand rotated. This will have to await the arrival of Spring 2005.

E.S.W.Ms



The mention in last issue that I was able to supply photocopies of these seven Eddystone Short wave Manuals (1932-1947) seems to have touched at the nostalgia that most EUGers have for the 'old' gear. Since that issue came out I have supplied NINE full sets and two specimen single copies to EUGers.

This has meant my young copy assistant working many hours to print them and then put them in binders - she gets paid though so is not unhappy about the job. I would like to mention that since an order for a full

set takes far longer than simply doing a receiver manual you might not get overnight service. Expect a couple of days wait as she does have school work to do besides. Several EUGers have mentioned their intent to construct simple gear from articles in these ESWMs.

SPARES !

The situation does not get any better with time and it has been suggested to me that EUGers should think carefully before jumping in and buying a 'bargain' Eddystone receiver which is missing knobs or other bits.

Colin discovered this for himself after buying a much cannibalised 940. Three years down the line he is still left with only a part receiver which needs many items such as IFTs and scale plate to get it working again.

A Twenty Pounds Eddystone may seem a bargain but it may well remain unusable for ever if you cannot get the spares. My stock of second hand bits have almost all gone out to other EUGers leaving very little in the shed, even for my own use.

The AMnet

The Third Sunday November AMnet will be past when you read this but it does seem to have had a fair response and no doubt more will come on this second net. 'GGL seems to have been well bitten by the OFAM bug as he has recently taken delivery of a rather poorly Panda Cub which I collected for him from East Coast Wireless.

Once he gets a manual for it he can get to work and fire it up on AM. All the bits seem to be there and so it is simply a case of tidying up and testing the beast, something he will no doubt enjoy doing.

Delta Loops

I am happy with the results obtained from my DIY inverted V dipole, especially since it has been fine tuned and can be used without an ATU (one less item to take out on portable operation).

However this has NOT stopped me from experimenting with other aërials. My latest was a 40 metre Delta Loop. This was up at about eighteen feet using my three telescopic fishing poles (SOTAs) and feeding the loop with twin feeder.

With a 130 foot total length in a triangular shape I got good reports on 40 metres but it was hopeless on 80 even using the ATUs I had with me, an MFJ934 and a DIY LC type.

I have now increased the length of wire to the magic figure of 230 feet and find that with my usual length of twin feeder (down the pole and onto the operating position) this matches very nicely without benefit of ATU using either the Alinco DX77 or my Orion 5000.

The latter puts out about one third more power but the difference at the other end of a link is hardly noticeable. If I can get another pole then I might try a quad loop. All this wire up in the air does not go un-noticed and I have had a fair number of visitors asking me what I am up to !

Well, I think that's it for the moment, folks, don't forget to check EUG "On-The-Air" activity times on the back outer cover of Lighthouse; SWL reports are always welcome from listeners. Send news, views and reports to me, Ted Moore, 21, Prince Street, Wisbech, Cambs, PE13 2EY. Landline 01945 467 356

Vy 73, Ted.



E-Bay Watching

by Chris Pettitt G0EYO

Those who track Eddystone sales in E-Bay will probably have noticed a slight drop off in equipment being offered up for auction in the past couple of months, however what has been sold has continued to attract some high prices.

For example this fine example of a 940 receiver sold for £205. This is how it was described by the vendor, Rolendra, who is often to be found selling vintage communications receivers on E Bay and also advertises in Radcom.



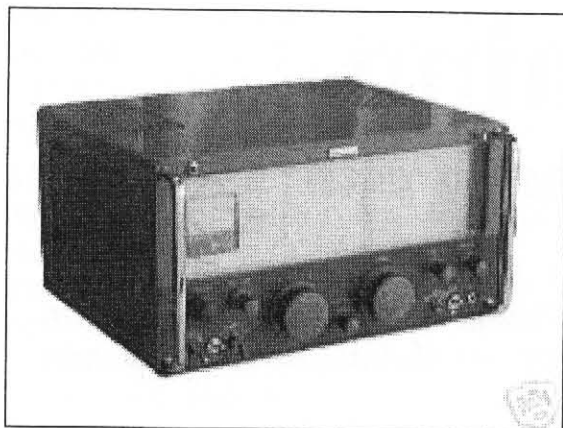
"You are bidding for an absolutely superb Eddystone HF receiver, model 940. Frequency coverage is 450KHz to 30MHz in 5 ranges - with super-smooth tuning control - the trade mark of Eddystone. Also has IF filtering - with crystal phasing - another Eddystone innovation from decades previous.

*To be picky - there are some small paint marks to the paintwork on the case - the pictures make them look worse than they really are. There is also a tiny 'ding' on the rear edge of the case - hardly noticable - but this will press out again. The front panel is perfect - no wear or marks at all. the Eddy 940 is a highly sought-after set because of its quality of build and high performance. You will go a long way to find one as nice as this. Doubts about bidding? - see it before you bid - call *****.*

PHYSICAL CONDITION:. *In very good condition indeed - a few small marks to the outer case only - see pictures.*

ELECTRICAL CONDITION:. *Working very well.*

IT is worth noting the detail Rolendra puts into his adverts. I am convinced that a little effort in photographing and describing your goods pays handsome dividends.



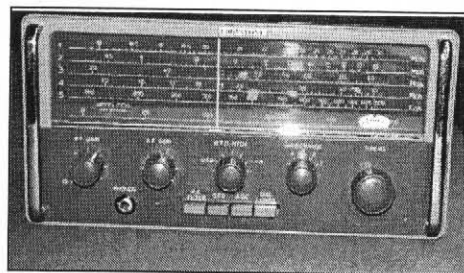
Equally well priced was this EA12 at £260. This was described as:-

"The unit powers up OK - but visually at least two valves do not glow - hence no sound. The case has some scratches on the side"

It came with a mains lead but had been modified to to accommodate a new IEC Euro style mains input connector (sacrilege!). Someone obviously wanted this receiver as this is a high price for a less than perfect specimen, but does confirm

that buyers will pay well if it is in good condition and complete even if it doesn't work. The picture might just of course be a publicity shot lifted from somewhere else but I would give the vendor the benefit of the doubt and assume that it is of the actual unit.

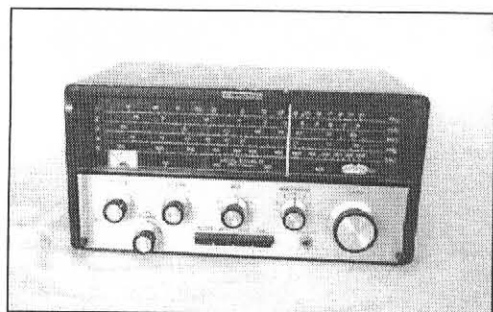
A couple of EC10 receivers came up for auction and attracted quite a number of bidders. The Mark 1 (right) went for £79 and the Mark 2 (below) for £102. The Mark 1 had its mains power supply and was described as being in good working condition with slight rust on back, and one screw missing on the back.



The Mark 2 was described thus:-

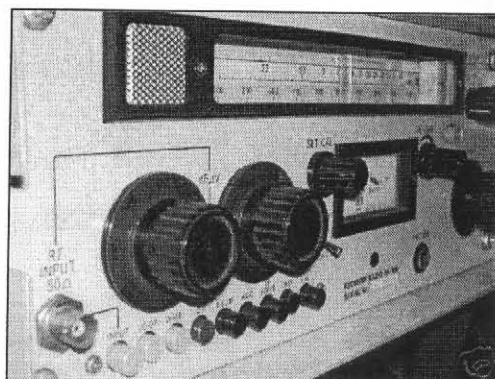
"This unit came from a local college a few years ago. I have plugged it in and put a short length of wire in the aerial and got stations on all five wavebands. Some were not all that clear but as I have little idea of what the various knobs and buttons do that is probably my fault." How honest! The front was described as being in good condition but the top had lots of small scratches and one long deep one. Both good prices and

remember that a top quality Mk2 sold for £140 earlier this year.



An EUG member sold a 40A Noise Measuring Receiver which was surplus to requirements for £160. I don't think these come up for sale that often but I must admit a number of EUG members do seem to have acquired one along the way. This receiver was well described in the auction and I will just repeat the vendors description for you:-

"The 40A was produced to GPO specifications in very small numbers. Coverage is broadcast and HF from 130kHz to 33MHz."



Based around the 1000 series solid state chassis this remarkable unit allows precise measurement of signal strength at the specified frequency. A precision attenuator means that apart from the obvious uses the 40A is really handy in the workshop to precisely gauge signal levels and deduce stage gain, attenuation etc. To say nothing of the capability to evaluate antenna designs. 110dB dynamic range. Using the tuning facility the 40A can be used to measure transmitter harmonics and many of the tasks normally assigned to a spectrum analyser. Apart from continuous level measurements the 40A will accurately measure impulse down to 1Hz rate as per the CICPR conditions. 50 ohm input, or uses internal calibrated ferrite rods. Built in speaker. 9kHz bandwidth. Supplied in cream coloured fibreglass carry case with handle and both catches working. (The front cover has a chip on one corner - does not affect strength and is not too unsightly). The extendable rod antenna is not with this outfit. Both MAINS and BATTERY power units are supplied". This looked to be a nice set.

If anyone fancied doing some refurbishment work then a Marine Receiver 659/670 in need of some loving care and attention was finally knocked down at £53. This receiver was described thus:-



"The receiver produced from 1948 onwards by the Eddystone Company (Stratton & Co) in England. Uses 7 valves (tubes) in a superheterodyne circuit. Frequency coverage is in 4 ranges, as follows:
250-550 kc's,
1.2-2.75 Mc's,
6-13Mc's
13-30 Mc's.

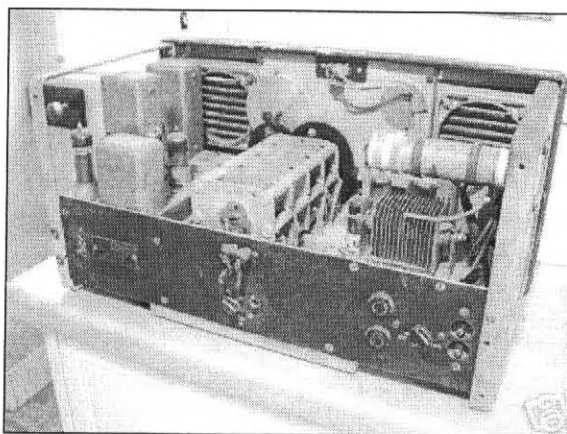
The receiver has a push-pull output stage and a built in loudspeaker.

Power requirements are 110V or 230V a.c.

The receiver is in poor condition, some rust and corrosion and dirty, but no dents and the Dial and control Knobs are in good condition.

Would make an ideal restoration, see pictures.

Stations can be picked up by just using a coat hanger as an aerial.



An interesting project for someone, perhaps an EUG member!

Well that's all for now, happy hunting

Chris Pettitt G0EYO



Letter from Bewdley

No, not from G3GGL this time but from Phil, G4SPZ

Dear Graeme,

Thank you for another very interesting October issue of Lighthouse.

It was the chance acquisition of an Eddystone 870A three years ago that led me to join EUG, and since then I have never looked forward!

I must say that membership of EUG has re-kindled my dormant interest in vintage radio, to the extent that I now have a small, but growing, collection of post-war valve receivers in my small, but shrinking, shack! The 870A is the only Eddystone, but it is kept company by a Codar CR70A plus various domestic sets from Murphy, McMichael, RGD, Pye, Marconi, Ferguson, Alba and Ferranti.

I am finding your series of articles "The Duffer's Guide to Valve Set Fault-finding" particularly interesting. As a duffer myself, according to your definition, I have learnt what I know from reading, tinkering and a practical try-it-and-see approach.

My only exposure to valve theory was as a schoolboy in the 1960s and 70s, and that never really extended to practical circuits and certainly not to fault diagnosis!

I built a little one-valve regenerative short-wave set, the "BOP Ether-Ranger", from a circuit in a friend's copy of *Boys' Own Paper*. It worked well, and I later added a one-valve audio stage, but after some years I dismantled the set, intending to rebuild it to a better standard. As I was nearly

16 then, motorbikes, a car and girlfriends unfortunately intervened and the box of Ether-Ranger parts was misplaced, and has now vanished for ever.

I would like to build another of these sets – as I recall, it was very sensitive and pulled in hosts of stations on medium and short waves, including some amateur CW, but I had no idea what frequency it was on!

Do you think I can find a copy of the circuit now? The basic circuit used an EF80 and plug-in Denco coils. Maybe an EUG member knows of the whereabouts of a copy . . .

Anyway, digression aside. My purpose for writing was to compliment you on an excellent series of Duffer's Guide articles. Long may they continue! Much of my own limited valve fault-finding experience comes from some years' dabbling with old TV sets, part of which is relevant but much of which is not.

Valve failure in TV sets was common, presumably as some valves were run far harder than in a radio receiver, where in my limited experience I have not had to replace a valve. TV heater chain droppers regularly failed, as did the cathode bypass capacitors in frame output stages, usually killed by excess voltage due to the cathode bias resistor going "high". As you note, this is rarely a problem in a radio receiver.

I think successful fault-finding is based on a sound knowledge of component "failure modes" and the likely effect on

the circuit. I now worry about short-circuited silvered mica capacitors, having always believed them to be 100% reliable!

There is no substitute for learning from the experience of others. Your explanations of the effects of a leaky AGC smoothing capacitor and an open-circuit decoupling capacitor were enlightening, and although I've never come across anything other than leaky components, I'll be ready when an open-circuit "red Hunts" presents itself. Hunts made black ones too, which always seem to be leaky. Mr Hunt should be ashamed!

Your comments on the usefulness of a capacitor meter are quite correct. Years ago I built a simple direct-reading capacitance meter from a PW design, and it is in use every time I work on a radio. To complement the meter, I recently picked up an old Labgear capacitance substitution box for £1 at the NVCF!

Finally, a modest request – I have no idea how many parts the Duffer's Guide will run to, but can a future episode on oscillators please include a simple explanation on how "self-bias" works with the grid leak resistor? I know it's got something to do with grid-to-cathode conduction on positive half-cycles, but I'd really like to know more!

Thanks once again Graeme,
vy 73 etc., Phil Harris G4SPZ.

Thank you, Phil, for your kind words and positive feedback.

This little series (I've no idea how long it will last!) has engendered more reaction than any other item in quite a long time. Members have commented positively and several have ordered a copy of the "Condenser Zapper" which

I published in EUG Newsletter some years ago. Several have ordered copies of the CD-ROMs containing Peter Lankshear's series on Valve set servicing.

It would seem that there is still a hard core of positive thought concerning valve servicing. Quite typical is this order from Tony in Cardiff:

Dear Graeme,

Please find enclosed £1 coin suitably disguised to prevent detection and fraud!

I'll have a crack at the neon condenser checker, it sounds really interesting, given my limited knowledge of the subject.

I thought your article "The Duffer's Guide" provided an alternative method of instruction which certainly helped me to address some of the difficulties of getting to grips with fault-finding. Please pursue it, I'm sure a lot of us "Duffer's" have a great deal to benefit from your methods.

Kind regards, Yours sincerely,

Tony Watkiss.

Thank you also, Tony, I hope you enjoyed the second episode and you'll find the third somewhere in this issue.

And back to you, Phil. I'm doing "Power Supplies" this month, because I realise that I should have started the series with them before output stages. If you've no power you've no output!

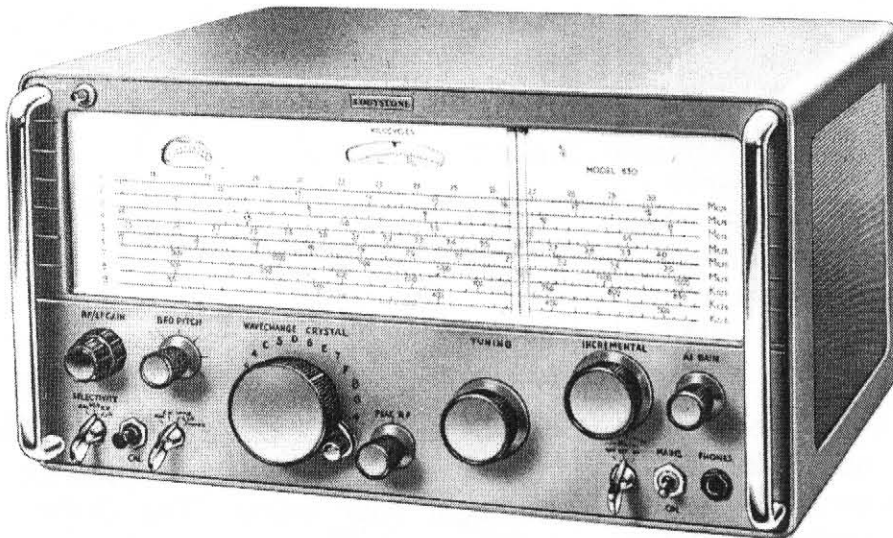
I promise to cover oscillators in the next issue and hope I can make them sound simple.

Graeme G3GGL



Serious TLC for the Jewel

By Graham Gosling
East Coast Wireless

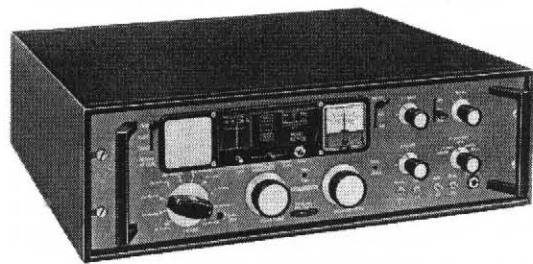


830/7

IN THE BEGINNING

Recently I have completed a very long restoration . . . no, wait . . . re-creation, of an EC958/5 out of three total scrap units from a ship-breaker's yard. Luckily, between them, there was enough to eventually make one really superb looking and sounding set.

I try now to forget the many faulty modules and intermittent faults which plagued my progress, the faulty discs in the turrets etc. etc., yet strangely, not one single failure of the miniature coax cables and connectors which frequently affect the 958.



EC958

No additional materials or components were required and the total cost excluding labour was £30 - just the original cost of the scrap units.

As I now had what many people consider to be Eddystone's finest solid state receiver, surely it was time for the last and best Hollow State set - the 830/7.

As a professional restorer of mainly broadcast receivers, I attend various auctions around the country and although I do see many Eddystones, 830/7s are not exactly stacked high on the auction tables and I expected a long wait to acquire one.

Now as Ted lives only a few wheel

rotations of his ever-Eddystone-laden Volvo away from me, he often pops in to the workshop for a chat and I mentioned to him that I was looking for one. To my surprise he said that he was to collect a number of Eddystone receivers in the next week or so and an 830/7 was amongst them.

Hastily I moved Ted to the kitchen and plied him with coffee and biscuits, after which he promised to deliver same. In due course Ted, Volvo and 830/7 appeared plus, very kindly, a spare 830/9 from his own stock for spares, which turned out to be a godsend.

He told me that the receiver was working but needed some TLC, and that it may have been used by the Diplomatic Wireless Service, as it was fitted with black painted carry handles instead of the standard chromium. Apparently the operators suffered eye strain from the artificial lights reflected from the chromium.

When Ted departed I was left alone to contemplate my new acquisition. Inspection of the internals was easy as I forgot to mention that it came minus its case. Where do they go?

The upper chassis condition was certainly not mint with some corrosion due to poor storage. The under chassis was better although the Power Supply area had a smoky appearance, no doubt caused by some 24/7 operation.

However, I was relieved to see that the phantom twiddler, hole borer and poker-solderer had not reached the set. In fact, only the cathode bias resistor and capacitor on the audio output had ever been changed and all the coils and transformers were undamaged.

The metal calibrator switch and the RF/IF gain knobs match the rest of the knobs, unlike the illustrations and most sets, which are fitted with that pair of strangely mis-matched knobs.

If the Serial No. Plate is to be believed, LY2918 was manufactured in Dec. 1973 so it surely must be among the very last to leave the bathtub. (*Note here from Graeme; Company records tell us that the last 830/7 was completed on 27th January 1973 . . .*)

LET'S GET TECHNICAL

After a check across the mains input and HT lines, an aerial was connected and power applied. The results were not at all impressive and certainly not up to specification. Some signals were apparent on all ranges but bands 4, 5 and 6 seemed very insensitive.

I consoled myself with the hope that it might simply be the result of misalignment. However, as our Editor rightly says, a deaf Eddystone is a sick Eddystone and my more practical pessimistic side told me that there was probably something nasty to be found in these ranges.

Meanwhile the Carrier Meter failed to zero but this is common and would be easy to address. The AGC system was faulty: AGC was obviously ON but could not be turned OFF as no increase in volume or distortion was observed on a very strong local.

The BFO did not work at all and the overall audio quality was poor. Not really distorted, just unpleasant to listen to, with various pops and rustles during the first 15 minutes of operation.

SOME DO'S AND DON'T'S

.At this point it might be worth mentioning some dos and don'ts with regard to restoration.

Please do not attempt to replace every resistor and capacitor in the set just because it has been there for 30 or 40 years. This is wasteful and time consuming, plus unless you are a professional wireman, you will end up with a receiver which looks a mess with burnt and untidy wiring.

There is also the likelihood of introducing an odd fault or two, as of course, it is necessary to remove some components before reaching others underneath. You will learn nothing from this exercise about the effects of faulty individual components on the

specification.

The application of a signal at 1 KHz across RV4 audio gain control at a level of 28 - 30 mv should give 50 mw on the audio output meter.

The 30mv level can be measured directly with a digital multimeter switched to AC. If you have no audio output meter, then use an AVO 8 on AC. Connect a 0.1 μ f capacitor from pin 5 V10 to positive lead, negative lead to chassis. Maintain a load on the secondary of T5, either a loudspeaker or a 3 ohm resistor. 50mw will give approximately 23.5 v.

Note: 1.6mw output will give approximately 3.5v. You will need this latter figure when performing signal to noise ratio checks on the RF stages.

A check and replacement as necessary of R32, R33, R34 and R35 were all that was required to enable the carrier meter to be zeroed.

As we move to the IF stages, I shall avoid tedium by sparing you a blow by blow account, but offer some pointers. Check for out of tolerance resistors. With regard to capacitors, Eddystone will no doubt have used different makes as supplies came to hand.

You may have a different set of caps in your set. Generally speaking any ceramic or silver mica caps are above suspicion and don't warrant extensive testing unless a fault points in their direction.

The paper caps however, are a different proposition and some ruthless surgery may be required. HT decouplers such as C91, C80 etc. .05 μ f were, in my set, a flat, green-sleeved type made by Erie which tested as excellent and can safely be left in situ.

The grey plastic moulded Dubilier 700 series usually show signs of aging now, resulting in a poor power factor

and out of tolerance values.

A bright red tubular type of capacitor by Hunts is also reported to be failing, although there were none in my receiver.

What was lurking however, were many capacitors of a type dreaded and detested by legions of radio engineers over the years. So bad are these caps that it is pointless to attempt repairs, alignment etc. in any set harbouring them. Those of you in the know will have already recognised the infamous Hunts Moldseal type, although mine were actually marked "Erie".

These small tubular caps have a toffee coloured case with white writing. The case is almost always cracked and crumbles to chips on removal, thus destroying the value written thereon. If you are working without a service manual, try to see the value before removal.

Although not usually seriously leaky, they will be found to be distressingly close to open circuit and may be intermittent as well. There is only one rule here - if you see any, however inaccessible they may be, bin them.

MOVING ON

It is a good idea to have a few spare valves (known good ones of course) to hand if you do not have access to a valve tester. They will be useful to substitute for suspects when checking whether a valve really does need replacing.

It is not necessary to re-valve an entire set just because the valves have been there since day one and although adequate spare valves are available they are not, in general, being manufactured now, so do not waste either valuable future resources or your money.

So, assuming our IF strip is working and we have completed the repair and

working of a circuit.

Naturally a number of components will need to be changed and thus we will cover the likely offenders. One or two additional items to your tool kit will be found most useful when servicing the close wiring in your Eddystone.

1. *A magnifying bench lamp*
2. *A temperature controlled soldering iron with a long cone-shaped bit around 25mm long, enabling you to reach the joint without the element melting associated wiring, and temperature controlled because the long bit will not have the same thermal reserve as a normal bit.*
3. *A thin tool with a hook on the end will enable you to pull the lead out wires of components away from the solder joint.*
4. *A pair of locking forceps will enable you to hold one end of a component while soldering the other end deep in the wiring.*

OK, four items then!

AND NOW BACK DO THE BENCH

I decided to see if I could clear the obvious faults before starting a full overhaul in case parts were required, as the donor 830/9 was not complete.

The AGC fault was investigated first. Years of experience directed me to S4, the AGC switch. It did not feel right in operation. On removal of the protective screen all was revealed. The wafer had split in half at its mounting points.

This problem is becoming more common on several Eddystone models and it is not clear whether it is due to over-tightening during manufacture or simply wear and tear. I suspect it might be the former so take care not to over-tighten your replacement. A quick transplant from the 830/9 resulted in AGC which could be turned off.

The BFO valve V13 and circuitry is contained in a small dungeon within the IF Strip. After removing the lid from this dungeon, it was obvious that the occupant had been there for some time as his head had gone all snowy.

A younger replacement with a nice dark head was fitted, the lid slammed shut and power applied. Great - a working BFO, not quite on tweak but that could be aligned later.

The Power Supply only required a minor clean and tidy and the replacement of R97, R98 and C208. These components maintain the heater supply of V7 EB91 at a few volts above ground to prevent hum.

In the audio stage C119 and R57 were replaced in a more proficient manner than they were found, i.e. not hanging about to the full extent of their lead out wires.

Check the value of R48 4.7K V10 screen feed. There should be no positive voltage on the grid of V10. If C116 is anything but a ceramic type, replacement is advised. V10 6AQ5 already runs at finger-licking temperatures so it does not need any assistance to become even hotter!

Around V9 6AT6, a very common failure is of R45 270K, the anode resistor. If very high it results in no audio. Even if you still have audio it is no doubt out of tolerance and in combination with R47 180K, which also ages high, will cause an unpleasant clipping effect due to incorrect biasing. Replace both these resistors for long term reliability.

TAKE IT IN EASY STAGES

One good thing about valves is that you can restore and repair stage by stage, checking the operation of each one as you go. I take no prisoners as far as correct working is concerned, so the equipment has to meet the

replacement up to say, the grid of V2 EF95, it may now be instructive to tune in a few stations while watching the carrier meter, with the selectivity control set to SSB.

The correct tuning point should result in maximum deflection of the carrier meter. Move selectivity to the AM position. This widens the IF bandwidth and there should still be only one peak on the meter. More than one peak when tuning indicates an asymmetric response and really requires realignment.

Yes, I know the service manual states that realignment is rarely required, but this was related to the expected service life of the equipment at the time, say 10 to 15 years. It is unreasonable to expect a receiver, after 40+ years, to be still at optimum alignment.

Components may have been changed or aged and we must not forget the attentions of the phantom twiddler! Those nice big slotted cores are so inviting. In my experience, it is rare for any receiver, broadcast or communication, not to benefit from a realignment.

It should also be noted that Eddystones have a lot of built-in redundancy and will continue to operate in some fashion with many faults and quite serious misalignment.

Think about this - have you a factory fresh one with which to compare it?

IF ALIGNMENT

In considering the alignment of the IF stages, some alternative procedures may be considered regarding the use of the set. The 830/7 incorporates a 100 KHz crystal filter which, when enabled, narrows the IF response to 50Hz. This crystal gate is pre-phased, so unlike previous designs, you cannot use it to notch out interfering signals.

Unless your interest is CW, you are likely to switch to it once, be amazed at how quiet and boxy the voices are and probably never use it again. If this is the case, you can skip the details of finding the crystal frequency and align the strip at 100 KHz.

I think it is fair to say that it is difficult to align the IF strip for optimum results without the use of a sweep generator. Spot frequency alignment as per the manual will result in the response being rather peaky, with the various bandwidths definitely not meeting the specification. In the widest position, double humping and ripple can approach 5dB. No doubt by spending much time plotting output voltages as the frequency is moved plus or minus from its centre value, the response could be improved.

Adjustment of T2 is critical here. I would not advise adjustment of the crystal phasing trimmer C84 on T2. If you must adjust, mark its position before commencing adjustment.

Everything becomes much easier if you have the use of a sweep generator and the following notes will help you achieve the very best performance. Connect the display unit (scope) to the S5A side of C108, not the AF gain side as C108 will introduce a phase error with distortion of the response shape.

Signals via the wobulator or signal generator should be injected at the relevant points within the IF strip via a matching pad. Although matching is not vital in this instance, it is as well to adopt good working practices as sloppy procedures will catch you out in the future at higher frequencies.

The matching pad consists of only two components. A resistor across the open end of the co-ax which should match the output impedance of your generator i.e. 50 or 75 ohms. A 0.1 μ f capacitor from the centre of the co-ax.

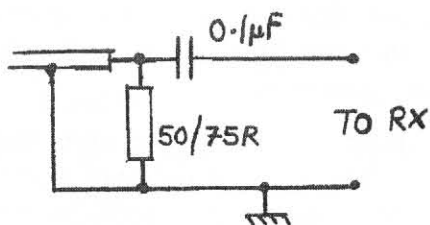


Fig. 1

This 6dB pad halves the applied signal so you will need to double your attenuator settings if making gain checks. Input signals via the antenna socket when aligning the RF stages will not require the matching pad. The output impedance of this generator should match the input impedance of the 830/7, namely 75 ohms. If your signal generator is 50 ohms use a 25 R resistor in series with the centre of co-ax. Attenuator settings will be as indicated on your generator.

First rapidly align the IF strip using the spot frequency method. Note the crystal frequency. It should be within 2 KHz of 100KHz - in practice it is likely to be much closer. Mine was -60Hz.

Make a visual inspection of the selectivity actuators on the IF transformers, both at the threaded adjustment and on the selectivity shaft which runs the length of the IF strip. If these show signs of disturbance, and they may well do, it will be necessary to reset these, otherwise it may be impossible to obtain correct responses.

Under no circumstances should you attempt these mechanical adjustments unless using a sweep generator as you are likely to lose the plot altogether.

USING THE SWEEP GENERATOR

To check and align the crystal gate, apply the sweep generator at C59 mixer gang. It is essential to use a very slow sweep rate, between 5 and 10 cycles per second. Reduce the deviation on the generator to make the

fine detail on the skirt visible. Adjust T1 and T2 to remove kinks and distortion. Adjust C84 crystal phasing to correct any tilt or loss of symmetry in the response.

Set the selectivity to SSB. Inject the sweep generator via the matching pad to V6 pin 1. Use a marker at the crystal frequency if possible, to keep the response centred on this, or note the centre response on the scope graticule. Adjust T4 for best symmetrical shape. If it is impossible to obtain symmetry, adjust the mechanical settings relevant to T4.

Repeat the above procedure, but with the signal at V5 pin 1 and adjusting T3. Then adjust T1 and T2 with the signal applied to C59 mixer gang capacitor, second from front. It is easier to align stage by stage as we only need to cope with the errors in a single stage. If looking through the complete strip, cumulative errors will make the adjustments unclear initially.

Check the bandwidth by adjusting the marker frequency by + or - 1.5 KHz from the crystal frequency, ensuring that the marker falls on the response skirt at 6dB. It is likely you will need to make small adjustments to widen the bandwidth.

Move the selectivity to its AM position and check the bandwidth as previously outlined but with the marker frequency at + or - 3KHz. Check that double humping and ripple is within 2 dB. T2 is critical here: make small adjustments only.

If all the above seems unnecessarily complicated, just remember that the majority of the receiver's gain and selectivity is achieved within the IF strip, so it deserves more than a quick tweak by ear with an ill-fitting screwdriver. The second IF sensitivity can be checked as per the manual but remember to double those attenuator

settings.

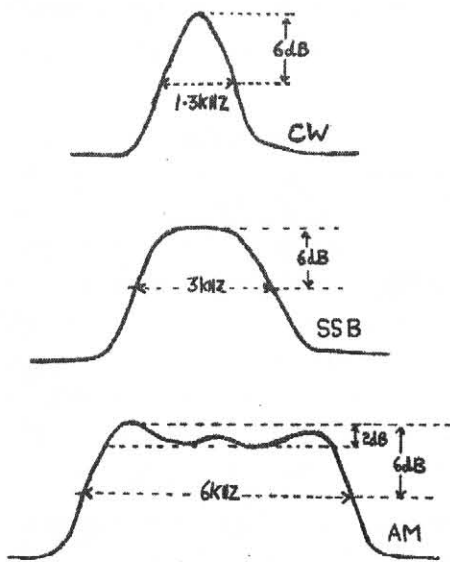


Fig. 2

REMOVING THE BFO

My BFO suffered from some general drift and intermittency which required the removal of the unit from the chassis. I fervently hope you do not need to do this as a great deal of tedious dismantling is required before those Rs and Cs are reached.

After a few replacements, including a new valve holder as the original had a frosted appearance and I definitely did not want to go there again, it was reassembled, refitted and realigned as per the manual.

SECOND MIXER

The second mixer oscillator assembly should have been straightforward but two faults here required attention.

The first consisted of pops and rustles accompanied by a frequency shift, and yes, I did think about the neon stabilisers.

A most useful addition to your test gear is a world band-type digital receiver, preferably with continuous coverage from 150 KHz to 30 MHz. These receivers are dual conversion so do not suffer from spurious problems and

unless you are using a synthesised signal generator, it will be more accurate and can be used to calibrate your signal generator.

It can be used to pick up and align the various oscillators in the receiver being aligned or repaired, (completely eliminating the possibility of aligning to an image), by keying in the signal frequency plus the IF on the digital receiver. Adjust the oscillator trimmer or core on the set under repair to produce a dead carrier on the digital receiver. If an SSB facility is available on the digital receiver, with this switched on, you can adjust for zero beat. Your receiver is now aligned to within a few hertz of your required frequency.

Our first fault was traced to C175, a 6pf ceramic capacitor. Placing this on our Marconi bridge and with a soldering iron underneath but not touching, the null meter flicked away from its zero position, indicating that C175 was going partially open circuit. Another fault bites the dust of my waste bin!

The second fault was a high level of noise from V3A, ECH81. On the single conversion ranges: 7, 8 and 9, V3A should not be doing anything. However, in my receiver it had turned into a highly effective noise generator and a replacement quietened things down no end.

SECOND OSC. ALIGNMENT

Alignment of the second oscillator is easy and quick when using a digital receiver. As the second oscillator tracks on the low side of signal, it is necessary to subtract 100KHz from all the frequencies given in the manual, so the red alignment point is now 1160KHz, centre zero is 1250 KHz and the black alignment point is 1340 KHz.

Set a frequency on the digital receiver, set the incremental dial on the 830 and

adjust L36 or C168 as necessary to produce a dead carrier on the digital receiver. It is aligned in minutes!

CRYSTAL CALIBRATOR

Remove the crystal calibrator and check R62. Replace C120 if the type fitted requires this. Refit the unit, key in 300 KHz on your digital receiver with SSB facility on, and adjust C123 on the crystal calibrator for zero beat. L37 does not adjust the frequency but serves to increase the amplitude of the markers at higher frequencies.

To adjust, switch the receiver to range 1, switch on the calibrator, find a marker and adjust for maximum - it is not critical.

THE RF SECTION

We have nearly reached our journey's end, the RF section and for many people, as far as servicing is concerned, accompanying Frodo Baggins into Mordor would be a more enticing prospect. However, servicing these sections is far from impossible. Keep calm. If something is in your way, remove or move it to one side. Make copious diagrams and take your time.

In the RF amp V1 section, remove L15. Fold its connecting wires back and you have masses of space in which to work.

There are only a few components to check but faulty items can have a profound effect on performance. Pay particular attention to R8, R9, R6 and R2. Capacitors C33, C34, C35 and C36. *(Special note here from Graeme: I have always found R8 and R9, the cascode grid bias, 100k each, to be miles out of tolerance, thus ruining the performance of this stage.)*

In the first mixer section around V2, things become a little tighter. Remove coil L24 to gain some space, lift polysleeved wires from coils as

necessary and gently fold back. Check R16, C63, C62, R14, R15 and replace as required.

The oscillator section around V12 is the most congested area. Start by removing L33, rotate the range switch to expose the allen keys in the shaft coupler, release the keys and ensure that the coupler is free to move. Now very gently, push the switch shaft rearwards - there is a hole in the rear chassis apron to allow this. Remove the shaft coupler.

Six polysleeved wires run down the centre of this compartment. Lift at coil ends and gently fold back against the casting divisions. There is now plenty of room to check those Rs and Cs. After all this, refit the screening cover on the coil box and we are ready to test and align the RF section.

Ensure the dial cursor adjuster is at mid-travel. Visually check that the RF peak capacitors are at mid-travel. Do not rely on what the control knob indicates. If using your digital receiver to align the oscillator stages, note that the frequencies required will be signal frequency plus 1350 KHz on ranges 1 to 6 and signal frequency plus 100 KHz on ranges 7 to 9. Now with the first oscillator aligned on all ranges we can align the RF and first mixer stages to track the oscillator and provide the high sensitivity and signal to noise ratio that this front end provides.

A quite basic signal generator can be used here but remember, drift can occur on the higher ranges and attenuator settings may be only arbitrary. Again use that digital receiver tuned to your signal generator to ensure that you remain on frequency. Use an audio output meter or the Avo 8 as described earlier. Do not align by ear or from the carrier meter as alignment should be carried out below the AGC threshold with AGC turned off.

Although as I have indicated earlier, it is a good idea to measure sensitivity and gain in the last stages we have worked on, here at the front end it is vital to have a reference point, if only to ensure that we have not made things worse by our efforts.

After repair or realignment of the receiver, do not test on air with an aerial because, unless the receiver was almost totally deaf, you will have no idea how the receiver is really performing will you?

The manual gives the sensitivity as $3\mu\text{v}$ or less, modulated 30% at 400Hz for 50 mw output at 15dB signal to noise ratio, at all frequencies. Assuming the use of a signal generator with accurate attenuators and calibrated output meter, to quickly find the necessary RF input for a given signal to noise ratio, inject a $3\mu\text{v}$ unmodulated carrier at the aerial socket, with receiver controls set as in the manual. Adjust the noise level to 1.6mw on output meter. Now apply standard modulation at the generator, i.e. 400Hz at 30%. Adjust the generator's RF output to give 50mw on the output meter.

We can take advantage of the fact that small changes in the input do not appreciably affect the noise output power. The ratio expressed in decibels is $10 \cdot \log \text{power signal/power noise}$.

When using a more basic signal generator and Avo as output meter we won't be able to boast actual sensitivity figures to our friends as our RF input level accuracy may be in doubt, but the ratios will still hold true and provide a reference point. The results can be logged for future use in the case of a suspected receiver failure.

To recap, if using the Avo 8 as output meter, 23.5 v approximately equates to 50 mw output and 3.5v approximately

equates to 1.6mw. Use the 100v and 30v AC ranges.

DID IT WORK

Enough classroom stuff. How did my actual receiver perform after its RF alignment?

In a single word - **Rubbish.**

It failed to reach the specification at any frequency on any range and with ranges 4, 5 and 6 desperately insensitive.

Do I see despondency lurking close by? Well yes, a bit, but we are not going to give up now, are we!

As intricate surgery had already removed the suspect items, could we have made a wiring error? Well, probably not as it was poor when first checked. A period of thought ensued as I mulled over the symptoms.

Higher frequencies provided better sensitivity which seemed to indicate the RF stage was capable of good results. If faulty we might have expected the reverse. All trimmers and core adjustments were normal and I decided to concentrate on one of the very insensitive ranges, namely 4.

Voltage checks around V1 were correct, no clue here. Check L4/L10 coil continuity, all OK. Remove L4 for inspection or swap and bingo! There was the problem. The primary aerial winding had a barbecued charcoal appearance. Not much inductance here then - just a shorted turn.

L5 and L6 also had barbecued windings. A quick transplant of all three from the 830/9 resulted in a dramatic improvement in sensitivity; still not to specification but now in line with the other ranges.

On a subsequent visit Ted and I ruminated as to what the cause may have been. **A 10KW TX nearby? Lightning?** I think not. I have seen

the results of lightning many times on PMR base stations etc. and coils do not survive at all, with much other damage usually present. Remember, my coils were not O/C.

We concluded that the likely cause was the aerial coming into contact with a supply line, unless of course, the owner connected the aerial input to the output of his transmitter. But no-one would do that surely?

THE FINAL SOLUTION

One fault now remained. Merely that of obtaining, at all frequencies, the sensitivity which Eddystone intended. Time to mull over the symptoms once more.

I have a local medium wave station within a few miles. It is only 300w but sports an impressive aerial which delivers a hefty signal. On the 830, this caused heterodynes up to 200KHz from its frequency. This indicated poor first mixer operation and associated with a general noisy background when receiving even a moderately strong station, it was time to check oscillator injection levels.

Waving a scope probe around V12A anode showed plenty of activity. Connecting the scope to the link wire between pins 2 and 7 on V2 showed less than 50mv P/P.

I had no idea what the level should be but I expected at least 0.5v P/P. As V12B can operate as a separate crystal controlled oscillator, it seemed a good idea to fit a crystal. This gave better results than the manual oscillator but was still not up to spec. With the crystal removed and hence no oscillator in operation, 200mv from a signal generator was applied to V2 cathode pin 2. Remember this frequency must be signal plus IF. Now the receiver was transformed, exceeding the specification at this one frequency.

So here was the reason. Now to find the cause. The likely culprit seemed to be C159. The .01µf capacitor coupling V12A anode to V2 cathode, but hang on - we have already changed all suspect caps haven't we!

Well yes, but we only checked and replaced what we could see. We did not replace against the circuit diagram as we knew there were no wiring errors or incorrect component placements. So where is C159?

Has anyone outside the Bathtub ever found it? The hunt was on. At V12 pin 6, a thin yellow wire disappeared ominously into a piece of black systoflex. At V2 pin 2 a yellow wire curved away towards V12. It seemed that C159 was buried underneath S1F, S1E range switch.

Nobody would put a cap under there would they? Oh yes they would. Even with my bench magnifier light I could not spot it and only the use of a very bright small torch revealed the unmistakable shape and colour of a Hunts Moldseal.

Fig. 3

To gain access, we removed L17 and unsoldered the thick co-ax from atop S1F wafer. After unsoldering C159's connections, it was teased out from its hiding place. With yet more surgical dexterity, a replacement was fitted.

Note: In this operation, do ensure that your sleeving is hard up against the capacitor body or you will get an HT short at the point where it passes through the casting.

FINALLY

Time now to check the oscillator injection level at V2 pin 2. Success! It is now 1.4v peak to peak on range 9 and the receiver meets or exceeds the specification at all frequencies.

The faulty C159 was then placed on the capacitance bridge for testing. Instead of (.01 μ f) 10.000pf, it read a minuscule 15pf.

So ... how many 830s are there out there with a faulty cap and poor results? I seem to remember an item in the Lighthouse concerning an 830 where V2, the first mixer, was changed to a different valve because of a high noise level, also necessitating a valve holder change. Was C159 responsible here?

With apologies to Graeme W's well-known little saying, I will just comment that **'a noisy Eddystone is also a sick Eddystone'**

Well, the electronics are finished and there is only the front panel to respray. Oh, and I still need a case but that is a

minor consideration, since the set is an absolute joy to use just as it is.

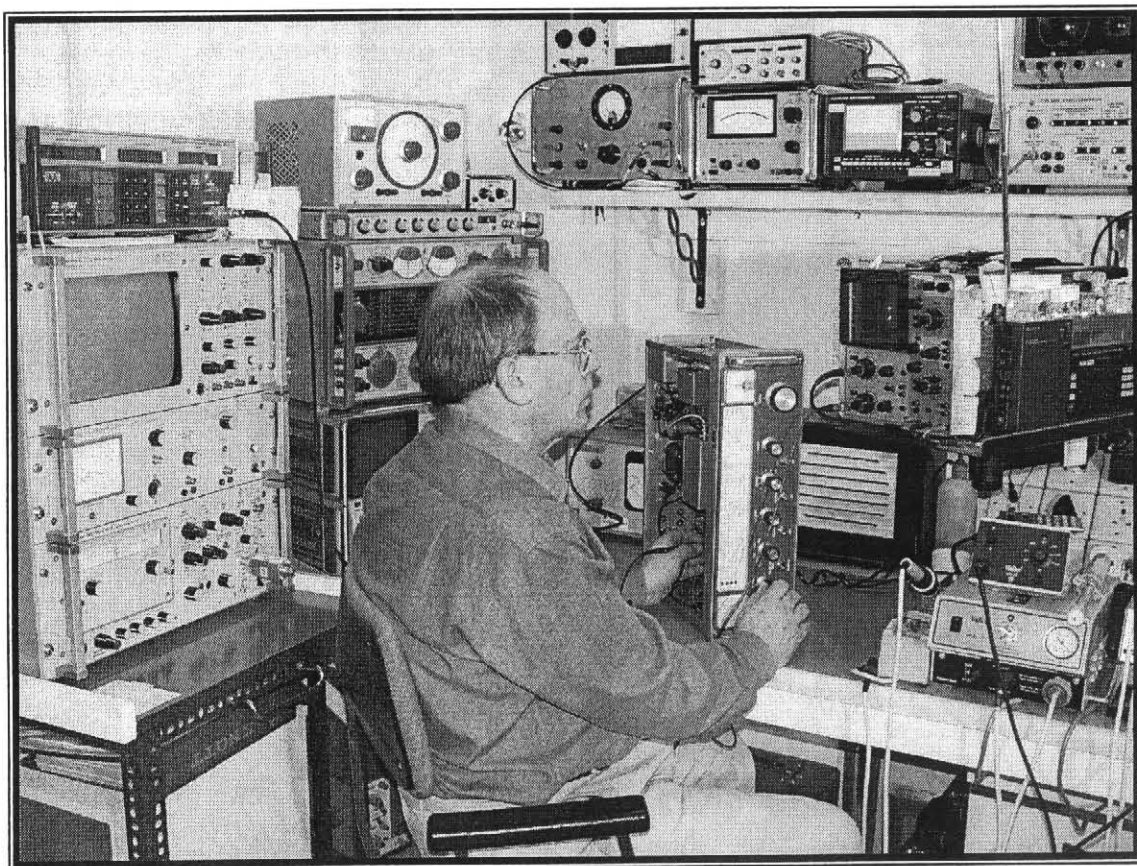
I do hope that you have found these adventures with my 830/7 of interest and that it has been helpful and instructive in helping you to obtain the very best from one of the best valved Eddystones ever.



Thank you, Graham, for your excellent and far-reaching exposition. There are lessons here for anybody with an 830-series Eddystone. Especially the bit about C159!

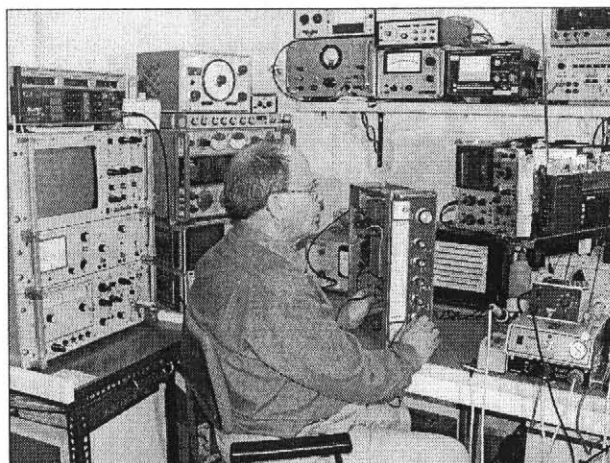
I shall examine my "Jewel in the Crown" in a very different light next time it has its turn on the desk.

- Graeme G3GGL



Graham Gosling examines an Eddystone 990R in his well-equipped professional laboratory

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The Great Q-Code Controversy and further comments.

By Graeme Wormald G3GGL

Since Radio Amateurs using fone (as opposed to CW) became the majority, which I think was some time in the late 1950s or turn of the '60s, people have been criticising their use of Q-Codes in speech. *"An affectation,"* say those who disapprove. But surely, every specialised interest known to man (and woman) is riddled with its own arcane jargon. Have you ever listened to a couple of cricket fans? *"That was definitely LBW; and the silly mid-off agrees with me."*

And have you ever listened to present-day aviators on the VHF R/T (radio telephone)? *"Can you give me the QNH for Fairford?"* (altimeter setting in millibars adjusted for airfield height). Or *"Can you give me the QDM for base?"* (the magnetic course to reach base in still air).

That's right. They're using the Q-code in speech communication. Pilots have used it since R/T began and they're not going to stop now. It's part of the mystery which separates fliers from ordinary mortals and exactly the same goes for radio amateurs.

Having said that it's my belief that we should give some attention to detail and actually bring back some of the uses which were once current but have become lost to a whole generation of hams.

It's also my opinion that the RST system of reporting, introduced by W2BSR in the late 1920s, has outlived its usefulness. The original system of reporting was "QRK" meaning signal readability on a scale of 1-5, which was retained in the RST system. This was followed by "QSA", meaning

signal strength on a scale 1-5, which was replaced by a meaningless scale of 1-9.

The question of CW tone, which in Q-Code is "QRI" (meaning "your note varies" and was replaced by T-9, also irrelevant in this day and age) and is nothing to do with fone operation!

The "SINPO" code, which is used by broadcast SWLs, is alien to most hams but is recommended for use in the new 60 metre NOV channels. And why is that? Because it's based on the old Q-code measurements on a scale of 1-5. Much more realistic in an area of subjective measurement. And make no mistake; it *IS* subjective, even though we think our hobby is scientific. It's not, it's very much a personal judgement and we all know that "5" is the limit of human guesstimation.

So let's bring back the report (still used by the military), readability five, strength five. Or, in good ham jargon. "You're coming in QRK five and QSA five." (Even the CBers used it when they reported "You're coming in five by five"!)



From the Archives

Some weeks ago Bill Cooke, GWØION, former chief engineer and managing director of Eddystone Radio, was clearing out some old files. The following “Reference Letter” was amongst them and Bill sends it for members’ edification. It contains some gems of history.

“I had an interesting session with Harold Cox (*Technical Director 1927-1967*) which confirmed my belief/memory that:-

1. No equipment (mobile) was ever supplied to the R.A.F.
2. That Eddystone VHF equipment was a private venture.

However, going over the history as discussed and recalled by Harold Cox, the short notes below I am sure are interesting.

For some time before the war (*W.W.2*) Eddystone had been involved in 2-way radio with Fire Brigades and expeditions and had started designing equipment more directly aimed at genuine “Police mobile”. An impetus was given by a rather strange route. Eddystone owned Retail outlets (Webbs) both in London (Dean Street and Soho Street) and Birmingham (New Street and Carrs Lane).

Webbs in London was managed by Picard and Adams and Reg Adams had a contact with the Metropolitan Police – using Eddystone “bits” he made some equipment which Eddystone were later to exploit.

The Eddystone effort was team as recalled, and included G. Brown (G5BJ) later to be in charge of Birmingham Police Radio, Garnett Lapworth (G6DL) and Ted Lawze, chief draughtsman. (Interesting to note that the juniors in this were J. Gwynne, Wilf Williams and Bill Cooke).

The war was upon us as Eddystone had equipment suitable for Police Forces and indeed the Metropolitan Police,

Birmingham and Glasgow were all either piloting Eddystone or installing.

However, about this time Frank Gee from Lancashire Police turned up with an early prototype TX which he was interested in Eddystone “cleaning up” for production and this was done – memory indicates that about 20 at most were manufactured. (I recall loading up Preston (Lancs) Black Maria with equipment in 1939).

The big change came as regards availability of Eddystone VHF TX and RX equipment when the Admiralty decided to adopt the equipment and between 3000 and 4000 systems were supplied to the Navy. The design was improved notably with the cast assembly of the RX system. TX were still being supplied to the Navy in 1948/9 and during this time Eddystone equipped Belfast Harbour.

However, the advent of greater competition from Pye in particular with rental arrangements, was not attractive to the family business and slowly the mobile equipment was run down. Harold Cox well remembers being approached by Frank Gee as regards modification of receivers but did not wish to undertake the work.

Eddystone moved on to concentrate on receivers and small 25 watt HF AM TX together with the development of direct view and projection TV receivers.”

B.O.Cooke. 16th January, 1986



E.U.G. Masters' Crossword News

Controversy over VK interpretation; compiler consulted

by Graeme Wormald G3GGL

So far as I can see I have no apologies to make this month; it would seem that I missed nothing out of last month's Crossword presentation.

A good entry from 16 members all looked very successful until I started to check the details and found disparity with our Puzzlemaster's answers.

Puzzlers will recall that 18 Across was the short snappy clue of "*Brits in VK land (5)*". Most entrants submitted the approved answer "*pomms*", but two members entered the questionable variant "*pomes*".

Now students of etymology will know of the two (both disputed) origins of this slightly derogatory epithet used by natives of the land of Oz and, according to my works of reference, also ZL, for newly arrived Brits.

One is the derivation from a blend of "*Immigrant*" and "*pomegranate*" (alluding, so it is said, to the rosy cheeks of English immigrants).

The alternative origin is commonly said to be derived from the abbreviation "POME", *Prisoner of Mother England* (referring to convicts).

The confusion is then compounded by referring to both the New Oxford and Collins which spell the shortened form of "*pommy*" or "*pommie*" as "*pom*", i.e. with only one "*m*."

On consulting Colin, G4HNN, to adjudicate in the matter he quoted a recent "Daily Telegraph" feature titled "*Ten Pound Pomms are back*" which refers to the possible reinstatement of one-way British emigration to Australia.

Concerning the "POMES" acronym he asserts that it is not an appropriate

plural (it should be PsOME, not POMEs) and therefore disallowed it.

Sorry, John and Tor!

The other minor variant was 14 Down; "*tympani*" in place of the more usual "*timpani*".

This, Collin agrees, is an acceptable alternative. The former is the Latin root whereas the latter is the modern Italian derivative.

And here we go with the roll of honour:

Brian Blake, G3JOS, Rugby.

Les Cates, G4AVE, Surrey.

T. Emeny, G3RIM, Surrey.

D.R.Gaskell, GØREL, Oxford.

Barry Johnson, ZS2H, R of S Africa.

Mike Maxey, G8CTJ, Leics.

Garry McSweeney Gi4CFQ, Belfast.

Ted Moore, G7AIR, Cambs.

Roger Roycroft, G1NXV, Cheshire.

Keith Seddon, GØOQU, High Peak.

Geoff Steedman, MØBGS, Leeds.

David Skeate, GØSKE, Suffolk.

John St. Leger, G3VDL, Devon.

And now the answers:- **ACROSS;**

1) Instability 7) Frail 8) Modem

9) SSB 10) AM net 12) Crater

15) Errors 18) Pomms 20) ANL

21) Pen pal 22) Iraqi 23) Alternating

DOWN; 1) Infrared 2) Scanner

3) all star 4) Iambic 5) IF data

6) Yard 11) Pressing 13) Replica

14) Timpani 16) Output 17) Scaler

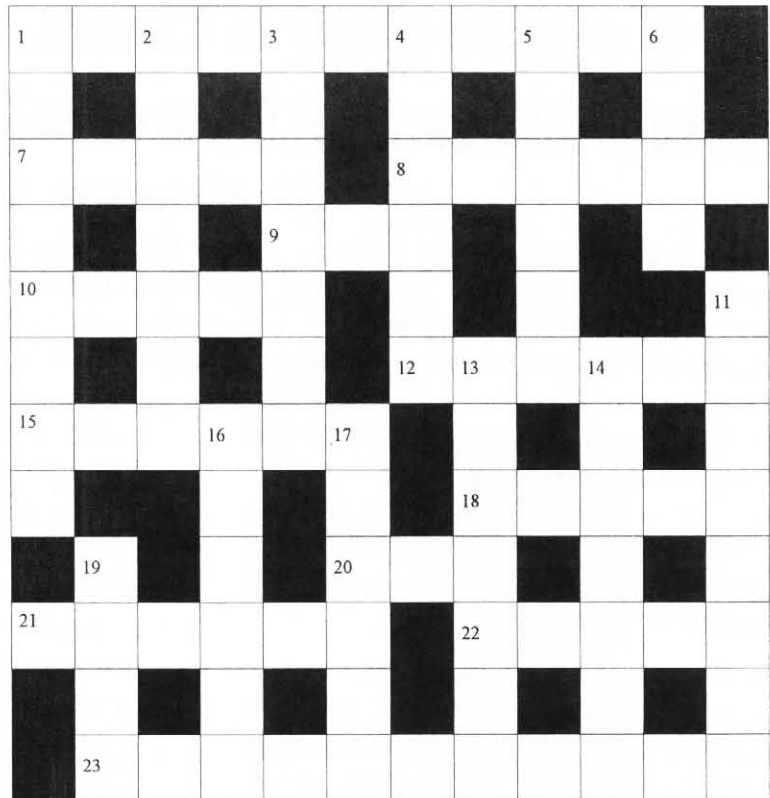
19) Beta



MASTERS' CROSSWORD No 23

Compiled by
Colin Crabb
G4HNNH

Photocopy or write out the answers so as not to spoil your copy. Send it to Graeme Wormald, G3GGL, 15, Sabrina Drive, Bewdley, Worcestershire, DY12 2RJ to arrive not later than 25th January, 2005. Don't forget to include your name!



ACROSS

- 1) The Production of a periodic voltage or current could be referred to as ----- (11)
- 7) Removal of system defects (5)
- 8) Pro-grade hf receivers favoured by the GPO coast stations from the mid 60's (6) (plural)
- 9) Tape speed measurement (3)
- 10) An early form of "Cold Cathode" rectifier, also known as a "Lodge" valve (5)
- 12) Complete nonsense (3,3)
- 15) Technical apprentice, reveals alternative to coax (6)
- 18) Grandma's nickname

is not applicable, but still valid in this case (5)

- 20) Alternative phonetic ident. For "D" (3)
- 21) Work break refreshment provider (3,3)
- 22) ETA (3,2)
- 23) Hot connection (8,3)

DOWN

- 1) A G2 or maybe G3 call sign holder could possibly be described thus (3,5) (Apologies to G3GGL)
- 2) Wireless enclosure (7)
- 3) Nand and Nor gates form the basic premise of one of these (5,2 pt. abb.)
- 4) Double barrelled rescue service (3-3)

- 5) Misnomer for an intermediate frequency transfo. (2,4 pt. abb.)
- 6) Often used to describe zero signal level in mobile vhf systems due to signal path fluctuations (4)
- 11) Famous name in the Eddystone empire (8)
- 13) Laborious mathematical process (4,3 pt. abb.)
- 14) Still waters --- ---- (3,4) (Proverb)
- 16) Connections to which signals are applied (6)
- 17) Call a halt to a "First Sunday" Sked. (3,3)
- 19) Authentic mobile mount for a WW2 19 set could give you the Willys (4)

In Consideration of Amplitude Modulation

Graeme Wormald G3GGL

Since I first launched this column in our last Issue of Lighthouse we have seen two "Third Sunday" 80 metre AM nets take place. They have both produced activity and listener reports. I can't say we have been overwhelmed with support but we are certainly gaining experience of a "lost art".

The first lesson to be learned is that our choice of frequency, 3636 kc/s was not a good one. We thought that by coming down from our usual SSB spot of 3695 we would be closer to the AM "window" of 3600 – 3625 kc/s.

Not a good idea! We were still well in the SSB activity area. On the first occasion (17th October) we ended up on 3615 kc/s with a "round table" of ten stations, half EUG, half VMARS.

The group ran for 1½ hrs and was considered to be a success, accepting our frequency problem.

A fortnight later we had the exciting enlargement of the 40 metre-band. This was most successful and is covered in its own article "At Last . . . "

AM produced much better signals than on 80 metres! On this basis I intend to promote yet another "NET". I shall entitle it "**the 40 metre AM Second Sunday Net**" Details on the back page.

On our November 21st "Third Sunday" we ended up on 3627 kc/s to avoid the SSB activity. Six of us were active.

It was interesting to note that all of us were experiencing "sudden dip" QSB except for Ted, operating G3EUG/P from the mouth of the River Nene, in the bottom corner of the Wash. He had steady reception all the morning, until we went QRT at 10.20am. Another case of the laws of reciprocity being broken? Seems odd.

I used two different rigs on this net; the first was my Codar AT5 running 9 watts input, harnessed to the Eddystone S.640, the classic of the 'forties.

I then changed over to the KW Vanguard (50 watts input) harnessed to the trusty 730/4.

Reports indicate that although the extra power of the KW was noticed by some (but not others!), the speech on the Codar was "sweeter". Now both rigs use a crystal mike, as was almost universal in the 'fifties, but of much different diaphragm diameter. The KW mike is about 1.5 ins and the Codar about 0.7 ins. Mmm. I'd better change them over next time and "taste" the difference.

But one thing stood out a mile! The receiver performances. The 730/4 on narrow-band was clear of sideband splatter but the 640 on its fixed IF bandwidth was riddled with it. I guess it reflects the different specs of the sets. The 640 has a xtal filter for CW, which was compulsory for the first year's licence, but then when you went on fone there was no SSB splatter! The 730/4 was a more professional spec and it still shows.

Do you recall that last month I was asking where all the Panda Cubs had gone? They'd been advertised widely in the late fifties but then seemed to disappear from the face of the earth.

Well, believe it or not, the week after

Lighthouse was despatched I received from Chas. Miller (of *The Radiophile*) details of his next vintage auction.

Now these auctions are usually full of period domestic radios plus the odd comms Rx and a little military stuff, but rarely any ham stuff. But there, standing out as large as life was entry No 99. A Panda Cub! Arrangements were made for a member to attend and for Ted to help with the transport.

Crossed fingers and it was mine. And still is. As you can see it boasts an Eddystone full-vision dial on the VFO and inside it has two Eddystone diecast boxes for the VFO and multiplier chain.

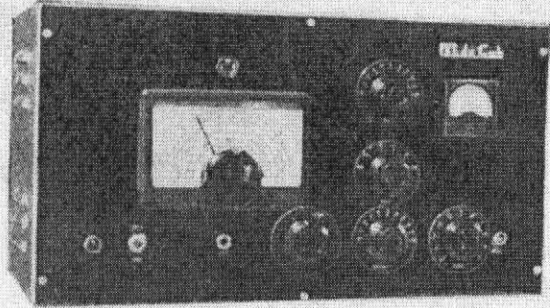
The first thing I did was to look for a handbook, and, would you believe, I can't find one! John Crabbe at the RSGB Library has very kindly found me a circuit, culled from a feature in SWM for Dec 1960. But handbook there is none. I've tried the usual commercial outlet, but No. I've trawled the web but all I can find are hundreds of animals in zoos and the odd "other man's station" type of article. No details. OK, the circuit is enough for me to get started (the set shows signs of damp) but if anybody can copy me a handbook I'd be grateful.

It uses an EF50 Clapp VFO and an 807 in the final, amplitude modulated by a pair of 6V6Gs. About the same size as the KW Vanguard.

Next month I'm aiming to present the details of a kitchen table AM Tx that anyone can build. Goodness knows I've done enough of them in the past to remember!

The first thing to decide on is favourite frequencies because it's going to be crystal controlled. I suspect that a kitchen table VFO wouldn't even be legal these days! Not that we're ever inspected any more. Would you believe my last Post Office inspection

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was 1967?

It will have a medium chunky crystal oscillator (6AC7 or EF91) in the modified Pierce mode which will drive the PA to about ten watts input. This can be anything from an 807 to a 5763 or anything similar which is suitably to hand. It will only have one tuned circuit: the PA anode. One coil with an Eddystone 160 pf variable will tune a 20 microhenry coil through both 40 and 80 metres and a loop coupling will drive a 50 ohm feeder

The modulator side will be a crystal mike (get looking!) into half a 6SL7GT (or 12AX7 if you want to use miniatures) which drives the other half into a Class A audio power amplifier. It will need about 5 watts to modulate the PA so a 6V6G (or EL84) will manage that on a good day!

Heising, or choke modulation will be used; that gets over the problem of where to get a mod tranny. Any old smoothing choke will do. ♠

Obituary

EDDYSTONE S640 HZ 0998

Born Birmingham, August 1948

Died Port Elizabeth, July 2004

“**F**riends, we are gathered here today to pay our last respects to a dearly beloved member of our fraternity.

HZ 0998 came into this world bright and eager as part of a growing band of enthusiastic people anxious to see how she would play her part in enlivening our times.

After a very short while she was spoken for and emigrated to what was then known as the Union of South Africa, and to live with a family in Port Elizabeth. She quickly endeared herself to her new family and in due time was joined by another friend of the family; his name was Viking, a member of the Johnson clan of the USA.

They fitted in very well together and gave their adopted folk many hours of enjoyment. HZ 0998 or as she was known to visitors, Gertrude, was very clever, she learned how to converse in many languages, even the one that sounded like short dots and long dots.

Lots of people, especially visitors, got to know Gertrude and Viking, however as time went by Gertrude's hearing started to deteriorate and Viking's voice grew a little hoarse.

For a while Gertrude's Pater wondered what he could do to help, then one day another fraternity member suggested a hearing aid may solve the problem and told Pater where to go and get more advise.

Well, Gertrude got her hearing aid, it was the latest thing out at the time, a Q-multiplier, as we were told, but it did not help a great deal. The trouble was that there was a new language and Gertrude could never quite get used to the Donald Duck sound and, of course, Viking had a problem with his accent as well, he could not make that kind of noise.

Pater, seeing that there was no other way out but to let Gertrude and Viking off for a well deserved holiday, said farewell to them and that they would be home again soon .

Sadly, Pater never saw them again as he was soon to be called to that Great Shack in the sky.

Then one day, a member of the fraternity mentioned that he had heard of Gertrude and that she was still in town but was very poorly. The member went to see about getting Gertrude home but learned that she was beyond hope and took her home to rest in peace.

And so friends we can say our farewells to Gertrude HZ0998, knowing that she had a good life, served her community well as even in her passing she donated her most vital parts to help the more frail of her kind.

May her dear soul rest in pieces.”

Just a piece of nonsense . . .

All the very best,

73's Barry ZS2H

Holiday Wordsearch

Too full of Christmas pudd?

Need to relax the brain?

Take a comfy armchair and do Graeme's Wordsearch.

E P R O P A G A T I O N S A E A N O D E
A S C I V K L G E U X E P O C D S H U W
S H E D A D G N I O N O S P H E R E G Y
T Z E H L O B J L D T N P T O F E S Y L
O E O T V H G A T E O L G E L S W R A P
W E A R E F K U T U O E N Y N E E A R O
D E F I H R N O U H G O L O I T E A R Y
B U G S O E O S H Y T Q E D T H O U A L
W E S T L O B D E S A U Y A E T G D O F
B F O Y D I A L Y O U A B T H E A D E T
Y E S T E R D D I N I R O U G C H R S T
E L E G R A D I O X E T L K O U G H T H
L E A M T E C S T A S Z U R S A V C H S
C H E A O A B Y Y L M U N E A B C C H Y
Y E A R I D Z C O A X T H A L O T H I E
C H O C L E U S C Y G H O C A S C O D E
A M M O U T H L E D O I R T H I R K S Y
G A I N S E N S A T I V E I D L O E S E
E L F I P C H A N T L E R O X P L U G S
M I C A N T U W A V E B A N D W I D T H

Find the following words in the above grid and ring them in pencil (examples shown). You will find these familiar words which may read left to right, right to left, diagonal, upside-down, downside-up, any way! Tick them as you go . . .

Propagation, Anode, Ionosphere, Piezo, Valveholder, Heterodyne, Knob, Gain, Dial, Bathtub, Stratton, Array, Battery, Quartz, Radio, Pentode, Echo, Acorn, Reaction, Cascode, Triode, Beat, Plug, Modulate, Detect, Bug, Coax, AVC, BFO, Mic, Megacycle, Eddystone, Gate, Yagi, Neon, Waveband, Choke, Marconi.

G3GGL ♣

Letter from Nantwich

By Jack Read

Dear Graeme,

After reading your recent notes in "Lighthouse" on the virtues of an 80 metre horizontal loop antenna I have rigged one up and tried it out on today's EUG net (3rd Oct). You will recall that I had effectively given up due to computer and other local hash rendering the Sunday morning event unreadable.

Well it really works here too! For the first time ever I am able to put together an outline reception report. I tuned in on the AM tests at 9.30 and thought, as usual, nothing doing. It was getting towards 10 O'clock when the penny dropped. People heard on LSB were:-

G3GGL yourself managing the net.

GD3EUG/P Ted, Orion 5000

G3XFE Chris, Watford

G3VFO

G3DPY

G1KXP Stephen

G4EBL Ralph

GØKKE Dave (*actually GØSKE*)

G4BXB Ben (*actually G4BXD*)

MØBGS Geoff

- - URS (*I can't identify this one in my log - Graeme*)

And calls I missed were from Tony (*GØMQG*) and Dave (*that was GØSKE - above*)

Topics discussed included the highest usable frequency (VHF) with valves, a one-off 770U, an 1154/55 set-up, and the effect of granite on propagation on Ted's mountain. Incidentally Ted

appeared off frequency against everybody else: funny as the Orion is xtal controlled (*maybe everybody else was off frequency!*)

During the above I was switching between my EA12 and RA17 (*Racal*). The RA17 seemed a little better for signal/noise ratio, which is funny because they both use the same ECC189 front end. (*remember they are 40 years old and the RA17 cost about ten times as much as the EA12!*)

You refer in "Lighthouse" 84 page 33 to an article in QST on full wave loop antennas. If it explains their method of operation, which is not immediately obvious, I would be grateful for a photocopy. (*regretfully I can't recall which QST; it just said 'make it and use it!'*).

Yours, Jack

P.S. Have included a couple of pages on my Radio Astronomy experiments over leaf.

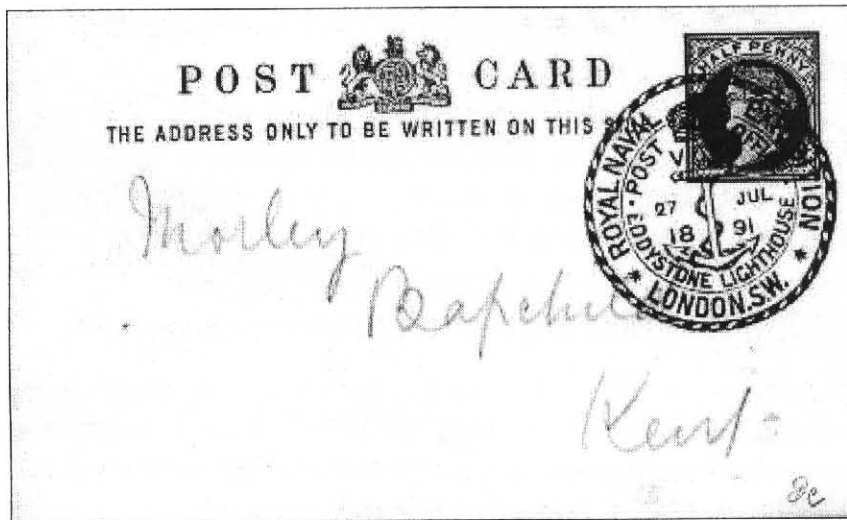
Thank you Jack for your interesting revelation re aerials. There was only Ted & I on AM that morning (poor show!) so by 09.30 we had changed over to SSB and were collecting contacts when you tuned in.

I shall run your radio astronomy notes in our next edition; many thanks for a new topic. I know some of our members have set up radio telescopes but none of them have put pen to paper until now. -- Graeme.



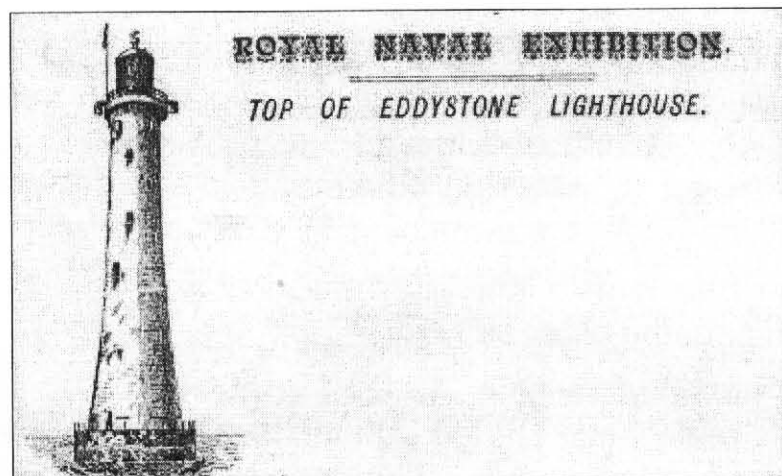
Big Fail on e-Bay

Readers will be acquainted with our Patron's coverage of interesting Eddystone sales on e-Bay. I cover the things Chris doesn't . . .



This interesting early example of a collectors' postmark dated 27 July 1891 was offered for sale on e-Bay last month.

After lingering for ten days with a starting bid (i.e. 'reserve') of £80 it completely failed to attract a buyer and received no further bids.



I must admit that I find the concept of a Royal Naval Exhibition complete with Post Office at the top of our favourite lighthouse to be an unlikely combination. And why does the postmark include a London Postal District ? (S.W. = South West)

But the address really does give the 'importance' of the recipient:- "Morley, Bapchild, Kent." Almost as impressive as "Radio G 3 Lima, Bewdley, Worcestershire" (See "At Last! Forty Metres Reborn", elsewhere in this issue).

Graeme Wormald G3GGL ♠

The Duffers' Guide to Valve Set Fault-finding – (part three).

By Graeme Wormald G3GGL

It has been very gratifying to receive positive feedback in recent weeks from members who are finding this series a help in their understanding of valve sets. There are many people, and I'm one of them, who are incapable of following any mathematical or academic explanation of radio-related technology.

In spite of having worked as a technician/engineer in the broadcast industry from the age of 21 for eight years, and ending up as a "senior master control engineer" (yes, that was my official designation), I "flew by the seat of my pants". In fact, that was the only formal professional qualification I ever acquired, courtesy of the Korean War. The rest of my technical background is entirely self-taught, starting with my ham ticket whilst at school. The result is that I always interpret technology in an entirely empirical manner.

This means that I can express myself in such a manner, and though a conventionally trained and qualified technician or engineer will smile and nod wisely (he knows the real answer to what I'm waffling about), a lot of folk find it works for them too.

For the record, at the eighth year (above) I realised that I could no longer bluff my way through life as an "engineer" with such a shaky foundation. I quit engineering and moved into presentation directing, a job which I had learned by watching others. I had two day's training and stayed in the discipline for the remaining 31 years of my working life.

In the meantime I enjoyed "mucking about" with old radio technology which became older as I did!

This month we're going to look at mains power supplies or P.S.U.s. I should really have started with this subject because if you have no power you've no set to service, but somehow that escaped my mind at the time.

I must also ask readers to excuse my tendency to mention things which should have been mentioned weeks before, but this series is very much written as you go. If done properly it would probably amount to 1,500 pages – the size of Langford-Smith's "Radio Designer's Handbook".

I doubt if I should live long enough and I think, dear reader, that you would have died of boredom in the meantime. So having wasted a page on platitudes may I remind you to check the introductory advice to Parts One and Two, and then read on . . .

CURRENT FLOW

I don't think we've gone into this before. We should have, but we didn't. Better late than never.

In the dim and distant past of the 19th century, when electricity was a mysterious and wonderful "substance" (*isn't it still?*), scientists and dabblers were presented with something which seemed to "flow" in a conductor.

Electricity was an "abstract substance", unlike, say, water which can be detected and followed by the human senses of sight and touch. But it **was** discovered that if an electric "current" flowed through a wire it would deflect a nearby magnetised needle, but they had no way of knowing which way it was "flowing". (Note the analogy with liquid in all this terminology.)

So they guessed. And they guessed wrong.

They decided that the carbon in a Leclanché Cell was positive (+) and the zinc was negative (-). (A Leclanché Cell was a very early version of our carbon/zinc 'dry' battery).

And they based all the laws of electricity and magnetism on this, such as Fleming's right hand rule screw rule (which I don't intend to go into here!).

But we're stuck with it and you might ask "Why?"

Well the reason is that electricity is based on the presence of electrons in atoms. And these are negative by the above convention.

That is to say that when you switch your flashlight on, the electricity actually flows from the negative end to the positive end of your battery via the filament of the bulb.

This is a trick to confuse those of us

with tidy, logical minds. And we're stuck with it. Not that it matters when we're talking about flashlights or even car headlamps but what about radio?

OK, then. Let's take a diode, the simplest of all thermionic valves. (Thermionic, by the way, means the emission of electrons from something hot.)

The simplest diode consists of a vacuum-filled low-voltage electric lamp bulb with a plate above the filament connected by a sealed wire to a terminal outside the lamp.

This plate is called an anode, which is why our American cousins call the anode a plate. (*More confusion*).

If you connect a battery of, say, 20 volts, from one side of the glowing filament to the plate lead, with the negative (-) pole of the battery going to the plate, no current will flow.

If you turn it the other way round a measurable current will flow, apparently from the plate to the filament. **BUT WE KNOW THAT THE ELECTRONS, (i.e. THE CURRENT) ARE BEING EMITTED FROM THE FILAMENT.**

This means that all our natural instinct of assuming the high tension positive is flowing from the plate (anode) to the filament (cathode) is proved wrong.

The current goes out from the hot cathode in every form of radio valve and is "sucked up" by the HT (positive) connected to the anode.

This is unnatural to our logic but nevertheless this is what is happening.

If no HT is present the current (i.e. electrons) just fall back into the cathode, except for a few which end up stuck to the glass, which is why you see a silvery deposit inside a very old panel lamp in your vintage Eddystone

receiver.

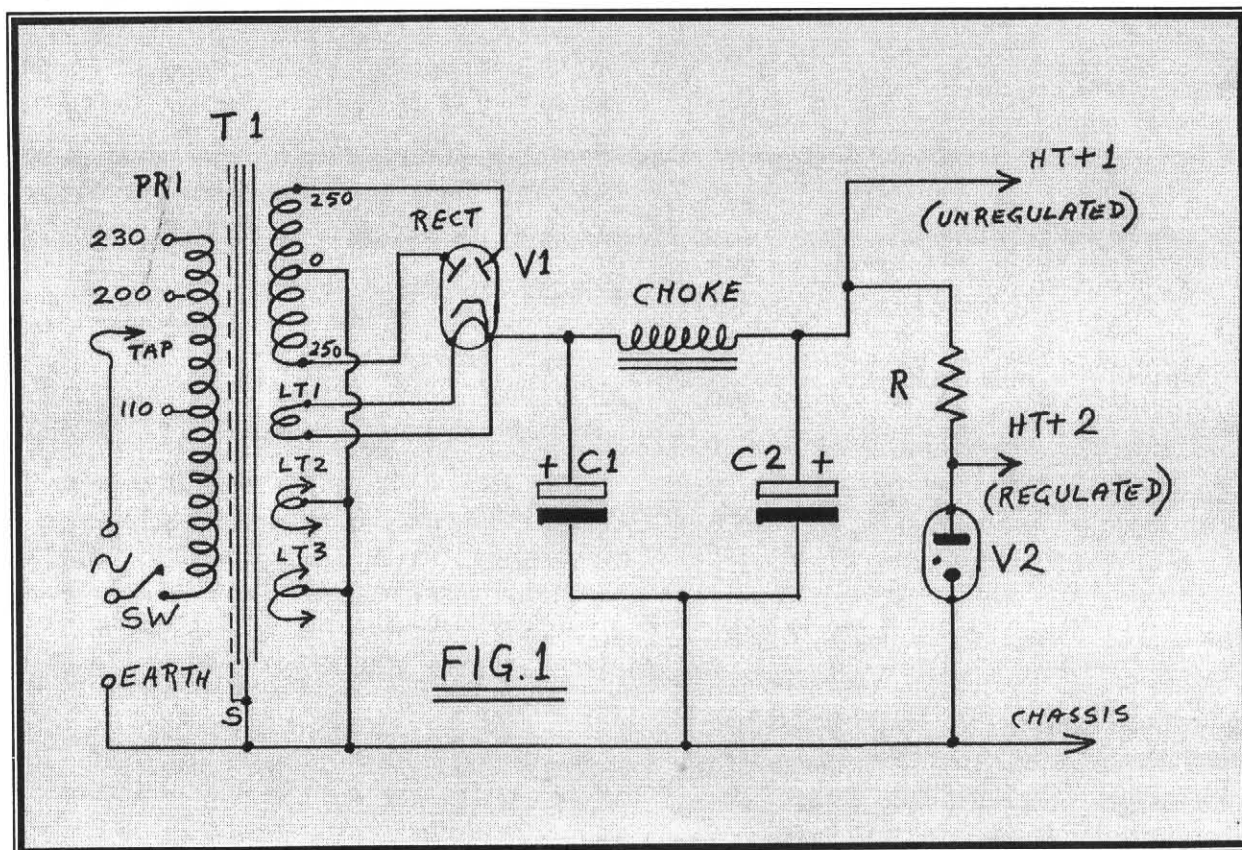
Now we seem to have spent a long time going round the houses to get to this point, but a clear understanding of the above basic principle is essential to a comprehension of valve radio.

It also makes it much easier to follow on with the bit about P.S.U.s, which is where this entire article started.

First of all may I make it very clear that there are two kinds of mains power

units which are used in Eddystone receivers. The first is the AC-only and the second is the "universal" AC/DC type.

We shall start off with the AC-only variety because this is used on all the better sets and some folk condemn the "universal" sets as "rubbish". However, there was a good reason for their presence in the Eddystone range at the time, but we shall discover that further down the column.



Consider now the above Fig. 1. It is the circuit of the power supply for a typical "upper class" Eddystone valve radio. We shall discuss every part of it starting from the little squiggle at the left hand side which represents the AC mains input.

On sets up to the early sixties this input connector was not polarised nor did it have a mains earth connection. In fact, on the first post-war models it wasn't even a connector; it was hard-

wired into the set. (At least they had a mains earth and correct polarity!)

The mains earth here has to be taken to the terminal adjacent the aerial connectors. The mains switch is single pole in some sets, double pole in others (i.e. a switch in each leg of the mains.) Some sets had fuses here, some didn't. Whatever the arrangement it is unlikely to cause trouble other than mechanical failure. Sets from the mid 'sixties onwards

used a polarised twin plus earth connector which is well-nigh impossible to obtain. It can be replicated by clever mechanics using parts of other connectors, but this isn't the place to explain that.

The advice I always give to those with a connector-less Eddystone is to remove the existing chassis connector and tape it inside the frame to be restored when the correct "mate" is found for it (this might take years). Then install a three way tag-strip and hard-wire the mains into it. There's nothing wrong with that; 99% of modern appliances are so wired.

The little arrow head marked "TAP" is a plug or screw link to select the appropriate mains input to the primary winding of the transformer. In Europe and other 230 volt countries this is most important to check.

110v is for our Canadian and American cousins only. The result of 230v at this point will double the voltages on all the secondaries and saturate the iron core of the transformer. Every conceivable disaster is imminent. The only question is "where will the fire start?"

The DC resistance of the whole of the primary, as measured on the AVO (or whatever) is low, of the order of 10-20 ohms. The most likely source of trouble is an open circuit (obvious) or shorted turn(s). In the former case the set will be dead. In the latter case the set may work and the fault remain "dormant" for a period until it finally burns out (which it will).

The owner has no control over either of these disasters. The only cure is a professional rewind which will probably cost about £100. It might be cheaper to acquire a rough Eddystone with a good transformer and cannibalise it. On close inspection many "similar" Eddystones are found to use the same transformer. (i.e. different sets of the

same era.)

This is one of the more serious reasons that a non-worker should be viewed with suspicion. If the valves don't light up our problem is in this area. On the other hand it may only be a faulty mains switch, in which case the AVO will reveal all.

I don't intend to go into the theory of mains transformers. It is complicated and may be read up in a suitable text book. Suffice to know what it does.

The three vertical lines up the middle of "T1" represent the soft iron stampings of which the core is constructed. The dotted line to the left of them is a screen separating the mains primary winding from the supply secondaries. This is to reduce the transfer of QRN from the mains into the set. It is always earthed. The core is also earthed but, as each lamination is magnetically isolated from its brothers it may well be electrically isolated from earth. This doesn't concern us.

But the reason that the core of a transformer is composed of laminations (and not just a lump of iron) is to stop eddy-currents being induced into the core. This would cause massive losses and overheating.

Now let us progress to the right-hand side of the vertical lines. Here you will see four separate windings. Starting at the bottom we have LT3. This is a 6.3 volt centre-tapped low tension winding used by Eddystone for the noise-limiter and S-meter double diode. The reason for this eccentricity has become clouded in the mists of time, but when you come across it that's what it's for. It's not always used. The centre tap is earthed so as to minimise hum pickup from the heater wiring.

LT2 is exactly the same except that it is of a much higher current rating,

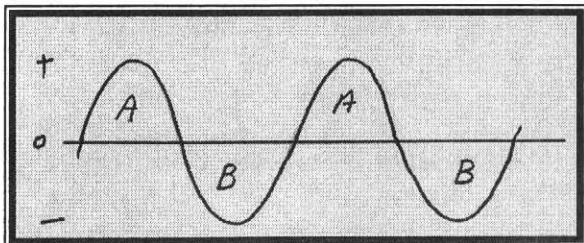
because it feeds all the rest of the valves in the set.

LT1 is a special isolated 5 volt supply for the HT rectifier valve. The vast majority of octal valve rectifiers have 5 volt heaters, some taking 2 amps, some taking 3. Some have indirectly heated cathodes (as shown here). Some are directly heated. This need not concern us as the same pin is always used for HT plus output.

One set springs to mind as being different in this area. One octal valve, the 6X5, which is used in the S.640 has a 6 volt heater. This was developed for use in 6-volt battery sets and presumably there was a glut of them in 1947! The cathode is not only indirectly heated but also heavily insulated from the heater as there will be full HT voltage between them. Again, this point is academic to us here and is only mentioned to complete the picture.

Continuing up the secondary windings we come to a 500 volt winding with a centre tap, labelled 250-0-250. This is the high tension winding and is commonly called a "full wave centre tap rectifier circuit". It is more properly called a "bi-phase rectifier circuit" but let's not worry too much about terminology. Most people just call it "full wave".

I haven't mentioned it before so I'd better mention it now. All the AC voltage references we have made are voltage R.M.S. That means "Root mean squared" and is easiest interpreted as "average". Remember that AC power is not a straight line like DC, it is a sine-wave. I think we'd better have a little picture here to make



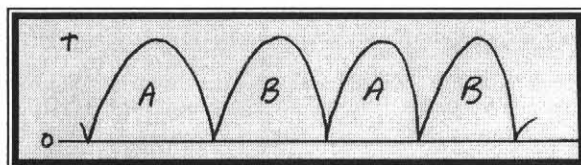
it clearer.

This is a normal AC voltage wave-form as put into the primary of the mains transformer. It is also exactly the wave-form which comes out of the secondaries.

Now let us consider the situation with respect to V1, the power rectifier. This is a double diode with a common cathode. It has the above waveform fed into its two anodes but from the opposite ends of a centre-tapped winding.

When the upper end of the winding is positive, current will flow through the right-hand anode (or plate). No current can flow through the left-hand anode because it is negative with respect to the cathode.

When the polarity reverses the current will then flow through the left hand anode (but not the right-hand) and the resulting output from the cathode will look like this:-



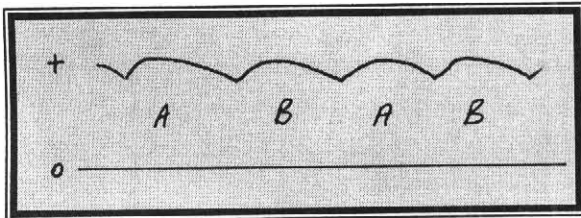
It is called raw rectified AC and once upon a time it was used to feed a power oscillator (1920's) to provide modulated CW giving a 100 cycle note from 50 cycle mains. That was outlawed so now we turn it into pure DC by the next stage.

C1 is the first Smoothing Condenser (or capacitor in modernspeak). It is called the reservoir condenser because it takes a charge when the above waveform peaks positive and gives it out to fill in the gaps. It is typically of a value of 8 to 32 microfarads with a working voltage of 450 volts. It takes a lot of strain and must be in first-class condition to do its

job properly. It will be of the variety known as "electrolytic" because anything else would be the size of a house-brick! Electrolytics condensers are "polarised", that is to say that they have a positive and negative terminal, the correct connection of which is essential. The result of error will be explosion.

At this stage the use of a "Condenser Zapper" is highly advised (see Part One, Issue 86, August 2004).

The voltage at the + end of C1 would look like this:-



A bit of a ripple, but shaping up. It's then fed into the Choke, commonly called the Smoothing Choke and it's very aptly named. It is typically rated at 10 Henries, 100 milliamps.

Consider it to be like one hole of a spaghetti maker. The mixture goes in crooked but comes out as straight as a die and Bingo! You have smooth DC.

No need to draw a picture of this waveform, it's a straight line. The voltage will depend to a large degree on the load taken, which in an Eddystone might be anywhere from 60 to 100 milliamps.

But there is one small addition necessary to finish the recipe. The HT rail (as it is now called) needs decoupling to earth, just the same as circuits in previous episodes.

Another condenser, C2, is provided here and to differentiate it from C1 it is called (yes, you've guessed) the Decoupling Condenser. The value is usually the same or greater than the reservoir condenser and, of course, it's

another electrolytic.

Many sets (such as the 640 and 740) leave the HT supply at that but the real professional (and hamband) sets use an extra stage called a "regulator".

This makes use of an interesting phenomenon found in certain rare and inert gasses such as neon or argon.

When a sealed tube with two electrodes inserted is filled with the gas at a very low pressure it is able to create a voltage drop across these electrodes which is stable to a fraction of a volt in (say) 100 volts.

This property is harnessed in a simple circuit called a shunt regulator.

In Fig.1 this is shown by V2, commonly called a neon stabiliser or regulator. Its design factors determine its operating conditions and a typical specification would be 150 volts at 30 milliamps. This means that if it were fed from a higher voltage source via a resistor (in this case "R") it would produce a steady voltage (HT+2) of 150 whilst the load varied between zero and 30 milliamps. This is more than ample to feed two or three oscillators in the typical communications receiver.

V2 is known as a "Cold Cathode" tube as it has no heater and relies on the principle of ionised gas for its operation. The "dot" shown in the "envelope" indicates that it is gas-filled.

The value of "R" is typically 5,000 ohms, 5 watts, wire wound.

I did intend to carry on and describe the details of the "Universal AC/DC" power supply used in many popular Eddystone models intended for use in particular on board ship, where, fifty years ago the available power was invariably 110 volts DC. But I think I've stretched your attention quite enough for one article. We shall continue in Part Four. ♠

A Leg by any other Name

By Graeme Wormald G3GQI

This section has a rather tenuous connection with Eddystone. In fact it wouldn't have any connection at all if, in 1940, Eddystone, in the shape of Webb's Radio, wasn't the British agent for the well-known American company of Hallicrafters! When the R.A.F.'s highly secret "Y-Service" wanted a tuneable VHF receiver they went to Webb's and bought up their entire stock of SX 27s and put them in Avro Anson twin-engined patrol aircraft to track down the infamous Luftwaffe "Knickebein" 31 mc/s radio bombing beams.

Now in the German language "knicken" means "to crack or bend" and "Bein" means "leg". We English-speakers treat "Knickebein" as an abstract noun and call it "crooked leg" in all our historical literature.

It is my contention that such a translation is inappropriate, and that the term "Knickebein" is not an abstract noun, but a proper noun; that is to say the name of something or someone.

This thought was triggered by Brian Johnson in the BBC2 documentary programme "The Secret War" (1988 – I have the video-tape). When he described the discovery of the German navigators' notebooks with the word "Knickebein" followed by frequency lists and bearings, he remarked that it was "the name of a magic raven in a German fairy story".

Being of a curious turn of mind I decided that I should like to read this story, or even discover its title. The fairy tales of the *Gebrüder Grimm* are widely translated into English and I thought that might produce a connection.

So with steady fingers I typed the word "Knickebein" into the "Yahoo" search engine. Needless to say it produced hundreds of references. The vast

majority concerned radio beams and bombing and were easy to bypass in whatever language they were written (although I must admit that Russian was a slight challenge).

And here I met my problem. Not a single reference could I find to "magic ravens"! Where on earth did the B.B.C. get it from? I don't know and, regretfully, Professor R. V. Jones, who was intimately connected with the discovery is no longer with us . . .

What I did find, however, was equally interesting. "Knickebein" is the name of a wicked witch on a broomstick in German folklore. I think the codeword is quite likely to have been derived from her, don't you?

A bit like the R.A.F. codeword for airborne centimetric radar: "H₂S", which is the chemical formula for hydrogen sulphide, a pungent gas produced by rotting eggs and also in the fume chambers of our centres of learning.

Word has it that when some high-up in the world of Air Ministry administration heard a description of this rather unlikely (for 1942) aid to bombing accuracy he proclaimed "It stinks!".

This then gave rise to the epithet which is still understood by students of military history.

But I digress; there is also another meaning for "Knickebein" which has at least a passing chance of providing the Luftwaffe's codeword.

It is the name of a German cocktail! Honestly! Some sort of an egg-nog. Possibly related to the Dutch Advocaat. Apparently it was invented during the 19th century (I thought the cocktail was an invention of the 1920s, but evidently not) – by a German brewmaster who was the unfortunate owner of bandy, or crooked legs and was so nick-named. Rather like our English "crookback", commonly used as a name for hunchbacks in times gone by.

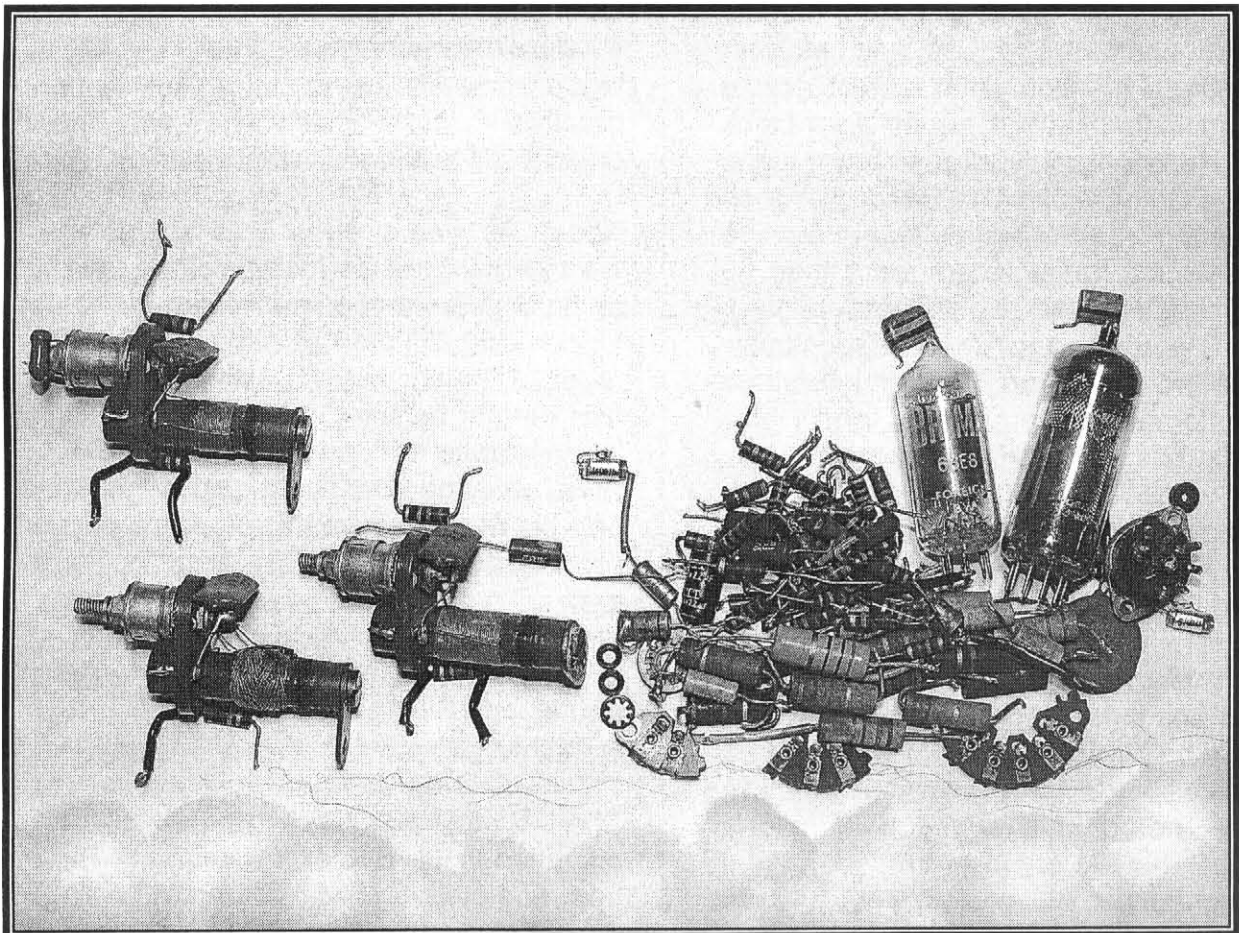
Could this be the origin of the name for the famous VHF bombing beams?

At this point I was getting slightly

cross-eyed and I decided to e-mail EUGer Peter, DC6BN - M3IZG, who is fluent in both tongues. In fact it was he who produced the reference to the German cocktail-inventor.

He has consulted learned libraries in centres of which I've never even heard, but can come up with no references to magic ravens. Which puts me back to where I started. I DON'T believe we should translate it as "crooked leg". I believe it is a proper noun from somewhere and should be used as such.

We must have some EUGer who has heard of Brian Johnson's Magic Raven, surely. Come on, chaps, get the grey cells moving!



"Christmas Magic" by Graham Gosling of East Coast Wireless

BILL'S 870

A cautionary tale by Peter Lankshear

Regular Lighthouse readers will know this writer's positive views on modifications to Eddystone receivers. There is generally little justification for them, and ideally any changes found should be reversed. One that does come to mind as being valid is the rewiring of the 640 B.F.O. tuning capacitor to minimise R.F. pickup, but such cases are not common. However, breaking my own rule, I have a modified 870 that I do not intend to return to original, even if I could find the parts.

Fellow NZVRS member Bill is a living legend in the in the New Zealand vintage radio scene. Recently, assisted by the local radio fraternity, he celebrated his 90th birthday in fine style, but it could well have been his 70th given his alertness and fitness. Bill's special ability is transformer winding, a skill that most radio enthusiasts seem to regard as a black art. He is probably eligible for a place in the Guinness Book of Records, for as a young radio service technician he first wound transformers more than 70 years ago! And he is still at it. Only a few weeks ago he meticulously rewound a Stewart Warner interstage transformer for me and his workmanship is as good as ever.

Now anyone who lives long enough and is sufficiently motivated could make some sort of effort at winding but Bill is a professional to his fingertips. His workmanship is superb so that often the finished product is superior to the original. If Bill rewinds a transformer it stays rewind – I've never heard of a subsequent failure. He can handle complex jobs too, and a straightforward project like an Eddystone power transformer is bread and butter to him. He enjoys a

challenge and a few years ago I arranged for him to rewind a Radford 100 watt wide range output transformer. These transformers are very complex with, from memory, fourteen separate windings interconnected in an intricate pattern. Radford transformers were of the highest quality, and Bill's rewind is practically indistinguishable from the original – it just looks a bit newer.

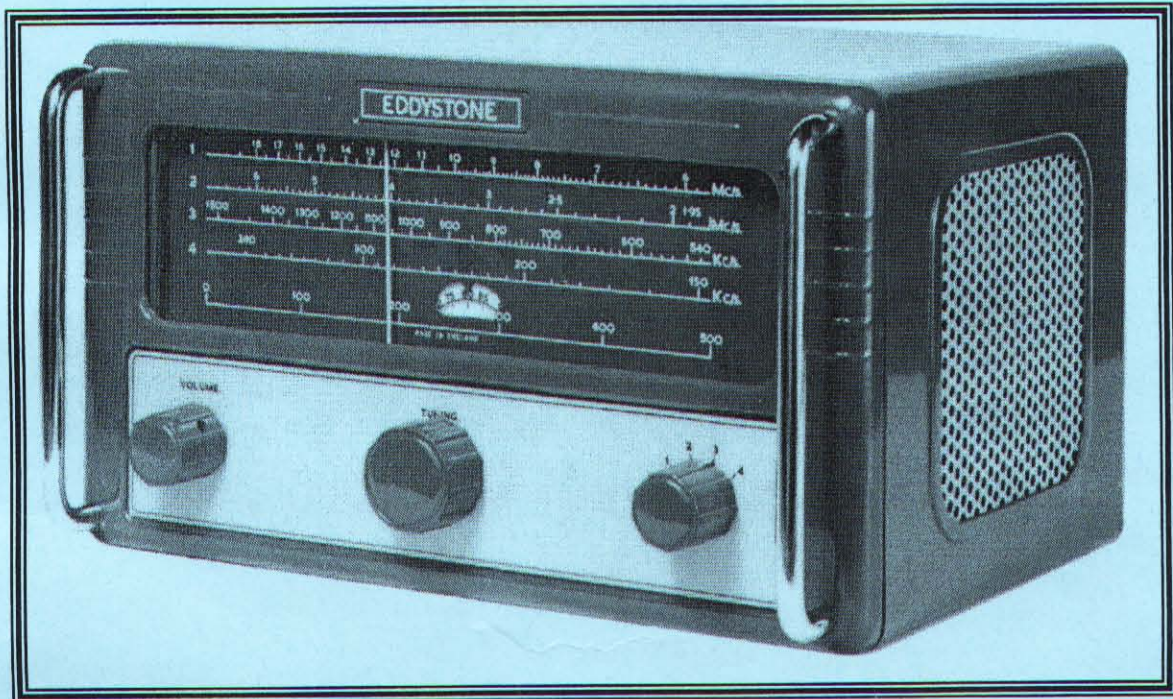
About 20 years ago, Bill's daughter wished to join in the fashion of the time of having an arched top radio in her lounge and Bill did not have a suitable model. During a visit, he suggested that I might be tempted to provide one in exchange for an Eddystone 870. Bill's workmanship with receivers is first class, as would be expected of a professional with his long experience, and I knew that I would not be disappointed with the 870's condition. It did not take long for a deal to be made, with Bill taking a small RCA R28 in exchange.

The Eddystone was in excellent condition, but Bill explained that he had made what he considered to be an essential modification. As EUGers will know, to enable the 870 to operate

from a wide range of power sources, including shipboard mains, it is power transformerless or in the language of broadcast receivers, it is an AC/DC set. New Zealand has practically no need for this class of radio and the few "el cheapo" domestic versions were known in the trade as "hot boxes", very apt in two ways. First, because the

volts high tension so as to derive the maximum performance from the new valves. The transformer is relatively small and fits nicely in the available chassis space, looking like it was meant to be there.

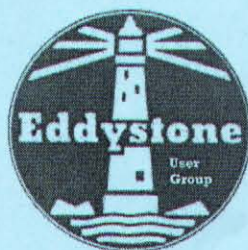
Bill however had overlooked the possibility of the increased H.T.



operating voltage was around 110 and the excess 100 or so volts were dissipated in resistors as heat, and the other reason is that the internals are necessarily directly connected to the mains. As Graeme points out in Lighthouse Issue 87, operating at 110 volts, these receivers are very cool running, and, Bill did the obvious. He made a transformer and threw away the dropping resistors. Faced with this situation, I would have settled for an external 110 volt transformer, but Bill went further. Because AC/DC sets are uncommon here, the high voltage filament valves are not readily available, and he went all the way by fitting the equivalent standard 6.3 volt valves and an internal power supply. And while he was about it, he designed the power transformer to supply 220

exceeding the ratings of the converter and I.F valve's screen grid. The addition by me of a screen dropping resistor soon corrected this.

To anyone other than an Eddystone specialist, the chassis looks completely original and I have a unique 870 that runs cool on 230 volts, has readily available valves and due to the extra H.T. possibly has a performance edge over its brothers. This is a rare case where a modification has made an Eddystone receiver more suited to the service to which it has been put (a bedside radio), and as the job has been well done I have left well alone. Although the 870 is now very useable, as a collectable receiver, it has been devalued.



“EUG on the Air”

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