> PC Update

April 2023

President’s Report April 2023

Hugh Macdonald, President

Dear members,

It’s somewhat crazy to believe that we’re already a quarter of the way through the year. I hope the month of April has been good for all of you.

Thanks Peter Bacon

Peter Bacon was our MC since 2018. He started when we still holding in person only meetings, transitioned with us to first Zoom only meetings when Covid hit in 2020, and then into the first lot of hybrid meetings in 2021, then back to Zoom only meetings, then back into hybrid meetings this year. Always cheerfully, and always with excellent preparation. Peter recently decided to step away from the role and I’d like to thank him for the service he provided to the club. Thanks Peter.

Monthly meetings coming up

Our meeting organisers David Stonier-Gibson and Kirsten Greed are doing a great job this year and booking many interesting speakers. We’ve still got many more coming up in the next few months. Just remember that you can either join in via Zoom or in person now. As I said last month in the monthly meeting, it’s a great night out. So if you haven’t been along for a while, I’d encourage you to do so.

Supporting SIGs

SIGs are a great way to meet fellow members and learn new things at the same time. Every SIG is open to every member in the club. So if some kind of new computer issue is interesting you or troubling you, have a look for a SIG on the topic. There are plenty that run each month and are listed on our website for you to find. You never know, you might get your issue solved and make some new friends as well.

Have a good month everyone and I hope to see you at the monthly meeting.

Our next Monthly Meeting is on Wednesday 3rd May 2023

This will be run as a *"hybrid"* meeting, meaning we will be in person in the Borrett Room at the club but also opening it up to members via Zoom. ***Click here a little before 7pm to join the meeting on Zoom*** or **make sure you have secured your raffle tickets at the door and are seated before 7pm**.

Our MC, Simon Rice, *will* start at 7pm *sharp*.

Online registration details can also be found in our ***Events Calendar*** before the meeting date.

Agenda

Topic: The Digital Technologies Hub – helping schools to implement the Digital Technologies curriculum

Presenters: Leanne Robertson is the Program Director for various projects in the STEM (science, technology, engineering and mathematics) education space, including the Digital Technologies Hub. Leanne has managed the development and ongoing work for numerous education resources funded by the Australian Government including maths interactives, the Girls in STEM Toolkit, drones safety resources and the recently published Mathematics Hub.

Martin Richards is the Content Manager of the Digital Technologies Hub and other STEM projects, an Australian portal and repository of teaching and learning resources for the Digital Technologies learning area. Martin has led the development of the ESA-developed supporting resources that feature in the DT Hub.

Both Leanne and Martin started their careers as primary school teachers.

And then … 

We are going to have an extended interval with drinks and nibbles and an opportunity to have a bit of a chat and generally socialise. We will provide light nibbles, tea, coffee and soft drinks. Feel free to BYO beer or vino.

… And then …

- **Hugh Macdonald**, will deliver his President's report
- We will then get a report from **iHelp**, courtesy of: **Bert Alesich.**
- To wind up we'll have as long as you like to chat over Zoom. Please feel free to hang around; the socialising is good medicine in these stressful times.

… and last but not least …

The restaurant has been arranged for WAFFLE, a relaxed social get together at nearby Fong's Chinese restaurant. Details and maps will be available on the night.
https://www.melbpc.org.au/sigs/waffle-sig-wine-fine-food-lovers-event/


The meeting will recorded and subsequently published publicly.

See you at (or a bit before!!!) 7pm. ***Via Zoom*** or ***in person***.

If you would like to submit questions for any of our speakers, you need to do so on the Zoom Chat panel.. *All you need to do is join the 'Monthly meeting live' group and post there.*

East SIG Report – March 2023

After welcoming members to the March meeting of East SIG, host Frank Maher outlined the nights agenda below:

Presentation 1: **Q&A** with George Skarbek
Presentation 2: **Latest SCAMs to be aware of** by Dave Botherway
Presentation 3: **Recover Deleted Files Using RECUVA** by Trevor Hudson
Main presentation: **Elgator Stream Deck Mk.2** by John Hall

Q&A by George Skarbek.

Question 1: I keep getting a message that I'm not signed on to Microsoft OneDrive. As I don't want to use OneDrive, how do I stop this message appearing? Is there a reason I should be signed on to OneDrive?

Answer 1: If you haven't been using OneDrive there's absolutely no reason at all to be signed on. The best way to get rid of that message is to prevent OneDrive from starting when you turn on your computer. To do this you need to go to Task manager to disable OneDrive. Right click on the taskbar and select Task Manager or alternatively press Control + Shift + Enter to display Task Manager. Select the Startup tab and you will see all the items that start when you turn on your computer. From the list of Startup items, find "MicroSoft OneDrive" and you will see that it is displaying "Enabled". Right click on "Enabled" and Select "Disabled" in the popup that appears. (see Figure 1)

It's worth going through the list of Startup items to see what programs start when you boot your computer. These programs slow down the boot up, but more importantly sit in memory all the time and can slow down your computer. Any of the programs listed that you don't need, right click on them and select "Disable". If you don't recognise a program, just disable it and if you find it's necessary you can restart it later.

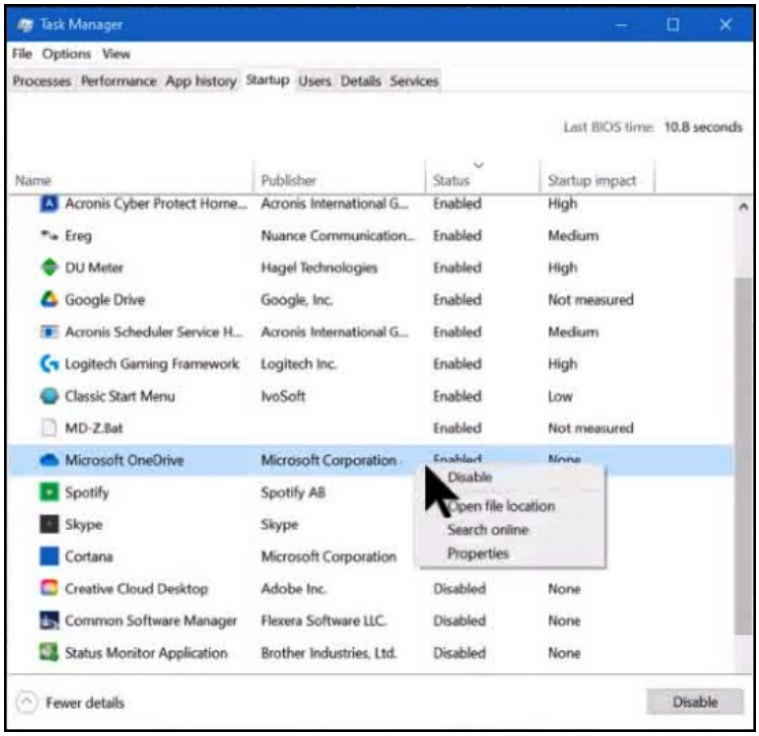


Figure 1 – Task Manager, displaying the Startup tab

Latest Scams to be aware of by Dave Botherway

Fake Gift Card Offer

The fake gift card scam has been around for a while, but according to the Scam Watch website is seeing a resurgence. Dave outlined how the scam works as follows:

1. You receive an email or text message out of the blue, or come across a social media post, claiming that you have been selected to receive or have the chance to win a gift card from a well-known company.
2. The email, message or post appears legitimate, using brand names and official logos to convince you it's the real deal.
3. You might be asked to complete a survey or pass on an offer to others before you can claim the gift card or voucher. This makes the offer seem more genuine.
4. Upon completing the survey, forwarding, or accepting the offer, you will generally be directed to a well-constructed webpage. On this webpage you will be prompted to provide personal information such as your phone number, address, and bank account details.
5. After handing over your personal information, you may receive a fake gift voucher or alternatively, receive nothing at all. You may also begin to receive unsolicited emails and phone calls requesting more information. This information then enables the scammer to commit identity theft and other fraud.

Modified Gift Card Scam

Scam Watch as warned that the modified gift card scam is a looming problem. Dave is unsure how this scam works as most cards have a pin number that is revealed when the covering is scratched off.

1. Scammers buys (or steals) a low value gift card from a store.
2. The scammers then copies the barcode from their low value card onto stickers which they place onto other cards in store.
3. When a customer adds money to the stores card, that activates the scammers card instead, with the money going onto the scammer's card.
4. When the customer tries to use the gift card, by scratching off the withdrawal code, the code is incorrect, and the card is declined.
5. Eventually the customer realises a sticker is covering the original barcode.
6. The money has gone and is untraceable.

Figure 2 – Common Australian Gift Cards

Australia Post Mastercard Scam

The Mastercard scam was reported on the television program "A Current Affair" as follows. A Mastercard was purchased from an Australia Post outlet, where $200 was added to the card and given as a gift. When the card was used to pay for items, it was found to have already been used. The card came inside a sealed packet, with the numbers on the front of the card and the CCV on the back all hidden. The personalised pin number must be scratched off before it is revealed, so Dave is uncertain how this scam occurred.

Several similar instances with Australia Post Mastercard's were highlighted in the TV program. Dave noted that neither Australia Post or Mastercard seem to be too interested in solving this scam.

Possible explanations for this scam are:

- There are people online who are hacking the cards, due to a poorly controlled security system.
- The cards are compromised before they're given to the customers, which appears to be the case with many of the complaints, according to the "A Current Affair" report.

Recover Deleted Files Using Recuva by Trevor Hudson

In this presentation Trevor Hudson played a video he'd uploaded to YouTube describing how to recover deleted files using the free version of "Recuva". The video commences by visiting the www.ccleaner.com website where "Recuva" can be downloaded. From then you're shown how to install and run Recuva.

To demonstrate the program in action, Trevor deletes 4 different file types, an image, video, audio and Word document from a USB thumb drive. The video confirms that the deleted files do not appear in the Recycle Bin or target USB drive, before he displays all steps necessary using Recuva to recover the deleted files, on the target USB drive. The recovered files are then played or displayed to prove recovery was successful.

Figure 3 – Trevor's YouTube thumbnail for Recuva

When recovering deleted files, Recuva gives users the option to search and recover all file types, or only pictures, sounds, documents or videos files. This feature speeds up recovery and is a particularly useful option when searching a large drive for deleted files. Because Trevor deleted 4 different file types in his video, he used the "All files" option in Recuva to recover the four file types that were deleted.

Trevor's video can be viewed on YouTube at https://tinyurl.com/4v96yspa

Elgato Stream Deck Mk.2 by John Hall

The meetings main presentation was by John Hall on the Elgato Stream Deck. At the time of his presentation John had only had this device for a few weeks, but can already see how it will increase his productivity for everyday computer use. At the time of writing, Centre Com are selling the Stream Deck Mk.2 for $239.

The Stream Deck Mk.2 is a small programmable pad with 15 LCD buttons that can be programmed to control your computer and favourite apps. As the name implies, it was originally developed for online streaming and for gamers, but can be used as an efficient tool to launch apps and more, as John later demonstrated.-

Each button on the Stream Deck can be programmed to perform any task or action you want, all with a single tap. It works with almost all programs, such as Word, Excel, PowerPoint, Outlook, VLC, Photoshop, Zoom, etc., some of which John later demonstrated. The appearance of the buttons on the Elgato can be changed with different faceplates, names and icons.

Figure 4 – Elgato Stream Deck Mk.2

The Elgato Stream Deck Mk.2 connects to a PC via a detachable USB-C cable. For maximum convenience it would be located within easy reach besides your computer like your mouse. Each of the 15 keys can be programmed to correspond to a single action or a sequence of actions. It's also possible to create folders and subfolders to access even more options, again with a simple tap of the icon. There is a cheaper mini version with 6 keys, and an XL version with 32 keys. However, John felt the 15 key Mk.2 was a good choice given its potential, so was the model he purchased.

After the above overview of the Elgato Stream Deck Mk.2, John played a YouTube video titled "You need a stream deck! The secret to my productivity working from home". This video at https://tinyurl.com/3phbkd92 outlined how the Elgato can be used as a productivity tool.

John followed the first video with a second that explained "How To Setup Streamdeck With Zoom" at https://tinyurl.com/2bdecahj. Although this video relates specifically to Zoom, it demonstrates how to program the LED keys with Zoom shortcuts.

After playing the above videos, John displayed the Home screen of his Stream Deck. (Figure 5). The top row of icons were programmed for applications he regularly uses, such as Zoom, Google Apps, YouTube and VLC Media Player. Selecting one of these icons changes the screen to display actions for that application.

The lower rows are utility keys John regularly uses, such as Cut, Copy, Paste, Explorer etc.

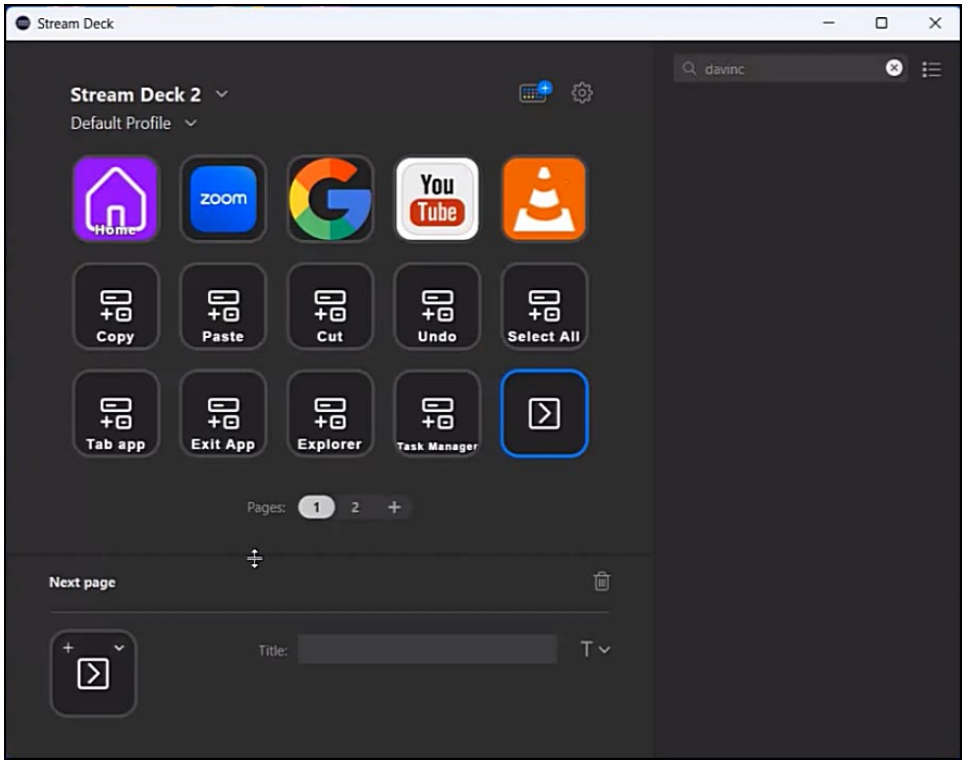


Figure 5 – John's Elgator Home Profile screen

One reason for his purchase of the Stream Deck was for hosting Zoom meetings to make Zoom easier and more convenient to use. To demonstrate this, John selected the Zoom icon (Figure 5) on the home screen, which then opened the Zoom folder shown in Figure 6. This is where Zoom shortcuts have been added. John then showed how to add Shortcuts to a button, then add title text or an icon to the button. Some of the shortcuts assigned to the Zoom folder include Mute, Speaker view, Gallery view, Chat, Users, Share screen, Search and some others.

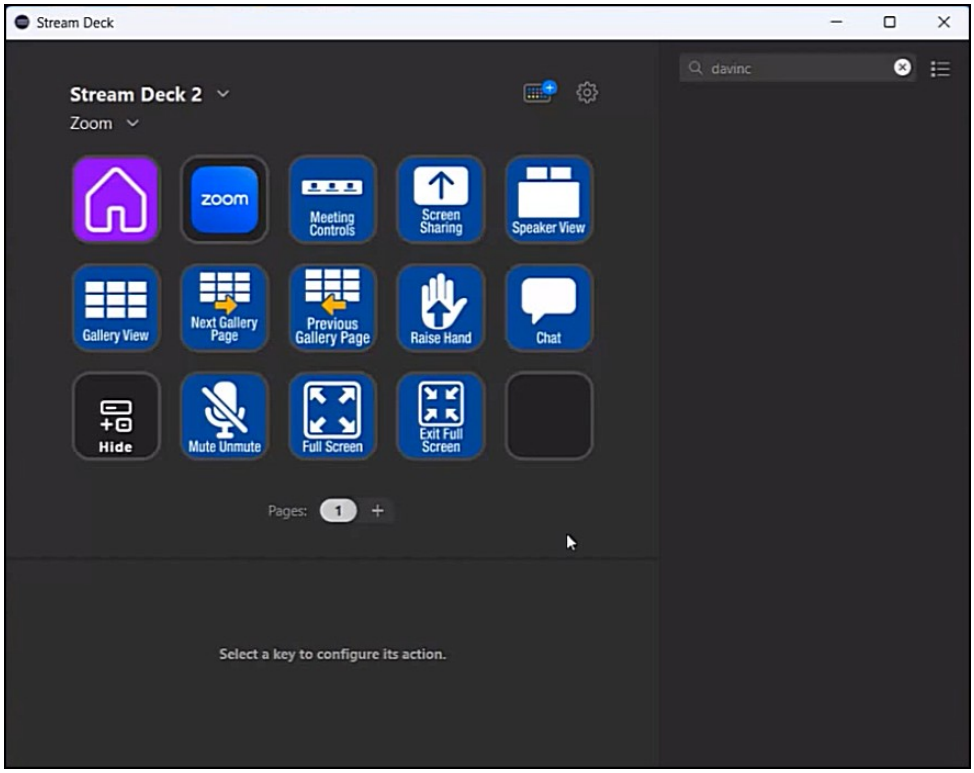


Figure 6 - John's Zoom Profile folder

Installation

When first connecting the Stream Deck to your computer, a Welcome icon appears in the centre of the Stream Deck's high-resolution LCD touch screen. Selecting this icon installs the Stream Deck app on your computer. From there you can program the keys and assign shortcuts, macros, commands, and other actions to each button from your PC. This is done by dragging and dropping the actions you want to assign to each key. From here you can easily switch between different profiles for different applications.

You can also use images of your own choosing from the built-in library of icons, create them yourself using the key creator, or pick from hundreds of user-submitted icons that others have added to the free icon shop. Figure 7 shows the icons John has chosen for his VLC media player folder.

To customise the Screen deck further, free Plug-ins are available from Elgato. Plug-ins are additional features that you can install on your Elgato Stream Deck to enhance the applications added to the Home screen. When selecting and opening the plug-in for VLC media player for example, all the shortcuts associated with VLC appear. To add these shortcuts to the Stream Deck, it's just a matter of dragging and dropping them onto the Window shown in Figure 7.

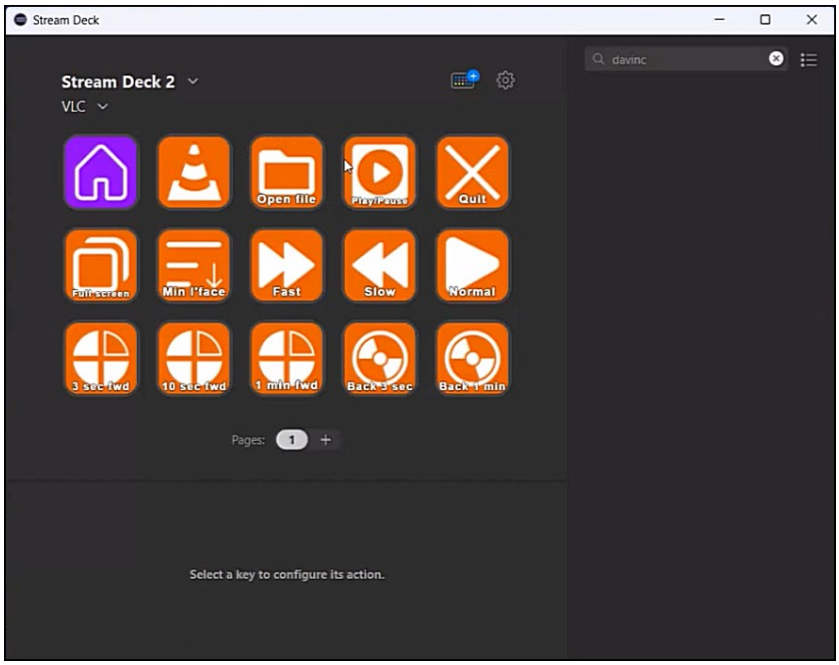


Figure 7 - John's VLC Profile folder

In a final demonstration, John selected the VLC icon on his home screen to display the VLC folder shown in Figure 7. The shortcuts John's added are from the VLC plug-in, but can also be found at https://www.makeuseof.com/vlc-media-player-windows-shortcuts/

For anyone contemplating buying an Elgato Stream Deck, John recommended they watch the YouTube video titled "Elgato Screen Deck Complete Setup Tutorial" found at https://tinyurl.com/m5bmy3wf. This is a long video at 1 ½ hours, but well worth watching to appreciate the benefits of the Stream Deck according to John.

To conclude, John noted that he has already seen efficiency gains in his daily computer use and plans to purchase a Stream Deck for use at Melbourne PC's hybrid Zoom meetings run from Wadham House. Following his presentation, John answered questions from the audience and general discussion on other computer related topics followed.

Neil Muller

YouTube Links

Recover deleted files using Recuva
https://www.youtube.com/watch?v=3P-mbkf2w8E
https://tinyurl.com/4v96yspa

You need a stream deck! The secret to my productivity working from home
https://www.youtube.com/watch?v=nrWRzYYC1rE
https://tinyurl.com/3phbkd92

How To Setup Streamdeck With Zoom
https://www.youtube.com/watch?v=kYEseJXRiX8.
https://tinyurl.com/2bdecahj

Elgato Screen Deck Complete Setup Tutorial
https://www.youtube.com/watch?v=JCxigOXltEM.
https://tinyurl.com/m5bmy3wf

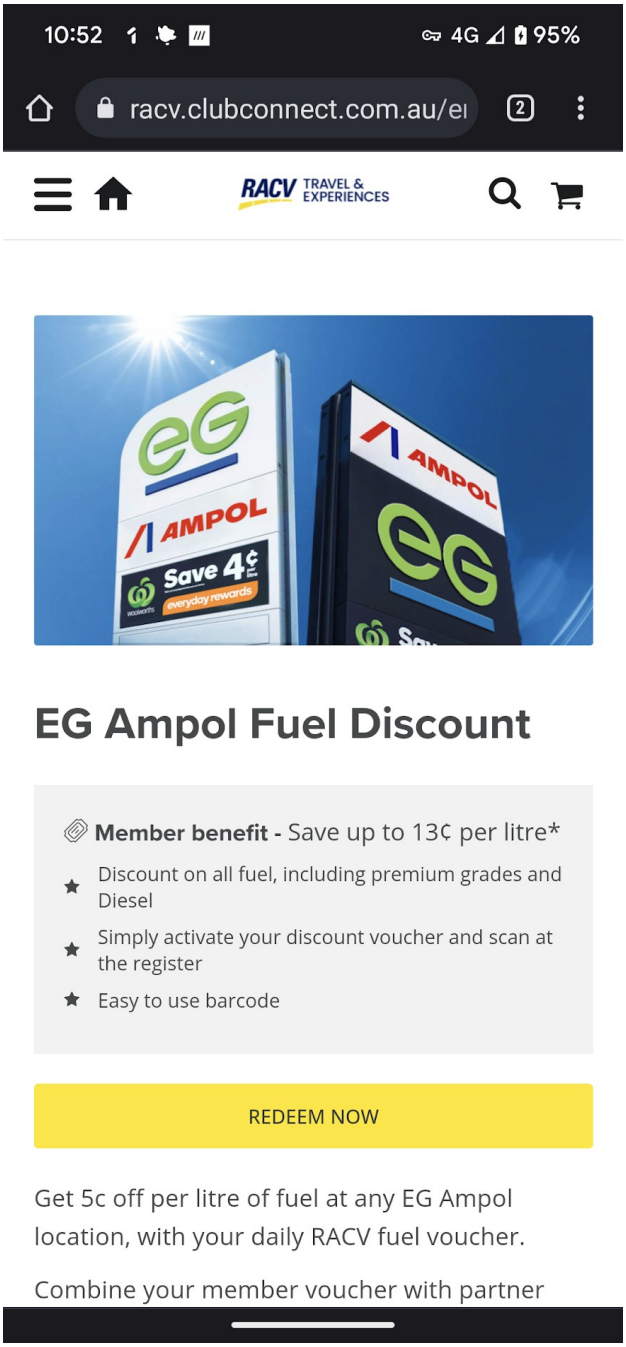
Member of the RACV? Get an extra 5c off per litre at all EG branded Ampol service stations.

Greg Eden

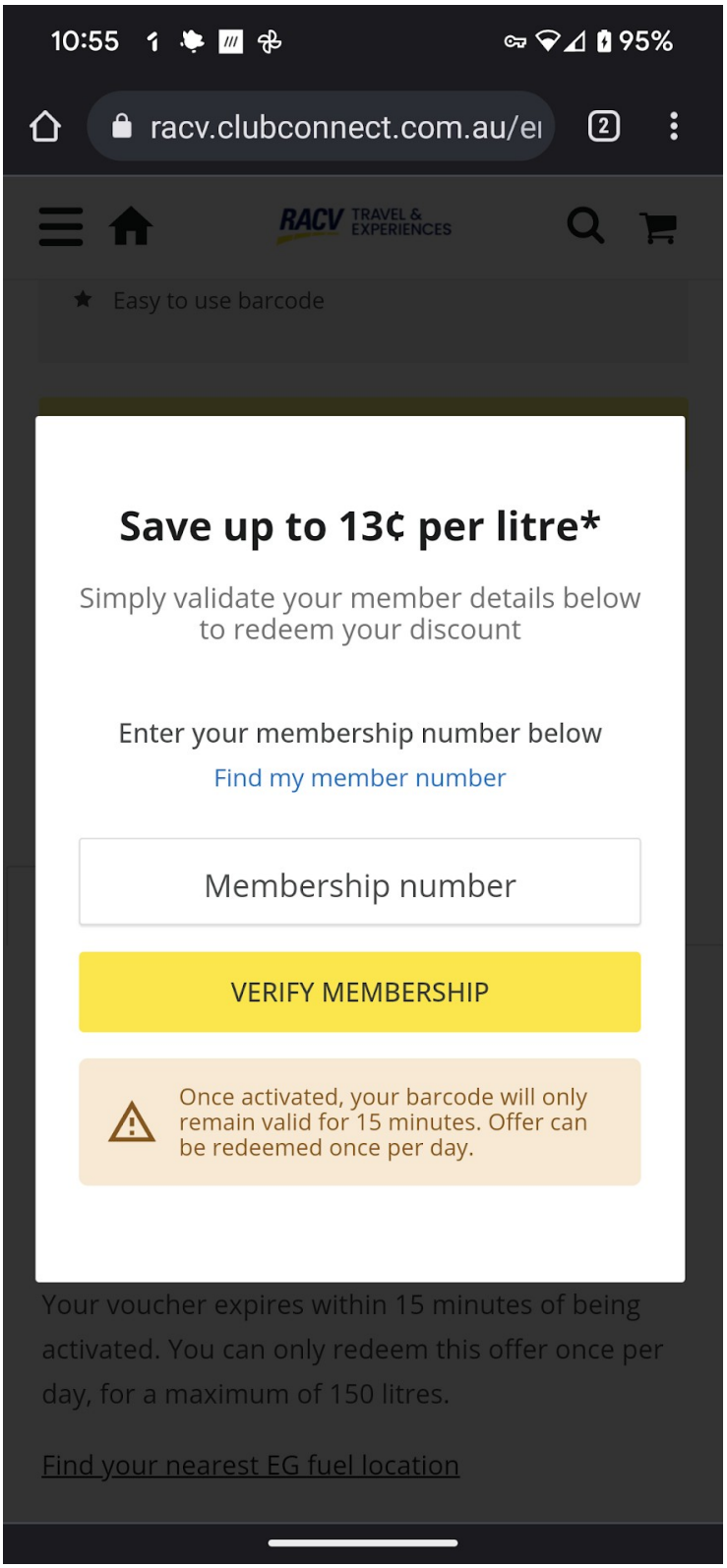
Great, but how do we get that scan code down to the servo? You could just waste a sheet of paper and print it out, or make a link on your phone. You need an active data connection to make this easy although you could do a screenshot at home.

It is relatively easy to do

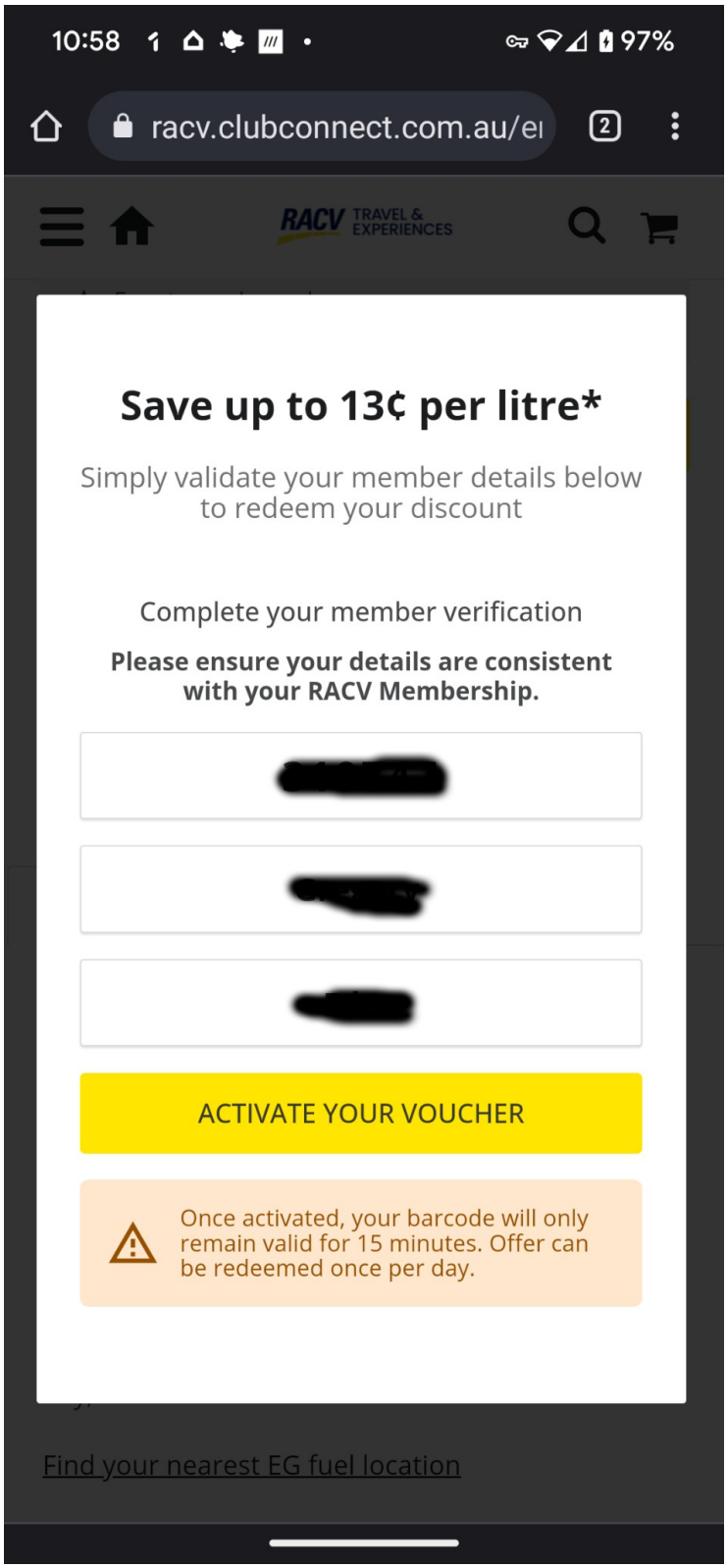
On your Android phone open Chrome, navigate to
https://racv.clubconnect.com.au/en/d/discounts/fuel/eg-ampol-5c-fuel



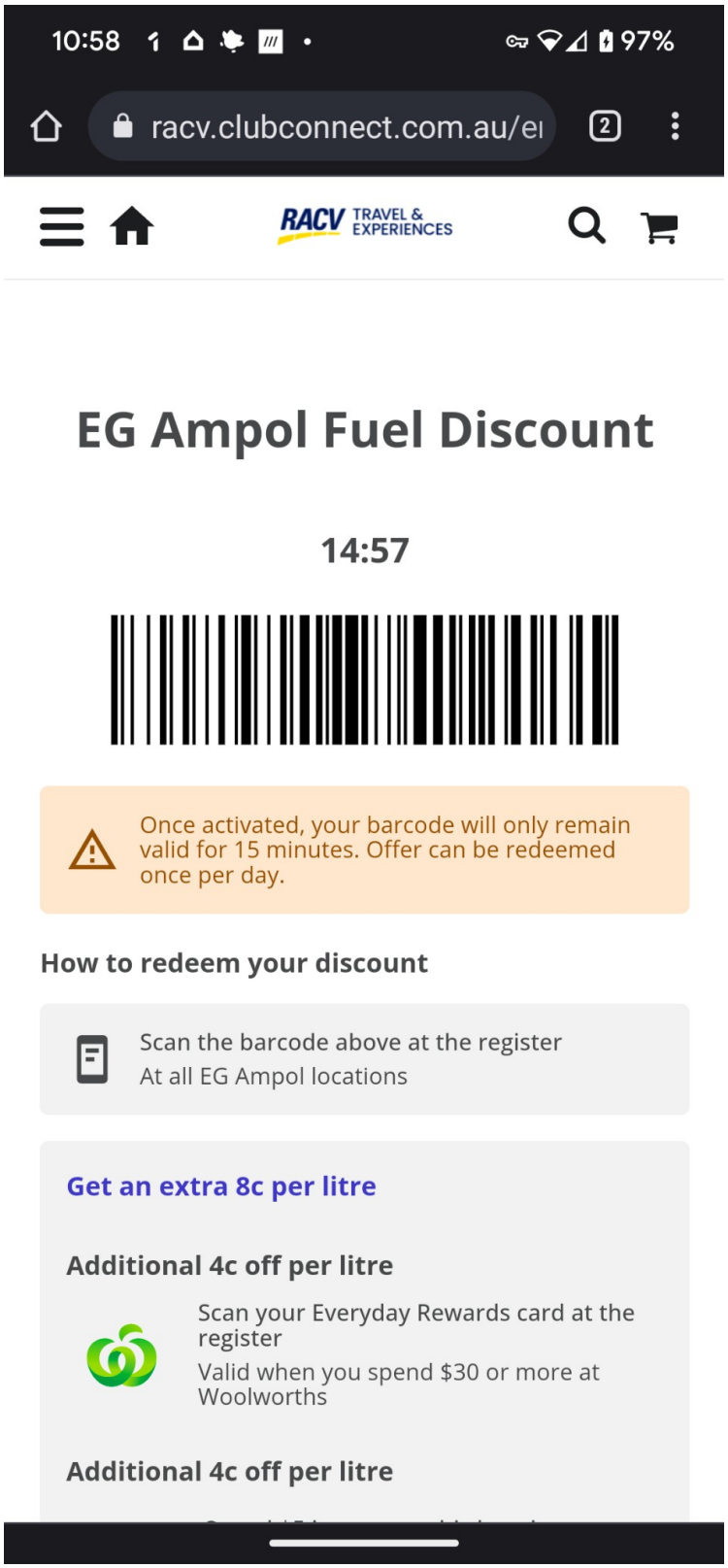
Click on Redeem Now and it will look like this



Put in your RACV Membership number then you get to



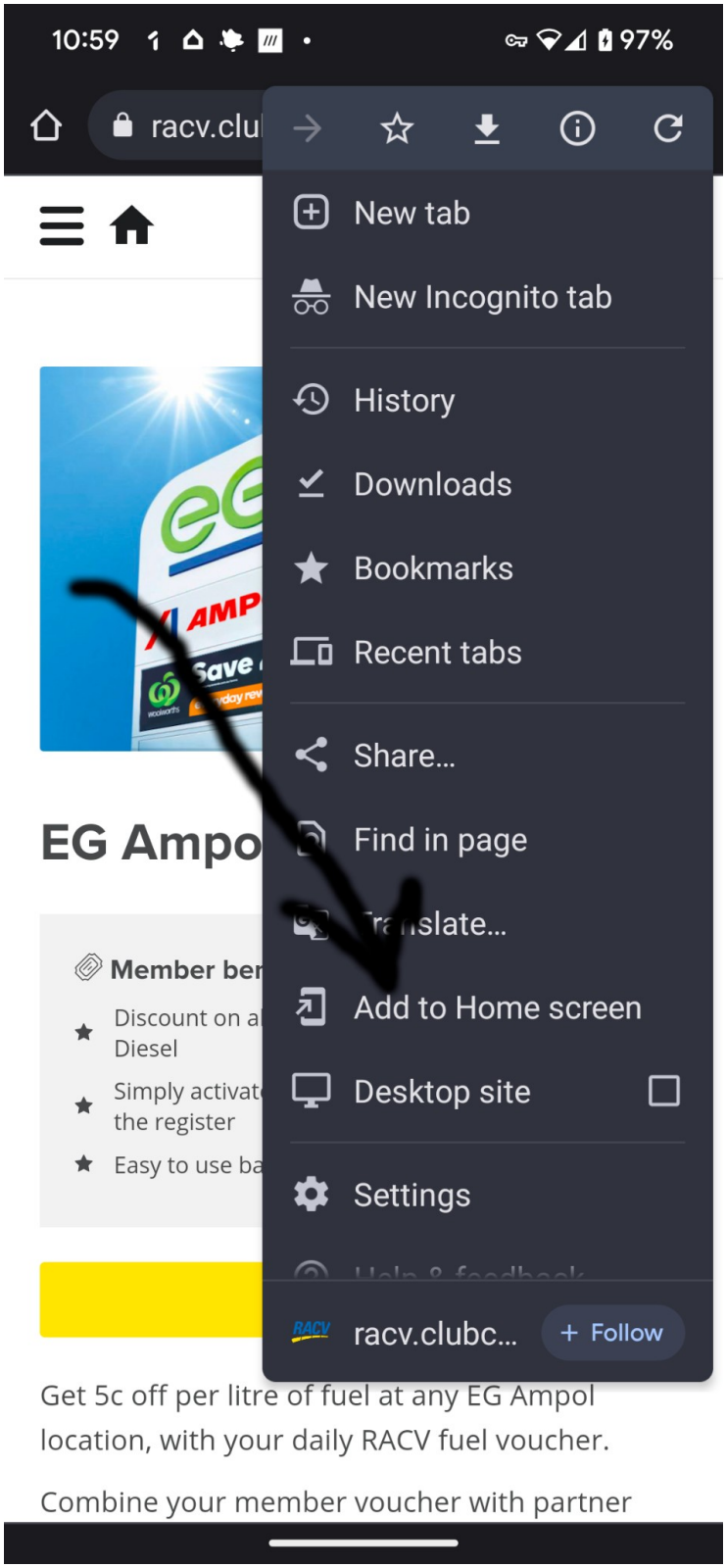
Activate your offer and then you get



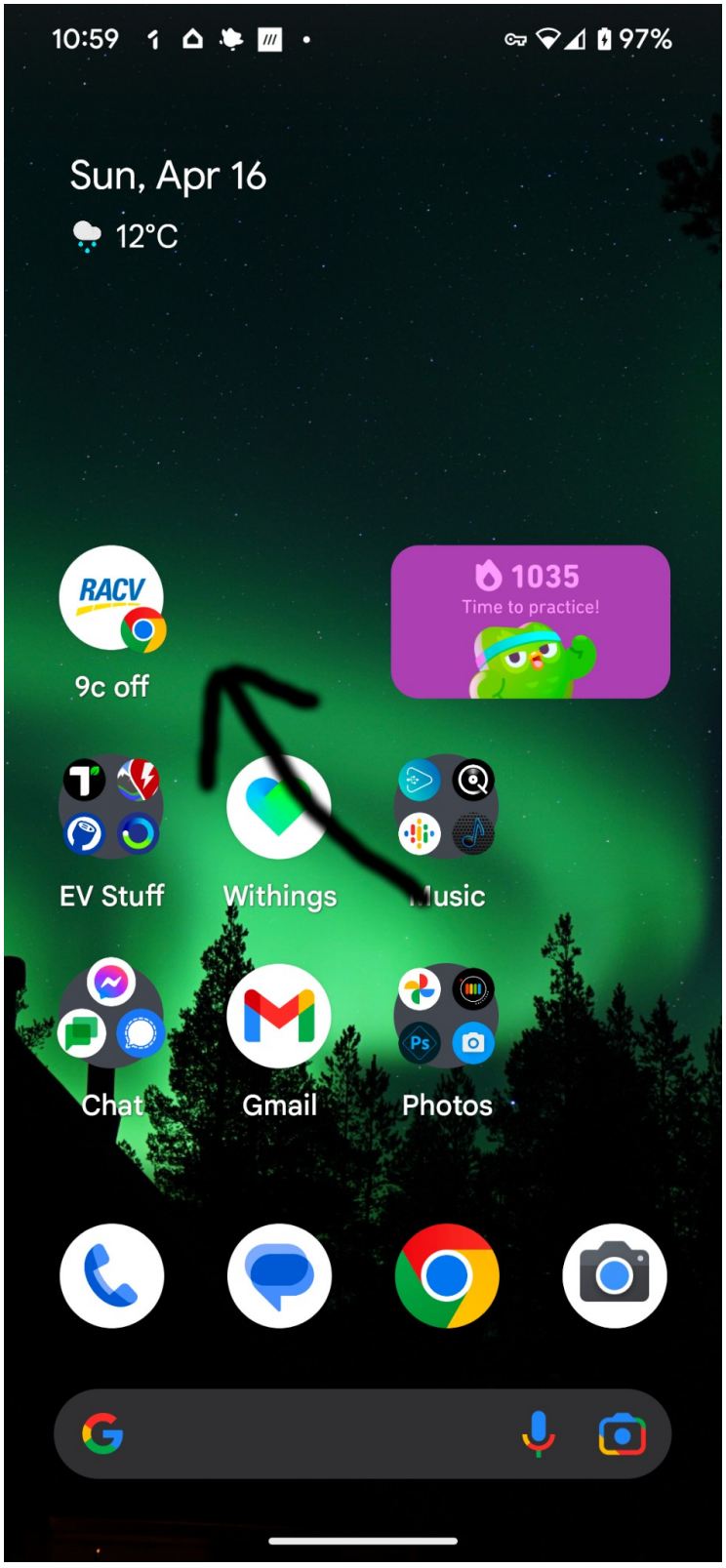
Show the code to the cashier before paying and you get your 5c off. If you have a Woolworths Everyday Rewards card you can also get another 4c off for a total of 9c/lt discount. By the way the scan code in the above picture will not work, it is just an example.

Easy. Next step is optional. Make a shortcut on your home screen.

From the first step above tap on the three dots at the top right and open a panel on the right side and select “Add to Home Screen”



Then you get an icon on your home screen to make it simple next time. Tip always have your RACV card handy because you will need the number each time. I renamed my icon to make it neater and obvious.



Reference: https://www.racv.com.au/membership/member-benefits/member-discounts/automotive/fuel-vouchers.html

A journey through the world of HiRes music

Greg Eden

Digital music is digital music, some say. No, there is a very wide spectrum of quality. If you are hearing impaired this article is of no use to you. For me this has been a long journey of dead ends and wrong turns, of wrong assumptions and so many paths.

Back in the olden days of the wild west of Napster and the like the world got flooded with pirate copies of just about every piece of music. But it was very very compressed. Mostly 128 kbps mp3. Yes you could listen to it for free but most of the dynamic range was compromised. Over time we got higher bit rates and other formats like ogg and aac (m4a). The record companies got into the act and started to sell digital music files, first with copy protection and later without. But still compressed music and a long way from CD quality.

A whole generation has grown up accepting compressed music as the norm. “320 kbps is more than good enough and no one can really hear the difference to a CD” has become the accepted wisdom. In parallel we have had the rise of Bluetooth headphones and earphones. Bluetooth has to compress the digital stream to keep up with the data flow. So now the listening public swarm to streaming services like Spotify to be served up compressed music that is further compressed by their Bluetooth devices. So now the current generation listen to double squashed music and think that is the norm. We have gone so far down the hill from the 1990s (audio wise) many people have forgotten what quality music reproduction sounds like. I too embraced digital music and retired my CD player and my three boxes of CDs. But whilst I was never really happy with the quality, I was very happy with the convenience. Tens of thousands of songs at a mouse click, then tens of millions of tracks available via streaming.

Then one day I wondered. “Can I have the best of both worlds?” Yes you can, but you have to have a quality sound system to playback that which it is fed. If you have a plastic portable then there is zero point in playing anything more than Spotify.

I will not go into the specs of my HiFi system (it is good) as that is off topic. Just remember there is no point in pouring Premium 98 into a 1985 Camry.

The lowest common denominator
Mp3 files at 128 kbps

Then better digital music files
OGG and AAC at 250 to 320 kbps

The AAC Bluetooth codec used for streaming by Apple and others is 264 kbps at 44.1 kHz. Android users can go to aptX HD (with the right headphones) and improve that to 576 kbps. There is also a Sony standard called LDAC that is rare, but much better. It goes to 990 kbps and can support 24 bit files at 96 kHz (1).

Then a CD
Digital files that are 16 bit and encoded at 44.1 kHz. A CD streams at 1411 kbps, so straight away we see a much denser amount of data per track that leaves the others well behind.

Equal to a CD (approximately) is a **FLAC** file encoded at the same 16 bit and 44.1 kHz. Lossless compression. If the equipment is up to it then a FLAC encoded CD will match a CDs 1411 kbps.

Here we reach the lowest step of “good” playback. Stream FLAC files encoded at CD quality. Most phones, tablets, computers and reasonable amps/speakers can handle that and it is a step up from compressed and double compressed music. Then you start using wired headphones and leave Bluetooth behind. Streaming services that provide these files include Tidal, Qobuz and Amazon Music. But not Spotify as they appear to not see the value in high quality playback. Apple has a brand new higher tier for their service, at a cost.

Then HiRes Audio
Then I discovered the HiRes Standard, which is not a standard. The next step up.
“High-resolution audio (high-definition audio or HD audio) is a term for audio files with greater than 44.1 kHz sample rate or higher than 16-bit audio bit depth” (2). So not really a standard, more a threshold.

You will find files that are 24 bit at 44.1 kHz that are the bottom of the HiRes audio world.
You will see 24/44.1, 24/88.2, 24/96, 24/192 and all the way up to 32/768. You will actually find music encoded at 32bit 192 kHz on YouTube. But when you play them you get 16 bit at 44.1 kHz - unless you are a YouTube Premium subscriber and you have the gear to decode the stream and play it back.

I have several Digital Analog Converters (DAC). If you have an adapter to use wired headphones on a USB C port or on an Apple phone then so do you. There is a chip inside that does the conversion from digital data to analog for the wired headphones. DACs are everywhere, that is how you playback sound on a computer. Not all DACs are created equal. Most of the cheap ones will go to 24 bit and 96 kHz. There is more to the quality of the sound than just the raw numbers, but we do not need to go into the specifics. I have a few 24/96 adapters and a 32/384 adapter. I also have a Creative 24 bit 96 kHz Play! 4 USB DAC that sounds better than the others, as there is an element of quality involved. Android Phones and Chromebooks have a native limit or 24 bit at 96 kHz. Windows and MacOS can go as far as your hardware can handle but you mostly have to go into the Device settings and select it or load a driver and app to control output. Ah but - you can bypass the limitations of Android by sending the digital stream straight to the external DAC. How? One way is by installing an app called USB Audio Player Pro. It is a wrapper around your music app that bypasses Android audio processing and sends the stream straight to the USB port and thus to an external DAC. For my HiFi I have an SMSL SU9 USB DAC (3), an expensive box, that connects to my Android tablet running USB Audio Player Pro that is in turn wrapped around my account with Qobuz. On the display of the DAC I can see the stats for each track as it plays back. That is a handy way of measuring the veracity of all you fiddling with drivers and config files. I have found that sometimes assumptions can be wrong and you still end up with 16/44.1, but with the DAC I can know what is working. I have played with Windows, Linux, ChromeOS and Android to see what works and where the limits come into play. Surprisingly ChromeOS automatically outputs to a DAC at the best quality of the source file.

Is it all worth it? That depends on how much you value good music reproduction over ordinary music reproduction. I think there is little difference once you go past 24/96 and that is an output that most people can achieve easily and possibly you have that capability already. You just need the music files that match. The music I play has a bit rate of more than 4000 kbps!!

MP3 < OGG/AAC < CD = 16 bit 44.1 kHz FLAC < 24 bit 96 kHz FLAC < a bridge too far!

Tidal, Qobuz, Amazon Music and others will stream at CD quality. And that is a very good start.

ps if you have an old LG Thinq or V series phone rotting in a draw it is the best HiRes audio streamer you can get for nothing. They were built with a high quality Quad DAC setup that you can activate in the settings. Repurpose it by connecting the headphone jack to your HiFi and set up a CD or better streaming account.

References:

(1) https://www.headphonesty.com/2020/03/bluetooth-audio-codecs-explained/

(2) https://en.wikipedia.org/wiki/High-resolution_audio

(3) https://www.smsl-audio.com/portal/product/detail/id/722.html

Most people already think climate change is 'here and now', despite what we've been told

Ben Newell

A quick search on the internet for “climate change images” readily yields the familiar photograph of a lone polar bear on a shrinking block of ice. Despite signifying an impending crisis, such images make climate change seem abstract – happening a long way off (for most of us), to animals we’ve probably never encountered.

The idea that climate change is perceived as “psychologically distant” – happening in the future, in distant places, to other people or animals – has long been presented as a majorbarrier to action on climate change.

Despite the intuitive appeal of this idea, new research published today in the journal One Earth by behavioural scientists at the University of Groningen now challenges it. The authors argue the psychological distance of climate change has been overestimated – according to their results, most people view climate change as “psychologically close”.

A review of the evidence

To investigate how prevalent psychological distance to climate change really is – and whether it might prevent climate action – the researchers systematically reviewed the available evidence.

First, they analysed data from 27 public opinion polls from around the world – including China, the US, UK, Australia and the EU – finding that most people perceive climate change as happening now and nearby. And this was not just in recent polls. Data from as far back as 1997 indicated almost half of US respondents believed climate change was already occurring.

Polar bears became an early symbol of the devastating results of climate change in the media.

Second, based on an analysis of past studies, they found people who perceive climate change as more distant do not necessarily engage in *less* climate action. Indeed, some studies have shown the opposite pattern. People who perceived climate change as affecting people in far-away locations were more motivated to support climate action.

In short, the evidence for the idea that psychological distance is preventing us from climate action is very mixed.

Third, after examining 30 studies, the team found very little evidence that experiments aimed at changing people's perception of the psychological distance of climate change actually increase their climate action. For example, studies where people watch videos about the impacts of climate change in local versus distant locations do not show these people having different intentions to engage in environmental behaviour.

As I've written in an article on the new study, these results remind us that evidence should always trump intuition when it comes to applying psychological theory. The conclusions also echo earlier calls by me and colleagues to be cautious about the relevance of psychological distance when it comes to climate action.

How should we communicate about the climate, then?

Climate communication strategies and guidelines from a host of different organisations have popularised the idea that climate change is perceived as psychologically distant.

Our own Australian Psychological Society recommends reducing psychological distance by making the local impacts of climate change more salient. For example, highlighting the increase in the number of extreme heat days in one's town or region.

But if the aim here is to increase climate action, is this good advice?

There is a trade-off between using psychological distance to capture attention, and the idea that it provides a scientific explanation for why people aren't doing something.

I've often used the idea of psychological distance in talks, and spoken to journalists about it, because it starts a conversation and can be a good way to engage otherwise hard-to-reach audiences. But there is a risk of mixing up the narrative appeal with the scientific support.

At worst, repeating ideas about psychological distance could lead people to overestimate the extent to which others think climate change is psychologically distant. In turn, this might demotivate action. If everyone else thinks this is a problem for the future, why should *I* do something about it now?

We already know it's here, now let's act

Another implication is that advocacy groups and governments could be wasting effort on information campaigns that focus on reducing the psychological distance of climate change. If people know that climate change is near and now, why do we need to reinforce that idea?

Our efforts might be better spent increasing people's belief in being able to take climate action ("self-efficacy"), and that those actions will be effective ("response-efficacy").

This implies a need to make pro-environmental actions like driving less or eating more plant-based foods easier and cheaper. But it also highlights the need for structural and societal changes that incentivise behavioural change: from offering subsidies for electric vehicles or renewable energy installation, to international agreements on carbon emissions.

There is also a need to remind people of the moral imperative of taking action.

Climate change hasn’t moved ‘closer’

There is no doubt climate change is becoming more “real” and more concerning for most of us. From 2018 to 2022, the number of Australians “very concerned” about climate change has nearly doubled, from 24% to 42%.

These changes in attitude are almost certainly linked to the Black Summer bushfires of 2019-20. But does explaining this shift as a reduction of psychological distance add anything to our scientific understanding?

The results of this new study strongly suggest the answer is no. It is time we moved on from considering psychological distance as an impediment to action.

We know climate change is affecting polar bears, but we also know it is affecting us right now. Our efforts now must be focused on changing behaviour at both the societal and individual level.

Online stumble-ons

David Stonier-Gibson

Just a few of the interesting things I stumbled on this month …

Progress in 3D printed homes. An article in The Conversation
https://theconversation.com/3d-printing-promises-to-transform-architecture-forever-and-create-forms-that-blow-todays-buildings-out-of-the-water-198954

Artificial intelligence: Have we already passed human level IQ? An article in The Conversation
https://theconversation.com/has-gpt-4-really-passed-the-startling-threshold-of-human-level-artificial-intelligence-well-it-depends-202856

Wolfram Alpha is an online tool for solving maths problems. ChatGPT is a language based AI chatbot, a very different kinds of beast. What happens if the two somehow join forces? CHATGPT + WOLFRAM – THE FUTURE OF AI! https://www.youtube.com/watch?v=z5WZhCBRDpU

The IBM PC 5150 – the world's most influential computer
https://www.youtube.com/watch?v=0PceJO3CAGI

The Forgotten Story of Kartrak: The First Barcode https://www.youtube.com/watch?v=5K8UpMNYIPo

The Secret Auction That Set Off the Race for AI Supremacy. I only learned recently that the type of AI we are now seeing only because practical in 2012.
https://www.wired.com/story/secret-auction-race-ai-supremacy-google-microsoft-baidu/

Then right here in our club, two presentations from the Microcontroller group.

Member Clive Maynard, co-author of The Art of LISP Programming gave us a bit of an overview of what the LISP language is all about. https://www.youtube.com/watch?v=C3epoerj-GI

David Stonier-Gibson (that's me!) wants to build a (very simple!) neural network from scratch in an $8 microcontroller and have it sort Smarties by colour. I am only at the start of this quest, but nevertheless shared what I had learned in the previous three weeks while in New Zealand.
https://www.youtube.com/watch?v=H9ywVLvY6bg

Owning an EV means much to learn

Greg Eden

You have many things to consider. First you have to stop thinking like a petrol car owner. I have purchased a Cupra Born EV and installed a 7 kW home charger in the carport. A Born is a hatchback about the size of a Corolla. At the time of writing my car is not yet delivered due to the backlog at our ports. My Born has a WLTP range of 511 km. Just like the rated range of a petrol car you can only achieve that in perfect conditions and driving carefully. I expect a comfortable 480 km. And just like a petrol car you do not run it down to empty. EVs have charger maps and reasonably accurate range estimates so running down to 10% is something you can do with confidence. Unlike the range estimate in my petrol car. In terms of efficiency EVs are the reverse of petrol cars. Petrol cars get their best consumption on the highway and consumption increases around town, EVs get their best consumption around town and use more on the highway. So if the vast majority of you driving is around town then an EV is a good choice.

Filling to 100% all the time is detrimental to a car battery. There are two aspects to charging. Home chargers and the destination chargers they put in Motels etc are AC feeds to run an internal charger built into the car. They max out at 11 kW, but for most people that is 7 kW for a single phase supply. If your EV has a 77 kWh battery you can do the maths. Around town you treat it like a phone. Charge overnight and trickle charge from an AC charger and limit the "fill" to 80%. In my car that is about 380km of range which is more than a week of driving for me. Most commuters do about 60 -80 km per day. That top up (20% - 80%) is about 46 kWh of charge for my car. So less than seven hours on a 7 kW charger (while I am asleep). And at a 30 cents per kWh tariff we get about $14. If you have solar panels and can charge during the day then that bill can approach zero.

The other aspect is high speed chargers. Fast DC charging starts at 50 kW and goes all the way up to 350 kW, depending on the charger and the car. There are two sockets on an EV to adapt to the two ways of charging. Using high power DC charging all the time can degrade the battery over time. When you are going up the highway to drive to Sydney for example then you would charge to 100% overnight on the home AC charger and then do three or four half hour breaks on the 900km journey and use DC charging to get back to 80% each

time. In my case that is about 25 minutes. You do not need to sit and monitor the charge. It is all app controlled. Plug in and wander off to the toilets and the cafe and then return and drive off. You do not go to the counter to pay. When you arrive at your destination in Sydney you would want to go back to overnight slow charging. You do not need a full tank before you go to bed, you need a full tank when you wake up. Sadly at the moment you will need a mobile phone with at least six apps installed for route planning and paying for DC chargers. If you are with the RACV you get a 20% discount at all Chargefox chargers nationwide. Without the discount a fast DC charger at a highway servo is about twice the price of charging at home. But then, overall, you do not do that very often. Many chargers at shopping centres and motels are free. They are slower, so a two hour shopping stop might only get you 50 - 100 km of charge, but that is 50 - 100 km of driving for nothing. It is like Westfield giving you five litres of petrol for using their shopping centre.

Why 80%? It is similar to a phone. The battery charges quickly to 80% then slows down for the last 20%. So a 20% to 80% charge is only about half the time of a 20% to 100% charge. Thus it can be faster overall to add an extra stop and only go to 80% each time. Of course there are times when you need that 100% tank if you have to drive 450 km to the next charger because there is nothing in between. On the main highways on the east coast there are plenty of chargers and more being installed every week.

For most people 90% of their driving is in Melbourne and a home charger is more than enough. In that scenario you would NEVER go to a suburban servo to recharge. A weekend trip to Bendigo and back, for example, can be done just by charging to 100% the night before you set off. Depending on which EV you have, its battery capacity and normal range. Borns have a very good range.

It is only on longer trips, that you want to do in one day, that will require you to use high speed DC charging at a servo.

Treat your battery right and it will last as long as the car. There is the issue of apartment dwellers and for them, for now, owning an EV is too hard. There is new battery technology appearing every other week and one advance is LFP (Lithium Iron Phosphate) batteries found in Chinese made cars (including our Teslas) that are quite happy to charge to 100% all of the time without degradation. BYD Blade batteries are very robust and are pretty much fireproof.

There is one last aspect to consider. That is maximum charge speed. If you only ever drive around Melbourne, or locally to your home, then a fast DC charge rate is irrelevant. Treat your EV like a big mobile phone. Most of the cheaper EVs can only charge at 80 kW. That means that if you do venture forth up the highway your recharge stops will be closer to an hour. If you were driving to Sydney then that would get tired very quickly. My car has a maximum rate of 170 kW. Some of the more expensive cars can go all the way to 350 kW. If you do a lot of highway driving then faster charging is essential. There is a YouTube video from Norway where a Cupra Born was driven 610 km. By limiting recharges to 80% and only using fast DC chargers the total stopped time was 38 minutes. That is 38 minutes in a seven hour journey. The reviewer barely had time for toilet breaks and food. But, of course, he was making a point and trying to get the best outcome. I often drive to Canberra which is 650 km. No problems.

How have I learned all of this before I have an EV? That is simple. YouTube. There are thousands of videos of road tests, charger tests, charging techniques, home charger installation and so on.

My charger is patiently waiting to be put to use.

Humans have been predicting eclipses for thousands of years, but it's harder than you might think

Sabine Bellstedt

The coastal town of Exmouth in Western Australia is due to experience one of the most spectacular astronomical phenomena on April 20 2023 – a total solar eclipse.

Eclipses have entranced us for millennia. But it turns out calculating exactly when and where we can watch an eclipse in its full glory can be surprisingly hard.

Watching the Sun and the Moon

Being so dominant in the sky, the Sun and the Moon were the most captivating celestial bodies for ancient cultures to observe. Naturally, they also tried to anticipate and predict their motions.

While the Sun's movement is quite simple, the Moon moves across the sky with much more complexity. For one thing, it has phases; it also grows and shrinks in apparent size as it travels on an elliptical orbit around Earth.

On top of this, the Moon appears to rock and wobble quite haphazardly on its journey across the sky, making it extremely challenging to accurately describe its orbit. In fact, explaining the Moon's motion was the only problem that made Isaac Newton's head hurt.

Since eclipses are so startling to witness, many ancient peoples both noted their occurrence in writing and art, and discovered the repeating characteristics of such events.

During a lunar eclipse, where Earth blocks sunlight that would otherwise illuminate a full moon, the dimmed Moon takes on a bloody hue. Many cultures attached foreboding to such events (like the partial lunar eclipse seen during the Fall of Constantinople in 1453) and quite reasonably wondered when the next such event might occur.

The not-so-mythical Saros cycle

Various cultures around the world have independently discovered eclipses seem to occur on an 18-year cycle. It was mentioned in written records by the Babylonians and Assyrians (of ancient Mesopotamia and modern Iraq), and oral tradition suggests the cycle was used for ceremonial purposes by Torres Strait Islanders in what is now Australia.

This 18-year cycle, which can persist as a sequence for over a thousand years, is now known as a Saros cycle. The word “Saros” was referenced in the 10th-century Byzantine Suda encyclopedia, and possibly has a Greek origin (“saro” meaning “sweep”, perhaps relating to how eclipses sweep across the sky).

The Saros cycle represents how long it takes for the Sun-Earth-Moon system to return to almost exactly the same triangular configuration. So, if you see a lunar eclipse, you can expect another one 18 years later, visible from most places on Earth.

If you were an ancient culture that happened to observe a total solar eclipse, you would have been very lucky indeed (they occur roughly every 375 years at a given region on Earth). But would you have seen a similar event 18 years later? Alas, no. While there probably was another total solar eclipse 18 years later, it would have been over a completely different part of the planet.

After 54 years – three Saros cycles – the eclipse region should have returned to roughly the same position on Earth. But only *very* roughly, as it could be thousands of kilometres away from the previous observation spot.

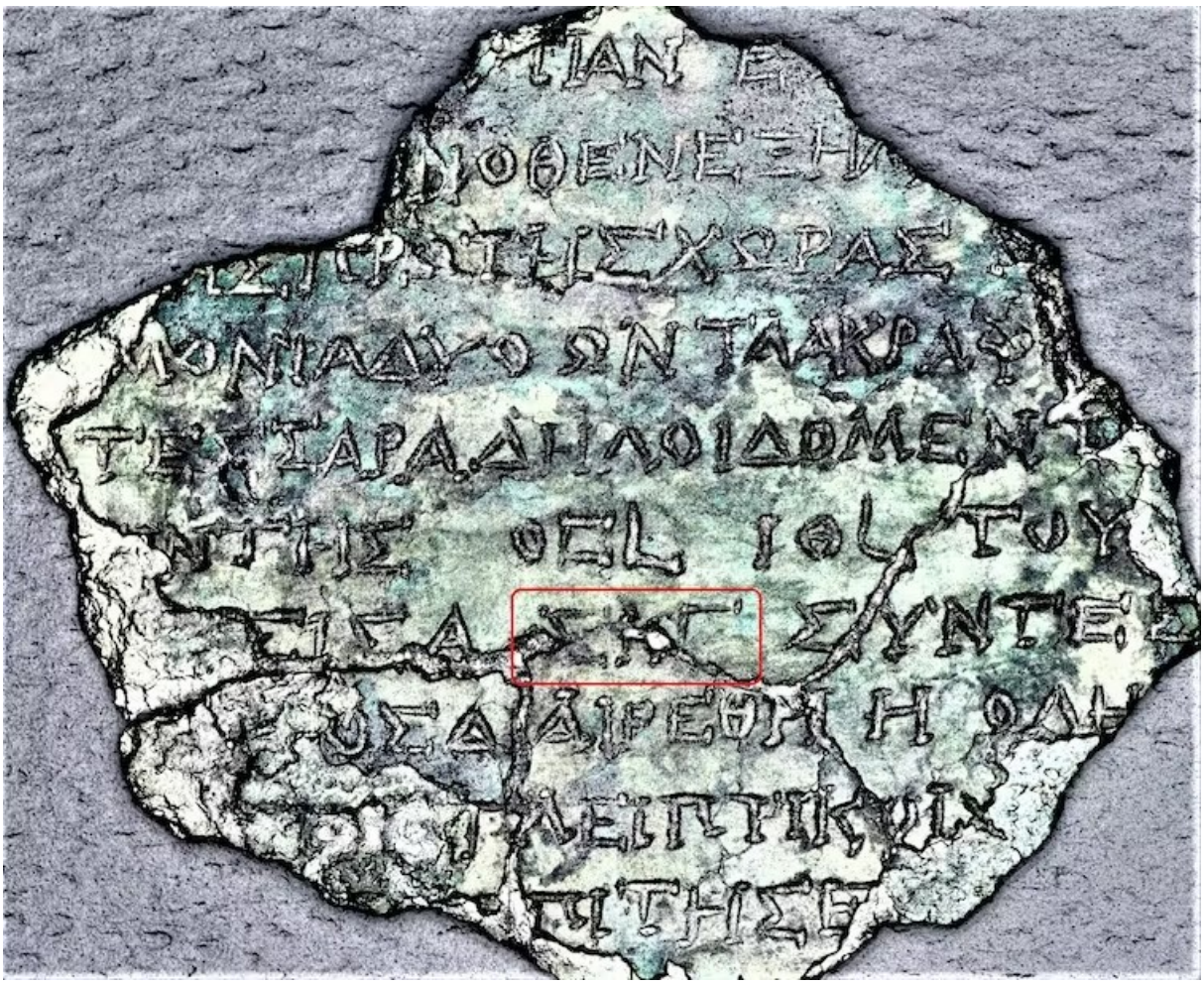
Worldwide, there is a total solar eclipse visible somewhere roughly every 18 months during one of two possible “eclipse seasons” per year. This is much more frequent than an 18-year Saros cycle, and is possible because multiple repeating Saros sequences overlap at once (roughly a dozen), each offset by at least six months. For example, the 2028 total solar eclipse that will be visible in Sydney is part of an entirely different Saros sequence than this year’s eclipse.After about a thousand years, when one long-term Saros sequence ends, another will begin with slightly different timing.

From antiquity to modern day

So could our ancient ancestors actually predict eclipses? Yes, if we are talking about lunar eclipses, and perhaps even partial solar eclipses.

A famous predictive example is the Eclipse of Thales in 585 BCE, although the fact that a total solar eclipse happened over Greece was almost certainly more luck than science. That is, they wouldn’t have predicted that 18 years later (567 BCE) a total solar eclipse was visible in what is now the United States.

It is likely the famed Greek Antikythera Mechanism, an astoundingly complicated 2,000-year-old mechanical device that was used to predict the night sky, could calculate the 18-year Saros accurately. But significantly, it could not predict total solar eclipses at a precise place on Earth – just their timing.



The Saros period (marked with a red rectangle) is visible on a fragment of the 'user manual' of the Antikythera mechanism. Xmoussas/Wikimedia Commons, CC BY-SA

In summary, it is clear ancient people could predict timings for lunar eclipses and partial solar eclipses, but there is no convincing evidence of people predicting the times and locations of total solar eclipses.

The path of the eclipse as described by Halley in 1715.
University of Cambridge, Institute of Astronomy Library

Entering the modern era of science, the first true prediction of a total solar eclipse (both in time and location) occurred in 1715. Edmond Halley (of comet fame) correctly predicted, to within four minutes and 20 miles, a total solar eclipse that rather conveniently passed over his own house in London. He did this by making full use of Isaac Newton's new theories of gravity and orbital mechanics: the Principia.

Today, we don’t rely on calculating the orbits of the whole Solar System to predict eclipses. For example, NASA uses a highly advanced form of an ancient technique – pattern recognition. Using some 38,000 repeating mathematical terms, NASA can predict both solar and lunar eclipses for 1,000 years into the future. Beyond that, the Moon’s wobble and Earth’s changing rotation make eclipse prediction less accurate.

So for those of you lucky enough to witness a total solar eclipse this month, take a moment to think about what this shared experience has meant to humans around the world for thousands of years.

Trying to predict and explain this phenomenon has directly driven advancements in mathematics and orbital mechanics, and with its beauty we have been forced to embrace the limits of our scientific knowledge.

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