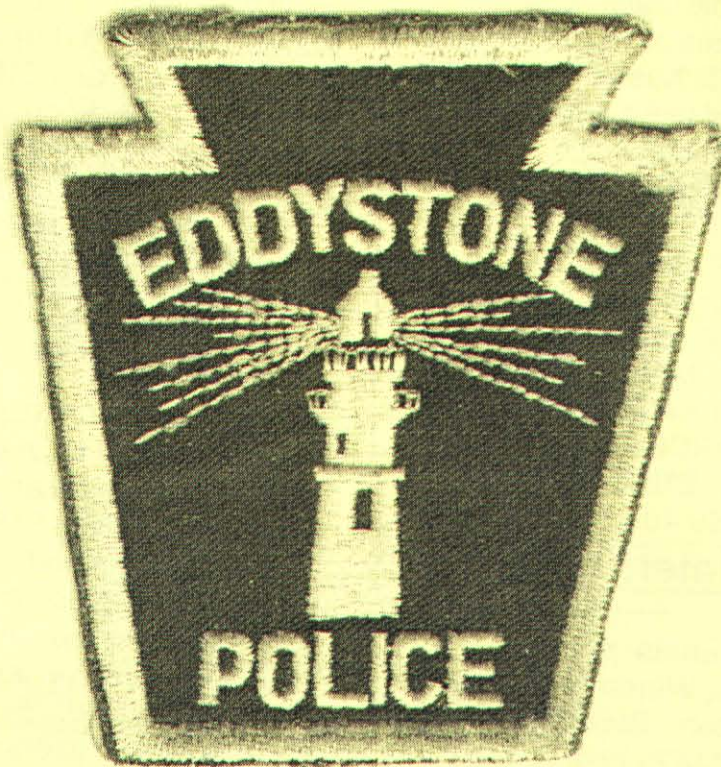


Lighthouse

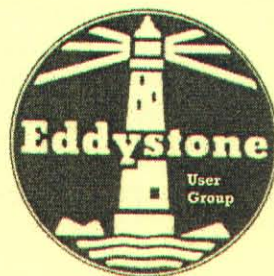
Founded 1990

The Magazine of the
Eddystone User Group

Issue 87, October 2004



It seems we share a logo with
the City of Eddystone, Pennsylvania . . .



EDDYSTONE USER GROUP
A non-profit-making Group for
Eddystone Radio Enthusiasts.
Founded in 1990 by
Ted Moore, G7AIR
Issue 87, October 2004

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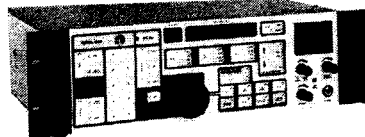
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FOR SALE

Eddystone 730/4, Nice condition,
good working order, £150. Also
Marconi B28 (CR100) Nice condition,
good working order, £100.
Buyers to inspect and collect (Watford)
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Unmodified, tested and working in
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28 enthusiastic users so far – join the
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Eddystone 680X and 730/4, both in
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Phone Mike on 02380 848 268 or
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Eddystone EC10 Mk II, £100.
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EA12, £250. All with handbooks and original mains leads. Two small plinths (not with speakers) and some spare valves. All sets in good condition, with some small scratches on cabinets but no mods or bodged repairs. Call John G3PJK on 01772 813 857 (Preston)

Large quantity of valves for sale. Telephone or send for list: Sid Gray G7FUV, "Allington" Old Dartford Road, Farningham, Kent DA4 0EB, Tel: 01322 862 082

Eddystone 730/4 in good working condition, £150. **Eddystone** modules, new, for 1837/8; **LP3506/22** muting ae attenuator £5. **LP3531** BFO £15. **LP3533** tunable IF £15. **LP3519** PSU £15. PCB assy., new, for 1837/8:- **9581pa** 600 ohm line amp. & meter, £10. **9580p** high level amp. £10. **9575-9577** inc. coil assy. £10. Other Eddystone pcbs etc. mainly ex equipment. **KW2000B** inc. PSU. mic. in good working condition, £100. Contact Ralph G4EBL, 01568 780 396 (EUG member, Herefordshire). Please note Post & Packing will be extra charge by agreement.

WANTED

MAINS TRANSFORMER drop through chassis type for an Eddystone E.C.R. receiver, to fit a 2.5" square hole, all connections ideally below chassis, secondary 250-0-250 and two 6.3 v windings. Also wanted are the chassis mounted plugs and fly lead with socket for an Eddystone Mains Filter and photo of an Eddystone military R101 receiver. Any help please ring Andrew Humphriss on 01789 262 872.

Wanted: GRUNDIG Melody Boy 1000 scrap as long as complete (£10 plus post offered), also manual for WRL Globe Scout., Bill 0141 562 4571.

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

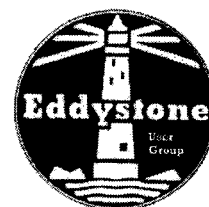
Wanted, any small boat/yacht receiver with DF, e.g. Pye, Sailor, etc. Must be solid state. These were fitted to thousands of pleasure craft in the 60s and 70s and have been discarded en-masse with the advent of G.P.S. . **ALSO Wanted R1155** any condx for rebuild project, including scrap for spares. Details please to Peter G4IXY 01727 839 908.

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

Wanted Eddystone S880 or S830 or EA12. Also valve tester, preferably AVO. Contact Clive MØBGA, on 01637 875 848 or E-mail to sunbeam@thersgb.net

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¾" (19mm) dia. Silver, White and Blue enamel de luxe. Price incl P&P £2 UK; (Selotaped onto card please)
\$5 any other currency (bank-note)



From Graeme G3GGL
details opposite

E.U.G. Honours Doyen of the British Short Wave Industry

By Chris Pettitt, GØEYO, Patron, EUG.

This November sees Bill Cooke GWØION, my predecessor as Managing Director of Eddystone Radio, and its technical guru for most of the company's existence, celebrate his 85th birthday.

As a special tribute to Bill, and in recognition of his outstanding contribution to the field of short-wave communications, Ted, Graeme and I have agreed that we should ask Bill to become Honorary Life President of the Eddystone User Group.

I am pleased to say that Bill has indicated his acceptance of this position. As someone who counts Bill as a friend as well as mentor I must say that this recognition is well deserved.

I always felt that Bill never got the recognition from his Queen or country that he richly deserved, though he served both with courage and dedication for all his life. Bill is a man who believed in British design and manufacturing. Without Bill Eddystone Radio would have not seen its 25th birthday let alone its 75th. Well done old friend!



Bill Cooke, GWØION, entertains overseas visitors with a joke and big eats at the Bath Tub

Newport
Gwent

23rd Sept. 2004.

Mr. Graeme Wormald, G3GGL
15, Sabrina Drive,
Bewdley,
Worcs.

Dear Graeme,

I must say that it came as a big surprise to hear that I was proposed to be the first Honorary Life President.

It gives me much pleasure to accept this honour and I would like to thank you Graeme for your great work and effort producing the Lighthouse Magazine also the work involved with the E.U.G. along with the Founder and the Patron. Long may it continue!

Yours sincerely,

Bill

Bill Cooke.

Chris's Column

Welcome to another interesting and packed edition of Lighthouse.

I attended the Telford Rally and what a fine show it turned out to be although I got to see little of it. This was because I had volunteered to man to Bring and Buy stall for Wythall Radio Club who provide a Bring and Buy service for local clubs for a share of the profits. Ted and Graeme happened upon me when I was busy in the middle of booking items in and unfortunately this gave me very little time to speak to them. I gather that they brought along a collection of early radios at the organisers request to make a show in one of the other hangars. Never got around to see it, but I bet it was good. Hopefully someone will have taken a picture or two. It helped of course that it was a really fine day and what could be a more interesting place to have a rally in than an aircraft museum.

Whilst at the rally I picked up a copy of *Wireless in the Midlands* by William Moorwood G3CAQ. This is a book of some 158 A4 pages which provides a history of Amateur Radio Clubs and Shops and manufacturers in the Midlands 1910 to 2000. This is a privately printed run and the print run is limited to 100 copies. It is in its second edition and I have copy no 84. Bill has done a fine job of documenting the various club histories and those of the retailers and Midlands manufacturers that served them.

He has also taken the trouble to provide thumb-nail sketches of many of the local hams some of who have become local legends. He documents the birth (and sometimes the deaths) of some 70+ societies in the Midlands. Graeme provided a history of Eddystone Radio, well done Graeme,

and gets a mention. The book contains articles and references to many SK hams, Chas Young, G2AK and Fred Ward G2CVV., Tom Douglas G3BA, ex BBC transmitter engineer, (Sutton Coldfield E.i.C.), ex Far East POW and RSGB newsreader. G6VA, Pick Pickard who gave Bill GWØION the shock of his life with the Polish transmitter in 1939; George Brown G5BJ, who worked on the Eddystone pre-war VHF transceivers and apparently worked on clandestine radio with a company called Monitor Radio of Stechford.. This book is a fascinating history of amateur radio and well worth the £14.50 it cost me.

I have recently taken delivery of my first DAB radio. Given that DAB played a big part in my career with Eddystone, I am surprised that it has taken ten years from when I first heard of DAB to acquire a radio capable of receiving its signals. The growth in DAB radios in the past year or so has been phenomenal. From about 50 in the UK in 1996 to 500,000 in 2004 and set to go much, much higher over coming years.

I can hear some 30 stations from my house on the set's vertical whip antenna. I chose the Roberts Gemini 5 radio which retails for around £150. What I would really like is one in my car, but they are still not standard fit for most vehicles. I find myself listening to BBC 7 which is the comedy channel; remember the Goon Show and the Navy Lark or Round the Horn. They don't make them like they used to.

Chris Pettitt

GØEYO

Patron, Eddystone User Group

Our New President:



A Thumbnail Sketch.

By Graeme Wormald G3GGL

I know that members will join with me in sending their Vy 73 to Bill Cooke, GWØION, not only on the occasion of his 85th birthday in November, but also for granting our Group the honour of accepting the dignity of Life President of E.U.G.

In 1998 Bill gave us his memoirs (*The Cooke Report*), which ran to

almost 50 pages over an 18-month period in our magazine. For those who weren't with us at the time and don't have the CD-ROM back-numbers I'm presenting this very abridged version of one of the more colourful characters in the history of British short wave radio.

Bill was born in the city of Birmingham, the industrial centre of the British Empire, and grew up in the 1920s, arguably the most innovative decade of the century. His father served with the Royal Flying Corps in the Great War and gave Bill a firm technical foundation. He could wind a basket coil and make a crystal set before he learnt to read and write.

Stratton & Company had founded the famous name of Eddystone Radio which, by the time Bill had passed his tenth birthday, was a leading player in the new short-wave technology.

In 1930 he was ready to construct his own short-wave gear and, being only a

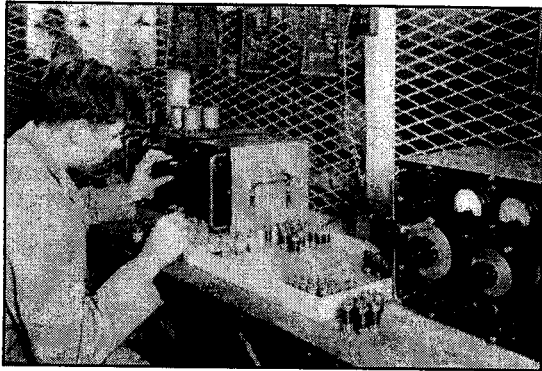
short tram-ride from Eddystone's Balmoral Works in the City centre he decided to go direct to the fountainhead.

He found himself being given a guided tour by none less than the founder of the radio business, George Stratton Laughton himself. As Bill said, he must have made a good impression because he was promised a job when he left school in another five years time! All this at the age of eleven.

In 1935 he became one of Harold Cox's technical apprentices. Cox's boys were considered the pick of the bunch. They had to graduate through the tool-room, the model shop, test

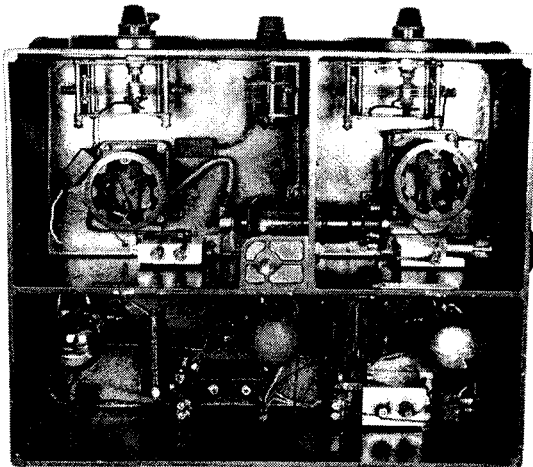
section, service department, design and drawing office.

They made a pattern, cast it in metal, machined it, drilled it, assembled it and wired it. And to cap it all they did the theoretical stuff at night school.



16-year-old apprentice Bill checking coils on an inductance bridge, 1936.

As a final test Bill and his colleagues each drew from stores all the parts for an "All World Four". Every joint was checked by the assembly chief and by tea-time the set had to be sitting on the bench receiving Moscow and Pittsburgh.



Inside an 'All World Four'

As Bill said, "I must have managed OK, because I was chosen to construct the first ERA7, the company's new flagship model in 1937." The *Wireless World*, reviewing it in 1938 (12th May), stated "**Workmanship under the chassis is in keeping with the clean**

exterior . . . this is an instrument which cannot fail to catch the eye of the experienced wireless enthusiast."

Young Bill was on his way. But the clouds of war were looming. In July 1939 he was helping to assemble a rack-mounted H.F. transmitter for the Polish Army when he took a 4,000 volt zap from the modulator and ended up in hospital.

In August 1939 military national service spared few young men and Bill found himself involved in the arcane world of electronic warfare and mobile radar transmitters on the south coast.

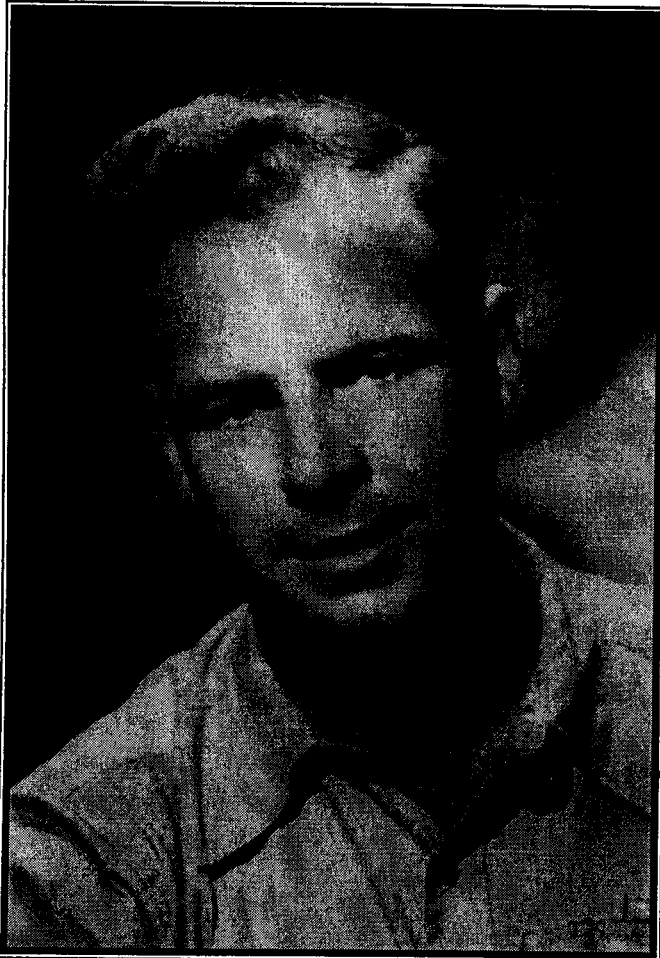
The Battle of Britain came and went, and the war spread to North Africa. Early in 1941 he found himself newly-married and on a troopship bound for Egypt.



Corporal Bill Cooke, scourge of the Afrika Korps, 1942.

Bill's main service in the desert was with a ground controlled mobile radar unit supporting the Desert Rats (the British 7th Armoured Division.)

After a spell in Algiers he finally returned to UK in time for V.E. Day and some well-earned leave after four years absence. He was preparing for a big move with his unit to the Far East when another piece of modern technology brought W.W.2 to an end with a bang.



Bill relaxes in Cairo, 1943

As Bill was one of the first in he was one of the first out and in late 1945 he found himself back at Eddystone, but very different from that which he left in 1939.

The 1940 Blitz had seen the total destruction of Stratton's city centre factories and they had re-located at a

disused lido on the southern outskirts of the city. Bill's first project was an R.F. welding machine for one of the group to use in the manufacture of plastic pants for babies. A very new technology!

It operated at 50 mc/s and Bill likened it to a cross between a sewing machine and a diathermy unit. Three were shipped out to the company's Australian factory and saw many years' service.

In 1947 the famous 640 went into production and the firm was put on a more professional footing. A new development block was built in the bottom of the drained swimming pool and Bill was thrilled to be promoted to the post of Chief Engineer. He had just celebrated his 28th birthday.

During the rest of his reign the variety of Eddystone receivers was so prolific that I can only refer readers to "QRG", the Quick Reference Guide.

Bill is a fund of anecdotes which could form a book in their own right. One story is about a consignment of 60 model 680Xs destined for the Indian P.T.T. Shortly after they were despatched an order being prepared for New Zealand started to blow up on soak test. It was discovered that the reservoir and the decoupling smoothing electrolytic condensers were transposed, thus giving an increased high tension voltage on components not designed to take it.

The error was corrected on production models but Bill had the problem of those on the way to India. He decided to keep stum and not mention it to Harold Cox. (Harold was still the company's technical director and Bill's boss).

No report came back and at last Bill checked up. The whole consignment had slipped off the crane and lay at the

bottom of Bombay harbour. They would have to make another 60 sets. Word never got out . . .

Bill travelled the world on Eddystone business and when Marconi's bought the business from the Laughton family in 1965 he was the only senior member of management to survive the change. He hit it off with Marconi's appointed managing director, Dick Carroll and the pair of them travelled far and wide gaining business for the company.

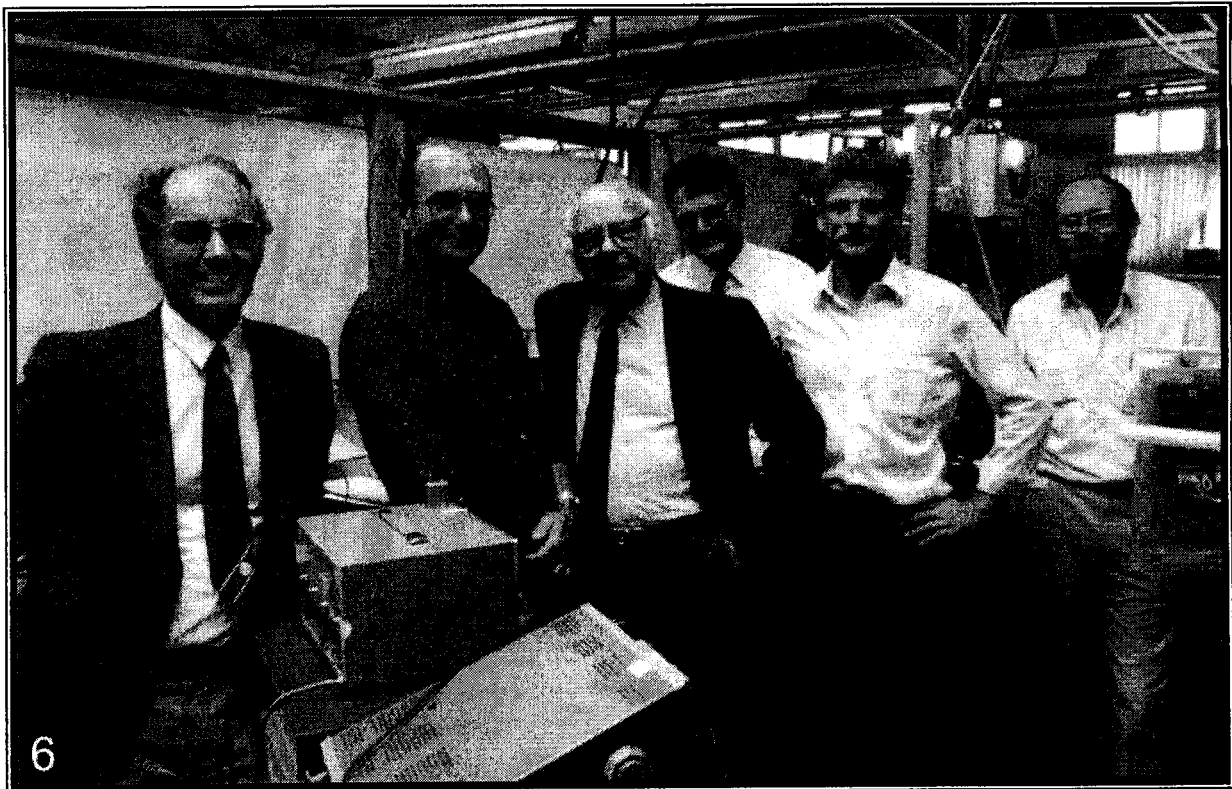
When the professional communication receiver market started to dwindle in the 1970's Bill organised the join-up with the BBC, where Eddystone were to manufacture thousands of 'fill-in' transmitters under license. These are still being made in the 21st century.

Bill became managing director and finally stood down in 1987, after 52

years with the company. Although many of his colleagues and contacts were licensed hams, Bill had never taken the plunge.

When he came to retire he said to Hans Landwehr DJ3DB, one of his old friends in the business, "How are we going to keep in touch?" Hans replied "You'd better take out your amateur licence!" After Bill's lifetime in radio Hans didn't think he would be taken seriously and he was most surprised when, the following year, he had a call to say "This is GØION, Bill talking, time we had a sked!"

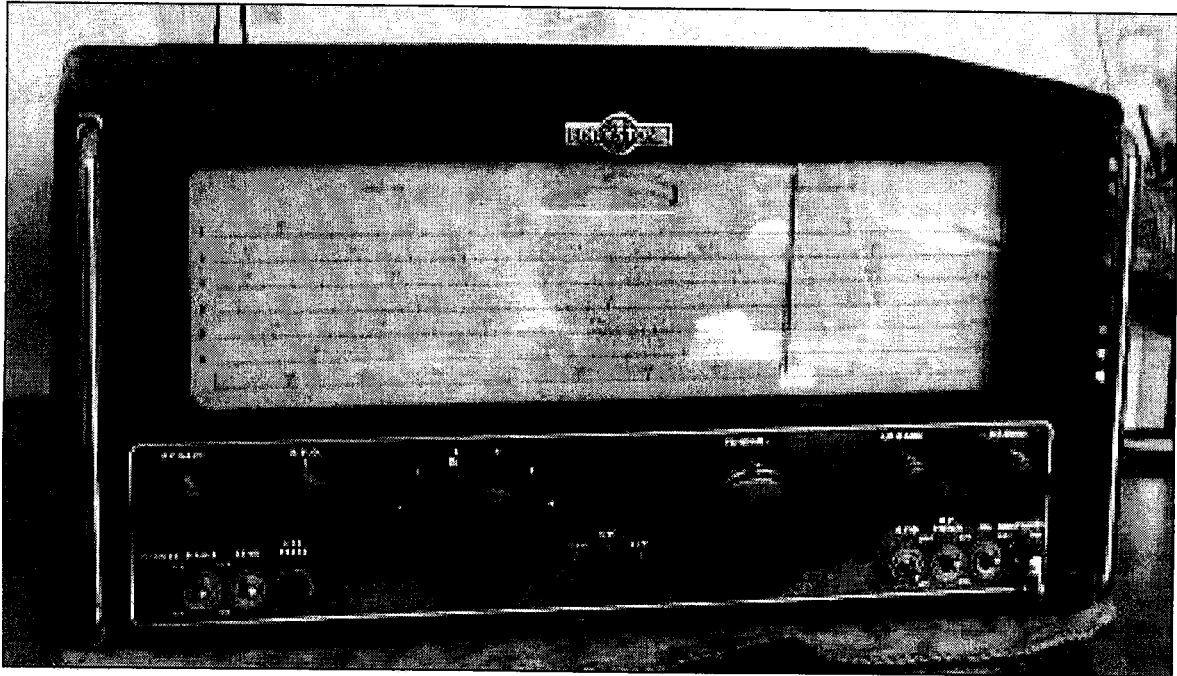
And now Bill, who has the memory of an elephant for people and places, maintains contacts by CW the world over. Now that's what I call a *REAL* ham!



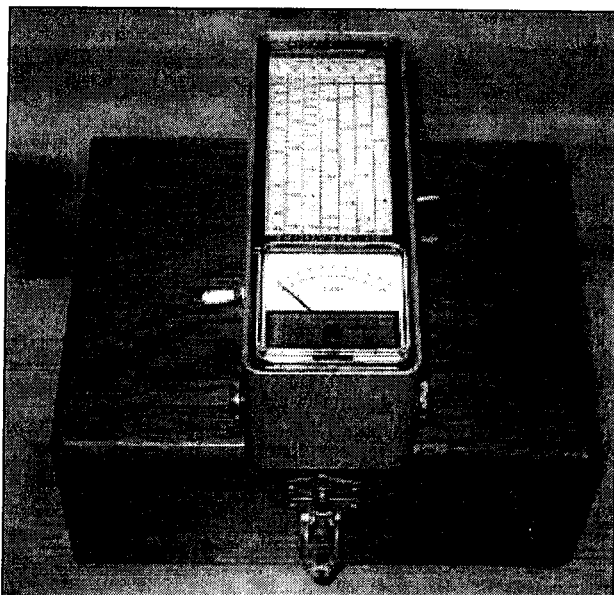
Bill Cooke (centre front) oversees the acceptance test of a medium wave Eddystone Transmitter for Süddeutscher Rundfunk.

E Bay watching

by Chris Pettitt G0EYO



This 888 caught my eye on E bay recently, described by its owner as Eddystone's first amateur bands-only receiver; it was produced for a short time before being superseded by the 888A. The 888 and 888A look very similar but there are a number of circuit differences, the easy way to tell them apart is that the 888 has its headphone jack on the front panel, on the 888A it is on the side. This model is fairly rare today. It sold to an EUG club member for £124.



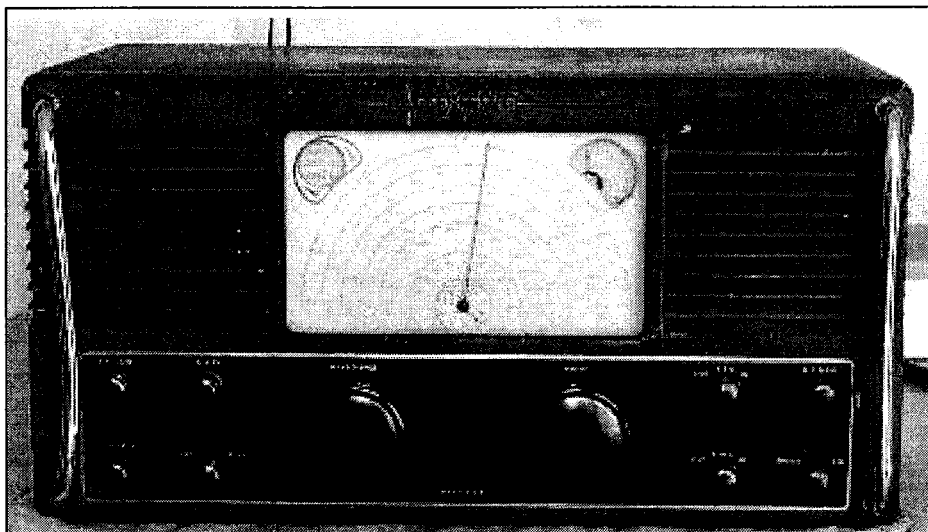
You don't see many Edometers come up for sale and I think this is the first I have noticed on E bay but this S902 Mk2 Edometer was sold as complete with original polished wooden box, a full set of coils, the original coax coupling loop and original instruction booklet. The Edometer itself and all of the accessories were reported to be in excellent condition, it had clearly seen little use over the years (I wonder just how many of them were ever used?). This sold for £129

(I often use mine! – Graeme.)



Another fairly rare item on E bay is the S899 Square 7" speaker. This example sold for £47 and is considered to be one of the more uncommon Eddystone accessories. They were made in the mid sixties, possibly only for a short period. This one was in good condition, with some markings on the oyster hammer finish. This model is roughly 7" square and contains a 5" 3ohm speaker. It was in good working order, although the connecting cable is not original. It eventually sold for £47.

A reasonable example of an S504 communications receiver came under the hammer and was knocked down at a very good price of £171. The S504 was Eddystone's first post war communications receiver, it was



launched alongside the S556 broadcast receiver and was primarily aimed at the export market, thus it is fairly uncommon here in the UK. This Eddystone 504 is complete, un-restored, unmolested, and untested. Cosmetic condition is reasonable, it has the correct knobs, (all operate smoothly) and a good fingerplate, the tuning scale has faded slightly (see photo), the case has lost some paint particularly along the top front edge and there is some discolouration on the left front side. The most noticeable problem is the bent left hand chrome handle. Note that it is only the handle that is damaged, there is no damage to the case, this should be an easy repair as the same handles were fitted to many post war sets. Inside, the receiver looks good, there are some signs of earlier repairs but NO butchery, the valves are mostly Mullard Red ones (EB34 has been replaced with metal type). This set should make an excellent restoration project.

SAGA No.1 -- 1990R/3S



*By Alan
Robinson*

The Eddystone 1990-Series was introduced in 1975 to augment and finally replace the incredibly successful 990-series, the first general coverage transistorised VHF/UHF communications receiver. The 1990R/3S covered 25 to 500MHz in 7 bands and boasted a 'synchroniser' facility (the 7 knob box at the right of the set above.) This, in effect was a 'switchable synthesized crystal' which afforded an instant selection of frequency, accurate to one kHz at 500 MHz. A big step forward. It was not a cheap set; in 1982 its R.R.P. was £5855. It made an interesting restoration project as our member discovered . . .

This is the story of the problems I have had with my Eddystone Model 1990R/3S. They did not occur all at once, but were spread over a long period of time.

I bought the receiver in 1993, through an advert in what was then the 'Electronics and Wireless World', as a companion/replacement for my 770R, which is another saga waiting to be told.

After a while, two faults became apparent. The first was an intermittent connection in the 25-225 MHz aerial connector. The second was an

intermittent operation of the 'TUNE LOWER' l.e.d. in the synchroniser unit.

Opening up the set revealed quite an amount of ironmongery, no doubt for screening purposes, thus making access time-consuming.

THE VHF AERIAL SOCKET

Opening up the aerial socket revealed that the co-ax inner conductor had broken off at the solder joint to the connector pin, leaving the inner conductor floating and making intermittent contact.

This posed quite a difficult job,

E.U.G. CROSSWORD NEWS

Nearly, not quite. 15 winners out of 16 entries.

First of all I must make a BIG apology for missing off the last three answers to Puzzle #20. In reporting the results in our last issue I gave up to 14 down and then stopped. There were 16, 17 & 19 still to go. The reason for such sloppiness was that the answers (from Puzzlemaster Colin) actually filled two sides of paper (such is the profligacy of I.T.) and I had lost the second sheet! Sorry.

The missing answers were:-

16) SILICA 17) PLIERS 19) PART

There's just one other slip; the clue to 19 Down should have been "Component", not "Components."

One day I'll get everything right.

Back to this month: out of sixteen entries (including some first-timers) only one slipped up. I won't say who he is but he managed to pick "gate" instead of "path" for a signal channel and that messed him up!

Actually you can easily tell who it is because it's the name missing from this month's Roll of Honour which has been there for ages in the past!

So here goes with the winners of Puzzle No 21:-

Brian Blake, G3JOS, Rugby.

Roger Bracey, G4BZI, Crewe.

John Caines, Merseyside.

Les Cates, G4AVE, Surrey.

T. Emeney, G3RIM, Surrey.

Richard Gaskell, GØREL, Oxon.

Dave Jones, MW1DUJ, S.Wales.

Gary McSweeney, Gi4CFQ, N.I.

Ted Moore, G7AIR, Cambs.

Joe LeKostaj, K9LY, Illinois.

Jack Read, Cheshire.

Roger Roycroft, G1NXV, Cheshire.

Keith Seddon, GØOQU, High Peak.

David Skeate, GØSKE, Suffolk.

Geoff Steedman, MØBGS, Yorks.

Well done, chaps, a great effort, and I for one don't think these puzzles are getting easier at all!

Now let's have the answers to Master Puzzle 21 for those who couldn't quite complete the grid.

ACROSS:- 2) Trepanned 7) Path

8) Eiger 9) AOR 10) Stud

11) Tapping 14) Rotary 15) Farads

16) Grandpa 19) Lair 20) AVO

21) Wheel 22) Apex

23) Lincompex

DOWN:- 1) Watt-hour 2) The drain

3) Eighty 4) A trap 5) NAAFI

6) De-rig 12) Parallax

13) No driver 15) Fade-up 16) Grail

17) Acorn 18) Dr Who

At the time of writing I haven't got Crossword No 22 to hand so I can't make any clever comments (or relevant pictures) about any of the clues, so I'm going to change the subject completely.

Elsewhere in this Issue you'll see my little treatise about AM activity: "In Consideration of Amplitude Modulation". If *YOU* know of AM activity, drop me a line and give me details.

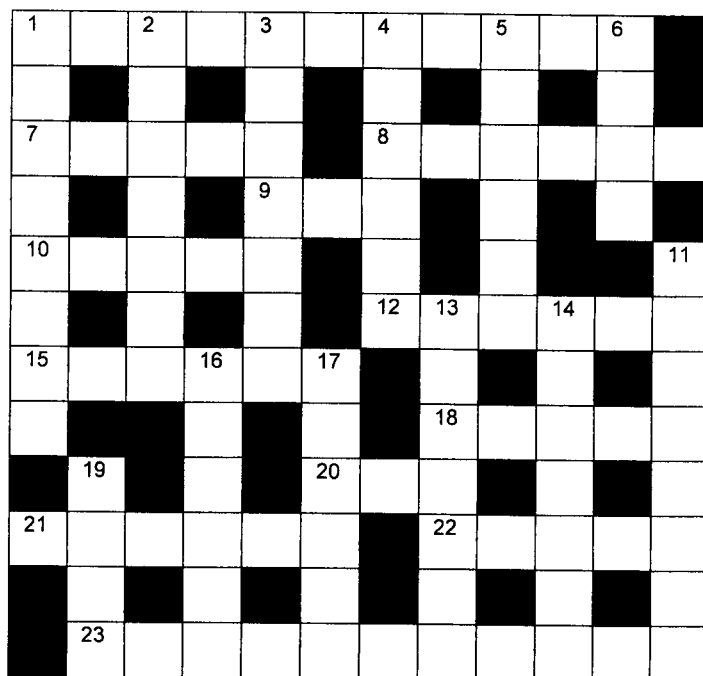
Graeme - G3GGL

MASTERS' CROSSWORD

No 22

COMPILED by
COLIN CRABB G4HNNH

Photocopy or write out the answers so as not to spoil your copy. Send to Graeme Wormald at 15, Sabrina Drive, Bewdley, Worcestershire DY12 2RJ, England, to arrive not later than 20th November 2004. See previous page for further details. Don't forget to include your name!!



ACROSS

1) Tiny's bail it seems could lead to unwanted oscillations (11)

7) Has a flair perhaps for moral weakness (5)

8) Royal Navy's method of procedure is in current fashion (6)

9) Quacky Duck modulation! (3, abb.)

10) The 9am "first Sunday" sked (2, 3 pt. abb.)

12) Oddly, a tracer shell could possibly cause one (6)

15) --- & omissions excepted (6)

18) Brits. in VK land (5)

20) Front panel switch to control the "spherics" (3, abb.)

21) Your regular SWL QSLer (3, 3)

22) Ham operator from YI land (not very likely at present) (5)

23) Let tran. gain perhaps equate to an ac definition (11)

DOWN

1) Electromagnetic waves in the region 700 nm to 1mm (8)

2) Anne's R.C. interfered with, this utility rx (7)
(R.C.= Remote Control)

3) Stall, start and define a celebrity cast (3, 4)

4) Type of Morse keyer (6)

5) Intermediate frequency info (2, 4 pt. abb.)

6) 0.9144 metres (4)

11) A ptt switch is activated by ----- (8)

13) This headphone ear clip is not the real McCoy (7)

14) kettles to drum up for the orchestra (7)

16) generally the final stage in an electronic circuit (6)

17) Circuit that provides an o/p pulse when a given no. of i/p pulses have been received (6)

19) The common emitter current gain (Hfe) of a transistor is signified by this Greek letter (4)



RADIO RAMBLINGS

Gottings from my Notebook



By
Graeme
Wormald
G3GGL

Bewdley, October 2004.

The nights draw in and soon daylight saving time will be a thing of the past. Time to put all those New Year resolutions into action!

PRESIDENTIAL GOOD WISHES

I'm bound to say that I'm quite thrilled that Bill Cooke, GWØION, has accepted the dignity of Life President of our User Group.

I can honestly say that I have rarely had the pleasure of meeting a legend of such stature who has the gift of pride and humility in equal measures. Thank you, Bill, and may I offer early good wishes for your 85th birthday on the 24th November?

E-MAIL? WHAT E-MAIL?

It so happens that, at the time of writing, my e-mail facility has gone on the blink, so I'll apologise in arrears for the delays that members will have found.

It all started on 30th September when I checked my incoming mail for the umpteenth time. Being on Broadband we're connected all day, so it's just a question of logging on (or in, or whatever) which is a simple operation.

But in this case it threw up an unusual notice asking for my password. It never does this because the password is entered and memorised, and it's set to do it automatically. However, if it wants me to do it for old times' sake, I'll oblige.

This then produced another 'window'

which declared that my password had been rejected. Mmmm. Could it be that my memory was slipping? Possibly. So I fed it with my middle names; my mother's maiden name, the dogs' names and several other unlikely possibilities.

All separately, you understand, not all at once. But no, the magic box didn't care for any of them, and kept saying so.

This called for pretty stern measures so I went into the page which asked me if I had forgotten my password. I tried to explain that no, the black box had forgotten my password, but this wasn't provided for.

So I was invited to enter my e-mail address, my date of birth (amazing that the device went back far enough), and my post-code. After a few momentary rumbles and flashes the screen proclaimed "Success" and that my password was being sent via e-mail!

I ask you . . .

At the present time I'm waiting for visits from son and grandson, both of whom are computer literate. But will they be able to resolve this genuine "Catch 22" situation?

I don't know, I may have to call in the undertaker. I've discussed the matter with our Patron, Chris Pettitt, and he is of the opinion that it is my server, btinternet.com, that has got a dose of the colly-wobbles!

WHO SAID "e-BAY"?

Our Patron, Chris is doing a grand job keeping an eye on some of the more interesting Eddystone items coming up on e-Bay. And I've now got thirteen crested china lighthouses! That sounds pretty unlucky to me; I think I'd better get bidding again and round it up.

But seriously, folks, I saw a prime example of one of my regular observations; to wit, that condition matters. This was two EC10s on offer a few hours apart (ie, both auctions ended on the same day).

One of the sets was nice and clean and in its original state. The other was nice and clean but there was a pilot lamp fitted in the finger-plate just below the RF gain knob (on the left). It was also missing one of the push-switch finger covers

One went for £85, the other fetched £40. No need to tell you which was which!

UP FOR GRABS

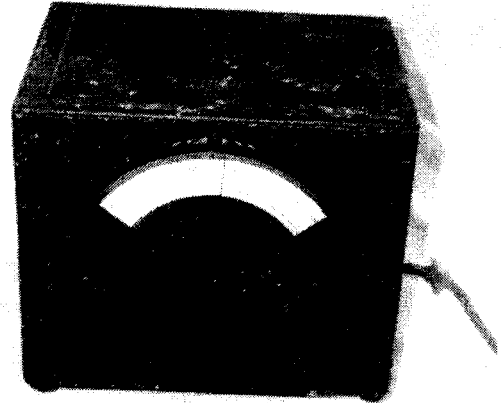
Some unusual offers which have come my way from non-members:

The first one is described as "a pre-war Eddystone case in poor condition with twin 'Indigraph' dials, a top opening lid and some parts in it. **FREE TO A GOOD HOME.**" It is undoubtedly a 1930 All-World Four as described in QRG page 17. **The generous donor is Adrian G4AZS, QTHR (Shrewsbury) 07870 751 642.** Get in there, somebody, it's got to be a good winter project.

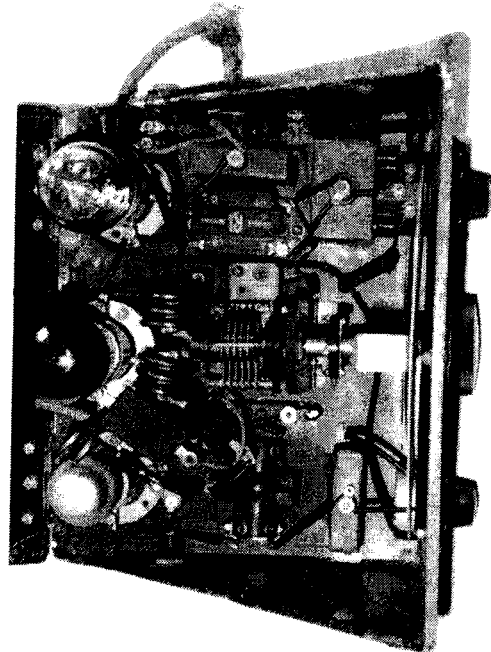
The next items are almost as old; three Eddystone clamshell projects. As far as I'm aware these unusual cases were never used by Eddystone for "ready made sets". They were, however, offered in the 1935 components catalogue for 29 shillings. This was a week's pay for a BBC

Technical Assistant!

They also featured in several D.I.Y. projects described in "Eddystone Short Wave Manual" No 2 of the same year.

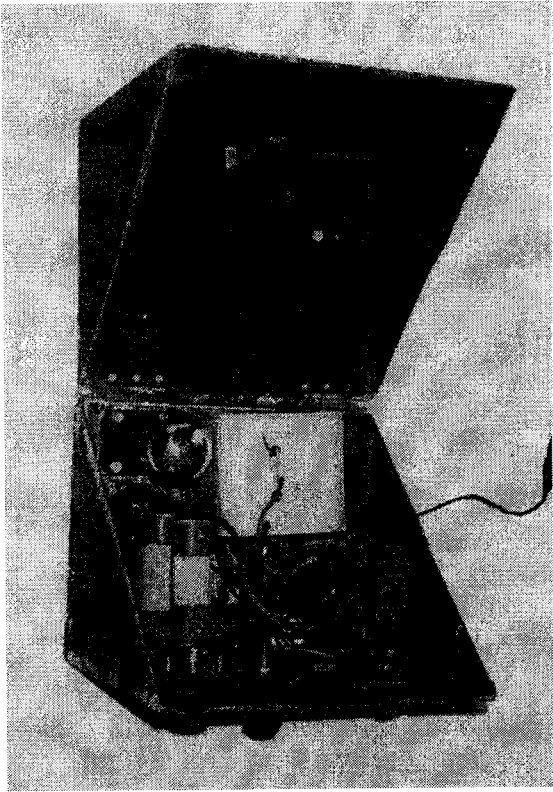


The first (above) is very clearly the "Ultra Short Wave Receiver" which covers 30 – 66 Mc/s in one band. It is a super-regenerative job and although the paint work is a bit scruffy the innards look remarkably clean for 70 years. (Below).

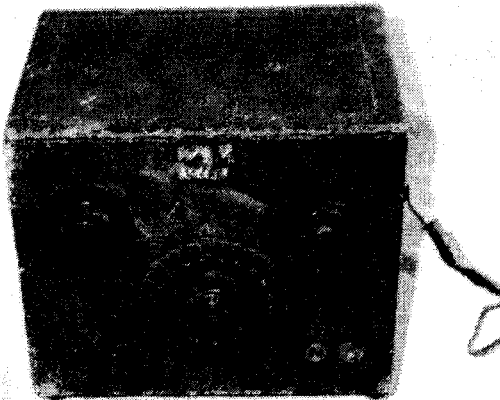


The second item (below) seems to be a free-lance job. That is to say that the layout looks nothing like any other project in the book. It comes from the era of add-on short-wave converters, rather like set-top digital boxes for

present-day TV sets.



It looks rather scruffy within and I think it might well be re-constructed as a freelance version of the "1935 Amateur Bands Two", also described in the same E.S.W.M. No.2.



Come to look at it the outside front panel doesn't look too prepossessing either. (Above.) Definitely the poor relation of the pair.

These two clamshell projects are the property of Tom Williams and are at present in storage in Nottingham, together with an **empty clamshell box**. (Three items in all).

Tom is a 'roving reporter' and never knows from one week to the next where he is going to be. He rang me and asked what I thought he should ask for them. My answer was that I've not the slightest idea; I've never seen anything like them for sale before.

A true Eddystonian would almost certainly make a good offer so, wherever you are call Tom on his Mobile and discuss things.

Serious offers to 07749 107 333. Don't call me, I'm only the newsbearer, but they were too complicated to put in the small-ads.

BOOK-KEEPING

I nearly put "book-making" up there but I'm not in the betting business and what I was trying to say was "could members take note of the following to help me with my clerical work?"

Two mini-problems keep occurring which sometimes catch me out.

The first is when members (or joiners) make out a cheque in **MY Name**. Being very poor at paper-work I sometimes overlook it and then get very embarrassed at the bank when I try to pay it into the E.U.G. Account. I have to take it home, put in into **MY** paying-in book and write out a cheque on **MY** account and take it back to be deposited with the E.U.G. Account. It makes my own accounts look very odd! All cheques to **Eddystone User Group (or E.U.G.)** please.

The other little thing is when you return your renewal forms will you please return the whole form and not tear a strip off the bottom (or, in one case attach a "Post-It" note to a cheque).

I can then put it in my "renewals" file and not lose it because it's so small

Thank you folks, it will help me no end!

Vy 73, Graeme, G3GGL ♠

Aerials and Matching Units . . .

A review continued by Graeme Wormald G3GGL

You may recall that in our last issue I wrote about the merits of feeding balanced aerials with true balanced matching units (commonly called balanced ATUs). I made reference to the new MFJ-974 true balanced matching unit, the only one then easily available in Britain, and also mentioned the bad habit of using a balun in a standing-wave condition. This produced a response from Gary McSweeney, G4CFQ, who spotted an interesting item in QST for September 2004. (*But remember where you first saw it!*) This is on page 60 of QST and is actually a product review, but it addresses exactly the same problem; concern about using baluns under high SWR conditions.

I commend this feature to all who have access to QST. Not only does it go into details concerning aerials, it also announces the arrival of two further 'true balance' matching units (ATUs).

These are manufactured by 'Palstar'; the AT4K and the AT1500BAL. Full test reports are given for these as well as the MFJ-974 and 974H (Top Band version).

What is instantly obvious is that all these units are a bit lossy on 160 metres, the MFJ more so than the others. This is of marginal importance in UK where the very low maximum aerial power allowed can easily be juggled to get the legal 32 watts in the wire.

Perhaps the most interesting fact to our eyes is that the price in US\$ compares as follows:-

MFJ-974 . . . \$179.95

MFJ-974H . . . \$199.95

Palstar AT4K . . . \$895.00

Palstar AT1500BAL . . . \$695.95

"Yer pies yer manny and yer tikes yer choice," as they say within the sound of Bow Bells. The Palstar units are, of course, capable of handling much more RF than the MFJ (300w pep, which is enough for us weaker brethren on this side of the pond!).

I'm afraid if you wish to price them in Pounds Sterling, by the time they've attracted transit, import duty and VAT you can almost call dollars pounds.

Ted Moore, G7AIR, our MailBox conductor is rather scathing about his own unbalanced MFJ tuner which has 'hot' condenser spindles under the tuning knobs giving rise to hand capacity. First of all I must point out that the 974 balanced tuner has nylon shafts and gears and there is no question of hand capacity.

But further, I do have an unbalanced MFJ (actually a 'Vectronics', badged by MFJ) and this does have 'hot' shafts inside the knobs. Now I use it to match my shack's 20 ft whip aerial, which is low impedance on 80, but quite high on 12 metres, and on

neither band do I get any of the dreaded hand-capacity.

I can offer no explanation for Ted's problem, especially as he uses it for matching a 50 ohm Tx output to his inverted-V dipole, which can't be much of an impedance change. . . . very strange, some of these aerials!

THE BIG LOOP

Last month I promised to consider the question of the all-band horizontal loop. You will recall that I had erected a 66 ft doublet aerial, centre-fed with open ribbon feeder and matched with the MFJ974H. It was at a height of about 20 ft and it was possible to use this simple piece of wire effectively on all bands.

I also have a 'random' horizontal wire loop, which was originally cut as a full-wave on eighty, but was found to load up happily on virtually any frequency.

As it was obviously not frequency-sensitive when fed with resonant line, it was 'tidied up' and ended up as a 242 ft circumference "square", also at a height of 20 ft (give or take; the plot is very, very sloping).

Now this may sound like an enormous amount of wire and quite beyond the capability of the average suburbanite. So at this stage I must point out that the QTH here is a 1978 bungalow on a compact estate with modest amenity space (garden to you lot out there) and surrounded with telephone lines and street lamps.

On measuring the sides of this "Squaerial" I found that they were all different in length. Being a bungalow the plot is wider than long, but that's academic. Two sides of the aerial are about 70 ft and the other two about 50 ft. The feed point is about 1/3 the way along one of the longer sides. All very unscientific.

But it works. And how well it works!

On the EUG "First Sunday" net I am usually as strong as any other station and stronger than most.

I have a selector box and can go straight from this aerial to the 66-footer without having to re-align. (I use a KW EZEE-Match for the alternative aerial). Effective though the 66-footer is, the big square usually beats it by 2 to 3 S-points.

Although it goes within about 6 ft of my TV aerial it causes no TVI (I do, of course, use a 'braid breaker' ferrite ring on the TV co-ax). It goes within 3 ft of the telephone line (I use the telegraph pole to hold one of the corners!) and 8ft from the street-lamp lantern.

It's my belief that the nature of a large loop is such that the very high impedance present at the tips of a doublet (dipole) or far end of an end-fed is totally lacking. This means that capacity-coupling to nearby objects is much reduced, even non-existent.

The radiation pattern on 80 metres will be pretty well straight up, I should think. What our trans-Atlantic cousins describe, with characteristic good humour, as a 'cloud-warmer'.

But it has the advantage that as you go higher in frequency the radiation pattern will start to spread out like a flower in bloom and the transmission will be of a low angle from 20 metres down. Perfectly adequate to work the Americas, etc. . . .

It's also worth bearing in mind that in this day and age of Planning paranoia, when just the application will cost over £100, that a wire aerial which is not higher than the roof ridge is considered exempt. A couple of 6 metre aluminium scaffold poles painted green (which need no guying, just a god-father post) will hold it up at the far ends and the house will hold it at the near ends. ♠

Ted's MailBox

A Review of Mail and Happenings By Ted Moore, G7AIR, Founder of EUG

Tick - Tock

Or more nearly 'Tick - Tick' as it came through the speakers. Speakers plural since it could be heard loudest on any set, anywhere from 1.5 Mc/s to over 10 Mc/s but appeared to lose steam after that.

It was more of a nuisance than a downright problem and so I checked and found almost nothing coming through on my EC10 running on batteries. Unless I approached a mains socket with the whip aerial. Inspiration ? Just plain common sense said that it was mains borne.

I put a 'scope across the mains after making up a capacitive attenuator, and there they were. Big ugly spikes superimposed on the 50c/s supply. This was definitely something new at my QTH and so off I went on my bike around the area, with an EC10 in my rucksack too !!

But I didn't need it as I soon spotted the culprit in the chipshop just 100 yards from home. They had installed one of those Insect Killers which apart from an ultra-violet light also has an EHT unit to electrocute the flies. It was a BIG ONE, almost three feet long. Around about 4500 volts !

What a lovely spark transmitter that made. Something had evidently got itself across the electrodes as one could hear distinctly the crackle as the noise manifested itself on the EC10. The shopkeeper shook his head and said that he and his spouse had been

wondering what was messing up their telly but had never linked the Killer machine and the telly interference.

The long and short of it was that he switched off and took down the device in order to clean out the debris, promising to have it done regularly, for his sake and mine.

Before leaving the house I had succeeded in reducing the mains borne noise in my house by fitting two 0.25 μ F filter condensers rated at 630v AC inside a disused plugtop psu, the tranny was o/c anyway so the innards were dumped to make room for the two condensers, one from live pin to earth and one from neutral to earth. This won't work with a plugtop having just a dummy plastic earth pin remember !!

With this plugged into a spare socket just close by the meter the noise was considerably reduced, but you have to leave it switched ON.

A First Ever ! For Sure

If we exclude the pre-war tests done by Eddystone for their own purposes then this must have been the first modern QSO using ALL EDDYSTONE GEAR. I suppose one of our bright boys will come up with some previous occasion but none the less this has to be an event to record.

After all the work done by Geoff, MØBGS, to get my Eddystone 1560TR aka my MIMCO Marlin (marine rig) programmed for use on top band and eighty it naturally meant he had to

have a part in the first QSO using this mighty beast on 80. It is necessary, because of its total weight, to split the thing into three items, Tx, Rx, and Case, for transport /P in my car. Then one has to re-build it on site and this includes putting all the plugs into the right sockets on the rear before powering it up from two 75 A-H car batteries in series - for 24v operation.

Quite a task in itself. Having made arrangements the previous eve with first Geoff and then 'GGL I was up early and off to the river bank near the West Lighthouse just North of Port Sutton Bridge where I can operate from a genuine sea-level location.

I actually pulled onto the site on the riverbank at 15 minutes past high tide and so had water sloshing around my tyres for a half hour. When it had gone down far enough I was out and setting up my mast and stays plus inverted V dipole, stays and dipole ends anchored with 6-pint milk jugs full of H₂O.

Only then did I realise that it had been my intention to put the Alinco into the car together with the Marlin and the Orion, as a back-up if things went awry. I forgot !! So there I was with no alternative but to use the Orion 5000 for LSB/USB and the Marlin 1560 for AM/USB. Geoff had programmed in my usual channels as I had put in crystals for them into the Orion.

No problems as it happened, I had perfect copy immediately with both of them and we proceeded to do tests on AM, USB and finish off the QSO on LSB. I really do like the quality of the received audio on the Orion, very crisp and punchy and I am beginning to appreciate it now that I become more familiar with it's shortcomings as a Ham Band transceiver, something it was NEVER designed for. 'GGL says that received quality from it at his end

was okay too.

I have yet to obtain a suitable mike for the Marlin so it was necessary to rig up a temporary switch to swop over from one rig to the other, my DIY aërial switch box enabled me to use both rigs on the one aërial with no bad effects on matching.

Of course one does have to realise that being destined for shipboard use in a permanent installation the built-in atu on the Marlin would have been set up to suit the in-situ ships aërial.

Unfortunately the matching of my /P dipole seems to vary as to the state of the ground over which it is erected. This will be due to the ends of the dipole, high voltage points, being in close proximity to the ground. At the suggestion of 'GGL I therefore matched up the Marlin atu into a 50Ω dummy load at home and then used my normal atu to match this to the aërial on site.

I just had to get both these sets working and to USE them, after all my sets are not mere dust gathering collector's items. I shall now know that I can use the Orion when /P and have yet to decide on the Marlin. Very cumbersome to use /P but then I never operate from home do I ? So what to do ? Still I have done a few measurements and know that it fits comfortably in the boot of my Volvo with a couple of inches clearance above it when the lid is down, so that is a plus. Much cogitation to be done here to find a solution, as I DO want to use it.

The one problem encountered on /P site was that using two 12V 75Ah batteries whenever I switched to Maximum Power every LED on the Marlin panel began to wobble. Geoff and Graeme between them have

offered advice with the result that the 7mm battery leads are replaced with 9mm as per the Orion and the Alinco. 12 foot length is reduced to 6 foot, more than enough as the batteries sit beneath the picnic table. Problems are over. I shall let you know what is decided as to its future usage.

Special personalised QSLs plus photos of the station on site have gone out to both Geoff and Graeme. Think of it, all Eddystone, even my 40A used to tune up and monitor my signal.

Rants and Raves

Well, and why not ? Fair makes me want to spit sometimes. Too often we get frantic calls from folk who say "Why don't you answer me on the net ?" Or I listened but all I could hear was 'GGL, or 'XFE or Ted. You know if I, or we can hear you at S8-9 but you cannot hear any of us then something is usually wrong with your receive set-up. Yes, one way propagation does exist but far too often the problem lies with the complainant's aerial set-up.

I visited one EUGer who had bought a full size G5RV at great expense, it was in his garden. He had both a 680X and a Trio 2000 but they were being starved of signal.

The far end had about the last 10 feet of aerial wire going in through the foliage of a large leafy tree, at about 15 feet off the ground. I was assured that the wire did not actually touch the tree trunk but had a length of fence wire taken around the trunk to which was attached the aerial insulator.

The wire ran across the lawn drooping to about 10-12 feet at the feed point and then went up to a bracket on the wall of the house, formerly used for a hanging flower basket.

The feed coax came hanging down to

the ground then ran across the ground to the base of the fence which it followed along to the house. Here there was a taped up joint between the end of the aerial coax and a length of white TV type coax, of dubious vintage, which went in through a hole in the window frame down to the skirting board to which it was stapled for a total of some twenty feet until it terminated at a Belling type coax socket mounted on the wall close to the TV set.

A TV type coax lead then went behind the TV set, to the rear of the receivers which were sitting on top of a coffee table, the bottom shelf of which held a video recorder. Some 150 feet of mismatched feedline.

No ATU, or AMU as the purists insist we call it. The feed went into the two receivers via a Tv type 'Y' splitter of the resistive type, so it was connected to both Receivers at one time. Can you count how many impedance mismatches there were in that system?

Think of the losses ! Yes okay then, he could receive loads of broadcast stations but all amateur bands - even the usually vociferous 40 metres - were pretty silent. The difference between a couple of tens of watts and hundreds of kilowatts was quite noticeable.

Now at the extreme bottom of this garden there was a telegraph pole. On the roof of the two-story house there was a high chimney. In the wall of the room where the receivers were there was another window.

By drawing a plan of the garden plus house and the present aerial layout and then super-imposing on this a freshly designed - (mentally done in seconds!) - aerial layout I was able to explain what was needed. Since the

EUGers son was there we were able to rig it up in just over an hour.

The far end of the aerial now went via a longish length of polyester cord to the telegraph pole, as high up as the ladder available allowed, this was well over twenty-five feet and was now in the clear from the large tree by about fifteen feet.

This now brought the original coax feed to within easy reach of the other window in the operating room. The nearest end of the aerial was taken up and tethered via a shorter length of polyester cord to the chimney via a handy but unused iron pin.

It was here necessary to drill a hole in the window frame in order to bring in the coax, it now came to within about four feet of the receivers.

The 'orrible white Tv coax was no longer needed ! By now the EUGer had been persuaded that the video recorder and Tv could be moved to another corner leaving just the two receivers on the coffee table.

A DIY ATU of mine was brought in from the car and placed on top of the receivers. This had two outputs switched and one input, all SO239 sockets. The necessary plugs were fitted and the sets were powered up. Gone was the continuous QRM from the video recorder, gone was the high level of mush and there were plenty of stations on eighty and forty.

All in all, what with the talking and planning, it probably took him, his son, and I about two hours - with the essential coffee break included. When I asked why he had not done something similar before he replied that "he hadn't thought it possible".

Oh yes, he phoned up to say that he had heard most of us on the next

EUGnet, plus many other amateurs and lots of 'utes' such as Kinloss SAR and Humber Coastguard. THIS IS A TRUE STORY !!

But you know there are many who simply do not apply the necessary mental power to the consideration of the best possibly aerial system for their particular QTH.

I call this the 'Bit of wet string will do' syndrome, what on earth use is it spending tons of money on receivers when you just connect them to a very inefficient collector of signals ?

In another situation a friend, not in EUG, had struggled with domestic 'noises' such as the central heating boiler ignition, the fridge, the washing machine and the goggle box, for years.

His aerial was nothing more than a wire running up to the picture rail and then up and along the banisters in the hallway. Yet, there was a sash window just a couple of feet from his operating table.

Outside the window I ran an aerial wire up to the eaves gutter bracket (plastic) and thence right down the length of the back garden to be fastened to a twenty or so foot high pole which had nothing more than an ancient weather vane at the top. Results far exceeded even my expectations and his FRG7 was now very much more lively.

It doesn't get you better results just to sit on the sofa and bemoan your poor location, as some do. Living in a fifth story flat one EUGer had made do with just a length of wire running across the room, below the ceiling level, with about ten feet of it hanging loose out of the window.

A few words of explanation to the building supervisor and Ian now has some fifty feet of wire strung between

two brick ventilators on the roof, which is led down via a stand-off insulator screwed to the parapet, to a lead-in tube in the window frame.

This fed into his 840C has provided a real boost to his signal to noise ratio. The motto must be to "sit and think it through, then get to work" And the corollary maybe is "don't be afraid of hard work !!".

GB4WTA



Promises, promises, if all those who had promised to come on in the four Sunday sessions had turned up we could have been overwhelmed, but the many non-EUGers who came on really did make it a success.

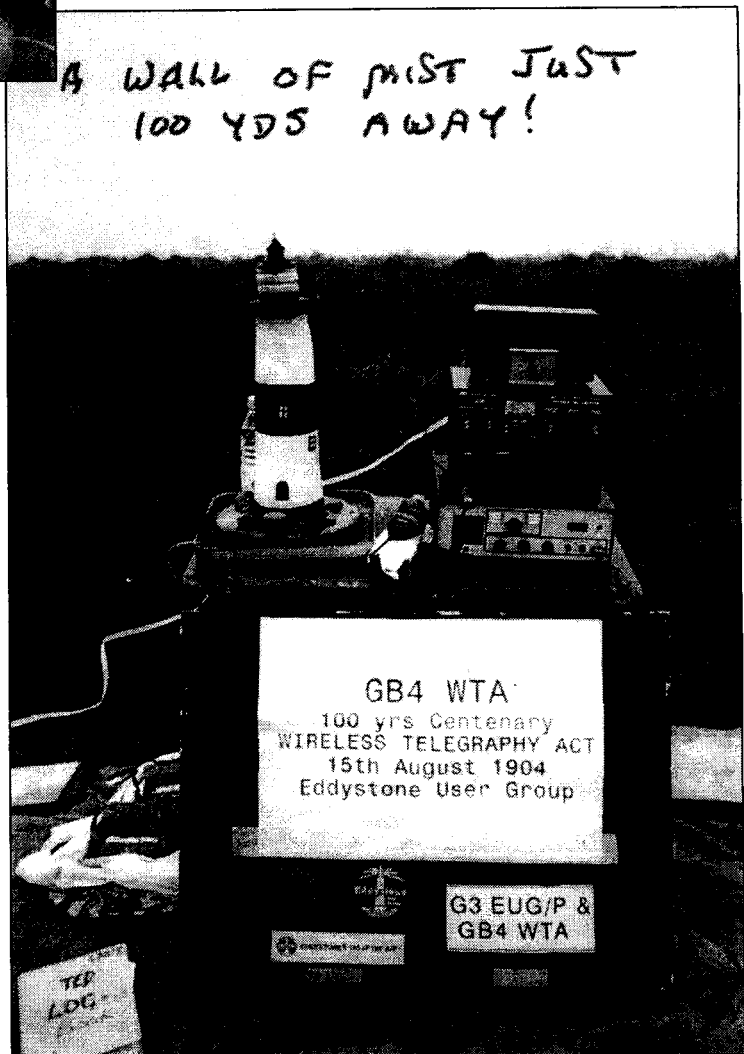
And my personal thanks to those of you who did come up on eighty for this Special Event Station. You should all have received your QSL cards for both the Special Event Station and for the prior G3EUG QSOs on AM/LSB run with the able assistance of 'GGL'. I sometimes wonder where EUG would be without him - definitely deep in the Doldrums, if not in Davy Jones's Locker.

In all Four Sunday sessions - despite the RSGB getting it all wrong and putting us down for

just the Saturday 14th ! Typical !

With the preliminary 'recce' trip to Wireless Hill to see if it was still there, that made FIVE round journeys of well over 100 miles each. Plus the time spent sorting out access permission with Anglia Water who use the site for a reservoir-cum-pumping station and with the farmer who owns the land.

There is ONLY a public footpath to the Trig point and so as I needed to get my Volvo up there it involved many 'phone calls and much explanation. It was a two hours plus journey using a busy main road and many country lanes plus a couple of hundred yards of 1 in 4 access track, then there was the checking and loading of the gear into the Volvo on four occasions, no good



turning up on site to find I had left the ATU or a very necessary coax lead at home.

A very time-consuming task putting on a Special Event Station with no back up from anybody. That it went off AOK has given me much experience and a fair amount of personal satisfaction and should anybody feel that he is lacking his just reward, the special QSL card from either G3EUG or GB4WTA then please get in touch and after a log check I shall send one off.

Thanks a bunch to all those who did come on, that includes the six SWLs who sent in reports. It involved much disruption to both my personal lifestyle and to the domestic bliss at the Bewdley Ranch. I feel I owe a very personal debt to 'GGL's XYL Eda for having disrupted her early morning routine on several occasions, not to mention getting 'GGL out of the shower on one occasion.

Next stop the I.O.M. where I hope to have my teenage body-guard bring me a hot breakfast on Snaefell Summit, as she did last year on the Great Orme.

Skywires, again

My inverted 'V' configuration has several points to recommend it. As I see it, the necessary NVIS properties for UK wide contacts on eighty cannot be bettered by any other system besides a full-wave loop, and I haven't figured out yet how that works for NVIS!

Just not practical to put one of these up when on a /P site. The fact that only a single 'pole' is needed must be a big plus too. I am still using the SOTA pole which I have had for well over a year, used on every EUGnet and also on many Receive only ventures when I have gone looking for NDBs etc; up at

Gedney Drove End or at the West Lighthouse at Guy's Head.

It looks to be as good as new and will no doubt serve for many more trips out there. It was a special offer at £12 at a Rally, with twenty feet overall I usually use just the lower eighteen feet with my dipole attached via a large rubber grommet slipped over the top. The far ends of the dipole are usually just tethered via similar grommets and polyester line so that they are but inches off the ground.

Sometimes I do add a five foot pole at each end to keep the ends up out of the long grass a bit, just a couple of those cheap plastic mop handles. The tethers for the ends and for the two stays are simply six pint plastic milk jugs full of water.

Not only is this aerial apparently efficient on the band it is cut for, but it does load up and get me good signals on the other HF bands. I find it is more than useful too for beacon chasing when at sea level.

The wire used is old BT hook-up wire with teflon insulation, more than strong enough as after so many operations the original dipole is still in one piece. I did try coax feed but the dipole is essentially a balanced aerial and coax spoils this balance so I use twin feeder, making this a 'doublet' in 'GGL's lexicon.

Without any ATU I can get almost 1.2:1 SWR and good signals, however I do better with one of my simple DIY ATUs or the expensive MFJ unit.

Can you believe it, I get Hand Capacity on the 'T' tuner variable condenser on the MFJ. No wonder that these things have earned the sobriquet of Made From Junk ! I thought hand capacity went out with reaction TRFs.

I saw one of the local Club /P stations recently setting up on the opposite bank not far from my simple, rapid deployment gear. They took all of two hours to get up two long steel scaffold poles, numerous staywires, coax feed led in via two poles. All done by a half a dozen beefy types who bickered about who did what.

My rig can be On The Air within fifteen minutes from arriving on site, this including the munching of a couple of chockie bars !

This is not to say that I would not appreciate company from other EUGers but it always seems to be too much trouble. It does pay to be hyper-active like me sometimes.

Words and Pages

'GGL has the kind of mind that revels in statistics and his recent comments about how many millions of words and thousands of pages EUG has produced did have me quite bereft of speech - for a moment.

Of course we have but a handful of those original members still with us, as a recent silent-key communication reminded me. One of the earlier publications was my list of those common faults which I, and others, had come across on the many models we had had on our work benches.

In my case the observations came from many years of repair bench notes. 'GGL has come across this in his archives - amazing fact but he just went straight to it whilst we were talking on the 'phone, this after some TEN years.

Anyway he is looking to maybe our doing a repro of the list which first came out as a supplement with the Newsletter in 1994. Some eighteen pages he tells me. Then there was the

Compendium with much detail of the history, the advertisements, the circuits of Eddystone Radio. Many of our present day members will never have heard of either of these early publications and so we plan to make them available again.

I am also doing repros of the Old Original Factory Blueprint Register, much of it in copperplate handwriting, these seem popular even though so far I have only got the first half - 1932 to 1974 - done. Time seems to be shrinking !!

The Telford Rally

A nice day with a very good turnout too. All thanks to the Telford Club members who seemed to be very much 'with it' and showed us all what the word ORGANISATION really means when applied to Amateur Radio Rallies.

A few other clubs could learn from the Telford lads whose Rally went with a swing. 'GGL and I had four tables with the EUG display and a couple of representative models from the 640 to the Orion 5000, via the EC10 and the 40A.

This latter was switched on all day reproducing in the speaker and on the meter the spikes of noise generated by my very own Eddystone Lighthouse which was flashing it's warning beacon for all to see. Not that I did not make one boo-boo but then who is perfect ? I took delivery of the ex E-bay 960 bought for me by GGL and collected by James de la Mare for me. Thanks to both these gents.

I also collected an ex 'GGL EC10 which has a few very special points to mull over, some strange sets do turn up ! This has a textured grey surface as does the similar coloured 870A, It

also has THREE not two cutouts at the rear, only one of which is used for the aerial sockets.

Then when opened up it has gleaming new-looking PCBs with one or two components differently placed. The one striking feature is that all of the IF OC171s have ferrite beads fitted to the wire legs, never seen this on an EC10 before. And it is the EC10, not the Mk II.

I bought a couple of hand mikes, one for the Marlin and one spare plus a couple of the exact screw/clip 5 pin DIN plugs. Since I bought a couple of Eddystone 200pF tank condensers and a pair of WWII headphones. I also spent some time looking for a couple of suitable knobs for the 'Tanks', only when I got them home did I find that the hole diameter did not match the Tanks. NTW though as I got some suitable knobs at Birkett's a week or so later.

Germaniums

I needed to stock up on Germanium Trannies since I have a number of sets which will probably need transplants when time allows. The 960 in particular. It may seem a long way to go, about 60 miles each way for about £30 worth of transistors but a visit to Lincoln to shop at John Birkett's Emporium is always a worthwhile exercise in my book.

And so it proved this time. Having my shopping list for OC170/1s, OA90s, OC44/45s, and matched pairs of Mullard OC82s filled took no time at all. He had everything I needed.

Then whilst gossiping a bit I spotted this lonely looking EC10 II lurking on a back shelf where he usually has a few communications sets. How much John? Well he said £80, I countered with a

shake of the head and £40, and we settled in time honoured fashion with £60. Complete with mains psu and getting it home I found it worked a treat. Have chopped the screen legs on the OC171s for now and this cut down on noise, but new ones will go in later. See, I meant it when I said a visit to Birkett's is always worthwhile !!

My 960

I really had forgotten more than I realised about this model, not having had mine since about fourteen years ago. Courtesy of 'GGL's internet and e-bay endeavours it was arranged for James to pick it up, once 'GGL had completed the necessary 'plastic' money exchange. All very mysterious (to me) this form of financing. Anyway I got my hands on it at Telford and duly stuck it in my car. Very chuffed to get another one even though as advertised it was not working and needs much TLC. The missing 'cheek' was provided from 'GGL's stores and the missing battery box was re-fabricated.

The rather askew EDDYSTONE logo above the scale window was carefully removed and having removed all trace of old adhesive it was re-stuck horizontally. The dreaded 'twiddler' had obviously had a go as most cores seemed to be lurking at the bottom of the IF formers, a couple missing too. Yes I know the last IFT only needs one!

Powered up it made noises like brekky cereals but no signals so I realised this was going to be a long job. The vernier logging dial spider was scraping on the gearbox as so often happens when some ill-advised person has had the gearbox fixing screws out and put them back without the VERY necessary original washers.

He had then tried to remedy the

scraping by bending the legs of the cast alloy spider - NEVER meant to bend ! Since I had to have the glass out and the scale off to clean I was able to get to the spider and vernier dial this way. I also managed to re-fit the needed washers.

This was all the easy-peasy work, now came the harder bit. ALL the trannies came out and were replaced, as several of the OC170/1s had a DC current passing down the screen leg of the tranny to chassis. Only microamps and varying from 870 μ amps on one down to 115 μ amps on another but it should not have been there!

Obviously it was passing from the collector via those dreaded 'whiskers' to the supposedly isolated can.

After the transplant the 960 had power applied - via a bench psu with current limiting, just in case. The AF board worked a treat straight off, but NOWT from the IF board. A check showed no Zenered 6.8 - 7.1 volts at all.

Dissing all of the wires attached to the top of the zener diode showed me an almost full short, varied from almost 0 Ω to about 4 Ω as I moved the Range switch so it is coming through the osc coils, there things rest for the moment as there must be a life outside of Eddystone.

I am looking forward to getting it on the air though. I STILL rate it a Good Buy for what I paid, and the vendor's description was accurate too.

'GGL's EC10

Or rather the ex 'GGL's EC10, and a very nice looking example it is too. It worked on the three higher ranges AOK, but he admitted not having had time to do anything to it.

On Range 4 almost nil heard, on

Range 5 oscillating only over part of the band. Well it did bug me at first. It was possible to adjust the slugs on the oscillator coils on both these ranges (4 & 5) to make it oscillate over a part of the range but nowhere would it 'osc' over the full range on the scale.

First off I spotted the slugs in these coils looked a different colour, jet black compared with slate grey of the others, put the proper ones in and the frequency range changed but it would still not oscillate over the whole of range 4 or 5. I intended putting new RF trannies in and so I did this whilst mulling over the problem.

I ought to have guessed it. The darned thing functioned as it should with a new oscillator OC171 fitted, and the old one showed collector to screen leakage of around 380 μ amps. Since these OC171s only cost 75p each (John gives a discount for spendaholics like me) then why not renew them ? This EC10 is now burbling away happy in Sasha's bedroom, sitting on top of her 730/4 (she only gave me £50 so I lost on the deal !) Ted.

Eddystone Babies !

Well things never come in Ones, usually in Threes, but within the last couple of weeks I have acquired FIVE new Baby Eddystones. The ex 'GGL EC10, the ex Birkett's EC10 II, plus another EC10 II, an EB35 (early one this not a II, without the IF pre-amp board), and then an EB37. They must be breeding somewhere. I don't really go looking for them it is more a case of them finding ME.

Two need some work to get them singing (crying ?) and will have to wait until time permits, the EB37 has had a couple of silicon (not silicone) transplants which will need to be

removed. More later.

Isle of Man Re-visited

By the time you are reading this missive the October EUGnet will be all over, I am hoping for some of that fabled Manx good weather so that operation can be out of doors but failing that my /P operation will be done from the top of Snaefell in my car.

The Volvo can get off the car park at the top and onto the grass just near the microwave tower at the top so I shall be 'snug as a bug in a rug' if the weather is bad. With a good number of promises of operation from EUGers, plus the outsiders, plus those very welcome SWLs, my Manx odyssey ought to be a busy one.

Incidentally I QSL direct not via the bureau so if anybody is missing a QSL for previous /P operations get in touch. If I don't have your address from the CallBook your card is probably sitting on my table here waiting.

If you are not in the CallBook and are ex-directory then don't blame ME. I have cards awaiting an address for the following - GB2 TD, G6 HKQ, 2EØ NRM, HB9 DAQ, G4 BXD, M1 KTM, G4 KCK, MØ MAA,(x2), 2EØ AWU(x2). Ted

CASES, PLEASE !

Both I and a couple of other EUGers need cases to complete Eddystones which we have acquired sans case. Why folk take the case off and then dispose of it and the receiver in different ways bugs me. Or is there maybe some misguided soul out there who collects ONLY the cases off Eddystone receivers ???

Whatever it is if you have any of the following then I and others would love

to have them. Cases for the following models, 990R, 830/7, 840C, EP17R, 670C.

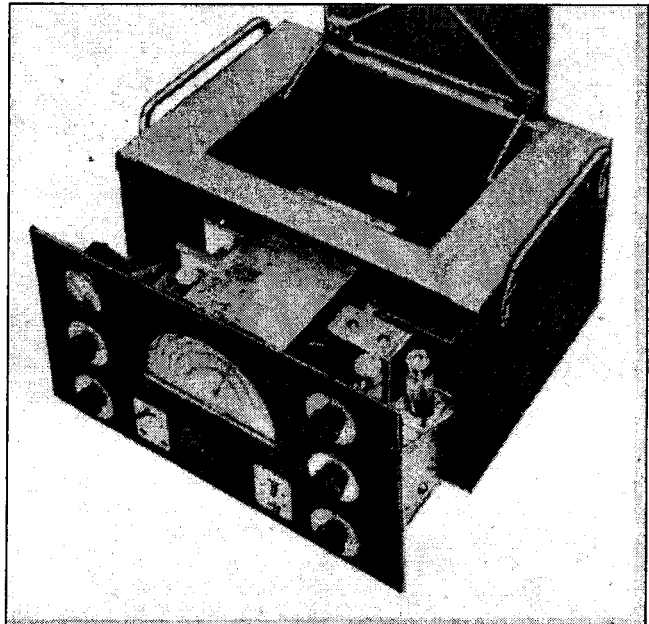
I can possibly do the collecting if closer at hand than the guy who needs the case, so PLEASE help us out. I have just acquired a repairable gear box for an S358/400 receiver if you need one, and I have a spare case for an S358 also. I have, too, a spare case for a 670.

S.358 + PSU S.390

Whatever the state of my memory for day to day things it does remain pretty reliable for things from fifty or more years back ! So it is nice to be vindicated now and then, as with the matter of the S.358 receiver series.

I have always maintained that we had them in the RAF and that I HAD seen them as late as the beginning of the '50s.

A recent offer by one of our keen EUGers up in the North West had me haring off up the old Great North Road,



no not in pursuit of Dick Turpin and his nag but to collect a 'scrap, for spares' S.358.

As it turns out the donor was about right and it will only serve us for spares, I know three members with such 358/400 restoration jobs on the back burner. So many thanks in advance Paul.

The VERY interesting thing about this set is that all of the coil packs bear the original 1940s type red paint stamp announcing to all and sundry that this is Air Ministry Property !!

You get the Crown with the letters AM and beneath is an RAF stores part number, different for each coil pack. It might well be that there is one on the radio but some individual has had a go with a paint brush and liberally daubed it all in light (too light) grey paint.

Yet another snippet of proof, if more be needed. I have gone so far as to lay one coilpack on my photocopier and send the ensuing piccie to 'GGL to show this is no illusion.

(Ted is dead right, the stores number is 10V/80 on this particular coilpack. "10", of course, is the old pre-NATO stores prefix for "Radio" gear, like "5" is the prefix for non-radio "Electrical" gear.

This is then followed by one letter and up to four numbers. Variations to this include items supplied from USA under Lend-Lease Agreement. They have a "1" before it, making radio gear "110".

Another other curiosity is the "10X" quartz crystal reference. This was a 3/4 inch pin spacing crystal and the following number was always the frequency in kilocycles. - 'GGL)

As I received three old 358/358X sets from 'GGL last year and have but one working so far I shall hopefully get a second one up and running - when time permits.

Tempus Fugit

And as I mention above, it certainly does that. But a few days left for me to prepare for my Manx Odyssey since I shall be going over before the end of this month.

By the time you are reading this it will all be history and I have the three sites worked out. The Sunday net from Snaefell, then one day from Port Erin at the South end, then another day from Point of Aire at the North end of the Isle.

I know we have a member just down the hill from Snaefell in Laxey so I am going to try and contact him beforehand.

Eddystone Short Wave Manuals

I now have made master copies from a set of these - courtesy of 'GGL - and am able to offer them in binders for £5 each. There are the six Short Wave Manuals from Pre and Post-War plus the Ultra Short Wave Manual of 1936. One set has already been shipped to a South African EUGer and one is being prepared for a nearer to home member. They are a mine of interesting projects which were built using mostly - but not necessarily - Eddystone parts. If you are interested, write me. -- **TED**

(Note here from Graeme 'GGL; details of these manuals will be found on pages 14 and 24 in your QRG - "Quick Reference Guide".)

TED MOORE, G7AIR,

As I am on the move a lot, please contact me by mail only at present for info and circuits, etc.,

21, PRINCE STREET, WISBECH, CAMBS, PE13 2AY. ♠

SAGA No.1 -- 1990R/3S



*By Alan
Robinson*

The Eddystone 1990-Series was introduced in 1975 to augment and finally replace the incredibly successful 990-series, the first general coverage transistorised VHF/UHF communications receiver. The 1990R/3S covered 25 to 500MHz in 7 bands and boasted a 'synchroniser' facility (the 7 knob box at the right of the set above.) This, in effect was a 'switchable synthesized crystal' which afforded an instant selection of frequency, accurate to one kHz at 500 MHz. A big step forward. It was not a cheap set; in 1982 its R.R.P. was £5855. It made an interesting restoration project as our member discovered . . .

This is the story of the problems I have had with my Eddystone Model 1990R/3S. They did not occur all at once, but were spread over a long period of time.

I bought the receiver in 1993, through an advert in what was then the 'Electronics and Wireless World', as a companion/replacement for my 770R, which is another saga waiting to be told.

After a while, two faults became apparent. The first was an intermittent connection in the 25-225 MHz aerial connector. The second was an

intermittent operation of the 'TUNE LOWER' i.e.d. in the synchroniser unit.

Opening up the set revealed quite an amount of ironmongery, no doubt for screening purposes, thus making access time-consuming.

THE VHF AERIAL SOCKET

Opening up the aerial socket revealed that the co-ax inner conductor had broken off at the solder joint to the connector pin, leaving the inner conductor floating and making intermittent contact.

This posed quite a difficult job,

because the centre pin of the bulkhead connector had to be cleaned out. The co-ax lead had to be stripped back and remade and there is very little slack available.

Then I had a stroke of luck. I found a bulkhead connector with a short tail of very similar thin co-ax fitted. I simply installed the "new" bulkhead connector and soldered the co-ax leads together.

Not a truly "professional" job but it seems satisfactory.

The 'TUNE LOWER' I.e.d.

The intermittent I.e.d. was more difficult because of the problem of getting inside the synchroniser. Fortunately I have the synchroniser manual and I was able to go to the relevant components quickly.

To cut a long story short, I traced the fault to an intermittent connection in L9, one of the RF filters to the 'TUNE LOWER' I.e.d.

I removed the plastic cover of the coil and examined it under a magnifying glass. I found that while the wire end of the coil proper and the axial lead from the former had been soldered, the solder had not flowed between them, making a poor or open circuit.

Re-soldering the connection cured a fault which must have existed from manufacture. (*Note from Graeme; the "synchroniser" was manufactured by Marconi, not Eddystone!.*)

TUNING METER

The next fault was the tuning meter going open circuit for no apparent reason.

I removed the meter and in its place fitted a plastic panel with a 2.5 mm and a 3.5 mm jack socket fitted.

The 2.5 mm socket connected to an external 50-0-50 micro-amp meter and the 3.5 mm socket is connected to an external loudspeaker, taken from the set's speaker switch via a 5 ohm resistor to protect the speaker amp from a short on the external output. It gives about 8dbs attenuation and will be replaced by a 3 ohm one when I find one!

The meter was supplied by E.S.R. Electronic Components, tel: 0191 2514363.

SYNCHRONISER AGAIN

Some time later a hum appeared on the audio output, the tuning seemed to go way off, and the 'TUNE LOWER' I.e.d. remained lit irrespective of the frequency settings.

I checked the +5v supply and found it to be +4.7v. Instinct told me to look at the synchroniser, and when I removed it from the set the supply returned to +5v.

I opened up the synchroniser once more and refitted it without covers. Using the manual to guide me I probed around with a 'scope and found no output from the 5MHz reference divider chain.

By running the unit out of the set and powering the divider section from an external +5v supply I was able to trace the problem as no output from the first divider IC1 (SN7409N). The IC was also causing a heavy drain on the +5v supply.

I acquired some new SN7409Ns from Cricklewood Electronics (020-8452-0161). To remove the IC the PCB had to be removed from the synchroniser. the IC was unsoldered using a low voltage iron and Hey Presto! The

divider chain worked and the +5v became correct.

The synchroniser was re-assembled and refitted to the receiver and so far appears to be working OK.

REALIGNMENT

With the set opened up, I decided to try to improve the sensitivity and dial accuracy.

the main test equipment used were a Racal-Dana 1992 counter, a Marconi TF 2015 sig gen with TF 2171 synchroniser and a Marconi audio power meter.

A performance check prior to adjustments revealed a lack of sensitivity and poor dial accuracy on the 235-380 MHz range.

VHF TUNER

I decided to do the VHF tuner first, using the procedure in the manual, using the RF OSC output socket at the rear of the set to measure the LO frequency (but didn't have suitable equipment to measure the oscillator output level).

There were no real problems here except not being able to find the HF end trimmers C46 & C47 for the oscillator and the HF end trimmers for the RF stages for the ranges \$ & %, and the amount of frequency change when re-fitting the tuner lid.

However, checking the performance after the adjustments showed a noticeable improvement in sensitivity and accuracy.

UHF TUNER

I started on the 235-365 MHz range. This range was quite insensitive and off-tune, and I decided to tune the RF

stages first.

When attempting to adjust RV1 at 365 MHz it was very erratic. It would adjust for a peak, but when the trimming tool was removed the output dropped right off. Touching the RV1 wiper brought the output back again.

Inspection by a magnifying glass showed the wiper blade to be bent upwards just sufficient to break contact with the track.

Not having a replacement, I had to repair the pot; another fiddly job. I was able to lift the tuner, without unsoldering any wires, to a position where I was able to remove the pot using a fine soldering iron.

I repaired it by very careful bending of the wiper assembly. After refitting the pot and the tuner assembly the RF stages were aligned satisfactorily.

Then the 360-500 MHz RF stages were aligned; no problems here.

UHF OSCILLATORS

Adjusting the UHF oscillators requires the lid of the oscillator box to be unsoldered. This requires the use of a 75W or more soldering iron.

before opening the box I noticed that the core of C46 was wound fully down, almost touching the bottom of the VHF tuner. This did not bode well.

The method of adjustment is to tune to 235 MHz and adjust C46 to a LO frequency of 235.4 MHz, then tune to 365 MHz and adjust RV7 for 386.4 MHz.

The same for the 365-500 MHz range, using C56 for 381.4 MHz and RV8 for 521.4 MHz respectively.

With the 235-365 MHz range problems

arose. Setting the C46 core to a sixteenth of an inch below the top, as per the book, I tuned to 235 MHz and adjusted C46 for a LO frequency of 256.4, then tuned to 365 MHz and adjusted RV7 for 386.4 MHz.

Retuning to 235 MHz I found it several MHz out so I readjusted C46 for 256.4 MHz then back to 365 MHz, which I find to be several MHz out.

This continued until eventually it came to a point when C46 core was wound fully down and RV7 was near the end of its track, but with no improvement.

It seems there is too much capacity in the circuit, but it is difficult to work in such a compact circuit, so I decided to leave it for the time being.

The 365-500 MHz range tuned up quite satisfactory and the sensitivity and accuracy are well within specification. After a final check the UHF tuner and oscillator lids were refitted and resoldered. No attempt was made to re-align the IF stages other than a slight adjustment to the BFO, as these appear satisfactory.

The set is now re-assembled and is working satisfactory, but requires a decent VHF/UHF aerial such as a discone.

A MODIFICATION

When studying the receiver circuit it was noticed that the secondary of the power transformer was fused after the bridge rectifier. A short in the rectifier could damage the transformer before the AC fuse blows.

So I fitted a 20 mm fuse holder next to the rectifier and extended the wires from the transformer to this fuse holder then to the rectifier.

I measured the current with an AVO; it surged to 3.5 amps at switch-on, settling to 3 amps. I fitted a 3.15 amp slo-blow fuse; time will tell if it is a satisfactory value.

COMMENTS

I was lucky with the synchroniser that the faults were fairly easily found. Had they lay in the more complicated logic I would probably still be struggling.

I've admitted defeat on the UHF 235-365 MHz range for the time being. Has anybody got any ideas?

The work was made easier by the accuracy and stability of the synchronised TF2015 and the receiver synchroniser; otherwise combined drifts and dial inaccuracies would have made work difficult.

As well as buying the divider IC's from Cricklewood Electronics (good service) I bought the varicap diodes and transistors used in the UHF oscillators, and bought two 3N200 FETs used in the RF amps. These cost £12 each; does anybody know of a cheaper source?

As well as the 1990, I have a 1570, a 940 and a 770R, all in need of repair; and an 870A which worked when I tried it some time ago.

The next to be repaired will probably be the 1570 (SAGA No 2).

But first I must repair some faults which showed up on the test equipment when working on the 1990.

I shall be busy for some time . . .



It's all a Question of Class

By Graeme Wormald G3GGL

Whilst writing the second episode of *"The Duffers' Guide to Valve Set Fault-finding"* (which follows this article), I made reference to the valve operating condition known as "Class A". I then realised that it meant nothing without some word of explanation and could recall little or no reference to the subject in earlier editions of our magazine. Having started to explain things in *"Duffers' Guide"* I realised that I was starting to muddy the waters considerably by mixing two quite different topics. I therefore decided to 'lift' the explanation of "Class" and I present it now in its own right. I hope it helps. Read on

First of all let us consider the basic operation of a valve, be it triode, tetrode or pentode, they're all the same at this simple level.

When the cathode becomes hot it emits electrons. These are attracted by the positive voltage present at the anode and flow at a rate controlled by the control grid (grid 1, hence its name).

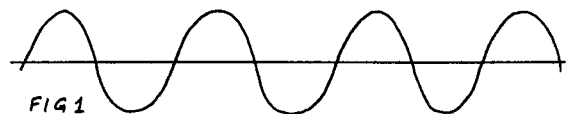
The mean flow is set by applying a negative bias to this grid. It then operates by superimposing a signal (R.F. or L.F., it makes no difference in simple terms). Let us assume that the signal is a sine wave (Fig 1). It should have a peak-to-peak amplitude no greater than twice the D.C. bias, and is usually a lot less. The current flow via the anode may then be 'trapped' to recover the signal in an amplified form. A suitable 'trap' is commonly some form of transformer, be it tuned (for R.F.) or aperiodic (for L.F.).

The major characteristic of a valve is given by the term 'mutual conductance' and in the U.K. it is normal to quote this as 'so many' milliamps per volt. In the U.S. this is quoted as a reciprocal using the term 'micromhos' (reverse resistance), but I shall not get involved with that system here!

A typical figure for an average type of valve might be '2 milliamps per volt'. This means that a change of one volt on the grid would produce a change of two milliamps in the flow of current through the anode (which might have been steady at, say, three milliamps).

If the 'trap' or 'load' in the anode circuit is, say, ten thousand ohms, then the change in flow will produce a signal of 20 volts, or a gain of 20 times. The reactive load of a tuned circuit, say an intermediate frequency transformer (I.F.T.), could be much higher, say 200,000 ohms. This would give a stage gain of 400.

What I have just described is a valve operating under "Class A" conditions; typical of the vast majority of linear amplifiers in a valve receiver. Assuming that the input is a sine-wave then the input signal and the output will both look like Figure 1.



It is simple to use, easy to adjust but is the least efficient form of amplification. About 25 – 50% efficient. This is of no account under small signal conditions but may be unacceptable for a power

amplifier, particularly in a battery set, or public address system running off secondary cells (accumulators).

The next stage in efficiency (and in the case of audio frequencies the final stage) is "Class B". In this mode the bias to the valve is increased (made more negative) until the anode current just ceases to flow. The valve is said to be quiescent. It is also essentially a power amplifier.

A signal of high voltage may then be applied to the control grid and a swing of many milliamps will then occur in the anode current. But it will only react to the positive half-cycles of the input signal. The negative half-cycles will merely reduce an already nil flow. Current cannot flow backwards in a thermionic valve. The output will look like Figure 2.



The efficiency is higher than the simple Class A condition (50 – 75%) but the result is of no use to man nor beast. You can imagine what it would sound like when fed to a speaker.

The answer, of course, is to use two valves in a push-pull circuit, in opposite phase, with the outputs combined to re-create Figure 1.

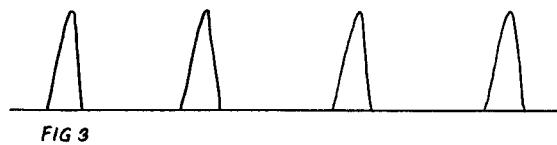
This can be a tricky job and requires extremely careful matching of the two valves concerned and precise setting of the grid bias. In practice most 'normal' push-pull circuits operate in "Class A-B", a sort of half-way house between the two and not so critical in operation.

Class B operation is used in all high-level A.M. modulators. I well recall that when I was working as a technical assistant (grade II) at the BBC Shortwave Transmitting Station at Skelton (Cumberland) in 1953, each of

the eighteen 100 kW transmitters had a 50 kW Class B modulator. The mod transformers were as big as large garden sheds. The high tension was 50 kV. I might add that my place there was acquired entirely on strength of having held a ham licence for four years and built and operated my own miniature versions of the above. True!

The most efficient type of valve operation is "Class C", an incredible 75 – 85%. This is achieved by applying a negative grid bias well beyond cut-off and then driving the valve very hard, with such a high voltage that the grid goes positive on sine-wave peaks and passes current, absorbing power as it does so.

The resulting output in the anode circuit is more like a 'pulse' than a 'waveform' (see Figure 3) and is absolutely non-linear. It is suitable only for high frequencies where the waveform can be restored by the presence of a tuned 'tank' circuit; so-called because it 'stores' power during the gap between the 'pulses', thus restoring the sine-wave of Figure 1.



It is suitable only for amplifying continuous wave and frequency modulated transmissions. Any amplitude-modulated drive source would have the modulation 'wiped off'. This is why high level (anode and screen) modulation must be used with a Class C amplifier (i.e. after the actual amplification). It is analogous to the frequency changer in a superhet receiver. The products of mixing the amplified carrier and the high level audio are the two sidebands which form the basis of classic amplitude modulation. ♣

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

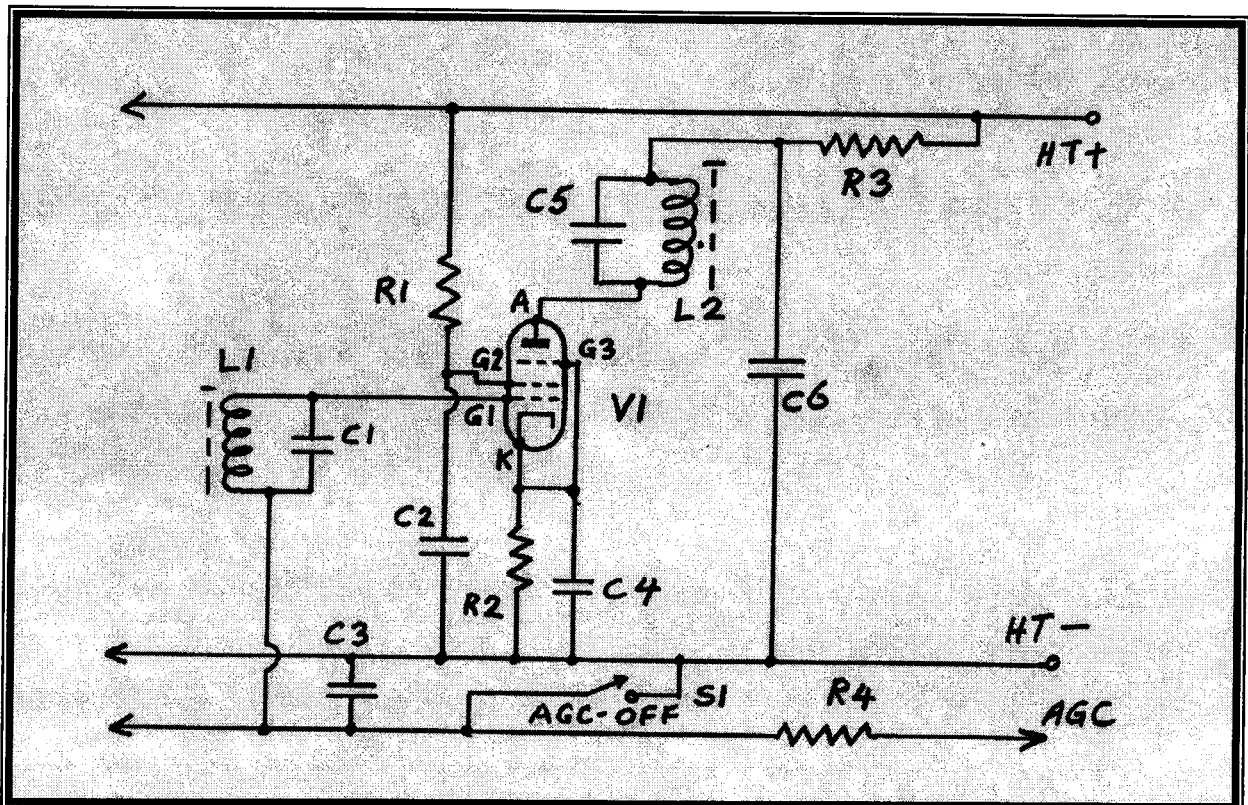
By Graeme Wormald G3GGL

In our last Issue I explained the philosophy behind this mini-series. How, in the past ten years, since I've been active with E.U.G., I've met members who could recite Ladner & Stoner backwards and others who'd never heard of A.G.C.

As an entirely self-trained "technician", whose only "qualification" is an old-fashioned City & Guilds Pass in the Radio Amateurs' Exam of 1949, I fall somewhere between these two extremes and my approach to old valve radios is a very subjective one, entirely devoid of high-tech explanations and based only on experience and reading.

"Lighthouse" magazine, during its 14 years of life, has published very many fault problems found in Eddystone models. Some of these are unique to certain sets or groups of sets but many are generic. It is this latter group which I am highlighting. By "Duffer" I don't make any derogatory reference, merely to target those such as myself who, for reasons diverse, never took a trade or professional course in radio or electronic engineering. Our last issue concentrated on the audio side of things; now we consider IF/RF amplifiers.

I would advise members first to read "Electronic Repairs to Eddystone Receivers" by Peter Lankshear, a six-part feature which started in "Lighthouse" Issue 68, August 2001 and was completed in Issue 75, October 2002. (Available from me in two CD-ROMs (Vols 10 and 11) price £10 incl p&p.)



HIGH FREQUENCIES

Our circuit this month shows a pentode (V1) arranged as a class 'A' voltage radio frequency amplifier; a universal condition for all such arrangements.

With the exception of the 'cascode' amplifier (an acronym derived from 'cascaded triode') all post-war general coverage receivers use pentodes for this job. Remember that signal frequencies and intermediate frequencies both count as radio frequencies, and may therefore be considered as one at this stage of the debate.

For the purpose of this article I have shown the circuit as an I.F. amplifier, but only to simplify the tuning arrangements. A five-band coil-pack would confuse the rest of the circuit where most faults occur.

TYPICAL CIRCUIT

So let's analyse the circuit and highlight possible problems. L1/C1 represents the secondary of an intermediate frequency transformer (I.F.T.). L1 is typically a pi-wound inductor similar to a medium wave tuning coil. It is usually trimmed by a ferrite core threaded through the centre. The coil is resonated by C1, typically a silvered mica condenser of a hundred or so pico-farrads capacity.

It may be that the roles are reversed and C1 is a pre-set trimmer and L1 has no core. Should we be considering a signal frequency stage, both L1 and C1 will be adjustable and in addition the variable tuning condenser will be in parallel with the coil (although one end will of course be connected direct to

chassis earth).

The top (or 'hot') end of L1/C1 is connected direct to the control grid (G1). A much-amplified signal then appears at the anode (A) and is tuned by an identical circuit, this time consisting of L2/C5. This is shown as the primary of an I.F.T. and could well be followed by another stage which is virtually identical to the one shown.

Let us now consider the rest of the components.

THE SCREEN GRID

The screen grid (G2) requires a steady supply of HT, the precise voltage being according to the design characteristics of V1, but supplied via R1 which is typically from 20,000 to 100,000 ohms in value. This is decoupled to earth by C2, typically 0.05 mfd., 350 volts working.

Both these components are common sources of trouble. R1 may go high in value or even open circuit. C2 frequently goes leaky, thus reducing further the voltage at G2. Gain will suffer. Special attention should be paid to the test voltage quoted for G2.

THE CATHODE

The cathode (K) is connected to earth via an auto-bias resistor (R2), in exactly the same fashion as the audio stages shown in part one. The value will typically be from 100 to 1000 ohms. The decoupling condenser C4 will be around 0.05 mfd. These components rarely cause trouble. Even a leaky C4 is of little or no account as the voltage involved is very small (3 – 4 volts).

THE ANODE or PLATE

The high tension (H.T.) is fed to the anode (A) via the decoupling resistor (R3), typically 1000 ohms and the R.F. return is made via the decoupling condenser C6 (typically 0.05 mfd.). This is also prone to leakage but the relatively low value of R3 will give no clue on the voltage check unless the leakage is very severe, in which case smoke will have been made! Check the body of R3 for discoloration due to overheating.

GRID BIAS

Next we come to the arrangements for biasing the control grid (G1). The vast majority of valves used in high frequency amplification in a general coverage (or hamband) receiver will use valves which are described as variable-mu (pronounced 'mew'). This is actually a letter of the Greek alphabet (μ = mu) which is used to symbolise 'gain'. It is also used, confusingly, to mean 'micro', one millionth part, as in 'micro-farad' (μ F).

The gain of such a valve is controlled by varying the grid-bias, both automatically (as shown here) or by a variable potentiometer (not yet covered).

AUTOMATIC GAIN CONTROL

The standing bias will be looked after by the cathode-bias resistor, R2, but Automatic Gain Control (A.G.C., sometimes referred to as automatic volume control – A.V.C., an archaic term) is universal in such radios.

This is generated in the same part of the circuit as the detector and will be

covered in a later episode. Suffice to say that a negative voltage is generated (typically 1-10 volts) depending on the strength of the received signal. This is fed back to the preceding stages via R4, a high value resistor, typically 200,000 to 500,000 ohms, and applied to the control grid, effectively in series with the standing bias. The R.F. return to earth is via C3. (Typically 0.05 mfd.)

The effect is to reduce the gain in such a way that strong stations sound hardly any louder than weak transmissions.

However, A.G.C. is really only desired for amplitude modulated material and Morse operation is much more satisfactory without it. In this case the A.G.C. can be disabled by shorting it out of circuit by the switch S1. The signal level is then controlled more effectively by the R.F. gain with the A.F. gain kept high.

PRODUCT DETECTOR

S.S.B. reception on some later valve sets is accommodated by a special detector (known as a 'product detector', which will be dealt with in a future issue). In this case A.G.C. may be used with it, but without this device S.S.B. should be treated like C.W. and controlled with the R.F. gain as low as possible.

C3, however, is a very common cause of trouble. Any leakage whatever will reduce the available A.G.C. voltage, causing overload on strong stations when the R.F. gain is fully up. This manifests itself readily in the loudspeaker. Strong signals grate badly, weak ones sound normal. This

is a sure sign of a leaking C3. The same effect will occur with an open circuit R4, but this is far less common.

Sets with a beat frequency oscillator (B.F.O.) often combine this switch with the A.G.C. (S1). The Eddystone 840-series are examples.

Sets without a B.F.O. (such as the Eddystone 670-series and 870-series cabin broadcast sets) don't have the facility to disable the A.G.C. There is no need.

TUNED CIRCUITS

Faults in these will show up as (a) great loss of sensitivity and (b) inability to peak the cores when aligning. Possibilities to look for include the following:-

Change in value of C1 and C5. These may go short circuit due to migration of silver round the edge of the mica. The coil screening-can will need to be removed and one end of the condenser isolated. A continuity test will then show a problem or otherwise. They may also go open circuit, usually due to a break or dry soldered joint at one end. Again the screening-can must be removed and the fault will usually be found by close visual inspection.

Another problem is a break in the coil L1 or L2. This can occur due to the dreaded 'green spot'. This is an acid corrosion at the point where the wire is soldered to the wiring 'frame'. (This is usually 'Litz' wire, a form of multiple insulated 'flex' having very good high frequency characteristics.)

This problem will have manifested

itself by lack of DC continuity through the circuit and is easily confirmed in the case of L2 by there being no voltage on the anode of V1.

In the case of L1 a simple continuity check will reveal all.

DECOUPLING CONDENSERS

Leaky decoupling condensers are well-understood and have been referred to under their appropriate headings.

What is not so common and is often overlooked is a decoupling condenser going open circuit which will not show up in the normal voltage tests.

In the case of C3 and C6 the peak of their associated cores/trimmers will be very flat if present at all. Gain will be down. In the case of C2 instability may manifest itself. In the case of C4 gain will be reduced by a modest amount.

The only way to confirm any such suspicion is to isolate one end of the condenser and apply a capacity bridge or a direct-reading capacity meter. (One or both of these items is an essential part of any vintage Eddystone servicing workshop).

I have on two occasions found 'red Hunts' 0.05 mfd decouplers to have a capacity less than one thousandth of that figure (50 pico-farrads). One was in a 940 and the other an 830/7. The effect was virtually to disable the sets completely. And there are a lot of 'red Hunts' about!

Don't forget that 'Golden Age' Eddystones have lots of spare gain and are well-made. A deaf Eddystone is a sick Eddystone. ♠

In Consideration of Amplitude Modulation

Graeme Wormald G3GGL

One way and another we keep tinkering around with A.M. but it always remains on the fringe of our on-air activities. Perhaps we should remember that the Golden Age of Eddystone was also that of A.M.

A.M. is the main operational mode of the Vintage & Military A.R.S. (*VeeMARS*) on 3625kc/s and also the Military Wireless A.R.S. (*MWARS*) on 3615 kc/s. I think the time may have come to consider A.M. to be the major mode of E.U.G.

There are several reasons which bring me to this idea of thinking. September's "First Sunday" was conducted by Chris G3XFD. Ted and I were at the Cosford (Telford) Rally and missed it but Chris reported as follows:-

"There were six of us (G3VFO, G7JAQ, G4DPY, G1KXD, G8YKE as well as myself) and we had a good QSO which started on AM and eventually, but reluctantly, changed to SSB at 10.15 . . . "

Now it so happens that I sold my surplus "Codar AT5" AM Tx (see last Lighthouse small ads) to a member in South Wales. I asked him if there was much activity down his way. Of course, he replied. Most weekday mornings we come up on 3615 . . .

So I joined them a few days later; there were eight of us on AM. Listen most early mornings (7.30 – 10.00) and you'll find AM activity. If not on '15 then on '25.

Society use (above) seems to be confined to Saturday mornings. The rest of the time it is left to the freelance 'boat-anchors'.

The more I listen the more I find out, but I do get it garbled. One station said he was going onto the "homebrew net on 2626". What did he mean?

I've been taking a peep at the ARRL website (huge it is) and find that they

have lots of pages devoted to AM. Not only that, they have designated AM activity and calling channels in their band plan.

"Top Band" is 1.885, 1.900, 1.945 and 1.985.

"Eighty" is 3.825, 3.870, 3.880 and 3.885.

"Forty" is 7.290 and 7.295.

"Twenty" is 14.286 (calling).

"Seventeen" is 18.150

"Fifteen" is 21.285 and 21.425

"Ten" is 29.000 – 29.200

It seems to me that AM is making a serious comeback, and about time too. At last, the opportunity to make a rig on the kitchen table and use it on-air. Sounds like the true ham spirit.

Now, I'm going to propose that we separate our "First Sunday Net" from AM tests and start also a "Third Sunday Net" on AM only.

My biggest 'problem' is deciding on a frequency to camp out on. As the other two societies are close together and at the LF end of the phone bandplan (and have been for many years) that's where people expect to find AM activity.

I do get the impression that other AM users are surprised to find us using 3695 for AM, they expect it to be lower

down the band.

3636 kc/s is an easy number to remember although Ted tells me that there are European coastal stations around there. I suspect you can say that for half of 80 anyway. so let's give it a try.

I'll also suggest that we start at 09.00 local and I'll kick it off myself on Sunday 17th October and then we'll follow that on Sunday 21st November. If it catches on I think we may even consider changing the "First Sunday" into an AM-only net.

It's an open forum: please write and let me know your views, SWLs as well as hams. Those of you who are regular AMers may be able to fill in my areas of ignorance (homebrew net??).

As late as 1968 both the RSGB and ARRL Handbooks were publishing constructional project for crystal controlled valved AM transmitters.

Which brings me to another point. Crystal controlled valved AM transmitters really are easy to build on the kitchen table. If we could settle on

a frequency (like the other groups), we could sponsor a suitable ten watt 80 metre rig (like a very simple Codar) and encourage people to use them with an Eddystone Rx.

Please, please, will members give me some feedback on this??

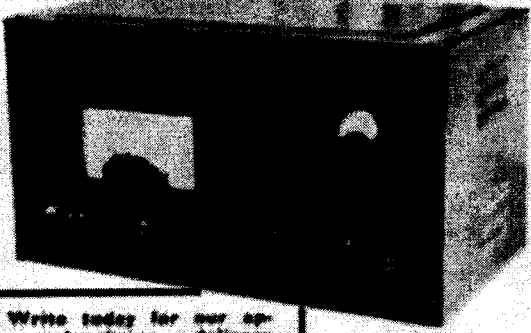
VMARS are also looking into the matter of an AM 'window' on Forty and I heartily support them (at this stage I must admit to being a founder-member! of that august body). I have been communicating with Colin, G4DDI, Editor of the VMARS News Letter, and he is of the opinion that we should stake a claim here, in conjunction with other vintage users, as soon as the new 40 metre band is released.

In the meantime, members may wish to keep an eye open for a vintage AM Tx. I acquired my KW "Vanguard" from a silent key sale advertised in RadCom for the princely sum of £15. It's incredibly heavy and must work out at about 10p a pound!

(Where are all those 'Panda Cubs'?)

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"EUG on the Air"

**The next "First Sunday" nets will take place on
7th November followed by 5th December.**

Freq. 3695+/- QRM

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

Controller G3XFE helped by G3GGL

NEW THIRD SUNDAY AM TESTS

(See Feature "In Consideration of Amplitude Modulation" in this Issue)

**These will take place on 17th October, 21st November
and 19th December**

Frequency 3636 kc/s. Time 09.00 to 10.00

AM only.

Listen for G3GGL or G3XFD

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

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