

**ARM Manus Research Station
RESET Visit 8M Report**

Visit Duration: October 1999

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 8-M Visit (routine) to ARCS-1 at Momote Airport on Manus, PNG were the following: 1) Replace and repair AdaM 2) Shaded PSP "Black & White" replacement 3) UPS battery change out 4) Install BBSS Omni directional antenna.

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-8M 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

- Bill Kornke
- Fred Helsel
- Dennis Morrison
- Larry Yellowhorse
- Jeff Zirzow
- Annette Koontz
- Jeffery Schmaltz
- Dick Eagan
- Larry Hatfield

C. Tasks Performed

1. Move D/I Van porch floor and roof

18-Oct

- Yellowhorse Completed.

2. UFS dump of entire RAID before ADaM dismantle

18-Oct

- Helsel Completed.

25Oct

- Disk with data hand carried home by Koontz

3. Dismantle existing ADaM rack

19-Oct

- Helsel Completed

25-Oct

- Hatfield removed remaining items from ADaM rack

4. Put old ADaM equipment in Airport Generator Bldg.

19Oct

- Completed, the old computer rack has been moved into the Y van.

5. Install new modular rack w/CPU(Y2K compliant), RAID

20-Oct

- Helsel fired up Adam and Eve and had a problem with one of the raid disks, we left at the end of the day with the File server rebuilding itself. We will keep our fingers crossed.

22-Oct

- ADaM seems to be working okay with a question mark on the raid disk drive.

23Oct

- Koontz got Hatfield's ADaM UPS software running.

27-Oct

- Hatfield tested and finalized the UPS power-down scripts.
- Hatfield wrote new scripts to force and immediate powerdown of the ADaM system for use during Y2K shutdown, and one to power-cycle the terminal server.
- Hatfield wrote script to allow observers to set time on adam and eve from a reliable time source.

6. Install Removable HD Data Media system

20-Oct

- Helsel Completed.

7. Install new terminal server

20-Oct

- Helsel Completed

8. Hook up old ADaM tape drive silos to new system

20-Oct

- Helsel Completed

9. Replace power panel(by E-Van) circuit breakers

18-Oct

- Helsel unable to find the three phase circuit breaker for the Hydrogen Generator electrical box. Has two of the single-phase breakers, but is wondering if a three-phase breaker was sent out.

23-Oct

- Helsel found proper breakers and completed the upgrade to the power box for the Hydrogen Generator and E-Van

10. Modify MACS/COMS to report Van H&S data only

(Build and attach cables, put exist terminal server in new rack, convert from 422 bit drivers to RS232)

20Oct

- Helsel completed. This effectively disconnects Inmarsat C from the system and we can no longer send SDLs using our current path.

11. Hook up stand alone and zeno logger instruments

23-Oct

- Helsel completed.

24-Oct

- Hatfield installed media converters for van to van network comms. No problems.
-

12. Update manuals with new ADaM rounds

27-Oct

- Kornke completed

13. Replace D/I Van porch floor and roof

19-Oct

- Yellowhorse completed.

14. H2 Generator routine maintenance (BOM)

15-Oct

- Grant Jeffery arrives Manus to start H2 Generator Maintenance

19-Oct

- Grant Jeffery has been working on the Hydrogen generator with no problems.

21-Oct

- Work completed
- During the subject scheduled maintenance visit by the Bureau of Meteorology, work was carried out as listed below. This included rectification of a known fault with the Remote

Balloon Launcher (RBL), installation of a light in the RBL launch enclosure, rectification of a number of unserviceabilities and the usual scheduled maintenance checks of the Hydrogen Generator and RBL.

- The release cable in the RBL was found to be broken at the lever end. The cable was replaced and adjusted. It was noticed that the adjustable stop within the lever assembly was loose and out of adjustment. This may have allowed the balloon filling nozzle to withdraw too far and become trapped behind the fitting it runs through. This would have stressed the cable when the lever was returned to the extended position.
- The hazardous area light fitting was installed in the RBL launch enclosure and connected. Two spare tubes were placed in the Y Van with the other spares for the RBL and Hydrogen Generator.
- The Teledyne Electronic Oxygen Analyzer was found to have flat batteries. The charging system was inoperative due to a loose fuse F2 inside the unit. The holder is a simple clip type and the clip at one end was spread. This was fixed and the batteries recharged. It was then discovered that the instrument could not be calibrated due to a faulty cell. It was noticed that one of the fittings was still fitted to one of the ports and this allowed air into the chamber continuously and it is assumed that this has shortened the life of the cell. The cell was replaced and observing staff instructed to remove the fittings from the ports when not using the equipment. A spare cell will need to be procured. (Larry?)
- The following work was carried out on the Hydrogen Generator:

a.	control systems modification (BOM Engineering Modification Instruction HYDGN/07). This adds two new indicator lamps ("Purge Fan Sail Switch Operated" and "Ready") and upgrades the electronics.	Incorporated
b.	sight tubes with new type.	Replaced all cell
c.	number 3 vent tubes and cleaned other tubes.	Replaced cell
d.	inspected the water seal.	Disassembled and
e.	current control potentiometer.	Repaired the
f.	corrosion control painting.	Carried out some
g.	scheduled monthly and weekly checks.	Carried out the
h.	nests from the vents of the manometers and manufactured screens for these to prevent re-occurrence.	Removed wasp
i.	observers on use of the equipment and the new lamps.	Instructed all

15. Emergency Generator maintenance (by Hastings Deering)

18-Oct

- Hastings Deering mechanic (Ruben) showed up to work on the emergency generator, however the generator wouldn't start so he is working on the problem.

19-Oct

- We are still having trouble with the emergency generator, the Hastings Deering guy is still working on it. He changed the oil and oil filter and fuel filter and when he tried to start the generator it kicked over and ran for a few seconds and then shut off. We are getting the following faults: oil pressure, over temp, short to ground, short to positive, sensor power supply.

20-Oct

- With some help from the states, we were able to get the emergency generator running. The starter solenoid had a bad ground wire.

26-Oct

- Generator still running; power company is dealing with tree downed lines.

27-Oct

- Grid power is back on, Generator is off.
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16. Install new GOES antenna

20-Oct

- Yellowhorse completed.

17. Install PC for reporting instrument H&S directly to GOES

22-Oct

- Schmaltz completed

25Oct

- Schmaltz got the GOES reporting but of course there's no receiving at Battelle's side for now because of "hacker" problem.
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-

18. Verify hook up of stand alone and ZENO logger instruments

23-Oct

- Koontz completed

19. Verify data flow of stand alone and ZENO logger instruments

23Oct

- Schmaltz and Koontz letting ADAM run and will do the data collection before resuming and manual debugging/collection.
- Koontz got ISSRWP data flow to ADAM.

25Oct

- Koontz is pleased with data flow/reporting and subsequently has made minimal changes to the software.

26-Oct

- Koontz completed

26-Oct

- Eagan configured ntp on adam1 to use it's internal Sun clock as the site time reference with eve as a peer. Here are the (non-comment) entries in adam1:/etc/inet/ntp.conf:

```
server 127.127.1.0 prefer
fudge 127.127.1.0 stratum 0
peer 198.252.143.18
broadcast 224.0.1.1 ttl 4
broadcast 198.252.143.255 ttl 1
driftfile /var/ntp/ntp.drift
statsdir /var/ntp/ntpstats/
```

Here is the equivalent for eve:
peer 198.252.143.16 prefer

These files are currently located at:
/apps/sysconfig/files/etc/inet/ntp.conf.adam1
/apps/sysconfig/files/etc/inet/ntp.conf.eve1
And, of course in /etc/inet.

20. Switch WSI from stand alone to ingested instrument

22-Oct

- Upgraded the NT machine to service pack 5.0, and checked and modified settings for the network, and data delivery. The following changes were made:
 - Dos machine IP address changed from 198.252.143.130 to 198.252.143.85
 - NT machine IP address changed from 198.252.143.142 to 198.252.143.86
 - Changes to runwsi.inp file:
 - Perform Ratio - already at 0
 - Perform cloud Decision - already at 0
 - Send files to Adam - changed from 0 to 2 (true)
 - Save raw data to disk - changed from 1 to 0 (turned off)
 - Save processed data to disk - already at 0
 - Changed the IP address in the wsiftp.inp file to account for the new IP address.
- Morrison completed.

30-Oct

- Eagan worked with Schmaltz on a WSI data processing problem; should resolve tomorrow.
-

21. Switch MMCR from stand alone to ingested instrument

23-Oct

- Koontz completed.

30-Oct

- Hatfield configured the MMCR to synch its system clock to ADaM.
-
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22. Increase WSI data collection frequency

22-Oct

- N/A until data rates/capacity observed over time - Koontz

23. Terminal server Y2K upgrade

17-Oct

- Completed by Helsel before server left AIS.

24. ZENO logger Y2K upgrade

22-Oct

- Ongoing - Zirzow/Kornke

27-Oct

- Zirzow/Kornke completed

29-Oct

- Eagan completed a version of the DAQ download software that may take care of the problems we are seeing with the upgraded loggers. This is only a temporary fix as it only allows for 4-5 days of buffer in the DAQs should ADaM go down. If this is a good solution, the new version can be uploaded to the Nauru site.

30Oct

- Eagan finalized the temporary data logger software patch to ZENOCOM and verified with Koontz that the patch was in place at Nauru site.
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25. Install Brusag tracker with Y2K upgrade

23-Oct

- Y2K upgrade installed. Zirzow will tune the Brusag when the sun returns.
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25Oct

- Tracker parameters set and tracking, so far, is right on.

27-Oct

- Observed that the solar tracker is "homing in" and "learning".

28-Oct

- Zirzow reports that the tracker is learning well, light spot within white area all day.
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29-Oct

- Zirzow continued monitoring tracker -looks good; downloaded final version located in EEPROM.

- Zirzow strain relieved Brusag Cable.

30-Oct

- Zirzow continued checks of Skyrad tracker; everything still looks good.

26. Replace BBSS Linebacker with PC

22-Oct

- Schmaltz completed.
- Jeff Schmaltz has been working on verifying data collection and will make a determination at tomorrow's balloon launch.

27. Train Observers on new rounds

23Oct

- Taking care of a lot of odds and ends. The observers haven't been around much so it's been a problem to get the observer training done. Observers are sparse, ownership issues??

25Oct

- Kornke is waiting to meet up with Francis Anuma for the observer training. If that doesn't happen by Wed, we will turn to David Akia.

26-Oct

- Training halfway completed.

27-Oct

- Kornke completed
- Spent most of the day with Frances going thru daily, weekly and monthly rounds.
- We did ADaM HD swap several times.

29-Oct

- Hatfield went through new/refined disk swap setup instruction to find that there is one yellow disk missing. Please advise...
-
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28. Run data collection system hands off

25-Oct

- Hands off testing will start midweek

28-Oct

- We were able to start "hands off" testing today. Everything seems to be working well now. The GOES message looked normal/green today.

29-Oct

- Hands-off testing was interrupted to fix the DAQ problem. Will continue hands off tonight/tomorrow.

29. Configure ADaM printer and write operation instructions

- Helsel, Hatfield, Koontz completed pre-shipping

24-Oct

- Koontz completed

30. Test Inmarsat B phone for Y2K use.

26-Oct

- Inmarsat B - Tried many times to make a call, with no success. We think the phone is fine, just that the satellite does not have an open channel. Will try again tomorrow.

27-Oct

- Hatfield made call with Inmarsat-B equipment to Wilcox and Meyer. Will work with Wilcox tomorrow to test data connection via Inmarsat.

29-Oct

- Used Inmarsat B for one very short (seconds) data call to PNNL.
- One short voice call to check connection via Inmarsat B.
- Hatfield worked with Guy Wilcox on the data connection via Inmarsat B. It appears to be reaching the PNNL modem, but will go no further. Will work with Wilcox tomorrow after he does some research.

30-Oct

- Used Inmarsat B for 2 very short (seconds) data calls to PNNL.
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31. Switch off external emergency power control on all UPSs

Helsel

32. Replace MMCR DC-DC temperature sensor

Morrison

33. MWR software upgrade(needs testing)

20-Oct

- Morrison has upgraded the ghost images for instrument laptops with no hitches.

34. Fix WSI pump and add coolant

22-Oct

- Morrison completed.

35. WSI calibration

12-Oct (from Nauru report)

- One concern I have on the wsi in Manus with the time/gps problem, is that the problem is recurring and not going away, so there is a more permanent solution required. I don't know what that solution is other than checking connections. Larry, would you please contact Jason Wertz and Monette Karr at MPL, explain what is going on and see what ideas they have and let me know, otherwise I could waste time there not knowing what to do.

13-Oct (from Nauru report)

- After speaking with Jason Wertz, Helsel mentioned that the wsi on Manus had correct time from the gps, if this is the case there may be something else going on other than the possibility of the arc drive being bad.

19-Oct

- Morrison spoke with Francis today about the WSI, and found out that each time the occulter was not shading the camera the computer had locked up, and so was not controlling the

occultor. The question now is why was the computer locking up. It has been working fine for the last week or so and I have seen no problem with it since I have been here. I will be looking for bad connections etc; it may be worth checking with MPL for ideas.

20-Oct

- Morrison completed the Y2K and software upgrades on the WSI computers.

21-Oct

- Morrison had a look at the arc drive on the WSI and it looked good with very minimal corrosion or rust, so we began its calibration. Sent some requested info to Monette Karr at MPL regarding the computer lockup problem. I could not find any RTV Sealant 732 at the site, so I am having Eagan bring some from Nauru and Larry Yellowhorse will do the final sealing of the arc drive.
- Morrison finished the calibration on the arc drive.

36. WSI stand bracing

20-Oct

- Yellowhorse completed the bracing for the WSI.

37. Install site poster

20-Oct

- Yellowhorse began working on installation of the site signs.

23-Oct

- Yellowhorse completed installation of one sign.

29Oct

- Hatfield took additional pictures of TWP signage, will do more tomorrow

38. Tag(WD) the RBL enclosure

Yellowhorse

39. ZENO Data logger misc upgrades

23-Oct

- Three loggers have been completed with just the fielded SKY and GND rad loggers remaining.

25-Oct

- All the fielded loggers are online and have been reporting all day. Will do some repair on the spares, including borrowing an 8pin connector from the SMET to install on the spare RAD logger. Also be aware that the spare SMET, though upgraded has no barometer. Some of the logger connectors look a little rough (chips, O-ring deterioration, bent pins, bad ventilator field cable, no labels); the Seacon upgrade should be considered for RESET-9.

26-Oct

- Upgraded logger bolts w/ silicon bronze nuts for seizure prevention.

27-Oct

- Constructed term cable for loggers so connections can be made outside of the logger.
- New style connectors for term and power installed on spare SMET.
- Upgraded logger bolts w/ silicon bronze nuts for seizure prevention.

28- Oct

- Backfill two spare loggers – Kornke.

30Oct

- Discovered low water levels on all logger batteries, some of them exposing the top of the batteries. Batteries looked sulfated, indicating insufficient charging current to keep them fully healthy. Further looking into battery data indicated a weakened battery condition for the loggers, and maybe for the MFRSR, (not fully knowing the relation between counts and real volts). Looked like there was a problem on the charging circuit to the Skyrad, only putting out roughly 2.5 amps, when measurement of the wire suggested 1.2 ohms of resistance. Measured the voltage drops in the wire, which indicated much higher than expected voltage drop. Finished the day with soldering ring terminals that were only crimped. Left that night, puzzled as to where to go next.
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40. Install RBL light

18-Oct

- Jeffrey installed RBL light and enclosure straps.

41. Repair RBL launch release mechanism

18-Oct

- Jeffrey repaired/replaced release mechanism.

42. Troubleshoot Inmarsat C

25-Oct

- Need information on when the Inmarsat account will be active

27-Oct

- This task has been cancelled as the new ADaM system does not have the capability to send SDL messages

43. Soft shutdown plan with Observers

27-Oct

- Hatfield tested and finalized the UPS powerdown scripts
 - Hatfield wrote new scripts to force and immediate powerdown of the ADaM system for use during Y2K shutdown, and one to power-cycle the terminal server.
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-

44. Update SDL file

20Oct

- Since Helsel modified the MACS/COMS to report Van H&S data only, this effectively disconnects Inmarsat C from the system and we can no longer send SDLs using our current path.

27-Oct

- Kornke will update the SDL tomorrow with Hatfield's help.
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45. Site Communication

26-Oct

- Eagan started setting up the PPP connection for the new system. Last night he had the manus site phone line connected to a modem to test a ppp configuration for Adam. He will continue testing and configuration tomorrow.
- PNG Telecom was testing phones at the site. The phones were ringing almost non-stop. Calls into the site would not have been possible.

27-Oct

- Eagan continued to configure PPP link into adam/eve. Will be testing from hotel since ARCS site has only on phone line.

29-Oct

- Hatfield built a switch for the phone line to allow the observers to easily switch the line to the modem when someone needs to dial-in to ADaM.

46. Ceilometer Troubleshooting:

26Oct

- On the GOES Report the ceilometer was red from 00GMT to 05GMT to to an unknown problem. We are still checking into the cause, but a simple reboot of adam/eve fixed the problem. We will check on it first thing in the morning.

27-Oct

- Discovered problem with exterior surface of ceilometer window.

29Oct

- Zirzow fixed Ceilometer fan motor housing, fixed loose wire on motor area, re-installed outer cover on unit. The green with yellow stripe wire had come loose. The housing had broken at the bulkhead connector due to the cable ties being broken on the inside that held the cable to the motor and housing in place. The broken piece was welded together with soldering iron. Ceilometer appears to be working ok, the window cleaning message and signal unusable a few days ago was apparently due to the connector on the Ceilometer itself being loose and not allowing the fan to run, thereby letting moisture condense on the surface of the unit's window.

47. ISS Activity:

25-Oct

- Need to talk to Paul Johnston about a time problem on his wind profiler computer.

27-Oct

- Francis Anuma had question about ISS data to ADaM. Hatfield says he'll work on it before he leaves.
- Eagan restarted GPS on ISS and the time problem has been corrected.

48. Other:

23-Oct

- Helsel installed the new fax machine
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- Much difficulty getting connected. Having a multi-team meeting on laptop settings and connection experiences.

25-Oct

- Turned the (Grnrad?) IRT mounting around for better door access.

26-Oct

- Organizing and cleaning up
- Packed boxes in preparation for shipment back to AIS.

27-Oct

- Mostly finishing tasks, going well. Island power is back.
- Organizing and cleaning up.

28- Oct

- Island power out for a few hours.
- Cleanup –Kornke.
- Zirzow packed boxes and coordinated w/ Pearse for shipment.
- Eagan, Hatfield continued to monitor and adjust the time synching issue.

29-Oct

- Hatfield made backups of new scripts and made a data tape to carry back to the US.
- Zirzow tied down cables on Skyrad to pedestal so they wouldn't get caught in the decking
- Zirzow arranged for Micron computer to go with Bill Kornke as carry on.
- Zirzow changed shipment information, got this to Dick Pearse (Micron now not on list).
- Zirzow started looking at slow leak on MPL that causes compressor to run about 2 times per minute.
- Zirow worked with Francis Anuma a bit on spare computers, tried to get one running, others will be "disposed of".

30-Oct

- Met with the U.S. ambassador to PNG and invited her and her husband out to the site for a tour. Her name is Arma Jean (sp??) She was not even aware that such a facility existed in PNG. We had a very nice visit with them at the site and at supper this evening. They had much interesting information about the country and the culture from their perspectives.
- Hatfield completed script for observers to manually set the system time on ADaM if it becomes necessary.
- Hatfield/Eagan/Zirzow completed several various clean-up activities in preparation of leaving.
- Got one of the older PS/2 computers working, Francis Anuma plans to use in the NWS building when he can get a voltage-reducing transformer.

31-Oct

- Took the Skyrad power wiring run, disconnected it , at the power supply in the van and shorted the end at the Skyrad. Fed a power supply to the Ivan end and put the Fluke meter as an ammeter in series with the power supply feed. This was done because I felt we might have a high resistance splice or something like one in the run. It turned out that the Fluke meter was off in current readings by roughly a factor of 3. This was done as a check against the power supply measuring the current into the wire and at the same time looking at the fluke and doing comparisons. Filename is: voltage drop calcs 10-30-99 manus skyrad.xls
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- Emptied portable toilet - I don't think I'm likely to take on a job like this on a regular basis. Whew!!
- Selected set of tools available for the observers, locked up the rest.
- Took some pictures with American Ambassador to PNG along with Dick, Larry and I and another set of pictures with local officials.

49. Audit out

27-Oct

- Eagan started.

28-Oct

Eagan, Hatfield completed Audit out and spares inventory

D. Future RESET Visits

- Be aware that the spare SMET, though upgraded has no barometer.
 - Some of the logger connectors look a little rough (chips, O-ring deterioration, bent pins, bad ventilator field cable, no labels); the Seacon upgrade should be considered for RESET-9.
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