

**ARM Nauru Research Station  
RESET Visit 18N Report**

Visit Duration: 06 March to 17 March 2003

Denig District, Republic of Nauru

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## **A. Introduction**

The main goals of the TWP Operations RESET18-N Visit (routine) to ARCS-2 at Nauru were the following: 1) Install new SDL system 2) Installed repaired MPL 3) Attempt to repair MMCR.

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-18N 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)

## C. Tasks Performed

### 1. MMCR Repair

#### 07 Mar

- Pulse controller from Darwin does not fit into the MMCR rack and has different connectors. Checked pulse controller operation and the gate pulse now looks normal.
- TWT amplifier always goes into fault mode and has a “smell” to it.
- Paul provided some training on the pop software.

#### 07 Mar

- Email from Rex: “1. The pulse controllers are not a swappable item - if you remember the pulse controller here is a prototype, the front panel connectors for the switch and ND come from a single connector whereas on the Darwin unit there are 2 MS style connectors and they are different sizes. The rear main connector is a ribbon cable connector whereas the Darwin unit is a MS style connector. So these units are not directly replaceable - faultfinding the existing unit looked to be a good idea until the next stage was checked. 2. Firing up the existing system causes the TWT to go into fault mode – I removed the pulse drive with no effect then removed the RF drive – turned off the CUDC. The TWT still went into fault mode. Looking at the indicators it is failing on helix over current - I can see from the meter readings the TWT attempting to come up to idling current without drive but then fails. It may be worth trying to find out if there is a way of increasing the bias etc so that I can get it to operate so as to continue fault finding. We know the TWT worked in Darwin so don't expect it should be faulty unless the TWT was damaged in transit. (Heavy knock etc can cause damage or dislodgement to the helix). Let me know what you can find out - there's gotta be a way to get this going. Round 2 of the saga I have been able to determine that the pulse controller initially looks ok - I am now getting a good square pulse for the gate drive and other points look ok. That has taken one potential problem out of the equation. Also the Darwin controller is 2 u high whereas the one here is 1 u – wont fit in the rack!! No spare room. Now for the worsening news - there is a faint smell from the TWT amplifier – I am going to pull it out and have a look to see if there is anything obvious causing this and will let you know. Rex Pearson”

#### 08 Mar

- Continued checks on TWT amplifier spoke to Kevin Widener re problems

#### 12 Mar

- Attempted to install Solaris computer in MMCR
- X server is not recognizing the monitor (I assume as this all worked in Darwin – only the monitor has changed) E-mail sent to Widener and Eagan to seek assistance.

#### 13 Mar

- X server now working on the Solaris computer and network setup. Able to communicate to the computer from the data system. Have advised K. Widener.

#### 14 Mar

- Kevin advises he is able to access both the Solaris and OS2 computers.
- Continued work on TWT amplifier – removed unit from rack and found there was moisture ingress into the wave-guide at the RF out port of the TWT. Upon further inspection moisture and corrosion were noted on all of the wave-guide coming down from the roof. Signs of corrosion were noted on the coupler assembly joining the roof WG to the TWT WG and the receiver port. Drawing is attached showing components that will most likely need replacing. Pictures of the damaged sections have been sent to Kevin Widener.

## **2. AERI Repair**

### **08 Mar**

- Installed AERI computer, connected GPS, hatch controller etc.
- Setup up network connection and can ftp to AERI computer from laptop in E Van
- FTP path setup to c:/ftp – need this confirmed
- Ron Reed ensured collection was enabled on SDS

### **09 Mar**

- Collection/Ingest occurring on AERI
- AERI alarms checked and fault found on dirty connector (Centronics style connector on rear of signal conditioning electronics module)
- Conner logged in and confirmed the data is looking good plus provided training on AERI commands.
- Desiccant changed on AERI Interferometer.

### **11 Mar**

- Per Ralph Dedecker email to Rex: “Attached is a summary of a more detailed examination of the data we've seen and recommendations. While the current mirror drift is acceptable until the mirror motor controller box is replaced, I suggest that we increase the Encoder Scene Confirm variable (mirror drift tolerance) in the AESITTER.SCR file so that health and status we receive before the Computer box gets replaced does not flag all records red. This will allow us to detect further degradation that might truly adversely affect the data. Rex promised to deliver a bit more data that we will examine to confirm acceptable operation and to establish a tolerance window that is acceptable. My understanding is that Rex will be in Nauru until about 17 March. While I don't believe we can get the hardware there within that time window, we should be able to update the AESITTER.SCR file and send it to him. Can we get an estimate of when Rex will make his next visit to Nauru? We will schedule the hardware delivery to match that time. Ralph.”

### **12 Mar**

- Scene encoder alarm and RH alarm have cleared only alarm left is the computer temperature. Checking the environment it is cool so suspect a monitoring fault.

### **13 Mar**

- Scene encoder alarm back on – happened after rain so suspect it may be related to the motor drive as it appears to occur after the scene motor was turned.

### **15 Mar**

- AERI computer is playing up!!
- The system was checked ok this morning at about 10am then sometime after 1230 it was noticed to be doing a reboot – the sequence is as follows:
- It is booting after doing a chkdsk, bringing up the OS2 GUI with 2 dos windows showing the NFS ok and trying for the GPS (I think) the preheat indication in the bottom left hand corner indicates the preheat is completed. The timer is at either 60 or 180 secs
- It hangs at this point and finally reboots doing the chkdsk again etc
- Have sent e-mail to Conner and Ralph asking them to contact me or to provide a number and I will call them.
- There have been no power outages since this morning so power is not the problem.

### **16 Mar**

- Continued to check AERI. As reported yesterday the system was hanging on calling a time routine (nistime). The nistime function (getting time from NIST) was timing out and then the WDT was causing the AERI to reboot
- Got on to Conner (Thanks Monty and Conner) and we worked thru – 1st bypassing the WDT and the AERI booted ok. Then renaming nistime.exe to nistime.old causing the program to bypass the nistime call, then Conner found the location of the script calling this and I commented it out to stop it being called.
- The AERI was then rebooted and came up ok. We are not sure why this didn't fail on Friday – Conner is to follow up with the AERI people.
- Rebooted the AERI again at 4.30z to see if it would come up again as a test and all worked ok. The collection has gone green but the ingest is still red. Sent Conner an e-mail so that we can check tomorrow why this is happening

### **17 Mar**

- AERI checked and functioning normally. Files collected on collector appear normal but none being ingested. Conner is going to check tomorrow and advise if this is correct.

## **3. MFRSR change out**

### **07 Mar**

- MFRSR change out completed and leveled
- Supplied new cables were not long enough to reach existing logger location – this required the logger be moved to a new location to allow the leads to reach.
- As the new spare leads are the same length this ensures the observers can replace without intervention. Initial check of the data shows the 7 channels are working and the temperature has come up to near normal value. Data in the morning will confirm the temp readings

### **08 Mar**

- MFRSR shadow band alignment checked at solar noon.

### **11 Mar**

- Per email from Donna Flynn: “Currently the Nauru system looks good. All channels are operational and look reasonable. The head temperature is stable so the heater is functioning. I have about a two-day delay in getting the data here at

PNL so I have only been able to review data on 3/8 and 3/9. Both are cloudy days so it is difficult to verify the alignment yet but it seems to be okay. Hopefully we will see (or have seen since 3/9) some clear sky before Rex leaves so we know the shading is good. Donna Flynn”

**12 Mar**

- Email from Donna Flynn confirms data is ok so far – sent some more data for analysis

**14 Mar**

- Received e-mail from Donna Flynn confirming MFRSR data is good

**4. MPL bracket installation**

**07 Mar**

- MPL mounting bracket installed and MPL leveled

**5. SDS repaired hardware replacement**

**09 Mar**

- Hardware has not arrived yet

**10 Mar**

- Hardware has arrived will replace when SGP working

**11Mar**

- DS1 installed and DS2 reconfigured. System restored to normal configuration. Ron Reed is to monitor for any SCSI errors

**6. SDL install/training with Observers – Brad**

**07 Mar**

- Downloaded SDL Software

**12 Mar**

- Installed the SDL software on observers’ laptop and trained 3 observers in the use.

**13 Mar**

- Trained one more observer in the SDL operation

**14 Mar**

- Franklin is confident all observers can now do the SDL

**7. Observer Training**

- Sonde launch discussions on early flight termination

**09 Mar**

- Monitored early flight termination today. Error was due to bad telemetry about 45 minutes into the flight.

**14 Mar**

- Watched several flights – there is nothing obviously wrong in the procedure the observers use. I have seen several flights terminate early, they appear to be traveling normally then the telemetry abruptly stops and there is no

further data from the Sonde. I have monitored separately via my scanner and confirmed the same so do not suspect a ground system fault.

**16 Mar**

- Monitor launch today that failed. The balloon went aloft initially with good telemetry then the data stopped. Monitoring the carrier of the Sonde there was no modulation on the carrier so suspect the Sonde failed in the modulator area. Monitored the carrier for nearly an hour afterwards – the BBSS was able to also see the carrier and get an AFC lock but no data.

- IRT gold mirror cleaning training
- Completed
- Lock out/tag out procedure with Observers

**09 Mar**

- Initial training during the repair of the Electrolyser
- Procedures CD change – destroy old one

**09 Mar**

- Completed

**8. Record images of site systems and send to TWPO image library**

**14 Mar**

- Images recorded on camera will download back in Darwin (camera battery power low and forgot to bring my charger!! – site camera is faulty).

**9. Complete inventory (ask Andrea)**

**08 Mar**

- Inventory checks commenced

**09 Mar**

- Continued checks

**10 Mar**

- Continued checks

**11 Mar**

- Continued checks

**16 Mar**

- Inventory tasks completed

**10. Repair corroded tracker leveling bolts**

**09 Mar**

- Removed bolts, cleaned and coated with inhibitor. Greased tracker gear assembly. Leveled tracker again and checked alignment.

**11 Mar**

- Per email from Bill Porch: “I downloaded today's data from
- Nauru. The NIP data look fine (given cloudiness). I'm copying Peter
- (Gotseff) in case he sees something I don't. Bill Porch”

**11. Outfitter call restriction install**



**15 Mar**

- Attempted task but Sim reports wrong pin number – there is only 1 attempt left on the pin before a lockout occurs E-mail sent to Cheryl and Monty.

**17 Mar**

- Phone book created from supplied list. Spoke to Outfitters this morning and they requested I call back tomorrow morning – they are checking on the programming sequence.

**12. Maintenance Checklist****07 Mar**

- Maintenance checks commenced

**09 Mar**

- Continued checks

**10 Mar**

- Continued checks

**11 Mar**

- Continued checks

**12 Mar**

- Continued checks

**13 Mar**

- Continued checks

**16 Mar**

- Completed maintenance checks

**13. Check DC power system (loggers)****09 Mar**

- DC power system checked in E Van

**10 Mar**

- Checked wiring on Skyrad stand – fuse holder for Skyrad logger had high resistance joint and corroded wiring. Repaired – downloaded data and checked data system logger voltage

**11 Mar**

- Gndrad and Smet logger supplies checked. Repaired fault on Gndrad power supply – fuse holder clips tightened to remove additional resistance/voltage drop. No wiring configuration changes were made.

**14. Have Observers paint #1 and #2 on fuel tanks.****14 Mar**

- Numbers painted on fuel tanks “1” on the original tank and “2” on the new tank

**15. Install proper fuel level gauge on spare diesel tank.****09 Mar**

- Gauge has not arrived

**14 Mar**

- The required gauge has to sense in the vertical not use a swinging arm as it touches the side of the tank baffles and cannot show the level of the tank above about ½ full.

**16. D-Van I/O block repair**

**10 Mar**

- Power Trac block in D Van not reporting supply values.
- Configuration of unit has been lost – reprogrammed and tested ok

**17. Repair Electrolyser blower motor**

**09 Mar**

- Electrolyser blower motor failed – motor stalled and tripped the internal circuit breaker.
- Replaced motor – training observers on lock/tag out procedures in the process. Restored to service 0500z

**18. Check R1 computer failure**

**09 Mar**

- R1 computer was found to have locked up yesterday afternoon. During a power failure today the same occurred. This was due to a failure in the UPS power in D Van. R1 is plugged into the Clary UPS. The SDS did not fail as it is connected to the APC UPS.
- R1 is to be connected to the APC UPS tomorrow.
- 10 Mar 03:R1 has been connected to the APC ups – no more problems have been experienced during power outages. Contact sheet CS-2003-0192 refers

**19. Check D Van UPS operation**

**09 Mar**

- During a power failure today R1 computer failed. After investigation of the power supply it was determined it was connected to the Clary UPS whereas the SDS is connected to the APC UPS. During the power outage (before the diesel started) the Clary provided no output and the inverter light was off. Further investigation needed tomorrow BUT this is the cause of the alarm e-mails from the APC UPS in the D Van.

**12 Mar**

- Commenced checking UPS operation

**14 Mar**

- UPS in the D Van is in series with the Clarey.

## **16 Mar**

- Continued checks

## **17 Mar**

- Continued checks unable to fault UPS today – worked correctly every time

## **20. Configure I Van instrument laptops to run from APC UPS**

### **10 Mar**

- MPL, Ceilometer and MWR laptops connected to run from APC UPS to prevent transient failures of the I Van Clary turning the laptops off.

## **21. AERI Mads computer**

### **10 Mar**

- AERI Mads computer running and connected to the network. IP address is site address ending in .38. Need information on the setup to allow it to collect data from the AERI system.

### **11 Mar**

- Continued looking into setup

### **12 Mar**

- Borrowed AERI Mads keyboard for MMCR Solaris computer
- The original computer used an XT style keyboard whereas the replacement uses a PS2 keyboard

## **22. Reassign rocket port connections to match other TWP sites**

### **12 Mar**

- Planned to change today but waiting for the SDS upgrades to be completed.

### **13 Mar**

- Rocket ports changed this morning – data collection confirmed during next collection period.

### **14 Mar**

- Data collection functioning normally

## **23. Document replacement procedure for satellite system components**

### **15 Mar**

- Sent draft procedure/pictures to TWP office

## **24. Replace Smet aspirator fan**

**16 Mar**

- Smet aspirator fan replaced - failed during the night

## **25. Repair I Van UPS monitoring on SAM**

**17 Mar**

- Checked to see why UPS not registering on snapshot page.
- There is power to the analogue block but the block is not indicating anything. There appears to be no spare blocks onsite to replace the faulty unit.

## **26. Low priority**

- Red mark site drawings and update electronic drwgs while onsite
- Clean out transportainer (X, Y vans)
- Remove unused components/devices from vans (D, U, I, E Vans)
- Troubleshoot GOES H&S stream, files to Wallops (Wilcox).

**07 Mar**

- Confirmation required - I think Guy Wilcox sorted this out.

**12 Mar**

- No advice received

**12 Mar**

- Per email from Guy Wilcox: The 07 Mar 03 comment is correct, the GOES transmissions are getting to Wallops okay from Nauru.

## **27. Miscellaneous**

**08 Mar**

- Nic arrived back. Paul Johnston arrived

**11 Mar**

- Nic departed for UK.
- Paul Johnston departed for Australia