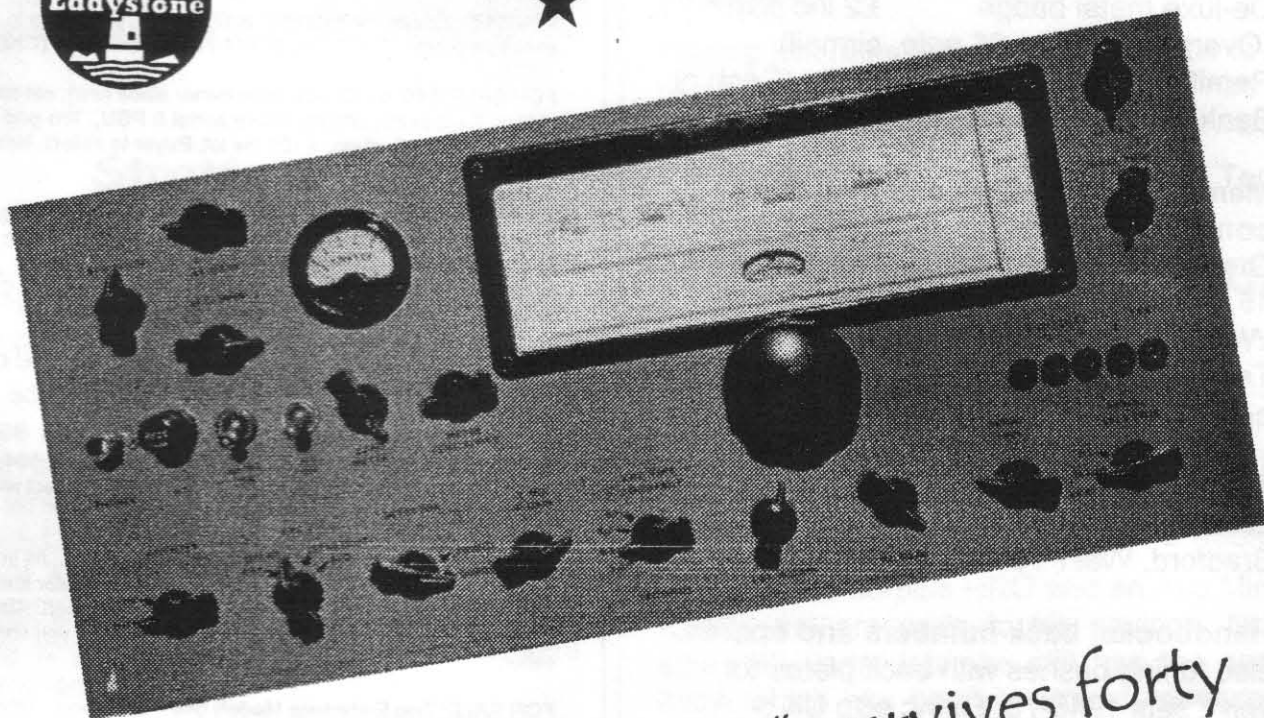


Lighthouse

The Magazine of
The Eddystone User Group

FOUNDED 1990

ISSUE 63
OCTOBER 2000



"Home-brew Eddystone" survives forty
years -- "still works" says proud EUGer
-- see feature inside



EDDYSTONE USER GROUP

A non-profit-making group for Eddystone Radio Enthusiasts

Founded in 1990 by Ted Moore

Issue No 63. October 2000

MEMBERSHIP DETAILS:

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WANTED: Nice 830 and EA12 Call Chris G3XFE, 01923 250673 (Watford).

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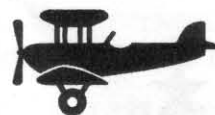
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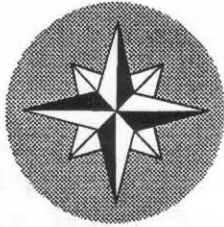
FOR SALE: 940 £195; 770U MkII £150; 840C £125. All in good condx, located near Carlisle. Not mine and the vendor knows little about them. Buyer to collect or arrange transport. Call Simon M5POO on 01434-633913 and he will pass you on to the seller.

FOR SALE: Two Eddystone Models 640 – one good – other needs re-stringing. £120 the pair. Call Peter 01727 839908. St Albans.

NEW REPLACEMENT cogwheels for Eddystone 'slide-rule' dials (see feature on page 30 of EUG Newsletter No 60 – April, 2000 for full details) Price £3 for one, £5 for two, inc p&p and instructions, anywhere. Anthony Richards, GW4RYK, Castell Forwyn, Abermule, Montgomery, Powis, SY15 6JH

FOR SALE: Eddystone 640 in working order and fair condx £50, call Simon 01434 633913.





LIGHTHOUSE

Welcome to the new edition of "Lighthouse". The EUG newsletter goes from strength to strength and this is all due to the efforts of Graeme, Ted and Simon. And what about the QRG supplement with the last issue? I think Graeme is really getting the hang of the desk top publishing business. Well done Graeme. (*Thank you, Chris, it's a bit of a struggle!*)

I was able to visit the International Broadcasting Convention and Trade Show at Amsterdam last month. Megahertz had a large stand with the Eddystone equipment very well situated where it could be seen by anyone passing. Matt Parkes and Les Crompton (Sales Manager) were showing a new range of broadcast equipment. I saw a new Digital Television Transmitter as well as a new DAB and FM transmitter. The style, chosen by Roger Sutton, was very attractive and looked very modern.

Matt and Les said they had a good show, and that things were going well for the company. Good news for all of us who have a fondness for the old lighthouse!

I see that Graeme is proposing to send out the data sheet for the S6100 Channelised LF/HF Receiver. My

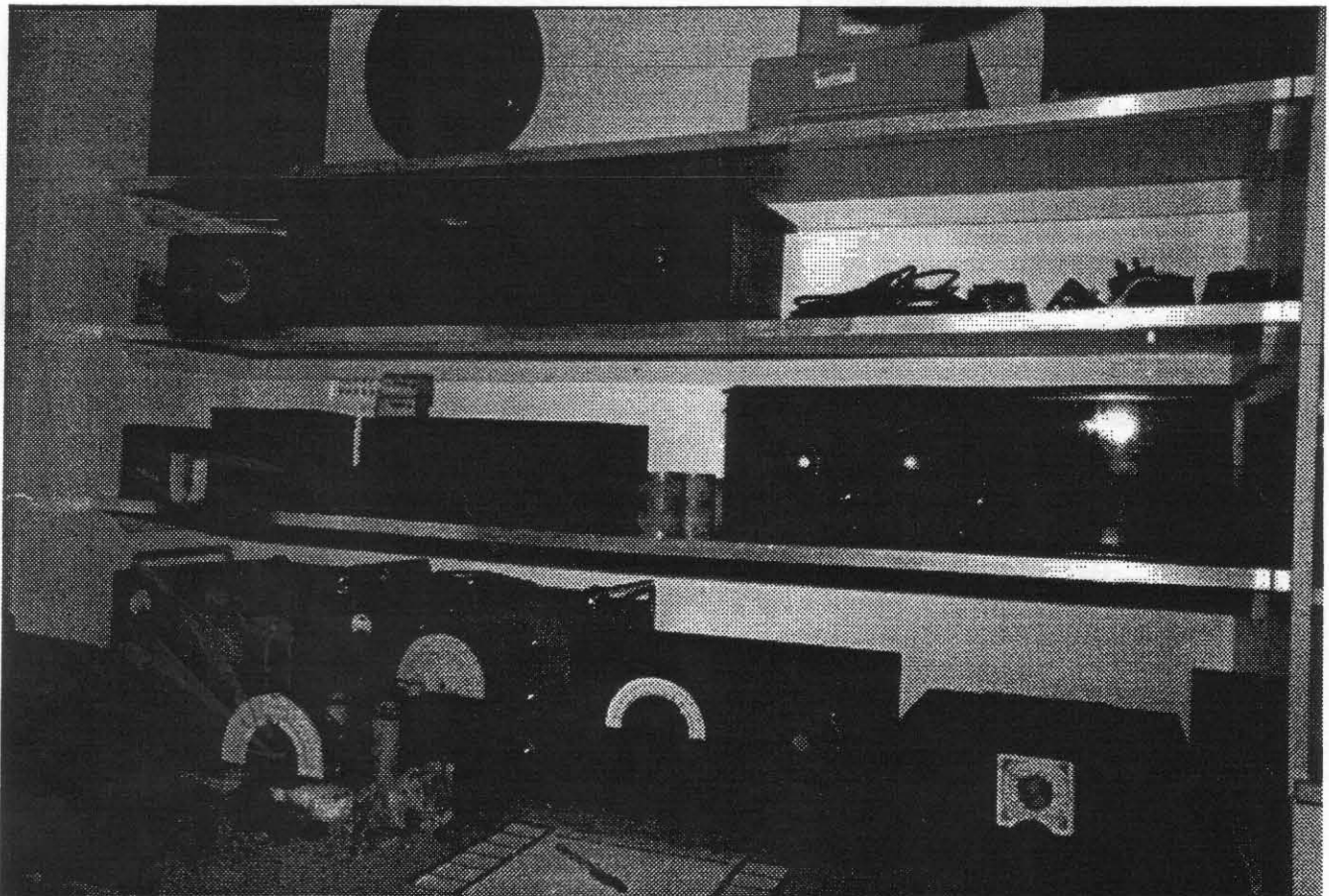
memory is not good on this receiver but I do remember that it was the forerunner of the S6200 which is the tunable version that replaced the S1650. The company is still selling the S6200 and possibly even the S6100. The channelised version was sold mainly to Civil Aviation Departments in the developing countries where they needed HF links with aircraft. I remember we sold some to some islands in the Pacific.

Looking through some photo albums I came across some photos I took of Richard Baker's collection of Eddystone Receivers about ten years ago. Richard was a well known collector before he retired and set up residence in Spain. At his house in Crick he built a purpose-built museum and invited Wendy and myself over one Sunday along with other friends to celebrate its completion. I saw some very early sets that I have never seen since and I have promised Graeme that I will let him have copies of the photos for future newsletter. Here is an example.

My best 73's

Chris Pettitt - GOEYO

Patron (chris@g0eyo.freemove.co.uk)



SPECIAL ANNOUNCEMENT

In the last edition of 'Lighthouse', and also the new edition of QRG, references were made to the inflated prices of Eddystone models in 1982.

These prices were quoted in good faith, and were obtained from an apparently genuine source, to wit the catalogue of an Appointed Retail Dealer in the Tottenham Court Road, London.

Bill Cooke, GWOION, (Managing Director of Eddystone Radio at the time), advises us that these prices were inaccurate.

"They were the outcome of an over-enthusiastic campaign by new members of the company sales force, together with discussions with the retailer," says Bill. "The situation was finally sorted out by Ken Wilkins, Eddystone's sales manager. We should have managed the whole thing better – blame me!"

This was a period of change, after the company had ceased

trading in the High Street but traditional markets were waning. (Satellite communication was already in use by the Swedish merchant marine.)

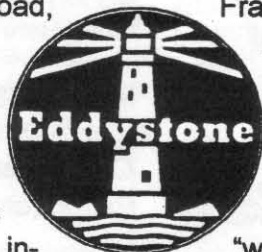
Bill would like to point out the world-wide success of the company's models, based on quality and pricing. These areas included Canada, Germany, France, Sweden, Norway, Australia, India, Russia, New Zealand, North Korea and South America, to name but a few. . .

"And -" continues Bill, "we were not without success in the USA. The valved 730/4 fulfilled top professional standards, as did the marine 909-series. The EC958-series complied with the highest MPT and CEPT requirements, as did the 1650. One of the most unusual was the diminutive EC10A2, ships' reserve receiver, which was a best-seller. The cabin sets, 670s and 870s, filled the liners of the world."

Would members please ignore all references to 1982 prices!

(Graeme & Ted promise to double-check future unlikely statements before publishing them in 'Lighthouse'!)

(Actually it's Collin's fault for sending us the price list . . .)



Eddystone User Group

ISSUE 63, OCTOBER 2000



Founded and Presented
by TED MOORE

Formatting & distribution by Graeme
Wormald G3GGL, Computer processing by
Simon Robinson M5POO

TED's MAILBOX

1999-2000 Index

Once again we are indebted to Anthony, GW4RYK, for providing us with a comprehensive Index for the last Volume of the EUG Newsletter (June 1999-April 2000).

It is bound in the centre pages of this magazine and should be carefully prized out from the staples and bound with last years copies, or receive a plastic spine binder-clip.

Thanks, Anthony, it's nice to have a professional to rely on!

We Are Not Alone

Picture this if you can. Here we have an EUGer stalled in Bank Holiday traffic at the end of August. The M40 is flowing evenly in the other direction and our bored and frustrated EUGer is idly watching the opposite

flow of vehicles when this Astra or Escort type of van passes by.

He has time to register the letters E.U.G in black on the side of the white van, large letters circa 5 inches tall, with what was probably a phone number in smaller lettering underneath. His position meant that even had he reacted fast enough he could not have seen the vehicle registration.

So, hence the heading. Have we been cloned? Has some person or organisation usurped our abbreviated title? Something like the **Environmentally Unacceptable Gimmicks**, maybe?

Whatever, we are all agog here. Despite a thorough search in both Kelly's Business Directory and the Compass Guide to Business Organisations I have come up with zilch. One assumes that this van does have a home so is there anybody out there who can come up with an answer to this enigma?

I promise to write a strongly worded letter to the miscreant if any EUGer can identify the vehicle owner.
Ted.

Receiver Prices

Following the items recently about prices I have heard from one member who boasts of having six Eddystone receivers all of which are in very good nick and work perfectly.

His comment is that the whole collection has cost him less than £200 over the past five years. The contention being that basically it is the Law of Supply and Demand that determines prices here as everywhere.

Sam tells me that by not actively going out looking for a particular model he has been able to wait for one to come along at a low price, or in two cases by swapping unwanted domestic sets for the wanted Eddystone.

An inherited Philips Export model was swapped for a very nice 940 which, although looking almost as new, did need some work

with switch cleaner on both pots and range switch.

The 830/9 was similarly swapped for a working Bush AM/FM set plus £15. This 830/9 did require a lot of work internally with duff resistors and condensers but was, and still is, in wonderful condition externally.

The other four sets are a 740 bought locally for £35, an 840C and a 670A bought for £55 and £40 respectively. Even placing an approximate price of £30 to £40 on the domestic sets he has been able to build up a nice collection of working sets for a minimal outlay. Since he is a pensioner this matters, and he adds that NO, none are for sale. Ted.

Graeme's Mast

Or what I have come to call it! An item in the Telegraph recently stated that the battle to save the Listed Monument mast at Bawdsey Manor has been lost.

This remaining example of the 372 feet tall Chain Home mast is in such parlous condition that demolition has begun, and by the time you are reading this the mast will be no more.

Corrosion and decay had so badly affected the structural integrity of this relic of the WWII radar chain that English Heritage had to give up all hope of saving it.

The Battle of Britain celebrations were taking place last month as the contractors moved in to effect the demolition of the mast, all that will remain for future visitors to Bawdsey Manor will be a commemorative plaque on the concrete foundation block.

Some EUGers may know that Graeme went there during his stint in the RAF. Ted.

Signals at Sea

In a recent copy of the New Scientist there is a reader's letter from one David Brown of Bath. In the letter the writer states that as a true 'Naval Briton' he suggests that the true

inventor of radio (wireless) was actually Captain Henry Jackson of the Royal Navy.

It seems that Captain Jackson sent signals by radio from ship to ship in 1896 and it was only later, after this, that he became a friend of Guglielmo Marconi. So besides the Russian Popov and Tesla, and Fessenden, we now have another claimant. I wonder just how far back we can take this claim?

I have read that primitive primary cells have been discovered in Iraq. Chemical analysis has proven that these 1000-year-old earthenware pots held traces of the necessary chemicals and electrodes for them to produce small currents. But what did they use this current for in that era? Ted.

Highjacked - Again

Well if somebody has highjacked our EUG then what about the 'new breed' of mobile phone technology et al, calling itself WAP with the 'W' standing for Wireless?

I was quite incensed to hear somebody on the World Service calling the new WAP technology the "only truly wireless application of modern times" — all depends on what he meant by 'wireless' and 'modern' I guess.

And yet our hobby and broadcasting are just as much a modern technology and just as equally wireless in the accepted sense.

Ted.

730/4 Plus

This 730/4 was bought from Anchor and almost certainly had an Army origin going from the label tied to it.

The set worked okay when powered up and was enjoyed for some weeks before the overwhelming desire to see the innards was heeded. A lot of muck inside which was cleared out with the Hoover. No real surprises

except to discover an original trimmer tool, very unusual these days!

Next step was to invert the beast on the table and check the underchassis. Just adjacent to the rear of the chassis was a small paxolin tagboard attached with a nut to one of the plug retaining screws. The tag board held two glass-bodied germanium diodes and it looked as though this was fed from the IF stages.

Some sort of discriminator for teleprinter use maybe? Ian is asking if any EUGer has owned an ex Army 730/4 with this mod? And if so what is it for? Letters to me please. Ted.

AFN on VHF/FM

Where I am at present, in the environs of Rutland Water, at Stretton, it is often possible to receive the broadcasts of the American Forces Network on 87.65 Mc/s.

The signal is fairly strong on a simple whip, appears to come from a southerly direction and shows none of the signal peculiarities of a Dx signal. In fact just the opposite. The quality is quite exceptional with no QRM or QSB and when it is there it may well last for several days and nights.

By checking with the MW signal on 873 Kc/s I have verified that it is the same programme but when operating an AM receiver in proximity to mine (on FM) there is a definite echo effect. A satellite feed being picked up and broadcast by somebody? This does appear to be the most likely explanation. Can anybody out there help me to identify the source, please. Ted.

Buying a Pig in a Poke

This EUGer wrote to me about the 640 which he bought recently at a Club Bring and Buy Sale. The wanted price was £50 but as there was a quite large and visible dent in the rear top corner of the case Tom managed to get it knocked down by £10. But he only paid over the hard earned cash after plugging the 640 in and warming it up to check reception. It

seemed okay despite the seller admitting that he had 'bounced it a bit' getting it out of the car that morning. Using a scrap piece of wire signals were there on all bands so the 640 was carted home.

The damage appeared to be purely cosmetic but the rest of the exterior did look a bit mucky. So the case was removed, again plenty of muck, and a few dead insects but this was cleaned up. The pots and switches were all squirted with 'cleaner' and a thorough check made of the rest of the set.

A metal 6F6 was fitted in lieu of the glass 6V6 and this was noted as a danger point. DO NOT EVER USE METAL VALVES IN THIS POSITION, or you may get a real belt of HT. A 6V6 from an AF amp was purloined temporarily and the set was tested out.

Definitely lively on all bands but a bit off frequency at the high end of Range 1. This is more often than not the case with most old receivers..

All of the other valves appeared to be okay, not even a hint of microphony in the IF/AF area. Despite some switch cleaner the slide switch seemed a bit 'iffy' and so this was removed and replaced with a modern version, same fitting too.

By now the set was as good as any 50 odd year old veteran ought to be, except for the case. Luckily a son-in-law who did car body work offered to do a complete 'rehab' job including spray painting.

He knocked out as much of the dent as possible, added a wee bit of filler and contoured it before doing a double coat spray job. The case looks factory new after his ministrations. That left the front panel. With a quantity of sticky drafting tape and a spray can of black shoe polish this has now been brought up to scratch and the cheap 640 now looks a million quid model. Ted.

TED'S MAILBOX

CONTINUES ON PAGE 18.

The EC10 Report

A continuation of the feature which first appeared in Newsletter # 61. Here we have members' ideas and tips.

Conducted by Graeme Wormald G3GGL

Since the last edition I have been the lucky recipient of Simon 'POO's munificence in the form of a working but pillaged EC10-MkII. (No S-meter, etc.) This is to be used as a test-bed for experiments suggested by members. At the time of writing I've got a set of tests lined up, but none carried out! Sorry.

Paul, G3JDM, writes suggesting that the Mullard AFZ11 and AFZ12 might be suitable alternatives to the OC170, being of industrial standard. Also the Texas GM6290.

The AFZ12 rings a big bell with me; when I was very active on 4-metres in the mid-1960s (using all-thermionics, of course), I constructed a low-noise pre-amp using the AFZ12 and boy! Did it work! For two years I had a daily sked with my dad, the late G3JQE, five miles north of Manchester, 80 miles from Bewdley. We NEVER missed a contact. We used Stratton S440B's at both ends (5 watts output, AM/CW).

Chris, G3XFE, reports that he tried the factory modification recommended in the last report. The drift was much reduced but he was unable to re-trim the set to cover the scale! He recalls that when he had an EC10 new thirty years ago it suffered from none of these problems. He puts it down to ageing of the germanium and suggests a BC560 as a good replacement.

Martyn Lindars in the West Country reports that BFO drift is due to a factory mod. He says that in order to increase injection the upper bias resistor was changed from 82k to 47k. Change it back to reduce BFO drift.

Chris '3XFE has recently referred me to an EC10 page on the www. Members with the facility may care to take a peep at this: http://minyos.its.rmit.edu.au/~rmmca/edd_ec10.html

Wow! What a web address! It belongs to Chris, VK3JEG. I've given him a shout and he's making one or two changes to the site.

Chris (VK) suggests a change for a dead OC171 RF stage. He tried a Silicon PNP type 2N2907 (which I gather is 'around'). In order to accommodate the new element he gives the following changes:-

- Replace R1 (68k) with 33k
- Replace R3 (470 ohm) with 220 ohm

He also suggests that a similar change to the IFs would be even more productive, but hasn't tried yet.

For those of you with extensive library facilities, the SWM for August 1973 carried a seriously complex feature by J.M. Osborne, M.A., F.Inst.P. G3HMO. The EC10 was still in production when this was written, but JMO gives the set a serious makeover! The article covers four pages of 8-point print; rather extensive to reproduce here, and in any case we don't major on huge modifications. Suffice to say that if anybody really wants to do the job the National Library Service could provide photocopies of the item. Quote Volume XXXI, pages 345-348.

This issue of 'Lighthouse' contains an interesting feature by John Instance, a former member of the Bath Tub crew, on his life at West Heath (see 'Echoes from the Bath Tub'). It covers (among other things) the early days of EC10 production.

We have also received an extensive letter from an anonymous Eddystone "old boy" (who has already been identified from his typewriter - ok, G4Nxx?). More of that next month, it will be a feature and a half!

★

★ MY EDDYSTONE BEGINNINGS ★

By Roger Bebbington MØBWP

Most of us started our 'radio life' by constructing something. But how many of us still have anything to show for it? Not many. But Roger has this tale of early endeavour . . .

My first real interest in short-wave radio was as a schoolboy, when I obtained an R1155 via a friend of the family. It cost the princely sum of £5; I think I paid him 10 shillings a week for it. He had just acquired an Eddystone receiver, probably a 750, definitely a slide-rule 'B' type.

So every week when I cycled to his home to pay him his 'ten bob' I took the opportunity to operate the Eddystone for as long as I could. The 'shipping band' was the one to listen to, of course. My 1155 didn't cover that band and being near the port of Liverpool there was plenty to listen to. I remember Anglesey Radio very well; sadly no longer there.

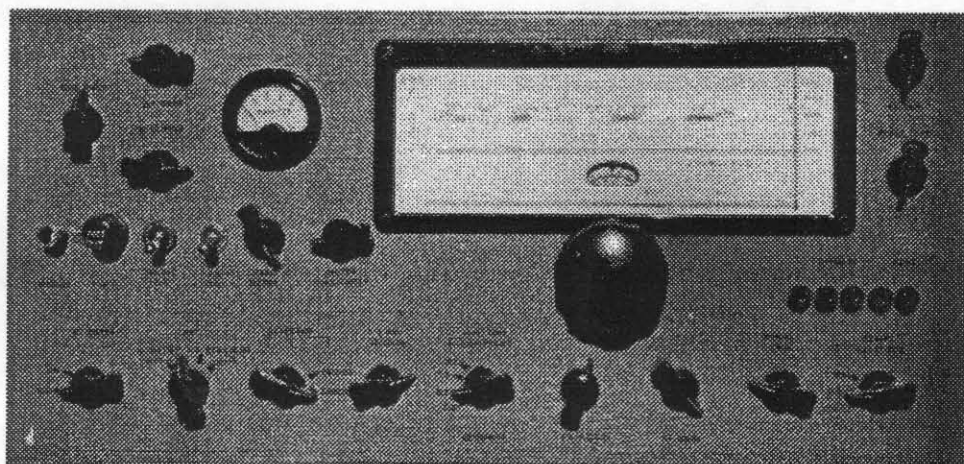
By this time I'd gained an apprenticeship at 'Pilkington Bros.' glass works. It was where everyone went to work, I think it employed about 22,000 people in the town at that time. Of course, you couldn't afford

taking at least five years, on and off, but the result was worth it in the end.

The receiver first appeared in the 1963 May, June and July editions of 'Practical Wireless' magazine. It was entitled 'A Double Conversion Communications Receiver' by P.R.Lewis. (I wonder if he's still around?)

He stated his main source of reference was 'an excellent series of articles in the P.W., October to March, 1954-5'. I've been unable to obtain any of these issues for any reference to the author, etc., but I was lucky enough to obtain the twelve editions of 1963 P.W. at a local rally recently for the sum of £2. They've provided a good memory-jogger to help describe the radio.

The circuit description was of a 13-valve double conversion design using all Denco Miniature Dual purpose coils.



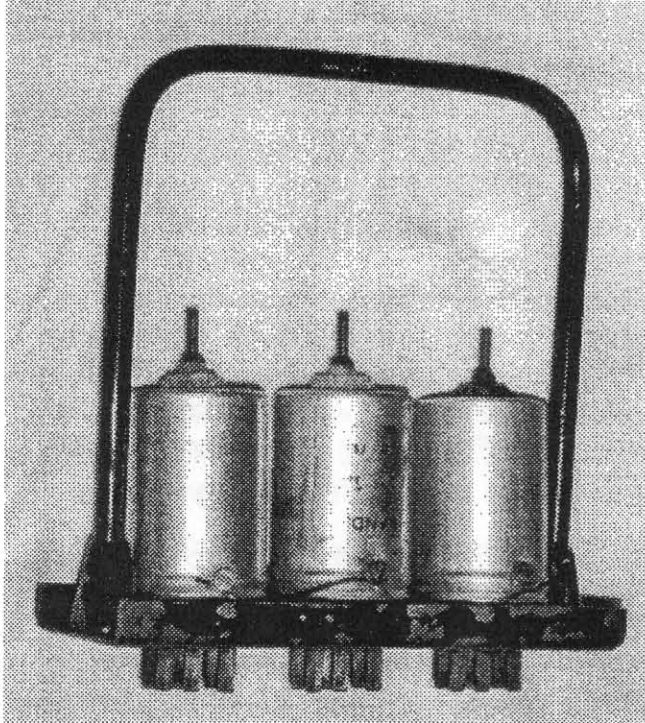
to buy an Eddystone on apprentice's wages and, as I had become interested in 'chassis bashing' by then, the next best thing was to build my own. It ended up

that time; a great era for home-construction.

After exploring the mysteries of the coil

I think the selling-point for me of this receiver at the time was the use of plug-in coil-blocks — obviously Eddystone 358 inspired. There were numerous receiver designs about at

wave-change boxes on the R1155 and various Eddystone I have acquired in recent times, I think this was a wise decision! The mechanical work involved in constructing the plug-in coil sets was well worth the extra effort.



The coil section actually consists of three 6-way miniature Jones sockets mounted in a row under the receiver. The plug-in coil sets were fitted with three 6-pin Jones plugs

with the Denco coils soldered onto them; one set for each wave-range.

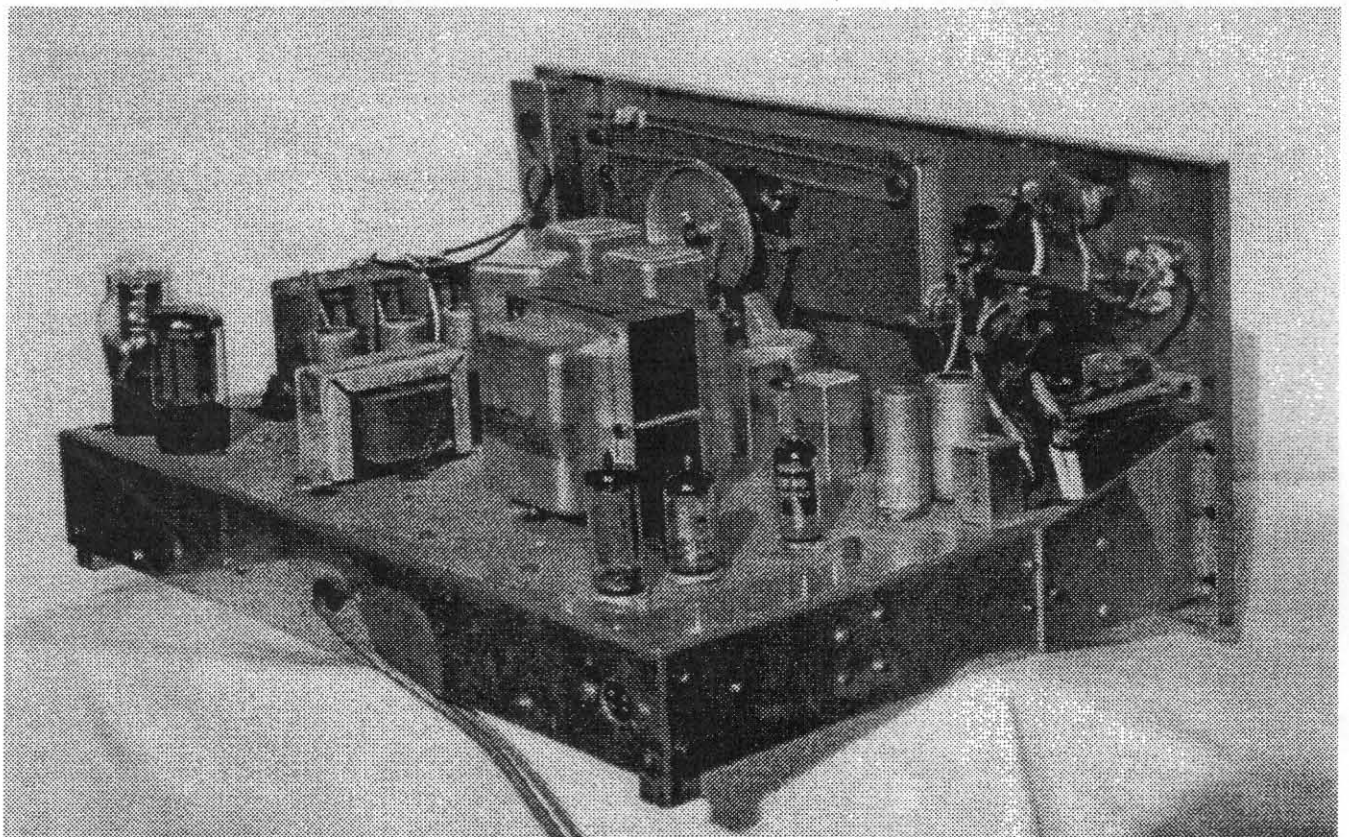
I remember the miniature Jones plugs and sockets being by far the hardest items to obtain. But at the recent rally at Blackpool I spotted new 'old ones' for sale, still in the Ministry waxed paper wrapping.

FRONT PANEL

The original P.W. design used a half-moon dial mounted at the far right-hand side of the front panel.

I had spotted the new Eddystone dial (which I used) in an amateur radio shop in Manchester (long gone, I suppose). Some re-engineering had to be done to take the Eddystone unit. The front panel had to be mounted away from the main chassis by about two inches. An extra wire pulley wheel had to be mounted to connect the dial drive shaft to the main tuning gang.

As the photographs show, it finished up being mounted off centre. I suppose with a little more planning I could have managed to mount the dial in the centre; but it doesn't look too bad!



I think the 'S'-meter is similar to the one used on the Eddystone Model 880. The Bulgin knobs and switches I used were obtained from various radio shops around the area.

The front panel was originally sprayed grey but it now has a yellowish tinge due to the lacquer, which I used to secure the lettering, discolouring with age.

The tuning dial is a pleasure to use and is made to the same high standard as the commercial ones (*it's the same mechanism as in the Model 870 - Graeme*). I like to think that the radio has a distinct 'Eddystone' feel about it. What do members think?

LAYOUT & UNDER CHASSIS

The chassis layout is more or less as described in the P.W. articles. The valves used were pretty standard for the era - 13 in all. 2 x EF95; 1 x 6BE6; 2 x EF93; 1 x ECH81; 2 x EB91; 1 x 12AT7; 1 x EF86; 1 x EL84; 1 x GZ34; 1 x VR150.

The first intermediate frequency is 1.6 mc/s and the second is 465 kc/s, these being the standard Denco coil sets of the time. 45 kc/s would have been better than 465 kc/s! The wiring layout was very much left to one's own arrangement.

The wiring colour-coding is a bit different; very much my own idea.

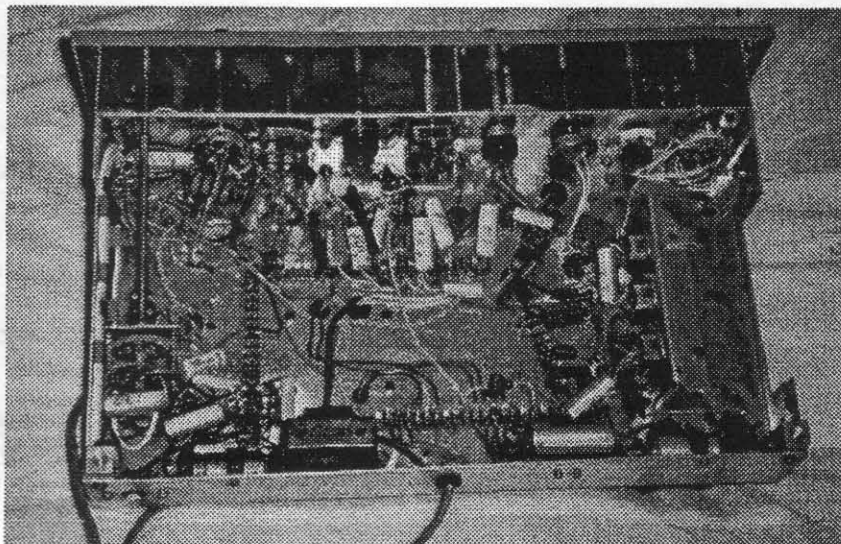
I set out the required parts to wire the stages one at a time and used a common colour for each section, and also wired each stage in one go. As perhaps two or three weeks might go by before I started again it enabled me to pick up the wiring quite easily using another colour. A form of error-proofing, I suppose you could say. I've also realised that it makes the circuit very easy to trace after all these years!

CONCLUSIONS

All-in-all, building and operating the receiver gave me a great deal of enjoyment; it was the next best thing to owning a real Eddystone!

The radio may just have gone a little deaf over almost forty years, but the Eddystone dial is still as smooth as silk.

I suppose twenty years was to go by from the end of the '60s before I was to develop a serious interest in short-wave radio again, via the same old friend from whom I originally bought my R1155 - "and how it had changed!!" . . . On to my Amateur Licence and finally back to real radio again, but that's another story . . .★



RADIO RAMBLINGS

Gettings from my Notebook



By
*Graeme
Wormald
G3GGL*

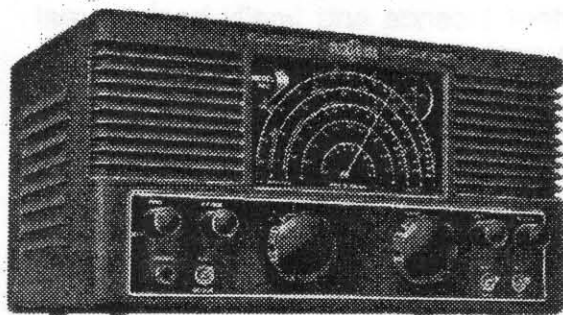
October 2000

Here we are ready to go and I can't remember what I was going to start off with! "It can't have been much," I hear you say. But it was! I remember now; it was one of Bill Cooke's stories; you know, the sort that makes the word 'Eddystone' come alive.

AN EMBARRASSING PROBLEM

Back at the end of the 'forties - start of the 'fifties, Harold Cox (Technical Director) had a phone call from one of Eddystone's main agents, Alf Willings, at West Hartlepool on the north-east coast. Alf had been the instigator of the famous 670-series of cabin-sets, when he suggested that the ships' crews wanted something better than cheapo American 110v AC/DC sets for their cabins.

Anyway, that's all by the by; this time it wasn't a suggestion but a complaint. Alf had five Eddystones in for service: 640s, 670s, and



740s, and he couldn't get any of them out of their cases. Seized solid!

A serious business . . . Next morning Harold and Bill (Chief Engineer) were on the Newcastle express (that's how we used to travel in those days; remember?).

And Alf was absolutely right! Nothing would persuade the cases to shift. They were crated up to return to West Heath. On the train home Bill and Harold worked out their strategy for investigating the problem.

Next day they strolled round 'Test', the holy of holies, where newly completed sets were aligned, checked and cased-up before being crated for despatch. Suddenly a muffled clunking-noise came from behind a closed door at the far end.

Slowly opening, they found the Head of Test wielding a large wooden mallet on the case of a 670! He swore it was the only way to assemble some of the more intransigent models . . . The answer to the problem was the little half-moon cut-outs you find on the front underside of most Eddystone cases. Insert a large screwdriver blade and twist gently. But you won't find it mentioned in the books! Has your early model got them?

REPORTS FROM THE SHOW

The Autumn Vintage Communications Fair at the NEC took place on the 17th September, following a week of absolute chaos on British roads caused by the fuel tax protests. Simon POO and I managed to get there and found only a few empty tables, but the visitors were noticeably thin on the ground. You could stroll round in comfort! So were there any Eddystones? Yes.

Yours truly acquired a 'brand new' 820 am/fm tuner in perfect working order for the modest sum of £25. Bill Cooke tells me it

was rushed onto the market in a great hurry in the mid-fifties to catch the trade for the newly opened BBC FM service.

Another interesting buy was a model 740, late '40s economy model. Not very often seen these days. It was in a pretty scruffy state but at £30 worth a second look. Not butchered and a new finger-plate has been ordered from Dave Simmons' stocks.

Also seen was a very clean EA12 (hambander), reputedly in GWO at the giveaway price of £100 (worth double); a nice clean 730/4 at £120 (well worth it, you see them for this price in a very scruffy state), and a poor 680X at £160 (not impressed!).

The novelty side was catered for on a stall which had four models of the 1000-series; two type 1002 (domestic AM/FM version) and two 'Marconi Sentinels' (alias Eddystone 1004). All with NATO numbers on them, all slightly scruffy-looking, all at £100 each. And they were all sold by lunchtime.

DIGITAL MAGIC

A couple of weeks ago a packet containing a CD-ROM dropped through my letterbox. Nothing new there (I'm always getting CD-ROMs through the letter box), but this one was labelled "Lighthouse". Now I don't get on very well with 'PC accessories' (such as the Internet!).

I find my screen covered in invitations to acquire facilities I don't need, and pay for services I don't understand. So I pushed this latest curiosity through the slot with some trepidation. But WOW! Within seconds I had EUG material bursting out of the screen, page upon page.

It had been sent to me by EUGer Dave Oakden G3UFO/VK6DJO and contained the Quick Reference Guide (QRG) and lots of Eddystone Service sheets. It was closely followed by others containing EUG Newsletters. A whole year on a CD. Dave tells me that he will shortly be in a position to offer this on a non-profit basis to

members at a very reasonable figure. Watch out for a statement here next month!

CORRIGENDUM

Which now brings me to last month's deliberate mistake! QRG, which was very well received by members (thank you for your kind words), has had its first correction. Dave MW1DUJ points out that the Eddystone 1002 hasn't got a BFO, so it doesn't cope very well with CW and SSB. Too right, Dave, I don't know what I was thinking of! WOULD YOU ALL please cross out the offending modes on page 16 of your New Edition QRG (model 1002 only). Thank you.

Whilst we're talking about last month didn't we create a flurry with the 1982 price list! No sooner had the postman delivered Bill's copy than I had him jump down my throat (in the nicest possible way, of course). "Where did you find all that rubbish?" he demanded.

It took quite a bit of effort to persuade him that we had a genuine copy of a catalogue and price list. I'm sure he thought it had been strangled at birth in 1982!! Anyway, the result was the notice on page 4 of this edition of your favourite Eddystone magazine; please take note and amend accordingly.

PHANTOM YACHTSMAN

An e-mail came in yesterday with news of a new version of the EY11 transistor Yachtsman. A friend had acquired it at the Leicester Show. (Not an EUG member). He was enquiring about the handbook!

I had to explain that the only set in the world was in the Marconi Museum . . . or so we said in last February's Newsletter! Today I went to examine it. Quite a bit different from that in our feature, but definitely labelled 'EY11'. No serial or makers' plate; very much a 'one off'. Ben has promised pictures for the next 'Lighthouse'.

LUCKY FIND

We are all indebted to EUGer Chris Snipe who had a lucky find at the Dunstable Car Boot Event. Two bound copies of the "Wireless Magazine" (about 3" thick altogether) for the year 1931. And we owe Chris a GREAT BIG 'THANKYOU', because he's donated them to EUG!!

Not only has it got Stratton adverts we've never seen before, it's got a review of the first Eddystone All World Four of 1930. This was the all-diecast aluminium model, designed by Harold Cox, which set the style for the next fifty years. "The best short-waver yet" is the reviewer's finding! Keep watching 'Lighthouse' for the reprint. And see the end page of this feature for a taster. Thank you Chris, you're a gent.

SKELTON RELAY

As regular readers will know by now, I first started my paid radio life at BBC Skelton Pastures (I'd been an unpaid ham for four years by then!). This is the giant multi-Tx station in Cumberland with universal shortwave capability. Now that the cold war's faded away this has left spare capacity, and I can commend one user to you.

This is Radio Canada International, which isn't always easy to get direct here in UK in the evenings, but Skelton (now part of Merlin) relays their English service every evening at 20.00 to 22.00 GMT on 5995 kc/s. It comes in at S9++ here in Bewdley, so I expect it will be fine throughout England and Wales. Not sure about Scotland. It's one of the better English services, so give it a try.

REPAIRING THE S.358

I've recently been 'looking' at a member's vintage Eddystone S.358 of 1941. It's the oldest Eddystone most of us are ever going to get our hands on and it hasn't got much of a reputation. Let's face it; it's pretty ugly compared with its little sisters!

But it really was a well-thought-out set. It has a built-in valve tester, well worth having, and the innards have modular construction. This helps servicing no end.

So what was wrong?, you say. Well, the set was as deaf as a post. Here in Bewdley we're ten miles away from the Midland region transmitters at Droitwich. My 80-metre loop aerial produces 4-volts peak-to-peak from them! The meter was giving iffy readings for the first RF (an EF39 pentode) which, on examination, turned out to be an ECH35 triode-hexode (frequency changer)! The quickest repair yet. But no, not much difference. And hang on. The last IF (also an EF39) wasn't looking very good on the test meter either. No wonder! It was an EBC33 (double-diode-triode detector). Change that too, it must work now. But no, still very deaf.

So now down to the serious sort of fault-finding. Signal generator on 450 kc/s; peak all the IFTs. All behaving well except the last secondary. As flat as a pancake. Mmmm.

The trimmers in the 358 IFTs are Jackson Bros. airspaced, not dust cores. So you can't be sure if it's actually peaking at all, or just favouring all in or all out. There's only one way to find out, and that's get in the can and look at it. Which is where the modular construction comes in. You can take out the sub-chassis to get at things.

A little forethought would have told me that the circuit diagram was suspect in this area. A 4-40pf trimmer isn't enough to tune a hi-Q 450 kc/s IFT. A rule-of-thumb guide is 1pf per metre in such a circuit, and 450 kc/s is a wavelength of 666 metres, so where's the extra 5 or 6 hundred puffs? Answer: inside the coil can, but not on the circuit!

On removing the screening can there was a chunky ceramic fixed condenser, an inch in diameter and 1/8" thick, labelled 500 pf +/- 1%. It was suspended in space on one lead, the other had succumbed to metal fatigue in the solder.

After repair and re-alignment life was restored. A first-class performance. So don't belittle the S.358 (or its rare LF version, the S.400). It's lovely to work on. And there's no dial cord to break!

HEARD ON THE NET

Last month's feature on the product detector produced some comments on the September 'First Sunday' 80-metre EUG net. Ralph, G4EBL, who understands these things better than most, is looking into the question of creating a batch of printed circuit boards for this 730/4 project. I think he had six orders for it on the spot! If anybody would be interested perhaps they'd like to drop me a quick line (or e-mail or telephone) and I'll let Ralph know.

Oddly enough, we have a feature this month, culled from a 1960 'Short Wave Magazine', which decries improper use of a receiver's controls for CW and SSB reception. Watch out for 'Receiving Technique'. The anonymous author would doubtless consider a product detector to be a namby-pamby piece of trickery!

SSB FOR ALL

Actually, using the little grey cells rather more than usual I have come up with another answer for those who wish to create such a device for pre-SSB Eddystones (and other sets too).

Stratton has already done it for us. In 1956 they produced the ham-bands-only Model 888, without a product detector. This was rather short-sighted because the writing was already on the wall. Within a couple of years they had to re-hash it as the 888A, with a product detector. And how did they do it?

Just look at the two circuits side-by-side (they come together for the price of one from Dave Simmons). You will see that the pentode BFO has been changed to a pentagrid BFO/product detector. The IF has

been routed down to it, the audio comes out from it, and back to the AF gain!

Actually it couldn't be simpler; all it will need for any set; (504, 680X, 640, 740, 750, 840, 840A, 840C, 730) is to shift a couple of wires, add three or four Cs and Rs. I'm not sure if it would be counted as vandalism or not! Perhaps one of our more inventive members would like to study the circuit of (say) the 680X, and give us the benefit of the simplest mod possible to achieve the result.

YET AGAIN!

I see that another member has broken the age barrier again, possibly by accident, because he didn't actually claim the record! So I won't give you his name but I will tell you that he was born in 1908. And that's before *Bleriot* flew the Channel . . .

Even this pales beside the report in *RadCom* this week of the *hundredth* birthday in August of Doctor G.A.V. Sowter (Gav), G2OS. First licensed in 1922 as 2OS (*same year as 2LO*), Gav is still active on the DX bands with his FT-990 and a 3-element beam. He has been a member of the Institute of Electrical Engineers for 79 years and belongs to the Surrey Radio Contact Club. Well done! Sir, and congratulations.

BROKEN TEETH

I've just been repairing a friend's 888A which had been standing for a very long time in a damp environment. Everything had survived very well except the dial cord wire, which had rusted badly. Someone had turned the knob; it had snapped and taken three teeth from a dreaded cog.

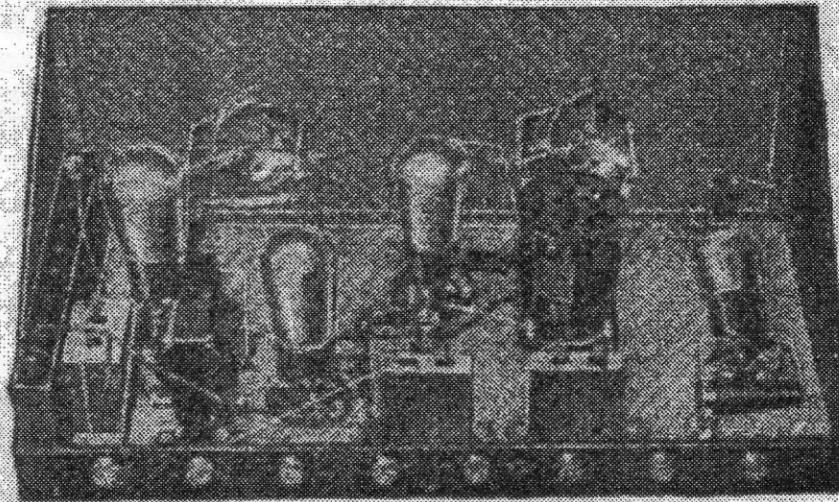
I had to do Anthony Richards' (GW4RYK) cogwheel repair. It worked perfectly!! To remind you, Anthony has had some cogs specially made for grafting onto the spiral wheels. See 'Readers' Free Adverts' for details (recommended).

★★★

Graeme - G3GGL

EDDYSTONE

HOMELAND FOUR SHORT-WAVE RECEIVER KIT OF PARTS



A RECEIVER designed for Home construction and capable of reception of S.W. programmes at Loud-speaker strength over vast distances and under adverse conditions. Simple to operate—only one tuning dial. Smooth reaction control and no unpleasant capacity effects. Wavelength range from 12.5 to 85 metres and from 250 to 550 metres. Coils for any between wavelengths up to 2,000 metres can be obtained. Receiver is built on a metal chassis which is ready drilled for assembly and includes all components, wires, screws, etc., needed to make up the complete receiver.

Kit complete, without valves, **£10**

Constructional booklet, with diagrams and details, 6d.

Send for list No. 38 for S.W. apparatus.

Sole Manufacturers :
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London Service Depot :
C. WEBB, LTD.
184 CHARING CROSS ROAD,
LONDON, W.C.2

Thanks to the generosity of EUGer Chris Snipe we are able to bring members historical advertisements like this. Thanks, Chris.

Wireless Magazine. March. 1931

'RECEIVING TECHNIQUE'

EUGer Richard Witney, G4ICP, spotted this feature in a 1960 Short Wave Magazine. It is essential to apply it to any vintage Eddystone when copying CW or SSB. Read on.

We repeatedly discover for ourselves that many listeners (and even some transmitting amateurs) possess good gear without having the faintest idea how to make the best use of it. A good example is the reception of CW. Someone recently sent us a tape recording of the Top Band tests, as heard on the American East Coast. On it were dozens of strong CW signals, but it was all we could do to read them from the tape.

It was obvious that the receiver had been operated with almost full RF gain on, giving a terrific background noise to start with. Under these conditions the BFO was not nearly powerful enough to produce a clean beat with the stations, so the CW showed up as an anaemic kind of thin piping sound, breaking into and partially suppressing that terrible background roar.

If the operator had merely turned the RF gain well back and advanced the audio gain by a corresponding amount (and, obviously, switched off the AVC) we should have had clear, musical notes from the CW stations, with little background noise.

If you are not satisfied with your receiver's performance on CW, try this test for yourself: Tune in any CW Station you like, on any band. Listen to it awhile, and then slowly back off the RF gain until it has become practically inaudible. Bring up the audio gain until you can hear it clearly and then back off the RF gain some more. Continue this process until you are using practically full audio gain, and note where your RF gain setting now lies. You will probably find that for all future CW reception you will keep the audio gain control almost full out, and do all your volume controlling with the RF control.

The same applies to SSB. Ninety percent of the listeners who complain that they can't resolve SSB are trying to do it with too much RF gain and insufficient BFO injection. Switch off the

AVC, advance the audio gain and turn the RF gain back until the signal is at a comfortable level. Leaving the BFO in the same position that you would normally use for listening to CW, tune up and down the "monkey-chatter" very carefully with the normal tuning control, until you find a place (very sharp) where it makes sense. If there isn't such a place, rotate the BFO pitch control through zero-beat until it settles at the same pitch on the other side. Then have another go—it's bound to work on one side or the other.

The only time when it really pays to use full RF gain and AVC is when you are tuned to a phone net comprising stations of all strengths varying from a "local-signal wallop" to much weaker signals. Then, for your own comfort, the AVC should really be allowed to work; and if it does work properly you should have all stations in the net delivering roughly the same amount of audio to your loud-speaker, some with more background noise than others, according to their relative carrier levels.

This method of reception is also essential if you want to give accurate S-meter readings, especially on a noisy band. For all general use of the receiver, however, you will need, if you wish to get the best out of it, to find that correct balance between RF gain and audio gain which gives the best signal-noise ratio.

On every occasion on which we have heard a particular type of receiver condemned as "too noisy," we have found that it has habitually been used with the RF taps full on. One listener we know even managed to acquire a bargain in this way: the owner was convinced that it was faulty, and sold it for well below its proper figure. The new owner simply used his common sense and found that he had acquired a much better receiver than his former one, with which he had anyway been quite satisfied.

★★★

TED's MAILBOX

CONTINUED FROM PAGE

7

An EY11 ?

The recent purchase of an EY11 by one interested collector has thrown Graeme and I once more into confusion. Given that we have so often been told that none went into production, then it must be that this is one of those Pre-production prototypes that DID exist.

It will be interesting to find out more about this EY11 and as Graeme commented, 'especially the serial number, if any'. (See 'Radio Ramblings' for latest report - Graeme).
Ted

Cabin or Communications

My idea is that when a receiver has a BFO it becomes a communications receiver, without a BFO it is a cabin receiver. This makes the difference between the 840 series (with) and the 670 series (without).

The letter from one non-EUGer asking for info on his 670C Communications receiver was the start of a correspondence with me stating it was no such thing and the other guy insisting that it was.

I duly explained what I could imagine was the cure for his problems with the 670C and after twice re-iterating my feelings re the +/- BFO I dropped him.

Two weeks later I got another letter asking me why I had declined to continue the

discussion. The fact is I had nothing more to say and more importantly had a pile of EUG mail awaiting my attention.

This is just to explain a few "Facts of Life". Whilst I am happy to try and resolve problems for non-EUGers, I have little time left to carry on long correspondences with them.

My time is limited and I put as much of it as I can towards EUG. Sorry but that is the situation, others can always join EUG though.
Ted.

The 720 'Yachtsman'

Whilst not owning one of this rare breed I have heard from Tom who was allowed to try one out for a half-hour or so.

Being a visitor on board the boat whilst he was on holiday in Cowes, Tom was able to tune up and down the bands on this set and said that his recollections were that it was not all that sensitive.

Then he adds that this may have been a poor aerial system and not a receiver problem. Despite the boat in question being one of those classic Gentleman's Yachts the available aerial wire was but some 15 feet. To compound the difficulties this was situated amongst a pile of other wire halyards.

The set operated well enough on the Consul stations and both Bushmills and the French one were at good strength. He was also able to hear a number of Beacon Stations on both the French and English sides of the Channel.

The fixed tuned BFO flummoxed him at first but then it was adequate. On the R/T or so-called Trawler bands he was able to resolve a fair number of stations both boats at sea and the British and French shore based stations which catered for shipping.

If there was one aspect which he did not appreciate about this model, it was the constant hum from the vibrator power supply, this was noticeable in a quiet cabin environment. He was also reminded of the owner's warning that the 720 was pretty quick to 'flatten' the batteries.

Despite all this Tom says that he would jump at the chance to buy one if it became available, being that the 720 is one of the rarest of the breed. **Ted.**

870A Fault-Finding

The rather simple circuit of this basic model was still a bit of a mystery to Dave who has more knowledge of solid-state circuitry but when his set began to go off and on seemingly at random he decided to sort it out himself.

What he noticed was that the intermittent nature of the signals occurred on any band, could be brought on by turning up the volume or by changing the bands up or down. He could also bring the set back to life by flicking his forefinger hard against the Range knob.

Taking off the outer case and turning the 870A upside down on his table Dave had a good look at the underchassis area whilst the set was OFF. Nothing appeared to be wrong and so without more ado he powered it up, keeping his fingers well away from the 'live' chassis.

The set began to play when warmed up and so he 'flicked' his finger against the Range knob, off it went but the power was still there as the valves were still lit up. He checked that HT was there too with his DVM.

Next step was to make himself a 'hammer' from a long wooden knitting needle and a pencil eraser glued to the end of this handle. Taps almost anywhere but in the region of the range switch wafers seemed to have

little effect, raps onto the Range knob, the spindle of the switch or the wafer nearest to the front panel worked on each occasion. One tap on, another tap off

Next step was to purloin a pair of plastic tweezers from a long unused PCB making kit. This time he began by very gently touching the various wafers of the Range switch and the wires soldered to them. His successful tug on one wire had surprising results, it was a dry joint!

A blob of solder firmly attached to the wire but having no attachment to the tag of the front wafer. Using no more solder than was on the tip of his soldering iron he re-soldered the joint and made certain that the solder had flowed into and around the tag hole

None of the other tags appeared to have the same problem and so he powered up the set again and once it was warmed up he tried his sadistic 'hammer' investigations.

There was no sign whatever of the original problem and so the 870A was once more boxed up and put into use.

This set has had at least three owners in its long lifetime, had the problem made itself known they would certainly have cured it. The only conclusion must be that a very minute amount of solder must have bonded but that with time and fatigue this had broken away leaving the dry joint phenomenon. **Ted.**

Old, but Unused Condensers

Joe has always been a hoarder and has an overflowing junk box gathered over some 40 years of the hobby.

Needing some paper insulated type decoupling condensers for a domestic radio repair he removed and tested several cards of old waxed paper type of 0.1 and 0.01

muffs. Lucky that Joe did test them before use since he discovered that not one of them gave anywhere near the marked value of capacity.

Some of the 0.01 type were reading as low as 0.005 on his Capacity meter. Checking the meter with known good condensers of modern polypropylene construction showed that the meter was okay.

It was decided to open up one of the duff condensers for examination and this was done by dissecting it along its length with a Stanley knife. When opened up and the rolled foil and paper was examined it was found that most of the foil had oxidised to a grey powder and that there were even holes in places through the waxed paper dielectric. Hence the low capacity readings.

Several dozen of these old, but unused, condensers have had to be dumped. Not only those with an external wax coating over a cardboard tube but also several cards of those grey plastic coated Radiospares type from the 1950s. These all read low in capacity and in some cases were quite leaky. A warning to all of us who re-use old components or hoarded unused old bits.

Ted.

AM/FM Tuner Problems, The 820, Encore

Back in September 1998 Colin wrote in re problems with his Model 820 tuner unit. This was featured on page 4 of the EUG Newsletter Number 51 the following month.

Well Colin has written in once more to say that he has had precisely the same problem again, and with the self same cure too!

To save you looking back this was the gist of his problem, a drop in performance on the FM band but AM as normal. Sometimes there was no FM signal coming through to

his amplifier but occasionally there might be some faint signals from the local BBC station at Holme Moss just a few miles away.

Originally the 820 had been used fed through the AF stages of his 670C but recently this had been swapped for a home built amplifier to a vintage Mullard circuit. Since AM was fine it began to look as though there was something similar to what had happened a couple of years back.

Sure enough, the same components — the Philips type trimmers and the same fault — the build-up of white corrosive deposits inside them causing short circuits from stator to the rotor, in this case the 'twisty' cap.

Once again the cause was obviously the vast amount of humidity in the outdoor shack, but why only this unit and none of the other domestic or comms equipment in the shack?

The simple answer is that the 820 combined with its amplifier is used for background music whenever in the outdoor shack and is wired to come on whenever the overhead light is switched on. It gets far and away more use than any other equipment, gets warmed up and cooled down much more often as the shack is often used as a 'sanctuary' where the radio mags can re-read in peace.

Anyway, off came the tops of the trimmers and out came the small typewriter cleaning brush and the switch cleaner aerosol. Of course it sounds easier than it is since after this TLC the 820 had to have a re-trim again.

It may be that this job is going to become a regular task every two years so do not be surprised to hear from Colin again in 2003, or 2004.

Ted.

**More of TED's MAILBOX
follows on page 50**

THE EDDYSTONE SETS THAT NEVER WERE.

Why they failed to make it into QRG

Since the new 'QRG' was issued last month I've been asked why I got the date of the introduction of the 680 wrong and why I failed to include the 1951 770M.

The answer is: because they never made it to the customers. 'But the 680 DID make it to the shops!' I hear you say. Yes, but not until 1949, not in 1947 as the 'Wireless World' would have us believe!



(Wireless World, October 1947, page 373, 'Radiolympia Report) -

"Eddystone Model S.680 communication receiver (above) is an improved version of the "504". It is 'a nine-valve super having two R.F. and two I.F. stages, the latter incorporating a crystal filter giving a 45-db attenuation 1 kc/s off resonance. Use of this filter is optional. This receiver provides continuous tuning from 30 Mc/s to 600 kc/s."

The announcement (above) seems genuine enough, but wait! How many valves? Doesn't the 680 have fifteen valves? Well, yes. The one that got into the shops, that is. It also had a variable IF selectivity control (not a toggle switch) at the bottom right, and the phone jack was round the corner on the left.

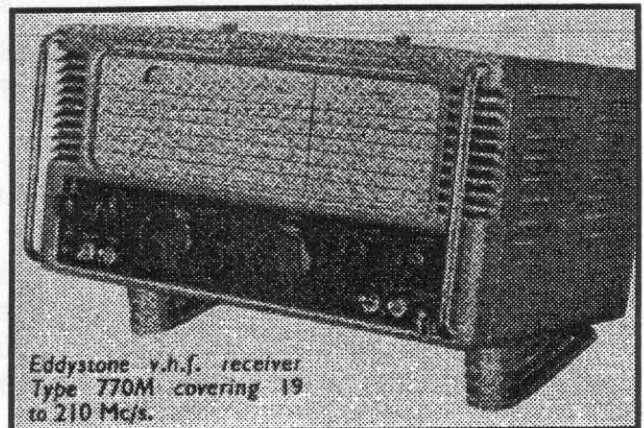
Also, not very obvious on the picture, the cabinet is 3" less back-to-front than the ones which adorn our collections. The original 680 was in a 640/740 case; there wasn't enough cooling space and the mains tranny wasn't man enough for the extra load. To cut a long story short, the model shown in the Wireless World had an unfortunate propensity to burst into flames!

The Radiolympia model was more in hope than anticipation. It took another two years to develop and when it did, it had acquired another six valves to

make it a star. When it was advertised in the Wireless World in 1949 it was described as the 'NEW 680'. (For some reason, honour decreed that the '680' was a success, it couldn't be re-numbered!)

The 770M was no better. It was announce in W.W. for October 1951, having been ordered for the Government radio spy service (GCHQ). The specified upper frequency of 250 Mc/s, combined with a lower frequency of 20 Mc/s resulted in an impossible tuning condenser design. It hit self-resonance around 200 Mc/s. No matter how they juggled it at the Bath Tub it remain stubbornly intractable.

Something had to be done for the 18th National Radio Exhibition so another bit of fiction made it to the display stand!



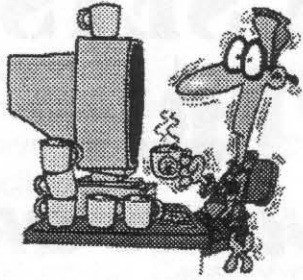
Eddystone v.h.f. receiver
Type 770M covering 19
to 210 Mc/s.

(Wireless World, October 1951, page 395, 'Radio Exhibition Review'.) -

"Conforming to the same external appearance as the new Model 680X is a new v.h.f. communications set, the Model 770M. It is a double superheterodyne covering in six bands 19 to 210 mc/s and having a diecast rotary coil turret. The set accepts a.m., f.m., and n.f.m. (narrow-band f.m.) telephony and c.w. signals . . . "

REALLY! They never did get it to work, of course, and after another two years of research it emerged as the 770R, a single superhet covering 19 to 165 Mc/s. The higher frequencies were catered for a year later by the successful introduction of the 770U double-superhet covering 150 to 500 Mc/s. ★★★

Graeme Wormald - G3GGL

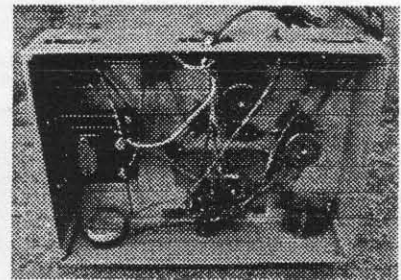
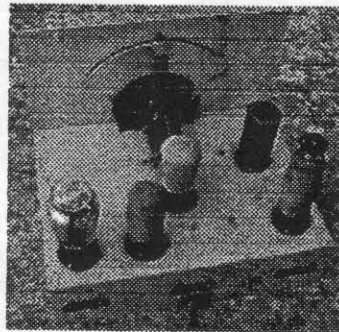
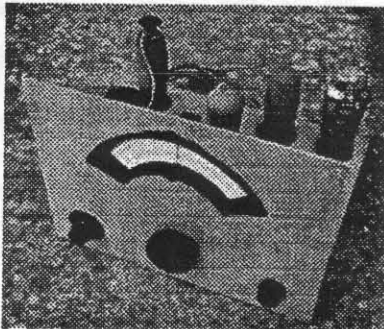


POO'S PONDERINGS

'Stray thoughts from an absent mind!'

by Simon Robinson M5POO

October heralds the beginning of autumn and dark, cold nights when it's better to be inside with a good radio. What better than an Eddystone Kilodyne 4 from 1935! The radio below has only just been acquired and has no specific provenance attached to it. It will therefore be restored to original condition. These sets were available for several years both in kit and ready built form. Mine is the former and will be treated to plenty of TLC.



The three views above show the set in all its glory; complete with a little corrosion here and there. Pictures of the restoration will be posted in full colour on the website.

A trip to the NEC and the National Vintage Communications Fair

Despite the madness of the general populous regarding petrol, I joined Graeme for a visit to the NVCF in September. Attendance was down due to petrol fear but there were several Eddystone sets on sale. I always find the fair a great source of hard to find components for sets such as the Kilodyne 4.

Our contribution to prevent global warming

Graeme and I called to see a friend of mine whilst I was down South and we came away with an estate car full of old Wireless Worlds, Short Wave Mags, Radio News, 73, CQ and other choice samples i.e. about half a rain forest!

Scanning through the magazines it's amazing how many Eddystone sets are featured. Virtually every station in the 50's and 60's had one in the shack. Even 'Clegg', an American radio manufacturer was using Eddystone 898 dials on their sets.

These magazines make much better reading than the newer stuff. People used to be real amateurs forty or so years ago. Remember?

More finds!

I recently acquired two model 730/10 receivers. Outwardly they are the same as a 'normal' 730/4 but the rear panel has alternative connectors. There does appear to be a minor circuit difference, which I will report next month when I've researched it some more.

Problems with a 940

Recent repairs to a 940 unearthed a potential problem I had forgotten about for some time. The set was almost dead with very distorted low-level audio. Initial checks revealed nothing wrong and all the valves were 'waggled' to make sure they had a good contact with their bases.

Cold checks on various components revealed some open circuit decoupling capacitors and many very out of tolerance screen and anode resistors. After these had been replaced I expected beautiful noises from the 940 but it was just the same as before! I checked and rechecked all voltages; they were almost spot on. Further checks with a 'scope confirmed that the signal was being distorted at the first IF. I swapped valves for known good ones; no change.

A quick call to Graeme and we were both rather bemused. He suggested I check the valve bases, which I did. Several of the contacts had opened so wide as to come nowhere near the valve pins at all. Even the 'waggle' test had failed to show them up. Once they had been retensioned the set worked 'just like a real one'. I had bad dreams about this set for several days afterwards.

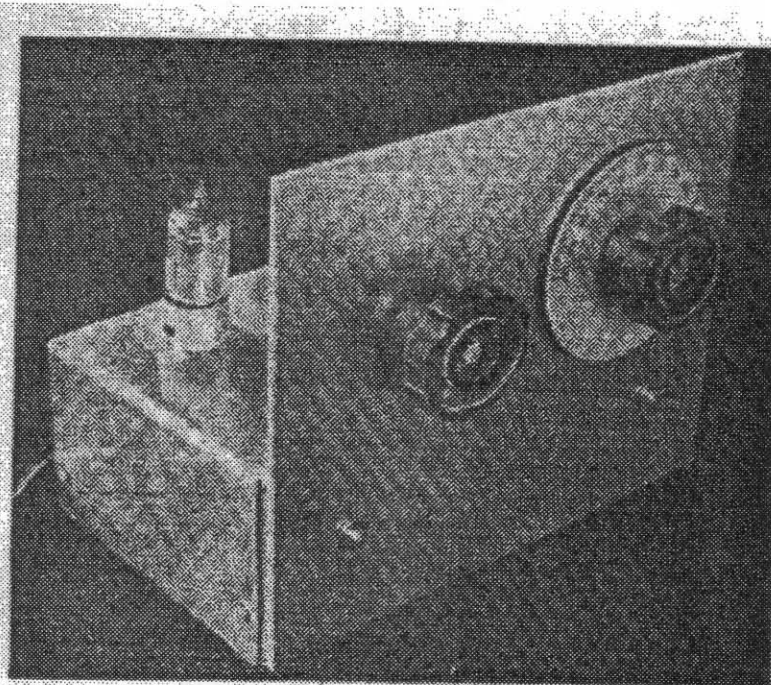
M5POO joins the HF fraternity

Most 'new' amateurs go out and spend a few hundred quid to get on HF with a nice new shiny rig. M5POO did not, as he was given a "working" Yaesu FT901. Thus begins nightmare number two. The set could not have worked for some time as one PA valve (a 6146) was white and a previous owner had tweaked every preset in the radio. Both PA valves and the driver were replaced and a great deal of time was spent realigning the radio from front to back. All the high voltage capacitors were replaced at this opportunity too.

Try as I might I could not set up the sidebands correctly. After much pondering it was decided that of all things the SSB crystal filter must be faulty. A shiny second hand spare was fitted and the fault remained. OK it can't be that then! Many hours were spent looking for other problems but I kept on coming back to that filter. I still had a scratched and dented second spare. This was fitted and the set was on the air fifteen minutes later. I've always thought that these filters NEVER failed; never mind two in a row. This has been included this month so that no one else wastes there time looking for 'standard' faults that don't really exist.

That's all folks; I'll see you next issue.

After last month's discovery we have a surprise



the AT S.

THIS is a very simple receiver, and thus suitable for beginners. If used as a single-range receiver, it will cover approximately 15m to 40m, and this includes those bands most generally used for long distance reception. The set also works well on other wavebands, over the range 9m to 200m, and can easily be wired to take plug-in coils.

Circuit

The circuit is shown in Fig. 1, and none of the component values is critical. The tuning capacitor, VC1, is shown as 160pF, but 100pF to 200pF may be fitted, with some change in band coverage. Current is obtained from a mains power pack, and the phones are isolated from H.T. and mains voltages. The receiver will be safe, if the power pack is arranged as described. Consumption is

quite low, and it may be possible to take supplies from an amplifier or receiver. If so, the safety precautions mentioned for the power pack should be observed.

Regeneration in the detector is controlled by VR1 and this gives high sensitivity. Reaction is obtained by a cathode tap on the coil, and this is an effective and very satisfactory method. The second valve acts as an audio amplifier, with bias developed across R5, which is 10M. C3 should be a mica condenser, to avoid upsetting working conditions.

Coil Windings

For a single, fixed coil, a waveband of about 15-40m is most generally satisfactory, as mentioned. This coil is thus recommended. But if it is wished to tune other wavebands, it is quite easy to wind further coils for these. Ribbed plug-in coils, with a chassis mounting holder to suit, may be easily obtained, and as many coils can then be wound as wanted.

For the 15-40m coil, a ribbed former about 1½in. to 1¼in. in diameter, and at least 2in. long, will be required. The windings are shown in Fig. 2. There is no need to adhere to the exact wire gauges, turns spacing, or other details. Changes in these, or in the coil diameter, will modify the band coverage, but results should be just as good.

The grid winding of the 15-40m coil consists of 9 turns of 22s.w.g. tinned copper wire, turns being spaced to occupy about 1in. The cathode tap is soldered on one-half turn from the earthed end of the winding. For aerial coupling, 4 turns of 26s.w.g. wire are used, this winding being about ½in. from the grid winding, as in Fig. 2. The ends of both windings are

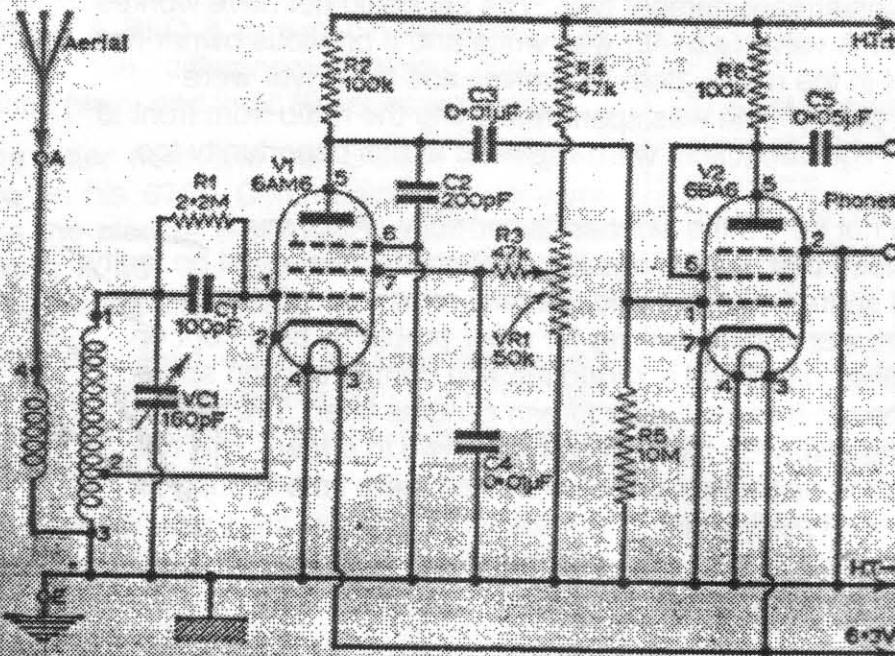
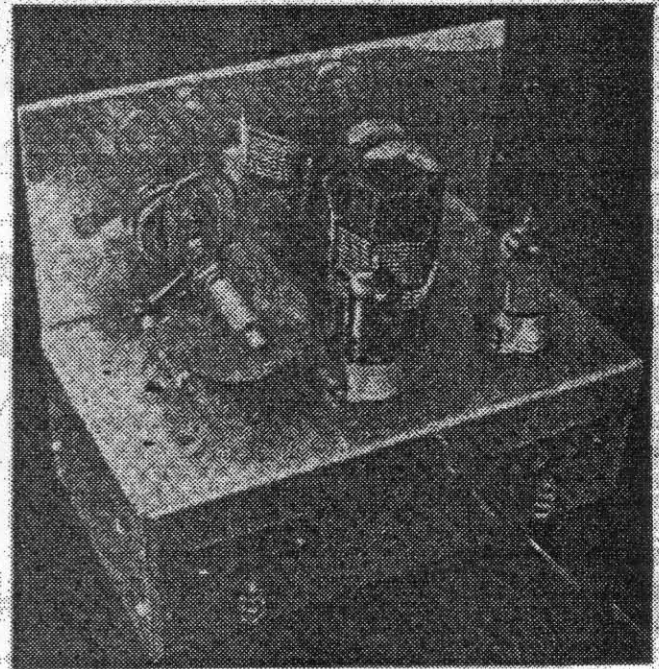


Fig. 1—The circuit diagram.

Eddystone Specified from Tor Marthinsen.

ANTIC W.TWO

by F. G. Rayer



joined, as indicated, this lead going to the receiver chassis.

Other Ranges

If required, other coils can be wound to give approximate bands as follows:—

9-15m 4 turns 20s.w.g. occupying 1in. space; tap at $\frac{1}{2}$ turn; aerial coupling, 2 turns.

30-60m 16 turns 24s.w.g. occupying 1 $\frac{1}{2}$ in.; tap at $\frac{1}{2}$ turn; aerial coupling, 6 turns.

60-110m 32 turns 24s.w.g. occupying 1 $\frac{1}{2}$ in.; tap at 1 turn; aerial coupling, 8 turns.

100-200m 55 turns 24s.w.g. occupying 1 $\frac{1}{2}$ in.; tap at 1 $\frac{1}{2}$ turns; aerial coupling, 12 turns.

Aerial coupling windings of coils covering 30 to 200m can be of 28s.w.g. or similar enamelled wire, with turns side by side, to save space.

Chassis and Panel

Fig. 3 shows the layout, the chassis being 7in. x 4in. and 2in. or 2 $\frac{1}{2}$ in. deep. The panel is 7in. x 6in. and is secured to the front runner of the chassis by means of two 6B.A. bolts. Fig. 3 will allow the valveholder holes to be suitably placed, and indicates the positions for valves.

Further details of the tuning drive will be seen in Fig. 5. The dial is slightly clear of the panel, some form of reduction drive is essential, and a small ball-drive of this kind is easy to fit. The projecting lug on the drive must be prevented from rotating, and this is arranged by passing a bolt through the panel, as in Fig. 3 or Fig. 5. A slotted bracket will allow the tuning capacitor to be mounted at the correct height, so that the whole turns smoothly.

The moving plates tag of the tuning capacitor is connected to a tag bolted to the chassis. Lead 1 from the coil is left long

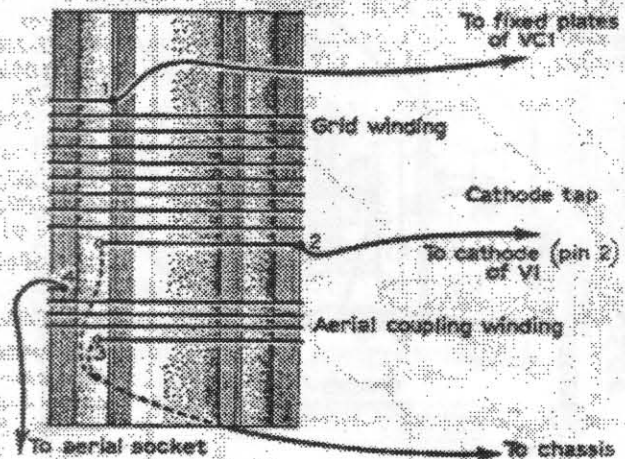


Fig. 2 (above)—The coil winding details.

Fig. 3 (below)—The above-chassis layout of components.

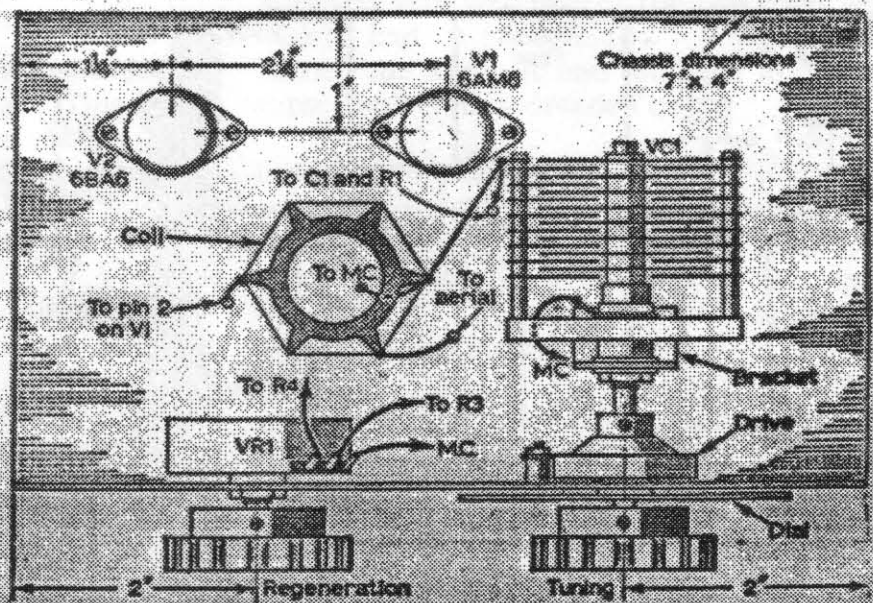


Fig. 4 (right)—The underchassis wiring diagram.

enough to reach the fixed plates, as in Fig. 3. An insulated lead also passes from this point, through the chassis, to R1 and C1.

Lead 4 of the coil is long enough to reach the aerial socket, and is covered with sleeving. The cathode tap goes to pin 2, as indicated. The remaining coil lead passes directly through the chassis to a tag.

Three leads are taken from the 50k potentiometer; all these may be passed through a single hole, provided they are correctly identified, or the lead marked 'M.C.' may be earthed to the panel at the potentiometer bush.

Wiring and parts underneath will be seen from Fig. 4. A tag is placed on each bolt holding the valveholders, and also on the bolt near the earth socket E. These points, marked M.C., are in good

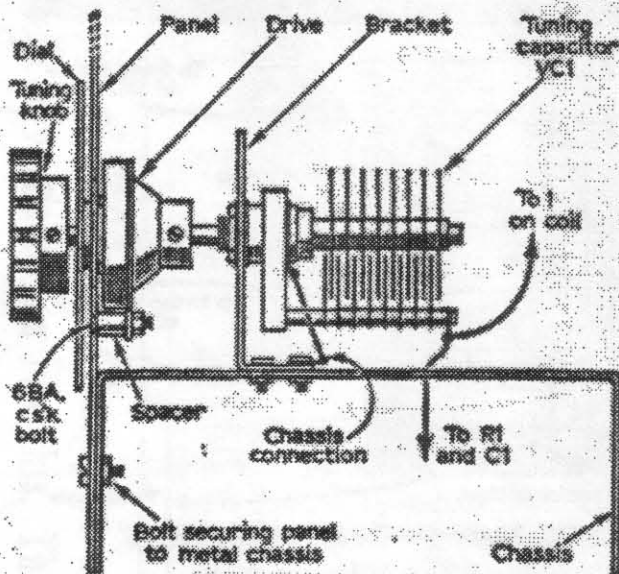
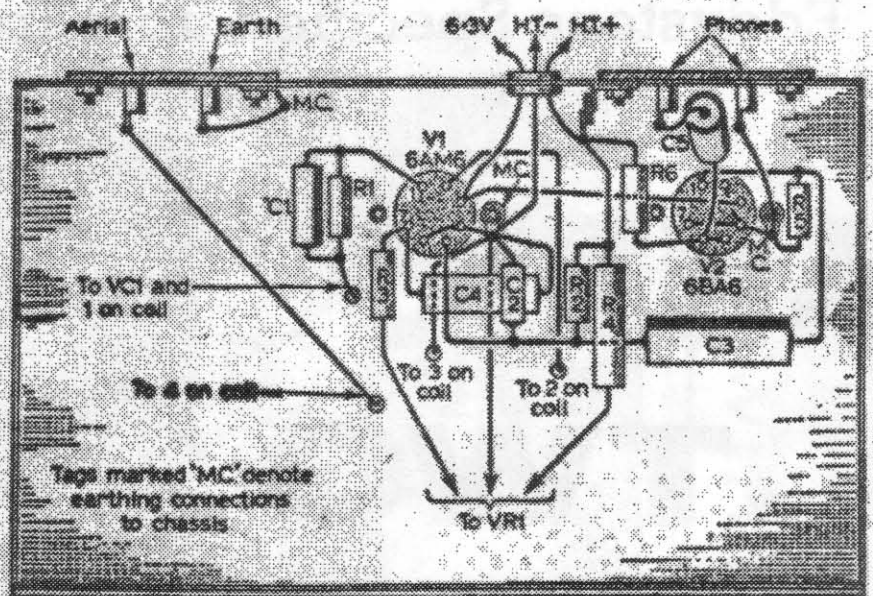
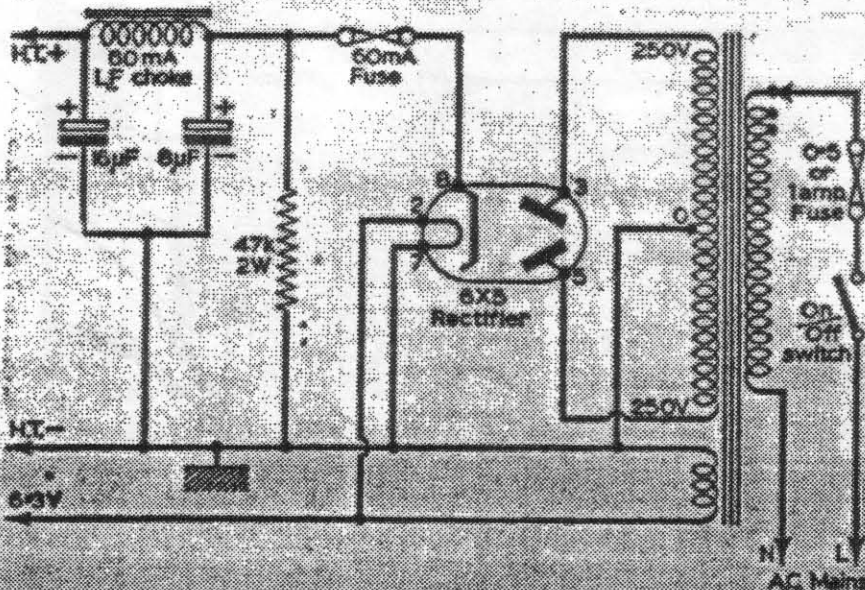


Fig. 5 (above)—The tuning drive mechanism.

COMPONENTS LIST

- Resistors:**
 R1 2.2M
 R2 100k 1W
 R3 47k
 VRI 50k
 R4 47k 1W
 R5 10M
 R6 100k 1W
- Capacitors:**
 C1 100pF mica
 C2 200pF mica
 C3 0.01μF mica
 C4 0.01μF 250V paper
 C5 0.05μF 500V paper
- VC1 160pF S.W. tuning capacitor (see text)
- Valves:**
 V1 6AM6
 V2 6BA6
- Miscellaneous:**
 Chassis—approximately 4in. x 7in. x 2½in.;
 panel—about 7in. x 6in.; two twin sockets for
 Aerial, Earth and Headphones; insulated tag
 strip; two B7G valveholders; condenser
 bracket; 6 : 1 or similar ball-drive; two ½in.
 knobs; 2½in. or similar 0-100 or 0-100 dial;
 ribbed coil former about 1½in. x 2½in. long (or
 1½in. diameter plug-in coil formers, and
 chassis socket—Eddystone).



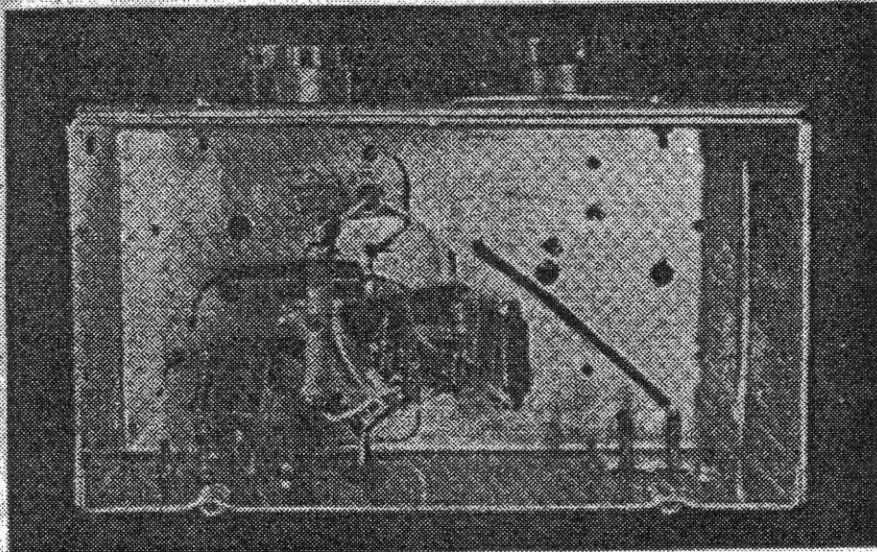
contact with the chassis. If the valveholders are of the type with a centre metal spigot, this is joined to the nearest M.C. tag.

A single tag, on a small tag strip, and insulated from the chassis, forms the H.T. positive junction point, for R2, R4 and R6. The three supply leads emerge through a grommet in the rear runner, and should be identified to make sure there is no error in connecting the receiver to its power pack. A lead from the chassis forms the H.T. negative connection, and is also the return for the heater circuit. Pins 3 on both holders

Fig. 6 (left)—The circuit of the power supply.

are joined, and the lead from this point is for the 6.3V supply. The remaining lead is for H.T. positive, as described.

The wires from R1 and C1 to pin 1 should be short, to avoid hum. For the same reason, the wires from C3 to R5, to pin 1 of the second holder, should be short, direct, and clear of the heater lead.



An underchassis view of the receiver

Power Supply

If a mains unit is to be constructed for the receiver, the circuit in Fig. 6 will be satisfactory, and can provide current for larger equipment, at a later date. The 6X5 requires 0.6A for its heater. Added to the 0.6A of the two receiver heaters, the total consumption is 1.2A, so a 1.5A winding will easily provide this current, and also current for a 6.3V, 0.3A indicator lamp, if wanted. A 6.3V heater winding with a higher current rating is also suitable.

The receiver requires a very small H.T. current, at 150V to 250V or so. For the receiver only, the smoothing choke may be replaced by a 5k resistor. However, the power pack is more useful for other purposes when a choke is used. The H.T. voltage will rise somewhat, with little or no current drawn, so a 47k bleeder resistor is fitted. The H.T. voltage can be reduced, if wished, by wiring a resistor

between the 60mA fuse, and choke. This fuse is merely to protect the rectifier and transformer, in the event of an H.T. short.

Current is drawn from a 3-pin plug, and the chassis of the receiver is earthed. If this earthing is effective, and a 500mA or other low-rating fuse is included in the mains circuit as in Fig. 6, mains voltages cannot be present at the receiver, even if the mains transformer were faulty.

If preferred, the power pack can be scaled down, to provide a supply of up to 10mA or so, at 150V to 200V. This can be arranged by using a small metal rectifier, and "feeder" type mains transformer. The earthing, and mains fuse should not be omitted, however.

The receiver must not be worked from an A.C./D.C. power circuit, in which the H.T. negative line is connected to one mains lead.

Operating Notes

Any kind of aerial can be used, including short indoor wires. Naturally a fairly efficient aerial will give best results with the weaker, more distant stations. If the aerial is at all long, a small condenser should be added in series with it, at the receiver. A 25pF pre-set trimmer is suitable, or the lead-in can be twisted for a few inches round another insulator wire, to form a small capacity.

Tuning will be very sharp and critical, especially with weak stations, and with loose aerial coupling. Reaction is also very critical, with weak distant stations. Powerful stations will be heard easily, and the exact setting of the reaction control will not then be very important, but, for weak stations, this control must be operated very carefully. It is slowly turned clockwise, from zero, until the set is just on the point of oscillation. Sensitivity is then extremely high, and very long distance reception is possible. The reaction control should be carefully adjusted, as necessary, while tuning. It must not be rotated too far, or the receiver will oscillate and sensitivity will be reduced.

After seeing our "New Zealand Eddystone Atlantic Two" last month, Tor Marthinsen (our Scandinavian Eddystone expert) searched his massive radio files for any references and came up with this soundlike set!

It uses an Eddystone type 1131 tuning condenser with 708 bracket and opts for type 538 plug-in coils, and the circuit is remarkably similar to the Eddystone "Amateurs' Shortwave Two" of 1938, but otherwise, regretfully, it's no relation.

Dating over 30 years later than its namesake, it was published in "P.W." for August 1962, to whom we make grateful acknowledgement.

Echoes from the Bath Tub

By John Instance

Greetings to all 'Lighthouse' readers! This article came about in a most unusual fashion. I have been living and working as a local water-colour artist with my own gallery on the river-front of the Georgian town of Bewdley for the past eighteen years.

One day a customer called in with a smile on his face and said: "Roger Sutton ... ? Bill Cooke ... ? Dick Carroll ... ?" "EDDYSTONE!" I shouted, breaking into an equally wide grin. I was presented with a copy of 'Lighthouse' by Graeme who asked if I could make a contribution to the next edition. As his walls are covered with my paintings what else could I do? Here goes!

I started at the Bath Tub in 1965 as a mechanical assembler. The foreman at that time was Frank Meredith; he put me to work assembling ganged condensers and drives. I can remember looking out of the window and seeing the old Lido diving boards. They were wrapped in barbed wire. They said it was there to stop frustrated test engineers from scrambling up to end it all!!

I was soon promoted to help with assembling the model 880 front panel, with a guy called Ted (no, not Ted Moore!), who was the charge hand at the time and a very keen radio ham. Most days he would bring in the latest QSL cards from his large collection.

The Model 880 was the most complicated valve set Eddystone ever made, and the assembly was quite a challenge. It had spring-loaded gearing with rack and pinion drive sandwiched between two steel plates which weighed a ton! All the bushes were reamed by hand to fit the spindles. It was a great job; I was sorry to see the end of production. I can remember an 880 having the 'drop test' from a great height to check stability. It was soon working again!

I worked on most drive assemblies, in particular the 770R and 770U. With the introduction of printed circuit boards (the model EC10), a flow solder machine was installed in the drive section, near the works canteen. A training school was set up and I was put in charge of

printed board assembly and flow soldering. Boy! Were there some problems!

The polystyrene condensers shrivelled up with the heat and had to have the ends coiled before fitting. The boards got covered in flux and transistors were cooked! We used box-loads of hair grips from Stratton's as heat sinks. My girls were always asking for more (??). After soldering it was a full-time job looking for shorts.

Production and orders for the EC10 increased at this time. That's when a large plywood clock-face was placed at the end of the main assembly-line. Each time a set was passed by Test (ready for sale) Stan Carney, our section manager, would move the pointer up a notch.

If we got the pointer round to the top by the end of the week we got a bonus. It worked so well that the bonus was stopped. We were hitting the sales target too often!!

Times were good at Eddystone. Employment was up and things were booming on the social side. We entered West Heath Carnival and won the Best Float with a replica of the Eddystone Lighthouse. It was 12 or 15 feet high and we built it in our own time.

The girls on the float were dressed in costumes from around the world. I've been looking for some photos of the event but can't find any, so if anybody out there has

Snapshots from the Bath Tub



(above) Jim Vinner adjusting the drive on an EC10

(below) The Drive and Gang Shop crew





Open day at Eddystone printed board section in the 1960's.
The young lad was so interested that he started work at Eddystone when he left school.

some I'd be pleased to see them (*and we'd be pleased to print them – Graeme*).

The Social Club worked hard to make everything. I remember the Lighthouse was left outside to weather in the end! The Club Committee at that time was Joyce Taylor, Joan Clark, Roy Timmings, Derek Woods and myself.

We had barn dances in the canteen, car treasure hunts, trips to a beer festival in Belgium and a trip to Paris, but that's another story!

The section grew larger, with more circuit boards for the 990R transistor VHF receiver and the EC958 high stability model. The 958 was modular and, with looms to construct, we had all the overtime we wanted. In fact I took on making 100 kHz IF filter modules at home. It became quite a cottage industry!

With so much work going on we all moved into the new block. I ran the printed circuit section and Ray Evans ran the coil section. The Foreman was Eric Walmesley and he was followed by Fred Griffith; the two sections ran well together.

When Fred retired I became the Foreman. Then Eddystone work dropped off a bit and we took on the assembly of Marconi boards and units, with Joyce Taylor and Bob Hanson as charge hands.

This kept us going until, in 1982, I left Eddystone Radio to start my own business in Bewdley by the river, painting (and selling) my water-colours.

In one of the issues of the EUG Newsletter, I see the 'Orion' SSB transceiver was featured.

When the set was first developed there was a competition at the Bath Tub to choose a name for it. There was a prize of £25 for the best suggestion and it was won by Ada Leigh, one of my section.

Dick Carol, then the managing director, had so little to show a customer, due to visit the following day, that he asked me to do a drawing of it. It was a success and he paid me well. Maybe that's why I became an artist!

John Instance

EDDYSTONE RADIO

**A SHORT HISTORY OF RECEIVER DEVELOPMENT
FROM 1965-1995; PART TWO - CONCLUSION.**

BY

ROGER SUTTON

(MANAGING ENGINEER, EDDYSTONE RADIO LIMITED)

In 1995 the Institute of Electrical Engineers (IEE) promoted a Conference to commemorate the Centenary of radio communication. One of the most interesting papers was presented by Roger Sutton, Managing Engineer of Eddystone Radio. It is with the permission of the IEE and the consent of Roger that we are able to offer his treatise to members of the EUG. Due to it's length and complexity we have presented it in two parts. This concluding feature covers the section on Dynamic Range and the use of the Microprocessor.

**International Conference on
100 Years of Radio**

5-7 September 1995

IEE, Savoy Place, London, UK



The Conference was organised by the Science, Education and Technology Division of the Institute of Electrical Engineers in association with the British Vintage Wireless Society and the International Union of Radio Science.

PART TWO

Last Month Roger Sutton expounded on the development of the high stability receiver and the phase lock loop. He now continues, explaining the development of Dynamic Range and the Microprocessor

Developing Dynamic Range

The dynamic range of early transistorised designs was considered poorer than that obtained with the best valve designs using low noise beam deflection valves. This was particularly unfortunate, being at the time when the HF radio band was becoming increasingly more congested.

Dynamic range can be simply described as the difference between the level of a just perceptible wanted signal and the level of unwanted signals that will just start to interfere with it. There are several minor variations in the actual definition and method of measurement and thus, great care should be taken when making comparisons. However, most give figures from 90 to over 100dB, indicating the range of signals the receiver can handle. The early use of transistors was essentially to replace valves, using otherwise very similar circuitry.

The first Eddystone transistorised receiver, the 960, produced in the early 1960s, used the same chassis and mechanics of the previous valve designs. Internally, transistors were placed in the positions originally occupied by valves. Externally, the 960 appeared similar to the previous valved models, **Pettitt (9)**.

The early, relatively poor, bipolar transistors were soon replaced by field effect transistors. With their square law

transfer curve, they were considered to generate lower third order intermodulation products than bipolar devices. Interfering third order products can be produced by unwanted signals close to the wanted and cannot easily be removed by filtering.

Field effect devices in cascode or dual gate configurations were therefore commonly used in receivers of the mid 1960s to mid 1970s such as the Eddystone 958 and 1837. Although the dynamic range of these devices was still limited, the receivers that used them did perform well in practice.

This was later shown to be because they retained several tuned circuits before the active stages which tracked the tuned frequency. This was the normal arrangement in receivers, up to that date, to reject the close-in image responses produced by low first IFs.

Several significant papers were written during the 1970s, which detailed the selectivity and dynamic range required to handle the quantity and levels of signals present in the HF band, **Sosin (10)**, **Winn (11)**, **Barrs (12)**.

On the basis of number of useable channels, the traditional tracking tuned circuits, even when using relatively low dynamic range devices, could give better performance than newer designs using better devices but wider, fixed filters before them.

Filtering however is expensive both in parts and in the time required to align the circuits during manufacture. With increasing competition, the need arose to have such filtering only as an option. This approach was taken with the Eddystone 1650 series initiated in the early 1980s. The basic version was wideband with narrowband tracked tuning or sub-octave fixed filters as options at significantly higher cost. The dynamic range of the active circuitry thus had to be higher to allow for the low cost wideband option.

Three principal phenomena determine dynamic range, these being noise figure, reciprocal mixing and intercept point. Noise figure determines the lowest level signal that can be perceived. For the HF bands, where antenna noise is relatively high, adequate noise figure is normally easy to achieve.

Reciprocal mixing is a phenomenon whereby an unwanted signal mixes with noise sidebands of the local oscillator to produce interfering noise at the wanted frequency. Reduction of this effect demands close attention to the synthesiser configuration and the design of the first mixer local oscillator. The MHz per volt sensitivity of the varicap diode setting the oscillator frequency must be kept low to reduce phase noise produced by noise on the control line.

In the 1650 series, the 46 to 76MHz range required used four switched oscillators to reduce the varicap diode pulling range. This technique was generally adopted for this reason with, in some cases, binary switched fixed capacitors to give many more ranges

with just a small proportion of controlled varicap diode tuning on each range.

The present Eddystone 6000 series uses just two ranges with a higher voltage varicap diode to reduce the sensitivity below the maximum figure of about 1MHz per volt.

The level of intermodulation products generated by the receiver determines intercept point. It equals the power input level at which the products would be at the same level as the signals generating them.

This situation does not arise in practice, as the receiver will start to compress or limit at about 10 to 15dB below this level. Intercept point however gives a useful figure to enable comparisons and allows calculations determining intermodulation levels to be performed.

Once again however, care has to be taken in its use, since the extrapolation of levels down from the intercept point often does not take the idealised straight line path. Intermodulation is caused by non-linearity particularly in the RF and first IF stages of the receiver.

Second order non-linearity generates products which are the sum or difference of two signals. Third order generates products which are the sum or difference of one signal and the second harmonic of another and so on.

Obtaining adequate second order intermodulation performance has presented some problems when wideband RF selectivity is used. For this reason sub-octave filters became common as an option. In this arrangement a number of switched block filters, each covering significantly less than one octave, are employed.

The advantage of sub-octave filters is that they attenuate at least one, of any two signals, which can produce a second order product within the passband of the filter. Improved transistor design enabled low noise, high intercept point RF amplifiers to be designed.

Class A, high quiescent current stages were used with, in later designs, lossless feedback. However, greater problems were encountered with the first mixer and the following first IF filter. This filter became known as the roofing filter as it ideally was just wide enough to cover or roof the maximum bandwidth of the second IF stages and thus give as much filtering protection as possible to the second mixer.

The dual gate field effect transistor was commonly used as a mixer in designs up to the mid 1970s, such as the Eddystone 958 and 1837, with the first local oscillator applied to the second gate. Its dynamic range was however, limited and, as already explained, good overall performance was only achieved because of the narrowband tracking selectivity also employed.

During the 1970s, two other forms of mixer became common, these being the double balanced diode ring and quad field effect transistor. A particular problem with these is that the intermodulation performance is highly dependent on the impedance presented to the ports.

Any variation from the ideal 50 Ohms can produce a significant decrease in dynamic range. Great care had therefore to be taken, particularly in the mixer to roofing filter interface. Typically a buffer amplifier with high reverse isolation

would be used and termination insensitive mixers incorporating such techniques are now available.

At Eddystone, diode ring mixers have principally been used in VHF/UHF receivers, such as the 1990 series of the 1970s and the 1995 series of the 1980s, where dynamic range requirements are not so great.

Quad fet mixers were used in the 1964 multi-channel receiver of the mid 1970s, these being found to require careful balancing to reduce leakage of oscillator noise directly into the first IF stages.

In more recent times, it has also been more generally recognised that the transition time of the local oscillator waveform should be as short as possible to reduce the time when the mixer is between the two switched states and is more liable to produce intermodulation products.

Unfortunately, such waveforms contain oscillator harmonics up to the UHF region. These are difficult to isolate from the second mixer, where they mix with the second local oscillator harmonics to produce spurious signals at the second IF. To overcome some of these problems, Eddystone HF receivers since the early 1980s have used proprietary integrated circuit mixers incorporating bipolar transistor long tail pairs.

These have the advantage of having isolated outputs which give slight gain and can also be directly connected to the roofing filter, without compromising their intercept point. Quiescent current can be set at a high level, without significantly degrading noise performance, to give good linearity, and oscillators levels can be low.

A higher performance variant of the 1650, the 1650/9H, uses four such mixers paralleled by four way splitters and combiners. This technique, common in power amplifier design, gave a 6dB increase in power handling and thus intercept point, without any increase in noise. The present 6000 series uses a pair in a simpler circuit.

The following roofing filter generally has to be a crystal type to give adequate protection to the following second mixer. In some cases however, helical filters are used when a high dynamic range second mixer is available. This is done because the crystal filter can be the limiting factor if overall intercept points above 25 to 30dBm are required.

At these levels, crystals filters can be highly non-linear and become difficult to incorporate with predictable results. Since the early 1980s, crystal filter manufacturers have given increasing attention to this problem to ensure their products give the necessary performance.

All crystal filters for Eddystone receivers now have intercept point specified. Ferrites can also be a source of intermodulation being non-linear at high flux density levels. Care thus had to be taken with inductor design, especially when using high permeability soft ferrites.

For RF tuned circuits, low permeability iron powder ferrites have generally been used to prevent filters introducing more intermodulation than they remove. The switching diodes used to select different RF filters also need care in their use for the same reason. Silicon diodes, run at too low current, can introduce significant second order inter-modulation and

reduce the benefits of the filters they switch. Normally PIN diodes are now used and provide adequate performance. In theory they are not ideal for HF use, however in practice they do provide better performance and PIN diodes, specifically for HF use, are now becoming available.

Making use of the Microprocessor

Until late 1970s most communications receivers were operated directly from their own front panels. With the advent of digital integrated circuits however, it had become possible to incorporate remote control using a simple serial link. This meant that receivers could be situated close to the antenna with the operators concentrated at a centralised location, giving both technical and logistic advantages.

Automatic control by computer was also made possible, reducing the number of operators required and allowing systems not previously possible. However, discrete logic control circuits were somewhat complicated and unadaptable and thus remote control was an extra.

This all changed with the advent of the microprocessor which enabled much more compact and powerful control with the functions effected by software, **IEE Colloquium (13)**. The same microprocessor could also replace many other discrete logic control circuits and thus became a standard component of virtually all communications receivers to the present day.

For a while, the term Microprocessor Controlled replaced High Stability in the description of new receiver designs. With the added power of software, facilities

not previously practicable were introduced. Channel storage, automatic channel scanning and frequency sweeping as well as remote control, were becoming standard features.

The 1650 of the early 1980s was the first Eddystone receiver to incorporate a microprocessor and, very early on, it was realised that it was important that all these new features were made easy to use, user-friendly as now described.

The operating system developed was thus based on single key selection of the desired function, without use of shift or double function keys. Most importantly a single key was provided to select basic, traditional receiver operation for users not requiring the extra facilities, **Sutton (14,15)**. This operating system has been retained, with improvements and additions, for the present 6000 receiver and 7000 transceiver series.

A popular addition for broadcast monitoring, for example, has been channel scanning by time of day or week. This and other changes have gradually increased the size of program memory from 8kBytes in 1982 to 64kBytes at present.

Use of the microprocessor also allowed a variety of improvements to be made to the basic radio receiver functions. As previously mentioned, the use of mathematical algorithms simplified the hardware design of the synthesiser in the 6000 and 7000 series.

Other algorithms enabled new tuning functions. One of the earliest developed for the 1650 was variable rate tuning. This smoothly accelerated the tuning speed as the tuning knob was turned

more quickly. A single knob thus provided fine tuning, at 60Hz per revolution, well as search tuning at rates up to 100kHz per revolution without having to change the tuning rate setting.

Later models also allowed fixed steps between 10Hz and 100kHz to be selected, to give operators greater choice in the feel of the all-important tuning knob. The use of Software greatly aided the incorporation of Built in Test Equipment (BITE) which has now become almost mandatory for professional receivers.

It is however remote control that has been the most significant recent change in receiver operation. Nearly all receivers now supplied by Eddystone are for remote or automatically controlled systems. The product range of most receiver manufacturers now may include more remote control equipment than actual receivers.

Eddystone has developed mimic remote control units, which have the same front panel as the remotely controlled receiver and give the same functions and feel of control. In this area, development of an efficient control code set proved most important. Most systems require a number of receivers to be controlled at various distances and using a variety of hardware links.

Address selectors, Modems, line drivers etc. have thus been developed, to allow such systems to be provided, many of these also incorporating a micro-processor.

Conclusions and the Future

In 1965 the communications receiver was still basically an improved version of

that produced twenty-five years earlier. Since 1965 it has evolved into a truly electronic equipment capable of remote or automatic operation.

In recent years, digital signal processing has been a key area of development and will, no doubt, remain so for the foreseeable future. Already receivers are available which digitise the signal at some point and perform, for example, filtering in software.

Eddystone is incorporating such techniques in the present 7000 series of transceivers. The approach used is to retain a substantial degree of analogue filtering, digitise the baseband signal and use the digital signal processor to perform tasks which are more efficiently done in the digital rather than the analogue domain. Squelch, noise reduction, speech compression, audio agc and data demodulation are typical examples. Great efforts are being made by receiver manufacturers to digitise the signal as near to the antenna as possible, thus eliminating analogue circuitry. The ultimate goal is the antenna signal directly feeding an AD converter with all signal processing and conversion to baseband being performed in software. All that then remains is to digitise the operator!

In conclusion, I would like to acknowledge my colleagues at Eddystone Radio and the Managing Director, Mr. C.A.Pettitt, for their invaluable assistance in the preparation and presentation of this paper.



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Chrome Switch Levers

I must have been aware of this for very many years and yet it took a letter from one member to remind me.

He has been looking for one of those chromed switch levers as used on the 730 and other models. Fine, but just when he thought that all was settled and he had one he got another surprise. IT WAS THE WRONG TYPE !

Okay, I recall now that there are two different types. The one which Steve needed was that with the indicator 'pip' at right angles to the finger grip as used to operate the rotary switch on his 730.

But the one which tumbled out of the envelope, after he had paid over £2.50, was the other one, where the indicating pip is in line with the finger grip of the lever, as on the EA12 etc.

Just one more manifestation of Sod's Law, as he says, but I of all people ought to have remembered there were two types. Still he got it swapped by return of post so all is not lost.

Ted.

Digital Audio Broadcasting

Latest news is that the BBC are asking cash to open up 15 more stations in the UK to add to the already underused network.

Surely not ? This item was spotted in a small paragraph in one of the Dailies and if true it makes me wonder. Are these stations, (the present large network almost covers the

entire UK), are they being used sufficiently to merit the spending of another £15 million on further additions to the network ?

I have to admit to knowing nobody who has a DAB receiver. Most folk are not even aware of the existence of this form of Broadcasting and surely it has been superseded already by the Internet Broadcasting?

Mind you, if the order for the Tx's goes to Eddystone again then maybe all is not lost, I am nothing if not partisan.

Ted.

Another Car Boot Tale

At a recent Car Boot sale, not in any way connected with our hobby, this happy EUGer was pleased to purchase a nice looking EC10 together with a round diecast speaker which had unfortunately been given a spray with an aerosol of grey gloss car paint.

There not being any facilities to do a 'field test' he snapped up both for £15, as against the originally asked for £25. To say that he was sweating all of the way home would be an understatement, would it turn out to be a pig in a poke?

The speaker was connected up and some second hand D cells liberated from the XYL's picnic tranny. NOTHING, not a peep out of it.

Frustration was already high when he tried it on 'phones. The relief when he heard normal signals was phenomenal and he gave the EC10 a good on-air test with no apparent faults at all, but the battery box needed cleaning up and painting to disguise the corrosion from duff and leaky cells used in the past.

Back to the speaker. Apart from the 'orrible paint job the replacement oriental speaker had a torn diaphragm and an open circuit

speech coil. A replacement cannibalised from an old domestic chassis was fitted and all was well in that department, but the paint?

The local car parts emporium is a large place, name begins with H and ends with S. They supplied some proprietary stuff which was guaranteed to remove cellulose paint, and it did, almost.

Trouble is that the surface of the speaker case is not smooth so the end result was a sort of speckled Black/Grey. The only thing to do was strip it, spray it properly, and then rebuild it.

Of course for use with the EC10 it is a bit redundant but then it comes in handy for the 940.

Ted.

Strattons PSU

This Black crackle painted psu was bought from a local Silent Key sale some time back, as a part of his small collection.

Neil says that he believed it was for the 358 series but only recently he started checking up on it and finds that it is a Type 427 Power unit which Strattons made for use with those Lease-Lend HROs that came over from the US of A. It badly needs new electrolytics and although all else appears okay he is not going to power it up until these condensers are replaced.

He is now looking for one of those Lease-Lend HRO-MX sets to go with it. He suspects that the psu has never been used in earnest.

It looks nice and newish and was in some kind of packing with a paper label saying 'Acceptance Tested 19 November 1942.' A very nice find for Neil!

Ted.

The ECR Comms Receiver

This is a very rare model even for EUG, but one member has got an ECR (*only built for a few weeks in 1939 – Graeme.*). He writes in from Scotland to say that it is in only fair external condition and has been loft stored for yonks.

He has decided to completely restore this set and has begun by taking a series of photos of both internal and external views. He next intends to completely strip the set of knobs, front panel, etc; before going for the passive components such as resistors and condensers.

Having just retired he has loads of time to do the necessary work. I have asked him to keep us advised as the task moves forward.

Ted.

Saga of the Ancient 840A

Stan cannot recall the exact year but it must have been about 1958 when he spent all of his savings on a sparkling new 840A. This was a massive expense for somebody like Stan who was then earning just £6 a week.

He sold off a surplus HRO and an Avo Minor to add the proceeds to his savings. Now, some 43 years later he still has the same 840A which has been in almost continuous use ever since, not an altogether trouble free ownership period but a very rewarding one.

He has had two really major problems with this set and a number of smaller ones but nothing has, touch wood, gone wrong since about 5 years back.

On this occasion he went for a set of new valves after a cathode/heater short produced so much hum that the set was unusable.

Several years after its purchase the 840A went 'belly up' one evening whilst in use. The smoothing electrolytic had succumbed, possibly to overheating as this was a hot summer's day.

Several years on from this and the cord drive needed to be rewired, this was done by a local company as Stan had not the expertise to do the job, the only repair which he has had to pay for and it cost him thirty bob in 1965.

At the grand old age of (about) twenty years the 840A needed a new dial bulb as the original was so badly silvered that it gave no illumination. Whilst the set was open the range switch wafers were squirted with some 'oil-dag'. This was a switch cleaner plus lubricant used by the GPO for relay contacts.

Only one other repair has been required and this involved replacing the insulating washers on the mains input pins, damaged when the set was rather rudely pushed hard back against the wall of the shack.

Stan has been thinking of giving the set a total clean up both inside and out and having the present set of valves tested for emission. Given the amount of pleasure that he still gets from the 840A he believes that the set deserves some TLC.

His tip to other proud owners is that aerosol spray cans of silicone furniture polish do a wonderful job of Keeping the outside of the set clean.

Ted.

FM, or lack of, on the EB35

One of the first signs of old age on this series is likely to be the complete, or partial, disappearance of the FM reception facility.

This may happen in a number of ways. If the set is being used on batteries it may be that

FM reception disappears long before the batteries have lost enough voltage to mar AM reception, going back to mains power will usually restore the FM band.

If operating solely from mains supplies then it may happen that reception is possible on strong signals up to about 95 Mc/s and that the top end of the band is completely dead. Quickly switching off and on again may shock the FM oscillator into action for a while but then it will simply go dead again.

The most dramatic signs of ageing are when the set simply goes dead during reception of a signal, this may happen at either LF or HF ends of the band, nothing will bring it back on, not even the usual oaths and imprecations resorted to by SWLs and Amateurs.

In almost every case it will be found that the culprit is the FM local oscillator transistor. Sounds easy enough doesn't it? Well it is darned difficult in practice as the pcb for the VHF tuner is not only enclosed in a sealed and soldered metal box, it will soon be noticed that the box is attached to the chassis by another soldered joint.

Again, it is not possible to remove and unseal the VHF tuner by utilising the present day standard mini soldering iron. I have found that a minimum of 50 watts, preferably a 100 watts iron is desirable, but then again don't go using this iron on the pcb and transistor joints. In the past I have used BC212 transistors in this position and they appear to give a long life, despite their being described as digital switching transistors. One which I fitted in 1987 is still performing well.

When refitting the VHF tuner do be aware that the braid connecting the box to the chassis needs to be well soldered, I once had a tuner which would no longer trim to the band edges and discovered that this was because of a dry joint on this braid. Ted.

More from TED's MAILBOX next month