

**ARM Manus Research Station
RESET Visit 12M Report**

Visit Duration: 29 October 2000 – 10 November 2000

Papua New Guinea National Weather Service Momote Station, Manus Province
and
Papua New Guinea National Weather Service Headquarters, Port Moresby

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A. INTRODUCTION

The main goals of the TWP Operations RESET-11M Visit (non-routine) to ARCS-1 at Momote Airport on Manus, PNG were the following: 1) Replace the MPL Laser Diode; and 2) Perform DC Power Upgrades. Details of the RESET visit planning are found in Attachment 3.

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 put together by the RESET-11M 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 coordinates 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 a 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 12M Members

- Bill Kornke
- Larry Yellowhorse
- Larry Hatfield
- Dennis Morrison
- Colin Maxfield (Australian BOM)
- David Edwards (Australian BOM)
- Eric Fore (Kenmore)
- Francis Anuma and the Observers (PNG NWS)

C. TASKS PERFORMED

1. Install Outfitter's Inmarsat B Unit:

30Oct

- Installed Unit.

01Nov

- Larry H. worked on the satellite phone system, the fax machine was moved to the Evan so the observers could see if a fax was sent by only looking in one place. He also attached a second handset to the sat phone (voice #2?) which was also placed in the Evan for the observers to use. This way if an observer is in the E or D van they will hear the sat phone.

08Nov

- Larry H. has been working on getting the old Inmarsat radio to work, it would be useful for higher speed communication.

09Nov

- Sat phone card numbers and locations at Manus were sent to TWPPO. Extra card is atop ADaM.

2. Replace modem with new one, and install modem line surge arrestors:

01Nov

- The Telebit ADaM modem is still connected, but we haven't had a chance to check it out yet.

02Nov

- Larry Hatfield tested the new modem (Currion B, US Robotics) on ADaM and was not able to make a connection to ADaM, we suspect phone line problems and/or terminal sever problems.

04Nov

- The new modem for ADaM works, but due to the bad phone lines we have not been able to connect to ADaM through it. The modem for the Sat phone is set at 2400 baud. Larry H. has been investigating a problem with the modem defaulting back to non dial up status.

06Nov

- The sat modem and land modem are working - I was able to connect from the hotel fine, but the landline is very, very noisy.

08Nov

- Larry H. has been working on getting the old Inmarsat radio to work, it would be useful for higher speed communication.
- Surge arrestors installed.

3. ACCESS upgrade – hand carry documents

29Oct

- We've unpacked boxes and staged what materials we've received. Unfortunately, four boxes haven't arrived. They contain the xfrmrs and other important HW. Pearse is tracing.

30Oct

- U-Van HW installed except for xfrmr's which came late today.
- UPS circuit run in U-Van. Francis will have laborers dig short ditch to extend AC feed from D-Van UPS.

31Oct

- Continued work on the Access installation, the tasks are moving along with most of the sensors installed in the vans. The general consensus here is to remove the Macs and Coms before doing the installation. This decision was made mostly because it doesn't look like there is enough room in the power boxes to have both systems.

01Nov

- Access work continues, all power and genius boxes are installed as well as all sensors inside the vans, the genius buss has been installed (communication lines between the vans), power lines are being run to power all the genius boxes from one circuit in the Dvan. Bill had to rearrange the circuits in the Dvan to make the current draw on the UPS more acceptable. Larry Y. began converting the Evan power box to the new access system.

02Nov

- Continued work on access, converted the Evan and Ivan power boxes, conversion of the Uvan is continuing. Bill finished installing the power for all the genius boxes. Larry Y. and Dennis began testing the readings from the E and I vans, we had trouble with the Ivan power module, it took a bit of a beating in shipping and had some loose boards. Larry H. ran tests on the various modem combinations we have, and installed door switches.
- We will be ready to switch from Macs and Comms to Sam at least temporarily tomorrow, it will be necessary for the DMF to begin handling the larger data package and we need to know if this is done or will be done.

03Nov

- Turned off the power to the site to install grid power sensors. (Kornke)
- Installed Dvan power box sensors. (Yellowhorse)
- Began troubleshooting and checking the Sam system. (Yellowhorse, Hatfield).

04Nov

- The major tasks for access have been completed, there is some troubleshooting left as in Ivan HVAC and setup of analog voltages and check out of all readings.
- The Goes/Sam laptop is completely installed and is sending the transmission of both access and instrument data, we need Guy to check this on that end and incorporate the message into the health and status.

06Nov

- Access troubleshooting continues, there are issues with the Ivan Hvac, some of the battery voltages, and the GENSET fuel gauge which has reverse logic from Nauru, the logic was reprogrammed (Larry H. will let Guy know what he did). Larry H., Bill, Larry Y.

07Nov

- Access testing began today, all sensors and readings will be checked. Bill, Larry, and Larry.

- The old Macs and Comms was shut down and disconnected today, we held a short service. Larry H, Dennis

08Nov

- Access testing is essentially complete with the exception of one issue with the H2 generator power indication which will be worked out tomorrow all other systems are working and reporting. Bill, Larry H., Larry Y.
- Larry H. was able to determine that the Goes transmitter was not sending a large enough data packet to include all the data in our message. He increased the size of the data transmission which allowed the last bit of data to be sent. Larry H.

09Nov

- Access is finished, all testing is done, the last fix was made on the transformer for the H2 generator, the smoke detector on the work side of the UVan is bad and we have no replacement, the wires are shorted to test the system. There will probably be some tweaking of the access system as discrepancies arise. Bill
- T/RH problems have not yet been worked out.

4. WSI ACP/Arc Drive repair

03Nov

- Installed ACP on WSI which fixed the problem with the occulcor, will wait to do the calibration before turning system back on. (Morrison).

06Nov

- Began work on the WSI, the occulcor ACP had been replaced, and we ended up replacing the Arc drive as well, due to some inconsistent arc position readings. The arc drive was calibrated and when we put it all together the brake did not work so the arc would not move. We traced the problem to a loose relay inside the occulcor ACP. The WSI is now up and should start reporting soon. Larry Y. Dennis

07Nov

- The WSI was re-calibrated today due to some concern with the arc position. Dennis, Larry Y.

08Nov

- Note to Monette Karr and Janet Shields - I wanted to let you know about a problem I am having on the WSI in Manus which is where I am right now. The GPS is not getting position data to the WSI. It looks like time and date are making it put I don't know this for sure. I have checked all the connections and have run gpscheck to see the output, which is as follows:
 - 719 bytes read
 - 12 lines of special characters (unreadable text)
 - Rx buffer over flow
 - Line error or break detected
 - GPS valid - 0
 - Time and date are displayed correctly but not the position.
 - Lat 32.7 Long 117.2
 - Time source: B
 - Time mod: 4

- Hopefully you will get this in your morning and if you send a reply by noon your time I will get in my morning before I go to the site where I don't generally get email connected.
- The WSI quit displaying a picture today. After checking connections it began working again. There has been an ongoing problem with the WSI not getting GPS data, I have checked all connections as well as the GPS itself, and also reseated all the boards in it's computer. Time and date are being received but not position. I will send an email to MPL to get some advice. This is not a serious issue, if the WSI cannot get the position from the GPS it defaults to its known position. Dennis

5. Drawing book checking, red-marking

09Nov

- Began work on the drawing book updates. Dennis, Larry Y.

6. Laptop replacement (BBSS, GOES, and Spare), CPCC upgrades

04Nov

- The Goes/Sam laptop is completely installed and is sending the transmission of both access and instrument data, we need Guy to check this on that end and incorporate the message into the health and status.
- I sent a current laptop inventory to ATOSS as I could not get through to the TWP office fax.
- The BBSS and Observer laptop were setup with the new CPCC. I will keep the old goes computer as a spare for the site.

07Nov

- The old Goes laptop was re-ghosted and will be used as a spare at the site.
- There are two other spare laptops at the site which are not useable as instrument laptops, they will be shipped back. Dennis

09Nov

- The Ceilometer laptop was reinstalled with the new version of the CPCC, which completes all upgrades on the laptops. Dennis

7. Observer training: a) Newer sondes will have humidity sensor cap that needs to be removed when used; b) Clean rad domes at 10am daily; c) Outfitter's Inmarsat B use; d) digital camera use; and e) He Cylinder handling.

09Nov

- Observer training occurred today, new sondes for the BBSS, they will clean rad domes at 10 am each day, sat phone usage, digital camera use and He cylinder handling. Larry H. & Y, BOM
- David Edwards from BOM has been busy training the observers on all aspects of the balloon launch sequence. Edwards also went over the humidity sensor cap removal process for whenever those arrive.

8. H2 Generator maintenance: tri-annually (BOM)

05Nov

- H2 Generator maintenance completed by Colin Maxfield.

9. H2 Generator/RBL Observer training (BOM)

06Nov

- Observer training begins – Dave Edwards.

09Nov

- David Edwards from BOM has been busy training the observers on all aspects of the balloon launch sequence.

10. Check DCP unit (Yellowhorse)

04Nov

- The BBSS binary data from last night did not get sent until this morning when the observers came in and ended the program. The morning launch was not done yesterday due to no power. The binary files were checked during today's launch and transferred with no problem.

06Nov

- The BBSS binary files have made it to ADaM the last two launches, there was some confusion on some of the previous launches.

07Nov

- DCP was checked for proper time of transmission values, they were all good. We spoke to the observers about the need for proper time entry for the Digi-Cora, and the procedure for ending the BBSS program on the laptop so that the binary files will make it to ADaM. Dennis, David Edwards

08Nov

- We have not been able to dial into Wallops, we need someone to dial in and look at the BBSS data sent over the DCP for Manus and see if there is still a message overlap error. If there is we need to know what Wallops sees as the transmission times are for the two data sets. We may need to adjust the time of the transmission.

09Nov

- Work on the DCP transmission problem has been ongoing, which is made difficult by not being able to connect with Wallops Island. We are still not sure if the data is getting to the WMO through Wallops. Dennis, Larry Y.

11. Mount CD on ADaM for Eagan remote IOS and zenocom upgrade

07Nov

- The Zenocom CD is in the ADaM CD drive for Dick Eagan to do the installation.
Dennis

12. Terminal Server Flash & RAM Memory upgrade config from Eagan.

- This was completed on RESET-11M.

13. Emergency Generator Mods (fuel/oil gage replacement/tilt tank,repaint top)

07Nov

- The GENSET fuel tank had a major rework on its topside, out of the goodness of their hearts Colin and David from the BOM scraped and painted the top of the tank. These guys did a great job on a nasty hot task. The tank level gauge was replaced

and the tank was tilted to allow water to run off. The fuel level will be affected a small amount from this. Larry Y.

14. Emergency Generator Maintenance (Hastings/Dearing)

08Nov

- The Hastings Dearing rep never showed up for GENSET maintenance. They are due to come after RESET team leaves – due to flight conflicts. Larry Y.

15. Repair Skyrad Logger can seal, fill with desiccant, repressurize

29Oct

- Water has found it's way into the connectors. There was corrosion on several connectors. All O-rings were intact. No water was in the logger. It would probably be a good idea to check data on all SkyRad instr's. The weather is overcast and rainy. I'm looking for a good window for rad data. Cornwall will be first to know.

30Oct

- I am transferring skyrad data for the past 24hrs from Oct30 08:30GMT to <ftp.twppo.lanl.gov>. The connectors were cleaned and dried at ~08:00GMT on Oct29. Oct30 was considerably sunny. The shaded PIR ventilator is barely spinning; air flow is negligible. Wind and rain yesterday, prevented proper diagnoses. Will fix first thing in the morning. Dry air run thru Sky logger.

16. Verify GOES power supply to big battery on D-Van(Kornke).

09Nov

- Completed. Did mod. Removed broken UPS battery and charger and hooked system directly to orange UPS outlet.

17. Remove old I-Van power supply that was part of old DC system.

09Nov

- We have unplugged the old Ivan power supply to make sure nothing is running from it. It will be removed tomorrow if there is no problem. Bill

18. Coordinate the installation of strapping for all Helium cylinders

07Nov

- All helium bottles were strapped securely. Larry Y.

19. Skyrad PIR troubleshooting

30Oct:

- SkyRad. I am transferring skyrad data for the past 24hrs from Oct30 08:30GMT to <ftp.twppo.lanl.gov>. The connectors were cleaned and dried at ~08:00GMT on Oct29. Oct30 was considerably sunny. The shaded PIR ventilator is barely spinning; air flow is negligible. Wind and rain yesterday, prevented proper diagnoses. Will fix first thing in the morning. Dry air run thru Sky logger.

20. Ship back equipment (File server backup disc, replaced laptops, redmarked drawing books, old modem pack, etc.)

09Nov

- We have packed up all equipment that will be shipped back. Larry Y.

21. Audit out

09Nov

- Completed. Larry Y.

22. Replace the I-Van temperature sensor

09Nov

- ACCESS upgrade fixed this.

23. Redo phone system as per US standards

09Nov

- Partially done

24. Possibly replace Terminal Server, possibly config sat phone to dial-in connection to Term Server AUX port.

07Nov

- Terminal server does not appear to need to be replaced, Hatfield feels it is better to have the sat phone attached to ADaM and the phone line modem attached to the terminal server to allow better versatility of contacts with the system. Larry H.

25. Remove the Stainless Steel Sky stand power distribution box and install an aluminum box.

09Nov

- Completed – Larry Y.

26. Install florescent light bulbs in existing sockets.

01Nov

- Yellowhorse replaced light bulbs in the vans.

27. New overhead phone line installation from airport to site(Telkom)

08Nov

- Went to talk to Telcom today with Francis, we were informed that they avoid running overhead lines due to vandalism and problems with hitting the lines with equipment, etc. This must be a different guy than the one who last looked at the site and recommended overhead lines. We agreed to have some one come out again while reset is still here and evaluate what would be best. We stressed that whatever the solution we need new lines installed. Dennis

28. Install Seacon plugs on unused logger can terminals.(Yellowhorse)

07Nov

- The blank connectors on top of the logger cans were replaced. Larry H.

29. Replace UVB

09Nov

- The replacement UVB never made it – lost in shipping.

30. Throw away all Observer, Troubleshooting and RESET Manuals

09Nov

- Completed – Larry Y.

31. Mark anemometer alignment clearly on stand

08Nov

- The Met tower sensors were set so they could not be misaligned. Bill, Larry Y.

32. ADaM Data Collection Troubleshooting:

04Nov

- Bill worked on logger data storage on the ADaM HD's.

06Nov

- Larry H. looked into the HD disk problem and would like Annette to dial in and transfer the files as we do not know where the files are stored.

08Nov

- Hatfield is also looking at the tape read problem we have had with backups for the raid. Larry H.

09Nov

- The green C HD will be hand carried back.

(Routine Maintenance tasks):

33. Test generator 12v batteries with Hydrometer.

09Nov

- Test completed and battery needs to be replaced. There is a battery there with electrolyte. Possibly have HD replace battery. Larry Y.

34. Change all AC unit filters

01Nov

- All AC filters were replaced.

06Nov

- Eric Fore of Kenmore(Lae) is at site for Air Conditioner maintenance.

07Nov

- Eric Fore has been checking out all the air conditioning units at the site.

08Nov

- Eric Fore completed his evaluation of the air conditioners at the site, and sent Monty a copy of the report.

35. Change out Gas Analyzer Sensor Cell (BOM)

05Nov

- Completed.

36. Change out Velcro Strap Sonde Retainer (BOM)

- Not done.

37. Perform all MMCR maintenance checks (on CD of RESET Manual)

02Nov

- A note on the MMCR, there have been a lot of fault episodes similar to the one on Nauru where the power drops to zero and a fault light labeled "CR1 Helix OI" is lit, the time on the TWP is 1245114 where the last two digits are red.

08Nov

- We have noticed that the radar computer on the MMCR has occasionally shown a black and white screen, Larry H. mentioned that this could cause some problems with the computer locking up. Since we had a spare video board for the MMCR, I replaced it and while at it all the boards in the computer box were re-seated. After this, it appeared that the MMCR was running much better, at least for the 2 hours before we left the site. Will keep an eye on it. Dennis, Larry H.
- MMCR maintenance checks were completed. Larry Y.

38. Brusag Solar Tracker Maintenance and Troubleshooting

06Nov

- The Brusag solar tracker had a blown fuse which was replaced several times until a slo-blo fuse was installed which solved the problem. Bill

07Nov

- The Brusag Tracker 2A fast-acting was replaced with a 2A slow-blow. It's odd, but fortunate, that it blew while we were here. A plan to measure actual current draw will be done, if possible.

09Nov

- Completed, but did not use silicone since it would just attract grit. Cleaned all connections as well as bugs and geckos from the open underside of the Brusag.

39. Replace all smoke alarm batteries and CO units.

01Nov

- Yellowhorse replaced smoke detector batteries in the vans, the smoke detector in the Evan was replaced.

40. Oil WSI coolant pump bearings.

06Nov

- Completed - DM.

41. Replace metal screen filter in WSI Blue Box.(Morrison)

06Nov

- Completed.

07Nov

- WSI blue box AC filter was cleaned, we could not find replacement filters. Dennis

42. Nauru remote troubleshooting:

02Nov

- Dennis spent quite a bit of time trying to get a hold of the Nauru observers to work on the SAM issue. The land lines to the site were always busy which indicates bad phone lines, it appears that the fax connected to the sat phone is disconnected or not working.

03Nov

- After many attempts I contacted Nauru and worked on resetting the time on the goes transmitter, it was off by 12 hours, we don't know what caused this.
- The Nauru satellite fax machine was not connected properly to the phone, it now works. We set up a new phone in the Evan which is connected to the satellite phone (second phone port - phone # is 0384). This will allow us to call the Evan where the observers are more likely to be. Later on I called about the (Nauru)MPL which had already been rebooted. Total contact time - one hour fifty minutes. (Morrison).
- Larry H. switched the satellite phone(Nauru? Manus?) back to 2400 baud, no parity which may have caused problems with previous connection attempts.

06Nov

- Tried contacting Nauru to reboot the MWR with no luck. None of the faxes went through, it appears that both 3277(fax) and 3276(voice) are working now, the fax answers but does not go through. Dennis

09Nov

- Made contact with Nauru on the MWR and spoke with Meagan, we checked the telnet connection, the MWR laptop is running with no errors, and there were unprocessed files. We restarted the processes for the MWR and will wait to see. Dennis

43. Other

05Nov

- The Ceilometer was locked up and was rebooted.
- MFRSR Logger - as far as I can tell the heater resistor is doing it's job. No corroding indication on the electronic board but there is a slight corrosion inside the box around the cable connector. (See attached photo not included in this report)

07Nov

- Sky stand backing plate was replaced. Larry Y.

09Nov

- The Ceilometer laptop was reinstalled with the new version of the CPCC, which completes all upgrades on the laptops. Dennis

D. FUTURE RESET VISITS

1. Tasks for Future RESET Visits

- Replace GENSET starter battery (a battery is on site).
- Air Conditioner maintenance from Lae in 6 months?
- Air Conditioner replacement – 2 on E-Van.
- U-Van tool area smoke detector is broken, but don't replace it since battery powered one will suffice. Mark old one "don't replace".
- Need to fuse the voltage potential transformer and transfer switch junction.
- On the GENSET the CAT fault relay board cable needs to be replaced. Currently has splice in line due to short cable.

2. Items to be Purchased

- Tools need general replacement - many are gone - Morrison.
- Need new electronics equipment. Not much left. Yellowhorse and Kornke will list what is needed.
- Need straps for the Helium cylinder storage in the balloon barn – 10 each.
- Need new microwave.
- Replacement spare BARD A/C unit "relay" P/N 3100-15Q-107/8401-007. Coil 24V AC.
- Replacement spare BARD A/C unit "circuit breaker" 45amp, 2 pole, 120/240V, type QOU-HACR