

OSOP RJAM implemented by Peter Gray, SAA
3 CHANNEL SEISMIC RECORDER



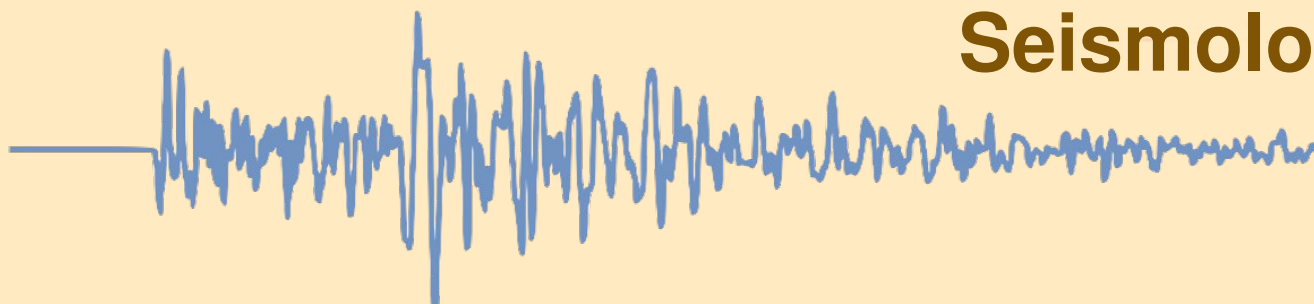
A Raspberry Pi Model 2B V1.1
Single Board Computer application

Optimised for Kinometrics SS-1 Ranger Seismometers

Nominal 12VDC Input
with battery backup

Seismometer Connector
XLR & MS3116F14-19P

**Newsletter of
the Seismological
Association of Australia Inc. Jan-Feb 2020**



Seismological Association of Australia Inc.

Newsletter of the
Seismological Association of Australia Inc.
PO Box 682, Mylor SA 5153

Your Committee

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The SAA can be contacted by post to the
address above, or by email to any member of
Committee, as listed above

Membership of the SAA is open to all, with the
only prerequisite being an interest in seismology.
Membership applies for the calendar year
(January through to December)

Membership fees are:
Full member \$50

A Membership application form can be obtained
from the Treasurer by email or [download it here](#).

Member Submissions

Submissions for inclusion in the Newsletter are
welcome from all members; please note that
submissions may be held over for later editions.
Wherever possible, text submissions should be
sent via email in almost any word processing
format. Your name may be withheld only if
requested at the time of submitting. Images
should be high resolution and uncompressed,
although high resolution JPEGs are acceptable.

All enquiries and submissions should be
addressed to the Editor and preferably sent by
email to weaksignals@iinet.net.au

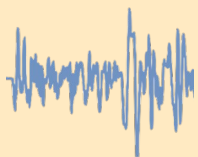
A word from the Editor

My apologies for the lateness of this issue, there
has been a lot going on behind the scenes so far
this year and sometimes I'm just a little slack.
I was also hoping that there would be a late
submission to help fill out a few more pages but
that didn't eventuate either. There are a couple of
articles in the pipeline but as they are about
seismic software, I like to get them working with
actual examples before publication, rather than
cut & past images from the internet and pretend
it's easy to install and implement.

Just a quick reminder that your annual
membership may now be overdue, assuming that
you may have overlooked it.
We (the Committee) appreciate your ongoing
commitment to the association and look forward
to your continued support for the aims and
objectives of the association.

Thanks again for renewing your membership.

Peter Gray



SAA News

Telstra does it again

You might remember a short article in the last issue about a couple of modems that went rouge and racked up a \$21k bill in a couple of weeks. Fast forward to the next billing cycle and surprise, surprise, the same thing happened again but this time we were down the hole for another \$15,000. Telstra has agreed to wipe our original bill and we have only had to pay our usual monthly amount.

Our first Bunnings BBQ for 2020

On January 23rd, we conducted our first BBQ fundraiser for the year. Fortunately the weather was kind, apart from an early shower, which slowed the setup process somewhat. As usual, lots of people made themselves available to help and the day went by without any problems, my thanks to everyone that attended and made it a success. Being a Thursday, the demand for our product was slower than we might have liked but we manage to make sufficient cash to pay for a couple of months of our phone bill. If we are lucky, there may be some additional opportunities throughout the year to bolster the SAA's bank balance.

Voluntary Work Approvals

The SAA has been approved to host job seekers who are undertaking voluntary work as an approved activity.

What this means: Under social security law, job seekers receiving an income support payment with mutual obligation requirements must show they are actively looking for work and are participating in a range of approved activities that will help them into employment. Some job seekers are permitted to undertake voluntary work for an approved organisation in order to meet their mutual obligation requirements.

Job seekers who wish to complete voluntary work for your organisation

and have this recognised as an approved activity will need to obtain separate approval from their Employment Services Provider or the Department of Human Services. You may be required to complete a form to verify the job seeker's voluntary work arrangements (for example, the number of hours volunteering at your organisation) as part of this process. If you think that you may qualify for voluntary work and have some skills that will benefit the association, please contact Secretary/Treasurer Joe Grida for more details.

Palmer & Mt Rat are back online

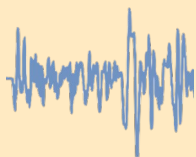
Another EchoPro was sent over to Mt Rat (MRAT) recently to replace the moisture damaged unit that featured in the Nov-Dec 2019 issue. The damage is not as extensive as it looked in the image(s) and there may be some life in it yet, but only some extended testing will tell. Blair & David ventured out to Palmer (PLMR) earlier in January to resolve the SATCOM issues being experienced from the radio quite site. While the service was restored, there are some lingering doubts about its long term reliability and alternate comms options are being considered.

And Kelly Hill Cave isn't online

It is sad to report that our old site at Kelly Hill Cave (KELC) was destroyed in the Ravine bushfire which engulfed a massive portion of Kangaroo Island recently. The SAA's responsibility for KELC ceased when Geoscience Australia took over the site in 2018 and upgraded most of the equipment. It is not known if or when the station will be replaced anytime soon, higher priorities are still to be addressed. We hope that it was not the last we will ever hear from this site.

Another new year and another Newsletter

I understand that just about everyone has had some unusual experiences this summer and the last couple of months have been very trying for many. Please feel free to use this Newsletter to share your experiences with your fellow members and submit something to the SAA Newsletter.



National Radioactive Waste Management Facility - Wallerberdina Station community ballot - 13 December 2019

The Australian Government acknowledges the outcome of the ballot in communities around Wallerberdina Station, regarding the proposal for a National Radioactive Waste Management Facility. The ballot, conducted by the Australian Electoral Commission (AEC), took place over a four-and-a-half-week period from Monday 11 November to Thursday 12 December, with the question posed to members of the communities being as follows:

“Do you support the proposed National Radioactive Waste Management Facility in your community?”

A total of 880 ballot papers were returned for scrutiny, 862 of which were formal votes.

Of those, 408 (47.33%) voted Yes and 454 (52.67%) voted No.

Minister for Resources and Northern Australia, Senator the Hon Matt Canavan, acknowledged the ballot result which demonstrates there is not enough broad community support for the proposal.

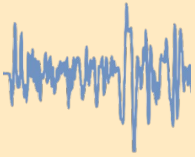
“While the community ballot was just one of many measures I am considering, I have said that achieving at least a majority level of support was a necessary condition to achieving broad community support,” Minister Canavan said. “This ballot does not demonstrate a sufficient level of support and I will no longer consider this site an option for the facility. I will make a formal announcement early next year on the site selection process, and would like to thank everyone who participated in the ballots and other consultation mechanisms.”

“I especially want to thank the communities of Hawker and Quorn for their patience and resilience through this process. They are a fantastic community that I have had the privilege to know better through this process. I want to especially thank Flinders Ranges Council, the Outback Communities Authority, all members of the Consultative Committee and Economic Working Group, the Adnyamathanha Traditional Lands Association and the Viliwarinha Yura Aboriginal Corporation.”

“While we will not be proceeding with a radioactive waste site at Wallerberdina Station, I will continue to work with the community to invest \$2 million through our Community Benefits Fund, and we will look for further ways to provide investment and benefits to the Flinders Ranges region.”

For more information on the project, go to: www.radioactivewaste.gov.au

Media contact: Minister Canavan's office 02 6277 7180



Could this be the future of PSN?

Introduction

Having been introduced to amateur seismology only recently, I have often wondered what the future of Public Seismic Networks (PSN) might look like and how the next generation of equipment available to us would be applied. The introduction of OSOP's Raspberry Shake was interesting mainly for its small size, moderate cost and the considerable amount of backend support built into the product. The trouble (as I saw it) was the original Raspberry Shake product line was based on built-in geophones.

We had access to a reasonable number of serviceable but ageing passive and active seismometers but the digitisers were becoming obsolete and difficult to replace. Then along comes the RJAM, a Raspberry Pi Hat 24bit digitiser with three configurable channels available, operating at 100sps and the backend support is still there too. While 100sps is probably slower than one may really like for short period seismometers, it should be adequate for many basic seismic applications that an amateur might want to get involved in.

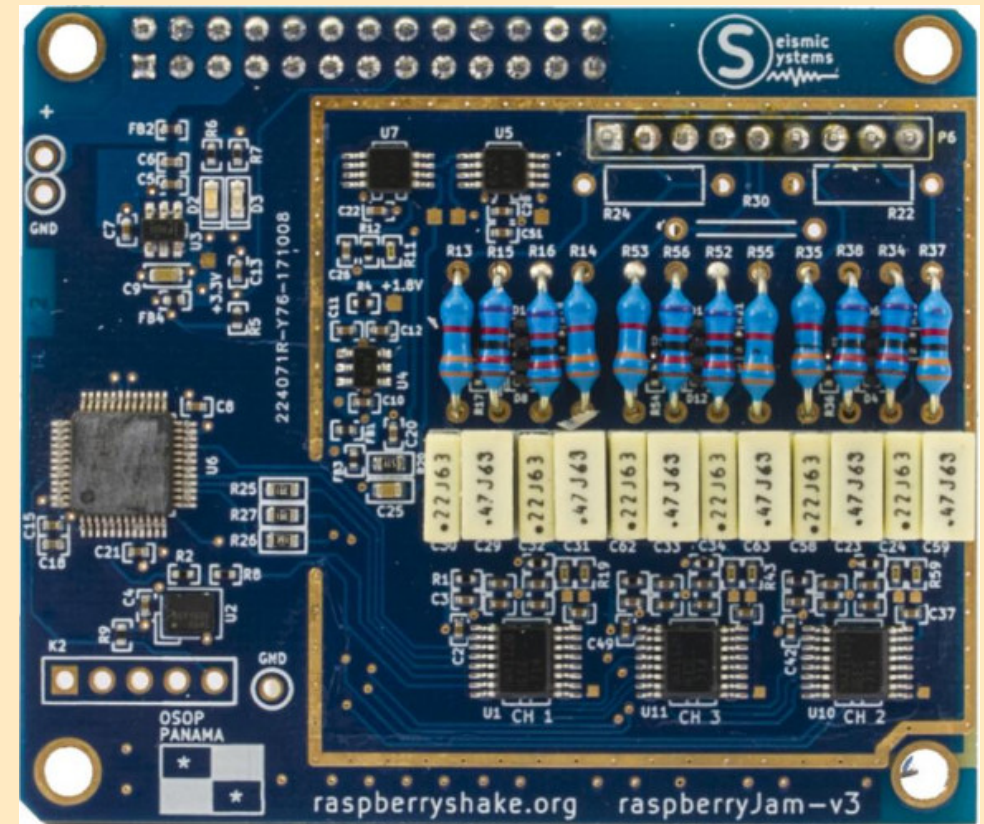
The pool looks cool and inviting

Dipping my toe into the water, I began my purchase of an RJAM by ordering one in early August, 2019 from a UK based company who advertised an "IoT Universal Digitiser (Board Only) | Raspberry Jam" on their website. With a "WE SHIP WORLDWIDE!" banner at the top of the page and pricing in AUD further down the page, I paid my money and received notification of an order in the works and a lead time of 14 days. I patiently waited for three weeks and tried to get an update from the company to no avail, so the order was cancelled and my money returned. Next day, sales staff (same company) emailed me suggesting that if I ordered again, they would be able to supply the RJAM. I'm up to my ankles by now and getting a little impatient, I complied with their request and placed another order. September came and went, as did October and November without any feedback or progress. Feeling that I was drowning at this point, I once again cancelled the order. Just prior to Christmas 2019,

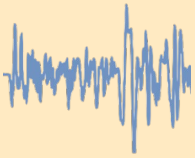
A personal journey (sigh) - submitted by Peter Gray

I received another full refund. Can someone please throw me a towel?

I'm not sure whatever the problem was, or who was the cause of it, but I was determined to try again in the new year and get my hands on one of these things. It was time to remove one unnecessary source of confusion from the process and order an RJAM direct from the OSOP website, even though it was going to cost considerably more.



The RJAM Raspberry Pi Hat (RPI not included)



Could this be the future of PSN?

Ordering and Customisation Options

OSOP allows its customers to determine how you want the three channels configured for your seismometer(s) of choice.

For passive & active instruments: There are several models which have been evaluated and tested, there is a dropdown selection available on the website. My own choice was the Kinemetrics SS-1 Ranger option.

The SAA has about six SS-1 instruments, several of these are in the field and the remainder are in storage and may be available for testing purposes. This customisation service justifies a US\$75 charge on the product price. You will need to be able to provide individual instrument calibration information, sensitivity, coil resistance, critical damping resistance figures etc... There is also an option to "I will do customisation" If you choose "I will do customisation" the US\$75 charge is deducted from the final price (so I have been told by OSOP).

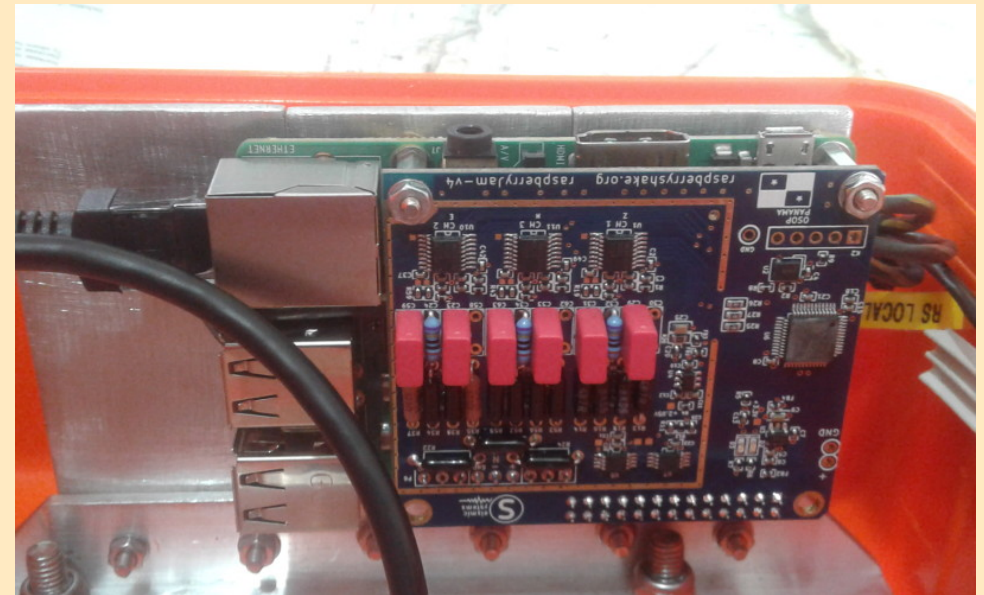
Be aware there is one further customisation option on the dropdown list

Other - Pay US\$120/hr for other (Specify in Order Notes)

This appears to be an open ended charge (a blank cheque) for OSOP to determine the characteristics of your instrument (bear in mind that they don't have one to test with and may ask you to send one to them). This could end up coming close to, or exceeding, the cost of your original order. As I stated earlier, buyer beware.

Customisation also adds considerable delays to delivery due to additional production and testing activities. Individuals should qualify for the Home/Classroom Use Option which removes the US\$125 licence fee for professional institutions, businesses, governments etc...

The US\$50 delivery fee via DHL is pricey, but it only took 7 days from Panama to Adelaide with excellent tracking and no involvement by Australia Post (it arrived as scheduled and undamaged).



Battery removed, the RJAM is mounted onto the RPi. While not really necessary, the HDMI & USB ports are still accessible.

While I was waiting for delivery

I'll need a Raspberry Pi: I prefer to use the Raspberry Pi 2B V1.2 because it doesn't have Wi-Fi and therefore only consumes about 2W of power. This means it runs cooler, batteries last longer during power failures but you do need a wired LAN connection. You can use the Model 3B+ without any problems if you don't mind the higher power consumption but OSOP do not recommend the Model 3B, if you want to use Wi-Fi. This is due to radio frequency interference noise induced by the proximity of the Wi-Fi antenna to the RJAM hat.

I'll need an enclosure: The SAA had a water damaged Kelunji Echo removed from a site at Strathalbyn. This Pelican case had been gutted and stored in David Love's shed for some time. With some minor modifications and a fair amount of polyurethane glue, the unnecessary holes were plugged and connectors fitted, things started to take shape.

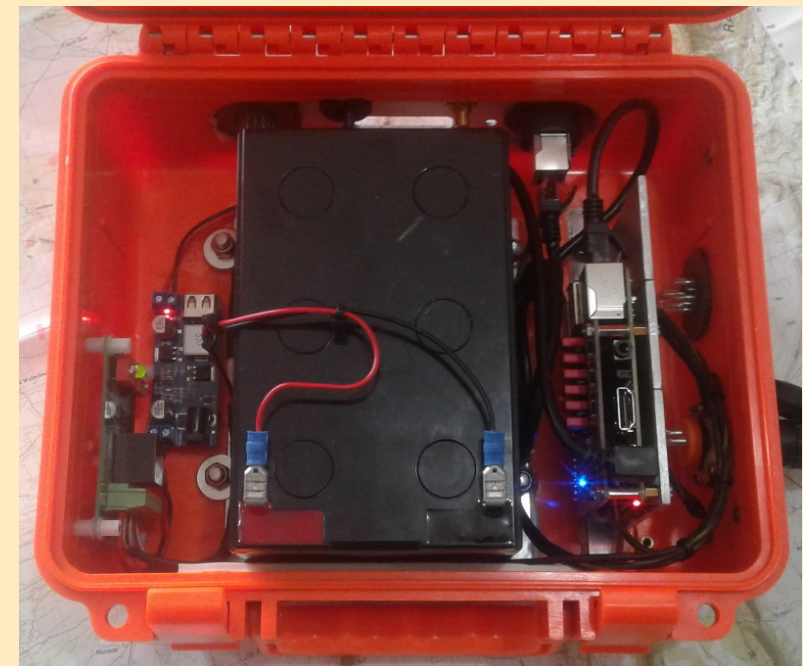


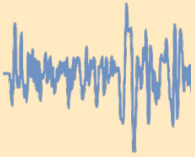
Could this be the future of PSN?



I'll need some input connectors: Two sensor connectors were fitted, one XLR socket was used for a single vertical (Z) passive SS-1 seismometer input and a MS3112F14-19S (Echo/EchoPro compatible) for either multiple SS-1 connections or other passive / active triaxial seismometers. While not an optimal solution, the Z channel inputs are wired to both connectors.

I'll need a power supply: A Panasonic 12V, 15AH SLA Battery was chosen as the primary accumulator, maintained by a CTEK #1047 (XS 0.8) battery charger. There were some power management components recovered from a previous PSN project (see SAA Newsletter #9) available to be re-used. Battery protection from excessive discharge is provided by a Low Voltage Disconnect Module, CZH-LABS #D-1077/12V. Finally a 12V-5V DC-DC Converter was used to reduce the battery voltage down to a suitable level to power the Raspberry Pi.





Could this be the future of PSN?

Conclusions

I've only had this recorder operating for a couple of days so I don't want to draw any conclusions on the RJAM product at this stage. There are a couple of bugs in the current version (V0.16) of the software which are annoying but the Raspberry Shake Online Forum was quick to identify these and an update solution is being rolled out across the network.

I used a 32Gb microSD for my system which should allow me to store plenty of data, if needed.

The web browser interface is wrapped up quite securely, primarily to deter hackers from corrupting the stations and to a lesser extent, stop users from doing the same. If you're familiar with Linux command line operation, you have more access to the system files via SSH and can add your own touches to the way things are run.

Would I buy another RJAM?

Yes I would and I am counting down the days before my next order. In case you are in any doubt, I will be opting to "I will do customisation" Perhaps by the next edition of the Newsletter, I will have a better understanding of this machines capabilities.

**This is the webpage that you will encounter when you log into the RJAM Raspberry Shake software.
It's pretty much a system configuration / status page with some options available across the bottom to access system functions.**

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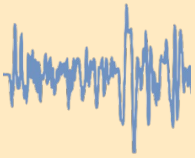
Raspberry Pi Model:3 Model B+
System Status:RUNNING
System Version:0.16
Ethernet Local IPv4:10.1.1.81
Ethernet MAC:b8:27:eb:46:a3:73
Data Producer:ON
Data Consumer:ON
Stand-Alone:OFF
Data Forwarding:ON
Server Connection:Connected
Latitude:-35.4834
Longitude:138.6784
Elevation:190 m
System Time:2020-02-11 05:59:09 UTC
Disk Usage:12% Used -- 26419Mb Available
CPU Temp:50 C / 122 F
Uptime:0 Days 4 Hours 33 Minutes

GO TO SHAKENET

GO TO STATION VIEW

DOWNLOAD LOG FILES

English

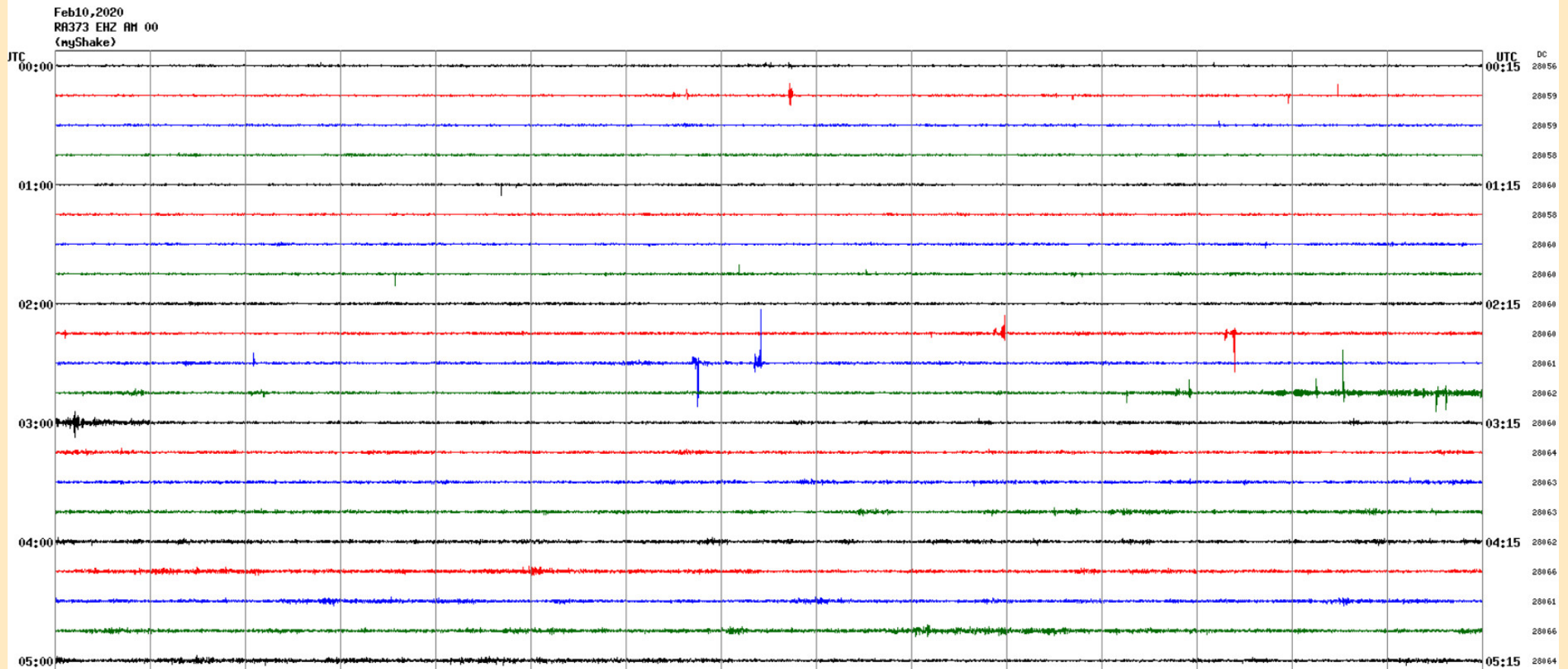


Could this be the future of PSN?

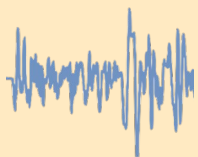
Raspberry Shake



www.raspberrypishake.org



The Helicorder plot (cropped) created by the Raspberry Shake software which controls operation of the RJAM and Raspberry Pi.



Resources & useful links

Description	URL / Webpage	Notes
SAA Membership Application	https://www.assa.org.au/media/74629/saa-membership-	Join up with the SAA using this form
SAA Flier	https://www.assa.org.au/media/74629/saa-membership-	Our current brochure - flier, saying what we do
SAA Newsletters	https://www.assa.org.au/resources/technical-special-	Download any SAA Newsletter from this site
SAA EqServer	http://ade-eqserver.dyndns.org:8080/eqserver/	South Australian miniseed seismometers
Melbourne University EqServer	http://meiproc.earthsci.unimelb.edu.au/eqserver/	Australian miniseed seismometers
Regional Seismic Network	http://www.regional-seismic.net/	PSN seismometers - Aust. Centre for Geomechanics
Australian Public Seismic Network	http://cqsrg.org/psn/stations/	Australian PSN seismometers
Recent SA Earthquakes	http://earthquakes.mappage.net.au/q.htm	Data & summaries of recent SA quakes
Central QLD Seismology Research Group	http://www.cqsrg.org/	CQSRG - Kevin McCue
Astronomical Society of SA	https://www.assa.org.au/resources/technical-special-	ASSA - Seismology page
Geoscience Australia	http://www.ga.gov.au/earthquakes/initRecentQuakes.do	Our national authority on seismic events
QLD Uni Environmental & Earth Sciences	https://sees.uq.edu.au/	The University of Queensland - Col Lynham
Seismic Research Centre	https://www.src.com.au/	OEM of seismic instruments & software
symCDC	http://symcdc.com/	OEM of seismic instruments & software
IRIS Seismic Monitor	http://ds.iris.edu/seismon/	Global seismic events
Joint Australian Tsunami Warning Centre	http://www.bom.gov.au/tsunami/	Bureau of Meteorology site
Australian Earthquake Engineers Society	https://aees.org.au/	An organisation with similar interests
Atlas of the Underworld	http://www.atlas-of-the-underworld.org/	Mapping the Earth's mantle
Atlas of Living Australia	https://www.ala.org.au/	A Citizen Science initiative