GATEWAY

The Official Magazine of the Gippsland Gate Radio & Electronics Club Inc.

February 2017

The Arduino Group re-starts

Arduino Keyboard Controller

Digital privacy and its demise

All of House Sound Systems

And More

President's report - page 3

Contents.

Event Queue

February:

7th	Arduino night, 7pm – Note $4 hall contribution
17th	General Meeting & Talk by Peter Brennan VK3TE, on DMR

March:

3rd	Natter Night – club rooms
7th	Arduino night, 7pm – Note $4 hall contribution, **To be confirmed**
11th-12th	RSGB 80th Commonwealth Contest for 24 hours FROM 10.00 GMT
12th	Ham Radio On The Ferries
17th	General Meeting
18th-19th	John Moyle Memorial Field Day
21th	Arduino night, 7pm – Note $4 hall contribution, **To be confirmed**

PRESIDENTS REPORT JANUARY 2017
By Ian Jackson, VK3BUF

Welcome to the February edition of Gateway. I'm sure it has lots of good stuff in it, so read on. Last week I purchased a small TV for the dining area, which doubles as a monitor for security cameras. It was a Chines brand, 'Changchong'. It seems to work ok, but the audio quality is not great as they had tried to make the unit too thin and the speaker size has suffered. Good enough for watching some news. After a couple of days of operation, I decided to look at the operation manual. The first third of the booklet was taken up with bafflingly obvious do's and don'ts, like not feeding plastic bags to babies, cleaning the TV in the dishwasher or using the TV remote as a hammer. Finally I got to the good bit. How I should be connecting the unit to the outside world. I was confronted with this bit of advice: (exact reproduction)

> *According to the different function terminal type, the design becomes more single terminal or row terminal, you can easily find the back in television function after terminals. Please according to your actual type of correct operation!*

With quality advice like that, what could possibly go wrong? Even reproducing the text here made my grammar checker want to sit down and fan its face for a while. To me, it drives home the importance of documentation of any design or project. There are lots of approaches to this, but my favourite is to write the operating manual *before* the project begins. It seems like a backwards strategy, but it works really well, particularly if the project is for someone else to use. It gives the end-user the opportunity to say: "*Why does it do that*" or "*Why doesn't it do this?*" or even "*This feature here is completely useless for me.*" The process can save a lot of re-work if the design is not really what was wanted, but for me the real benefit is where the act of writing out its features and behaviour as a manual clarifies in my mind exactly what it is that I am about to make. Hence, the process is mostly for my own benefit, even if I must add to it or change things somewhat as the project progresses. If you are one of the participants in the Club's Arduino program, then give this strategy a try. The bonus is that a couple of years from now it will help you to remember how your project works.

This brings me to the next topic. **The 2017 Antennapalooza Field Weekend in Foster**. This will be the fourth event of its kind and probably the largest. On an elevated ridge overlooking Wilson Prom we will be setting up camp facilities and antennas for April 7,8,9 (Friday, Saturday Sunday) So prepare your tents and wax your baluns in anticipation.
During this past month. both the website: http://antennapalooza.org.au/ and the Facebook page: https://www.facebook.com/events/730873427076160/ has been established with some details about this event. This year's Antennapalooza has also been given good publicity newsletters of other Clubs, with a few visitors travelling from interstate to participate. The 2017 theme looks at SOTA (Summits On The Air) operations and the art of operating portable. Plus there will be guest speakers giving short lectures on themed topics.

Technology with beer and fire – what could possibly go wrong with a combination like that! There will be more to read about the Antennapalooza event in the March edition of Gateway.

Lastly, don't for get to roll up to the meeting This Friday Night to discover the art of Digital Mobile Radio. It's new. It's big and it's coming right for us. Now is the time to learn more about it.

See you at the meeting for another thrill-packed evening…

Cheers, Ian VK3BUF

Notice Board

FEBRUARY GUEST SPEAKER

On February 17, the General Meeting night of *next* month, we shall be visited by Peter Brennan VK3TE, who shall be talking to us about Digital Mobile Radio (DMR) technology for Amateur operations.

This shall be a rare opportunity to find out how this system will shape the future of mobile communications in this country

---

Arduino Nights

Hi guys,

I have selected some dates for the Arduino sessions up to the end of the financial year.
Although it would be hard to take suggestions and make changes for individual requirements, can I get a consensus from everyone if they are ok with the proposed dates.
Are there any glaring mistakes.
I have not included the Tuesday after Easter Monday for obvious reasons.

The next session would be

February 21; then
March 7
March 21
April 4
~~April 18 cancelled due to Easter~~
May 2
May 16
May 30
June 6
June 20

We need to firm these dates for the Guide Hall hire so I will be looking for any changes to be made by this Sunday evening at the latest so we can discuss it with the Guides.
Keep in mind that participants will need to pay $4 on each night to pay for the hall hire please so mark that in your diaries as well.

Regards
Albert VK3BQO

From The Editor

Boy has February come around quick, or rather the time to publish this magazine.

I had an idea for an Arduino project leading from the last one I did about the paper tape reader, so I put out a few feelers for possible old computers and keyboards to base this project on, unfortunately I basically ran out time before I had much success.

I have seen converted keyboards (Commodore 64's) available on the web that were a tad expensive, after all they are mostly of a novelty value rather than a must have that is going to be used on a daily basis. – So time for some more Arduino articles.

They did however mention one good idea, and that was to use one whilst running a PC emulator for that computer – about as close to the real thing as you could get, assuming the original computer is dead and unrepairable.

In a way I'm kind of kicking myself, all the oddball keyboards and computers I've had dealings with in my life, and now almost none. However one cannot keep everything, it's just a pity nobody has perfected the crystal ball, so you know what to chuck and what to keep.

My 'concept' for managing 'junk' is to manage it like I have a long shelf on which to store my unused trinkets. At one end is where I place my latest scores, pushing the previous ones along just enough to make room for the new arrival. At the other end is a skip, or bin, if an item has been languishing unused on that shelf for too long it eventually ends up at the far end and finally it gets pushed off the end into the bin by the new arrivals.

Then other article this month is a starter for a series about my journey's into sound systems, HiFi, PA (local church) and other oddball audio projects that have tickled my fancy over the last couple of years. – Like a TV speaker, No not a speaker for a TV, rather a speaker made out of an old TV set – i.e. rip out the picture tube and replace it with the largest driver that will fit. For an amplifier to go with it, how about the innards from an old 5.1 channel home theatre amp. Connect all their inputs together, then wind a custom transformer to combine all the outputs into a single 8 ohm drive. With 6 by 16W outputs, that's nearly 100W, not bad – if I can pull it off. The idea of combining many small amps to make a big one is common practice with high power RF amps, so why not try it on with audio? Nothing to lose, the worst that can happen is I end up making another smoke machine.

Another one is a valve amp, I have been interested in building a small one based on a 6V6GT valve – I think I have most of the ingredients, it's just finding the time to make a start.

It's got to be more successful than one I tried when I was very young. I tried making an amp with a 6CM5 pulled from an old B&W TV. I was monitoring the plate voltage and didn't think the valve was conducting, so I drove the grid harder and harder, till I heard a funny noise from the valve and then my bias pot went up in smoke. So I learned the hard way, lots of positive grid drive is a sure recipe for disaster. (My HT of 70V was not optimal either, it's just what I had)

So what do you think, yes it's not radio, however neither is Arduino.

I'm sure there are quite a few club members looking for material of a simpler nature than that of Arduino and the steep learning curve that comes from playing with code.

Any other idea's? – My inbox has been rather quiet of late – Feed it please.

Paul VK3TGX

Arduino Keyboard Controller

A while ago I chanced on a website selling Commodore 64 PC keyboards. Confused, "Commodore 64" & "PC Keyboard" in the same sentence? What it basically was is a gutted Commodore computer fitted with a custom circuit board allowing you to plug it into a modern computer as a keyboard. Recently, I heard about alternative firmware for the Arduino Nano's USB controller. The USB controller is not a dedicated IC as has been used in the past rather it is an Atmel Mega16u2 micro, it has 16K flash for program storage, & a USB controller. However it doesn't have as many timers, nor has it an A/D converter. Its whole purpose in life here is to act as a USB to serial interface for the main Arduino processor. However the 16U2 can be re-programmed using alternative firmware from the web. (as in you don't have to write anything here, it's all done for you) On the Uno board is two ICSP connectors, or In Circuit Serial Programming headers, one for the main ATmega328, the other for the 16U2 "USB interface". All you need is an Atmel ICSP programmer, fortunately there are quite a few of these doing the rounds in the GGREC as they were used in a previous "Learn to program" course run by Ian VK3BUF years ago. Failing that there is a technique to re-program the 16U2 via the Uno's own USB interface, not with the normal Arduino software, but by special software, again, easily downloadable. – See the Arduino website for instructions.

So what is the point to this, well you can reprogram the Uno so it appears to your computer as a keyboard, mouse, sound interface etc. etc. rather than the standard serial port they come programmed as. Meaning and data sent back to the computer via the USB interface will be treated as keystrokes etc. by you PC.

So all that has to be done now is to obtain an old "Commodore 64" etc., keyboard and connect it to the I/O ports on the Uno, next we need a 'sketch' to scan the keyboard matrix and send the keystrokes to the serial port. Most old computer keyboards are just a matrix of keys, However some like the one at the start of this article have an IC or two on them, usually just buffers, sometime a multiplexer – to save I/O lines on the main computer circuit board.

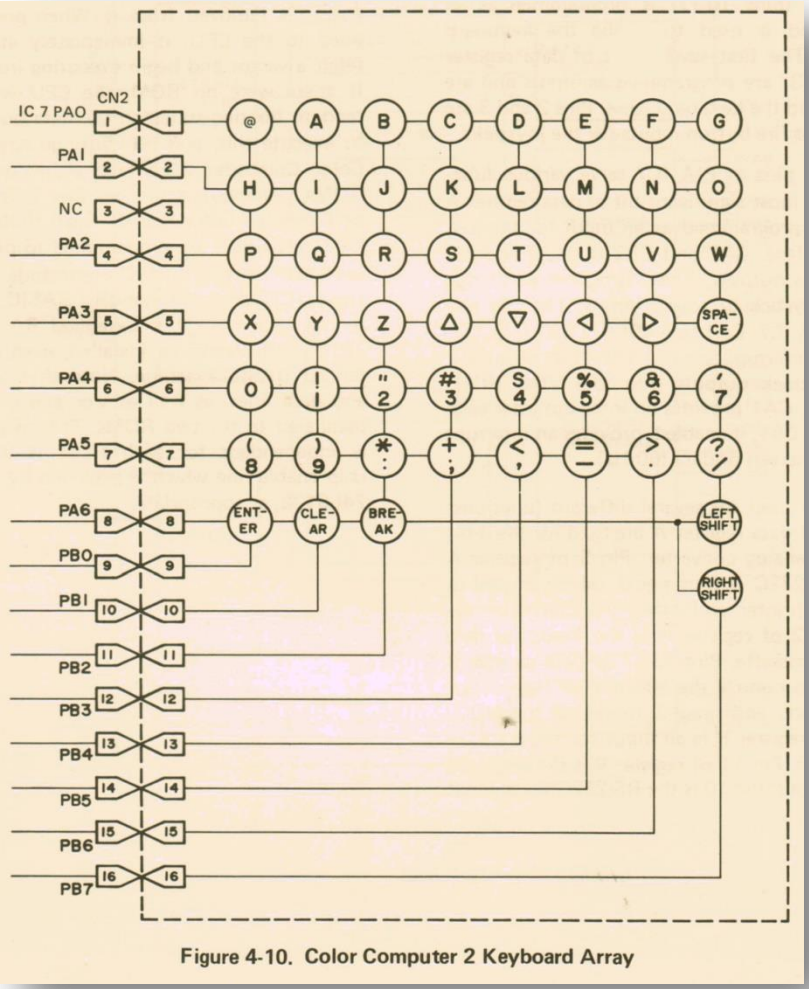


Figure 4-10. Color Computer 2 Keyboard Array

Here is the keyboard circuit from a Tandy colour computer.

If you compare it to an IBM PC keyboard you will see a few discrepancies, with the double character keys, as in the numeral & punctuation keys.

The IBM PC style keyboard does not send back the characters on the keys, rather it sends back a code to say which physical key is pressed down. For example, on the US layout most of us use, the code for the first letter key “Q” is exactly the same as the “A” key on a French keyboard, because they occupy the same physical location. It is up to the connected computer to translate them into their final ASCII characters.

I mentioned making a PC keyboard, but this is not the only option. However whatever you choose, you need to make a chart, or lookup table to translate the X-Y, or column and row results from our key-scan sketch to the format required by whatever you plan to connect this keyboard too. One ‘page’ for un-shifted, the other for shifted keys. If the keyboard has any extra ‘shift’ keys like Function and Control, then extra pages may be needed. On the ‘CoCo’ keyboard above, two will suffice for now.

Now having output as “IBM USB” is only one option, others to consider could be RS232 serial, RTTY, Morse – almost anything goes, but for a start I’m going to code for RS232, because firstly I have to get the keyscan & translation code working & fully debugged before I reprogram the 16U2 to “keyboard mode” – since once that is done I won’t be able to talk to the Uno with the Arduino IDE, until I re-flash the 16U2 back to the default USB<>serial.

There is another option to help out here, and that involves using a second USB<>serial converter. As I just said, after I reprogram the 16U2 to keyboard mode, I will lose connection to the Arduino IDE, continually reprogramming the 16U2 back and forth is both time consuming and potentially dangerous, because you run the risk of getting it wrong and trashing the 16U2, unlike the ATmega328, we cannot just change that chip for a fresh one, we have to scrap the Uno and buy a new one.

Standalone USB<>serial converters are readily available on the web, as some of the smaller Arduino boards come without a USB interface. Running two in parallel is no real problem, just don’t try and talk on both of them at the same time – i.e. unplug the on-board one during Arduino downloading, otherwise the download handshakes will end up as erroneous keystrokes to your PC (Actually a separate PC for each may make life easier.)

Paul VK3TGX

HERE'S LOOKING AT YOU KID…

Digital privacy and its demise, by Ian Jackson, VK3BUF

This month I wanted to examine the trend of suppression of choice and loss of privacy in our new digital age.

When I see choice being removed in the name of progress I become very concerned. Here is one example. On my PC I often look at pdf files for their technical content. That's fine. I had a basic Acrobat Reader that let me view pdf files. A couple of months ago, this was somehow replaced with something called Acrobat DC. I don't know why. It just showed up and I don't recollect being asked whether or not I wanted it. Suddenly my pdf file viewing was intruded by extra icons, prompts as to whether I want to '*share my pdf viewing experience with others*' or upload files to the '*Cloud'* and a variety of other features I didn't want being thrust upon me whenever I use my machine. Out of the corner of my eye, I kept seeing little messages every couple of days telling me that *Adobe Update* is now complete. Why is it doing that? Was it such a lousy product in the first place that it must regularly consume up my internet bandwidth to repair itself? Apparently, with standard settings, it is now reporting back to someone what pdf files I am viewing and with whom I share it with. Ok, so I think I will just go into preferences and turn the update feature off, but no, that option is gone! More research revealed that Adobe has now removed my ability to block automatic updates. The rationale is that they are *improving security and stability*, but it seemed to be doing an awful lot of it. Remote systems are diving into my PC several times a week to do unknown things and to download unknown data about my computing activities. So I thought *to hell with this* and uninstalled Adobe Acrobat entirely. Now I just view pdf files with a *Chrome* web browser, which seems adequate to my needs. Possibly there were a few fine features I have lost that could have been handy, but its the lack of choice in every facet of the Adobe approach that frustrated me. I since found that I was not on my own and lots of people hate this intrusive crapware. If you have time, take a look at the first page or so of this forum: https://forums.adobe.com/thread/1835765

Death of a PDF reader

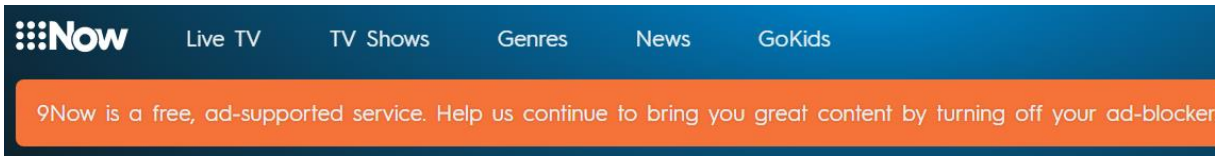
I have a Garmin GPS that works quite well in navigating the streets. It came with a 'Free Maps feature where by every few months I connect it to my PC and download the latest maps. A few weeks ago I read some of the fine print on this. Every time I update my map, the program automatically updates the Garmin company of everywhere I have driven, every destination I have selected and every waypoint I have created. It says it steals my personal information to '*improve my map usage experience'* but did not tell me it was doing it until I dug deep This is the default setting. Fortunately, it does still allow me to turn off this feature. At least I think so. Who can tell?

Garmin, Garmin on the wall…

Which brings me to the main point. Modern Information technology is the mirror image of censorship, in that we don't really know what is being taken from us. When we agree to simple actions, like entering into a free competition at a supermarket checkout, we are also agreeing to a whole lot of hidden stuff in perpetuity. Whenever we take look at modern systems, they quietly look back at us very hard, whether we like it or not. Whether we have something to hide is incidental to this argument. If a government mandated that we must all wear transparent clothing, there would be justifiable outrage, and yet we so easily sign or 'click' away our privacy on all sorts of things for unknown people to observe, because it comes bundled with other goods and services we may want to use.

Stop looking at me!

A contemporary example is ‘free-to-air TV’ and the ‘IVIEW’ systems that go with it. It was heavily marketed as catch-up TV, whereby if you miss a scheduled program, you have around two weeks to look it up on a web site and hit the play button. This free service bubbled away for a year or so, now they have moved to the next phase. Privacy invasion. For example Channel 9 offers a catch-up TV service, but first you must ‘Sign In’. By doing this you also agree to a whole lot of things that are not obvious. Lets examine some of the fine print…



First you are agreeing to turn off any pop-up Add Blocker software on your PC, so that advertising material will erupt all over your screen thereafter. Then you have just agreed to their *’privacy policy’* which has all sorts of intrusive actions that come with it.

Here are just some extracts from that policy:

> the type of personal information we collect and hold could include (but is not limited to) your name, address (postal and email), contact details, geographic location (including your suburb or post code), gender, date of birth, activity and transaction details relating to your use of our products and services and any preferences you tell us about. We may collect your personal information over the internet, over the phone, when you write to us, when you attend an event or program run by us or when you participate in a survey, questionnaire, competition or other marketing campaign run by us or our partners.

This means that you are giving explicit permission for them to compile and hold a secret file all about your movements and personal preferences.

They reserve the right to merge and cross-reference this information with other sources::

> We may access information, including personal information, about you across the Nine Entertainment Co. group of companies and from third-party sources and platforms (such as social networking sites, databases, online marketing companies, Microsoft Products, third party websites and ad targeting companies) and supplement the information we collect with information obtained from those third party sources.

This allows them to merge this data with other information found on Facebook and Google web browsing sessions and details of software you have purchased on-line.

By clicking on ‘***I Agree’*** you have just abandoned your rights to any listing on the ‘*Do Not Call’ register,* or laws that prohibit calling outside of business hours.. They can send spam marketing emails, SMS messages or try to sell things to you by phone. They can do this at any time of the day or night, forever, because you just gave them unlimited permission for this to happen.

> We may use or disclose your personal information for the following primary purposes:
>
> - providing you with news and information about our products and services (including newsletters, product surveys and special offers);
> - sending marketing and promotional material about our products and/or services that we believe you may be interested in;
> - providing to entities whom we have a shareholding in;
> - communicating with you, including by email, mail or telephone.

You are agreeing to let them do intrusive things to your PC. You are giving them permission to place monitoring malware in your computer to let them know what you are doing on the internet, including what movies you are watching and what news articles you read.

> Our websites may also contain electronic images known as "web beacons" - sometimes called single-pixel gifs - that may be used to assist in delivering cookies on our sites and allow us to count users who have visited those pages and to deliver co-branded services. We may use web beacons to determine whether messages have been opened and acted upon, or from third parties in order to help us compile aggregated statistics regarding the effectiveness of our promotional campaigns or other operations.

Remember, this is not a home loan contract or a job application, this is just the by-product of you wanting to watch a TV program you just missed on a TV broadcast from the night before.

Do you *still* want to watch that program?

SBS have recently gone the same way. They enlisted the help of '*living legend'* Lee Lin Chin to soften the blow, but the SBS policies are very similar to the Chanel 9 ones above.
Check out: http://www.sbs.com.au/ondemand/why-login and play the short video. It made me laugh a lot, but reassured me not at all!

Of course the most intrusive technology of all is the modern mobile phone. We could spend pages outlining what privacy you give away when you first activate your phone. It is quite extensive. Last year ABC journalist Will Ockenden legally obtained six months worth of 'Metadata' from his mobile service. This is information automatically logged and accessible to government instrumentalities as you go about your daily routines. Phone companies are now obliged to store this info for two years. He put this information up on an ABC web site and invited the public to try and analyse his lifestyle from the data. Over 300 people analysed this information and were able to work out an extraordinary amount about his life.
You can read more about this experiment on:
http://www.abc.net.au/news/2015-08-16/metadata-retention-privacy-phone-will-ockenden/6694152

A popular accessory available for people to monitor their health are the wrist mounted devices that count steps and movements to see how active you are. It sounds like a good idea, but when you use one of these devices you also agree to allow remote organisations to use copies of that information for undefined purposes. These are systems such as Fitbit, Charge HR, Garmin and Mio Fuse.


Activity Tracking device

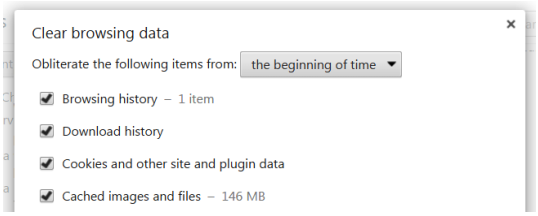
The Norwegian Consumer Council took a close look at these devices and compared the agreements with the national privacy laws and found that the information taken by these companies from users of the products were quite onerous. They claimed:

- None of the companies will give users proper notice about changes in their terms
- All of the wristbands collect more data than what is necessary to provide the service
- None of the companies fully explain who they may share user data with
- None of the companies state how long they will retain user data

This data could be used by health insurance companies to deny new policies to people, or as a mechanism to deny future claims because the data may be construed as revealing a pre-existing health condition.
The web site browser history feature within most internet access programs sounds like a great idea. If you visited a site yesterday or last week, you can examine where you have been and find that elusive site a second time. With normal settings in place it gathers a lot more information than would be conceivably useful to us alone. It just sits there collecting details of the things you have seen and read, getting longer and longer. Within Google Chrome on my own PC I found that it had recorded details of over four thousand web sites visited

over a couple of years. Certainly I have no practical use for all of that information, but lots of companies would love to get their hands on it. It would show which bank I use and how often I visit it, where I get my daily news from, reveal the things that I may be researching to buy or service. It would show whether I had young children or not by the entertainments and TV programs I may have examined.

There would be few reasons for retaining more than say ten days of such data, but within Chrome it stays there forever, getting bigger and bigger unless I deliberately choose to delete it. Why? It's not for MY benefit. When you click on 'I agree' with an on-line vendor, how would you know if in the fine print, you had just given permission for remote parties to mine that data?



Is it <u>really</u> erasing your personal data?

While Google Chrome allows you to delete that data from a menu, it starts growing again. You can't stop it doing that unless you locate the log file and change it to 'Read-only'. But does it *really* delete your browser history if you ask it to, or just flag it as invisible? For the exercise, I checked the file size of the log history of 4000+ web site visits. It was a little over three gigabytes. Then I asked Google Chrome to delete the log history and it showed zero records on the list, but the log *file size* did not change. To me, that sounds an awful lot like the records are still there, but hidden.

The last topic I wanted to relate to is car technology. Modern cars have lots of computers in them, which is mostly fine, because they do a lot of useful things. However, now they are recording a lot about our driving behaviour. There are the obvious items, like speed, our mobile phone usage, our travel and parking habits via GPS. However, there is a lot more being developed. Our braking habits, both normal and ABS events. Automatic data logging of all events just before collisions, including passenger audio recordings. Our rates of acceleration and evasive manoeuvres at speed. Time & date stamps for all headlight, wiper and seatbelt usage. GPS cross-reference with stop signs, to record if we stopped, or just slowed down at intersections. Seat occupancy and seat position profiles to identify drivers. There are no guarantees that this information will ever be private, or if we will own it. It is likely to become 'an offence' if a driver were to try to interfere or delete any of this information within their own car. This information would be wirelessly collected from your vehicle and retained by car manufacturers and government instrumentalities. Police would be able to analyse this data and issue automatic fines for a wide range of recorded events. Perhaps the seatbelt in the back was not engaged while the vehicle was in motion and a person's weight was detected. (even though you were just taking a slab of beer home) Perhaps you only stopped for 2 instead of the obligatory 5 seconds at a stop sign somewhere. Maybe you just failed to turn your headlights on soon enough after leaving a well-lit petrol station at night, or parked for 2 hours and 2 minutes in a 2 hour max carpark. The scope for automatic revenue-raising under the guise of 'safety' is immense. As we have seen from radar and number plate recognition systems, if it becomes technically possible, then very quickly, laws will be devised to make such things mandatory.


Perfect for the large family,
But what is it recording?…

I like technology. I have spent a working life using it, developing it and making a living from it, but it is a tool and like most tools it can be abused. A hammer is just as good for breaking windows as it can drive nails into wood. When I see some new software and hardware that was designed to do much more than the consumer could reasonably expect to use, I become suspicious. When it comes with a contractual arrangement that exceed the scope of its basic function, I become doubly suspicious. When we choose a product, we should also reserve the right to 'not choose' the scary stuff that comes with it.

All of House Sound Systems

For quite a while I've been interested in extending my stereo throughout the house, the backyard, and my radio shack, that is literally a shack. (ex granny flat)

Sometimes you just want to sit down and relax with some music, however other times there is too much to be done, so being able to listen as I move around doing things sounded very desirable. You can be busy and when the net starts, you'll hear it no matter where you are.

There are a number of ways to go doing this, both wirelessly and wired. Probably the most known wireless system is Sonos, they make some really nice wireless speakers that can be controlled by your computer etc. The point I see them falling over is when you want to send them a signal out of an analogue source – i.e. play a real record, a tape, or route the sound from your TV through them. Yes they have a box to do that, but the last time I looked it was $1500! Get real! If your sound is on a hard drive (actually a really good idea) or from the internet, no problem, but if you want to extend the Melbourne cup from your TV, or the GGREC club net etc. throughout your house, you're in for some pain.

Other competing digital wireless solutions are Apple's AirPlay/AirTunes, or Google's chromecast, almost the same thing, great for 'their' content , not so for a signal coming out of an RCA audio cable. Also forget Bluetooth, it only travels a couple of meters, to one device.

How about analogue wireless, i.e. set up a small FM audio transmitter, and place several radio's around the house to pick it up? Small FM transmitters are in plentiful supply, often marketed as a way to link sound into your car's audio system. Problem is they don't put out a very strong signal, and boosting it is rather illegal, something like 10uW is all your allowed, now that's not going to cover more than the proverbial dog box – Not that you'd probably want your neighbours to pick it up anyway. Use 2meters etc. you say, well then forget music & TV etc.

As a more general problem with all wireless devices, all the remote speakers have to be powered, i.e. more phantom power loads, or you have to run around turning them all on every time you get the urge to use the system.

Now for the wired solutions. You could run a line level audio cable around the house, and have powered speakers in every room, or have one big amplifier running non-powered speakers in every room. With the powered speaker scenario, if you look at the catalogues from the various electronics suppliers, you would soon be disheartened (and broke) However used computer speaker systems are readily available and cheap. Also a lot of portable sound system's on offer these days have audio inputs, intended for connecting a mobile phone etc. (even my bedside clock radio has one) Now if you want better sound, i.e. HiFi, don't forget the flea markets, there are plenty of old sound systems (amps & speakers) out there for almost give away prices. At our last hamfest there were a few blokes desperate to give away equipment at the end of the day, rather than having to fess up to the wife that they hadn't moved it. The only downside of stereo amp's is they are usually grounded, so hum loops are a possibility – easily fixed with isolators from jaycar etc. or DIY with some audio coupling/isolation transformers.

Now for the central amplifier approach, most stereo amps cannot drive a load lower than 4 ohms, which usually means two speakers per channel. If however you are happy with mono sound, then you can mix the normal stereo

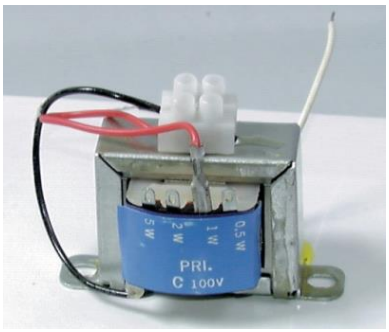
Roadside special, $Free

Home theatre amps usually have plenty of connection options

audio signal down to mono, feed it into both channels and have sound in four rooms. If you can scavenge a home theatre surround sound amp (junk market, curb side hard rubbish giveaways etc.) they usually have 6, or 8 outputs, if combined into mono, 8 rooms!. And it gets better; the subwoofer channel is usually higher powered meaning you can squeeze two speakers on there, 9 rooms! Unfortunately the Marantz unit above only had 5 channels. It used a powered sub.

One big drawback with home theatre amp's is the sound quality, they are targeted at movie sound tracks with lots of special effects, not symphony orchestra's. The smaller ones typically have a bunch of IC amp chips, more at home in a car stereo, with two in bridge mode for the subwoofer (hence my comment about two speakers on that channel). The other main drawback is running the speaker cables back to a (hopefully) central location. If you can drop them all into a central hallway cupboard etc. and have the amp there, good, but if you want them to all come out of a wall plate behind your entertainment cabinet in the lounge room, a headache.

Now if you want to use one good quality central amp (one of the new Silicon chip 200W amp kits etc.) then you have to solve the 4 ohm impedance problem. The quick-n-easy way is to series/parallel connect the speakers. Two 8 ohm speakers in series is 16 ohms, now connect four of these pares in parallel to give you 4 ohms, 8 speakers, not bad, so long as they are all the same. Other combinations are of course possible, like 6 parallel strings of 3 series speakers, 18 in total. The problem is when you need an odd number of speakers, you can easily drop a whole series string from the above configuration, but dropping one driver from a series string is a real problem – probably the easiest fix is to replace the missing driver with a high power 8 ohm resistor. Another problem is the speaker configuration is easily visualised on paper, but extremely easily to bugger up in the ceiling, or if an under floor solution with floor standing speakers is your goal, forget this setup. Remember what happens with Christmas tree lights, lose one and heaps stop. If one speaker is unplugged for whatever reason, other rooms will die.

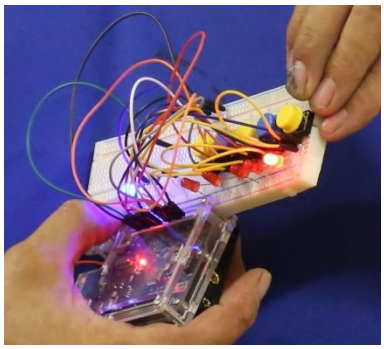


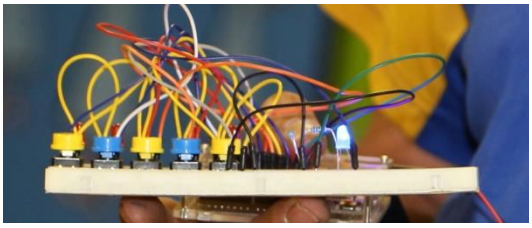
This leads us to the last solution, the one used by the pro's, the 100V system. In this the output from your amp feeds a transformer that steps the output up to 100V, this then feeds a single speaker cable that runs to all the speakers (wired in parallel). On each speaker is another smaller transformer that takes off a set amount of power for that speaker (Not all have to be the same) A typical transformer has taps for 0.5W, 1W, 2W, & 5W, bigger transformers giving higher power options. One then adds all the speaker power's together (not the drivers spec, but what power tap's you've chosen) and if that is less than your amp all is ok. If not, then select lower speaker taps too lessen the load.

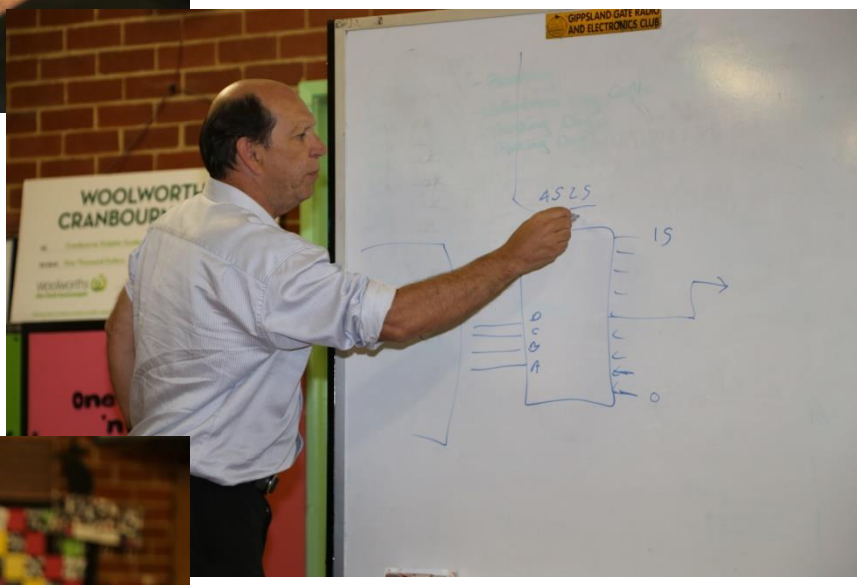
The beauty of this setup is individual speakers can be unplugged, or have their power taps changed (add a fader for finer control) without effecting other rooms, And as this is now a high impedance setup, very long light figure 8 flex runs can be used (Like to a backyard 'shack') without the losses seen in an 8/4 ohm system using long speaker leads.

Paul VK3TGX

The Arduino Group is back for 2017







General Meeting Minutes

Date : 20th January 2017
Start time : 20:00
Location : Club rooms.
Chairperson : Ian Jackson 3BUF
Minute Taker : Michael 3GHM

Present : As per attendance sheet

Visitors: Chet Cline

Apologies : As per attendance sheet.

New Callsigns : Robbie VK3FAMT

Correspondence received : listed and tabled

Correspondence sent : listed and tabled

Treasurer's report : As read and tabled
Read & Moved : Graeme 3bxg **Seconded :** Leigh 3FACB **Carried :** Yes

Previous Minutes : As per Gateway magazine
Moved : Michael 3GHM **Seconded :** Bruno 3BFT **Carried :** Yes

Business arising from the previous minutes :

- Thanks to Graeme for use of his property for the Christmas get together. Appreciation shown by clapping.
- Arduino session on the 7th February $4 each at the guide hall. Bring your projects to show and discuss and work on.

New business :

- Antennapalooza weekend. Date to be held on the 8-9th April at Foster. Antennapalooza.org.au has been registered to the GGREC for approx.. $20 for two years.
- Hamfest on July 22nd at the Cranbourne Hall. Confirmation is yet to be received from the hall committee. Volunteer/s required to coordinate the event. Please contact the committee if you are interested.
- Repeater has issues. They are Motorola Syntrx radios and are getting old. Discussions happening about what we do with this. Albert will do a report as to the options to either repair or replace and approximate costings. Incorporating DMR options. Currently there is a fault in the TX section. The 6m repeater is also off the air. Discussion is also happening regarding Mt Worth.
- Australia Day BBQ Thursday 26th from 11:00. Sausages, bread etc supplied. Bruno will have a look at the back yard and mow it before the BBQ.
- GGREC 40th Anniversary Spit roast partially subsidised on June 17. More info to follow.
- Working Bee on April 22nd around the shack.
- Aviation museum visit at Moorabin general consensus to procede with a weekend visit.
- Old white board disposal with a mini auction if anyone is interested. Sold to 3BRS for $15.
- Foundation and upgrade weekend on the 11-12th Feb 3BXG
- Casual radio chat every morning 10am 145.40MHz Bruno 3BFT
- February talk on DMR by Peter Brennan VK3TE

Meeting closed : 20:33

Next Committee Meeting : 1st Tuesday of the month
Next Prac Night : 1st Friday of the month
Next General Meeting : 3rd Friday of the month

Club Information

Meetings 2000hrs on third Friday of the month at the
Cranbourne Guide Grant Street Cranbourne
Prac nights first Friday in the Peter Pavey Clubrooms Cranbourne 1930hrs
Visitors are always welcome to attend

Office bearers

President	Ian Jackson	VK3BUF	Repeater Officer	Albert Hubbard	VK3BQO
Admin Sec	Michael Van DenAcker	VK3GHM	Web Master	Mark Clohesy	VK3PKT
Treasurer	Graeme Brown	VK3BXG	Magazine Editor	Paul Stubbs	VK3TGX
General 1	Rob Streater	VK3BRS	Property Officer	Bruno Tonizzo	VK3BFT
General 2	Max Hill	VK3TMK	Secretary	Ian Jackson	VK3BUF

Call in Frequencies, Beacons and Repeaters

The Club Station VK3BJA operates from the Cranbourne Clubrooms.
6m Repeater VK3RDD – Currently de-commissioned until further notice - *sorry*
70cm Repeater Cranbourne VK3RLP In 434.475MHz Out 439.475MHz CTCSS 91.5Hz
VK3RLP Repeater supports Remote Internet access (IRLP), Node 6794.
70cm Repeater Drouin VK3RWD In 433.575MHz Out 438.575Mhz CTCSS 91.5Hz
Simplex VHF - 145.450MHz FM • Simplex UHF - 438.850MHz FM
VK3RLP Beacons 1296.532MHz & 2403.532MHz

Membership Fee Schedule

Pension Member rate $25.00 Extra Family Member $20.00
Standard Member rate $40.00 Junior Member rate$25.00
Fees can be paid by EFT to BSB 633000 - Account 146016746.
• Always identify your EFT payments.
• Membership Fee's Are Due at each April Annual General Meeting.

Magazine Articles to editor@ggrec.org.au or vk3tgx@gmail.com Cut off, 10th
All other Club correspondence to: secretary@ggrec.org.au
or via Snail Mail : GGREC, C/O Ian Jackson, 408 Old Sale Rd, Drouin West 3818
GGREC Web Site & Archive may be viewed at: www.ggrec.org.au
Website errors, contact web master via email webmaster@ggrec.org.au
Facebook Page www.facebook.com/GippslandGate