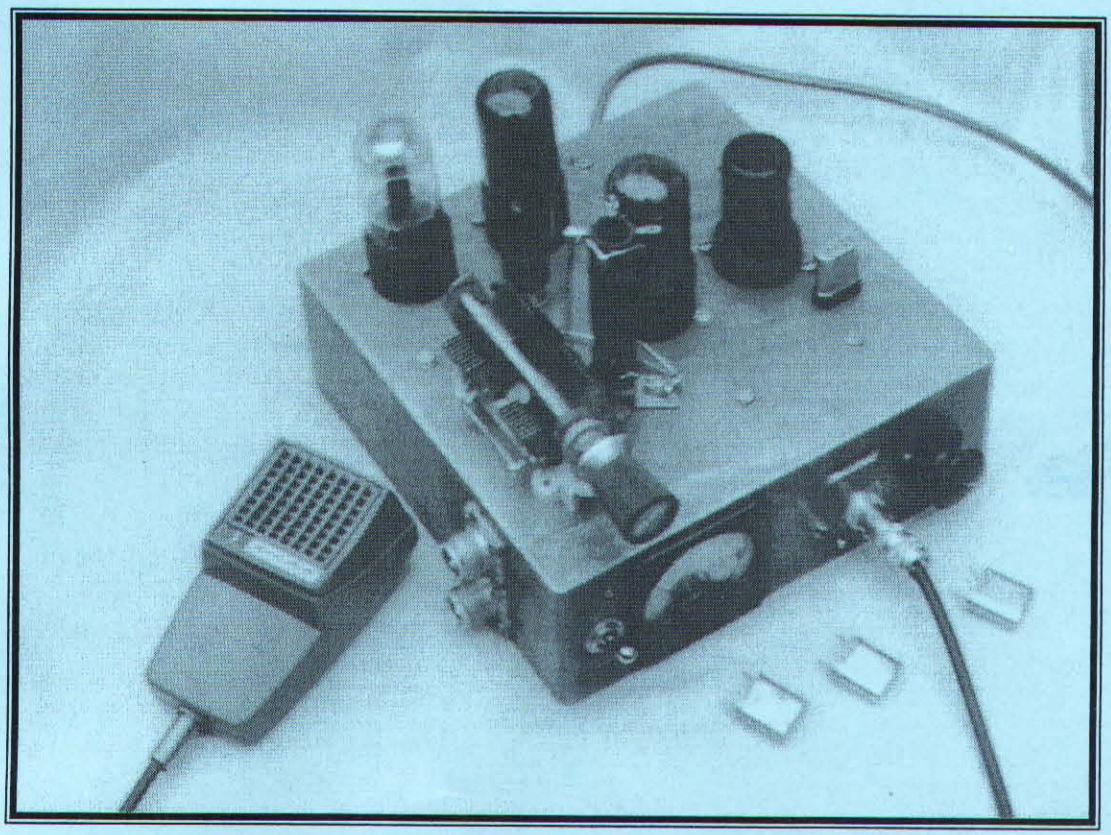
Lighthouse

Founded 1990

The Magazine of the Eddystone User Group

Issue 89, February 2005



JUNK-BOX BABY

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A non-profit-making Group for Eddystone Radio Enthusiasts.
Founded in 1990 by Ted Moore, G7AIR
Issue 89, February 2005

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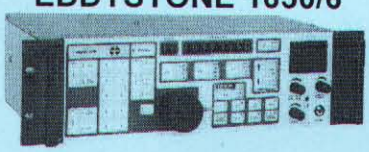
FOR SALE

Eddystone models 740, 670A, EC10, EC10 Mk2 and 990R.
Contact Ted Moore G7AIR for details, telephone 01945 467 356.

EDDYSTONE 1650/6



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WANTED

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

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

Wanted: Period output transformer (not for Eddystone). Fixing centres 2.5 inches, primary approx 650 ohms, secondary very low! Five primary tags to accommodate field and bucking windings. Hopefully a standard early 1930s component. Call Andrew Watt, G3WZJ, on 01522 868 255

Wanted: R1155, any condition working or not or any bits for spares. Call Peter Beardsmore, G4IXY, on 01727 839 908.

Wanted: mains input connector 2 point and plug 2 pole fixed, and or mains socket polarised with earth comtact and its mains plug for an Eddystone 870A receiver project, also the Finger plate blue/grey in colour. **Also Wanted mains transformer** drop through chassis type for Eddystone E.C.R. receiver to fit a 2.5" square hole. Please telephone Andrew Humphriss on 01789 262 872

WANTED: PERDIO TRANSISTOR RADIOS, Models PR1 and PR2, (1957), also any leaflets or advertising matter of the period. Call Gordon Bussey on 0208 660 2240.

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BACK NUMBERS OF LIGHTHOUSE are available on CD-rom and DVD

On CD (Acrobat with program):- Issues 1-15; 16-30; thereafter in bundles of six issues (i.e. one year) up to Issue 84 (April 2004); £5 each incl. p & p to UK, overseas £6 or equivalent in local banknotes ($ or €) airmail.

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EXTRA CD – DVD: there is available a small quantity of DVDs (*as just described*) which were made with one EUG Newsletter omitted (No 16) These are available at the knock-down price of £6 each post paid.
Order all CDs from Graeme G3GGL details on opposite page.

PLEASE NOTE: when submitting adverts please give contact number

ERRATUM

Please note that pages 30 and 31 in our last Issue were transposed.

Sincere apologies to Graham Gosling of East Coast Wireless

Chris's Column

Welcome to another issue of our wonderful vintage wireless magazine. To us the Lighthouse is the trademark that we associate with our favourite radio receivers. To mariners of course, it means safety from the destruction of the seas. This Christmas, many of us added a new word to our vocabulary which actually meant the opposite; death and destruction from the sea.

I am, of course, talking about the Asian Tsunami. Depending upon your religious viewpoint, this was an Act of God, a terrible wrath inflicted mostly upon Moslems from a prophet who was angry at their desire for Western ways such as freedom, democracy and equality to do what they want to do.

Or was it Nature reminding us how we should not take it for granted. But what it was, from the moment of the earthquake itself, was certainty that the resulting tsunami waves would be very destructive.

But, unlike the Pacific Ocean, there was nothing anyone could do, as the situation unfolded, to warn those that lived on the affected coast lines that there very lives were about to be wiped out.

These terrible waves took anything from 20 minutes to 4-5 hours to reach their destinations. Scientists on watch in the Pacific knew that death was on its way, but there was no warning system, no command structure to convey the dire warnings that people should move away from the coast lines.

Whilst there would still have been significant loss of life, moving people perhaps half a mile away from the beaches could have saved many thousands. In an age of instant communications, where millions have mobile phones, (yes, even in the third world where they are cheaper to install than land line phones), where they say an unprotected new computer can be hit by spam or a virus within 10 minutes of being connected to the internet, no one had considered it worth the money to put in a warning system.

In the Alaskan and Pacific Regions, tsunami watch, warning and information bulletins are disseminated to appropriate emergency officials and the general public by a variety of communication methods.

Tsunami watch, warning and information bulletins issued by Pacific Tsunami Watch Centre and Alaskan Tsunami Watch Centre are disseminated to local, state, national and international users as well as the media.

These users, in turn, disseminate the tsunami information to the public, generally over commercial radio

and television channels.

The US National Oceanographic and Atmospheric Administration (NOAA) Weather Radio System, based on a large number of VHF transmitter sites, provides direct broadcast of tsunami information to the public.

(These special radios which switch on automatically cost around $25 each and are also used in Tornado watch areas). The US Coast Guard also broadcasts urgent marine warnings and related tsunami information to coastal users equipped with medium frequency (MF) and very high frequency (VHF) marine radios.

Local authorities and emergency managers are responsible for formulating and executing evacuation plans for areas under a tsunami warning.

I hear that under the supervision of UNESCO, they are now making plans to set up and build an Indian Ocean Tsunami Watch Centre. Should we feel concerned that we don't have one based on the Atlantic Ocean?

Some years ago Eddystone sold a large number of Orion Transceivers through the World Meteorological Office for use in the flood plains of Bangladesh. Each village had a large house on stilts that could accommodate the local population.

Officials communicated with each other through the Orions and if there was any danger that the flood plains could flood and endanger human life. If there was then they were directed to the houses on stilts.

Whilst this Asian tragedy was unfolding I was reading a new book about Marconi, called Signor Marconi's Magic Box. This is written by Gavin Weightman, a writer and film maker, and is the best biographical account of Marconi's work that I have ever read.

It dwells not so much on the technical advances but the social impact on the world of the development of radio and more on Marconi's private life and the competition he got from other anxious to capitalise on his ideas.

The need to communicate with ships at sea was a driving force in the development of wireless telegraphy in the first years of radio. This was primarily for reasons of safety and certainly some of the more spectacular "rescues" helped Marconi in his quest for fame and fortune.

What a great pity that, a hundred years later, when we take for granted the many advances that have been made in radio communications, we did not think it worth while putting in a solution to mitigate this disaster.

Was that a stable door I heard being bolted in the distance?

Enjoy your read

Chris Pettitt GØEYO
Patron

Memoirs of an Eddystone Collector

By Anthony Richards GW4RYK

My interest in Eddystones began back the 1960's when we had a Signals section in the school CCF. It seemed somehow a far more attractive proposition to spend the Tuesday 'Army' afternoons ambling around with a Wireless Set 18 on one's back, or better still ripping round in an Austin Champ operating a 19 Set, than doing the arduous assault courses etc. that the Cadre (non-signals) had to do.

In addition to the WS 18s and 19s, we had 38s which seemed pretty useless apart from the Mk III version which was a huge improvement. These were worn on the hip, radio on one side and battery pack on the other, as was the 88 Set which was a four channel vhf job, with no great range.

There was a WS 22 but it got very little use as the 19s seemed far better; the main base station consisted of a 12 set transmitter and R107 receiver. All this equipment was of WWII vintage and hardly state of the art, being hand-me-downs from which the regular army had moved on, rather like the Lee Enfield .303s we had!

Some years after I had left school I noticed that the R107 had been replaced by an Eddystone 730/4 which, when I last looked in about 4 years ago, was still in service.

We were all mad keen on radio at that time and Practical Wireless, Short Wave Magazine, Radio Constructor, RSGB Bulletin and Wireless World were avidly devoured each month. There were those lovely adverts for Eddystones which seemed (and of course were) impossibly expensive and I was as likely to buy an E Type as an Eddystone. With their slide-rule dials and symmetrical controls they seemed so beautifully designed and looked just right. Apart perhaps from Hallicrafters and maybe the KW77, for visual appeal nothing else even came close.

I had to be content with a 52 receiver, £5 from GWM Radio and which took most of the Easter holidays to arrive via British Railways – no wonder they lost most of their freight business!

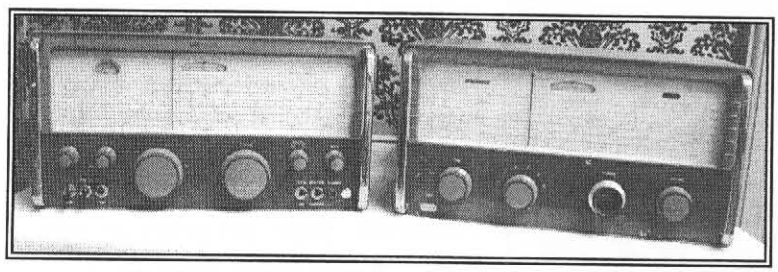
I finally purchased an EC10 Mk II in about 1970 from Charles H. Young of Birmingham, This was taken to Portugal but I didn't keep it long as some friends who were building a house there persuaded me to sell it to them. Twenty years or so later I was given it back, and to this day my wife swears it was the Eddystone that caused the flight from Lisbon to be delayed by two hours!

Then around 12 years ago I was browsing round Lowes of Matlock where there was a small collection of Eddystones on display. Apart from the EC10, I hadn't seen one for years but those Eddystone memories all came flooding back, so I resolved to try and find one – just one, of course!

The late Norman Birkett, whom some may recall having an amateur radio shop on The Spot in Derby but by then had retired to Cornwall, had an 840A

for sale. A deal was done, with an HRO going in part exchange. But big disappointment – when it arrived it was an 840 and not an 840A, so didn't have the essential slide-rule dial!

I remonstrated with Norman since he had, after all, sold them new so should have known what was what, but the cost of returning it made the exercise hardly worthwhile. Some months later it was swapped with an 870 at the NEC by prior arrangement with another EUGer. Oh yes, by then I'd heard from a friend about the EUG and I think I joined at about issue 10 of Ted's newsletter....another step down the slippery slope!



Models 940 and EM34

Another 840A was then located at Centre Electronics, this was the genuine article and was twice as expensive but absolutely mint. An underrated set, in my opinion, and a good compromise between broadcast and communications receivers with good audio quality. I've never yet had to take it out of its case.

Then someone locally was selling a 770R, in very nice condition and ex BBC. I thought I may as well buy it, but somehow I never took to the vhf sets and it was later sold to our own illustrious Graeme, whom I believe still has it. *(Well, no, actually. I recently sold it to another member for the same reason! – Graeme.)*

Well, after that the slippery slope was well and truly being descended, and somewhere along the line I decided that it would be really nice to try and collect ***all*** the h.f. slide-rule dial models.

It's difficult to recall what order they came in, but probably next was a 940, bought from another Norman (now regrettably a silent key) and collected from a lay-by rendezvous near Chester on a very foggy winter's day prior to a business meeting.

Then there was a mint 680X from a Flight Lieutenant at RAF Shawbury, and a 670C from an EUG member in Tywyn on Cardigan Bay.

A conference at the National Motorcycle Museum was escaped from early to collect an EA12 from deepest Warwickshire one afternoon, whilst a chance visit to Martin Lynch's emporium when in London with an afternoon to spare produced a lovely 888A complete with S meter for an amazingly reasonable (for Lynchie!) £50.

Yet another business trip encompassed the collection of an 830/7 from Wrexham, whilst a local silent key's daughter sold me an 840C.

A detour was made from a Cambridge to London trip one afternoon to collect an EB36 from EUGer Jim in Romford.

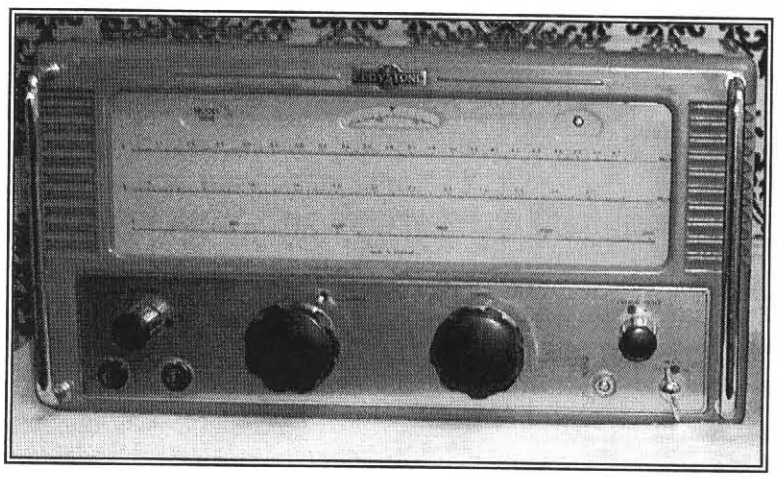
Some Eddystones were bought unseen and delivered, but I cannot think of any that disappointed, apart from the original 840. A super 730/4 came from GWM Radio (a second purchase from them after a 35 year interval!), another set from Centre Electronics in the shape of an EB37, with EB35s Mk I and III (Statesman) coming as a pair from another Jim in Norfolk, the latter declared not working but soon got going.

A rare 909 came all the way from Sweden, and an 870A also came by carrier, as did a 750 from Peter Lepino.

The National Vintage Communications Fair has produced some rare

Eddystones: an inexpensive 670A, badly repainted case but otherwise excellent; a super 850/4 (Howard of Centre Electronics again), and a rough but working and restorable EM34 acquired very cheaply.

There was also an EC10 Mk I, cosmetically perfect but not working very well and thus reasonably priced. However, I doubt whether I would have acquired any of these, other than perhaps the EC10, had I not paid the somewhat exorbitant additional entry fee to get in early; they would surely have all gone by the official 10 a.m. opening time.



The rare Swedish Model 909

And last but not least, eBay. This has yielded an EB35 Mk II, a 960 and an EC10A/2; all with no bad experiences and at seemingly reasonable prices when one sees what some Eddystones *do* achieve on eBay.

I'm sure the decline in classified adverts in publications like Radcom is due to an increasing amount of stuff being sold via the internet and eBay has to be the best source of Eddystones on the planet.

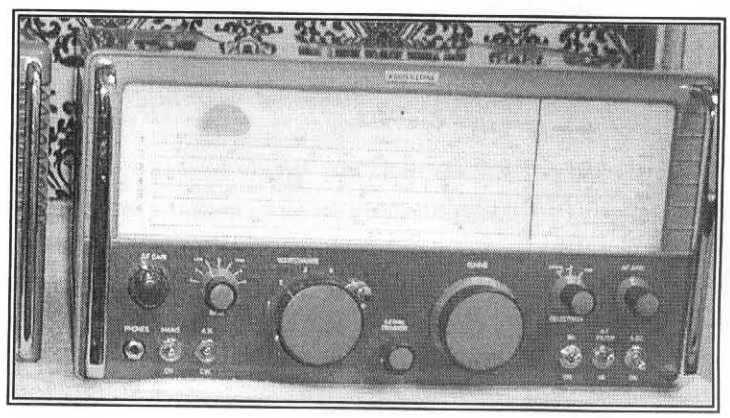
Those who've never used it seem to be very wary of it and yes, it's possible to get caught out, but my own experiences of both selling and buying have been nothing but good and it seems to me that most models eventually appear there.

For example, the 960 was the model that eluded me for the longest time, but within the last few months there have been at least three on eBay, one of which I was pleased to see was acquired by Ted (and another I was even more pleased to acquire myself!).

Likewise accessories such as speakers, meters, diecast 'wedge' feet and Edometers all seem to get listed sooner or later somewhere in the world.

The few 'wanted' adverts I placed *for* specific Eddystones in the Lighthouse, PW or Radcom were never wildly successful, they generally resulted in being offered something else altogether! However, they did procure the two EB35s from Norfolk and the EB36.

So I now have now at last achieved nirvana with a grand total of 25 Eddystones which, as far as I'm aware, represents ***all*** the slide-rule dial h.f. models, at least those that I want.



The rare VLF Model 850/4

Missing is the 910, but perceived wisdom considers that this was only ever available in Marconi HR101 guise anyway. There are a few one-offs like the two Yachtsman models and the

760 which surfaced recently.

Of course there are many variants of the basic models too, but it would hardly be feasible to collect all these, most of which were for export only. Also missing are the Queen Mary and 880 models, but really I consider these too big and heavy to be particularly desirable.

The favourites? Well, if I had to sell all bar a couple I think I'd keep the 940 and the EC10 Mk II, for some indefinable reason that these have always been the ones I've liked best.

For serious swl-ing, the 830/7's a great receiver with the 730/4 not far behind, and for broadcast reception the 670A and C offer pleasant listening and, as mentioned already, the 840A and C are a good compromise.

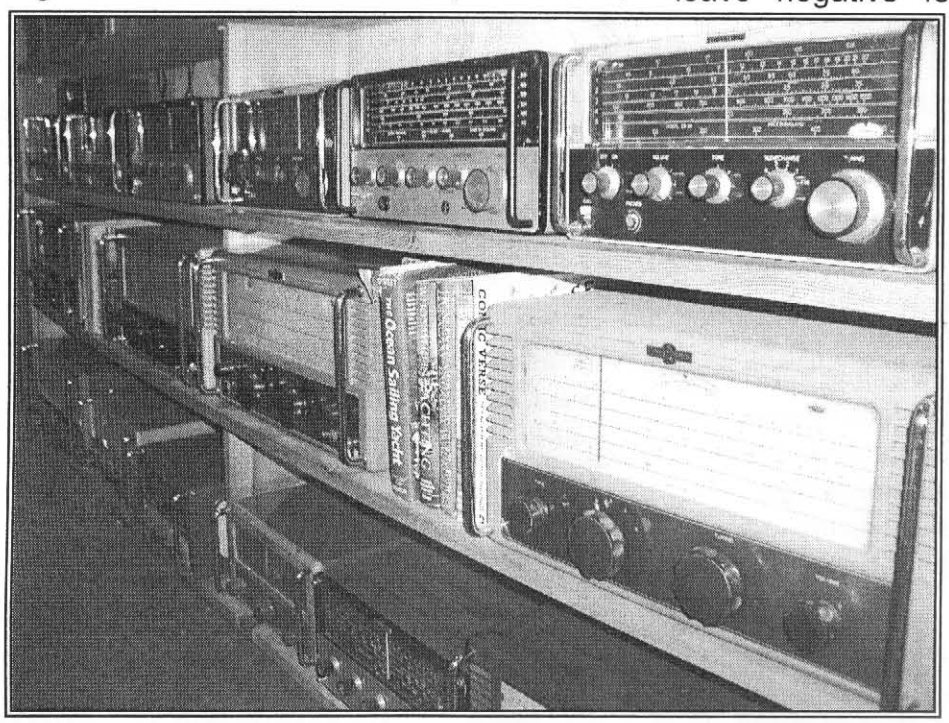
I like the EBs as well, such handy and neat little sets; a pity they don't have internal aerials which, with a battery pack, would make them more versatile. And the dinky 870s are lovely Eddystones in miniature.

The receivers I'm not too keen on, again for no definable reason, are the 888 and EA12, plus the 680X and the EC10 Mk I (the MK II was such an improvement). The v.l.f. 850/4 is not a very useful animal, nor is the a.m. only 909 with its limited coverage although with the increasing a.m. activity on 80 metres it is coming back into review. I intend to use mine soon on our EUG a.m. net.

What next? I do believe that I might actually sell one or two, sets that I don't seem to use or don't really like much. These will probably be of the larger variety as they take up more space and are a bit big to sit on shelves etc.

This will leave me with a nice nucleus of receivers with a few 'minters' and some restoration projects to keep me occupied; I'll start with the simple 870s.

My advice for those who find themselves similarly afflicted would be to keep searching eBay and the Lighthouse for Eddystones and accessories, and don't be afraid to buy unseen; in my experience most eBay descriptions are fairly accurate because, if they are not, the buyers will leave negative feedback which any serious eBay vendors definitely do not want.



Finally a "thank you" to Eddystone for introducing me to some really nice people in the course of the hobby, from church-mice to millionaires and from Newfoundland to New Zealand.

♠

Junk-Box Baby

By Graeme Wormald G3GGL

The resurgence of Amplitude Modulation as a *niche* mode on Eighty metres and now on the new Forty metre extension has brought a lot of fun back into Amateur Radio. For the past thirty years the only broad path open to the kitchen-table technician has been QRP-CW. A most worthy facet of our hobby but not everybody's cup of tea. A resurgence of interest in vintage technology during the last decade has resulted in two *de facto* A.M. channels, namely 3615 kc/s and 3625 kc/s, and that's where the dinosaurs congregate of a morning. This has now been augmented by 7143 kc/s on Forty, also in a morning.

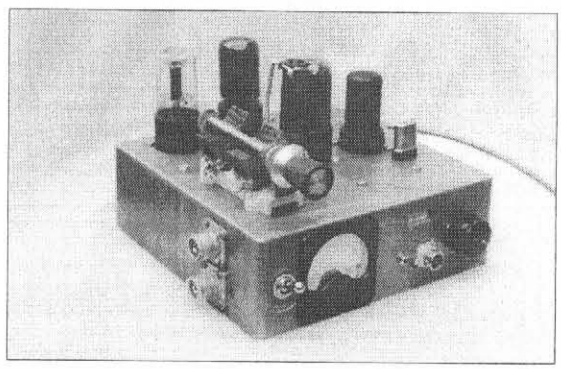
I must admit that one of my favourite radio-related pastimes is 'messing about with valves' and valve technology is very suited to A.M. transmitter construction. It is also very forgiving when you get your wires crossed (which we all do from time to time) and with a bit of luck the worst effect is a blown fuse.

So in our last Issue of "Lighthouse" I promised to bring news of a simple homebrew A.M. transmitter. Here's the first instalment.

In my book 'kitchen table technology' doesn't include the design and construction of a "legal" V.F.O. This old-time habit of like-minds congregating on a regular frequency is a perfect answer to the situation.

It is still possible to order HC6/U crystals, the only ones big enough (physically) to stand use in a valve oscillator without overheating. They are the thin-pin half-inch spacing crystals used in Eddystone 830s, EA12s, etc. They are advertised in RadCom by QuartsLab and cost between £5 and £10 with about ten days' delivery.

You may throw up your hands in horror at spending good money on little rocks, but let me remind you that in 1938 a forty-metre crystal cost 30/- (£1.50) which would buy you 240 first-class stamps then. So let's have no more of it. Radio hams already have enough reputation as cheapskates!



I decided that I would stick to International Octal valves. Two good reasons for this. First, they are incredibly reliable valves, several of them still in production. Second, the valve holders are a butterfinger's dream. Two holes to each pin, plus a 3-tag solder mount bolted on each fixing lug. No problems changing a dubious component or amending the design; plenty of space. Don't forget that the chassis hole for an octal is 1⅛ inches and if you don't care for the drill and file system you can still get Q-Max chassis cutters. Telephone 01908 368 006 for ordering. They still do imperial as well as metric!

Next I decided that the construction would be based on an Eddystone die-cast box, readily available both new and surplus *(I never go to a rally without buying one!)*

And now I must point out that although I'm going to go through the details word by word this isn't actually a "constructional feature" within the meaning of the act. Originally it did lurk in my mind that it would be a good idea, but then reality reared its head and I realised that apart from the valves and holders all the other parts would come from the junk-box and therefore any question of "copying" would involve a complete mechanical re-design!

Having said that perhaps I should describe it as a "catalyst", intended to provoke readers that it's more fun than buying a black box . . . go on, start trawling for some bits.

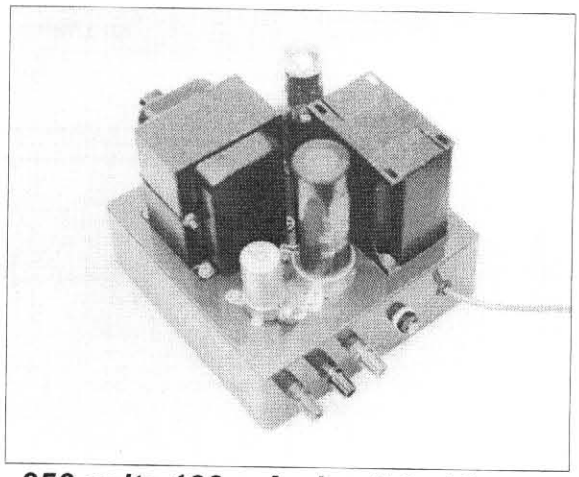
IN THE BEGINNING . . .

I must assume the presence of a power supply (psu). No valve-orientated radioman should be without a basic 250-volts unit giving 100 mA H.T. plus 6.3 at two or three amps L.T.

Exactly like the one described in "Duffers' Guide" in our Christmas Issue. No need, of course, for the neon regulator or the balanced L.T. supply. They are Eddystone refinements for de-luxe receivers, not for Junk-Box Babies.

I had occasion to build such a unit specially to go with my Eddystone "Radio Amateurs' Two", both of which are described the "Eddystone Short Wave Manual No 4" of 1938. We'll assume anybody considering a Chinese copy of this project will already have such a supply.

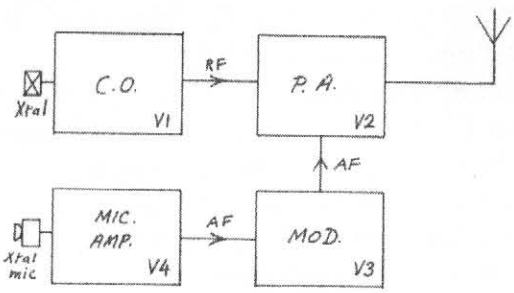
But make sure there's a fuse in the H.T. plus lead!



250 volts 100 mA plus 6.3 at 3 amps

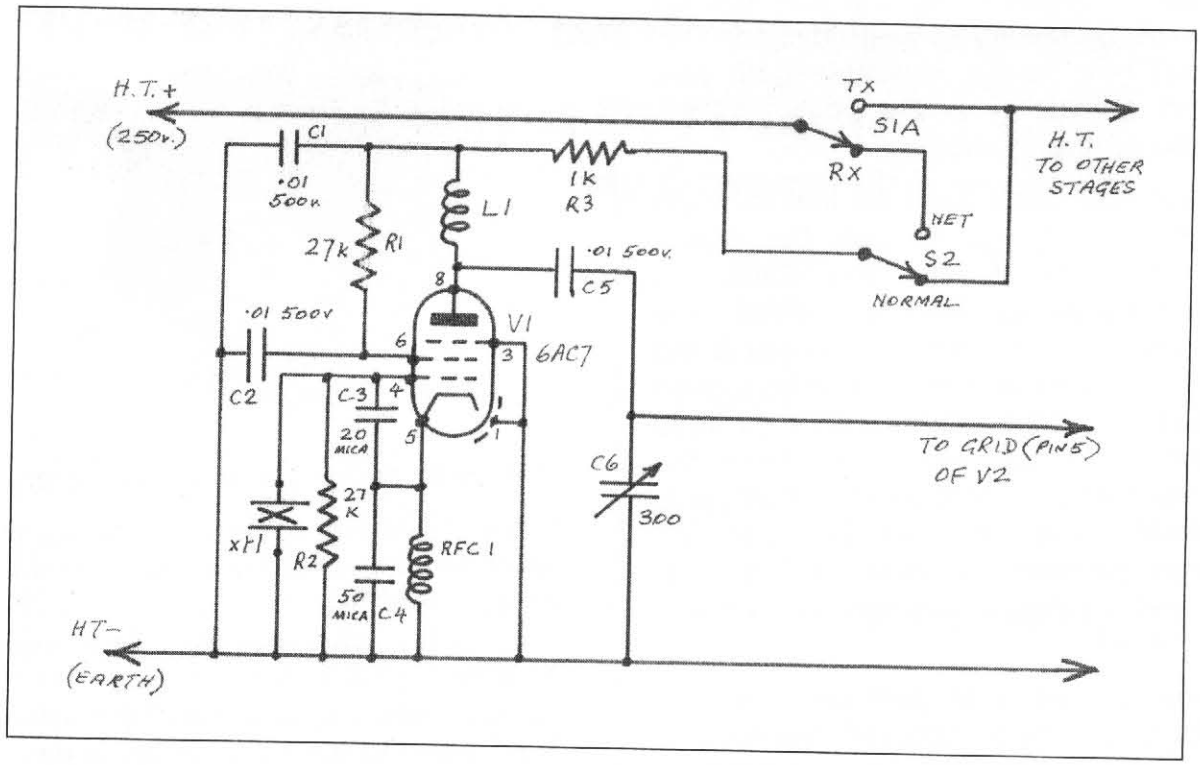
When I was first licensed in 1949 new hams had the option of either a 10-watt or a 25-watt licence. That of course was D.C. input to the final R.F. amplifier (P.A.) feeding the aerial. Nobody was too sure about the actual R.F. reaching the aerial in those days. I had a ten watt ticket so I decided to repeat the deal.

This means that 40 mA at 250 volts will fill the bill, leaving plenty for the other stages.



A very nice little power valve is the famous 6V6 beam tetrode of 1936, still in production after almost 70 years. Although designed as an audio output valve it works fine in Class "C" up to about 30 mc/s and takes 40 mA at 250 Volts. Surprise!

Plate and screen modulation is by far the most efficient and easiest form of amplitude modulation and a 6V6 will give about 5 watts, just enough for the job. That settled it then.



CRYSTAL OSCILLATOR

This stage is the most problematical of all. Not due to lack of information but because of too much! First of all I selected a metal 6AC7 valve to do the job. It was originally designed as wideband video amplifier and is probably the nearest octal equivalent to an EF50 or an EF91, either of which could be used for those prepared to move away from my "octal choice". It is modest with H.T. current (c.10mA) and has a very high gain.

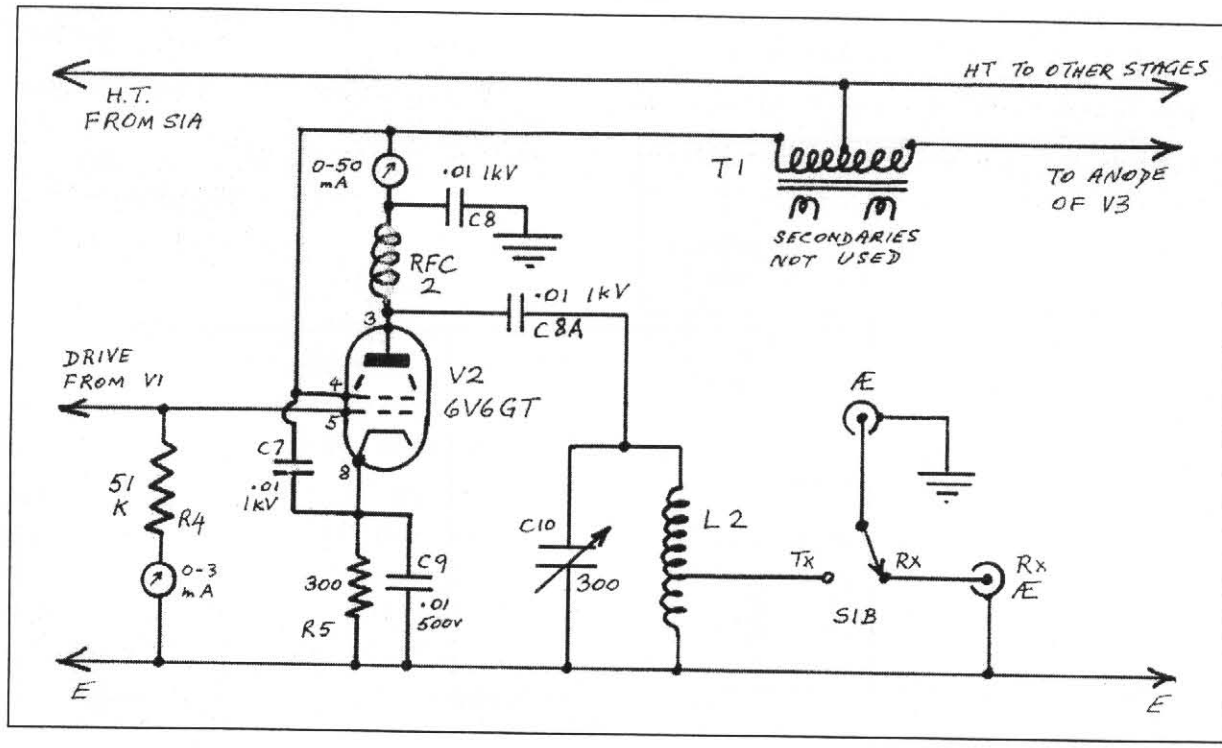
The circuit is described as a "modified Colpitts", giving output on both the fundamental crystal frequency and harmonics.

The decoupling condensers, C1 and C2 are high voltage ceramic discs, about ½ ins diameter and 500 volts working. Make sure to lay in a stock of such items, any values down to .001 mfd will do, and while you're about it get some 1 kV as well. They'll come in for the next stage.

L1 and C6 form a parallel tuned circuit to select the required crystal frequency (usually the fundamental). L1 consists of 20 turns of 30 swg enamelled copper wire close wound on a ½ ins former. C6 is a very tiny twin-gang air-spaced variable of about 150 pf per section. They are strapped to make 300pf.

It will tune from about 3.3 to 7.7 Mc/s, thus covering both 80 and 40 metres without any band switching.Originally I had intended to use RF-choke/capacity coupling to the grid of the PA but drive was found to be too low. I'm still working on that!

RFC1 is the universal Eddystone 2.5 milli-henries, or one of its many rivals. C4 and C5, which form the feedback from cathode to grid, are 20 pf and 50 pf silver-mica, 250 volts working. I don't think the values are too critical. (Remember that this is a "hot cathode" oscillator.) I suggest you photocopy this page, and the next three, and selotape them together for easy circuit study.



THE POWER AMPLIFIER (PA)

On the previous page the "net" switch is S2, a single pole change over (SPCO) which fires up the C.O. whilst leaving the rest of the set un-powered.

Send/receive switching is achieved with S1, a double pole change over (DPCO). S1B powers the set for send, and S1B changes over the aerial. No provision is made for muting the Rx on send. You use the standby switch on the Eddystone with your other hand! (Vintage custom & practice).

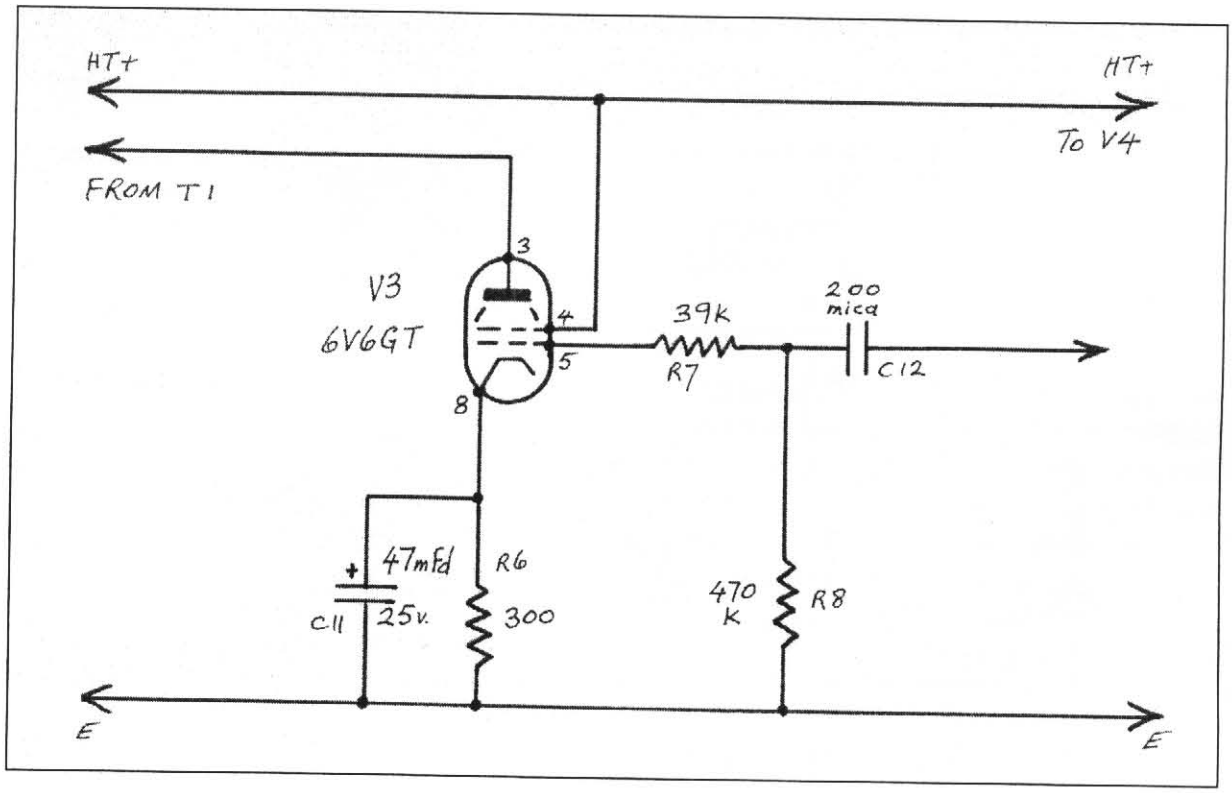
The PA grid-current meter at the bottom of R4 is labelled as 3 mA. It's probably about right . . . It was fitted as an afterthought when the chassis had been cut and is a tiny one-inch movement salvaged from the junk-box. It was probably off an old cassette recorder and had to be shunted to reduce its sensitivity. It is, of course, essential for tuning C6. (I'd hoped to get away without tuning, remember?)

The return of the screen decoupler (C7) to the P.A. cathode is an old designers' trick to improve stability in the P.A. Fingers crossed!

The plate current meter of 50 mA was brand new in my junk-box. It should really be 100 mA but I just get away with it.

R5 is to provide auto-bias in case of drive failure (forgot to plug the xtal in?). It just relapses into Class "A" and takes about 40 mA, The Class "C" bias is derived by the grid current flowing in R4 (about 1 mA) and thus biases the valve to neg 60 volts. Lots of drive is needed for plate modulation, otherwise the audio peaks get bent . . .

The tank coil L2 is from a W.S.19 (honestly!) and has been in my box since 1948 . . . It has 27 turns self-spaced on a 15 mm former and the 52 ohm (?) tap is five turns up. The tank condenser is a "J.B." 150 + 150 pf strapped like the oscillator output tuning. It also tunes happily from 3.3 to 7.7 Mc/s without bandswitching. RFC2 is like RFC1. I'll describe the mod tranny on the next page . . .



THE MODULATOR

The output from a 6V6 audio stage going flat out in Class "A" *(around five watts)* is just enough to anode modulate another 6V6 P.A. running ten watts input in Class "C".

A very natty way of achieving a reasonable coupling is to acquire a new chassis mounting ten-watt power transformer. The type that is now universal, with two 120 volt primaries which may be put in series or parallel. In our case we put them in series and feed H.T. to the centre-tap. The H.T. then flows each way and cancels out the saturation effect thus maintaining high mutual coupling.

It doesn't matter if the secondaries are six volts or twenty volts: we won't be using them!

In fact it's not possible to modulate to 100% with this system, only about 90%. In my opinion this is no bad thing, it sounds the same and you can't overmodulate (which breaks the carrier and causes lots of trouble!).

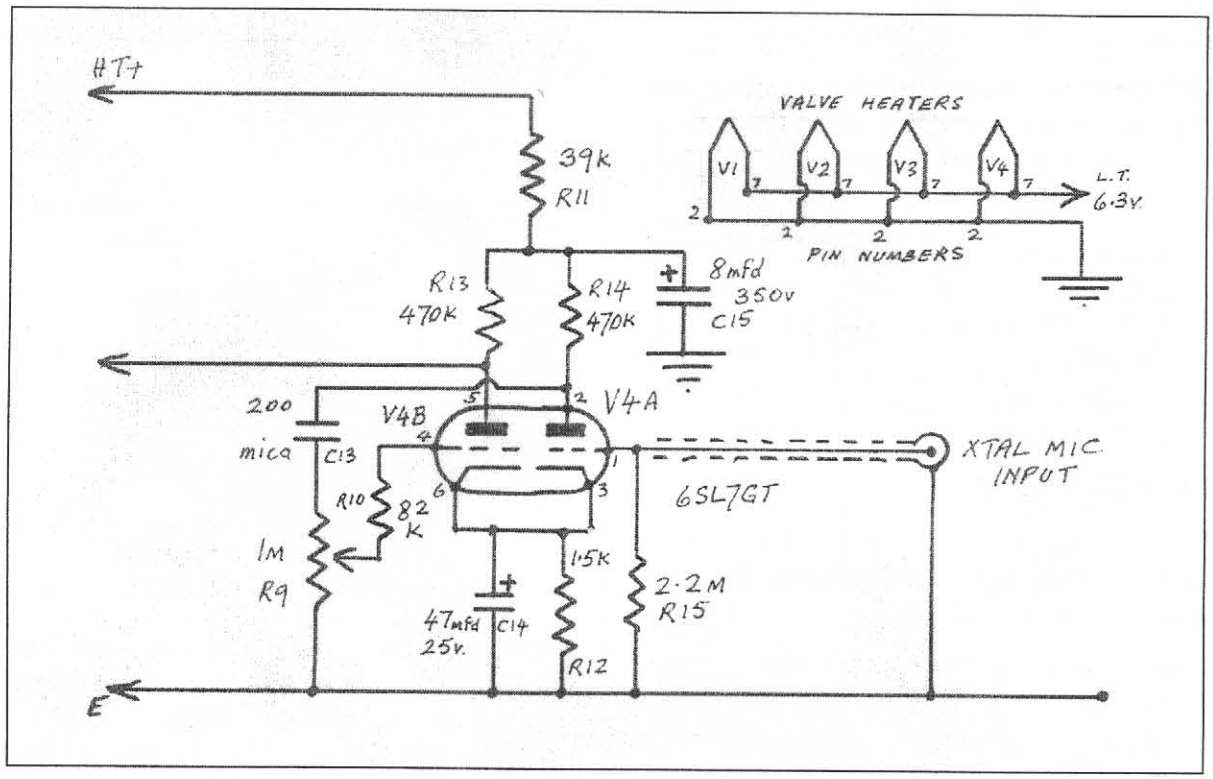
Note that the coupling condenser from the speech amplifier *(alias microphone amplifier)* is of a far smaller value than most audio couplers (C12, 200 pf).

This is because we wish to tailor the audio response to a fairly narrow limit. Short-wave speech quality is not improved by lots of bass response from the male voice. (Why do you think they used girl R/T operators in WW2?). Small coupling condensers stop it getting through.

Cathode auto-bias is quite standard and you can use new transistor-type decoupling electrolitics.

The grid-stopper, R7 (39K) is not a critical value but serves to keep any wandering R.F. out of the circuit.

Oh, and I forgot to mention that all the resistors on all pages are modern 0.6 watt metal film (Maplin, 7p each). Second-hand resistors are a false economy.



SPEECH AMPLIFIER

You might have noticed that these circuits started off at the left edge, with the signal travelling to the right, but when we hit the modulator it started to go the other way. It has to be like that or things would never join up.

So here we come to the last circuit page which has the start of the speech chain on the right; to wit, the microphone socket which is a Belling-Lee T/V aerial connector. This is because, in common with all 1950/60 A.M. rigs we are using a crystal mic and they are of incredibly high impedance. Perfect screening is paramount.

The 6SL7GT is a very logical choice for this stage. It is a pair of high-impedance high-gain triodes in the same envelope. The handbook gives each half a gain of 100, which means a gain of 10,000 when cascaded like this. I know that can't possibly be true, but it does mean you have plenty to play with to accommodate the untold 'losses' which creep in.

Here again, the coupling condenser between the stages (C13, 200 pf) is much less than normal, for the reason just explained. If you are thinking that the higher audio frequencies are getting away untouched, then think again.

Go back to the P.A. circuit and examine C7, C8 and C8A (yes, I forgot to label it!). These are all 0.01 mfd and are right across the high level audio feed to the final (P.A.). They'll get rid of lots of "top".

R9 (1meg. variable) is the modulation level control. It can be anything around 0.25 or 0.5 megs. It should really be linear, not log as you might expect in an audio circuit. But remember that "modulation" is linear, unlike human hearing. To set the modulation level tune up the Tx into a 50 ohm dummy load (non-inductive, ten watts or more) and listen on

headphones to a receiver without an aerial. There should be enough coupling to simulate on-air conditions.

Using your best technician's voice repeat the words "One, two; one, two" *ad nauseam* whilst slowly increasing the modulation control.

If all is well you should get a nice crisp readable voice until suddenly it starts to grate. That's when you are starting to overload the grid of V3, the modulator power stage, and clipping is occurring. Back off and leave it alone.

SATISFACTION

At this stage you may be thinking "I did all this years ago." or perhaps "I don't really follow any of it."

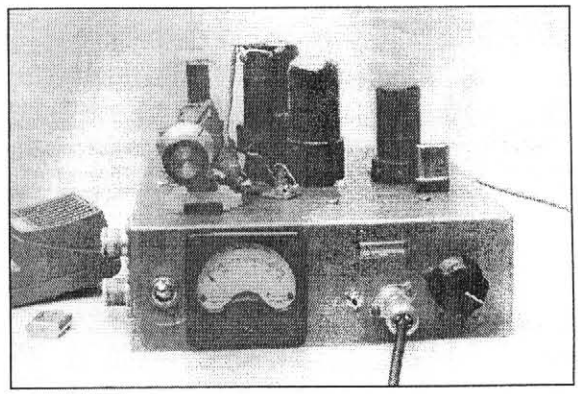
That's as may be, and I know that more questions are posed than answered. But what I'm saying is this. If you know all about it get the bits out and make it (or something like it). If you don't know all about it get hold of a copy of the Third Edition of the R.S.G.B. Amateur Radio Handbook (1961 and reprints) or a copy of the A.R.R.L. Radio Amateurs Handbook of 1950 to 1960. For preference get both. They're worth their weight in gold.

For me the real satisfaction came last Sunday on January's "*Third Sunday 80-metre E.U.G. A.M. net*" (See further reports in this month's edition of "In Consideration of Amplitude Modulation").

Conditions were a bit lacklustre at nine o'clock when I called on my K.W. Vanguard harnessed to my trusty Eddystone 730/4.

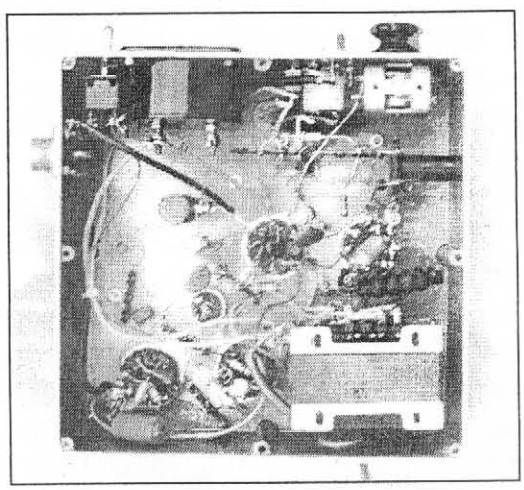
By nine fifteen things had picked up sufficiently to switch over to my just finished "*Junk-Box Baby*" as here described. The Vanguard was giving 35 watts and has always attracted reports of good speech quality.

The "*Baby*" was giving 4½ watts carrier *(exactly the same as a W.S.19, curiously enough)* and reports came back "About one S-point down but better speech quality." Wow! You just can't beat it for sheer delight . . .



Not an easy rig to photograph (above), but to the left of the big meter is the DPDT send/receive switch. To the right is the small SPST netting switch. To the right of this is the mic plug and above it is the grid current mini-meter. The knob to the right of this is drive tuning.

On top of the chassis to the left is the knob on the tank condenser with the tank coil to its right, obscured by a couple of 6V6GTs. Beyond it on the left is the 6SL7GT speech amplifier and extreme right is the 6AC7 C.O. with HC6/U crystal beside it.



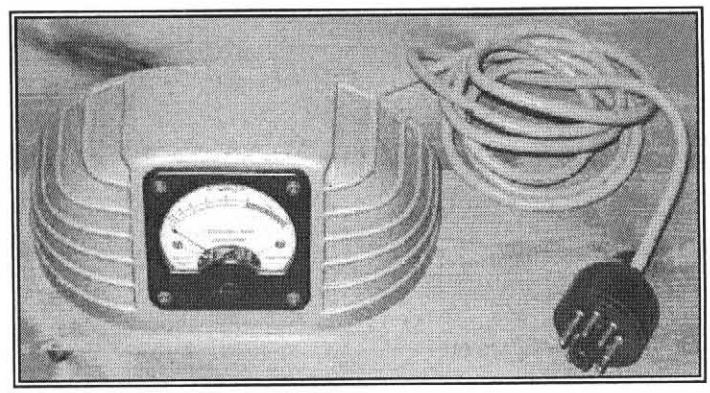
The mod tranny is bottom right . . . ♠

E-Bay Watching

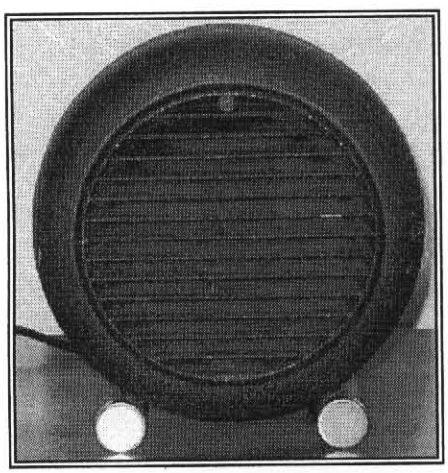
by Chris Pettitt GØEYO

Activity on E-Bay has been very quiet in the past month but I have gathered a few interesting items for your information. Accessories continue to do well . . .

. . . with good prices being obtained for a 669 S-meter and 688 Round Speaker.



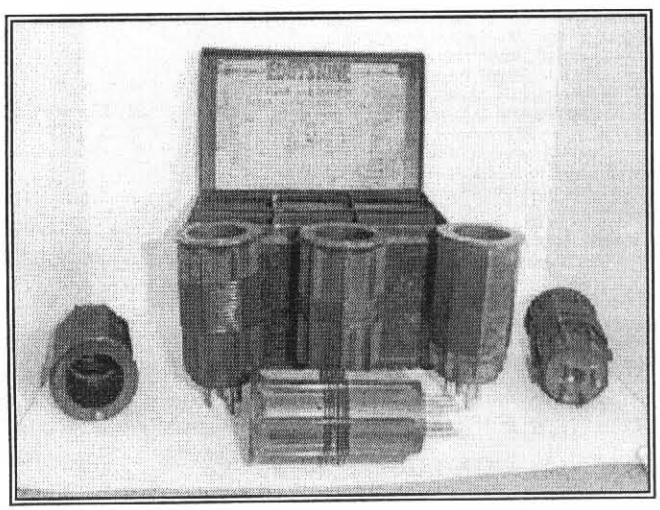
The S-meter was in silver and looked in very good condition with its lead and octal connector. It sold for £69.



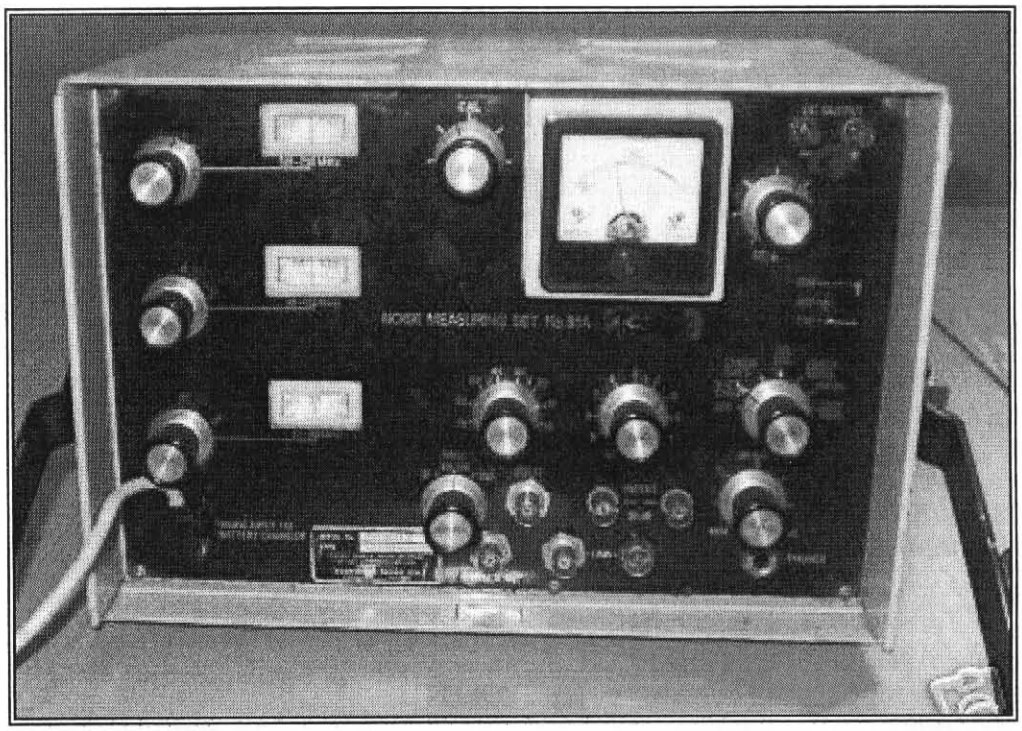
The speaker was a black-painted 7 inch model with chrome feet and again, apart from a couple of scratches it looked to be in good condition. It sold for £85.

I was also attracted to a set of six coils in their original metal container . . .

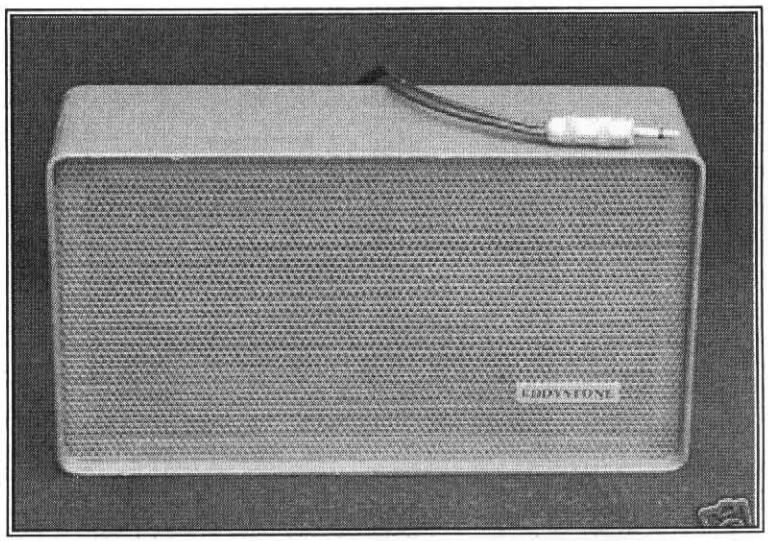
The coil types were:- (1) = Blue Spot, 12-26 metres.
(2) = Yellow Spot, 22-47 metres.
(3) = White Spot, 76-170 metres.
(4) = Pink Spot, 150-325 metres.
(5) = Green Spot, 260-510 metres.
(6) = Double Blue Spot, 9-14 metres.



The metal box has six compartments to separate the coils. On the inside of the lid is a label "Eddystone Four and Six pin interchangeable coils", specifying different coils available using a 0.00015 variable condenser. This sold for £54 whereas an identical set, not so well photographed went for only £16 a few months earlier . . .



I bid on an Eddystone Type 31A Noise Measuring receiver myself, which went for £29 (I bid £28 and got done out of it in the last ten seconds – no doubt using this sniping software that some of our members use!). this covered three ranges, 31-68MHz, 68-135MHz and 135-250MHz and was complete with antenna, calibration chart, AC lead and cover. Checked to be basically working – readily responds to broadcast signals. 230v AC mains for charger. I thought this was a real bargain and was sorry to have missed it. Don't know what I would have done with it if I had won it, and no doubt I have saved having a debate about it with the XYL!



Another loudspeaker which caught my eye was this grey rectangular one which was bought by an EUG member for a very healthy £80.

You don't see these very often on E-Bay. It was described thus:-

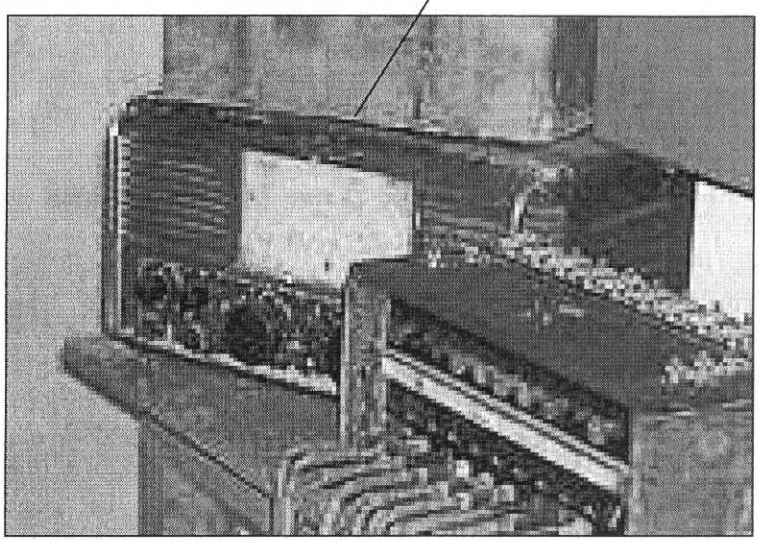
"Eddystone Loudspeaker – Box approx. 8" (wide) x 4½" (high) x 2½" (deep) – Speaker; Richard Allen 3 ohm eliptical, approx. 8" x 2½" – Approx. 1 yard connecting lead with 3.5 mm min. jack plug.

Well that's all from your E-Bay watcher this month. Keep checking out what is being put up for auction; there is the occasional bargain such as the 1650 that went for £375 which was at least half what the seller was hoping for.

VY 73, Chris GØEYO

Achtung! Der Fiend hören!

When Peter le Quesne, ZL4TCC, went to visit his ancestral home in the Channel Island of Jersey he took the opportunity to visit the communication centre in the Museum of German Occupation (1940-1945).



Imagine his surprise when he found a little stranger hiding on the table! His first thought was that it was an Eddystone 640 which had found its way across the channel. But the 640 has no handles!

In my opinion it is one of the long-lost S.720 "Yachtsman", of which I know no sample existing (production run = 100). Answers please!

Graeme, G3GGL

E.U.G. Masters' Crossword News

More Apologies, lost entries found in 'Sales' file

I spoke too soon last month! When listing entrants in the Roll of Honour I managed to omit no less than FOUR, who had ended up in the 'small ads' folder!

So without any further ado let's have a late addition to the Roll of Honour for Crossword 22:-

Roger Bracey G4BZI, of Crewe

Phil Harris G4SPZ, Worcestershire

Dave Jones MW1DUJ, Carmarthens.

One more entry had fallen into the 'Pomes' trap and was declared wrong. Please accept my deepest apologies all round.

Now to Crossword 23. This attracted 15 entries of which 14 were correct but TWO had omitted to put their names on the entry!

So if you made an entry but are not listed below then you are the defaulters . . . unless, of course, you are the one who managed to dig your own hole. I'll keep it secret but I must explain that number 17 down was "Call a halt to a 'First Sunday' Sked. (3,3)"

The answer, reasonably, was "END NET". However, our only failure had managed to put "END NOT".

Could it be that he was trying to get a message over to our Net Controllers?

Never mind, let's get on with all the answers for Puzzle # 23:-

ACROSS

1) OSCILLATION. 7) DEBUG.

8) RACALS. 9) IPS. 10) IONIC.

12) ALL ROT. 15) ENTICE.

18) NANNA. 20) DOG.

21) TEA URN. 22) DUE AT.

23) POSITIVE PIN.

DOWN

1) OLD TIMER. 2) CABINET.

3) LOGIC IC. 4) AIR-SEA.

5) IF COIL. 6) NULL.

11) STRATTON. 14) RUN DEEP.

16) INPUTS. 17) END NET.

19) JEEP.

And now for this month's Roll of Honour:-

T. Emeny, G3RIM, of Surrey

Barry Jackson, ZS2H, of S. Africa

Tor Marthinsen, of Norway

Mike Maxey, G8CTJ, of Leics.

Ted Moore, G7AIR of Cambs.

G. Oaks, G3WRK, of Cheshire

Jack Read, of Cheshire

Anthony Richards, GW4RYK, of Montgomery.

Roger Roycroft, G1NXV, of Cheshire

David Skeate, GØSKE, of Suffolk

Keith Stammers, GØXSG, Oxon.

Geoff Steedman, MØBGS, of Leeds

And now two minutes silence for those who missed their names off their entries!

It's only your conductor who's allowed to do silly things like that; I can't get away with it.

I suppose I could go through all our correspondence with a handwriting expert, but I'm not going to!

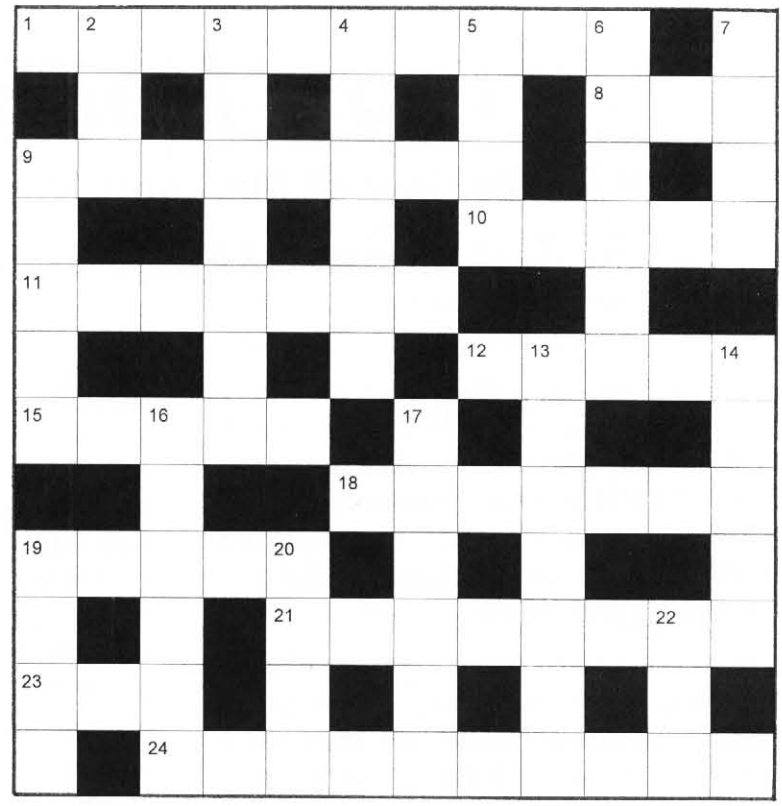
So many thanks, puzzlers, keep it up and let's have more entries!

Vy 73, Graeme G3GGL

EUG MASTERS' CROSSWORD 24

Compiled by

Colin Crabb G4HNH



ACROSS

1) Luftwaffe 31 Mc/s radio bombing beam (10)

8) Admirable society of "Lighthouse" keepers (3, abb.)

9) Crucial influence on deciding whether or not to purchase a rare Eddystone item (5,3)

10) Essential part of the tuning system in most vintage receivers (5)

11) In acoustics, a length of wind pipe eg, in a church organ , must be configured with an ---- --- to ensure that the wavelength of the fundamental resonance is approx. double the length of the air column (4,3)

12) The author of A Hitchhikers Guide To The Galaxy (surname only) (5)

15) Strangely, my pet says "it's mealtime" (5)

18) The output of a bistable device is said to be "-------" if it remains constant, despite changes in input voltage (7)

19) Indian drum (5)

21) In amplitude modulation, the -------- frequencies are directly related to the modulating frequency (8)

23) Zero (3)

24) In maths, the name given to the locus of a point on a circle rolling on another circle, if the rolling circle is outside of the fixed circle (10)

DOWN

2) North German radio network (3, abb.)

3) One of a "lovely bunch" (7)

4) Teletext ends and provides info on a synonym for "prolong" (6)

5) One joule is equal to 10^7 ---- (4)

6) Amateur radio retailer named after an American state (6)

7) The donkey's friend is one, in the current box office smash hit animated film from DreamWorks (4)

9) Used to be synonymous with R/T in radio comms. parlance (5)

13) The unit of comparative power (7)

14) In geometry, the 4th face of a cuboid figure could be termed thus ---- - (4,1)

16) A millstone for the BBC? (6)

17) An SOS using 9 down's mode of transmission

19) A "----" circuit is usually a parallel resonant circuit connected to the anode of a valve oscillator (4)

20) Abbreviated reference to a sparkling Italian white wine (4, abb.)

22) How the British lifeboat service might be referred to without the royal assent (3, abb.)

Submitted by . . . . . .

♠

Ted's MailBox

A Review of Mail and Happenings

By Ted Moore G7AIR, Founder of EUG

Generic Faults

Some makes and models are known for their performance problems right from the start, when new, and here I am thinking of circuit noise, drifting, microphony, and similar problems.

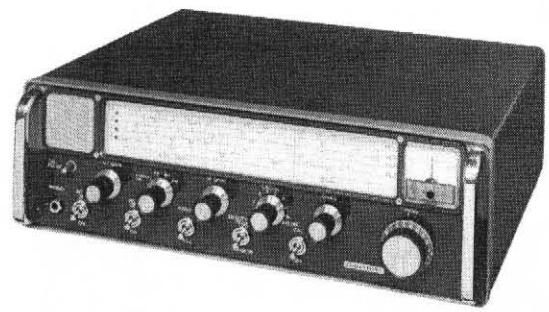
Many of the early imports from the Far East were none too solidly made and whilst they had state of the art electronic circuitry the gauge of metal for chassis and front panel was a shade too light.

I recall one receiver I had from new in the fifties. A tap on the front panel or the top of the case made the BFO note warble like a soprano in distress. Examination showed that the BFO was nothing more than IF regeneration !

Nothing could be done to cure this and the set was soon disposed of, to be replaced by an American import of the same era. This had not the same mechanical problem but it was a poor circuit design which allowed too much of the local oscillator output to get back into the ærial circuit.

The net result of this was whistles on any other radio operating nearby. It would even produce these whistles in the domestic 405 line Tv, much to my mother's disgust. That too did not last long.

Where am I going with this ? Well despite the robust design and build quality of our favourite Eddystones some of their models DID have the occasional problem right from the day they left the Bath Tub. A recently unearthed letter from the Design Department of Eddystone Radio Ltd to the Italian Marconi Company dealt with the problem of microphony in one of two 990R receivers sent to them for a customer. On test, before delivery to the customer the Marconi engineer described microphony on this set when using the built-in mini speaker and only on the top frequency range. Turning up the AF gain more than half way was impossible.



The reply from Eddystone was simply that this was a problem experienced on some 990Rs and was caused by audio vibrations reaching the tuner unit and 'exciting' resonance in the tuning gang !

The suggestion was made that these sets should be operated with external speakers when the cause of the problem would no longer exist.

Strangely enough I have one of my three 'R's which does exhibit this problem. I have tried without success to eliminate the problem but have now resorted to the palliative cure suggested by Eddystone - an external speaker.

* * *

Spend It

You cannot take it with you, the saying goes. I am a firm believer in this as the amount of radio gear in my house shows. At the end of each month, and depending upon how frugal, or profligate, my spending has been, I usually treat myself to some new toy, or toys.

By and large I usually get first class service from most of the advertisers in magazines such as SWM & PW. One to be mentioned is W & S down in Hockley I ordered a scanner at about 1500 one afternoon and the 'postie' was knocking on my door with it at 0930 next day. It was the same last year when I bought my DX77E from them, next a.m delivery. Nevada too are very quick with usually a next day delivery.

I had ordered a DX77 from a West Midlands company earlier, paid with plastic and having waited a week I called them to find out what had happened. Seemingly when they opened the box before packing it was found the power lead was AWOL, they had ordered a replacement and were awaiting the arrival of this.

Having waited another week and having made several 'phone calls I gave up on them, cancelled my order and ordered it from W & S. Last week I took a chance and ordered an item from the same dilatory company, hoping that my last problem with them had been a one-off.

At first the guy on the 'phone was not even sure they had the item in stock and promised to call me back - this was around 0930. He called me back next day at about 1700 to say that they did have one and would send it off.

This was a Thursday. Here I am the following Tuesday and no new 'toy' - yet. Having 'phoned them I get told that he will check up and call me back ! My query as to why he could not find out there and then on the computer elicited the surprising reply that they don't keep their stock on computer.

I am resolved never again to deal with these cowboys, who must be doing business somehow since they can afford double page spreads in both magazines. Really frustrates me this kind of thing. If somebody orders anything from me I try and get it off same day or at least next a.m.

* * *

Beacons ? - or what ?

I don't know the answer, do you ? When I go on 80 metres, usually early morning or evening I can often hear a strong CW signal on about 3.7 Mc/s which sends the letter 'P' continually. I once tuned it in on a spare receiver and it was still beeping away an hour later. What is it ? Who is it ? Somebody must know.

Likewise, on about 3.75Mc/s I have several times heard this poor CW signal sending 'QUT' repeatedly with never-ending regularity. The keying is not too clean from what I see on my 'scope.

Since I have consulted my 1949 issue of Admiralty Signals along with a comprehensive 'Q' code list published by The Alfred Holt, Blue Funnel Line in 1954 and 'QUT' is not included in either list. I just don't know what it or he is trying to tell us all. Can any kind soul out there help me ?

* * *

The Ultimate in Portable Ærials

If size and ground area covered are what it is all about then my new Full wave Delta (€) Loop resonated on 3700 Kc/s is IT. I had read about this

in one of Pat Hawkers 'Bibles' and resolved to have a go, not that my half wave inverted 'V' doesn't give a good account of itself. I do just enjoy experimenting with skywires though. I began with a total of 260 feet of my usual ex BT teflon insulated hook-up wire. Not much left on my 500 metre roll now !

Using my usual economy type insulators which are merely one inch diameter rubber grommets I soldered on the feeder and using my three telescopic fishing poles (ex SOTA) it was soon hoisted up in the air, this in the garden outside my Deganwy shack. Close to the water but about 100 feet asl and with the Welsh mountains in between me and the rest of my contacts, about 18 feet at the poles and sagging to about 16 feet in the middle of each span.

That was the easy bit really as I now had to check the resonant point using milliwatt output from my transmitter - I had a step-variable 100 db attenuator for this. Up and down at least a half dozen times with a bit snipped off each time until I had it resonant at near enough 3700 Kc/s.

On reception it was not easy to tell much so off went a PAN PAN call to 'GGL via my mobile. Despite the short notice (none at all really) he came on the air for a quick test of my new skywire.

The results at his end seemed AOK but then others had been earwigging our little test and before you could say 'SNAP' we had a five way net going. Four EUGers and an ousider (no offence meant). Chris 'XFE must QAP this part of 80 on a 24/7 basis I think. He came on as did Vic, G3IKN, and Dennis G4GJE so I got good reports from all.

I even managed to have a test of the new Delta Loop using my Orion 5000. It is a pain not having more than 200 c/s RIT on a crystal controlled rig but 'GGL coped by retuning his rig until I could decipher him.

A very successful test and if anybody out there wants to do any similar tests then just get on the landline to me.

* * *

Marine MF Band

I really do get myself into some trouble. I have mentioned to various EUGers over the landline and in the Lighthouse that this is still alive and well.

Reed's Nautical Almanac for 2005 has loads of active frequencies in and around what we used to call the Trawler Bands. It will cost you £33 to buy so best thing is go to your local library and copy the relevant pages. It will be in the Reference Dep't so you cannot book it out.

And they are active too, even good old 2182 the so-called Distress frequency, which is still monitored by countries in and around this part of the world. English is the 'lingua franca' as with airband. USB is almost universally used but I know of several coastguard stations still using OFAM, honest !

I had a letter several weeks back and now a 'phone call telling me that both of my correspondents cannot hear a peep on those frequencies. I guess that I took it for granted that EUGers would realise that these are NOT 24 hour broadcasting channels but that they only come on the air when they have messages to pass.

Most of them give a *Securité* call on 2182 first announcing that they will be QSYing to their traffic channel to transmit signals of various kinds, weather warnings or forecasts, navigational warnings (wrecks or missing buoys for instance) etc.

Having got this across to them both of the above mentioned EUGers have now begun to hear those signals. Your best bet is to monitor 2182 for these short *Securité* calls and then QSY where they tell you to go. Try Humber on 1869, or try Scheveningen on 3673 Kc/s.

A typical example heard just minutes ago (1820z) was when Ostend Radio (Belgium) came up on 2182 Kc/s to announce that it would be transmitting navigation warnings on 2761 Kc/s.

Now what happens is that these stations have regular schedules and in the case of Ostend it is 'EVEN HOURS PLUS 20 MINUTES'. Anyway up came Ostend on 2761, in English, to give a list of nav; warnings and a gale warning for the channel area.

Another thing about these stations using the old MF marine band is that at night, or very early morning it is possible to hear some good DX. Gander Coastguard comes into that category surely, and both the Azores and Lisbon are audible depending upon the conditions. Also regular catches are Lyngby and Tromso Radio, helps if you know their frequencies though. Try it and get hooked !

I bought a DX394 a couple of years back on GGL's recommendation, a good but cheap set, if you discount the drawback of having the LW/MW ferrite rod permanently in circuit on those bands. I have now programmed in to it a number of MF marine band frequencies and can 'do the rounds' rapidly to see what is active. Incidentally I also make use of the scanning feature on this set to run up and down between 3600 and 3700 Kc/s to catch any OFAM nets worth listening to. Not an Eddystone but it is putting the set to some use in my hobby.

Deaf ? No, DEAD EB35

I collected this set thinking that I was going to have an easy job; with age it is common for the trannies, first generation germanium types, to go leaky.

It did not take long for me to become disabused of the notion. All of the cores in the IFs and the RF coils had been screwed down as hard as possible, this had apparently not been sufficient for several of the RF cores had been screwed until they disintegrated into small bits. The bits fell out when I took the case off ! None of the formers were damaged here, luckily.

Worse to come, four of the IFTs had damage to the formers on which the coils were wound - this often happens when folk try to 'adjust' them with a steel screwdriver. Why do they do this when an old plastic knitting needle can be made into a trimming tool in just seconds ?

I don't have any replacements so the unhappy owner will have to await the sourcing of another - scrap - EB35. Having paid £100 for the set he is not a happy bunny ! But then, a little thought before spending one's hard earned pennies will make you realise that for sets which are Forty, Fifty, or Sixty years old spares are just not available off the shelf. If you have a duff EB35 then let me know and maybe we can do a deal which will get this EUGer's set going again.

December EUGnet

I guess that going /P with a full wave 80 metres Delta Loop would seem like hard work to some folk, even going /P first thing, 0730z, on a Sunday morning in winter would be classed as masochism by some !

But that is what I did. I had done a trial to verify its efficacy the previous week and got good reports as mentioned earlier in this feature. A total of 252 feet of wire, just my usual ex BT hook-up wire. That gives me about EIGHTY FOUR feet in each side of the triangle ! Using this on the December net I had good reports all around.

Having just come home after a longish weekend in Wales I simply took my gear up to the Guy's Head Lighthouse on the west bank of the Nene, fourteen miles from home. No nice young lady to bring me a NAAFI repast so I took along a flask and some sandwiches, cold out there ? It sure was ! I operated from the back seat of the Volvo, one seat folded down as a table for my gear.

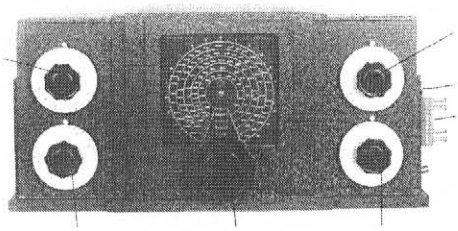
The weather for my earlier test up in Deganwy had been coolish but dry and now at 0730z it was B----- Cold, minus 2 deg. on my car thermometer and the tide had just been up a few hours earlier so I had wet underneath and ice on top of the muddy river bank.

Luckily this change in ground conditions under the new loop ærial had not changed the resonant point in any noticeable manner. As I have been doing recently with my inverted 'V' I was able to feed this ærial directly without any ATU. ATUs do introduce losses you know, and with baluns the loss can amount to 25% of your transmitter power. Read up on them, just remember you get nothing for nowt! They may help the impedance match for balance feeders but you pay a penalty.

The All World Eight

When this was launched onto the market it was minus the necessary BFO to make it a true Communications Receiver. As soon as the armed forces shewed an interest in it however the Company did the necessary mods.

This meant making the Output stage a single-ended instead of a push-pull amplifier. Into the space left by the removal of one output valve went a BFO, sundry other minor mods and the AW8 became the LPC or R101C.



It was now a 'proper' communications receiver but it had one drawback for military use. The directly heated filaments on the battery operated valves were not robust enough to withstand the rigours of military use and they failed spectacularly !

Apart from several sent for tests and trials, few were used by the military in any except fixed shore-based installations. I have had for many years the original factory manual for the AW8 plus a copy blueprint of the mods made at the factory to produce the LPC/R101C, I even have a copy pictorial diagram of these mods. Thanks to the kindness of an EUGer, and via 'GGL, I now have a copy manual for this R101C derivative. If only I could locate an actual set for myself.

* * *

RWM - WWV

This has happened before, and it will probably happen again ! A recent phone call from one member led to us

discussing SFTs (Standard Frequency Transmissions). He commented upon the fact that his new, all bells and whistles, transceiver was almost FIVE Kc/s out when he checked it against WWV, this on both Five and Ten Mc/s.

Now this call was at about 1900z and I could hear the SFT beeping away in the background. WWV at 1900z seemed a bit much to expect and so I twigged immediately and asked him what frequency he was tuned to. Five Mc/s he replied, but it is coming in on about 4996 Kc/s.

Well, it became necessary to explain to him that he had little chance of hearing WWV on "fives" at this time of day but that what he was hearing was the Russian SFT with the callsign RWM and a similar one second beep format.

The same applied on 9996 where he thought he was picking up the 10000 Kc/s WWV signal.. Nothing wrong with his new rig at all ! Both the 4996 and the 9996 RWM transmissions are a good strong signal here in the UK the one on 9996 in daylight and the one on 4996 after dark.

WWV is often inaudible here and these two Russian SFTs come in very handy for calibrating receivers. I even use them to fine check my 1940s BC221 signal generator which shows very little sign of suffering from old-age, only wish I had weathered the years as well as my BC221 !

The moral must be that if you are using an SFT for calibration of a receiver then do listen for the callsign in slow morse. Two other SFTs which come in useful are the Canadian CHU on 3330, 7335, & 14670 Kc/s, LOL2 in Buenas Aires (Argentina) is regularly heard in mid-afternoon & it transmits on 5, 10, & 15 Mc/s with the usual slow Morse ident.

Unfortunately the short-sighted powers-that-be in the UK discontinued the HF transmissions from MSF leaving just the 60 Kc/s one, fine for time-keeping but useless for us to use to calibrate our analogue Eddystones.

You can always rely on the BBC as most of the high power transmitters are sufficiently accurate for our purposes, especially 198 Kc/s on LW.

One trick I have used in the past is to make the QRM produced by the line time base of a nearby Tv set earn its keep. The fundamental is 15625 c/s and the harmonics are audible well up into the HF bands.

The 64th harmonic of this falls spot on 1 Mc/s !! Similarly the 128th harmonic will give you 2 Mc/s This will give you a signal accurate to 0.01%, good enough for an analogue set.

990 Woes

And woes they were ! Not only had the drive cord come adrift but the gear box appeared to have a severe case of 'disfunctionality'. One of the drive cord pulleys had lost the small circlip holding it in position, and the nylon monofilament used as 'cord' was much too thick as the requisite six turns on the pulley took up too much space.

If you know the 990 then you will appreciate that removing the gear box to work on it is not for the faint of heart. It had to be done though. Off came the knobs, then the nuts holding the switches and pots to the front panel.

Then off came the panel itself so that I could access the gear box fixing screws. Oh Heck ! Now I could see the tell-tale scratches on all the screws which meant that the phantom twiddler had been at work.

Once the gearbox was out and on the bench I could see that the rear brass bush for the one shaft had gone AWOL along with the circlip. This was where my secret weapon came in handy.

Have you ever needed such things as tiny circlips, 6 volt 0.3 amp bayonet fitting scale bulbs, etcetera, ad infinitum ? Well do send off to Squires the model and craft tools suppliers of Bognor Regis for their 700 page catalogue. Not just the above mentioned items to interest us Eddystone collectors but also a million other useful items, variable condensers, fixed mica, polyester, electrolytic types too. Resistors, transformers, you name it. A real cornucopia of 'bits' for the hobbyist. A supply of diecast boxes ? These too. It seems that I am ordering stuff from them almost every week now that I have their catalogue. Try a call to 01243-842424.

Anyway, when I got the big box of various sized circlips I soon had the gearbox fixed and having refitted it and the panel I then had the task of re-stringing the 990 with a new drive cord - it CAN be done in about twenty minutes if you use a crochet hook.

The 990 is back working again but despite my being VERY careful with the refitting it needed some touching up of the alignment.

* * *

Better Radio Reception

Over the years STRATTONS-EDDYSTONE produced several editions of this booklet and of those I have, the latest edition was printed in 1966.

Apart from a few updates the content is pretty much the same, ranging from a basic explanation of how radio waves are propagated through installation of a receiver, various ærial shapes and sizes, and interference elimination.

Quite out of the blue I was recently asked if I had a spare copy, well I had none to spare but did provide the enquirer with an A4 sized copy. Being a 'wrinkly' like me he was appreciative of the larger size print and drawings and wrote back wondering why we did not provide copies for members.

In my case I suppose that I tend to imagine everybody has a copy of these things, and I am surprised when a member tells me "never heard of it"

Whilst written some 40 years ago this last (I believe) edition is still very much up to date. Almost everything in it is pertinent to the improvement of signals for today's listener. I have been avidly reading the chapter on ærials for use on board ship, since I am in the process of buying a small yacht for use in this area (The Wash).

Buying one is easy-peasy but the difficult bit is in finding somewhere to keep it ! The local, council-run, marina in Wisbech is horrendously expensive, even for a 22 footer.

It is interesting to find that many of the ærials, shown both marine and for land use, are designed for use in restricted space. If anybody wants a copy of this booklet then just give me a bell. (o1945 467 356)

* * *

Surprise, Surprise !

And it was too ! I had been using a variety of receivers to listen to the early morning Bedlam on 80 metres. Early morning for me means circa 0700, when all those foreigners are gassing away and not a word of English to be heard.

By 0800 or thereabout I had gone through 640, 740, 840A, 840C, 1570, EC10II, and then came the venerable old 556. It was an eye-opener as it easily handled the 80 metres OFAM nets, yes nets, because there were two of them on that morning. The selectivity was quite adequate to

ensure that nearby LSB signals did not annoy, the sensitivity was more than adequate. I have found over the last month or so that I am frequently using this set for spot monitoring purposes. You haven't got one ? Tough, you are missing out on a superb receiver, think of it, 10 valves, 2RF, 2IF, etc; what else can compete ?

* * *

WHY - Oh Why ?

Yes, why do those morons do it ? I'm sure that many of you will have bought a nice enough looking Eddystone with the slide rule type scale only to find that the circular vernier dial is catching when the tuning knob is rotated.

Now it never left the Bath Tub like that for certain, so some goofball must have had it apart and the usual cause of the scale catching is that when it was re-assembled the spacing washers have been omitted completely or put in the wrong place. Often removing the screws again and re-fitting the necessary washers will solve the problem but not in the case of this poor 670A.

The culprit had put the washers back next to the bolt head together with the spring washers instead of between the chassis and the panel so that was easy enough to correct.

However he had apparently discovered for himself that the vernier scale now caught on the linear scale and so he had attempted to cure this by applying force to the legs of the diecast spider which supports the vernier scale. They were never meant to bend but this miscreant had bent them.

He most probably calls himself, and considers himself, an engineer ! I bet he was wondering why it was catching after he had re-assembled it. Probably it had been taken apart for nothing more than a scale clean-up.

Forty What ?

'GGL's idea for an early morning AM net on the new bit of the 40 metres band has not been a success from this end of the country. On both occasions when I have been out /P and listening for him, and anybody else for that matter, the result has been ZILCH. So much for NVIS on 7 Mc/s.

For all I could hear I might as well have been listening/calling on 7 Zettacycles (10 to the power of 21). Sure enough I could hear stations but they were so distant from me as to show that my chances of working 'GGL or anybody in the UK were minimal. 'GGL himself could only work Ben in Kidderminster, he could have done that with two cans and a bit of string. *(See also report in "In Consideration of Amplitude Modulation" – Graeme 'GGL)*

The latest test on 09-01-05 I heard just one Scottish station who was working a station in the Isle of Wight and both had QSB problems. The Scottish operator described it as being "up and doon like a Yoyo". Methinks I shall stick with Eighty, propagation is a very fickle phenomenon, sometimes even on eighty !.

Speaker S.935

I understand that one of this ilk was auctioned off on e-bay recently for the princely sum of £80 ! I am willing to bet that it is never ever "used" as it was meant to be.

My S.935 cost me all of £4.50 about two years back and is in daily use, even to the extent of accompanying me on all of my /P trips. Photos of these trips sent to 'GGL and others will show it on top of the rig. I like it for the very crisp communications type speech it produces. But £80 ??? Seems that some folk have too much lucre.

"ESSELLE"

The EUG yacht is now a reality !!! It is in the marina compound still on the trailer and is being personalised, not that it needed much work really. It could have gone in the water immediately but me, being me, had to do some extra work.

Painting inside and out, insulation on the cabin to lessen condensation, fitting of a dual battery system, solar panel charging, a power supply panel, the list seems to be endless but I did operate from the cockpit, ashore, the other week for 'GGL and others, even took my 556 along for monitoring.

The requisite mains supply coming from a 420 watts inverter. This was one of those 'uninterruptible' psu's so beloved of computer nerds. I have two of these and they produce a very nice clean AC output running from a car battery.

Anyway the boat is now legally re-named "ESSELLE" and you should not need to ask where this name came from, not if you know your Eddystone Radio history. It has been registered with the Maritime and Coastguard Agency on the small ships register and I am in the process of negotiating, I hope, a suitable marine radio callsign. Once in the water I shall be able to operate G3EUG/MM or G7AIR/MM as the River Nene is tidal way up beyond Wisbech. It is almost fourteen miles from here to the Wash at the mouth of the Nene but since the licence conditions for /MM working do say in "tidal waters" I need not go that far. Watch this Space ! It ought to be fun working out a suitable ærial for 80 metres.

Wisbech, A Seaport ?

But IT IS SO ! Folk I talk to just cannot realise that despite being FOURTEEN miles inland from the Wash the Port of Wisbech is a Seaport which can take cargo ships of up to 120 metres length. The River Nene from here to the open sea is an artificial 'cut' which is pretty straight and deep and we have tidal ranges of 15 to 18 feet. Okay, anything over 150 feet has to be brought up to the port in reverse as the turning basin will not accommodate them, and you MUST use a pilot but they come in regularly with wood, steel etc; from Europe and Scandinavia going back out with fruit, grain, etc.

And the Port is in the town centre, as is the Marina. Geograpy lesson over.

So here's to the next time, All the best from Skipper Ted, G7AIR/MM,

Reach me at 21, Prince Street, Wisbech, Cambs. PE13 2EY, phone 01945 467 356.

* * *

NOTE FROM GRAEME:- Believe it or not Bewdley was also tidal until the 19th century although it is 90 miles from the open sea. Tide tables were published for Bewdley Bridge. In 1472, when the Borough was awarded its Royal Charter, it was the fourth leading port in England, after London, Bristol and Norwich. The tides were blocked when the River was canalised and weirs were constructed in the 19th Cent. Just look at the arms of the town. See that anchor!

A BRUSH WITH THE SPHINX

By Bill Cooke GWØION

Readers will recall that our President spent most of WW2 in North Africa with RAF mobile radar units. After the defeat of Mussolini's troops early in 1941 there came a calm before the storm that would surely follow.

"The front line in North Africa had vanished with the capture of the remaining Italian troops . . . many tens of thousands of them.

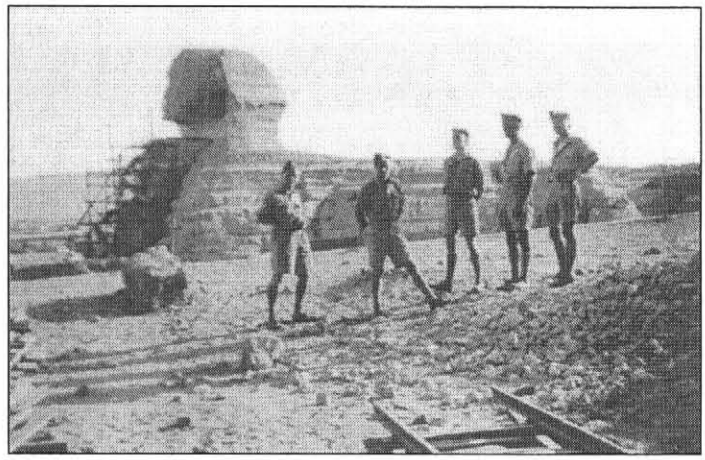
"But the Luftwaffe had started to send photo reconnaissance aircraft (Ju 88s to be precise) over Cairo, Alexandria and Giza, all places where the British forces had been established since the days of Ferdinand de Lesseps, the French diplomat behind the building of the Suez canal. It was only a matter of time before Hitler turned his attention to the Western Desert and the British High command was worried about damage to ancient Egyptian relics.

"In particular the head of the Sphinx was looking distinctly threadbare and exposure to blast might cause disaster. A call went out to all local army and RAF units to release any volunteers who could get out to erect a sandbag buttress.

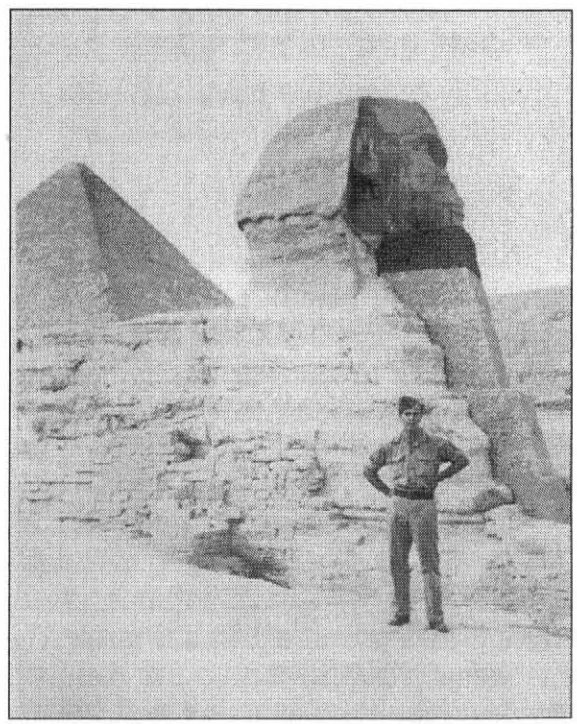
"I was feeling a little 'browned off' at the time and the idea of some sightseeing appealed. A truck was provided and off we went.

"The Royal Engineers were already hard at it making quite a business-like job of scaffolding under the face of the amazing four thousand year old statue. There was no shortage of sand and we soon got to work filling thousands of burlap sacks and scrambling up the scaffold.

"At night we trundled back 'home' and returned daily for the rest of the week.



"After all was finished a Canadian colleague snapped me standing proudly in front of the sandbagged Sphinx. A picture unique in the annals of Egyptology, I suspect." ♠



RADIO RAMBLINGS

Jottings from my Notebook

By Graeme Wormald G3GGL

Bewdley, January 2005.

Once again it's time to send New Year Greetings to all of you out there and look forward into a new year of Eddystonia. My sincere thanks to all of you who sent us good wishes here in Bewdley, they were much appreciated.

QRG/3 EDITION TWO

The envelope containing this issue of "Lighthouse" is rather fatter than usual because it contains the latest version of the "Quick Reference Guide" or QRG for short. It is now very nearly three years since this work of reference was last updated and printed and we have finally run out of copies.

It is a tenet of our E.U.G. fellowship that all new members receive a copy on joining, so a reprint was urgent.

The majority of you will have had your copies since it was first produced and it's probably beginning to get dog-eared (assuming it hasn't been stolen by a jealous non-member).

We are therefore sending a new copy to each and every one. We've taken the opportunity to correct the known errors (few) and also added some new items (also few) and hopefully it will be as treasured as its predecessors.

RUNNING REPAIRS

I finished the old year with a piece of "bad luck". The gales, which are rarely of any strength down here by the river in Bewdley, managed to break my 240 ft big horizontal loop. It was really a simple matter of wire fatigue. It had given way just where it was tied to a corner insulator.

I made emergency repairs by replacing a foot of the broken section with a new piece knotted in, and made "good" electrical connections with that old bodgers' favourite, the "chocolate block".

I'd almost hoisted it up to the top when the halyard broke. This was polypropylene rope of about 3/16ths diameter, the orange stuff that the Post Office used to use for wire pulling. It should be good stuff.

Then I remembered that the guy who donated it to my "good cause" has been retired a good bit longer than I have *(1992.)* In any case it had been rejected by BT as past its sell-by date so I don't suppose I can grumble. (That's why hams are called cheapskates . . .).

I managed to lower the mast (which had three VHF aerials on top of it) but had to call out the troops to finish the job. (Thank you, Colin and Jesse).

The halyard is now replaced by a brand new length of pale blue polypropylene which, presumably with a burst of psychic foresight, I had acquired at last year's Telford Club rally at RAF Cosford Museum.

Having mentioned that, I must tell you that this year's rally is on 4th

September BUT AT A NEW VENUE!. Orleton Park School, Wellington, one mile north of Junction 7 on M54.)

My 40 metre doublet (i.e. half wave, balanced feed) is held up by the same mast but as it's made of 16 s.w.g. solid drawn enamelled wire I think it will probably outlast me.

CONDX? WHAT CONDX?

Speaking of 40 metres, hasn't it been a disappointment since it was extended? It has either been dead flat or very weak long skip. At least, it has been when I've stopped to listen.

I do know that I've upset Ted G7AIR-G3EUG by starting off our "Forty Metre Second Sunday AM Tests" (09.00-10.00). Of the two events that have taken place since we started them the band has been zilch, causing Ted to complain bitterly that he would have been better off painting his new boat!

I've no answer to that one. I'm afraid that H.F. condx can be as unreliable as fishing and horse-racing . . .

IS THE SUN SETTING?

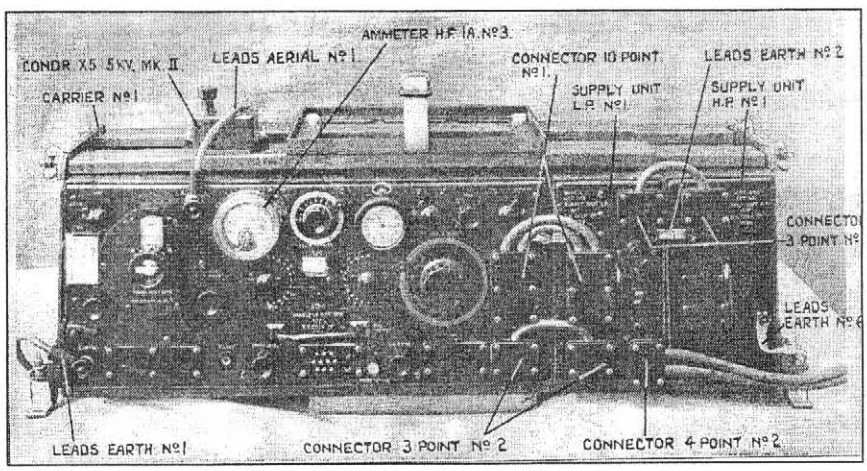
We have been reading some strange things about sunspots recently, such as none being visible! Now according to my received wisdom it's a question of "no sunspots, no short waves". It's a good job the professionals have moved over to satellites! Perhaps one of our more erudite members would care to do a short piece on the subject.

I always thought that sunspot minima affected the higher frequencies *(above 14 megs, for instance)*, not the bread and butter frequencies of 3 to 10 megs. Yes, 80 metres has also been a disappointment on many days.

I wait with baited breath for a layman's explanation of these miserable conditions.

THE ARMY BAND

No, nothing to do with "Colonel Bogey". I'm going back to my earlier radio experiences when I joined the Junior Training Corps (J.T.C.) at Leeds Grammar School in 1947. Apart from the usual clutch of W.S.18 and W.S.38 the Signals Section also boasted three W.S.11.



At the time I thought them a little old-fashioned in their wrinkle black finish, compared with the latest W.S.19 and 22. Especially as they bore the date "1939"; that was eight years previous, almost a lifetime!

In retrospect, I realise that they were very nice pieces of kit and their rarity was due to the fact that they were too complicated to mass-produce. Hence their replacement by the 19 and 22.

However, that's all as may be. This is what I'm getting round to saying. The 11-Set covered the frequency range 4.2 – 7.5 Mc/s. Somewhere in those dear distant days I found a handbook (the army was very keen on little handbooks) – I found a handbook

which made reference to this set and mentioned that it covered "the army band".

This was a new concept to me and I spent months asking questions about this mysterious "army band". Finally I found the answer. It was 7.0 – 7.3 Mc/s. Surprise, surprise! This, of course, was the forty metre hamband of those days. The "alternative" title became blindingly obvious. On Friday 1st Sept 1939 radio-amateurs were "grounded" and the army had a guaranteed clear band in the UK.

Have you ever wondered why, after the end of WW2, the Post Office was very slow to return 40 metres to ham use? Well now you know!

The 11-Set ran about one watt output on "low power" and 3 watts on "high".

By 1949 when my ham ticket arrived my rather "swish" rack-mounting Tx was still under construction. I went on the air (CW of course) on 40 metres for my first contact using low power on a W.S.11 which I'd "borrowed" from school (C.C.F. by then). I made immediate contact with Penrith, Cumberland, some 90 miles.

My 40-metre dipole was fed with twisted lighting flex . . . incidentally, the 11-Set handbook gives it a range of up to 500 miles with 3 watts CW on 40 metres to a 60 ft end fed aerial.

Can it be that 40 metres is less reliable than it was 60 years ago? I certainly don't recall the band ever being 'dead'.

SOURCES OF SUPPLIES

I am not infrequently asked by members about sources of supply of a wide range of materials. Perhaps this is a good time to publish some of these and suggest that members copy them out NOW onto a sheet of paper and then phone up PRONTO for catalogues.

The best known catalogue is probably **MAPLIN**. This will cost you £3.99 plus postage but is a serious work of reference. Telephone 0870 429 6000. 974 pages.

A little-known catalogue is **SQUIRES**. (693 pages). This is probably because it is aimed primarily at model-makers and crafts-people but you will be amazed at its scope.

Every conceivable form of hand-tool plus a very wide range of electronic hobbies components. Call 01243 842 424. It is sent free of charge. The minimum order is £7.50, sent post free. A must for any active hobbyist and radioman.

My favourite valve supplier is **JIM FISH G4MH**, (Wison Valves of Huddersfield) Give Jim a call on 01484 654 650 and ask for his current catalogue of over 2,000 valves listed and priced. Jim takes phone orders via credit card and same day despatch.

A really oddball supplier is **ISOPLETHICS – Real Radio Resource.** Tim specialises in brand-new custom-built valve type components and aluminium chassis and panels built-to-order. Call 01692 403 230 for the Isoplethics catalogue.

The last one I'm going to mention here is **John Birkett of Lincoln**. Almost certainly known to most of you but you may not be aware that he also has replacement transistors for the famous Eddystone EC10 and EC35. Also plenty of high voltage condensers and electrolytics. No catalogue but give him a ring on 01522 520 767. He takes plastic.

I'm sure there are plenty more sources, but I don't happen to have references to them, so if anybody can give recommendations let me know

and I'll print them.

COLOUR CODES

I was studying the ARRL (American Radio Relay League) website recently and was interested to follow their member-participation section.

It came to light that 37% of their members had no idea of the resistor colour (color?) coding. Now that made me rock on my heels. I couldn't imagine any radioman who didn't know his colour-code as well as his callsign.

Perhaps I'm way behind the times; maybe there's no call for resistor colour-codes for black boxes. Then I started to wonder how many E.U.G. members know their colour code . . .

Well, I'm not going to run a contest on it but I am going to list it!

Each of the ten digits has a colour, which must be learnt by rote if you are going to be able to "read" the values of resistors straight off (and you should be able to).

zero - Black

one – Brown

two – Red

three – Orange

four – Yellow

five – Green

six – Blue

seven – Violet

eight – Grey

nine – White

The first two coloured rings starting from one end are the first and second significant figures. The next ring is the 'multiplier' *(i.e. the number of noughts after the first two figures).* If the component is very old it won't be rings but 'body, tip, dot.'

There's an old-timers' *aide memoir* to help you remember the sequence and it goes like this:-

"Better Be Right Or Your Great Big Venture Goes West."

Good, isn't it!

AMERICAN OCTALS

Even though the term "International Octal" was applied to this well-known valve format before the War (WW2 that is) we all know that it was an American innovation and that our transatlantic cousins were much better at organising valves (or even 'tubes') than the rest of us.

Developed around 1934 most of them were actually valves from previous American bases (UX) mounted on the octal base and, where applicable, using a smaller top-cap.

This doesn't indicate that the valves were out-of-date to start with but that their manufacturers were already ahead of the field (along with Philips in Holland).

Not only that, they managed to standardise their nomenclature from the earliest days. And that's where we get a slight cause of confusion, so I'll have a go at straightening it out. When American octals appeared on the scene they had two common factors. The first was that the first number indicates the filament or heater voltage (to the nearest whole volt).

This was then followed by a letter and then another number. There may have been some meaning to these latter items but if so they still elude me (*the letter "S" indicating the lack of a top-cap, and standing for "single-ended" didn't appear until a few years later).*

As an example, the most famous small beam tetrode power valve was loosely referred to as the "6V6". In practice we

must now look at the physical characteristics of the octal valve.

We must consider that the "metal valve" – *not to be confused with the British metal "catkin" valve* – arrived on the American scene at the same time as the octal base. It was a steel outer case, not a big anode. There was no glass inside it and it was very successful and long-lived. The term "6V6" referred to such a metal valve.

But when some manufacturers produced the same valve in a traditional glass "bottle" it was known as the "6V6G", for obvious reasons.

And as well as producing prodigious 12-valve radiograms they also initiated the popular "American Midget". This hadn't room for glass bottles and so manufacturers who were still in the glass-blowing business produced items that were no wider than the base, and with a marvel of logic they called these "glass tubes" and such a valve became known as a "6V6GT"

This term must have been slightly confusing, bearing in mind that they called valves "tubes", as well as cylindrical-shaped objects of any description. However, they seemed to cope.

The vast majority of U.S. valves that came across the ocean during WW2 were "metal" and thus bore no suffix. The result is that we tend to apply the "short" name regardless.

Now the 6V6 was produced in all three formats, but it is shear chance that my junk-box happened to contain a couple of 6V6GTs and no metals. Hence its use in the "Junk-Box Baby". Otherwise I would always use a metal.

The 6AC7 (actually a high-gain video valve, used, of course, widely in Radar) – which I chose as a crystal oscillator, was only ever produced as a metal. The 6SL7GT twin triode (speech amplifier in the J-B B), on the other hand, was only ever produced as a glass tube version. There was a very good reason for this though. All "metal" octals had the steel envelope connected to pin # one, for earthing. This was fine if you only needed seven electrode connections (inc heater), but the 6SL7GT needed all eight.

Octal valves which are still made today (and they are coming from eastern Europe and China) to satisfy the valve hi-fi market, have a mixture of alien letter suffixes, mainly to indicate their source of origin and confuse the innocent. This would have no relevance to their use in a retro AM rig.

End of valve history lesson!

WIRELESS FOR THE WARRIOR

It's now ten years since "Wireless for the Warrior" Vol. I by Louis Muelstee, PAØPCR, was published. I can recall 30 or 40 years back, when military radios were being scrapped left, right and centre, that somebody should be writing a book about it! Elsewhere in this issue you'll find an advert for the series, now augmented by a fourth Volume.

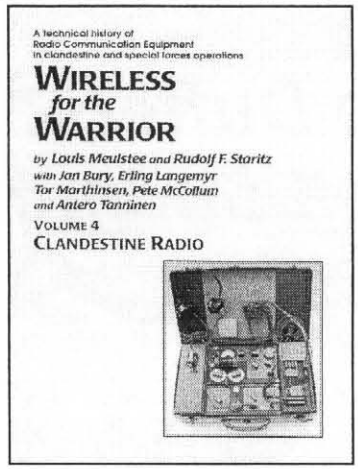
This is a most incredible library of British and Commonwealth military radio from the 1930s to the 1960s, including all the Eddystone kit that was pressed to service.

They include the R101C (1939), S.358-series (1941), W.S.57 (1942), S.930 (1956?) and 730 (1960). Louis' research into the subject is undoubtedly the best ever published (or likely to be) and I have no hesitation in recommending these books to all serious students of vintage communication radio. You'll be a lot wiser and you'll enjoy it!

Vy 73. Graeme ♠

WIRELESS *for the* WARRIOR

Volume 4
CLANDESTINE RADIO



Volume 4 'Clandestine Radio' – not only 'spy' equipment but sets used by Special Forces, Partisans, Resistance, 'Stay Behind' organisations, Diplomatic Service, Australian Coast Watchers, RDF and intercept receivers, bugs and radar beacons. The information has been compiled through the collaboration of a vast number of collectors and enthusiasts around the world. Volume 4 includes information on more than 230 sets and ancillaries. It contains 692 pages in hardback format, and features over 850 photographs, 360 line drawings and 440 data tables.

Volume 1 'Wireless Sets No.1 to 88' – covers the early radios, prior to the outbreak of World War II, and wartime sets which were never released in large quantities or were abandoned after trials.

Volume 2 'Standard Sets for World War II' – provides information in detail of mass-produced Wireless Sets such as No.18, 19, 22 and 38. Additionally included are a number of post-war sets on which development had been started during World War II.

Volume 3 'Reception Sets' – the receivers described span the era 1932 to the 1960s, and coverage includes not only reception sets specifically designed or adapted for the British Army, but also sets adopted from other arms (RN and RAF), special receivers, direction finding receivers, army broadcast reception sets, Canadian and Australian army sets, commercial receivers adopted by the army, and army welfare reception sets.

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Wireless for the Warrior, Volume 1 *by Louis Meulstee (RB38)*	£31.00	£32.00	£42.00
Wireless for the Warrior, Volume 2 *by Louis Meulstee* (hardback)	£43.50	£47.00*	£55.95*
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Wireless for the Warrior, Volume 4 *by Louis Meulstee* (hardback)	£45.00	£49.00*	£57.95*

***NOTES** – **1.** Because of their weight and value, we recommend the use of airmail to despatch Wireless for the Warrior, Volumes 2 and 4 outside Europe. **2.** These books exceed the postal weight limit of 2kg for Canada. Orders for that country will therefore be sent by air postal post, at a total price of £58.50 for Vol. 2 and £59.50 for Vol. 4.

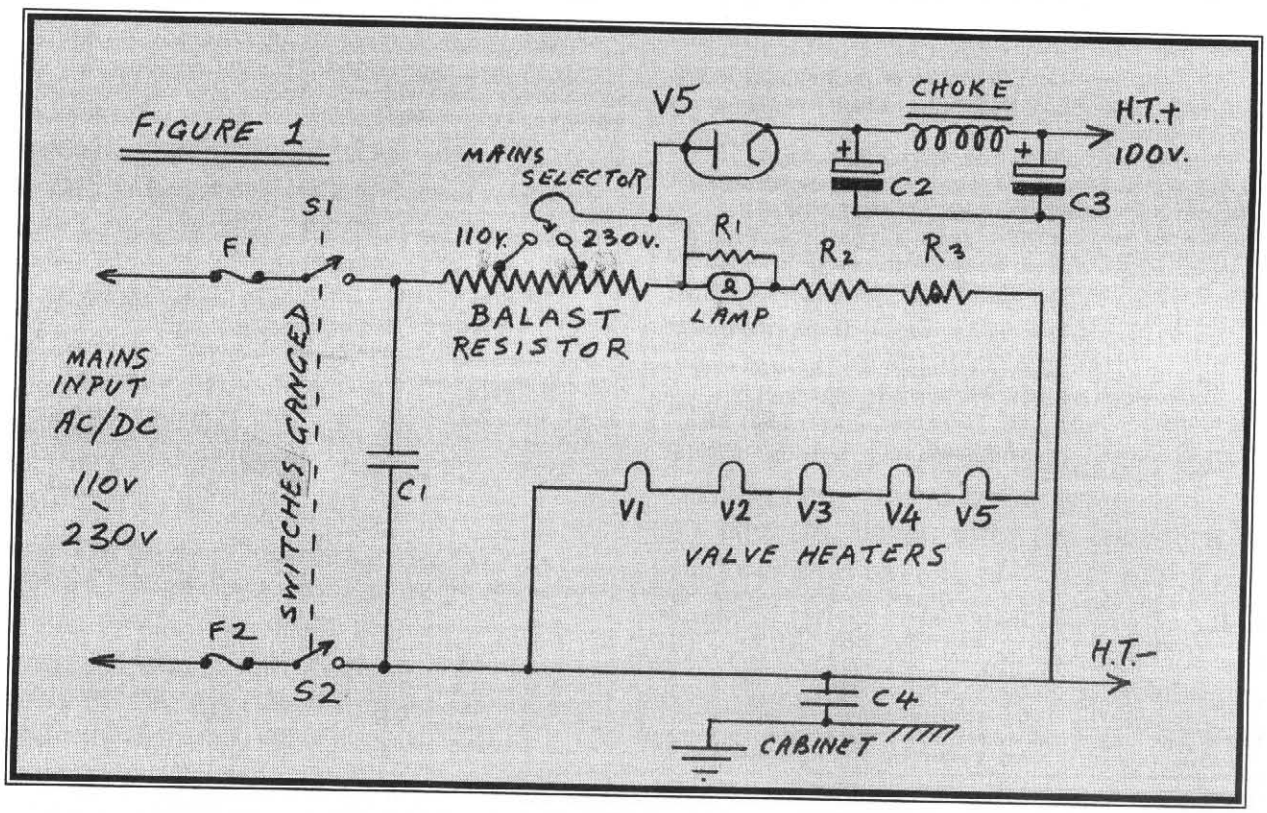
The Duffers' Guide to Valve Set Fault-finding – (part four).

By Graeme Wormald G3GGL

I had promised to be sufficiently advanced in my writing of this little saga to be covering the principles of oscillation by this stage. Regretfully, writing in my truly amateur style I have fallen well behind. I apologise; I shall catch up one way or another.

Last month we covered the standard type of 'A.C.' power supply unit (p.s.u.) and I had intended to describe the 'universal' type of AC/DC p.s.u. at the same time, but we over-ran (as I suspect we may well do now!).

I'll just remind readers that I'm writing for those quite unacquainted with electrical theory, and who just pick up amateur radio as they go along (as I did). So here goes with the counterpart to last issue's episode.



It might well help to have last month's "Guide" before you as you read this. Every section has its counterpart although this circuit looks rather more complex!

PHILOSOPHY

There are two reasons to design a receiver which will work off both AC and DC mains. The first is to have a set that will actually work off AC as well as DC supplies! The second (mark this well) is to save manufacturing costs.

So, you may ask, why bother with AC-only sets if they are both less flexible and more expensive? Fair enough. But there is one over-riding answer. Reliability. In general terms an AC-only set is much more reliable than the so-called "Universal" or AC/DC model.

Ask any old-time service engineer. He will tell you that valves last longer in an AC-only set and that you have far more trouble with ballast resistors and thermistors than with mains transformers. OK then, so why did Eddystone ever get mixed up in AC/DC sets when their motto was "Quality"?

The answer is very simple. By the time Eddystone produced their first AC/DC set (the S.670 in 1948) AC mains were rapidly spreading throughout the world, at least they were in places likely to be investing in Eddystone radios.

The answer lay in places with no mains at all. I'm referring, of course, to merchant shipping. Even such wonders of the seven seas as the "Queen Mary" were running off 110 volts Direct Current. And had been doing since before the "Titanic".

All these Universal Eddystones were aimed primarily at the seafarer. The land-based customer was a secondary (but very welcome) issue.

Hitherto, the vast majority of universal sets had been of the 'cheap and cheerful' variety. Unfortunately, over the years, Eddystone has become 'guilty by association'. But in fact the opposite was true. Eddystones were probably the best Universal sets built in the world. Certainly letters from satisfied customers, still standing on the company's files, would indicate so:-

J.K.Andrews, wrote from India in 1961:

"I have had my Eddystone 670 Marine Receiver for 13 years now and have been more than satisfied with its excellent performance in all conditions"

A LOOK AT THE DETAILS

So let's examine the circuit of Figure 1 and analyse the role of each section. Remember that this is not a specific set, merely typical of the *genre*. If you can follow this circuit then you'll be able to follow any other AC/DC power unit and make allowance accordingly.

The mains goes in at the left hand side and in all Eddystone sets the chassis, which is connected to one side of the mains (hopefully the 'neutral') is isolated from the metal case and all accessible metalwork. **But once out of the case it is lethal, even when the chassis is 'neutral'.** There are too many points of high voltage floating about.

At this stage may I point out that any radioman dealing with valve sets, especially 'universal' sets, should own a traditional electricians screwdriver. These are still commonly sold.

It is a 5- or 6-inch long instrument-type of screwdriver completely insulated except for the last half-inch at the blade end. The handle is transparent and may be clear or yellow.

Within the handle is a small neon lamp and resistor connected at one end to the blade and at the other end to a small metal disc at the top of the

handle.

It may be used as a screwdriver in the normal way (it was originally produced for repairing wire fuse blocks). For testing the polarity of power mains the blade is touched onto the terminal or metalwork to be tested. A finger is then placed on the top disc, thus creating a very high impedance capacitive return to earth through the body (i.e. 'neutral'). It is quite safe, painless and without 'sensation'.

If the blade is touching a part of similar potential then nothing will be observed. But should it be touching a part at 'line' potential (often wrongly – but graphically – called 'live'), then the neon lamp in the handle will glow quite clearly and you are warned.

If you're reading 'Lighthouse' and don't have such a simple life-saver, go right out NOW to your nearest hardware shop and get one. They cost about £1.

Never work on a 'universal' receiver without one to hand. If the chassis is found to be live then change the power leads over at once.

The two fuses (when fitted) will be rated at about 250—500 milliamps, depending on the design of the set. The two-pole mains switch is usually ganged to the volume or tone control.

The condenser C1 is intended to reduce interference coming in on the mains. This is questionable, but what is not questionable is the likelihood of a vintage condenser to explode on being presented with 400 volts peak.

Yes, that's what 230 volts r.m.s. *(root mean squared)* standard AC mains is at the top of the sine-wave. If you find such a condenser get rid of it. Value typically 0.01 mfd. Don't bother to replace it unless you're a purist, and then use one rated at 1,000 volts.

The bottom line in the circuit is HT negative and in an Eddystone receiver is isolated from the cabinet by C4, again typically 0.01 mfd. Replace this with a new similar one of 1,000 volts working. Don't mess about; we're talking about serious safety here.

The next most obvious item is the 'heater chain', which equates to the L.T. winding in an A.C.-only set. The requirement here is to illuminate all the heaters from a power source of 100 volts upwards.

In an AC-only set it is normal for all valves (except the rectifier) to use a heater voltage of 6.3, the required wattage being adjusted at design stage by varying the current consumption.

For instance, a normal voltage amplifier such as an RF pentode or detector commonly has a consumption of 0.3 amps (6.3 x 0.3 = 1.9 watts). A power output (loudspeaker) stage might have a consumption of 0.9 amps (6.3 x 0.9 = 5.1 watts). This is in order to provide the extra emission from the cathode to allow a heavier HT current to be drawn.

With a universal set the heater supply must be drawn direct from the mains supply so the common factor becomes current, not voltage. This means that valves requiring a greater emission have the same current as the rest of the valves but at a higher voltage.

The principle is just like old-fashioned Christmas tree lights where (for instance) 24 ten-volt lamps are wired in series across a 240-volt supply.

Unfortunately there were several different current standards of "universal" valve heaters, including 0.1 amps, 0.15 amps, 0.2 amps and 0.3 amps.

Of these, the latter was really intended for television use and the 0.2 was a series which was never used by Eddystone in AC/DC sets. The two first standards were widely used.

At 0.1 amps, for instance a normal RF stage might be rated at 14 volts (1.4 watts), whereas an output stage might be rated at 45 volts (4.5 watts).

There is one limitation, however, and that is the requirement to operate on a mains (or ship's) supply of no more than 100v. Add up all the stages for a communications receiver (don't forget the rectifier is a power valve!) and it will soon pass the 110-volt mark.

To digress here for a moment, the history of successful universal sets is very much that of the American midget of the 1930s-40s. Take a standard 4-valve plus rectifier superhet.

The first three valves (I suppose I should say 'tubes' in this context!) are standard 6.3 volt, 0.3 amp types, but with the heaters modified to operate on 12.6 volts at 0.15 amps. That makes 38 volts when in series. Take a 35-volt heater rectifier and a 50-volt output valve and count on your fingers.

That makes 123 volts, which is (was?) the standard North American domestic supply. No coincidence! Dead easy. But we old-worlders have a problem in logistics. What do you do with the other hundred-odd volts?

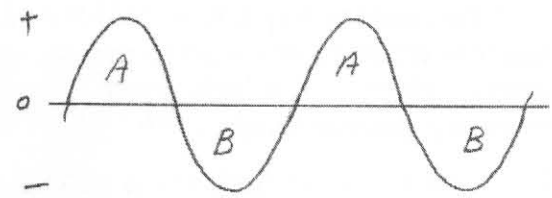
There's only one answer, I'm afraid. Throw them away by putting a series dropping resistor in the heater chain. Commonly called a ballast resistor, it is a chunky wire-wound device more suited to central heating than radio technology.

So for typical values we need to refer to the set design. Are they 0.1 amp heaters (670 series)? Or 0.15 amps (870 series)? Or do they fall into the trap of adding up to over 110v and have to be wired in series-parallel (840 series)?

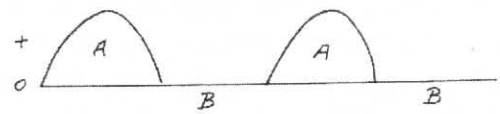
What a nightmare! I think we'll keep away from those details and look at the circuit again. The ballast resistor is quite clear to see. It is invariably in the 'top' end of the chain and feeds the anode of the rectifier also.

When operating on a DC supply the rectifier is doing nothing, just passing a smooth flow of current, but don't forget that of the supply polarity is reversed (easily done) then no high tension will reach the set even though the heaters are glowing. A diode cannot conduct 'backwards'.

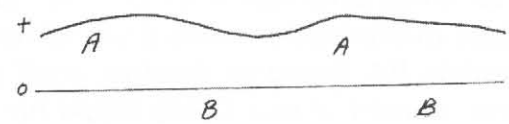
Let us now continue down the rectifier route. Presented at the anode when run on an AC supply there will appear the classical AC sine wave voltage.



The positive half-cycles are labelled 'A' and the negative ones 'B'. Being only a half-wave rectifier there is nowhere for the negative half-cycle to go. It is completely suppressed. Appearing at the cathode of V5 will be the following VERY lumpy DC waveform.



This goes straight into the reservoir condenser, C2 (compare with part three of this series) which has to work very hard for a living. The modified waveform which then enters the smoothing choke looks like this:-



After it's gone through the choke and been decoupled by C3 it will be a straight line, just the same as in the AC bi-phase (full-wave) circuit of last month. But the three smoothing

components (C2, C3 and the choke) have all contributed a little extra to achieve it. That's why a weakness (reduced capacity) in either of the smoothing condensers is readily detected by a 50-cycle hum in the loudspeaker. In a full-wave circuit any hum due to poor smoothing will be a 100-cycle note. Remember that!

So having acquired an HT supply of around 100-volts let's go back to the heater chain which has some extra (as yet) unexplained components.

First of all let's take the lamp (or lamps, there may be more than one of them, still in series). If it were just in series with the heaters any failure of the lamp filament would spell death to the set. It would effectively switch itself off by removing the low tension.

Some sets *are* like that, but a sensible designer would make it a 'fail safe' condition by building in a hefty shunt resistor across the lamp, shown here as R1. Again, the values will depend on the (variable) design parameters, but let's make some up for an example.

Let us say the valve heater chain is 0.15 amp and the pilot lamp is 3.5-volts. It is normal practice to under-run such lamps so a 0.2 amp filament would be typical. A value for R1 of 20 ohms would be reasonable, allowing about 2 volts to appear on the lamp. (Note that this is a very inexact calculation; the resistance of an under-run lamp is a good bit lower than a fully run one, but it serves to illustrate.)

Should the lamp filament blow then the whole of the heater current would flow through R1 giving a voltage drop of three instead of two. This would have no effect on the operation of the set; it just wouldn't have its pilot light showing.

R1 would be a wire-wound item of about one watt.

Moving now on to the next item in the chain, R2. Strictly speaking it has no purpose whatever; it is merely adding a little more voltage drop to that obtained by the ballast resistor. But so many Eddystone models incorporate it that I thought I should alert people to it.

It is wire-wound, about 50 ohms and rated at six watts. I can only think that it is to adjust the heater drop from an otherwise stock value of ballast dropper. It will only drop about five or ten volts in any case and I must admit to being slightly baffled!

Next in line is R3, shown as a resistor with a black dot in the centre. This represents a patent device called a "Thermistor". It is sometimes depicted as a zig-zag resistor in a little oblong box. Same thing.

A thermistor is a negative co-efficient resistor. Most conductors increase their resistance when they heat up. A thermistor reduces its resistance when it warms up. Typically, when cold, it will be of several hundred ohms. After reaching operating temperature this will fall to about 40 ohms. It usually takes two or three minutes to do this.

The philosophy behind this device goes thus: the valve heaters in such a radio will be of a disparate nature, as already explained. This means that during the warm-up period some valves reach operating temperature before others.

The result is that, because the resistance of the cooler heaters is still reduced, the current through the warm heaters is increased and therefore the voltage is increased. (Ohm's Law.) The life of these temporarily over-run valves will therefore be reduced. (This is one of the reasons why 'universal' sets are less reliable than AC-only.)

The presence of a thermistor reduces this risk and is incorporated into all such Eddystone sets. Very few cheap

universal sets incorporate them; they just have a little extra resistance in the dropper.

They came into their own with the advent of mass television with a huge string of 0.3 amp heater valves in series and ready to give trouble at the drop of a hat! They were worth their weight in gold to the pre-solid state television owner.

Now never having being involved with the domestic repair business I know very little about these thermistors. They are no longer made and are virtually unobtainable. They were made in different ratings, viz. 0.1 amp, 0.15 amp, etc. etc. and they had reference numbers such as CZ1, CZ2, CZ3, which mean nothing to me.

They look like black one-watt carbon resistors and I've never seen one with any markings on it, even new. I presume they were supplied in labelled packets! I am quite often asked by members where they can obtain such devices for their Eddystones.

I've only once seen them advertised recently, and I don't know the amps rating, but try "BOWOOD ELECTRONICS", tel: 01246 583777 and ask them. One is "THM001 rated at 300Ω cold and 24Ω cold; or THM002 rated at 1000Ω cold and 90Ω hot. Price 30p each. P&P £1.50

My other answer is to replace the thermistor with a normal wire-wound resistor of the same value as the thermistor would be when hot. If the value isn't given on the circuit (it is on some but not others) then it is easy to work out using Ohm's Law on the rest of the given values.

OK, you're probably reducing the life of some of the valves by a few hundred hours in several thousand, so what the hell! (Even the famous and long-lived Bush DAC90A didn't use a thermistor.)

I've one last thing to say about Figure 1. I apologise for spelling 'ballast' with only one 'l'. I've just noticed it but I'm blowed if I'm going to re-scan the whole darned lot!

♠

Letter from Minchinhampton

By James de la Mare

As the news broke in December (just after the last issue of Lighthouse went to press) that the historic Marconi Collection had been donated to Oxford University, members may be interested to know what happened.

We had not heard much about this Collection for some years. It had been in store at Marconi's premises at Chelmsford for many years awaiting a permanent home where it could be displayed and open to the public and researchers.

There had been plans to proceed in conjunction with the local council, but with the great difficulties in which Marconi found itself after the collapse of its business and shares, the future of the Collection was in jeopardy. Moreover it required adequate conservation expertise and resources, and a local authority – subject to changing financial pressures – could find it impossible to provide these properly over a long period.

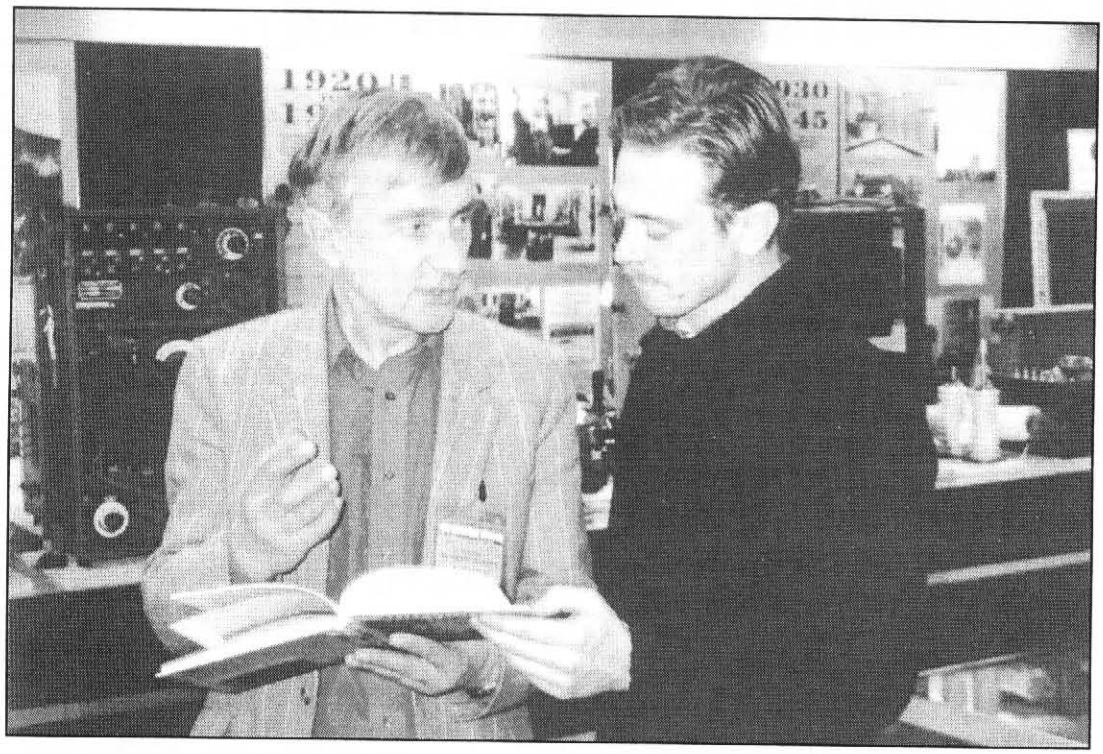
There should be no doubt about the seriousness of that situation. This Collection is unique. It is probably the most important wireless related Collection in the world. It consists of not only much of the very early equipment from Marconi himself, but a massive archive as well. There are some 3000 telegrams from the Titanic sinking alone. As a unique historic Collection of that quality it's impossible to put a precise value on it, but it is certain that it would realised millions of pounds if it had, in these disastrous circumstances, been sold at auction.

When the GEC/Marconi business collapsed there was a risk that the Collection would have to be auctioned. It would have been inevitable that the Collection would have been split up and much (if not most, perhaps all) of it would have gone abroad. The Marconi management had to face this predicament at the worst moment in the company's fortunes because the Collection had not at that time been transferred to the relative safety of an independent trust. Marconi had, however, one person who was vehemently opposed to losing the collection and who, with unremitting energy, sought some means of preserving it intact in the UK – the well-known radio historian, Gordon Bussey.

He had been Marconi's historical consultant for many years. He had already been responsible for Marconi's event in Cornwall marking the centenary of the first transatlantic transmission and for liaising with the Royal Mint over the design and issue of the commemorative £2 coin. He had also been responsible for the Eddystone Collection remaining intact when that had to be sold.

When Gordon was at Oxford doing research at the Bodlian Library he noted the proximity of the Library to the museum of the History of Science in the Old Ashmolean Museum building. This had been built as long ago as 1680 to house Elias Ashmole's "collection of curiosities"; making it one of the oldest museum buildings in the world, and architecturally handsome, too. The possibility that Oxford University might become a good home for the Marconi Collection was not lost on Gordon. Indeed Marconi had already donated its Elliott Collection of scientific instruments to the Museum in 2003.

Negotiations therefore began between the University and Marconi. These proved to be fruitful and



Gordon Bussey (left) briefing the Italian actor who played the part of Guglielmo Marconi in an Italian film about the inventor. Gordon is seen here explaining details from a copy of his book "Marconi's Atlantic Leap" at the Marconi Collection in March 2004.

constructive. It was eventually arranged that the artefacts (more than 250 unique items, dating from 1894-1920) would be donated to the Museum and the Marconi and G.E.C. archives, many tens of thousands of documents, donated to the Bodleian Library. When arrangements were complete it required five days for eight men and ten vans to move it all.

Excellent result though this was, it was not all. Further discussions led to the Trustees of the Wireless Preservation Society making a large donation to fund a Marconi Archivist on a three year programme to sort, catalogue and conserve the Collection. Furthermore there is also to be funding from the WPS for a "Douglas Byrne Marconi Research Fellowship" named after Douglas Byrne G3KPO, the founder of the Society. In 2006 it is intended to place many of the 250 artefacts on public display at the Museum in a major exhibition.

When so many important collections of all kinds formed by companies, families or individuals have been sold off and dispersed since the War, it is especially welcome to know Marconi's is now safe and in good hands. Oxford has obtained a world class collection of the greatest importance.

All museums own far more that they could ever display (and so, one supposes, do many private collectors) so we shall not see it all. But researchers will at last have proper access to the archives and we should be thankful that it all remains in Britain. We must be profoundly grateful to Gordon Bussey and those at Marconi who decided it should stay together at Oxford. ♠

(Members will recall that from the late 1940s Eddystone Radio produced "badged" radio receivers for Marconi. In 1965 the Marconi Company acquired total ownership of Eddystone Radio and maintained its identity until 1999.)

In Consideration of Amplitude Modulation

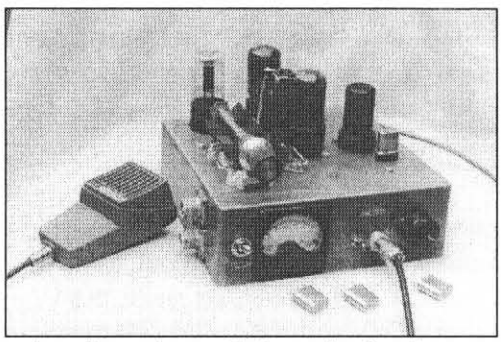
Graeme Wormald G3GGL

I never fail to be pleasantly surprised when I switch on the Eddystone "Receiver-of-the-Day" and tune to 3615 or 3625 kc/s. The early morning activity on A.M. is most gratifying to hear. I say "morning" because later in the day the skip distance lengthens and the channels are swamped by Euro SSB. But let's get down to a few details . . .

THE NEW "BABY"

Last month I promised you details of a "kitchen table" A.M. transmitter. Hopefully you will have found it in this Issue of Lighthouse under the title of "Junk-Box Baby".

The original idea was to present a



constructional article, but it soon became obvious that this was unrealistic. Why? Because no two junk-boxes have identical contents!

The best I can say is that it may easily be replicated with a bit of initiative and "nous", as my Yorkshire forebears would have said.

CHRISTMAS STOCKING . . .

I was the lucky recipient of a "nearly new" Eddystone 888A from dear old Santa. I'm impressed. So impressed that my "nearly new" 640 will soon be in the "For Sale" column!

Now whenever I've spoken to former Chief Engineer Bill Cooke, GWØION, about the 888A I hear a sharp intake of breath and he mutters something about "that blooming set". When pressed to enlarge on this derogatory exclamation he tells me that it caused more trouble than enough at the factory. It seems they had stability problems with it.

I've no idea of the extent of this problem, but I can't find it on my model (Serial HL0441 – August 1960, and fairly late in the sequence; the production run was 550). It really is a joy to use. The 85 kc/s I.F. is so sharp that you can actually listen to A.M. on either sideband! A real "Q-fiver"

EUG A.M. NET REPORTS

Although the S.S.B. "First Sunday" net continues to attract more members reporting in, the A.M. nets are picking up, but with one disastrous exception.

The Forty Metre second Sunday nets for both 12th December and 9th January were beset by total short-skip ionospheric blackout. Ted was hearing some North American activity and I heard some Latinate fone, presumably from the Mediterranean. But of Britain, there was none!

Oh, I nearly forgot. I did work Ben, G4BXD, with no problem. But then, he's only three miles away from here!

This is rather a shame, because I had several calls from members asking where we had got to, (not realising the

facts) and I have high hopes for our A.M. future on this band (7143 kc/s)

On December's First Sunday (5th) our nine o'clock (80m.) A.M. tests produced ON6PW, Pieter in Antwerp, five and seven both ways. I was using the Vanguard with 50 watts input (about 35 out) and the 730/4.

On our "Third Sunday" 80 metre A.M. net on 19th December Ted and I were joined by Chris, G3BYZ in Surrey using a 888A and a KW Viceroy. Anthony GW4RYK called in using a 19 set from Montgomery. Mervyn, GW8TBG from Swansea was running a 730/4 with a Collins Tx.

Ben, G4BXD, was running his ex-Lancaster bomber T1154/R1155 with a rather gruff carbon mike, whilst Garry, GW2ABJ in Neath was using his 730/4.

Steve GW1XVC and John G3GTJ both had bad QSB and I forgot to log their details, but I was using the K.W. Viceroy with the 730/4.

On 15th January "Third Sunday" 80 metre A.M. tests (3625 kc/s) we had the strangest conditions. Ben, G4BXD, three miles away was plagued with multi-path transmission. He obviously had a true vertical incidence skywave which was drifting in and out of phase with his ground wave.

I've never heard this before (after 55 years on the bands). Ted G3EUG/P, operating from the mouth of the River Nene on the Wash was up and down like a yo-yo and after about half an hour disappeared. I discovered afterwards that we were being swamped by Ostend Radio, also on A.M. on 3629 kc/s.

Anyway, the two Chris's from down south (G3XFE and G4BYZ) reported in OK at 5 & 9. This gave me the excuse I was waiting for.

The new xtals for "Junk-Box Baby" (3615 and 3625) had arrived the week before and I had it warmed up and harnessed to the 888A. I was running an R.F. output of about 4½ watts to the big square loop aerial which, by the way, had blown down in the gales. A working party had got it back up the day before.

The reports were one S-point down on the 35-watt Vanguard and speech quality rated excellent. Mervyn, GW8TBG, called in from Swansea and confirmed the good reports. I was quite "over the moon" *(as they say)*!

PANDA CUB

I reported last time that I'd acquired a Panda Cub in October. I gave it the once over and was saddened to see some cut wires inside, including one to the VFO box. Mmmm.

A STRANGE MIXER!

Have you ever realised that high level (plate and screen) modulation is achieved by heterodyning? Just like the frequency changer in a superhet?

Look at is this way: The drive to the control grid of the P.A. is one 'signal' (let us say 1,000 kc/s or one Mc/s) and this is 'beaten' or heterodyned against the outpu from the modulator which, let us assume in this case, is at one kilocycle (1 kc/s).

The product of this process will be the two original frequencies, their sum and their difference.

The carrier is still the carrier at 1 Mc/s. The sum is 1 Mc/s plus 1 kc/s, or 1,001 kc/s (the upper sideband). The difference is 999 kc/s (the lower sideband). The audio frequency is filtered out by the tuned circuit and does not reach the aerial. The other three do and give you a perfectly normal amplitude modulated signal.

Just replace the 1 kc/s tone by human speech and away you go . . . ♠

"EUG on the Air"

PHOTOCOPY THIS PAGE AND STICK IT UP IN THE LOO!!

The next "First Sunday" nets will take place on 6th March, followed by 3rd April and 1st May.

Freq. 3695+/- QRM

Times: 09.00 for AM and 10.00 for LSB (local times)

Controller G3XFE helped by G3GGL

"ALL NEW SECOND SUNDAY NEW BAND"

FORTY METRE A.M. only TESTS

These will take place on 13th Feb, 13th March and 10th April

Frequency 7143 +/- if spot in use by other net

Listen for G3GGL or G3XFE on A.M. time 09.00 – 10.00 local

"NEW THIRD SUNDAY A.M. TESTS"

Sceduled on 20th Feb, 20th March and 17th April

Frequency 3615/25 kc/s. A.M. only! Time 09.00 -- 10.00

Listen for G3GGL or G3XFE

Please send listener reports and comments to G3GGL QTH details below.

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