

**ARM Nauru Research Station
RESET Visit 16N Report**

Visit Duration: 09 September to 27 September 2002

Denig District, Republic of Nauru

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A. Introduction

The main goals of the TWP Operations RESET16-N Visit (routine) to ARCS-2 at Nauru were the following: 1) Instrument calibration and comparison 2) MMCR repair 3) MPL replacement.

This Report is organized according to the planned tasks or work units performed during the RESET Visit. Within these work units the activities accomplished are arranged chronologically. Most of the information was out together by the RESET-16N members based on the actual visit, daily reports.

B. TWP Operations Management and RESET Visits

Once an ARCS Site is established, TWP Operations maintains the site and performs data reporting. TWP Operations also coordinated equipment retrofits at the established sites; accomplished by local NWS site personnel, routine RESET visits, and non-routine RESET visits.

Routine RESET Visits

Routine visits are scheduled on approximately six-month intervals and are focused mainly on routine maintenance, instrument calibration, instrument replacement, and training. A formal audit-in is performed upon arrival and audit-out before departure.

Non-Routine RESET Visits

Non-routine visits are intended for technical non-routine tasks such as emergency repairs, retrofits, and/or the addition of new instruments.

The work on the RESET visit is performed by the RESET team, but often in close coordination with the local on-site Observers. The team holds a daily, morning tasking meeting at the site using the proposed RESET visit, tasking schedule. After each day's work, the team meets to summarize work activities and an assigned team member writes a "Daily Report" and e-mails the report to TWP personnel in the U.S. Because of time-zone differences, necessary calls to instrument mentors in the U.S. are done in the morning.

Reset Members

- Rex Pearson (BOM)
- Troy Culgan (BOM)

C. Tasks Performed

1) Audit in – get all Config files before calibration starts.

09Sep

- All files except AERI collected, only got internet connection functioning again tonight will transfer files tomorrow

10Sep

- AERI files collected and all files transferred to FTP site: - /reset/reset16n/audit_in_config.

2) Move TSI stand to Skyrad location for comparisons.

11Sep

- Completed

3) Rad, Spare Rad, Cal Rad electronic Calibration

12Sep

- Cal Logger calibration checked

13Sep

- Gndrad logger calibrated

14Sep

- Skyrad logger calibrated, Config placed on ftp site

22Sep

- Skyrad cables tidied up and placed under logger cover as per gndrad

4) Radiometer Comparison testing

12 Sep

- Cal logger installed in field with 2 x PSP, 2 x PIR and 1 x NIP data collection starting from tomorrow

13 Sep

- Cal and Skyrad data for today placed on ftp site

14 Sep

- Nil data collected due overcast weather conditions

15 Sep

- Gndrad radiometers inverted for comparison testing
- Radiometer data placed on FTP site

16 Sep

- Radiometer data placed on FTP site
- Change out radiometers on cal stand – new Config data and cal logger data placed on ftp site

18 Sep

- Radiometer data placed on FTP site

19 Sep

- No radiometer data placed on FTP site weather conditions poor and overcast

20 Sep

- Radiometer data placed on FTP site

21 Sep

- Suspected faulty radiometer placed on input 2 of logger and a known good logger placed on input1 for comparison testing.
- B/W radiometer placed on cal logger for comparison testing with unit on tracker. Data will be collected tomorrow if conditions are good

23 Sep

- Radiometer data as per advice to Porch placed on ftp site. Testing of faulty radiometer, B/W comparison etc

25 Sep:

- Cal logger removed from Skyrad stand and packed for shipment

5) Radiometer change out

20 Sep

- Bill Porch to provide radiometer swap sensor positions tomorrow morning

21 Sep

- Chris Cornwall advised change out information. Gndrad and Skyrad radiometers changed out and instrument replacement forms completed and placed on ftp site.

6) Replace MFRSR head & logger bd (or train Observers to do it)

15 Sep

- Replaced MFRSR head and logger, checked alignment and level

17 Sep

- MFRSR data placed on ftp site

18 Sep

- Additional MFRSR data for 14th placed on ftp site

21 Sep

- Instrument replacement forms completed and placed on ftp site

23 Sep

- MFRSR failed – reporting bad data. Replaced with old unit and data is now ok. Reinstalled new unit for testing, data is currently ok- will monitor

24 Sep

- Data files still ok

7) Replace UVB

15 Sep

- Replaced UVB, checked level.

21 Sep

- Instrument replacement forms completed and placed on ftp site

8) Replace T/RH probe & fan (calibrate before & after).

13 Sep

- Spare TRH probe assy assembled on Smet tower for cal checks

14 Sep

- TRH probes cal checked

15 Sep

- TRH probe swapped out and logger coefficients updated

21 Sep

- Instrument replacement forms completed and placed on ftp site

9) SMET and Spare SMET Logger Calibration

14 Sep

- Logger Config file placed on ftp site
- Smet equipment calibration completed

16 Sep

- Spare SMET logger calibrated

10) Calibrate Barometer in SMET Logger

16 Sep

- Spare SMET barometer calibrated compared to DA standard barometer

11) Construct TSI stand.

11 Sep

- Completed and placed in TSI location

12) Logger EPROM 185...1.4 version upgrades (PIF 991124.2).

11 Sep

- Spare Skyrad/Gndrad logger prom change completed

12 Sep

- Spare Smet logger prom change completed Sno 023 WD25949 Baro P0B30005
- Smet logger prom change completed – Sno 300 WD24828 Baro 505303
- Smet logger - out of service 2134 9/11/02 returned to service 2230 9/11/02

13 Sep

- Gndrad EPROM changed and calibration completed

14 Sep

- Skyrad EPROM changed and calibration completed

13) Install MPL

12 Sep

- MPL installation commenced

13 Sep

- MPL installed and operating.

14 Sep

- MPL ingest working – need confirmation as to how to setup CorePC on laptop for MPL

16 Sep

- MPL audit out and configuration records collected

17 Sep

- MPL reboot procedure tested - will train observers on use tomorrow

18 Sep

- Trying to sort out MPL problems – data is marked bad. Log file attached please pass on to Conner

19 Sep

- Call from Conner helped identify the MPL problem. For some reason the resolution had changed from 30 to 300 meters causing the bad data identifier.

21 Sep

- 24 Sep
 - Changed unit ID number as per e-mail from Conner Flynn
- MPL Failed – Conner seems to think it is the detector. Laser is still working ok but no received signal. Unit is packed ready for shipment on Friday
- 14) Install MMCR parts (or review with Observers)**
- 09 Sep
 - MMCR ADC and MUX installed and tested. MMCR producing POP display – testing continuing
- 11 Sep
 - 28 volt supply voltage checked for K. Widener it was 28.03 volts, continuing to work on circulator temp fault display
- 12 Sep
 - Checked 28 volt supply from Radian interface thru divider resistors – 2.8 volts to Mux
- 13 Sep
 - Checked circulator temp problem – it appears there is a “strange” voltage reading from the RTD transducers – still checking
- 14 Sep
 - Rectified 28 volt supply reading. This was due to faulty replacement ADC unit. Original unit was ok but it appears the 488 bus was being interfered with by faulty Mux.
- 16 Sep
 - MMCR audit out records collected
- 21 Sep
 - Continued working on circulator temperature fault and checking on low power reading
- 22 Sep
 - Continued working on circulator temperature fault and checking on low power reading. Will send e-mail to Widener with current status for advice from Widener/NOAA
- 24 Sep
 - Solaris (DMS) computer has failed – appears to be the CPU board. There is no bios message on boot up indicating the basic computer is not working. Data is still being collected on the OS2 computer. K Widener will log in on a regular basis and transfer the data to Adam. This will mean the H&S page is red but the base radar is still functioning.
 - Observers have been instructed to monitor the receive signal to noise bar graph and to advise if it flat lines. This will require a reboot of the OS2 computer.
- 15) Change out IRT gold mirror (en route from SGP).**
- 09 Sep:
 - Mirror on ARCS2 site is in good condition. Does it need to be replaced or should mirror on site be held as spare?
- 11 Sep
 - Bill Porch has advised testing procedure
- 13 Sep

- Checked calibration of Sky and Gnd IRT's. Replaced mirror on Skyrad stand. Will post calibration sheets when typed up.

19 Sep

- Calibration sheet posted to ftp site. Cal details the effect of the mirror changes

16) Install AWS.

11 Sep

- Commenced work for tower foundation and trenches

16 Sep

- Conduits formed into place and run awaiting arrival of AWS equipment

16 Sep

- AWS equipment arrived – cables run in conduit

17 Sep

- TBRG (tipping bucket rain gauge) concrete pad installed

19 Sep

- Temporarily installed the AWS electronics, rain gauge, temp and humidity probe and the display console in the E van. System is functioning and displaying data in the E Van.

23 Sep

- Installed AWS sat phone and antenna in E Van as a backup to Nera unit in case cable fails before replacement arrives.

24 Sep

- Aligned AWS (temporary) windhead to allow system to be tested fully

17) Install VSAT foundation (NPC?) and conduit.

18 Sep

- Additional drawing sent to L. Jones showing angles for comment before work commences

19 Sep

- Antenna look angles provided by Bill Kornke indicated the antenna will be at an elevation of 73 degrees. This will reduce the height of the antenna by 1.5 + meters - clearing the skyline for the camel. After discussions with Bill K this morning we determined it would be safe to locate the antenna at the proposed location.

23 Sep

- Arranged for Vsat foundation work to begin tomorrow

24 Sep

- Foundation hole completed today, expect to have reinforcing in tomorrow

25 Sep

- Reinforcement steel and boxing installed ready for the concrete pour tomorrow (Public Holiday in Nauru today)

26 Sep

- Did not happen today due to a hydraulic hose problem on the front loader. This was repaired this afternoon – hoping for the pour tomorrow morning. Didn't happen Friday morning but hopefully Friday afternoon – water is now the problem

18) Change out AERI hatch UPS Batteries & AERI electronics UPS batteries (batteries at site).

11 Sep

- Battery change out completed on AERI Hatch and electronics UPS's

19) Check and replace AERI MADS power supply.

17 Sep

- Kim N is attempting to pick up another power supply in Brisbane on route to Nauru (ATX style)

19 Sep

- Kim N was unable to obtain a power supply in Brisbane

20) Gndrad FO bit driver troubleshooting, cable check for water.

18 Sep

- Cleaned up cables checked for moisture ingress and placed cables under protective cover of gndrad logger (Photo attached)

21) H2 Gen maintenance (Culgan)

10 Sep

- H2 generator maintenance commenced

11 Sep

- H2 generator maintenance completed
- Replaced rectifiers lead (from previous report) and require a replacement bolt assembly. We have made up a temp replacement, which is functioning normally, but require the correct part. This has been ordered via BOM in Melbourne.

12 Sep

- Replacement part due to be shipped via DHL 9/13/02

17 Sep

- Replacement parts machined by NPC and installed. Electrolyser is back in service and generating Hydrogen

22) Routine Maintenance tasks (see attached)

AERI checks

20 Sep

- As per request AERI hatch control and hatch checked and is functioning correctly

26 Sep

- Cleaned AERI rotating mirror and checked operation of optics. Intermittent alarm on scene encoder
Air Con filter changes
CIMEL battery check, belt change

14 Sep

- Cimel GOES battery 14.1 volts. Cimel electronics battery 12.7 volts Aligned level of instrument

17 Sep

- Audit out completed
- Logger pressure check

22 Sep

- Skyrad, Gndrad and Smet loggers pressurized
- IRT lens, mirror check

09 Sep

- Mirror checked and ok

- MFRSR level, alignment check

15 Sep

- Checked as per alignment procedure

17 Sep

- Audit out completed
- MMCR checks

09 Sep

- MMCR ADC & Mux replaced and MMCR rebooted and checked ok

17 Sep

- Audit out completed
- MPL checks

17 Sep

- Audit out completed
- MWR checks

09 Sep

- MWR rain sensor adjusted

11 Sep

- Sensor seems to be operating in a “funny manner” Have spoken to Vic Morris and asked for any advice on this. Subsequent to talking to V. Morris we pulled the heater assembly apart, cleaned the moisture out of the electronics area and checked all connections. Sensor seems to be operating normally now but will monitor

13 Sep

- MWR and BBSS data posted to ftp site for comparison by B. Porch

17 Sep

- Audit out completed
- Vehicle insp.

26 Sep

- Generally in reasonable condition, rust appearing on panels
- SAT phone check

09 Sep

- Sat phone functioning normally

11 Sep

- Antenna connections checked

21 Sep

- Sat phone antenna cable failed during antenna panning. On investigation cable has a nick in the sheath (inside the uni-strut mounting bracket), which has allowed water into the cable. The braid on the coax is totally corroded. We stripped back the sheath and layered braid from coax over the break then taped with amalgamating tape. Continuity checked ok.
- Placed back into service ok. Continued to pan antenna, lifted signal strength reading from 440 to 485 by moving antenna to due east and raising the elevation angle. (The satellite is at 178 Degrees – almost overhead from Nauru)
- A replacement cable has been ordered from the Nera agents in Perth and should arrive in Nauru within the week. The observers have been instructed how to replace the cable)
- Tracker lubrication

11 Sep

- Completed
- Van checks

19 Sep

- Water buildup on the front of the E van and heavy mold on roof
- WSI checks

13 Sep

- WSI filters changed, greased motor etc

13 Sep

- WSI still coming up with intermittent alarm – camera power – does not seem to affect operation of WSI – this has been an intermittent alarm since the new software was installed.
- Diesel tank gage change out

23) Radiometer ventilator work

- Remove ventilator internal fuses on spare ventilators.

21 Sep

- Removed all fuses
- Change ventilator screws to isoplast type

21 Sep

- Changed to isoplast screws where possible, several screws were beyond removal but radiometers could be adjusted successfully. The isoplast screws showing signs of becoming brittle in the 3 months they have been installed.
- Change out all Ventilator fans

21 Sep

- Ventilator fans changed out

26 Sep

- Found new ventilator during cleanup, will change out fuse in November

24) Observer training

- MFRSR head & logger board change out and send raw data

15 Sep

- Trained Robroy to change out the head and logger board

25) Ship back equipment

- Replaced IRT gold mirrors to SGP

22 Sep

- Require cable ties in various sizes

22 Sep

- Require additional sun block cream

24 Sep

- Packed ready for shipment
- Replaced radiometers to SGP (PIR, PSP, B/W, NIP, UVB, MFRSR, Anemometers, T/RH probe)

22 Sep

- Replacement records commenced and placed on ftp site
- Commenced packing radiometers for shipment, awaiting advise from B Porch h as to what additional units to ship back

25 Sep

- Continued packing up shipping items
- Spare Seacon bulkhead connectors to Darwin
- Cal equipment to Manus

16 Sep

- Cal equipment packed up and transported to TNT for shipment tomorrows flight.

26) Audit out

- Spares inventory
- Replacement records

25Sep

- Audit out details placed on FTP site
- Re-label faded labels

27) D Van Access system

09 Sep

- Faulty module isolated and Access system restored to operation Unit 5 Analogue module – Temp/Humidity/DC battery faulty – awaiting spare from Darwin

11 Sep

- Tightened all connections on both ends of cable (SAM components and UPS) Fault has not reoccurred since this - monitoring

12 Sep

- Spare Analog board installed restored functions. Placed MOV on 120 volt supply

28) I Van Access system

10 Sep

- Mains feedback fault – replaced faulty auxiliary switch on side of mains contactor in I Van. Had to turn mains off to I van to achieve this. This was done at 0200z till approx 0220z today.
- Commenced looking into I van ups fault

29) Ceilometer checks

15 Sep

- Compensation testing showed a problem with the compensation of the unit. Tried to adjust but nil response from alignment procedure. Unit will be removed and returned to SGP.

23 Sep

- Replacement Ceilometer arrived and placed into service, replacement records placed on FTP site

30) BBSS barometer calibration

16 Sep

- BBSS barometer calibration checked

31) BBSS antenna rust

18 Sep

- Rust prevention work commenced

19 Sep

- Antenna mount cleaned up and painted with Galmet paint

32) Green cable on mains board near U Van

18 Sep

- Cable is the earth for the surge protection on the SAM data line. There is no safety issue from this cable but will connect to earth to protect SAM equipment

33) Humidity readings

20 Sep

- Comparison readings from the AWS and Smet humidity readings were different to that which the observers were noting on the observation forms. We had an average of 76% from the electronic sensors and the wet/dry bulb readings were around 92%. The problem was traced to dirty wick and caps on the wet bulb thermometer. We advised the observers these must be changed on a weekly basis. After changing out the readings were within 2%.

34) CorePC audit

26 Sep

- As requested – audit of CorePC version numbers for Conner completed on operational laptops. Data will be sent separately to Conner and Larry Jones