Mid Sussex Amateur Radio Society

NEWSLETTER

Aug 2020

Mid Sussex Matters

Radiola M30 from 1926

"CQ" G5RV G1ZMS G3ZMS

In this issue

Meetings are held on Friday evenings starting 7.45pm at the rear of Cyprus Hall, Millfield Suite, Cyprus Road, Burgess Hill,

West Sussex

Visitors are always Welcome

Please note that Cyprus Hall is currently closed due to the Pandemic

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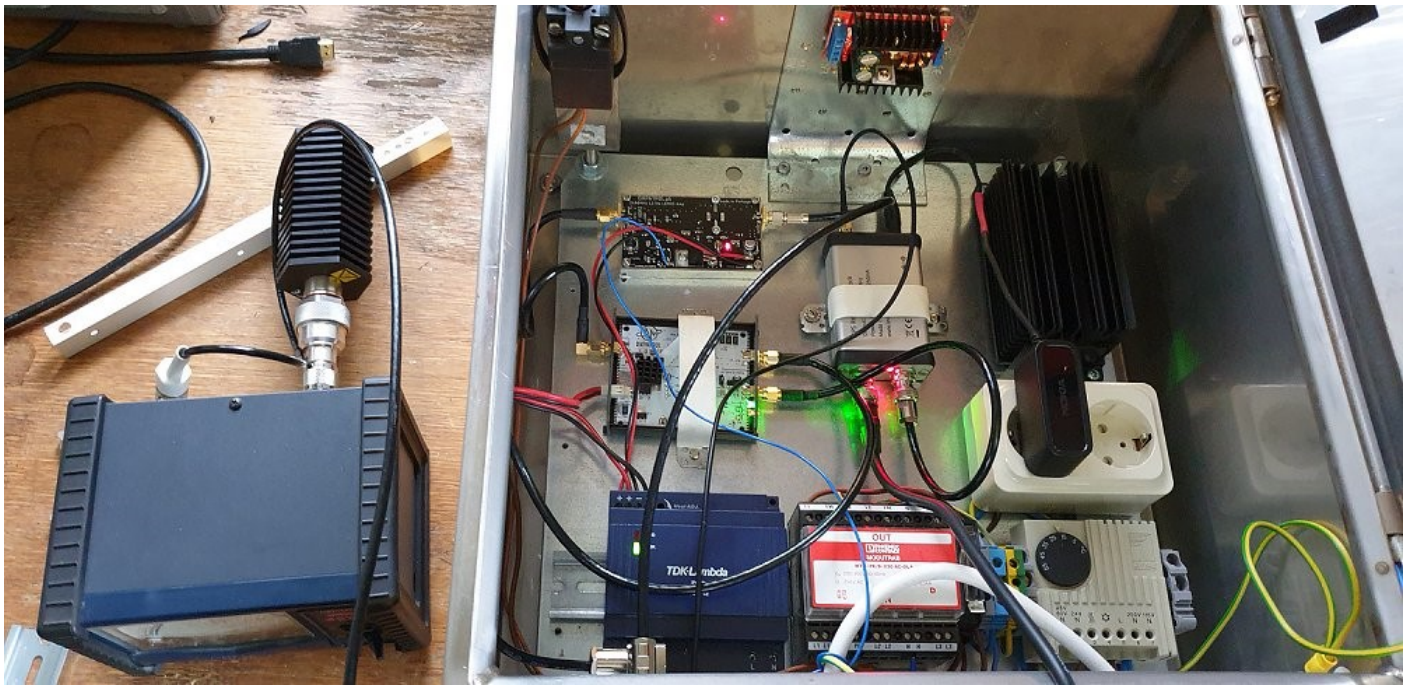
Letter from Barry SA7GDB to Ken with some Wonderful images:

The 4.5m and 3.7-metre reflectors are for “Freesat” and the little black

1.3m is for the up/down link to QO-100 satellite.



QO—100 Head End

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Barry SA7GDB to Ken with some wonderful images:

Items bought at the Horby Sweden radio rally (last year) Heathkit SB200, now repaired with new rotary band switch wafer. Yaesu aerial tuner, now repaired with two new germanium signal diodes (OA91s).

The Radiola wireless (Marconi royalty paid, written in English on the bottom) that the XYL (Christel) bid for, and won at the same rally (sf)

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Letter from Barry SA7GDB to Ken with some wonderful images:

Radio Shack Barry SA7GDB

Dear Ken,

Thanks for “Letting-me-in” on the nett today, great fun, but your stations signal was, by far, the strongest 5/9+20. Such a wonderful mine of information you have Ken = ST400.
I have taken the liberty of sending you some photos (sf)

My sat head-end nearing completion (Taken today) Our back-garden site (clear of trees) with a view to both Astra 28 and QO-100 amateur satellite at 26 degrees East. (Taken last week, in the garden)

The 4.5m and 3.7-metre reflectors are for “FreeSat” and the little black one 1.3m is for the up/down link to the QO-100 satellite.

items bought at the Horby Sweden radio rally (last year) Heathkit SB200. Now repaired with new rotary band switch wafer. Yaesu aerial tuner. Now repaired with two new germanium signal diodes. (OA91s).

The Radiola wireless (Marconi royalty paid, written in English on the bottom) that the XYL (Christel) bid for, and won at the same rally (sf)

Thanks again Ken for a wonderful chat (There’s nobody in Sweden, with your amount of experience) for me to talk to)!

/73

Barry SA7GDB

PS: Have you listened to this? = https://eshail.batc.org.uk/nb/ It’s a bit fiddly to get the sound, but well worth it (sf)

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Baluns and How to Build Them

By Ken G3WYN

A “balun” (balanced to unbalanced) is a transmission line transformer used to link a balanced antenna, dipole, beam, or delta loop, to an unbalanced coaxial cable to assist in the efficient transfer of power, and avoid the problems found if antenna and cable are directly connected.

Whilst commercial baluns are available, these are often more case than content, and this article deals with the construction of home built units which are both simple and economic to produce.

The two most useful type of balun for amateur use are of 1/1 and 4/1 ratios and the accompanying drawings show how both rod and toroidal construction of both ratios is effected. The toroidal type is heavier but concentrates the flux better than the rod type, but both have their uses particularly when lower powers of up to 100 watts are used.

Ferrite rods can be obtained from old transistor radios, and 2 or 3 taped together if higher power use is envisaged. Again, two ferrite rings can be taped together if the toroidal type is being constructed and considering this type of construction as an example, two ferrite rings should be individually bound with glass (B&Q) or pvc tape then stacked together and again bound with tape before winding on the turns as tightly as possible.

Heavy gauge enamelled copper wire should be used, and the complete assembly insulated with more tape before coating with polyurethane varnish if the unit is not to be fully enclosed.

When building rod type baluns, tape the two or three wires together as a flat tape, and wind this onto the rod, this keeps the wires closer together than individually winding them. Try to keep input separated from output with the plug at one end of the unit, and the balanced connections at the other and preserve symmetry wherever possible.

Take care when connecting up the individual wire ends, you can’t check them with an ohmmeter after you’ve finished, and believe me the use of a balun when connecting coax to a antenna, will assist in the power transferred to the antenna, and will in many cases eliminate TVI caused by unmatched loads.

I have examples of all the types shown in the drawings for you to see and use a torroidal 4/1 balun with my doublet antenna, 200’ of 450 ohm feeder, ATU and linear amplifier every day.

Ken G3WYN

See the following two pages illustrating the 4/1 and 1/1 Baluns
Recommend that you print these pages off — ED.

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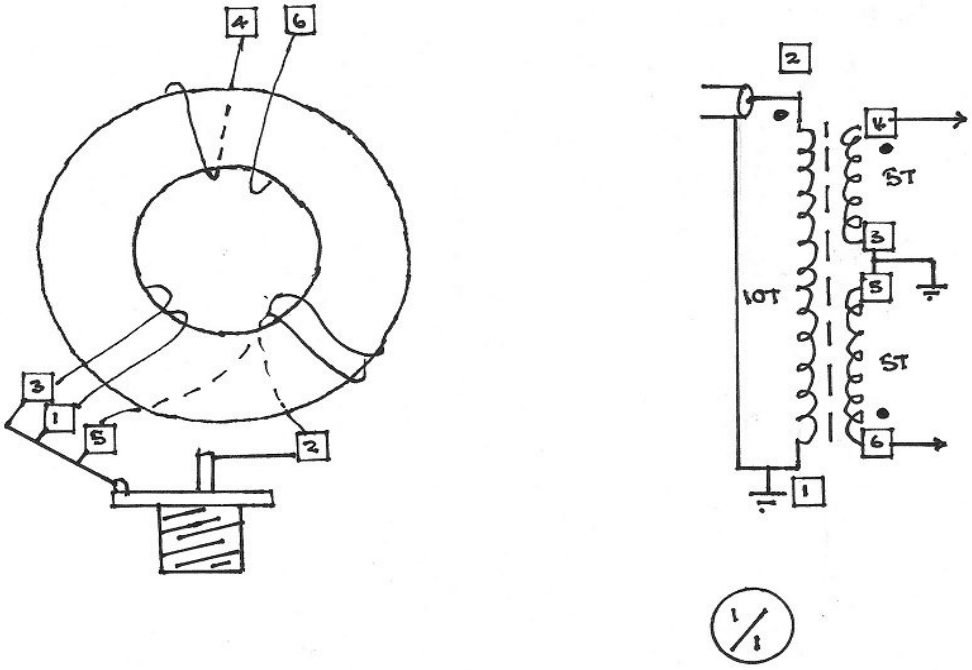

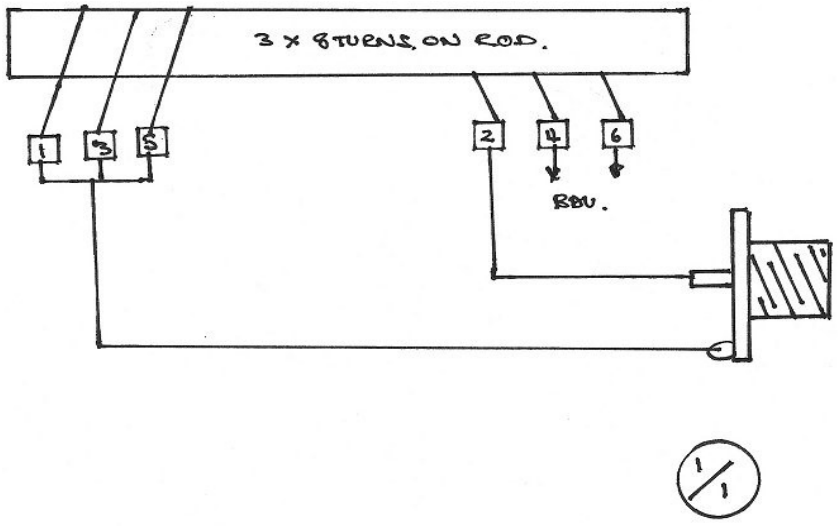

ONE TO ONE BALUNS G3WYN 9/02

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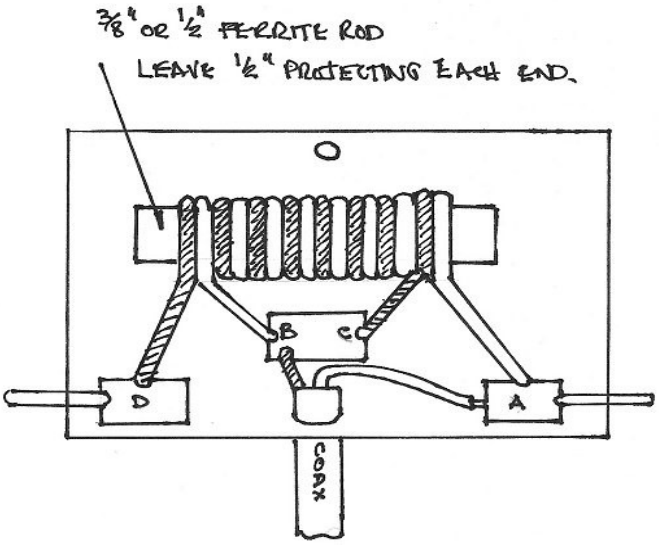

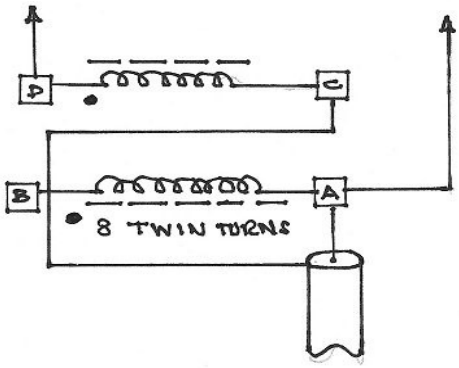

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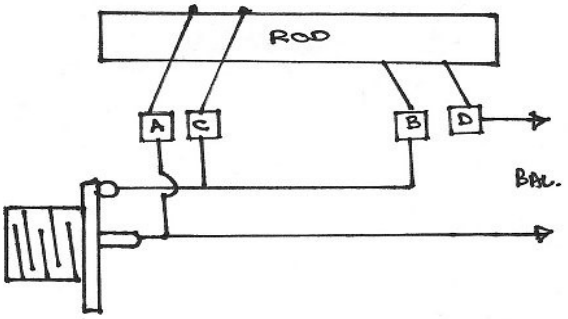

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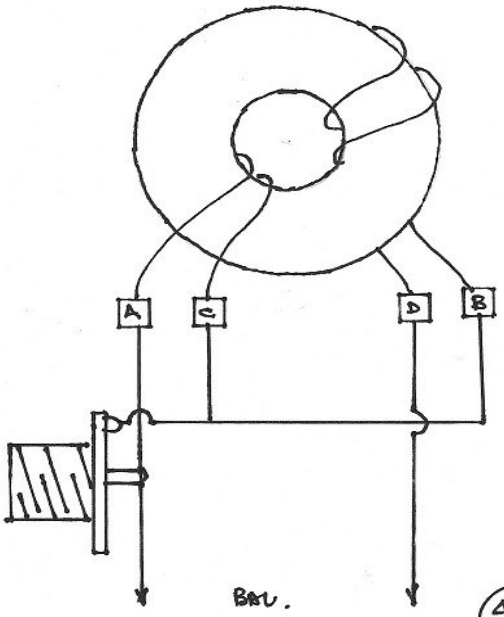

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FOUR TO ONE BALUNS

G3WYN 8/02

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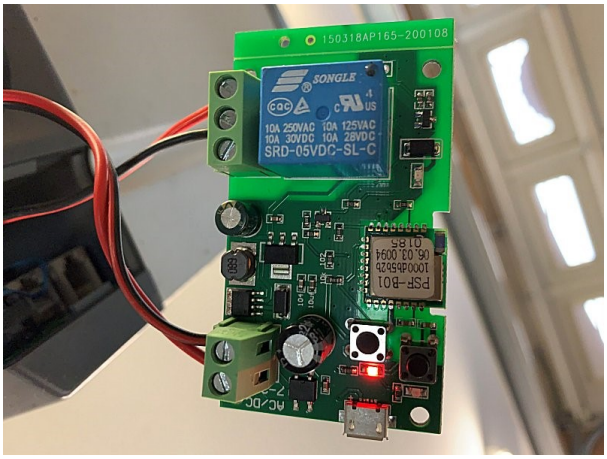
Pressing All the Right Buttons
By Steve GJ6WRI

Slightly away from topic, but in a bid to stay occupied during the Covid lock-down, I decided to do some automation around the house. Some endeavours were successful, whilst others worked, but only so long as I wasn't playing HF radio at the time. More on that in a future issue.

"Home Automation" is somewhat of a buzz word at the moment, and I'd thought about updating my automatic garage door opener. I did my usual thorough research into the matter by Googling the subject, and got quite confused by what I had read. I already have a number of Raspberry Pie and Arduino devices, so I thought I would write a short script to activate a relay. One of the criteria of this operation was to get confirmation of when the door was activated, it had either fully opened or closed. More of that later.

The next step was a huge step forward for me. I decided to "RTFM"! Having done so, I realised why I hadn't done so before. Poorly translated text, and even the "easy-to-follow" pictures were like hieroglyphics!
I proceeded to unscrew and remove the covers from the door opener attached to the garage ceiling (its an up and over door) and having done so, realised I didn't have to, as the access I needed was through a plastic panel that simply unclipped. I pacified myself by saying I waned to have a better understanding of its inner workings!



Pic A shows Single channel relay assembly

The solution I had selected was a small PCB with a single relay with WiFi capability, and very importantly it could be powered by a micro USB connector, or anything up to 30v DC. The existing installation is powered by a dedicated single 13Amp socket, so I replaced it with another single socket that had two USB sockets on it. Simples! No need for extra plug in supplies.

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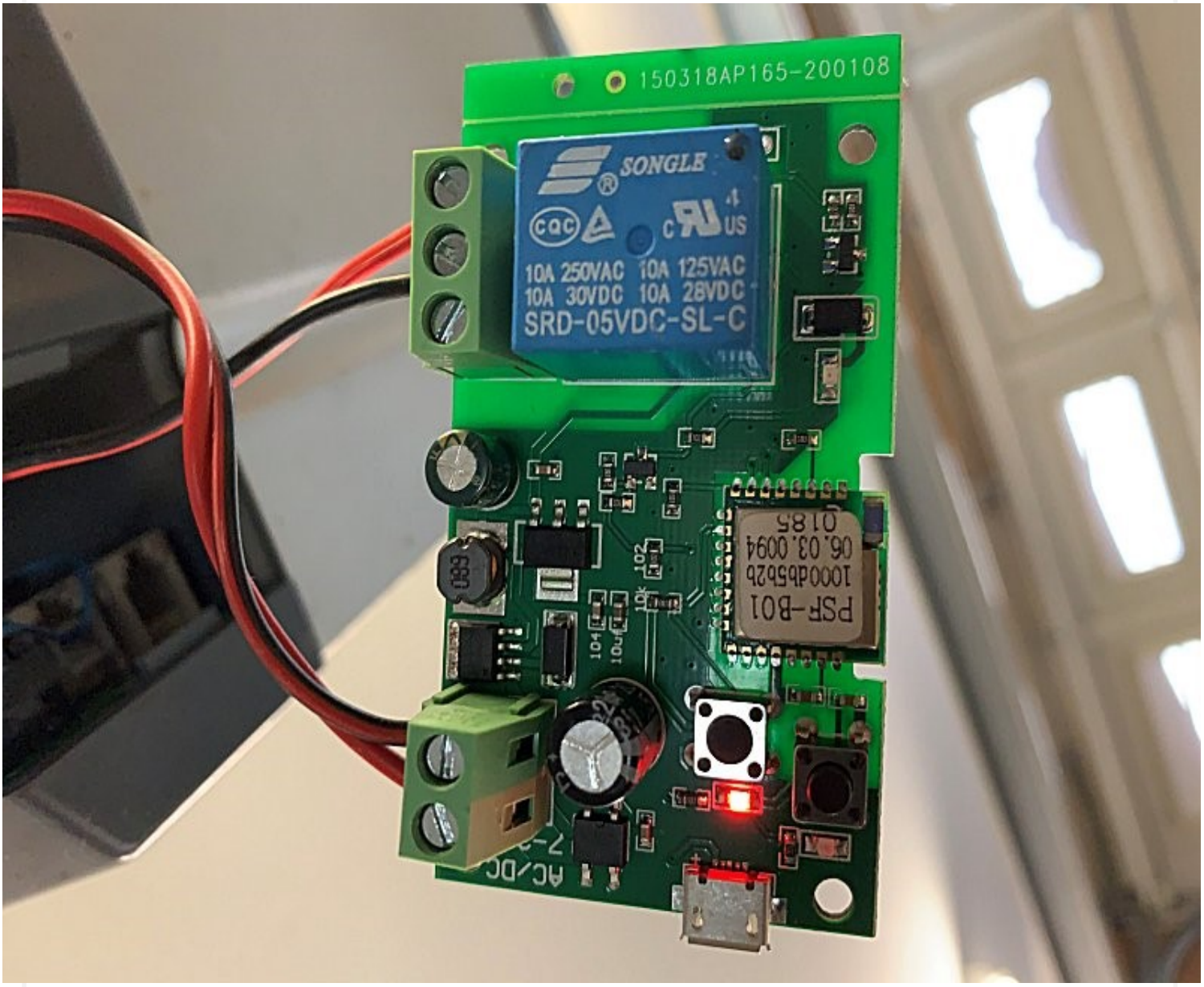
By Steve GJ6WRI Cont...



Pic A Closer inspection of the Single channel relay assembly

Bottom right is a micro USB 5v - in connector, bottom left is 7-32v DC-in, and top left is relay N/0 & N/C.

The square part of the sticker is the WiFi module. PCF-B01 is the product number of the complete assembly, while the 100db5b2b is the units serial number (not to be confused with the MAC Address)

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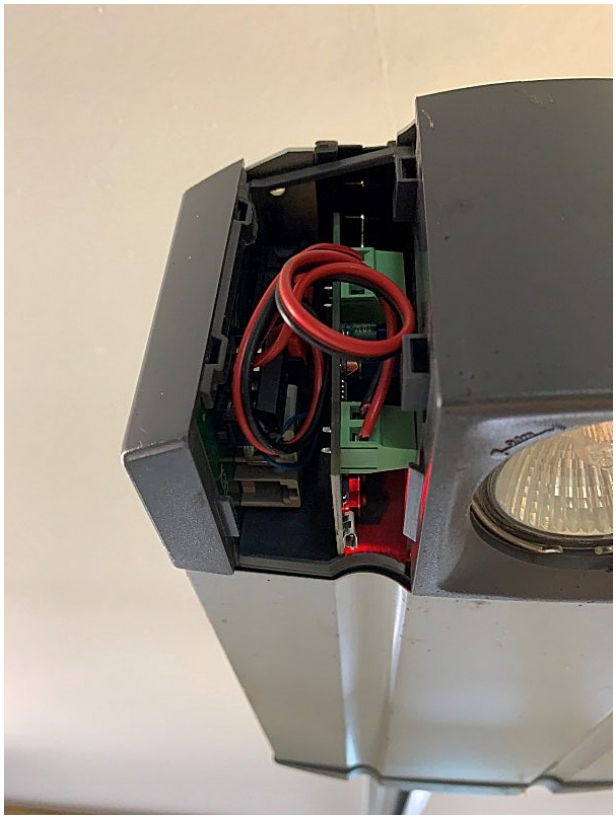

Pic B shows Relay installed in the options bay of the door actuator.

Closer inspection showed there were a number of ways the installation could be enhanced.

There was a "BUS" which can send and read serial data to a "plethora of peripherals" (say that quickly when you've had a drink), including proximity sensors, magnetic sensors and photo-optic sensors.

The next set of connectors on the sub PCB was for passive devices, and so any number of buttons or relays could be connected in parallel, and activate the door.

Activation of the door by this method simply required a momentarily shorting of the two terminals. The last two connectors on the sub board were DC power at 12v. Great! Everything I need is already contained in the existing unit!

The 12v supply negated the use of an external power supply making the installation invisible to the user. Connecting the relay to the normally open connectors on the board completed the installation. As only a momentary short of the connectors is required for activation with this relay board, there are two ways to achieve this. The board has two micro push buttons on it. One is for manual activation, and the second button alternates the operation from "Latching" where the device would be in effect, bi-stable, and "inching" where the relay is only energised so as it receives the WiFi signal to do so. Covers on, and were ready to test!

All of my automaton projects at home so far don't require a home-hub. This relay board was no exception, and a simple setup procedure on your android or iPhone is all that is required to link it to your home WIFI router. So now, I can just open the app and touch the screen and the door will open or close. Dead easy. I can share the functionality with anyone else with a phone, operate it from my PC, or even tell Amazon Alexa to "Activate Garage Door".

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Pressing All the Right Buttons
By Steve GJ6WRI Cont...

Pic C shows unit complete after installation, and also the single 13a socket with 2 USB 5v power outlets

The final part of this project, was to get confirmation that the door had in fact fully opened, or closed. I mentioned the "BUS" above, where manufacturer and third-parties vend kits to conform correct operation.

However, they normally require propriety additions that can make the upgrade quite expensive, and some even require a subscription to a monitoring service. My way of thinking is this. "Money is for two things, and two things only. Buying radio and electronics bits, with any remainder going on beer or cider" so definitely wasn't going to subscribe to a monitoring service!

So, the solution was to use a very cheap WIFI enabled pan & tilt video camera. This is the reason I fitted the 13 Amp socket with two USB sockets. A simple set up. 1) Plug in camera, and 2) connect to WiFi and app on my phone.

Now, I can control the door from home, or anywhere with internet access. You have to know when the door has been activated to know when to look at the camera obviously, and that is done by creating an "Event".

You may have heard of the acronym ITTT, If This Then That, so the "If This" is the door being activated, and the "Then That" is sending an door alert. Depending what App you use on your phone to open the door, it may by default send an audible tone to your phone, but the whole concept is knowing if the door is open or closed when you are not actually home, so in this case, it could send you an email, perhaps with a picture taken from the camera showing the door position.

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Pressing All the Right Buttons
By Steve GJ6WRI Cont...

Pic D shows the programming controls on the other end of the actuator housing to the relay location.

Depending what App you use on your phone to open the door, it may by default send an audible tone to your phone.

However, the whole concept is knowing if the door is open or closed when you are not actually home, so in this case, it could send you an email perhaps with a picture taken from the camera showing the door position.

You can then just open the Camera app and watch the live streaming video for 100% peace of mind. The camera I chose also has two-way audio, but more on that in another issue.

In 'Run" mode, the bottom led of the 7 - segment display is fully closed. The middle section is illuminated when the door is in transit, or has not reached the fully open/closed condition, and the top segment indicates the door is in the fully open position.

Some relay boards can have an analogue or digital input, and that could be used for confirmation of the door position. My Pan and Tilt Camera looks at these LEDs, so I can see its position.

From time to time we see adverts for the likes of "door bell cameras" that can let you see when the DHL man has arrived, but the cost of them is often well in excess of £100. In my book, that's probably in excess of 30 pints of beer, so I definitely wouldn't entertain that.

My costs were something like £8 for the relay, and £27 for the pan and tilt camera. Because it's a home improvement, it's probably tax deductible too, and the cost can come out of the Station Managers housekeeping money. Clever thinking or what!

I hope you have enjoyed this expression of my humour, and I hope to entertain you with my HF home automation, and the reason for Pan & Tilt camera selection soon.

73 Steve GJ6WRI

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Newsletter Articles Required.

Dear Members,

I think you will agree that we have had many excellent Article's in the Newsletter this year.

However to keep the club Newsletter alive, we are now in need of more copy from you.

The article can be a short piece, or a multi page one if you wish. I do hope you will be able to help.

My Contact details are as follows:

E mail: tonyfinch5@outlook.com

Tel 01444 254511 or 07519 374 575

Many Thanks

Tony G3XQM

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Home of the Mid Sussex Amateur Radio Society

All contributions of copy for the newsletter please contact:

Tony Finch Tel: 01444 254511

Mob: 07519 374 575

Details of club events etc go to:-

MSARS Web Site

General enquires about The Mid Sussex Amateur Radio Society Tel Sue 01273 845103

MSARS Web Site