

Lighthouse

Founded 1990

The Magazine of the
Eddystone User
Group

Issue 77, February 2003



830 Special

*Ten Pages Featuring the 830-series
Plus Much, Much More*

LIGHTHOUSE

ISSUE NUMBER 77, FEBRUARY 2003

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Chris's Column

It only seems like five minutes since I wrote the last piece for the Lighthouse. I thought the Christmas edition was particularly good and hope you all enjoyed it.

I look forward to seeing you at the Vintage Communications Fair in May, details of which you will find somewhere in this issue (*over the page - Ed.*).

At the risk of offending some of our more "purist" members I shall be on the lookout for a Hallicrafters SX26 or SX28 to complete my collection of war-time "Y" station receivers. I took delivery of my AR88D just before Christmas and it really is in beautiful condition having been lovingly looked after.

I have decided to retire from full time employment this year and from April onwards I have agreed with my employer to only work two days per week in a consultancy role.

20 years of profit and loss responsibility have finally taken their toll and I badly feel the need to do something quite different and be able to relax more. I have promised the family that I will try and lose some weight and get my knees sorted so that I can get around a bit easier again.

I have been asked by another Midlands ham club to give my talk on the early years of Eddystone and I expect to do this sometime in May when we have the lighter evenings. (I hate having to try and find strange addresses in the dark).

In the past year I have, through my work, become a member of the High Power Faraday committee. This is a government sponsored organisation dedicated to putting industry in touch with academia in order to let UK industry benefit from the opportunities

for research being conducted in British Universities.

I shall be getting a bit more involved in this when I have more free time. One of the benefits is that we are putting together an MSc in High Power RF so that we can help students specialise in this important branch of electronics.

Being on "cable" I have access to all sorts of strange TV channels. One of them, BBC4, is reported to have very few viewers (as little as 4000 according to my daily paper), however last week I stumbled across an extremely interesting programme on John Logie Baird. What a fascinating story that turned out to be. I would recommend anyone to watch it if they get the chance again.

I had the opportunity to go and see Matt Parkes at the SBS Eddystone Broadcast factory in Alcester just before Christmas. They all seem well settled there and they were busy getting out some local radio FM transmitters for Crown Castle. Good to see them back in the Midlands again.

There has been quite a re-surgence in new high power MW transmitter systems in the past year and this seems to be continuing. Believe it or not these are now nearly all-solid state these days and this is up to and including 1MW of RF power.

At the same time there is talk of a form of digital radio over MF called DRM which apparently has the advantage of improving the signal to noise and makes a more robust signal at the reception point. I am told that we can expect it to be a standard feature in

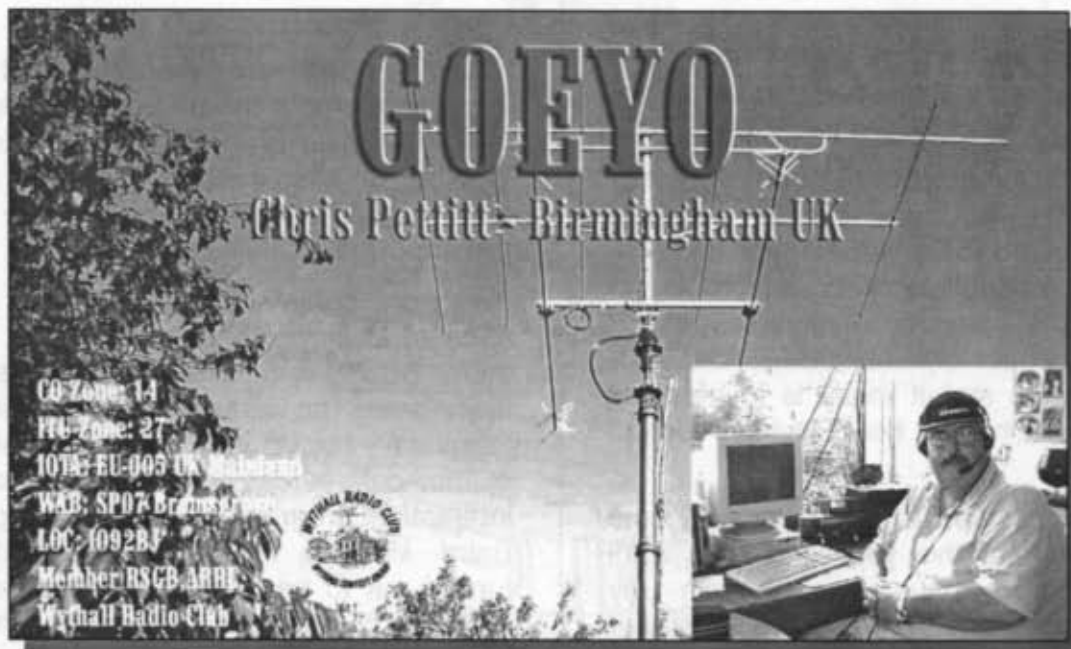
future AM radio sets.

I finally got to sort out myself some new QSL cards the other week and have been busy today catching up on 5 years of more of failure to send any out. In case anyone is interested I include a reprint below.

My best 73

Chris Pettitt - GØEYO

Patron (g0eyo@blueyonder.co.uk)



JUST IN CASE YOU'RE WONDERING, THE CALLSIGN IS IN CRIMSON



National Vintage Communications Fair
N.E.C. Birmingham, Sunday 4th May 2003

10.30am to 4.00pm £5 admission

(early entry from c.8.30am @ £15)

Next to Birmingham Airport.

Coach (5 mins) runs from Birmingham International
Railway Station

LETTER OF THE YEAR !

During summer of 2002 I received an e-mail from John Walker, ZL3IB, editor of 'Break-In' magazine, the Official Journal of the New Zealand Association of Radio Transmitters (NZART). He told me he had heard on the grapevine that Eddystone Radio was dead and buried. Was this true? 'Not quite,' I replied and sent him a half-page feature entitled 'Eddystone Radio – a near thing'. It was published in his Nov-Dec edition and has produced several enquiries. But the Star Letter came from Jim Daniels, ZL3QZ...

Westport
New Zealand

To:-
Graeme Wormald G3GGL
Bewdley

Dear Fellow Ham,

There is a very interesting article in the latest issue of "Break-In", concerning Eddystone Radio.

When I was first becoming interested in radio, as a young man (about 16) I was able to buy an Eddystone receiver from a radio shop called "Tricity House" in Christchurch. To date it is the only receiver I have ever used, and still use it. It is a type S.680/2A and cost £147-8-0. I have replaced the power transformer, and of course some tubes. (Not a bad effort for that length of time). It was purchased either late 40s or very early 50s. (it was a long time ago) !!

Thank you for giving me a little bit of the history of the company that made such an outstanding piece of equipment.

73^s

Jim Daniels ZL3QZ

Serial No FA0049

Series No S.680/2A





See the
EDDYSTONE '680'
COMMUNICATIONS
RECEIVER

ON STAND NO. 182 AT RADIOLYMPIA NATIONAL HALL

Here is your opportunity to make first-hand acquaintance with the Eddystone '680' Communications Receiver that has aroused so much interested attention among the more seriously-minded in the world of wireless. The '680' is a fifteen valve superheterodyne receiver embodying advanced technique. Among its special features are included: continuous coverage from 30 Mc/s to 480 K/cs, two R.F. stages, two I.F. stages, crystal filter, B.F.O., push-pull output stage, variable selectivity, "S" meter, noise limiter, standby switch, stabilised H.T. voltage to oscillator, provision for relay operation of transmitter, high signal-to-noise ratio and sensitivity, highly attenuated image response, very effective A.V.C., provision for twin feeder and single aerial, modern miniature all-glass valves, mechanical bandspread logging device. Available for rack mounting.

The complete frequency range is covered by five switched coil assemblies with an overlap between each. The gear-driven, flywheel controlled mechanism is positive, free from backlash and very smooth in action. The mechanical bandspread device takes the form of an auxiliary dial and gives a scale length equal to ninety inches per range. The dial can be read to one degree, I.F. transformers are permeability tuned to 450 K/cs. Operates from A.C. mains 110 and 200/240 volts, 40/60 cycles. The front panel and tuner unit chassis are aluminium, and the remaining units of stout brass, heavily nickel-plated. Lift up lid. The cabinet and front panel are finished a handsome ripple black, set off by plated handles. The finger plate is black and silver. 16½ in. x 13½ in. x 8½ in. high. Weight 41 lbs.

LIST PRICE IN U.K. £85 (No Purchase Tax)

Manufacturers:

STRATTON & Co. Ltd., West Heath, Birmingham 31 Cables: STRATNOID, BIRMINGHAM

Eddystone valve radios were always exported in great numbers, especially to the English-speaking world. After W.W.2 when Britain was destitute (our war debt to the USA was not paid off until 1972), the country virtually existed by barter. There was no hard currency to spare.

The Model S.680 got off to a false start in 1947 when it was first announced at Radiolympia (the National Radio Show).

Unfortunately it was under-developed and never reached the High Street. (It had a distressing tendency to burst into flames.) When it re-emerged two years later it was a much sturdier set.

The Serial of Jim's model shows it to have been manufactured in June ('F') of 1949 ('A') and was the 49th set produced. Although the final S.680 was labelled as the S.680/2 or

S.680/2A for New Zealand it was never marketed as such. It was always referred to simply as the S.680 or sometimes (rather coyly) as 'The New 680'.

It is interesting to note that, although in 1949 the New Zealand Pound was virtually at parity with the British Pound, the set had almost doubled in price on its long journey. Jim was a very lucky lad!

I suspect that we have a contender for the Guinness Book of Records here. To have owned and used the same receiver, to the exclusion of all others, must be absolutely unique for a licensed ham. Any contenders??

Jim's daughter Ellen has e-mailed us a photo-set of Jim and the rest of his shack. Thank you, Ellen. We are incredibly grateful!



Jim bought this Eddystone 680 when new in 1949. He was licensed as ZL3QZ in 1952 and it has been his station Rx ever since!
A world record?

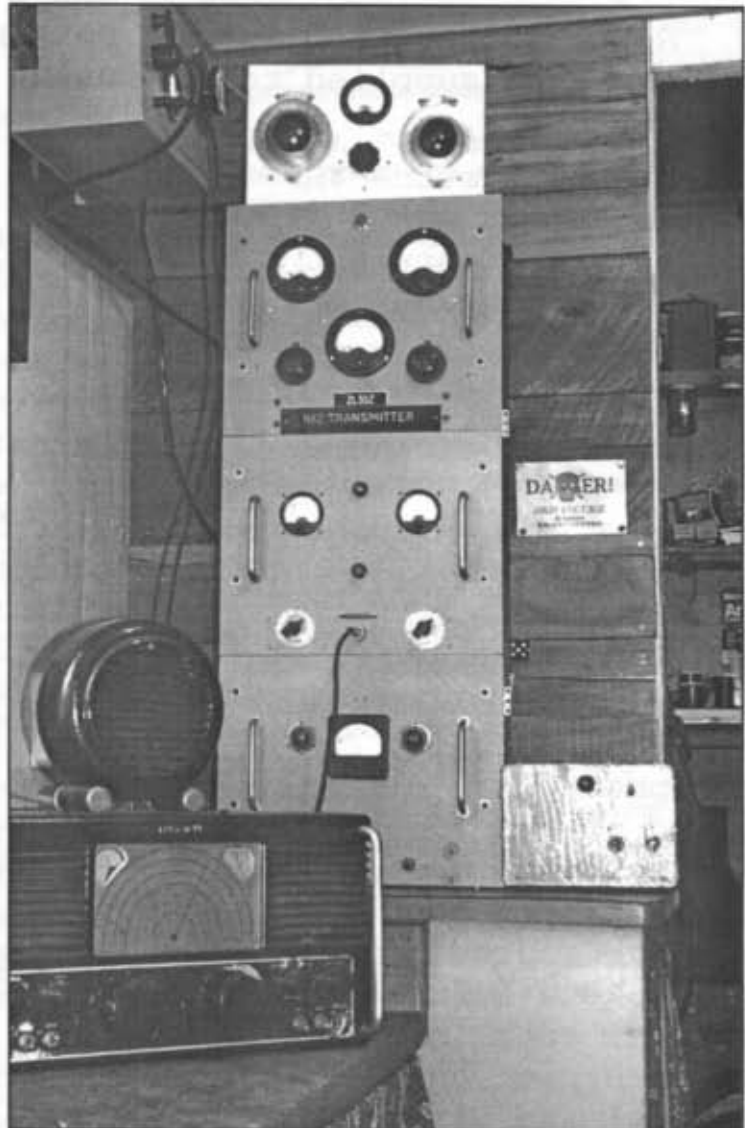
Here is Jim's home-brew AM transmitter. Line-up is 6V6 crystal osc., 807 PA and Class AB1 p-p 807s in the modulator. He says he's working on a VFO for it! Aerial is an end fed Zepp with open wire feeders

Did you know that the Society for the Preservation of Amplitude Modulation (SPAM) is based in NZ?

It must be AM heaven, with 300 kHz on 40 metres and the nearest neighbour 1200 miles away.

Jim has worked in coal mining, power generation and finally was Projects and Planning Coordinator for an Electric Power Board (*"When we still had them", says Jim!*)

His other interest is a working model of the first electric railway in New Zealand. It ran a century ago at the Westport Stockton Coal Company's mines.



LANCASHIRE POLICE RADIO

Via Bill Cooke GWØION

Last year Bill Cooke, former Chief Engineer and Managing Director of Eddystone Radio (who started with the company in 1935) was sorting out some old files. One of them was a letter from a Mr Davies who (in 1986) was writing a history of the Lancashire Police Radio. Bill (and I) thought you would like to read it.

I had an interesting session with Harold Cox which confirmed my belief/memory that:

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

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

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

(New Street and Carrs Lane). Webbs in London was managed by Picard and Adams and Reg Adams had a contact with the Metropolitan Police – using Eddystone "bits" he made some equipment which Eddystone were later to exploit. The Eddystone effort was a team as I recalled, and included G. Brown (G5BJ) later to be in charge of Birmingham Police Radio, Garnett Lapworth (G6DL) and Ted Lawze, Chief Draughtsman.

(Interesting to note that the juniors in this were J. Gwynne, Wilf Williams and Bill Cooke).

The war was upon us as Eddystone had equipment suitable for Police Forces and indeed the Metropolitan Police, Birmingham and Glasgow were all either piloting Eddystone or installing. However, about this time

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

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

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

of receivers but did not wish to undertake the work.

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

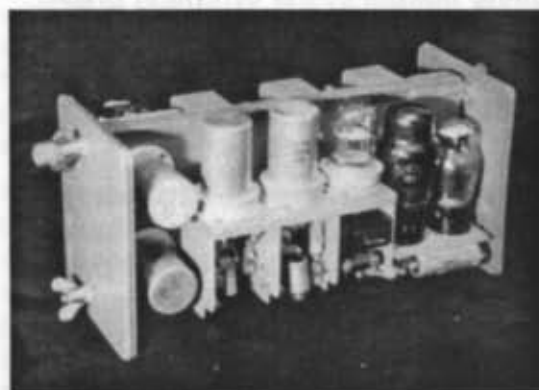
16th January 1986.

NOTES BY GRAEME:-

Harold Cox was Eddystone's Technical Director from the 'twenties to the late 'sixties.

The AM Tx and TV ventures mentioned above came to nothing.

The Admiralty equipment referred to was also used by the Royal Signals where it was known as the W.S.57. It is described in great detail in "Wireless for the Warrior" Volume One by Louis Muelstee (PAØPCR) published by Wimborne Publishing Ltd., Dorset, phone 01202 873872.



Stratton S.450 Receiver

They managed to get a ten-valve crystal-controlled VHF receiver into a package just about 12" x 4" x 5"



TALES FROM THE WORKBENCH

Graeme Wormald G3GGL

There are two main kinds of problems with valve radio receivers. The first is due to failure of a thirty- to sixty-year-old component; resistors and condensers in particular. The second is due to human agency, of which the most common is the phantom fiddler. This month we'll take a look at some of each.

TOP OF THE RANGE

My 830/7 had been sitting on a top shelf in the shack for about a couple of years. Well, you can't toss them around like Heathkits at my age, so the resting cycle tends to become a little extended.

Anyway, when it went up there it was working perfectly, so why worry? I got the junior op to help me get it down and the next day fired it up. Everything lit up fine, the S-meter flew across to the end stop (as it does, regardless of what people *think* it should do), and I waited for the rest of it to warm up.

After about five minutes it became apparent that it never would. Hope springs eternal in the Wormald breast, but it was pretty obvious that I was on to a loser. But honestly, it really was working perfectly when it went on the shelf!

Placing my left lug-'ole against the speaker a faint hum could be detected, as befits a well-smoothed power supply. Tuning to the local MF transmitter (Droitwich, BBC Five Alive, 150 kW, 10 miles away) sent the S-meter end-stopping again. Mmmm.

Off with the case.

Something adrift between the detector and the output stage grid? Not a true diagnosis but a calculated guess. (A

feeling in the bones.) Take the easiest option first and see if there's any HT on the first audio amplifier; (V9, 6AT6, double diode-triode, anode is pin-7.) One of the easiest pins to reach in an 830. But no volts present. Mmmm.

I pulled out the mains plug (always!) and checked the continuity of the V9 anode load resistor, R48, 270k. Nothing. Absolutely open circuit. And that happened while it was sitting on a shelf in a centrally heated shack.

It was carefully replaced with a new item (thank goodness Eddystone didn't tie knots in the wire before soldering). Checked for dry joints and solder bridges. All OK. Powered up.

This time it warmed up pronto and my head was blown off. (I'd left the A.F. gain control flat out!) So you see; these pesky little high-value DC droppers can turn their toes up even when on a shelf. This fault can happen to ANY Eddystone valve set, ANY time.

OH NO! NOT AGAIN . . .

Quite recently a member bought a 680X from a second-hand dealer. He wasn't too happy with it.

"What's wrong?" I asked.

"Well," he replied, "It's working but it doesn't seem all that lively. Was the

680X a good set?"

Was the 680X a good set ! It never fails to amaze me how people sometimes think any post-war Eddystone might have been a bit deaf since birth. Let's make it quite clear: Eddystones were not deaf. If they are, then there's something wrong! Got it?

Anyway, our member's 680X was put on the bench and plugged in. The first thing I noticed was that the power lead was flat twin, as was common with the old Bush DAC91 connector (which, of course, is common to most 'fifties Eddystones). A mains earth wasn't accommodated on the 2-pin non-polarised connector. It should be arranged separately via the earth terminal near the aerial connector.

But in this case there was NO earth terminal. Somebody had removed the aerial/earth panel, blanked it over and fitted a Belling Lee 75-ohm television co-ax socket. Ooohhh !

All this provides at least two faults before we start. First of all, without efficient mains earth the set will be 'live'. Not enough to electrocute you, but enough to strike a neon lamp from the chassis to your hand! Or to one of those little electricians' screwdrivers with a neon polarity tester built in.

Depending on which way round the power is connected the 'live cabinet' effect will show itself either when the set is switch on, or, alternatively, switched off. Confusing? Yes, but to be avoided. Use a three-core mains cable with the earth flying out and firmly bolted to the chassis.

Next. The aerial input impedance of a 680X is 400 ohms. If fed with 75 (or 50) ohm coax for more than a foot or two the signal will be siphoned off.

But worse; the 680X is supplied with a balanced input for twin feeder. If a single ended aerial is used then a shorting link must be connected from

the other aerial terminal to earth. Had the fiddler taken this into account?

A quick check with the AVO showed an open circuit from the co-ax socket centre to chassis. Oh-Oh!

Out from the case and off with the coil-box cover. A sharp intake of breath on my part; how CAN people leave a good set in this state ? The other aerial lead was floating loose in the coil-box!

After clamping it firmly to the nearest chassis-bolt the set needed re-aligning. The fiddler must have lined it up without the benefit of inductive input coupling, just a bit of stray capacity.

The result was a fine 680X, well up to original spec.

MY 'NEW' 670C UP TO TRICKS . . .

In our last issue I told you how thrilled I was to acquire a 'perfect' 1962 670C after hunting for three years. After a slight contretemps with the mains input filter condensers it worked fine.

Until one day, that is, when I switched it on and got the most awful growling audio from it. Just like that. It had been perfect the night before. This seems to be a bit of a habit!

So I look in the usual place (same as the 830/7!!). The anode load of the first AF stage. Lo and behold! The anode load of the first audio stage had increased from its specified 220 k to 720k. All by itself in the middle of the night. The result, of course, was that the auto-bias was so low that the stage was drawing grid-current, resulting in flat-topping of the audio wave-form.

This was confirmed by turning the AF gain down to a low level, when the sound was heard to be perfectly 'clean'.

Remedy: replace it, instant cure. And don't forget, never take anything for granted. The little people are always working to baffle us humans. ♣

Ted's MailBox

A Review of Mail and Happenings

By Ted Moore, G7AIR, Founder of EUG

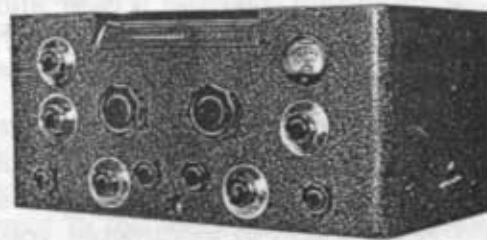
Resolutions

Well as usual a New Year means New Resolutions and I made mine. Less time spent gallivanting about the country and more time at home with my radios. It lasted all of one week and then I was off up to Yorkshire after some more Eddystones to add to my collection, plus an alien HRO. Thanks for the cup of tea Graham - it was really a 'life saver' on that cold and icy morning!

I have tried to be a bit more rational about this collecting business and have diversified in my leisure pursuits with a Christmas Holiday up in the Lakes involving lots of hill-walking, weekends chopping logs in Wales, another long weekend up there on a boat, a weekend in Kent removing furniture etc; but it always comes back to RADIO. So here I am having plotted my list of Rallies from available info all ready for the 2003 season.

It has been gratifying to be invited to see the collections of many EUGers and to compare the ideas of other folk to what I consider necessary for my hobby. I like to USE them and periodically rotate those in use with those in storage in the loft. My present set-up gives me a choice of fourteen Eddystones wired up and ready to 'go', no more will fit into my playroom and

even now my latest prize acquisition is on the dressing table in my bedroom. A place of honour as it deserves since it is one of only FIVE model 'ECR' known in the hands of EUGers - or elsewhere for that matter. I guess that others may yet come to light, hopefully so since surely they must still exist somewhere.



Stratton's last pre-war introduction, the E.C.R.

This ECR serial number AP4 was working when I bought it and apart from a bit of squegging when AVC is turned on with RF gain full up it behaves well. It weighs a lot, and is massively built as are all good Eddystones but then that is why they last so well.

I have tracked down the squegging fault to AVC decoupling but have so far resisted the urge to change the condenser. It must take its place on my list of 'to do' jobs. Thanks to keen ECR fan Tor I have a very nice

re-mastered copy of the original pre-war manual.

INCOMING MAIL

My mail has increased lately, no doubt due to publication of my new home address, thanks Dai for the info on the 1990 military acceptance tests. Even the squaddies seemed to like this model!

The Report will make a nice addition to my copy of the manual, maybe Graeme will find time to publish it for everybody to see how the Military go about acceptance testing of new models. *(OK Ted, but I'll have to do a condensed version; - it's 22 pages - Graeme)*

From Ross in New Zealand, hiya again, good to hear your news. Your letter coincided with the arrival of some new Lilliput lamps for my EC958 - please note 'lamps' as opposed to bulbs. You get the latter at garden centres. *(That reminds me of the time I wrote about 'torches' to an American, Ted. He told me that in the USA they light those with matches, not batteries! - Graeme.)*

The 958 had blown both the Hi-Stab indicator and the Kilocycle indicator within a couple of months of its arrival here. In all honesty I have to admit that the darned thing is ON 24/7 and is usually spotted on 5680 Kc/s for Kinloss Rescue daytime with the odd excursion down to their 3 Mc/s night frequency.

They do get some strange QRM considering what a vital channel 5680 is. Two guys yapping away about 'time-off' and leave periods were presumably based on an oil-rig somewhere. Two Spanish guys who

were yammering away for some time until they apparently heard Kinloss complaining and moved down 4 Kc/s.

Nice letter too from Alan who had a problem with his 840C, hopefully the non-operating AVC is functioning okay now. I have had two 840Cs recently with the same AVC problem - worth remembering!

Letters and phone calls and subsequent follow-up visits from a number of EUGers who had ignored the missing digit in my 'phone number as published in large print in the last issue. *(Sorry, Ted - and everyone else - my fault, Graeme.)*

They had simply turned back to where it was printed in the preceding text. Dave, Alan, Tony, Peter and Ralph. I much appreciated your taking time out to visit me and my Eddystones. Or was it the Coffee and Scones bit that drew you to Wisbech.

This seems to be a very easy place to get to with the A47 trunk road coming almost to my back door from way back in Hinckley, or the ditto A605 from down in Bucks. Feel welcome to call me up and visit whenever. I don't mind sharing my toys with like-minded enthusiasts.

One letter from Eric who tells me that his 740 expired over the Christmas holiday, over worked maybe? Anyway he is busy trying to get his mains transfo rewound at a 'reasonable'- to him - price. The 504, 640, and the 740 do seem to suffer this problem more often than other models it might be nothing more than age and a heavily loaded transfo but if possible do keep the primary on the highest possible voltage tapping. It may even

be worth while making up a plug-in solid state rectifier 'valve' as mentioned elsewhere in this column, cuts down on transformer load by eliminating the rectifier valve heater dissipation.

Some folk do believe that running a set on, say, the 210 volts tapping when the mains is way up at 240 volts gives more 'oomph' to the set but in so doing they do run the risk of failure of the primary winding.

One strange problem as brought to my attention by Dave was the 940 which had stopped working on both Range 1 and 2, although the LF end of Range 2 did have some weak carriers when the BFO was turned on. My immediate thought was the local oscillator not 'oscing' but when he swapped that over it was still the same.

Eventually, after he had me over to look at the set, we found that the nuts holding the range switch wafers in place had worked loose and so, as the range switch knob was turned the loosened nuts allowed the wafers to get ever so slightly out of alignment. An easily cured problem.

Going Bananas

Have you ever started a job and once deeply involved you wish that you had never begun? Well I certainly regretted it in this case. Never have I taken so long over such an apparently easy task.

I have this 1002 which I got from Chris Pettitt some 6 years back. A belated thanks Chris. Anyway it is DD 0001 and evidently the very first Design & Development prototype, a 'hack' which was used by D&D to verify their circuitry before the set went into production. It has worked very well,

given yeoman service over the years as my constant companion in my travels. A so-called 'Comfort Radio' as supplied for use in establishments such as NAAFI clubs this is not truly a comms receiver since it has no BFO - other versions such as the 1004 however do.

There have been one or two tiny faults over the years and the front panel has become somewhat scuffed. When I espied this almost new 1002 front panel at '3GGL's QTH I immediately grabbed it and carried it home, meaning to simply replace the panel on mine with the new one. Oh heck! Such a simple task it appeared at first sight. What a chore it turned out to be.



Eddystone 1002 de-luxe broadcast AM-FM receiver

Only when I got the set open on the bench did I realise with mounting horror what a task I had in front of me. The D&D set had the vital holes for the switches and controls in different places!

Not a problem you may think IF you do not know the 1000 series. The problem is that these sets have not one but two front panels with about a one inch gap between them. The inner panel is I guess meant to confer true Eddystone rigidity to the 'no chassis' receiver.

The main controls such as volume, tone, tuning are mounted on the inner panel with only their spindles protruding through the holes in the front panel. Even the five switches mounted on the front panel have their wiring brought in through matching positioned holes in the inner panel.

It was not too bad having to mount the volume and tone pots onto the outer panel and shorten their spindles - I was fitting new pots anyway. I had to nip off the top outer corners of both speakers since these now protruded into the path of both pots.

The five front panel toggle switches went in JUST ! But I had to be careful that the leads when soldered to their tags did not touch the inner panel. The new speaker grill went in nicely and the scale perspex ditto, but having had to extend, replace really, many of the switch and pot leads I decided to go the whole hog and replace much of the "mare's nest" of wiring which appeared to be the result of much trial and error, wiring NOT done on any production line. I was now well into my third week of what had appeared to be a one day job!

I had completed all of the AM side of things and was listening to it on MW, contemplating the task of rewiring and replacing the FM pcb when I spotted a braid earth lead - one of several - going from the tuning condenser to the pcb earth plane.

This seemed to be over saturated with solder and had no flexibility and from experience I do know this can be a source of

microphony at times. I usually do this work on transistor sets with the usual 15 watt soldering iron but for this heavy braid I decided to use the new 40 watt iron I had bought new at a recent Rally. Very well known make, nice yellow handle, nice round plastic lead which looks to be obviously three core. An act of sheer unadulterated stupidity !!!

At my first attempt to unsolder the old braid I spotted this tiny spark from the tip of the iron to the braid joint. Now when working on a set on my bench I always earth the chassis via a large croc clip going to just the earth terminal in a 13 amp plug, hence chassis and soldering iron, and any test gear are all at 'system earth'. So how come enough P.D between chassis and iron ?

First suspect was obviously the new iron and so a check was made between the iron tip and the earth pin on the moulded on plug. NO CONTINUITY !!! Snipping off the plug showed that I had not got a nice round three way lead. Just a twin.

Tests with the iron working showed a nice 38 volts P.D between tip and the system earth. Very high impedance since it showed negligible current flow and the voltage dropped to zero when earthed.

This was not a DC leakage from the element to the case but appeared to be a capacity effect. Fitting a new three way lead became imperative but meantime - horror of horrors, back to the 1002. Complete silence when powered up as opposed to the lovely sensitive operation I had previously found.

The part of the pcb closest to where I had been working was unfortunately the local oscillator compartment and a very tight place to work. I eventually traced the malfunction to a dud - blown - FET local oscillator buffer. One of those tin-can types no longer readily available.

Some enquiries over the phone with a friend and with Birkett's and whilst they did not have the required FET they had a compatible type, not a tin-can type but a modern epoxy encapsulated type. A 126 miles round trip up to Lincoln, for the cost of £2.80 Birkett's supplied me with the necessary trannies. I got eight of them for future use.

Back home the offending tranny was removed and again tested to be certain. It was shorted gate to source. The new one was fitted and the ergs applied once more. Lovely, all back to normal but a fault with the RF AVC. This set has two avc circuits. One for IF stages and a separate for the RF stages.

In this case the part of the four transistor IC which handles the AVC was duff. Not having any source for a new IC I simply chopped the three legs of the IC and removed the three remnants of legs, soldering a bipolar tranny in their place - AVC normal again.

Sounds pretty easy when you read it but it meant removing the tuning gang TWICE from the pcb to get at the underside of the pcb for soldering.

The first time for replacing the FET was pretty traumatic but the second time I had it all worked out - obviously experience tells.

Anyway the 1002 was now working okay again on AM and time came to sort out the FM board which is mounted outrigger fashion above the main pcb, just back of the inner front panel.

Like the main pcb which contains the AM RF/IF/AF stages this FM pcb is a hand made, hand drawn circuit, very unlike those schematic plans shown in the manual for the 1000 series. None of the components are in the same position, many of the components are of differing values to the manual listing. More importantly many of the soldering tags for the connecting wires are in different positions on the board.

As I had done for the psu, as I had done for the main pcb, I had prepared a detailed drawing of the board and connections by getting the manual plan photocopied to A3 size, and then drawing underneath my view of the actual pcb in MY set.

Even then there appeared to be several +11 volt supply leads surplus to requirement. This was due to some missing connecting tracks on the prototype pcb, as I eventually discovered.

Wired up and working the FM side of the 1002 seems to be okay too, touch wood. Almost four weeks work involved on what seemed so simple a task!

A very nice 'Comfort' set and in regular use, it is surprisingly sensitive on the SW bands using just the built in whip aerial. The fact that it is either mains or 12 volts operated makes it very versatile indeed.

SOLID STATE VALVES !!!

Having a box full of metal type valves of the 12SK7 and 12SR7 types which proved to have been burnt out by a previous owner I stood looking at them for a while and then the flash of inspiration came. Re-use them !

By removing the metal case from its base and emptying it of all its valve bits I had a ready made octal valve base and container to hold a solid state replacement for those amps hungry rectifier bottles such as the 5R, 5Y, 5Z and 5U types.

My solution is simple enough. 1N4007s are cheap enough and have a one amp rating, far above what current we need for our sets. I have used four 1N4007s with two in series in each leg of the full wave rectifier.

This is wired to the octal valve base for the two anode pins and the cathode pin. Well insulated with heat shrink the tin case is now slid back on and locked in place as before by those four 'indents'. I now have them in use in 940, 770, and 888 receivers with a considerable reduction in operating current drawn from the mains transfo, an easily replaceable mod which is detailed on a sticky label on the chassis of each set.

TYPOS

Some of you may have wondered about the many typos in recent issues and Graeme seems to have tracked them down to an incompatibility between his scanner software and my typed up sheets as submitted to him. For this reason I am having to take one further, grudging, step towards the era of modern technology. From this issue onwards I

shall be submitting my 'stuff' to him on a floppy and converted into μ soft 'word' files. Isn't modern technology wonderful ? So many different formats and they cannot recognise each other. Up with the Luddites I say ! Anyway hopefully some typos can be eliminated. *(Ted, we're cutting out all the typos in eliminating the Word Recognition software!! And stop trying to confuse us with Greek shorthand!)*

IGFETs

A letter from Jim re his need for a replacement for the four legged beast, a 3N128, as used in the 1000 series receiver. This is the one which I had blown over the Xmas/New Year holiday !

Anyway I had already set the phone lines buzzing all over the country whilst trying to buy myself a 3N128 so by extreme coincidence I am able to tell Jim that as a replacement for the 3N128 N channel IGFET either an MPS102 or the ubiquitous 2N3819 N channel FET can be used.

So long as we are not talking about VHF usage ! A direct replacement too as I have been advised by an ex-Mullard Semicon Engineer.

VARMINT VISITS

After a very long, five day weekend away sailing in North Wales I came home and turned on the ergs in my Playroom, all ready for some prime leisure time with my Eddystones. The problem was that THREE of the Fourteen which I have wired up and ready to 'go' simply did not work. No power on whilst I was away, an empty house, and yet there must have been a Convention of visiting (only visiting, I

hope) Gremlins there in my absence. An AVC fault on a 990R, an open circuit output transfo on my 870A, and a blown Hi-Stab lamp on my 958. So my long list of 'to do' jobs is now even longer.

The ECR was still there and I think it upsets me being on my bench so I have removed it to my bedroom. It simply has not got that aura which I discern over the post war models, I leave the pre war models to '3GGL. Anyway there it sits in my bedroom, banished from the playroom. I shall be happy to swop it for some other models which I do want, so phone me and we shall discuss it. The line is usually open from 0800 to 2000 seven days a week.

QRM !

Yes, Well, I have twice now had this extreme QRM at S9+. needle bending strength and on both occasions in mid afternoon for about an hour each occasion. It is a broadband signal heavily overmodulated at about twice mains frequency, 100 cycles.

It is only on and spread around 9 Mc/s and multiples of 9 Mc/s well up into VHF - it is still strong enough to drown out airband on around 126 Mc/s. Any offers as to a probable cause ?

I know of no domestic appliance that can cause it & there are no sounds out of doors as from some garden appliance etc; - but it is so very strong I believe it must be fairly local.

COMMAND RXs

Another of my alien likes, these very versatile and compact receivers have long been an interest of mine. I

bought several recently and was very 'aggranoyed' when I got them opened up to find that of the eighteen valves in them eleven were o/c heaters. Shan't deal there again ! I am now in need of some metal types such as 12K8, 12SK7, 12SR7 or 12SQ7, and 12A6.

Also I would appreciate a really good BC453 as my tatty one looks odd with the newish 454 & 455. I can collect within reasonable distance or will refund postage and pay your price if reasonable. If you have any of the other units such as modulator/psu and the various Tx's then I am also interested.

EC10 PROBLEMS

Dave has had a number of failures on his EC10 this last year and he believes that it is trying to tell him to stop smoking. In this instance he had to use WD40 to completely sponge down both pcbs as they appeared to have collected a layer of 'gunge'. A previous owner may have been over generous with spray lubricant on the tuning mechanism as both pcbs looked greasy.

Anyway this cleaning up did the trick and the instability which manifested itself as a chugging sound on the HF bands has now miraculously cleared up, VIVA WD40 he says.

A previous fault had been a growing lack of sensitivity and this was cured temporarily by chopping the fourth leg on the RF and IF trannies.

He has sourced some replacements and will fit them when time allows, being hesitant to start the job whilst the EC10 is once more working okay.

CNG ?

You may recall that recently I was asking for info on the meaning of these letters as I had bought a 770R Mk II which had them printed in white above the chassis label bearing the Eddystone model and serial numbers. Since the original serial number had a line through it and a new painted number it seemed obvious this was some company logo and stock number.

I am always keen to follow up on any precedents which show the use former owners had made of the sets which I get. And so began the detective work. No answers were forthcoming from EUGers about the full inscription or the logo CNG so I had, perforce, to go elsewhere.

A very helpful young lady in the local library when questioned suggested Kelly's but I had already tried that in the beginning. She, not daunted and maybe even relishing the change from the humdrum boring daily grind, went rushing upstairs to the Reference Library and began pulling books off the shelf in rapid succession.

At the fourth or fifth try she uttered a quiet but triumphant Ha ! The page she showed me dealt with the C.N Group and it looked promising. Being the cheeky sort I asked her if she could maybe send them an e-mail if I supplied the necessary info. A look on her face suggested that I was pushing my luck but then she agreed and so I gave her what I could gather from the inscription on my 770R.

I asked if this was a CN Group company stock number relating to an item, a Radio Receiver, that had

formerly belonged to them. I explained EUG and my interest and then came home, little hope in my mind.

Coming home from my sailing break in North Wales I found a postcard from the library awaiting me. Could I please call in to collect my e-mail. Well now it was too late that night but next a.m. as soon as I decently could I hopped on my bike and away I went into town.

I turned up at the library and my now smiling friend proffered me the reply. The 770R II had indeed been their property but had been disposed of some years ago. Nobody in their employ could tell me anything about it but they had provided me with the phone number of a retired ex employee who could, and would. I duly thanked the extremely efficient Lady Librarian and pedalled off home.

I telephoned that afternoon and got through to Bernie who had been a reporter on one of the local newspapers published by the Cumbrian News Group (C.N.G).

He remembered the 770R II which had been his constant companion for more than 16 years, sitting on a side desk in the news office it was on day and night tuned to the local Mr Plod. He assured me that it had frequently been able to give them the gen needed for one of their reporters to turn up at 'events' where Mr Plod had been sent.

Getting them news coverage before often the big 'dailies'. The replacement AOR scanner when it came did the job of several 770s but looked much less imposing sitting on top of the now unused Eddystone,

which he had bought from his employers for 'a tenner'. Bernie told me that the mast with the dipole on - an Eddystone vertical sleeve dipole - was still there on the roof of the old building although it is now unused. So now I know what the logo CNG stands for and what my 770R II was used for yonks ago. Being persistent (or cheeky) does pay off.

LILLIPUT LAMPS

Having had the need of a couple for an EB35 a couple of months back I now found I needed one for the Hi-Stab indicator on my 958, well they can be found - that is the good news.

Those used on the EB35 are of the 6-volt variety and I thought that all were so. Asking this time for a round half dozen for the 958 and future usage I was offered a choice of either the 5.0 volts or the 6 volts variety !

I simply had not known there was a choice. Anyway I bought six of each and now find that the one I took out of the 958 was a 5.0 volter ! This despite the manual saying it ought to be a 6.0 volts 60 mA type. Actually the 5.0 volt types give better results on both the EB35 and the EC10 so they are used on those models now.

RALLY TIME AGAIN

Yup, here we go again and I am off to the first one of the year this weekend, nearby this one, at Horncastle. With my shopping list in one hand and my EUG badge on display I hope to meet some of you EUGers.

REBELIOUS TEENAGERS

You know what happens when the teens are reached; acne &

rebellious behaviour ? Well this soon to be teenager will not suffer from either one or the other - we hope.

I am talking about EUG which will very soon be celebrating its THIRTEENTH BIRTHDAY. It just grew - like Topsy !

How many of the original members are there out there ? Those who have stayed with us through all of our growing up turmoil ? Do please write in and let me know and I shall send you a special prezzie for your continued support.

CU, Ted.

♦

Once again, (Graeme talking), I must apologise for missing a number "7" from Ted's phone number in the last Issue of 'Lighthouse'.

It should be 07957 951 998, and his QTH is 21, Prince Street, Wisbech, Cambs, PE13 2AY.





830/7

WIDE RANGE COMMUNICATIONS RECEIVER

The Eddystone 830/7 was the most popular of the Company's "classic" series of valve receivers. It was conceived in the Model 910 of 1957, a double superhet with tuneable first I.F., which was marketed by Marconi as the HR101 in the early 1960s. The 830-Series appeared in 1962 and was in continuous production until January 1973. It was the last valve set to come out of the Bath Tub. Contemporary Company literature states that it was phased out, not through lack of demand, but due to the impossibility of sourcing components. It continues to be the model 'most wanted' by most E.U.G. members. The Service Handbook is available from Dave Simmons (ibid.) but the sales leaflet is very rare. We reproduce it here for members' information and enjoyment.



Eddystone Model 830/7 (Retail price £275-£442)

The Eddystone "830/7" is a high-grade general purpose HF/MF communications receiver covering from 300 kc/s to 30 Mc/s in nine ranges. It is of compact dimensions and both rack-mounting and table versions are available. Operation is from any standard AC mains supply and provision is also made for using external power supplies.

Modes of Reception encompassed are CW, AM and SSB. Selectivity is continuously variable and the bandwidth appropriate to a given signal can be readily selected. On SSB, a separate detector is used, a panel switch permits adjustment to upper and lower sideband, and a fine tuning control is available. A crystal filter with a very narrow bandwidth reduces interference with reception of CW signals.

The Circuit is single conversion on frequencies below 1.5 megacycles, and double conversion, with a tunable first intermediate frequency, on frequencies above 1.5 megacycles. An incremental coverage of 100 kc/s each side of any selected signal frequency is available when using double conversion. The first and second oscillator circuits can be crystal-controlled for high-stability operation on frequencies above 1.5 Mc/s.

Tuning arrangements are particularly versatile. With the main tuning scale standardised against the internal crystal calibrator, the incremental control allows accurate tuning to within one kilocycle (1.5 Mc/s to 30 Mc/s). A switch on the panel provides instant changeover to crystal-controlled oper-

ation, with rapid selection of up to eight spot frequencies. Flexibility is afforded by the fact that any crystal within 100 kc/s of the nominal value called for can be used in conjunction with the incremental tuning facility.

Performance is of a high order, as a study of the technical characteristics given later will confirm. A design feature of importance is the low level of oscillator radiation, which makes the "830/7" suitable for use in installations where a number of receivers are operated in close proximity.

Ease of operation has received special attention. The panel controls are laid out for maximum convenience of the operator; the wide and well illuminated scales allow the frequency to be read with a high degree of accuracy; and the finely engineered, gear-driven slow motion mechanism permits smooth, precise control of the tuning.

Construction follows the traditional Eddystone pattern. The receiver is robust and well able to stand up to arduous service. Components, workmanship and finish are of the highest grade, ensuring inherent reliability.

Frequency Coverage

Nine ranges give the following coverage :--

Range 1	18 to 30 Mc/s
Range 2	11 to 18 Mc/s
Range 3	6.7 to 11.0 Mc/s
Range 4	4.0 to 6.7 Mc/s
Range 5	2.5 to 4.0 Mc/s
Range 6	1.5 to 2.5 Mc/s
Range 7	860 to 1500 kc/s

Range 8 480 to 860 kc/s

Range 9 300 to 520 kc/s

Intermediate Frequencies

First IF nominally 1350 kc/s. Variable over the range 1250 kc/s to 1450 kc/s to provide incremental tuning. Second IF 100 kc/s, with variable selectivity and crystal filter.

Valve Complement

V1 6SE8/ECC189 (CV5331)

Cascode RF amplifier

V2 6AK5/EF95 (CV850)

First Mixer

V3 6AJ8/ECH81 (CV2128)

2nd Mixer/2nd Osc isolation amp

V4 6C4/EC90 (CV133)

Second local osc.

V5 6BA6/EF93 (CV454)

First 100 kc/s IF amp

V6 6BA6/EF93 (CV454)

Second 100 kc/s IF amp

V7 6AL5/EB91 (CV140)

Noise Limiter

V8 6AU6/EF94 (CV2524)

Cathode follower IF

Output (100 kc/s)

V9 6AT6/EBC90 (CV452)

AM Det/AGC Rect/Audio amp.

V10 6AQ5/EL90 (CV1862)

Audio output

V11 6AU6/EF94 (CV2524)

Crystal calibrator

V12 6U8/ECF82 (CV5065)

First local oscillator

V13 6BE6/EK90 (CV453)

CW/SSB detector

V14 0A2/150C4 (CV1832)

HT stabiliser 1

V15 0A2/150C4 (CV1832)

HT stabiliser 2

D2/5 DD006 (or two DD058 diodes)

HT rectifier

Scale Presentation

The main tuning scales are calibrated to an accuracy within 0.5%. Using the crystal calibrator in conjunction with the cursor adjuster, a high order of accuracy is obtainable.

The incremental tuning is indicated on a separate scale, directly calibrated in kilocycles. The whole dial is well and evenly illuminated.

Controls

Wavechange switch and crystal selector; Main tuning, with 140/1 precision reduction drive; incremental tuning; peak RF; independent RF, IF and AF gains; selectivity; mode switch, selecting AM—CW—SSB upper—SSB lower; BFO pitch; combined AGC/NL switch; crystal calibrator; cursor adjuster; mains switch. Meter adjuster at rear.

Carrier Level Meter

On the front panel is fitted a carrier level meter, marked in arbitrary divisions over a scale of naught to ten. It is useful as a tuning meter and for making comparative measurements of signal strength.

Desensitising

When desensitising is a requirement, terminals at the rear (normally shorted out) can be brought into use, leads being easily taken either to an external switch or to contacts on a relay.

Noise Limiter

The series-diode type of noise limiter is effective against ignition and similar pulse types of electrical interference.

Power Supplies

Mains operation: adjustable to accept 100/125 volts and 200/250 volts AC, 40/60 cycles. Consumption 85 VA.

External Supplies: when mains are not available, supplies required are 6.3 volts, 4.8 amps (approx.) and 250 volts 160 mA.

Accessory supplies: when the receiver is working from AC mains, the following are available; 250 volts, 15 mA (unsmoothed) and 6.3 volts at 1.2 amps (earthed centre tap).

Construction

The receiver is housed in a strongly made, well finished steel cabinet of convenient dimensions and in standard form is supplied for table mounting. A rack-mounting version, the "830/7/RM", is available for fitting into a standard 19" rack, in which it occupies a height of 8¾". The table version can be converted to rack mounting by fitting special angle brackets and a modified cabinet. The finish is two tone grey.

Robust construction and high quality components lead to excellent reliability, and the receiver is intended for continuous use under all normal climatic conditions.

Physical Details

Width 16¾" (42.5 cm)

Depth 15" (38.1 cm)
(including rear projection)

Height 8¾" (22.2 cm)

Weight 49 lb. (22.2 kg)

Sensitivity

With an IF bandwidth of 3 kc/s, the sensitivity is better than 3 microvolts for a 15 dB signal-to-noise ratio, throughout the range.

IF Selectivity

The overall bandwidth is continuously variable within the limits of 1.3 kc/s and 6 kc/s (6 dB points) and is narrowed to 50 c/s when using the 100 kc/s crystal filter. The selectivity control is marked "CW—SSB—AM", a click stop being provided for positive selection of the correct bandwidth for SSB. The crystal filter is introduced when the control is moved to the extreme right-hand position.

Typical overall bandwidths are as follows, the crystal phasing being pre-set to give a symmetrical response.

Positions	6 dB bandwidth	50 dB bandwidth
Crystal	50 c/s	2 kc/s
CW	1.3 kc/s	5 kc/s
SSB	3 kc/s	8 kc/s
AM	6 kc/s	12 kc/s

Spurious Responses

Image rejection :-

300 kc/s to 1.5 Mc/s greater than
50 dB

1.5 Mc/s to 10 Mc/s greater than
70 dB

10 Mc/s to 30 Mc/s greater than
50 dB

IF breakthrough—

at the first intermediate frequency, better than 70 dB except at 1.5 Mc/s on range 6 where the figure is greater than 60 dB. At the second intermediate frequency, greater than 85 dB at all frequencies except on range 9 where the figure is greater than 60 dB.

Frequency Stability

After a ten minute warm up period, drift with the free-running oscillator is approximately 12 kc/s in the first hour, at 28 Mc/s. After a further thirty minutes operation, drift at any frequency will not exceed four parts in 10^4 .

With the first oscillator crystal controlled, drift during the first thirty minutes does not exceed one kilocycle. After this period, drift will be less than 500 cycles in any one-hour period.

AGC Characteristic

The audio output does not change by more than 9 dB when the carrier level is increased 90 dB above 3 microvolts (figure taken at 8 Mc/s with a 3 kc/s bandwidth). The normal AGC discharge time constant is 0.15 second and is changed to 10 seconds when the Mode switch is in an SSB position.

The AGC delay is also reduced for SSB reception. The AGC potential is brought out to a socket at the rear of the receiver, for diversity and other purposes.

Audio Output and Response

The audio output stage will deliver a maximum of 2.5 watts at either the 2.5 ohm speaker terminals or the 600 ohm line terminals when used independently. The audio response is level within 6 dB from 200 cycles to 6000 cycles and distortion at 1000 cycles does not exceed 5% at an output of one watt. Hum level is 50 dB down at 2.5 watts. A jack accepting a standard telephone plug is fitted to the front panel.

Aerial Input

Nominally 75 ohms unbalanced to a coaxial socket.

In the interests of continued improvement, we reserve the right to amend this specification without notice.

EDDYSTONE RADIO LIMITED

ALVECHURCH ROAD,
BIRMINGHAM 31, ENGLAND

Telephone PRIORY 2231

**Cables EDDYSTONE,
BIRMINGHAM**

Telex 33708

Issued November, 1967

The Achilles Heel of the 830-series

Graeme Wormald G3GGL

The revered 830-series may have been top of the line for a decade, but it had one component which was a poor choice in the original design – at least, it was in my humble opinion (Bill Cooke please look the other way!). Let's see what can be done about it . . .

Elsewhere in this issue, in "Tales from the Workbench", I described how my old favourite 830/7 was brought out from a period of rest and was found to have a duff anode load resistor.

Whilst the set was out of its case – (I hate taking these Eddystones out of their tight-fitting cases) – I decided to check over the calibration. So I pressed the little black CAL button and went for the nearest 100Kc/s mark. The first couple of goes were fine but then the operation caused a bit of a crashing sound in the speaker when the button was released.. Mmmm

So what do you do with a scratchy switch? Well, the first thing you do is wriggle it. Clear the dust.

I pushed it in and out half a dozen times and the crashing got louder. Then the switch started smoking. Honestly!

I peered at the back of this rather odd little open black switch and it was GLOWING RED! Oh dear.

By now the crashing had stopped. So had the set. I switched off, pulled out the mains plug and scratched my head.

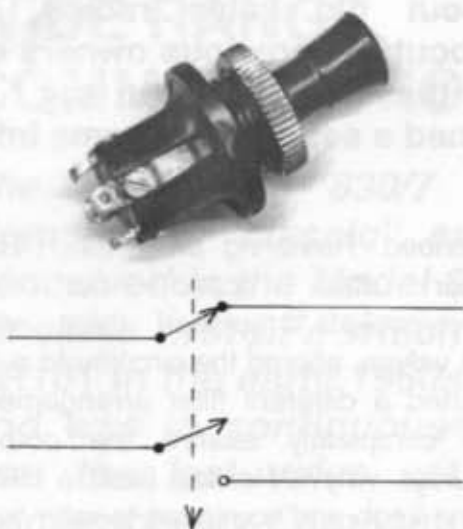


The black Bakelite CAL button.

I once had to change one of these on a member's set some years ago. The threaded body of the switch is all Bakelite and the projection through the heavy die-cast panel is only just enough to get the nut on a couple of turns. It's easy to strip if you tighten it, and somebody had.

I managed to install a replacement after using up a lot of nervous energy. It's a bit of a fiddle as the diminutive switch terminals are used as soldering points for components. It really needs the skill of a time-served Stratton apprentice to do it justice.

However, persistence prevailed and success was achieved. But the memory of that struggle remained in my information store, and when the above fire-brigade situation happened my heart sank.



Original Equipment Painton Switch

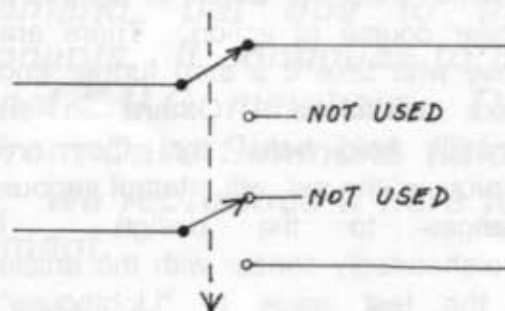
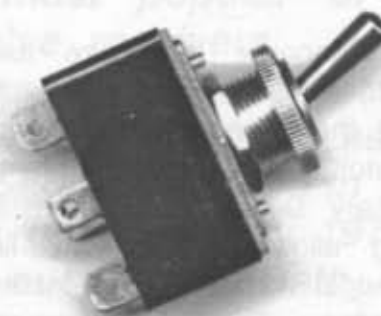
Now these switches are a four-terminal device; actually two independent single pole single throw switches. One is open whilst the other is closed. All the switch contacts are open to the air, and I, for one, don't believe they're rated for 250-volt use.

They just have the maker's name "Painton" moulded in them; no ratings are given. Now Painton was (is?) a perfectly respectable manufacturer, but I don't honestly think they're up to keeping 250 volts and earth apart!

The double-pole change-over spring-biased toggle switch is a standard item, and, of course, will do duty as the above by ignoring the opposite poles.

At my next rally I bought one, brand new and gleaming, for 90p. Its mounting diameter was 0.5 mm less than the original black Bakelite. (12mm instead of half-an-inch?) And the soldering tags were bigger.

A sketch was made of the components connected to each tag and the fire hazard was removed. It was found to have carbon tracking between two opposite poles, i.e. from the HT to the R.F. Gain pot. Not a recommended combination. This confirmed my inclination not to use a replacement of the original pattern "Painton" push-switch, but to use my new 250v 3a "N.S.F." spring toggle switch.



Robust Spring Toggle Switch

It fitted like a dream, easier to wire up, and the nut was tightened to perfection. The set sprang to life at first go and the CAL worked perfectly. No damage done by the fire, thank heavens. And, do you know, the shiny chromium toggle switch looks as if it was meant to be there. Just look at the picture in the previous page; isn't the legend "CAL" intended to have a toggle switch, not a push?

One last word here; the Models 888, 888A, 770R MkII and 770U MkII use the same dodgy switch for the same purpose (maybe others, for all I know).

EDDYSTONE 830/3 (Or is it?)

By Chris Morgan G3XFE

I read an article recently about old valve radios, it subsequently prompted a discussion about the previous owners of old radio equipment. The point being that few of us can say for certain who has, or how many have, owned a set before it came into our possession.

Whenever I acquire another Eddystone I always enthusiastically give it the once over with a signal generator or whatever I deem to be necessary under the circumstances making allowances for my limited knowledge but ever-increasing confidence. There is no reason to assume that we don't all follow a similar course of action. There are those who take it a step further and make alterations. Others, in an honestly held belief that they are 'improving' the set, will attempt serious changes to the design. I wholeheartedly concur with the article in the last issue of "Lighthouse" rebutting the need for drastic changes to a 940.

All of these points have been raised from time to time in back issues of the Lighthouse. My point is that most likely, every owner will have 'fiddled' with the radio at some time or another and if 10 people have had their hands on it since it left the manufacturers 50 years ago, heaven only knows what modifications or approximate components have been fitted to the point of making the internal circuitry barely resembling the original design.

I well remember a long write up in one of the other magazines that

described 'Restoring an HRO'. The owner had ripped out all valves/sockets, replaced them with B9A valves, altered the circuitry to suit, inserted a different filter arrangement and completely altered the output circuitry...why? He had fitted a HRO tuning knob and continued to refer to it as an HRO receiver. Nothing about it resembled an 'HRO'.

This brings me to my reason for authoring this article. A year ago I collected an 1830/1. Along with it came the 'baggage' of a defective and rather scruffy 830 (which cost nothing other than the fuel to go and collect them both). I had wanted one for a long time but wasn't prepared to pay the usual 200 quid asking price for an 830, I work on the premise that sometimes things may come to those who can wait.

As soon as I got it home I cleared the workbench and set to work on it. I established it was a /3 model which Graeme assures me is quite rare. The inside was clean and appeared to be alright. The exterior was scruffy but Dave Simmons promptly supplied a new main dial and incremental scale by return of post. There was an unusual Marconi filter, not Piccolo, fitted that made the selectivity pin sharp. It was

permanently in circuit, no switching had been fitted to bypass it, instead the method was to unplug the 2 lengths of miniature coax going to the filter assembly and connect them together directly. It didn't have a T2 and the output from the filter was passed directly to the grid of V5 (1st IF) via a 2000pF capacitor.



Once I had established that the mechanics were sound I tried to align it. By carefully following the handbook I aligned the 2nd IF(100kc/s). When it came to sorting out the 2nd oscillator I noticed that by the time the dial reached plus or minus 50, the performance had dropped off so much it was as if the oscillator had stopped working because the receiver was stone dead but it peaked again when I zeroed the incremental tuning. Yes I did peak the RF Peak control as I tuned away from zero.

It took me a long time to try and work out the relationship between the 2nd oscillator actual frequency and exactly how the mixing process should work. This was because no matter how I tried to align the tracking it never was remotely near the calibrations on the IRT dial and the receiver still died after the 50 markers. In the end I resolved to never use the incremental tuning, set it to zero then peaked everything there and used the receiver by tuning the main tuning only.

There the story ended for about a year because out of sheer

despondency I shelved the radio having wasted so much time getting nowhere. Meantime I put out a number of requests for some spare parts to try and construct a T2. I had it in mind that I would settle for an old BFO can with a B7G base on top into which I could substitute the valve for a crystal and suitably changed the components to make up the full crystal gate circuit as shown in the 830 diagram. Eventually my plea was heard on the EUG Sunday net and I drove some distance to collect another 'Free' 830. This time it was an 830/9, even scruffier than my /3.

I manufactured a pseudo T2, used a spare B7G 100kc/s crystal that I had put by for this occasion and fitted it. The microswitch conveniently mounted adjacent to the selectivity spindle and was switched by the cam that operated the crank arm to T1 variable selectivity slider as it was rotated to maximum.

I changed the R's and C's in the 2nd oscillator and 1st IF circuit in the enclosed box on the right of the set. I gleefully switched on and waited for the meteoric rise in output as I was sure I had addressed what was causing the poor tracking etc.. Not a bit of it. The set was just as poor as before. There remained only one course of action because I refused to let it get the better of me after all, I had set my sights on an 830 for a long time, so I put it to one side for a few days so that I could return to it with a clear head and renewed vigour otherwise I find I end up going around in circles.

I started at the aerial input and painstakingly inched my way through the set referring to every component by

checking it with the circuit. I made sure each component was the correct value and that it was where it should be. I learnt this from a similar encounter with a Collins TCS Tx/Rx a few years ago that had been wired it up incorrectly. When I reached the 2nd oscillator stage I noticed that several components were missing. This was not by my own hand as I had simply replaced like for like but with modern components. The 1st IF had also been wired incorrectly in one place. I spoke to the previous owner about it, he said 'Well you know the circuits are different for each of the sets' don't you.

I double-checked that I was indeed working on a /3 (serial/model number plate on rear) and that I was holding an 830/3 circuit, which I was. When I finally looked at a handbook with circuits for all models, he was right, the 2nd osc and 1st IF circuitry differed substantially. My 830/3 2nd oscillator and 1st IF stage had been wired up as if it was an 830/5. I hazard a guess that at some time in the past an owner hadn't checked that there were these differences and had simply made the adjustments to the circuit that he had on the assumption that all models were pretty much the same but then wondered why nothing would track properly so gave it up as a bad job. I am also aware that according to Graeme many sets were designed to meet the individual requirements of certain clients and that at their disposal at the end of their service 'special' mods were removed. Sometimes alterations were put in to distract the curious amongst us to throw us off the scent (Is that right Graeme?). *(You tell me !!)*

I continued my checking process and found nothing else

untoward having returned the previously mentioned stages to an 830/3. I now knew it would work, there was nothing else it could be. I still had trouble finding where the 2nd oscillator was actually tuned so resorted to a loop on some coax placed nearby acting as an aerial into my main base station transceiver. I found the signal and 'tracked' the edges to roughly 1150 kc/s and 1350 kc/s. Returning to the 830 I fine-tuned it to the scale reading with no problems at all and the readout is exact up to plus/minus 90 but drops a division before 100. The set is great and I use it much of the time and it is certainly a worthy addition to the shack despite its earlier problems.

The moral of the story here is NEVER assume that the radio is everything it should be and that it does have its full complement of components, expect that someone at some stage has altered something for reasons best known to him at the time. 'Beware of the phantom twiddler/fiddler' is a phrase I once heard and never has a truer phrase been ringing in my ears. My guess is that I acquired the set for nothing as did the previous owner because they saw it as a dead duck. It is surprising what a bit of time and patience can do when you set your mind to a particular endeavour and if you can be bothered to put all the parts back with the right values exactly as Eddystone intended then it must work.....indeed it did!

I hope this is of interest Graeme and may be of interest to our readers.

73 Chris G3XFE.

RADIO RAMBLINGS

Gottings from my Notebook



By
*Graeme
Wormald*
G3GGL

Bewdley, February 2003.

Greetings and welcome to our first Issue of 2003. I must start by wishing you all the very best for the coming year and at the same time thank all those members who were kind enough to send Season's Greeting Cards. I am most gratified.

CHECK THOSE CONNECTORS

Last month I had an Eddystone 680X brought to me with a non-specific fault. Its owner had asked if this model was known for its deafness! How many times have I said it? A deaf Eddystone is a sick Eddystone.

Deafness certainly isn't a characteristic of the 680X; two RF, two IF and pull-pull output. No Sir! It certainly isn't deaf by nature.

So the set was brought to me. A superficial glance showed a new finger-plate (nice) and a Belling-Lee type co-axial 75-ohm aerial socket at the back (suspicious). Certainly not original equipment on a set with a 400-ohm balanced aerial input impedance.

But not the end of the world, so long as you don't actually feed it with co-ax. However, did the phantom fiddler (for he it is who changes the aerial terminals on a 680X) – did he take note and put the unbalancing link inside the set?

Easily checked; out with the AVO; no continuity! Oh, dear. Off with the case. Off with the coil-box cover. And there it was. The lead from the bottom

of the aerial primary coupling coils dangling in space. And still with its tag-washer fastened on. It was the work of minutes to clamp it under the nearest chassis bolt. It gave the set another 5 S-points at the lower frequencies but the aerial circuits had to be re-aligned at the higher frequencies. The 'fiddler' must have re-aligned it after he sabotaged the terminals.

And I cannot say too often, when using an Eddystone with twin aerial binding posts plus earth, unless you are using a balance feeder (and not many do) then make sure the earthing link is in place. Otherwise you will have a deaf Eddystone, and it will be your fault!

Whilst talking about 'shorting links', this may be a good time to remind folks about sets made to work with external power supplies such as vibro-packs and rotary converters in far flung parts where no mains existed.

They have an arrangement where a connector on the back panel feeds these external sources direct into the circuitry. The internal power-pack is not wired directly into the set.

So a 'dummy' connector on the back MUST have a shorting link included to connect the internal supplies back into the set. This may be an octal plug or a Jones plug, depending on the set.

For instance, of all the popular classics the 640, 740, 750, 888, 888A have an octal (and also another one for the S-meter, don't get confused.)

The professional 730 and 830 series use Jones plugs for the same purpose.

If you're buying a set at a rally or show, where there are no mains to show the set working, do double-check round the back. It could save you a lot of heartache.

Another one waiting to catch you out is the transistorised 990-series. These will all work directly off a 12-volt supply and have a small Bulgin 3-pin connector to achieve this.

But if you're going to work it off the internal mains PSU, as most of us do, then you need a shorting link fitted in one of these little Bulgin plugs. Do check. I once nearly put a 990R in the skip for lack of this. We all live and learn.

FINALLY

And last but hardly least. The big difference in the VHF/UHF 770 (Mk I) models and the Mark II models is the provision for use with a panadaptor. There is a Belling-Lee socket (again! – but this time Kosher,) fitted at the back to allow the 5.2 Mc/s IF to be fed to the panadaptor. This is actually a 'circuit codge' and is abstracted from the cathode of the final IF amp. It is taken via the de-coupling condenser, which, if left as is, goes nowhere. This makes the set DEAF due to negative feedback. When not in use with a panadaptor for laboratory purposes, and let's face it, not many of us do that, then a Belling-Lee shorting plug MUST be popped into this socket.



The original one supplied with the set was turned out of a solid lump of

aluminium, but that isn't necessary. Just solder a shorting link from the centre pin to the braid gripper and screw up tight.

OVERSEAS SUPPLY

If any of our overseas members are troubled by this problem I suspect that the Belling-Lee plug may be a difficulty. They are standard TV items in UK and are widely available. They cost about 50 pence, so if you double that up for post & package and send me notes in your own currency I'll send you one. If you don't do a note small enough (€ ?) send me what you have and I'll send more to fill the bill.

'HOT' CHASSIS

Not actually connected with the above observations, but triggered by the 680X in question (which had the problem).

Most AC-only Eddystones of the 1950s used a standard Bulgin-type twin 5-amp non-polarised mains connector. These were actually very common on domestic items throughout the twenties to the sixties.

BUT they have no provision for the earth and this is very important for an all-metal set like this with a big mains tranny. Because the chassis has so much capacity to the 'hot' side of the mains you can strike a neon lamp off it to your body. Honestly! Not too nice and potentially very dangerous. (It impresses visitors to the shack, though.)

I know it looks crude, but you must use a three core flex and when you wire up the power connector leave about a foot (30 cm) of earth lead flying to connect to the earth terminal near the aerial connector.

This is especially important on the 680X and 730-series, neither of which has a mains side-contact like the later (and similar-looking) polarised

connector which was used right up to the Euro-connector era around the late '70s and which is still with us.

NOISE AND THE EC10 (EB35 etc)

Now everybody knows that I don't do Transistors (or they should by now). I sold my 1837 because, quite frankly, I couldn't understand an inch of the circuit and I came into the vintage radio business because I was one of the few who understood them! Valves, that is.

I crave forgiveness; I was punching above my weight when a member phoned me last month and said he had a noisy EC10. "Is it noisy with the AF gain turned down?" I said, full of importance. "Yes," he said, "It's there all the time."

"It's the audio transistors," says I, "They get noisy with age."

The next week I saw Ted Moore and told him about it. The answer is still embarrassing me and I can't remember whom it was who called me.

Anyway, to cut a long story short, Ted said to change the carbon composition resistors in the base bias network of the first audio stage and replace them with modern metal film ones.

Apparently those old carbon things are quietly frying away to themselves. So all you EC10/EB35/36/37 owners with hissing speakers, spend fourpence at the next rally and cure them.

SILENT KEYS

With regret we say goodbye to EUGer Tony Besford, G3NHU, who passed away in October. Tony was a regular member of the EUG 'First Sunday' net and will be missed.

Fred Ward, G2CVV, was first licensed in 1937 and active all his life in the hobby. Fred was elected President of the RSGB in 1971 and never failed to present his cheerful

elfin face at our EUG stand at the NVCF (which will be Sunday May 4th this year).

George Poppleton, who was the subject of Peter le Quesne's feature on Campbell Island in our last Issue, passed away just before Christmas. His book of the same title is still available for members' reading pleasure. George had just celebrated his 80th birthday.

FIRST SUNDAY – A REMINDER

Just to remind members who listen, as well as active amateurs, that our regular informal chat-net takes place on the FIRST SUNDAY of each month.

Chris G3XFE is the chairman and calls at 10.00 local time on SSB 3695 kHz. In case of QRM Chris goes HF until he finds a clear spot.

Here's a little tip for those calling in and being ignored. It's not because you only have 10 watts (M3's please note!), it's because you're having a problem loading your aerial. Honest!

Ron M3URU in Carlisle has no problem reaching me here 200 miles away with his ten watts. Roger, MØBWP on Merseyside could hear us but called fruitlessly many times. Then he found his ATU was up the creek and suddenly, one day, he was blowing my head off! Keep at it!

One more little tip; don't try using a half-wave end fed (128'). They may receive ok but the impedance is so high it's impossible to load a Tx with a conventional ATU. If it must be end fed, reduce it to 97' and lay a 65' counterpoise earth on the ground beneath it.

'POO's PONDERINGS'

Simon Robinson, M5POO, is taking a well-earned rest and has been 'excused boots' this month. We wish him well and look forward to seeing 'Ponderings' again later in the season.

GRAEME G3GGL

E.U.G. CROSSWORD NEWS

Reporter Forgets Answers. Bows Head in Shame! *Record Entry, 15 Correct Solutions (only 4 failed!)*

Shortly before Christmas a member phoned and asked about the answer to 24 Across in Prize Crossword # 10 (October Issue). I said I couldn't recall, and why didn't he look it up in the Christmas "Lighthouse"?

He said it wasn't there! OhmyGawd! He was right, too. With grovelling apologies I plead a senior moment and here are the answers (to # 10):

ACROSS: (1) Homelander. (8) ITA
(9) Toroidal. (10) Latin. (11) Pinions.
(12) Acorn. (15) Regen. (18) Bellows.
(19) Alarm. (21) External. (23) IBM
(24) Elasticity

DOWN: (2) Oxo. (3) Ebonite.
(4) Adding. (5) Dull. (6) Rig Two.
(7) Gain. (9) Taper. (13) Color TV.
(14) Nasal. (16) Graeme. (17) Septet.
(19) Axis. (20) Mega. (22) Ant.

Back now to Puzzle No 11. A record 15 of you managed correct entries, although many of you said it was one of the hardest!

The most trouble was given by 22 Across, "Common phrase still sometimes used by radio amateurs, especially old timers, to describe lack of output! (2,4). The answer (as you will see in a moment!) is "No ergs". Just in case you think that's a bit of "Brumagem" slang, may I remind you that an "erg" is the cgs unit of work or energy (from the Greek 'ergon', to work,) and is equal to 10^{-7} of a watt-second!

But now to this month's winners:-

Peter Beardsmore G4IXY, St Albans
Brian Blake G3JOS, Rugby
Tony Emeney G3RIM, Esher
Stan Garrett G3IJW, Bexleyheath

Richard Gaskell GØREL, Oxford
Dave Jones MW3DUJ, Llanelli
Tor Marthinsen, Tønsberg, Norway
Mike Maxey G8CTJ, Leicester
Gary McSweeney G4CFQ, Belfast
Chris Morgan G3XFD, Watford
Jack Read, Nantwich
Dr R Roycroft G1NXV, Macclesfield
David Skeate GØSKE, Suffolk
Geoff Steedman MØBGS, Leeds
John St Leger G3VDL, Devon

Well done, chaps, keep it up!

And here are the answers to #11 for the rest of our members:

ACROSS: (3) Sabrina. (7) Pile up.
8) ETA. (9) Leo. (10) Ampere.
(11) Cascode. (13) Switch. (14) In tune
(15) Microns. (18) Looped.
(20) Lee. (21) Mia. (22) No ergs.
(23) Reduced.

DOWN: (1) Film. (2) Detector.
(3) Speech. (4) Brass. (5) Igloo.
(6) Anode bend. (10) Assembler
(12) Cathodes. (14) Island. (16) Creed.
(17) Ohmic. (19) Eggs.

Which brings us round to this month's carrot . . . quite frankly, I'm beginning to scrape the barrel a bit. Regular winner Gary McSweeney G4CFQ has offered to pay for a prize, which is exceedingly kind of him and I haven't forgotten! But as readers will realise, I try to get a small (if rare!) item for every entrant, to encourage you all.

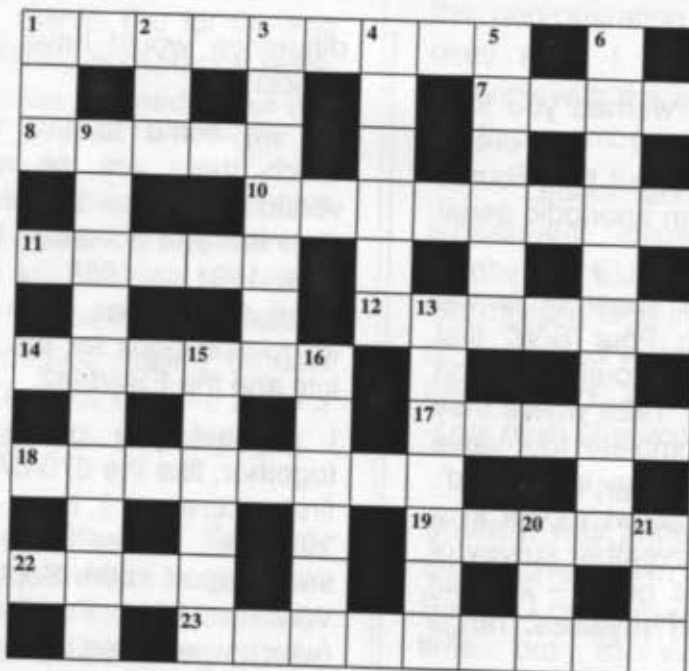
So this month I offer the sales sheet for the Eddystone Model 1707, 100W FM broadcast Tx., dated 1984. It's a single A4 sheet, double-sided in red & black and gives full technical details, plus a rather boring picture. But they're not printing any more!

Graeme - G3GGL

E.U.G. PRIZE CROSSWORD No 12

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 25th March. Don't forget your name! See previous page for further details.



ACROSS

- 1) All at sea with frequency measurement device (9)
 7) Nothing odd about this parity (4)
 8) Outside broadcast technician (2,3 pt. abb.)
 10) In physics, the "Curie point", as applied to certain ferrous materials, is also known as the "— transient temperature" (8)
 11) Common ref. to the United States (2,2,1 pt. abb.)
 12) A rearranged tea-set is included in this inheritance (6)
 14) Test gear units for waveform display (6 abb.)
 17) Flows freely in French south eastern vineyard region (5)

18) Successful outcome for an EMC trouble-shooter (5, 3 pt. abb.)

19) and 23) EUG contributor who developed his interest in Eddystone at Quartz Hill (5,9)

22) Voltage ref. point (4)

DOWN

- (1) How about this tv doctor of yesteryear (3)
 2) Generic US equivalent of the Avo meter (3 abb.)
 3) Troubled, mad, mean synthetic substance (3,4)
 4) Get log perhaps, to reveal a switch (6)
 5) Cure for dry joints (6)
 6) The real part of an impedance, characterised by the dissipation of energy, as opposed to

storage (10)

9) Simple VHF front end (5,5)

13) Chevrons denoting military rank (7)

15) Chemical compound that reacts with formaldehyde to produce Bakelite (6)

16) Valve electrode normally held at a fixed positive potential to eliminate unwanted feedback and instability (6)

20) Comms research organisation paramount in electronic warfare development during WW2 (3 abb.)

21) British military seagoing back up (3 abb.)

Letter from Tønsberg

Our Norwegian Correspondent, Tor Marthinsen, continues with his roundup of early Eddystone receivers, entitled *"Eddystone Fours – Part Two"*

Hello Graeme,

Here we go again, I warned you that this was not a quick job! So here is the rest of the story about the 'Fours', this time those with an aperiodic aerial input.

The first one that I know of is the 'Eddystone Scientific Four S/W' first mentioned in the stand-to-stand report in WW in September 1929 where they state that 'a new complete four-valve short-wave set has been introduced'. There is a special export model in a teak case. In the November survey of receivers the price is given – 27 quid including valves and royalties, range 16-550 metres.

In the 1930 stand-to-stand report in WW (also September) we have the following description:

There is a four-valve short-wave kit assembled on a metal chassis, and the circuit includes an H.F. stage, a regenerative detector and a resistance-capacity L.F. stage, in this order. Coils supplied with the set cover from 12.5 to 85 metres, and also the medium broadcast band from 250 to 500 metres. The price of the kit is £10 10s.

I believe that this is the 'Scientific Four' in kit version (from the descriptions) and that the 1930 kit was called the 'Homeland Four'. The March issue of the "Wireless Magazine" advert for the 'Homeland Four' confirms this. And most important – the 'Homeland Four' must have been out well in advance of the first of the 'Kilodynes', the price

difference would have prevented the opposite.

So we come to the 'Kilodynes', of which there are so many different versions. If you believe all they say then there is a version for every year from 1931 to 1935. I know of three good descriptions, from ESWM#1, the instruction book for the 1934 Kilodyne kits and the ESWM#2.

I suggest you group the versions together, like the 670/670A/670C. The first reference I have found of any 'Kilodyne' comes from the stand-to-stand report in the September issue of WW for 1931. For the 1934 version (which was based on the 1933 version, which is unknown to me) and which probably was available in 1933, there is another great change – the diecast chassis is introduced.



1934 'Kilodyne Four' Battery Model

The 1935 version was definitely available in 1934 as the ESWM#2 was advertised in the autumn that year. Gives you something to think about regarding names and introductory years! Perhaps I would date them as follows:

1931-32: as shown in the Sept WW-31 description and the ESWM#1 of 1932

1933-34: as described in the instruction manual and adverts

1934-35: the version which is named the 1935 Kilodyne

The 'Sphinx' of 1934 is a complete set but electrically identical to the 1935 'Kilodyne' apart from the wavechange switch.

As for the 'Homelander' I guess I've told you all I know about this set, and I have nothing to add to the 'Overseas Four'. One curious thing with both these receivers is the use of a tetrode rather than a pentode for the first valve, seems like a retrograde step.

I guess that I would have included both the 'Everyman' SW-sets as it is likely that you might stumble across these at a rally. I find the 'Improved Everyman' of great interest, I've been collecting bits for this one for years – the last of the breadboards! I need a source for the large capacitors, maybe I'll have to make new ones from brass sheet and put modern capacitors inside. (*Note from Graeme: a feature on the 'Improved Everyman' follows this article.*)

And yes, there is a last one – the 'Quadradyne'. In the WW issue from August 9th 1935 we can read the following:

Stratton and Company (Eddystone) announce an entirely new model, the Quadradyne, with a "straight" circuit; the set is housed in a welded steel cabinet, and, unlike most others of its type, includes a built-in speaker.

In the stand to stand report in August 1935 we can read further:

There is a new four-valve straight receiver, the "Quadradyne," housed in a welded steel cabinet. This should appeal to short-wave

listeners requiring a sensitive set at a reasonable price.

Some years ago Ted sent me his write-up on this receiver. I'm not entirely happy with his description, a rotary reaction coil in 1935 sounds strange. How do you change bands? Also the grid leak seems a bit small. (*Note from Graeme: the 'Quadradyne' was a very odd set and had NO RF stage but push-pull output!. I shall try and find out more.*)

That's it, Graeme, you probably knew most of this already. I have a further comment to a previous comment – one in my mail QRG-1 where I describe the virtues of having a stage ahead of the detector. You can look up the description of the 'Improved Everyman' in the ESWM#3 of 1938, page 5, at the end of the second part :

It (the aperiodic stage) prevents re-radiation on the aerial when regeneration is applied so that no interference is caused.

There was a good series on reaction in Wireless World from December 1939 to February 1940. On page 134 (1940) they wrote:

The use of an RF stage has one other advantage, which is so great that it makes its use almost obligatory. It very largely prevents the possibility of radiation from the aerial. With the aerial coupled directly to the tuned circuit of the detector, serious radiation occurs whenever the valve oscillates. A short-wave set is usually used a good deal in the oscillating condition, and so very serious interference with other receivers may be caused.

Thank you Tor, for an interesting roundup. In our next issue we'll take a look at your "Eddystone Threes" ♣

“I Swam at the BATH TUB before the War”

**Reporting from Norfolk on January's 'First Sunday EUG Net',
Dennis G4LAG volunteered the above information. Tell us more:-**

Dear Graeme

Very many Thanks for my year's supply of the Lighthouse and the QRG/s. The Best Reading I've ever received, I shall have to stop PW now, not so sure about RadCom although its content is no better, but the RSGB is the only body to look after the interests of us Amateurs. Where would Radio be today without Radio Amateurs? Marconi started it off but there are many developments that past Amateurs brought to the fore, we should never forget them.

I was introduced to short wave radio in 1936 when I started High School and I made friends with another new boy. This was after the ubiquitous crystal set my Father acquired in a beautifully polished cabinet, I think he made the cabinet himself being a cabinet maker, it must have been worth more than the crystal set! Under the lid was the conventional cats whisker and crystal in their glass tube with a large knob in the centre for tuning the two coils underneath the ebonite panel, one smaller inside the larger but I don't remember hearing it working. He finally graduated to a three valve GEC battery set with HT, Grid bias and 2-volt accumulator which was finally passed to me.

By this time the bug had bitten through my school chum who had already built his one valve short waver and was receiving stations in New York so I naturally had to follow with much help from him. Sadly he is not with us today. The GEC was partially striped for the valves and capacitors and other bits but being long and medium the coil was not suitable for the short waves so it was on the scrounge I went!! Most

tuning “condensers” we acquired had to be stripped of some of their plates to reduce the capacity. It was all hit and miss but great fun especially when America came in loud and clear, no cracks and bangs in those days just the few whistles from the reaction condenser if you tweaked it a bit too far.

The next step was to add a second Valve to give more gain, both were out of the old GEC, PM2s or similar, the memory gets a bit dim sometimes! I do remember using an Eddystone 6 pin former for the two valver which must have been my introduction if only in a small way, we certainly had some fun competing to see who could hear the most stations.

I'd better stop my waffle, don't want to be a bore. Incidentally all this was after the swimming phase when I went to the Bath Tub a time or two, it was a little up market too, so Sparkhill Baths were the favourite being indoor and we could get in for 1d (*that's less than ½ New Penny*) on Mondays and Wednesdays.

I had better close now and write my Cheque for renewal of your Excellent magazine, one most important aspect to me is that I can read it with out any eye strain, I need a many times magnifying glass for the other Mags.

Best Wishes And A HAPPY
NEW YEAR,

Dennis G4LAG

*Many thanks, Dennis, for sharing
your precious memories. – Graeme.*

They Seek it here, they Seek it there . . .

That Demmed, Elusive Power Connector

(With Apologies to Baroness Orczy)

Since 1946 Eddystone Receivers have used three types of mains power connectors. The conventional 2-pin 5-amp Bulgin type; the polarise side-earth version of the same thing and, from the later seventies, the current Euro-connector. The first two are now illegal and aren't made. But members still want them! *(Graeme Speaking)*

The first type is quite common in house clearances and SK sales. You find them in those boxes of bits under the scruffier stalls at rallies. They were standard domestic items for table lamps and radios from the twenties to the sixties. Everybody made them and everybody sold them.



Standard Domestic 5-amp Socket, inside and out.

Sometimes they had side-entry cables as on Bush radios – all fit the same.

These were used on Eddystone's larger sets like the 680X and 770R/U and the military 730/4. See this Issue's "Tales from the Workbench" for a discussion of these. Smaller sets of the period (such as the 640) were hard-wired (no connector).

Early 'Universal' sets (AC/DC) used a variation of this connector with a split or bifurcation between the actual pin sockets, often moulded in rubber. These are much rarer than the 'block' style.

The BBC didn't like these block connectors and on the 770R (used for re-broadcast and radio mikes) removed the connector on the set and replaced it with a small three-pin Cannon mains connector, mounted on a small plate which covered the original hole.

The New Zealand Civil Aviation Administration used the 680X and called it the R74 (to confuse EUGers). They considered this connector unsafe and they issued a modification (No 680X/3 ST1 52) to remove it and replace it with a hard-wired flex.

A plate with a hole and grommet replaced the mains connector on the set. This may be your answer also.

The later polarised connector, with side-contact earth, looks like this:-



Polarised Connector – very rare

This connector is sometimes found without the earth contact, in which case it should always be earthed separately. Noting that one pin (N) is the standard 5-amp size and the other (L) is a smaller 2-amp size easily identifies it.

It is possible to convert an early 'Bulgin' type to this by filling one socket with solder and carefully drilling it out. It may also be possible to attach a brass or bronze side earth, but these are only to be attempted if you are handy with tools and electricity.

If you are unable to source the correct mains connector for a classic Eddystone, I recommend carefully removing the existing chassis connector (retain for future use), and hard wire it. (Like the New Zealand Aviation Administration). ♦

Metal fatigue spoils the performance of my Eddystone 770U.

Brian Cauthery VE3DFC



Eddystone 770U 6-band 15-valve double superhet 150-500 Mc/s

I bought this radio about 10 years ago for \$120.00 Cdn and with the exception of a few new tubes plus an alignment, the performance has been impressive, especially when used with a Log Periodic Antenna.

HK 0626 was built in August 1956 (if the 'HK' is to be believed) and from the plate screwed to its rump, it pleased the RCAF Communications Division for about 25 years. I am told that the 770's were replaced with 990's, so the customer must have been well satisfied.

My 770U then spent almost a decade in the RCAF "OSF" which I gather is 'rafspeak' for the unit which looks after communications equipment until it is so old that only the surplus market will welcome it. I think OSF is the abbreviation for Obsolete Storage Facility.

On October 3rd, I switched HK 0626 on for my weekly overview of the UHF bands (There really is some good stuff on these bands in Canada). But this time Band 5 failed to respond to its selection. A quick check revealed that all other bands functioned normally, so I switched off, removed the case and then plugged in and switched on again. Feeding a 50 MHz signal into the IF Input (S2) quickly revealed that the fault was ahead of the 1st mixer.

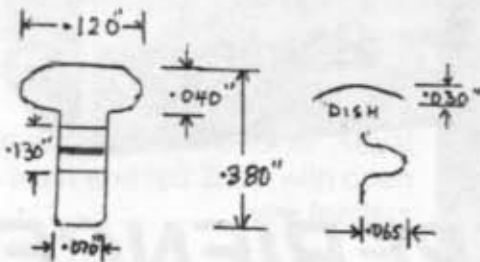
So I removed the coil pack cover and rotation of the band switch to bring Range 5 to the 12-O'clock position displayed the fault. One of the oscillator coil contacts was broken off and lay in the bottom of the coil box.

I removed the Range 5 coil strip and promptly dropped it onto the steel frame which surrounds each end of the 770U, breaking 2 more contacts in the process. An auspicious beginning to the repair!

It was at this time that I noticed for the first time that one of these tiny contacts had already been replaced with a piece of galvanized metal cut to the shape of a diminutive fireplace shovel. Although the design of the replacement contact lacked originality, artistry and interpretation it did work. However when one takes note of the fact that there are 77 other contacts in successive rotational view, I would have thought that a better copy of the real thing could have been achieved. So I needed 4 new contacts.

Before removing them, I made a detailed sketch of the components and layout of the Oscillator and RF sections of the coil pack for Range 5. Then I unsoldered these components and in the process, I discovered that the blade end of the spoon was flat . . . I had expected a round shank to fit into the tiny brass bushing which is moulded into the thermosetting plastic material from which the coil component support is made.

The blade has a 100-thou 00 mica bushing with a centre slot, placed over it before it is inserted through the bushing. I think the mica is there to prevent the solder running down the blade onto the spoon contact end when the support strip is inverted for soldering the blade to the bushing during production. There is plenty of ingenuity in this design.



The blade and spoon are stamped from .008" thick plated material. The spoon end is .120" wide x .040" deep x .030" dished.

Overall length of spoon and blade is .380" plus some 130-thou" for the deflection offset spring. There is some guesswork in these dimensions resulting from the difficulty of getting calipers or a micrometer onto these rather small components.

I managed to obtain some tin-plated steel shim .010" thick from a local machine shop and with the aid of a new pair of metal shears I cut out 6 blanks after making a thin cardboard pattern. The spring offset was easily produced with a pair of needle-nosed pliers that I had ground the edges round to produce a bend in the blade material rather than (an easily fatigued) angular direction change.

This left the apparently problematic job of creating the spoon end of the contact. I selected a nail which had an O/D of 1/8"

(.125") i.e., a little larger than the spoon width. I ground the pointed end of the nail to the contour and profile of the concave side of the contact spoon.

Then I cut a piece of hardwood from the skid of a pallet 3" x 3" x 2" thick. Using a 1-lb. hammer and the profiled end of the nail, I struck a succession of depressions into the hardwood, which began as too shallow and ended as too deep for the spoon.

I formed the spoon end by setting the blank over the shallowest depression and striking it gently with the hammer via the profiled end of the nail; then I moved to a deeper depression and repeated the blow.

I used 3 of the depressions in succession to get the correct spoon profile, with no creases in the metal. The spring contact, spoon and blade which resulted was a very good facsimile of the original Eddystone-made contacts.

Incidentally, the need for the spoon-shaped contact-end results from the bi-directional rotation capability of the band change switch; the stationary contact anvil can be approached from either direction. A square edged contact is prone to jamming.

Then came the joy of putting it all back together and finding that Range 5 was back to its normal signal productivity. A small realignment of the oscillator was required to restore the calibration.

A note of caution: before removing a broken contact, observe the direction of the contact face on adjacent coil strips. The contact faces of the spoons can be set either way into the coil support strip but of course to function correctly, they must offer a sloped face to the edge of the stationary contact anvil.

Rest assured that actually making these new contact spoons is much quicker than writing about the process.

Brian R Cauthery.

VE3DFC.

Is The Eddystone S.940 troubled by Gremlins? Are we being too critical of a 40-year-old model?

Following some controversial articles about the Model 940, here we have a letter from EUGer Alan Robinson that sets you thinking. It made me get my S.940 down from the shelf and make some observations (Graeme – G3GGL at the keys) My first short report follows this article . . .

MODEL 940 FREQUENCY INSTABILITY; ONE MAN'S EXPERIENCE



Alan Robinson

I read with great interest Simon Robinson's article on the 940 modifications in issue 75, and Peter Lankshear's comments in issue 76. I have a 940 and it suffers all the drift, jump, and wobble as described in 'POO's Ponderings'.

The receiver has been lying in a box, with bits missing, for some years now, for various reasons, until I find time and inclination to work on it.

I am drawing from memory to write this article, my notes I made have been long lost.

I bought the set for £125 in the early '60s, I wanted a receiver with a wider frequency range than my 2 to 20 MHz R1475. I saw it in a shop window, and liked the look of it. From the outset,

although I liked the 'FEEL' of the set, the drift was obvious and going to be a problem.

Even after a long warm-up, it was necessary to adjust the BFO every few minutes to resolve SSB, then to re-adjust the main tuning when the signal drifted out of the IF passband. For AM BC stations it was every 15 to 30 minutes.

The problem was noticeable on 80 metres, and a nuisance on 15 metres

and above.

The drift was downward in frequency, requiring tuning upwards to counter it.

I wrote to Eddystone's for advice, they sent me a new C62, (15 pf neg temp, local oscillator gang shunt) but I found it made no noticeable difference. This drift was commented on unfavourably by more experienced others.

FREQUENCY JUMPING

My set sometimes exhibited this problem, in a stable environment and untouched, it would suddenly change frequency, it is difficult to say by how much, maybe a few kilohertz, it may do it several times in an hour, then settle down for a long period.

WOBBLE

Despite what Peter says, my 940 is very sensitive to touch. With the set tuned to a SW BC station and the BFO switched on, a warbling note is produced when the set is lightly tapped, or the table is knocked. If the set is gently pushed or pulled, a change of note will occur.

Having written all this, am I being fair to the set? The L.O. is a wide-range, free running LC oscillator, what sort of stability can I expect?

How does the 940 compare, drift-wise with other similar Eddystones, like the 680X Peter mentions?

ECH81 MODIFICATION.

I share Peter's caution on this. A wide-band, un-neutralised triode RC coupled amplifier, whose bias point varies with the AGC, seems a recipe for disaster.

But Simon's colleague says it works so we must assume it does.

Perhaps someone with a mathematical bent could investigate?

OTHER MODIFICATIONS

I tried replacing the 12AU7 by a

12AX7. It increased the AF gain a lot, but I felt it was too sensitive so refitted the 12AU7.

I also considered replacing the GZ34 by silicon diodes, but was unhappy about applying increased HT to the capacitors and cold valves suddenly.

I don't recall any problems with the AGC, but it was a nuisance having to keep adjusting the RF gain when listening to SSB stations of different strengths.

All the above may seem just a moaning session, as I am unable to offer any solutions, but it may encourage others to come up with some ideas.

Alan Robinson

Graeme's notes: having rigorously checked out my 940, I find that it is rock stable on the 'thump' test, and the Local Oscillator doesn't jump. It shouldn't be used with AGC on SSB (the handbook says so). There is no carrier to generate it.

After a 30-min warm-up at the LF end of each band the drift is up to one part in 10^4 per hour, which is excellent. At the HF end of each band the drift is up to 40 parts in 10^4 , which is dreadful.

The finger of suspicion must point at C62, the N750K 15 pf negative temp compensation capacitor.

This was a late letter from Alan; not sufficient time to complete this analysis before we go to press.

But quite frankly, from what he says, it sounds as if his tuning gang was faulty and the whole set should have been presented back to the Bath Tub under guarantee.

More in our next Issue . . .



Stratton Laughton's Patent Double-ended Valve-holder.

In the mid 1930s the thermionic valve was reaching a peak of development which was only to be surpassed in specialised areas. The beam power tetrode, (currently back in fashion) had arrived on the scene and Stratton, Abe Laughton's eldest son, invented a device which could have netted him a fortune, but the International Octal base ousted him! We present here his Patent Application of 1935



PATENT SPECIFICATION 433,029

Application Date: March 30, 1935. No. 9925//35.

Complete Specification Accepted: Aug 7, 1935.

COMPLETE SPECIFICATION Holders for Multi-electrode Electrical Components

We, STRATTON AND COMPANY LIMITED, a British Company, of Balmoral Works, Bromsgrove Street, Birmingham, and GEORGE STRATTON LAUGHTON, British Subject, of the Company's address, do hereby declare the nature of this invention and in what manner the same the same is to be performed, to be particularly described and ascertained in and by the following statement:-

The invention relates to holders for multi-electrode electrical components such as thermionic valves thermocouples, coils and the like. Hereinafter the word valve is employed, as an example of any of these components.

The holder is of the kind right angle or L shaped metal legs are secured to an insulating mounting member. The legs all present parts approximately parallel to each other to form electrode-receiving

members and present parts radiating therefrom for attaching the leg to the mounting member and for connecting a current lead to the leg.

The object of this invention is to provide a holder into which the valve may be inserted from either end. The holder may thus be mounted by the same attachment device, either upon the upper face of a panel or base board so that the valve stands up from the board, or to the under surface so that the valve electrode pins enter the legs of the holder through a hole in the base board.

The invention consists of a holder of the kind set forth wherein the insulating member is a ring mounted by insulating distance sleeves or feet either above or below a panel and the right angle metal legs secured on the ring are flared at the part adjacent the ring and have outwardly

bent lips at their free extremities so that the component electrodes may enter them either way and the valve may be inserted from the same side of the panel, whether the holder is above or below the panel.

A preferred construction is illustrated in the appended drawings.

Figure 1 is a perspective view of the holder.

Figure 2 is a section on line 2—2 of Figure 1 and Figure 3 is a similar section with the holder below the base board.

In this illustrated construction, each leg *a* is formed of a strip of suitable metal such as copper or phosphor bronze having a flat attachment and connection piece *b* and a troughed electrode-receiving part *c* curving through an angle of approximately 90° to the piece *b* and from the point of attachment *d*.

Each electrode-receiving part *c* has a lip bent outwardly at the extremity as at *e* to form a lead to facilitate the insertion of the electrode pins of the valve when the holder is attached as shown in Figures 1 and 2. The legs *a* are mounted on a ring *f* of suitable insulating substance, such as one of the well known synthetic moulding products; and this ring *f* is mounted above or below a panel or base board *g* by bolts *h* through distance sleeves or feet *j*.

The curvature of the leg between the part *c* of troughed cross section, and the flat attachment part *b* gives a lead to the electrode pins of the valve when the latter is being inserted into a holder mounted on the underside of the panel or base board *g*, as in Figure 3. The attachment parts *b* are rivetted to the mounting ring *f* at the points *d* and are received in recesses *k* in a raised edge or flange *m* on the ring in order to prevent any disturbance of their positions in relation to each other.

The construction of each leg in a single piece with its attachment part *b*, to which a current lead is connected by soldering or like process, avoids the noises often caused where parts lying in the path of the current are screwed or rivetted together but it is not claimed as novel.

It is a convenience to be able to mount the holder either above or below the panel or base board whilst providing equal facility for valve insertion.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:-

1. Improved holder, for multi-electrode electrical components such as thermionic valves, of the kind set forth wherein the insulating member is a ring mounted by insulating distance sleeves or feet either above or below a panel and the right angle metal legs secured on the right are secured on the right are flared at the part adjacent the ring and have outwardly bent lips at their free extremities so that the component electrodes may enter them either way and the valve may be inserted from the same side of the panel, whether the holder is above or below the panel.

2. Improved holder, for multi-electrode electrical components such as thermionic valves, as in claim 1 in which the ring has a raised inner edge which is recessed to receive and locate the right angle metal legs.

Dated this 29th day of March 1935.

BARKER, BRETTELL & DUNCAN,

Chartered Patent Agents,

75 & 77 Colmore Row,
Birmingham, 3.

433,029 COMPLETE SPECIFICATION

1 SHEET

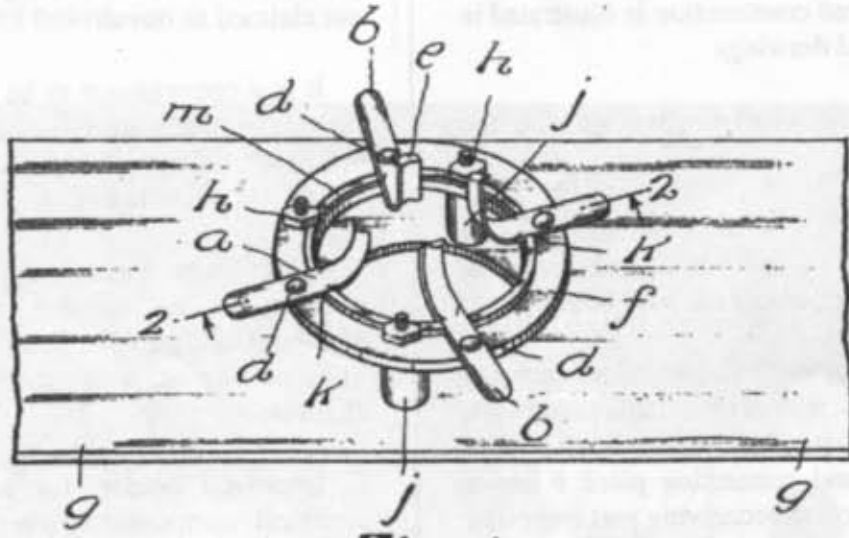


Fig. 1

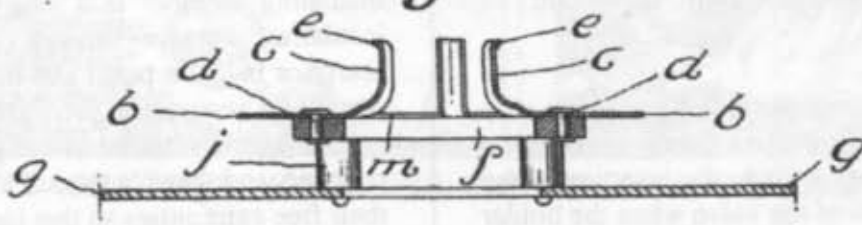


Fig. 2

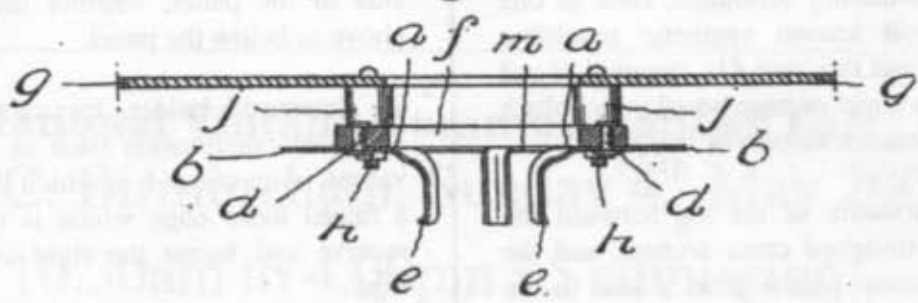


Fig. 3

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

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