GATEWAY

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

March 2019

Support the ACMA & AMC

High Power Audio

Nally Crash

And More

Contents.

Note: - club meeting minutes are on the club website

Event Queue

March:

15th	General meeting – Guide hall
16th-17th	John Moyle Field Day (as per WIA, **The dates in the last mag were a day out!**)
30th-31st	CQ World Wide WPX SSB Contest

April:

5th	Prac Night – Club rooms
19th	General meeting – Guide hall

May:

3rd	Prac Night – Club rooms
4th	20th Harry Angel Memorial Sprint
11th	Moorabbin & District Radio Club HamFest
17th	General meeting – Guide hall
24th-26th	WIA Annual Conference, Sydney

PRESIDENT'S REPORT MARCH – Bruce Williams VK3BRW

Hi everyone welcome to the 2019 March addition of the GGREC magazine.

TECH TOUR TO CHINA

This Friday night Ian (VK3BUF), with help from the other two members that went namely Michael (VK3GHM) and Bruno (VK3BFT) on this trip, will review the Technical tour to China that took place just over one year ago.

The trip included a visit to a PCB manufacture, a CNC Mill factory, a Tesla dealership, the Shenzhen Maker Fair, Huaqiangbei – The world's largest electronics market, along with a few other interesting places.

To quote Ian "Not everything that happens in China, stays in China"
So come along and find out more about this very interesting trip.

HAMFEST

Our Hamfest is currently being organized for July and we are looking for various volunteers to carry out specific roles. For example help setup the tables, man the BBQ, serve in the kitchen etc.
So please give this some prior thought. A form will be circulated on the night requesting the names of anyone that can help out.

WIA/AMA Update

Chris (VK3) has put together an article for this month's magazine that brings us all up to date on where things stand and raises some very interesting (some would say contentious) questions. As discussed at the last GM we intend to keep all members informed and kept up to date on the latest. So make sure you have a read of it.

TRAIN & HOBBY SHOW

The train & Hobby Show took place over the Australia Day Long Weekend and GGREC decided to participate, despite not really having the numbers to do so.

The theme of our stall, being to cover from old mile stone Transceiver's up to the more modern ones. It also included Interactive displays such as working transceivers, a Software Defined Radio (SDR) and Morse keys connected to code practice oscillators for the kids, and not so young to play with. The use of the phonetic alphabet to spell your name also proved to be popular.
Click on attached link.

https://www.youtube.com/watch?v=2XT5X5bI_wo&feature=youtu.be

My special thanks goes out to all those that volunteered their time and efforts to make this a successful event. Namely Bruce (VK3BRW), Ian (VK3BUF), Dianne (VK3JDI), Barry (VK3ABH), Michael (VK3GHM), Mike (VK3TO), Bruno (VK3BFT), Tony (VK3QX), Graham (VK3FGKE) and Graham (VK3BXG).

The work done by these volunteers included, but is not limited to:
Organising the event (from a club point of view), Administration work (getting the handouts done and printed), Setting up the stall (equipment going, antennas installed, banners up, projector installed, picking

up, or donating exhibits to put on display. Interacting with the public and last but not least, pull down and returning the equipment to its rightful owners (which include the club shack).
Obviously the more volunteers we have to do this work the easier it becomes for all involved.

I'll have more to say on this topic this Friday.

GGREC REPEATERS

70cm Repeater

This is now up and running under its new name. Refer to rear page.

6m Repeater (RDD)

This repeater has again failed after one of our many hot days and is currently off the air. The reason for the failure will be investigated this Friday.

JOHN MOYLE CONTEST

This takes place this weekend. I couldn't get our preferred place to set up. So please give it some thought and we will discuss it further this Friday night.

SHOW & TELL

Last month's theme was portable Multi meters. This month's theme will be portable component testers. For example Capacitor ESR meters, Transistor testers, LCR testers etc.

So make sure you bring along your favorite tester/s to give a quick talk, on the pros and cons on what you own, so others can learn from your experiences.

WANTS & NEEDS

Don't forget to think about your wants and needs, prior to the meeting. This is your chance to see if other members can help you out with components, or gear you're having trouble locating, or finding at the right price.

PRAC NIGHT

We are now into the build stage of the interference tracking Receiver. If you can't make it to the next Prac night and wish to build this receiver, then please let me know. That way I know how many kits to make and what components I need to buy?

Remember this receiver complements our 2m antenna build.

INSURANCE LIABILITY

This will also be discussed on the night.

FINANCIALS

As usual Chris, will give a brief description on how we stand financially.

I hope to see you all at the GM this Friday 15th March 2019).

Regards and 73s
Bruce

From The Editor

This month saw me continue my foray into woodworking, with me quickly realizing getting good accuracy was beyond the tools I have at hand.

One of the first tasks was sanding the wood panels I had cut from a block of red gum flat.

To me the obvious tool was a belt sander, all seemed ok till later when I tried to line everything up and I then noticed quite a bow in the pieces. I somewhat suspect the wood may be bowing itself, but hang on this is quite an old block of wood, shouldn't it be 'stable' by now? I just don't know enough about wood to be able to answer that one.

The wood pieces look nice, that is till I try and align them with each other.

So I've decided to just do my best at joining it all together, and then attack it later with a sander.

So next month I'll either have a nice piece of kit, or I'll be back to Bunnings to try 'plan B'

Of course this is not the only thing handed my way, I have three amplifiers to repair, one is on page 11, the other, a Yamaha home theatre amp will be next, once I can clear the workbench. Followed by a valve amp/radio I started a few weeks back. The valve unit has had to be put on hold as Jaycar does not have suitable high voltage caps, and Altronics is too far away – well it is if all I need is $2 worth of capacitors.

Then there is my radio tower whoopsie – see page 6. That incident has definitely got me thinking about better procedures when it comes to lowering & raising my tower. I was planning to add a largish concrete block to take some load off the tilt-over winch, but in the end it looks like the vertical extender needs more attention. I'd love a secondary cable with some form of 'damper' that will either just stop it, or at least slow the decent, kind of like a car seatbelt.

The next one will probably horrify you, I found a pile of old Philips - TMC illuminated 'Push button key' switches. They look really retro, maybe I'll turn them into another …. binary clock!

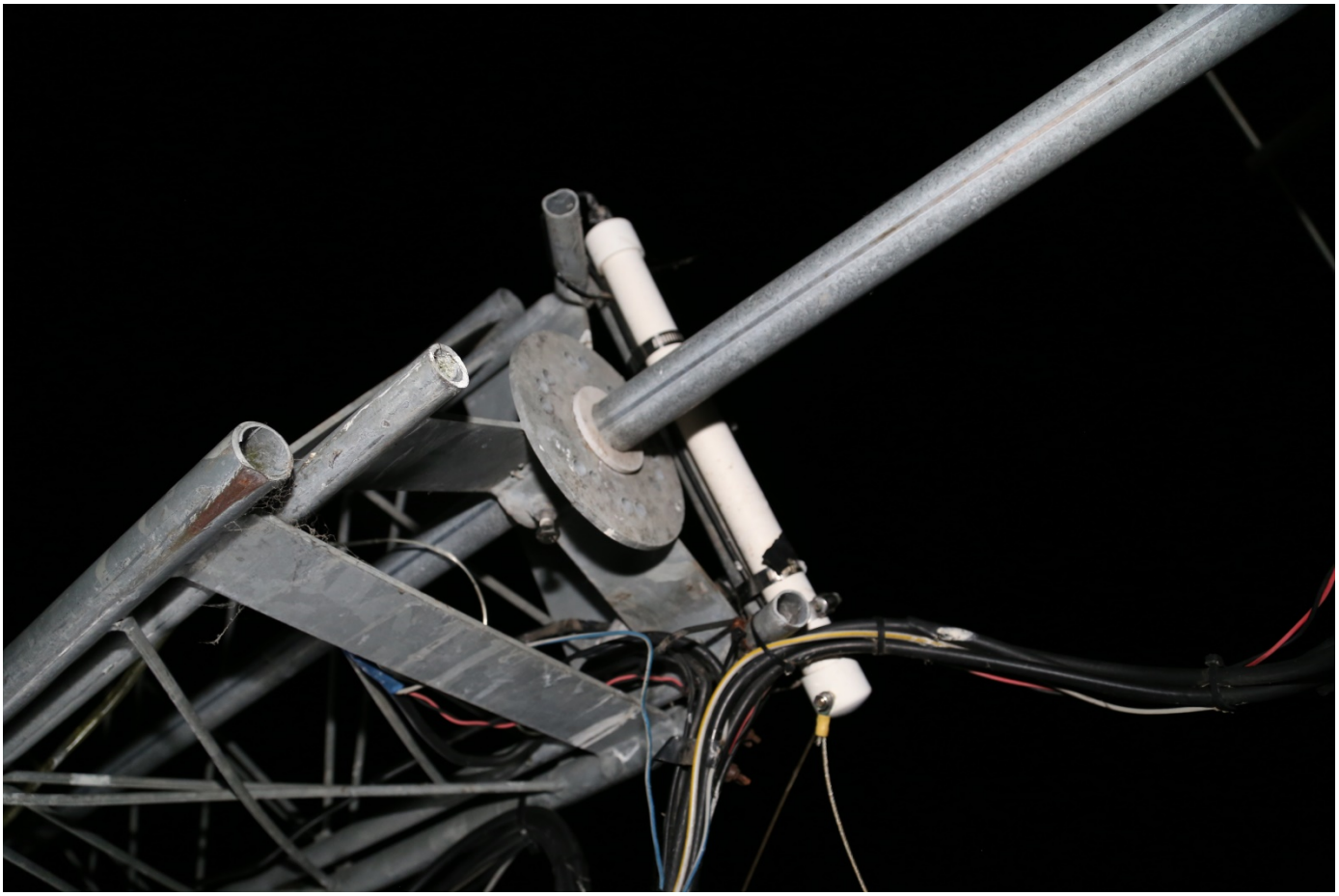
Why?, Because I can.

Paul VK3TGX

Nally Crash

When is the last time you inspected your radio tower's winch cables?
I usually give them a quick check every time I operate the towers winches, after all they are right in front of me, and in my case, I usually manhandle the vertical winch cable with some gardening gloves so it spools nicely onto the winch.
"The other day" after doing some work having safely lowered and tilted over my tower, I set about putting it back into its normal extended vertical position. Setting it back into the vertical plane was no problem, however extending it vertically was another issue! After I had wound it up about 2 meters there was a big "CRASH"

The centre section quickly came back down, somewhat lower than it usually is, and winch cable was all about me. Luckily I had my hands well clear, so no blood was spilled, or bones broken.



Later on after I took some time to 'recover' (no swearing, just a long drawn out "Bugga…")

At the top of my centre section is a horizontal pipe, intended to take a side arm (and pulley?), in the picture above it is just below the white PVC pipe. (HF off-centre dipole Balun) Normally all the vertical pipes are straight, but as you can see the two that hold the horizontal pipe have taken most of the force when the centre section dropped. They are not just bent, but almost torn off. I'd hate to see what would have happened had the centre section been all but fully extended.

Other damage includes a now sagging 70cm beam antenna, and two other bent brackets that hold a 70cm pre-amp, and a video camera which is now about 10 degrees off axis.

The antennas are not bent over, it's the camera.

I'm amazed I had no cable breaks, and that my rotator still works. (Or is more woe to come?)

At least I didn't experience 'Aluminium rain' as some call it when all your antennas disintegrate.

So how had the cable become so rusted, and how come I never saw it? I assumed the point that rust would start was on the winch drum itself, most of the cable is tightly wound there, and it's often soaked in water. To that point I have often applied 'WD40' to ward off any troubles, the other end of the cable being attached to the lower end of the centre section was also clearly looking ok. (As it passes my face during every extension/lowering) No, the troubled section was about a 3 meter length that is hidden further up the tower, wrapped around the pulley wheel. When the winch cable fell down by my side it was obviously severely rusted.

So I headed off to Bunnings for some new cable, but I was not that impressed, 99% of their offerings were stainless steel, and only rated to about 100KG static load, 250KG lifting. (4mm) So where next – Off to Dandenong to Nobels where I purchased some 4mm wire rope for the vertical winch, and 5mm for the tilt-over winch. (Replace like with like) Years ago the GGREC did a bulk buy of winches, time to replace mine; I had it sitting in storage for the last few years.

The 4mm wire rope I bought was rated to lift about 1.1 Tons, way better than the stainless steel wire rope. The bloke at Nobels told me to avoid stainless steel, it has nowhere near the same strength, and it also work hardens then fractures. He told me the story of a few fishermen mates of his who redid their boat trailers with stainless steel rope, but soon started complaining when it didn't even last one season. I think his response was "I told you so."

Having one's boat roll back off your trailer back into the drink is one thing; however having several hundred kilograms of steel come crashing down to earth close by you is another story. My galvanised steel cable has lasted over 20 years (maybe 30 years?), so I cannot see any advantage in stainless steel. Yes I do use it, both as antenna wire on my off centre HF dipole, and for other light duty uses, but now I know, NOT FOR WINCHES.

So do yourself a favour, and unwind your cables so you don't miss any hidden bits next time you inspect them.

Paul VK3TGX

We radio amateurs need to support the ACMA & AMC.

I wrote a brief article for the magazine last month regarding the announcement that the Australian Maritime College was the successful tenderer for ACMA's Examination Services and Callsign Administration.

As in politics, it seems a month is a very long time in our hobby. On the 5th of February 2019, WIA President, Justin Giles-Clark wrote to members, clubs and the community, and I quote:

"The WIA congratulates the University of Tasmania and Australian Maritime College (AMC) in being selected by the ACMA as the preferred provider for the delivery of amateur radio examination, callsign management and associated services….

The WIA regards this as a watershed moment in the history of amateur radio in Australia. The expedient delivery of these services by a skilled team backed by a sandstone university promises to deliver a robust, cost-effective and efficient qualification service for the Australian amateur community.

It is the view of the WIA Board and the WIA Education Group that anything other than a smooth transition to the AMC will damage the already fragile amateur radio community. For this reason, the WIA and ACMA met in October last year to begin planning for this potential eventuality. We are committed to ensuring that the WIA does not cause any disruption to this process.

….

There will be changes and uncertainty in the near term. To ensure a smooth transition and continuity of services for this great hobby the WIA will work collaboratively with the AMC and trust you will as well.

It is the view of the WIA Board, the WIA Education Group and many members we have spoken to that the transition to the AMC will allow the WIA to refocus its resources on delivering all the objects of the Institute."

That was written about five weeks ago.

More recently, WIA Secretary Mr Peter Clee also complimented AMC when he stated:

"One of the things that the WIA has been losing money on for the last ten years is this deed. The members have really been supplementing exams….

….The AMC have been running exams for a number of years. They actually do a really good job. I think that they will do a good job with Amateur examinations." (Perthtech, 2 March 2019)

These public statements by WIA Directors are in contrast to the most recent letter from the WIA just two days later (4 March 2019), to quote:

"The AMC have subsequently released their pricing and preliminary information on other processes
The result of the negotiations between the AMC bid team and ACMA procurement has resulted in the "headline" entry price to the hobby of Amateur Radio rising:

- *$75 to $115 (Foundation Assessment, Practical Assessment & Callsign Recommendation) for adults - an increase of over 140%, (WIA's proposal was $49)*
- *$40 to $115 (Foundation Assessment, Practical Assessment & Callsign Recommendation) for youth - an astonishing 285% increase. (WIA's proposal was $27)*

The WIA board and the Education Group is horrified by the existential risk that this creates for the hobby of Amateur Radio, especially given the widespread community support (at both a local and international level) for attracting younger participants to the hobby.

Not only has the process increased costs and failed to provide continuity (despite solutions to this being offered by the WIA), the processes described by the AMC in their recent release paint a picture of an exam service that, in the opinion of the Education Group, is of a significantly lower standard than that which was previously offered by the WIA and vastly inferior to that which the WIA proposed.

A succession of royal commissions have demonstrated the consequences of decision making that fails to consider the customer.

The only rational conclusion the WIA can draw is that the AMC, parties to the AMC bid and those involved in the ACMA procurement process have weighted political, commercial and personal factors ahead of their customers', the community and the hobby of Amateur Radio.

The WIA, as the only Amateur Radio organisation that is demonstrably committed to furthering the hobby, remains committed to resolving this situation for the benefit of our members and the community we represent."

Let's analyse this latest communication from the WIA and pose some questions.

Firstly, and perhaps most obvious and alarming, is the about-face in the WIA's position that it supports the AMC and their strong reputation, and that (quote):

"anything other than a smooth transition to the AMC will damage the already fragile amateur radio community. For this reason, the WIA and ACMA met in October last year to begin planning for this potential eventuality. We are committed to ensuring that the WIA does not cause any disruption to this process."

The WIA now appears to promote anything but a "*smooth transition*", instead taking an openly combative and disruptive posture towards ACMA, with claims that "*the ACMA procurement process have weighted political, commercial and personal factors ahead of their customers', the community and the hobby of Amateur Radio."*

Anyone who has worked with corporate or Government tenders will very well know that Government agencies look for stability and a solid track record when evaluating outsourcing contracts. There is no doubt that AMC offers these qualities; indeed the WIA President and Secretary have both made comments to this effect.

Next, there are claims of outrageous price hikes by the AMC. The ACMA approved these prices; the WIA has been operating a similar pricing model for years and making a loss. It is inappropriate and unprofessional to compare a pricing model from a failed bid to that of the successful tender.

The WIA has also refused to hand over intellectual property, namely the more recent (post 2005) Licence Exam questions, including the Foundation Licence question database.

What is to be gained by with-holding their examination question bank? How does the hobby benefit from this stance?

Lastly, shouldn't GGREC members be dismayed that Mr Giles-Clark believes *"The WIA, [is] the only Amateur Radio organisation that is demonstrably committed to furthering the hobby"*. This is simply untrue and unfair. Most, if not all clubs and associations are demonstrably committed to improving the hobby at local and national levels. Indeed, GGREC has been providing exams, a fully fitted radio shack with a workshop and various technical classes for many years.

Certainly, there has been, and will continue to be, some uncertainty in the near term. But would it not be more "in the spirit of co-operation" for the WIA to accept it lost the tender and offer a constructive, collaborative relationship with AMC? Would it not be better for the WIA to:

a) congratulate AMC and willingly hand over the exam question bank – surely this is a good thing for the hobby?
b) actually work proactively with AMC to ensure a smooth take-up of services; encourage assessors to continue their good work.
c) maybe suggest some opportunities to reduce prices for pensioners and young people once the processes are bedded down?; and finally,
d) perhaps help in the future to move to a modern delivery platform thereby offering even more benefits to all parties?

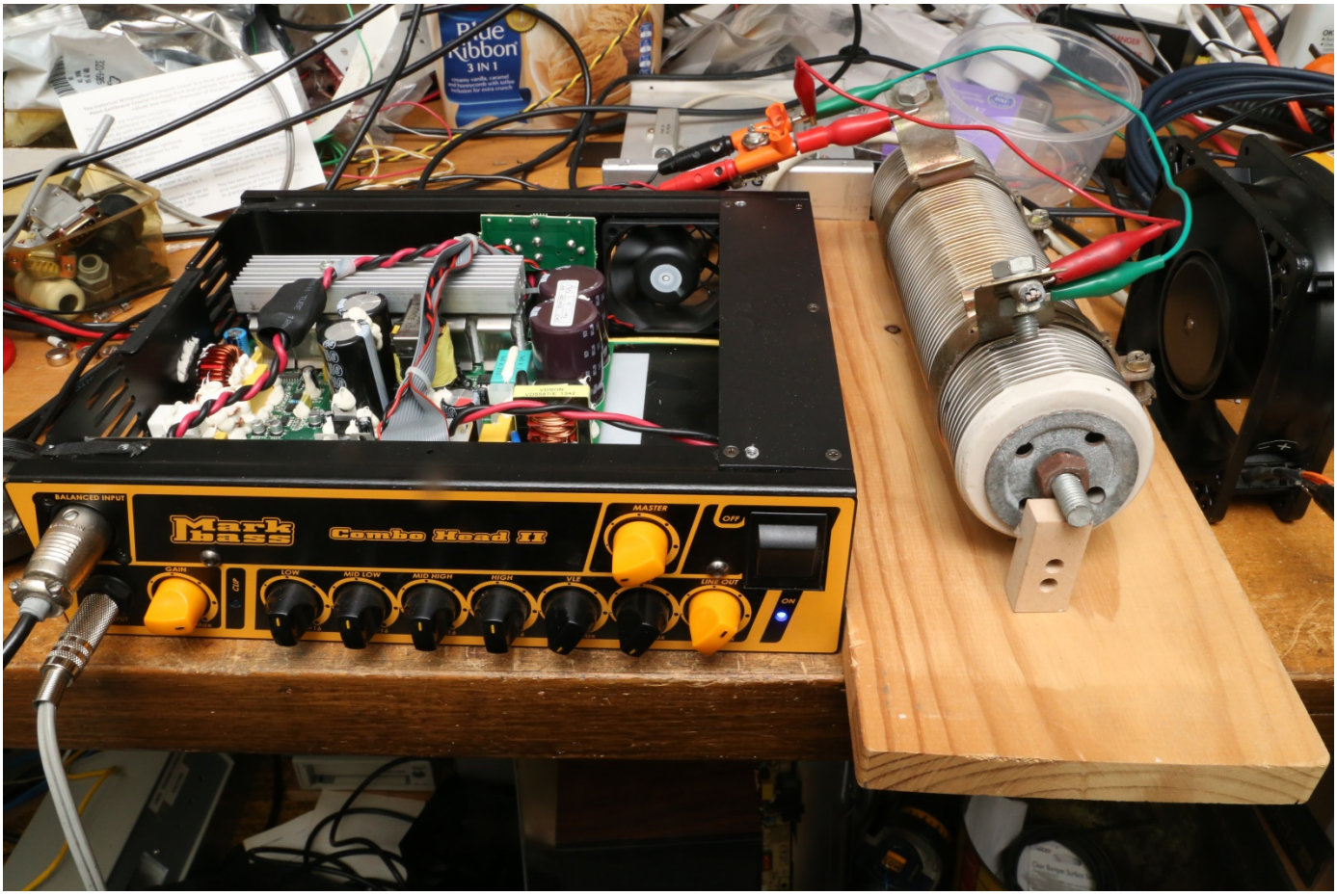
Wouldn't this be better for the hobby?

Should Mr Giles-Clark revisit his own words? "*It is the view of the WIA Board and the WIA Education Group that anything other than a smooth transition to the AMC will damage the already fragile amateur radio community."*

As an affiliated club, how do you think GGREC should respond to this situation?

73, Chris VK3QB

High Power Audio



Recently I was given a “Mark Bass” bass guitar speaker/amplifier to repair. A quick check with a microphone (I am not a muscician – see I can’t even spell it) Lots of distortion ensued, and the speaker cones seemed to be pulling inwards, so I kind of suspected a faulty output stage where either one of the output devices had failed, or we were missing a supply rail

Normally you have two symmetrical supplies, say plus and minus 50V, connected to two transistors; one supplies the positive signal swing, the other the negative swing. If you lose one, then half the signal is lost resulting in plenty of distortion.

When I finally removed the amplifier out of the speaker box, I was in for a surprise, this thing is extremely compact & quite powerful, rated at 500W into a 4 ohm load. To get all that power with almost no heatsink, they were using a class D switching amp. Not only that, but the main DC supply to run it was also a switchmode. So no big transformers or heatsinks. it’s quite light.

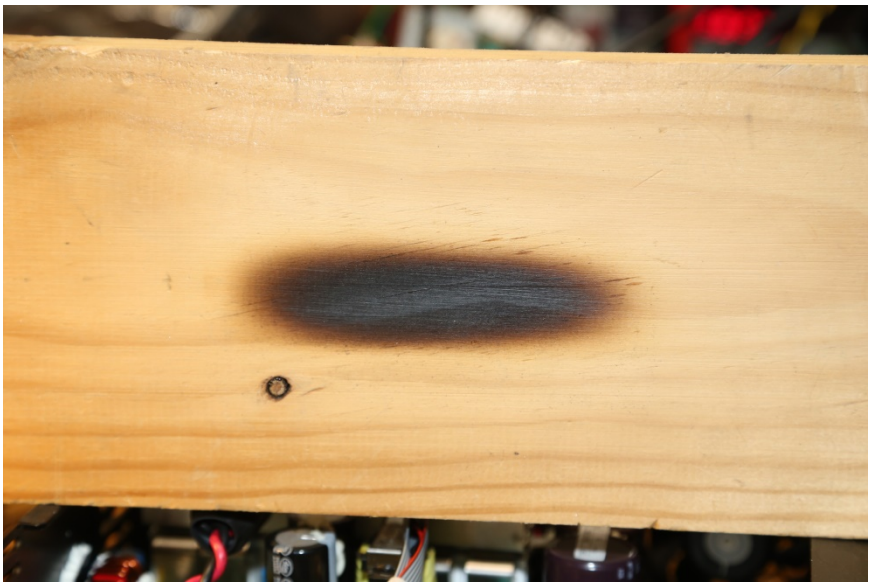
Normally to test an amplifier, I’ll use a 6 ohm dummy load. I made up this one from some Telstra scrap years ago; however it was not going to cut it on this amp. I did run it for a short time but it got too hot far too quickly.

10 seconds of audio was about all it was good for, I’m amazed I didn’t destroy it.

Then I remembered I had a pair of spare motor start resistors from an old lift where I used to work at Telstra in Carlton.

Well, that's what I think they were used for, there were 3 of 'em, for 3 phase power, I guessed they formed some type of soft start for the lift motor.

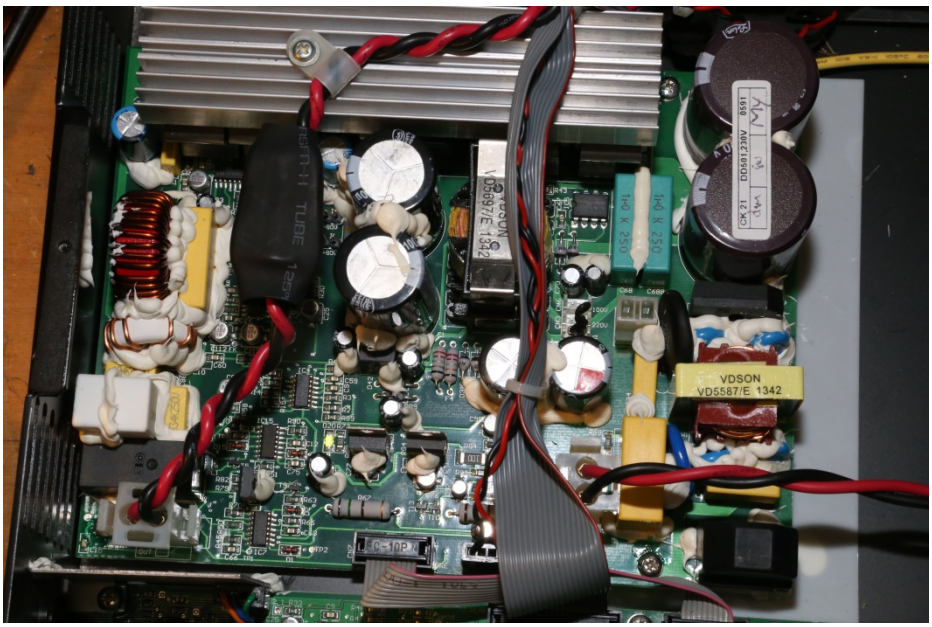
This one measured about 6 ohm's, so I moved in the end taps (basically hose clamps) till I had 4 ohms. Now we are talking, so I could wind the amplifier up to full output. I thought I better put some scrap under it just in case, a well-founded thought as it eventually hit 270^{O}C, then the smoke got out.



I ended up propping up one end of the resistor and placed a fan alongside to cool it off.

I'm sure that if I had properly mounted the resistor it could have taken the load all day. But then again working near something at near 300^{O}C is probably not a good idea.

Quite a while ago Aldi had these non-contact thermometers for sale, perfect for measuring the heatsink & dummy load temperatures.



This is the main board, both power supply & audio amplifier on one board, it's actually quite scary to work on.

The red and black twisted wires on the right are the 240V mains input, whilst the red and black on the other side is the speaker output!

The only thing stopping you from mixing them up is the mains cable is too short to make it over to the speaker connector.

SILICON LABS

Si824x

CLASS D AUDIO DRIVER WITH PRECISION DEAD-TIME GENERATOR

Features

- 0.5 A peak output (Si8241)
- 4.0 A peak output (Si8244)
- PWM input
- High-precision linear programmable dead-time generator
  - 0.4 ns to 1 µs
- High latchup immunity >100 V/ns
- Up to 1500 Vrms output-output isolation, supply voltage of ±750 V
- Input to output isolation for low noise (up to 2500 V)
- Up to 8 MHz operation
- Wide operating range
  - –40 to +125 °C
- Transient immunity >45 kV/µs
- RoHS-compliant
  - SOIC-16 narrow body

Ordering Information:
See page 25.

Applications

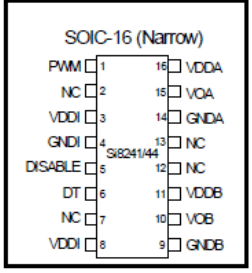
- Class D audio amplifiers

Description

The Si824x isolated driver family combines two isolated drivers in a single package. The Si8241/44 are high-side/low-side drivers specifically targeted at high-power (>30 W) audio applications. Versions with peak output currents of 0.5 A (Si8241) and 4.0 A (Si8244) are available. All drivers operate with a maximum supply voltage of 24 V.

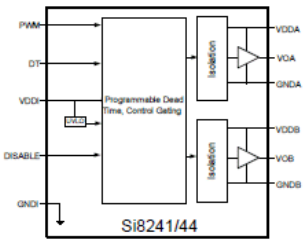
Based on Silicon Labs' proprietary isolation technology, the Si824x audio drivers incorporate input-to-output and output-to-output isolation, which enables level-translation of signals without additional external circuits as well as use of bipolar supply voltage up to ±750 V. The Si824x audio drivers feature an integrated dead-time generator that provides highly precise control for achieving optimal THD. These products also have overlap protection that safeguards against shoot-through current damage. The CMOS-based design also provides robust immunity from latch-up and high-voltage transients. The extremely low propagation delays enable faster modulation frequencies for an enhanced audio experience. The TTL level compatible inputs with >400 mV hysteresis are available in PWM input configuration; other options include UVLO levels of 8 V or 10 V. These products are available in narrow body SOIC packages.

Pin Assignments



Patents Pending

Functional Block Diagram



The power supply produces plus and minus 80V, which then goes into a push pull pair of transistors directly run from a class 'D' amplifier chip.

According to the data sheet it can handle supplies up to +-750 volts, or 1500V single ended.
Now that could lead to some serious ear damage.

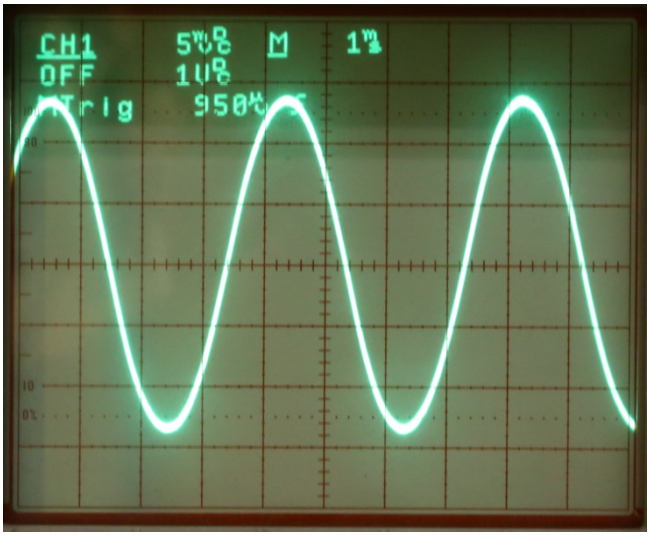
In one way this IC does make for some extremely compact amplifiers, because apart from this chip and the two output transistors (FET's) there is almost nothing else.

Class 'D' certainly seems to be the future, it gets us quickly past all the conventional amplifiers troubles with all their crossover distortion issues and cures.

I've been watching a few YouTube videos from high-end audio companies, they like 'D'.

One YouTube channel I watch is the "PS Audio" channel; Paul McGowan explains quite a few concepts.

Anyway, back to this amplifier, I did notice one extra 'feature' I didn't like, the output devices are not directly attached to their heatsink, but by small isolators that are about 1.5 mm thick. Now I think I know why they did this, these FET's are switching at quite a high frequency, and the last thing you want is some extra stray capacitance to slow down the switching times, something like a large aluminium heatsink. I can think of only one material, Beryllium oxide.
So (just like a lot of RF transistors, you have to be careful not to scratch or abrade these blocks, tricky if you are trying to remove an attached transistor. Be careful it is **EXTREMELY** toxic.



Unfortunately the fault appears to be rather intermittent, that and the fact a circuit diagram is not readily available, (Only to certified repairers) tends to make me want to give up easily and tell the owner to take it back to where he got it from.

Some gear just isn't worth all the trouble.

Paul VK3TGX

Club Information

Meetings 20:00hrs on third Friday of the month at the
Cranbourne Guide Grant Street Cranbourne
Prac nights first Friday in the Peter Pavey Clubrooms Cranbourne 19:30hrs
Visitors are always welcome.

Office bearers

President	Bruce Williams	VK3BRW	Web Master	Mark Clohesy	VK3PKT
Admin Sec	Michael Van Den Acker	VK3GHM	Magazine Editor	Paul Stubbs	VK3TGX
Treasurer	Chris Chapman	VK3QB	Property Officer	Bruno Tonizzo	VK3BFT
General 1	Barry Hamilton	VK3ABH	Assoc. Secretary	Ian Jackson	VK3BUF
General 2	Bruno Tonizzo	VK3BFT			

Call in Frequencies, Beacons and Repeaters

The Club Station VK3BJA operates from the Cranbourne Clubrooms.
6m Repeater Cranbourne VK3RDD, In 52.575 Out 53.575 CTCSS none
70cm Repeater Cranbourne VK3RGW, In 434.475MHz Out 439.475MHz CTCSS 91.5Hz
VK3RGW Repeater supports Remote Internet access (IRLP), Node xxxx. (Offline)
70cm Repeater Seaview 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 (currently inactive)

Membership Fee Schedule

Pensioner member rate $40.00 Extra family member $20.00
Standard member rate $50.00 Junior member rate $25.00
Fees can be paid by EFT to BSB 633000 - Account 146016746
• Always identify your EFT payments
• Membership fees are due by each April Annual General Meeting (AGM)

Magazine Articles to editor@ggrec.org.au Cut off, 10th of the month
All other Club correspondence to: secretary@ggrec.org.au
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