

**ARM Nauru Research Station
RESET Visit 15N Report**

Visit Duration: 15 April 2002 – 26 April 2002

Denig District, Republic of Nauru

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A. Introduction

The main goals of the TWP Operations RESET15-N Visit (routine) to ARCS-2 at Nauru were the following: 1) Repair AERI Hatch 2) WSI Software Upgrade 3) WSI night light pollution shades 4) BBSS transition from RS80 to RS90 sondes and 5) H2 Generator Maintenance.

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-13N members based on the actual visit, daily reports.

B. TWP Operations Management and RESET Visits

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

- Troy Culgan (BOM)
- John Glowacki (BOM)

C. Tasks Performed

1. Repair AERI Hatch

15April

- Found that the circuit breaker in the 110Vac board had tripped off. Plastic cover over the hatch was removed and the system started collecting data at 23:30 UTC 14 April 02.

17April

- ABCVALS.num file was installed.

18April

- I have tested the AERI hatch UPS (APC 1000) and found that the battery capacity is down and these will have to be replaced. We have a spare, small APC UPS that we can press into service until these arrive.
- Make and model was the original hatch UPS: The original hatch UPS is an APC SU1000NET.
- Make and Model of Temporary Fix: Temporary replacement, APC 600.
- Required for Repair of damaged hatch UPS: The APC 1000 needs two new batteries. Batteries are 2 of type CBS GP1210F2 (12V 11Ahr (4 x 6 x 4 inches)).
- The AERI spares from the states arrived.

26April

- Today started with error flags on the AERI system. The error was with the scene mirror position and the LW and SW responses. After checking the hardware I followed the procedure in the book and shut the system down and did a shut down of the electronics and restarted the system. This reduced the error reading of the scene mirror from 999 to 3.5. This is not enough to change the error flag (Green is -2.5).

27April

- The AERI computer hung up while stepping through the pervious records. When it was re booted, the scene error message cleared. At present the AERI status window is all green.

28April

- After reviewing the documentation I shut down the computer system and power cycled the mirror motor drive unit. When I powered the unit back up all error messages cleared.

2. WSI Software Upgrade from Tooman

27April

- RUNWSI6M implemented.

28April

- RUNWSI6M- After sometime of operating unit indicated a RED flag condition, Camera not responding. However an image was present and it continued to collect images. A stop and restart of the program cleared the RED flag condition (note: this was a stop and restart program not a shut down and reboot).

29April

- Reference the WSI6M Red Flag Condition
The red flag condition was again observed at 0800 Local. S Key entered for further information, this showed the following when the red flag occurred

| Time | Mode | Sequence |
|-------|------|----------|
| 07426 | G | 0 |
| | | 20D |

All other parameters within specified limits

- Exit program and re-started, all appears well until around the same time, same time, same sequence.

03May

- Janet Shields determine that the camera is still not responding on a few images, but it is getting most of them successfully. She wants to see how the new code installation goes on Manus and Darwin. That will help give us a clue regarding whether it's a camera problem or something else going on, but in the meantime, the performance is almost at full capability.

3. WSI night pollution shade work.

16April

- Found a number of sources of light outside the shaded areas. These consisted of a row of lights at the houses up on the ridge behind the site. The other source is from the church building near the site.

25April

- Sent images for review to mentors and also placed images on the TWP ftp site.

27April

- WSI night pollution shade work surveyed the site after dark and found a number of sources of light outside the shaded areas. These consisted of a row of lights at the houses up on the ridge behind the site. The other source is from the church building near the site. Temporary screen erected.

29April

- Images verified by Mentor.

4. WSI Occultor adjustment – not required.

5. Replace TSI back up batteries and repair TSI

15April

- The MC13 Ethernet to fiber converter was found to be dead causing a connection problem between the instrument and laptop.

25April

- Batteries changed
- Replaced the media converter for the ARCS site TSI. This cleared the communications problem and I was able to do a loop back. I still could not talk to the TSI with the TSI communications. We have moved the unit into the I-van to try and talk to it directly but with no luck. We have run out of options to try and recommend that the unit be replaced. If the replacement unit comes already to plug and play the observers should be able to change it out. I have marked the layout position on the stand.

26April

- The batteries on both the units were replaced with charged units. The ARC site battery is reading 13.75V when the power is on. We are able to ping the TSI from the TSI laptop and the results show no errors.

02May

- Brought the ARC TSI into I-van and connected a keyboard and monitor to record the boot sequence. The only way I had id recording the results was to photograph the screen and send the results to Chuck Long. There were a number of differences between the ARC2 screens and the ones sent by Chuck.

6. Repair MMCR

15April

- TWT Amplifier found to be faulty.
- Installed new TWTA Amplifier System Up and Running.

30April

- Nauru MMCR developed a fault alarm for the ferrite
- Wave-guide switches. System Down.

7. Empty all gas bottles to be sent back and officially label “empty” for shipment

23April

- Spoke with Andrew in the afternoon about getting the empty gas cylinders removed from the site, this week. Made up “Checked Empty” label for laminating.

29April

- Completed

8. Remove MFRSR level bubble

16April

- Bubble level removed.

9. Remove NET from Grndrad stand

25April

- Removed NET Rad and shorted input leads.

10. Install hose and manual pump for new Diesel tank.

11. Laptop configuration inventory

12. Wire Outside phone ringer

13. I-Van UPS diagnostics

14. Clean out storage vans

15. Demonstrate to observers how to use new Radiosondes (model RS90-AG)

24April

- John trained Franklin and Henry on the handling of the new 90 series sondes. The packaging and layout for the sondes is very different with the Temp/ RH probe mounted on top on one side of the string and the exposed GPS antenna on the other. The biggest problem was working out placement and a holder for the launcher that would still protect the antenna and probes. With the help of the observer, John fabricated a holder for the sondes while still using the blower fan to keep the Temp /RH probes dry while launching. The fabricated can be installed by the observers once they us up the old sondes. Photographs are going to be posted on the FTP site.

27April

- Observers have completed three successful balloon launches using the 90 series sondes.

16.D-Van SAM diagnostics

15April

- John worked through the system and found that the Analog I/O block (5) was causing the breaker to trip. It was changed out and a relevant configuration was loaded from another van.

19April

- Block one had the original problem of tripping the main breaker for the SAM modules. I changed the block with a spare and this indicated a communications problem. I then found that the block address was wrong, and after talking with Rex, I changed the block ID to 1 and reloaded the program from block 20. After unsuccessfully trying to clear the communications fault on block 1, I changed the base unit. When I powered the SAM system back up the 24V dc power supply for the two I/O blocks failed. The rest of the afternoon was spent checking wiring and try to get the power supply up.

29April

- Changed the 9-pin D communications cable connector. The old one was badly corroded. We spent time working with the observers tidying up the site and the area outside the gate.

17. Check Status of MPL

15April

- Left hand air pump appears to be partly powered on and gets very hot.

21April

- Settings from MPL: PWRT: 0.86W, HRS1: 81E4, PWR1: 0.85W, CUR1: 2.00 Amps, TMP1: 20.9, MODE: Pulse, GPIF: 5, SYNC: on, FDBK: Pwr, BAUD: 9600, PRTY: none, DBIT: 8 Bit, SBIT: 1 Bit, FLBD: None

22April

- Connor Flynn determined LASER diode will need to be replaced.

18. Routine Maintenance Tasks

a) ACCESS/SAM Laptop

02 Jan

- Change Out APC Office UPS: Determined to have been completed by observers in January.

b) AERI maintenance list (on CD of RESET Manual)

16 April

- Actuate Hatch Sensor with Moisture/Check Hatch Operation Visually: Completed

17 April

- Clean Out Air Intake and Coarse Filter-Completed
- Inspect Blower Belt –Completed
- Change AC Filters-Completed

24 April

- Clean Mirror -Completed

c) BBSS

16 April

- Change-Out UPS Batteries-Completed
- Inspect bolts holding Antenna to Van: The bolts appear to be in good condition but the antenna stand has areas of heavy scaly rust.

d) Ceilometer

16 April

- Inspect Glass/Check for Nests: The unit is free of nests and clean. Warning (Invisible laser light) signs fitted to the side of the cover and top

e) CIMEL

18 April

- Check Battery Voltage: Checked the battery voltage on the Cimel (14.7V) and Goes transmitter (16.3V) and they are okay.
- Change out belt: Belt checked and it is okay.

f) Diesel Generator

24 April

- Test generator 12v batteries with Hydrometer-Completed
- Check diesel tank fuel gage operation –Completed
- Change out Fuel Tank Gage: This task could not be completed as the wrong gauge sent. The fuel gauges sent out are 1.5 inches were as the tank has a 2.25-inch fitting.
- Change out Fuel Gage Cover-Completed

g) Data loggers

23 April

- Pressure Check-Completed

h) H2 Generator: tri-annually (Culgan)

26 April

- Change out sensor cell in Gas Analyzer: Checked Ok
- Check water level in storage tank: Completed
- Change out internal battery in Gas Analyzer: Not Required
- Change out Velcro Strap Sonde Retainer in RBL: Completed

i) HVAC - Change out all ac unit filters (Capellies)

j) IRT

18 April

- Corrosion Check: Both units on the Skyrad and NIES stand are showing signs of corrosion around the connectors. This corrosion is much worst at the NIES site.
- Check Lens: Lens on all three IRTs are clean and clear of dirt and scratching.

k) MFRSR

21 April

- Check Level -Completed

- Check Alignment N-S-Completed
- Change out Head and perform head comparison calibration

l) MMCR maintenance list (on CD of RESET Manual)

16 April

- Check operation of 12VDC Fan for Lotech MUX 488/64-Completed
- Check Operation of Antenna Heater Element -Completed
- Check operation of Antenna Heater Blower -Completed
- Clean Receiver/modulator Interface -Completed
- Clean Computer filters (foam) -Completed
- Check Antenna Heater, Inlet, port Viewing Window –Completed

17 April

- Check Radome Fabric: The fabric is in good condition but there is one of the reinforcing loops that is starting to let go.

m) Check Radian Receiver Fan and Clean Filter –Completed

16 April

- Check TWT inline desiccant -Completed
- Clean TWT Amplifier Air Filter -Completed
- Change out Antenna Heater Filters-Completed
- Change out Fan for Radian Receiver, 12VDC-Completed
- Change out TWTA Desiccant-Completed

24April

- Clean 4mm Tape Drives-Completed

n) MPL

28 April

- Clean Top Glass 4 months -Completed
- Check Shade and Mechanism-Completed

o) MWR

18 April

- Rust Checks on Mounting Bolts: Main-mounting bolt is okay but the three leveling bolts are badly rusted and look as if they may be corroded into the adjustment plate.
- Check Fan Screen for Reduced Air Flow: Screen is clean; this heater unit was replaced approximately two weeks ago.
- Check Heater Operation: The heater was on when I checked the unit. I showed Franklin how to adjust the heater.
- Check Instrument for Level: Unit is level.

27 April

- Change Heater Unit: Troy Installed new Heater/Blower unit. The MWR .CFG file was changed in both the \MWR and MWR\Current directories at 20020425 05:48UTC.
- Check Teflon Window Condition: Replaced were showing signs of wear.
- Moisture Sensor Adjust:

p) NIP

April 18

- Visual Check Stainless steel body is showing signs of light surface rust but the electrical connector on the rear of the unit is showing heavy corrosion although this had not got past the rubber seals.

q) Phone Mgr

- Phone Mgr:
- Check Setup

r) Pickup Truck

17 April

- Inspect Vehicle for Damage -Completed
- Inspect for Rust-Completed

s) PIR/PSP

17 April

- Check Ventilator Operation and Screen-Completed

t) Sat Phone

22 April

- Check antenna and connections for rust-Completed

u) SMET

22 April

- Check ORG mounting pipe for rusting: The pipe is fine but the flange plate where it is mounted to the cement block needs to be cleaned free of rust and painted.

23 April

- Visually Check Tower for Animal Nests on Anemometer: Both identical labels on the anemometers have worn off and require replacement.
- Check TRH Fan for operation -Completed
- Drop Tower and Check Anemometer -Completed

v) Tracker, K&Z

23 April

- Grease (use Aero Shell #17 grease) Azimuth & Zenith worm gear drives. - Completed

w) Vans

22 April

- Inspect Vans for Rust: Found leak in U-Van work side and water inside of the door. A temporary hole was drilled for drainage of the water. The door will be re-sealed at a later date.
- Check Dehumidifier Operation/draining: Found units iced up in the E-van and I-van. The units were de-iced and returned to service.

29 April

- Change out CO sensing module checked the CO2 module. The fire alarm sensors on Nauru have been changed and do not require this task.

x) WSI

22 April

- Check Coolant Flow -Completed
- Check for Cloudy Coolant in lines -Completed

- Check for Corrosion: The metal filter housing on the white box is badly rusted and needs replacement. The anodized black plate around the dome is weathered and has become shiny.
- Check metal filter in blue box –Completed
- Service AC's on White and Blue Boxes: When initially inspected the blue box door was opened the AC unplugged. The unit was plugged in and appears to be operating correctly.
- Change out metal screen filter in White Box

27 April

- Check both Sealants to Verify Seal 4 months-Completed
- Check to See If N2 Charge Is Needed -Completed
- Check heater operation -Completed
- Oil the coolant pump Bearings -Completed
- Change Out Desiccant Cylinder in White Box
- Cancelled Change Out ARC Drive
- Cancelled Calibrate Occultor
- Not Required Calibrate Electronic Stops and Limit Switches
- Cancelled Verify settings after maintenance (FS=2.8, Focus = infinity)

19. Observer Training

22 April

- 22 April: Franklin and Henry trained on how to use the handheld monitor to check the SAM blocks.
- Observers trained on how to perform LASER check on MPL and what the different readings mean.

24 April

- Observers trained how to correctly use the new RS 90 Sondes.

20. H2 Generator Maintenance: Tri-Annually (Culgan)

21. Talk to car dealer to find out how much to “lease” a vehicle.

16 April

- Talked with Nicholas and there is no car dealer on the island with most people ordering second hand vehicles through a Japanese company, private sales or purchased from Australia. Observers have a preference for other twin cab with a boot liner and additional rust treatment.

22. Ship Back Equipment

16 April

- Analog I/O Block
- MMCR TWTA Amplifier
- The unit was shipped to SGP for repair.

23. Audit Out

- Spares inventory (Maestas directed)
- UPS inventory (Apple form)

D. Future RESET Visits

- Finish all uncompleted tasks (review the task summary).
- Spare Diesel Tank: Requires electric pump.
- WSI Parameters will need to be changed at the request of Janet shields.
- Investigate I-Van UPS possible grounding problems.
- NIP: Corrosion is present. Suggest that NIP be replaced.
Clean BBSS tape reader following procedure (it was suggested that this should be done at each RESET visit).