

CALIBRATION REPORT
Portable Radiation Package

SERIAL NUMBER 01

DataSet Configuration: n99

Calibration date: 1999-05-03

Document date: December 12, 1999

Configuration File: hd:projects:prp:prpcal:prp:01:cfg01-n99.dat

PRP serial number 01 configuration

Configuration date (yyyyMMdd)

19990401

DataLogger/Preamp

DL99_2

PSP serial number -- agree with a file in the PSP folder

32386F3

PIR serial number -- agree with a file in the PIR folder

32388F3

Head serial number

431



PRP INFO FILE

Dataset = NAURU 99
Ron Brown cruise from Darwin to Nauru I.
Operator: Scott Smith
Dates: 15 June to 20 July 1999, approx
file identifier = n99
PRP 01 CONFIGURATION (19990401)
CALIBRATION INFO FOR HEAD 431:
This file : 431.CAL
Data valid from date : 10/05/1998
MFRSR system owner : PNL / S/O 240
YESDAS system password: Langley!
Supervisor password : Irradiance!
System Datalogger ID : \$0000 (Hex), 0 (Dec)
Instrument Head ID : \$277E (Hex), 10110 (Dec)
Instrument Head S/N : 431
DATALOGGER CALIBRATION: ProcLoggerCal (version 101) Run date: 03-May-1999 22:06:58
DATALOGGER S/N DL99_2, PREAMP 3
CALIBRATION DATE: 990503
TECHNICIAN: EDWARDS
VOLTAGE REFERENCE: VOLT-A-VIDER (cal: ???)
PSP CALIBRATION: S/N 32386F3
Factory calibration: 1998-02-12
8.990
PIR CALIBRATION - S/N: 32388F3
Factory calibration: 1998-01-13
3.670

ZENITH ANGLE ERROR PLOTS

Head S/N: 431

Cal date: 10/05/1998

Now: 21-Apr-1999 06:34:00

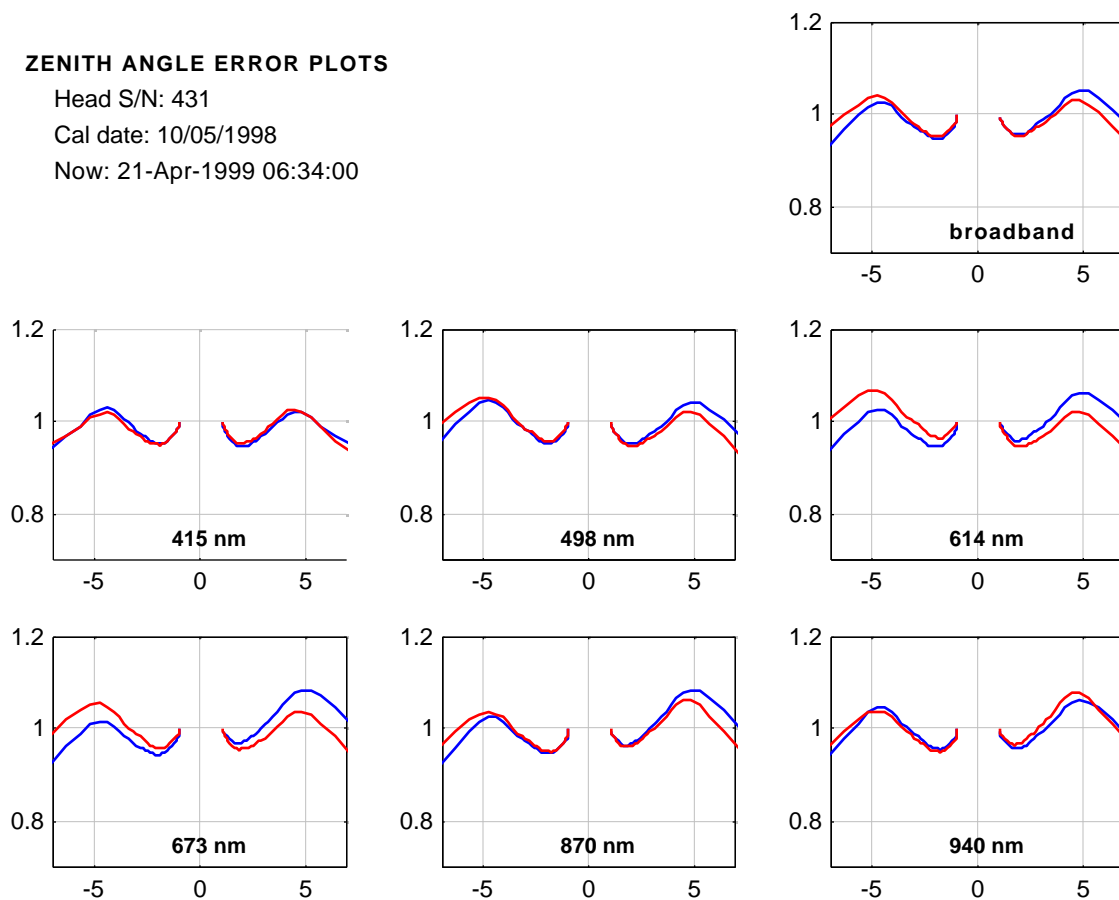


Figure 1: Zenith Angle Error

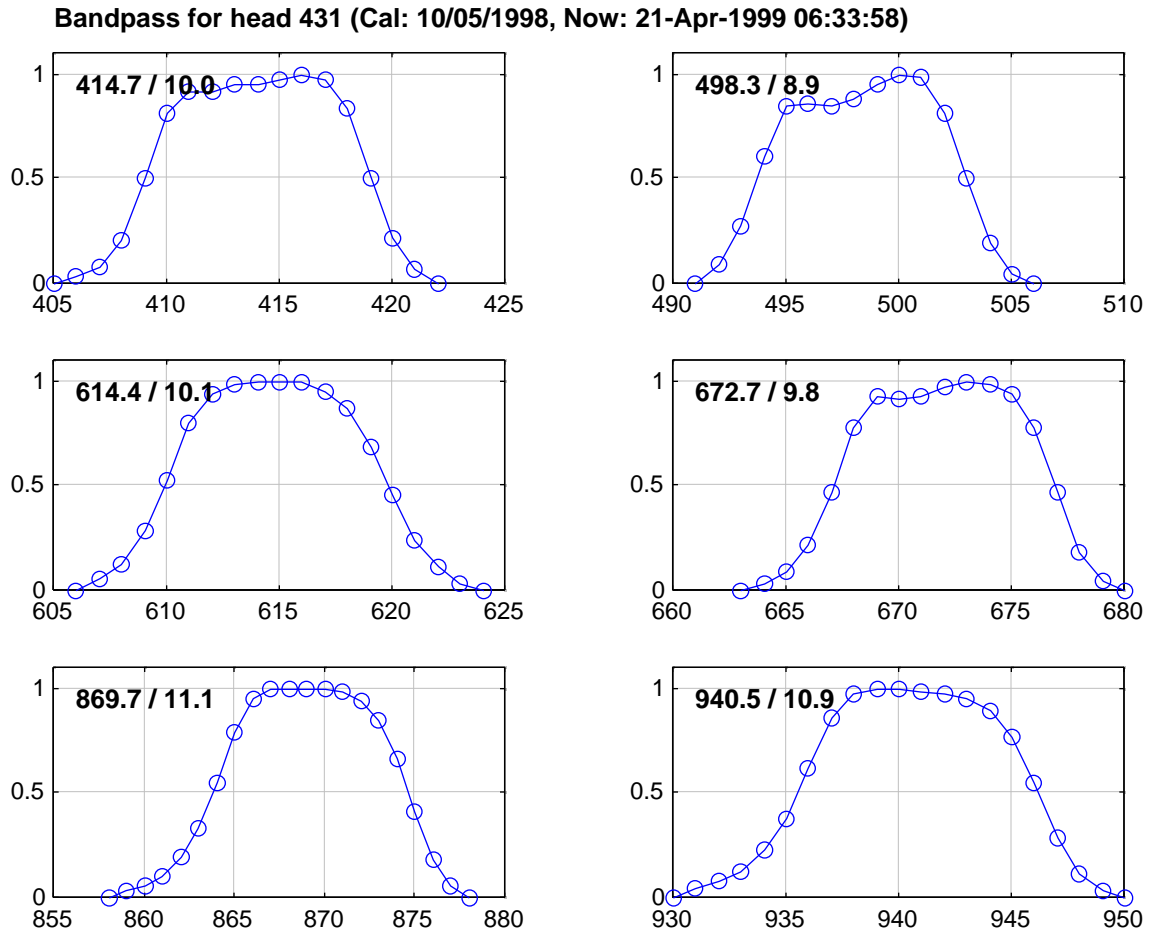


Figure 2: Zenith Angle Error

HEAD 431 TOA IRRADIANCES BASED ON ASTRONOMICAL SOLAR SPECTRUM

WAVELENGTH (nm)			IRRADIANCE (W/m ² /nm)		
LOWER	CENTER	UPPER	LOWER	MEAN	UPPER
405,	414,	422,	1.650,	1.737,	1.824
491,	498,	506,	1.837,	1.934,	2.030
606,	615,	624,	1.623,	1.708,	1.794
663,	672,	680,	1.451,	1.527,	1.604
858,	869,	878,	0.903,	0.950,	0.998
930,	941,	950,	0.779,	0.820,	0.861

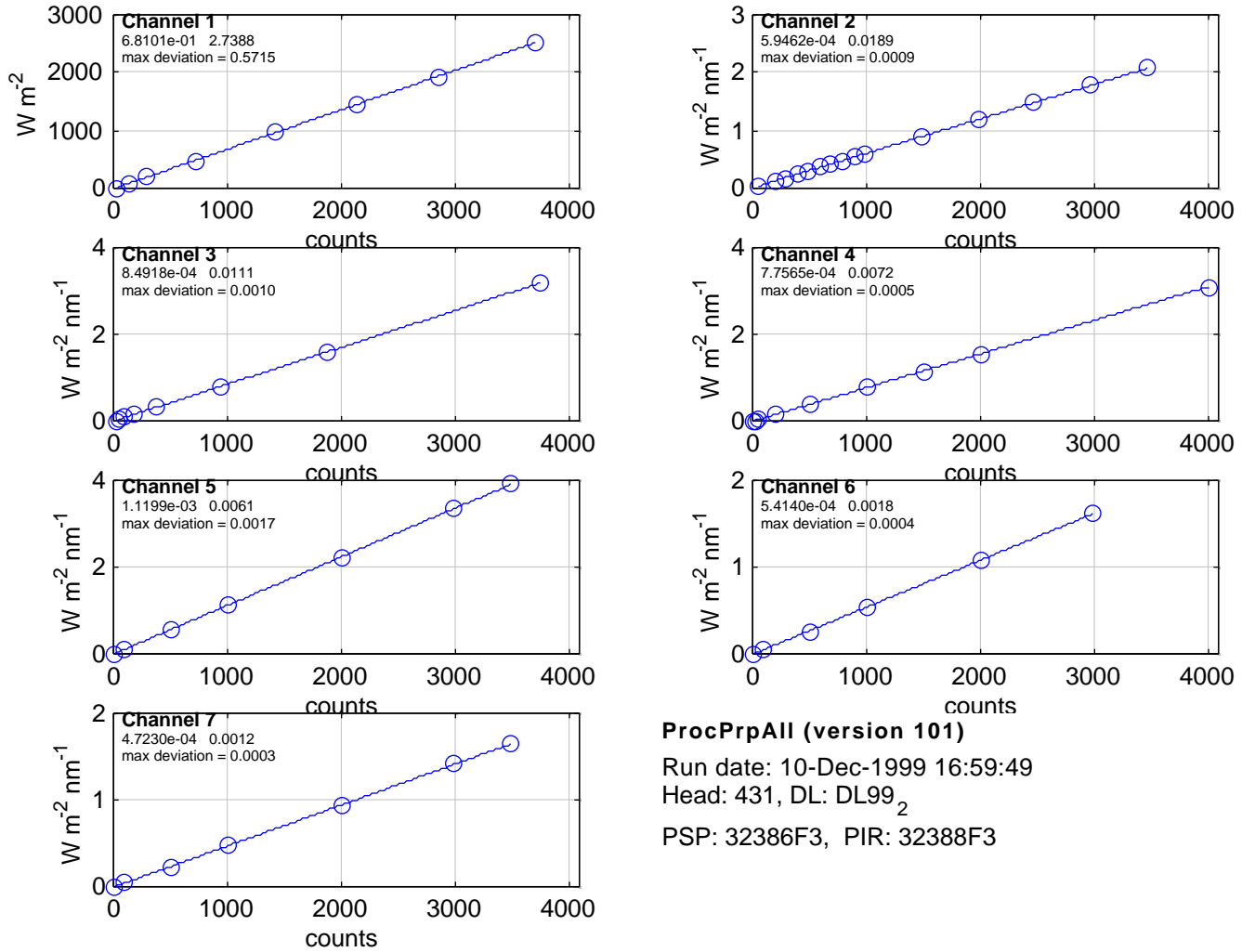
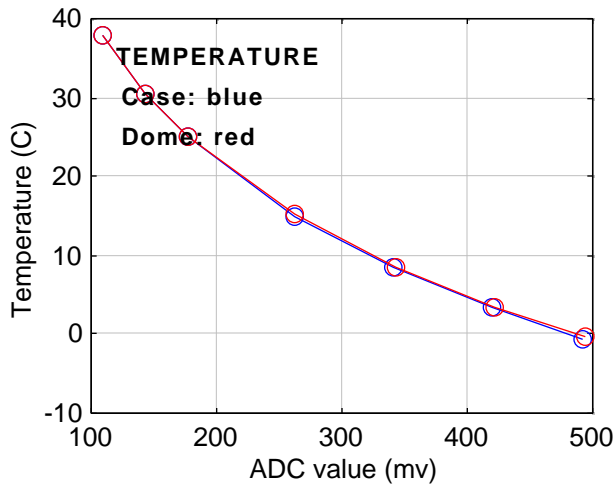
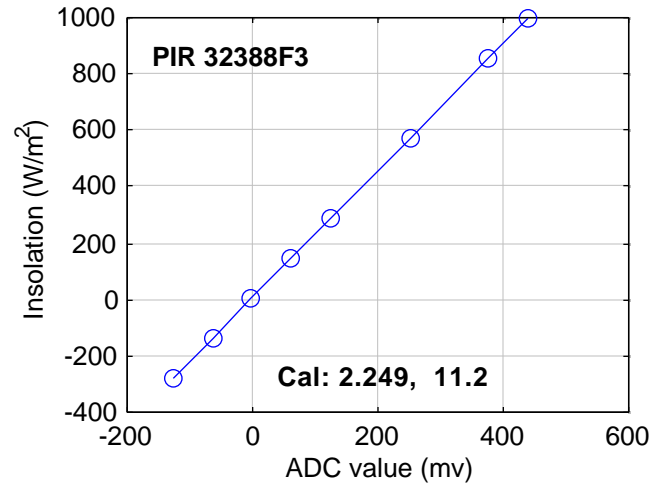
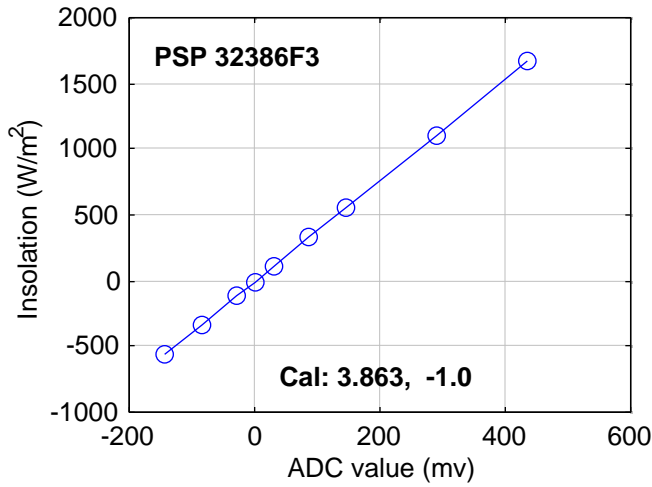


Figure 3: Head and Logger combined gains



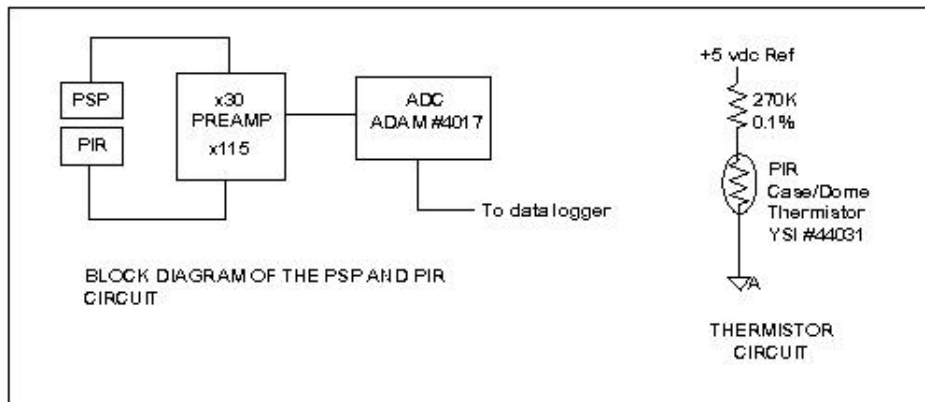
$$1/(T+T_0) = p_1 a^3 + p_2 a^2 + p_3 a + p_4$$

$$a = \ln(\text{mvadc}), T_0 = 273.15$$

Case: max err = 0.054 C
 $p_1 = 9.3417e-06$, $p_2 = -1.3855e-04$
 $p_3 = 9.7143e-04$, $p_4 = 7.4332e-04$

Dome: max err = 0.075
 $p_1 = 5.0662e-06$, $p_2 = -6.9041e-05$
 $p_3 = 5.9703e-04$, $p_4 = 1.4102e-03$

Figure 4: Head and Logger combined gains



Testing the Temperature Circuits

Table 1: Substitute a precision resistance for the case and dome thermistors and fill in the table. Read the values for case and dome temperature from the output from the PRP program.

T (°C)	R (ohms)	Case (°C)	Dome (°C)
40	5592	_____	_____
30	8194	_____	_____
20	12260	_____	_____
15	15130	_____	_____
10	18790	_____	_____
5	23460	_____	_____
0	29490	_____	_____
-10	47540	_____	_____

TEST PLUG:

$R_{case} =$ _____ $T_{44031} =$ _____ Logger Temperature = _____

$R_{dome} =$ _____ $T_{44031} =$ _____ Logger Temperature = _____

LOGGER CALIBRATION FILE

DATALOGGER S/N DL99_2,	250 936 2.5	-5 -143.69 .03
PREAMP 3	500 1876.5 3	-3 -86.19 .02
CALIBRATION DATE: 990503	1000 3758 2.5	-1 -28.61 .02
TECHNICIAN: EDWARDS	CHANNEL 4	0 .36 .02
VOLTAGE REFERENCE:	5 5.5 3	1 29.13 .02
VOLT-A-VIDER (cal: ???)	10 15.5 3	3 86.67 .03
CHANNEL 1	25 46 3	5 144.24 .01
10 24 3	100 195.5 3	10 288.21 .01
50 139 3	250 496 3	15 432.09 .06
100 282.5 3	500 997.5 3	PIR, Preamp: 3
250 710.5 3	750 1497 3	-1 -128.93 .14
500 1425.5 3	1000 1998.5 3	-.05 -65.80 .12
750 2140 3	2000 4001 3	0 -2.57 .12
1000 2854 3	CHANNEL 5	.05 60.45 .12
1300 3713 3	10 8 2	1 123.48 .13
CHANNEL 2	100 98 2	2 249.65 .16
5 38 6.5	500 497 2	3 375.79 .10
20 187.5 6.5	1000 997 2	4 438.73 .17
30 286.5 7	2000 1995.5 2	CASE
40 386.5 7	3000 2994 2	6000 107.91 .47
50 486 7	3500 3495.5 3	8000 141.99 1.29
60 584 7	CHANNEL 6	10000 176.52 .22
70 683 6.5	10 7.5 2	15000 261.34 3.27
80 782.5 7	100 98 2	20000 340.6 .46
90 883.5 6	500 497.5 2	25000 418.58 1.47
100 983.5 7	1000 997 2	30000 492.10 4.27
150 1478 7	2000 1996 2	DOME
200 1975.5 6.5	3000 2994 2	6000 108.21 .11
250 2472 7.5	CHANNEL 7	8000 143.12 .52
300 2968.5 7	10 8.5 2	10000 177.64 1.14
350 3465 6	100 98 2	15000 260.82 .47
CHANNEL 3	500 498 2	20000 341.65 .15
5 15 3	1000 997.5 2	25000 420.72 3.99
10 34 3	2000 1996 2	30000 493.00 4.42
25 91 3	3000 2994 2	END
50 185 3	3500 3493 3	
100 372 2.5	PSP, Preamp: 3	