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TOPEX Special Processing

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Revision 2

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About the Series

The TOPEX Radar Altimeter Technical Memorandum Series is a collection of performance assessment documents produced by the NASA Goddard Space Flight Wallops Flight Facility over a period starting before the TOPEX launch in 1992 and continuing over greater than 10 year TOPEX lifetime. Because of the mission's success over this long period and because the data are being used internationally to redefine many aspects of ocean knowledge, it is important to make a permanent record of the TOPEX radar altimeter performance assessments which were originally provided to the TOPEX project in a series of internal reports over the life of the mission. The original reports are being printed in this series without change in order to make the information more publicly available as the original investigators become less available to explain the altimeter operation and details of the various data anomalies that have been resolved.

Foreword

This document is a compendium of the WFF TOPEX Software Development Team's knowledge regarding Altimeter Instrument File (AIF) Processing, Sensor Data Record (SDR) Processing, and Geophysical Data Record (GDR) Processing. It includes many elements of a Requirements Document, a Software Specification Document, a Software Design Document, and a User's Manual. In the more technical sections, this document assumes the reader is familiar with TOPEX and the various associated files.

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Section 1

Introduction

1.1 Purpose

This document provides a detailed description of TOPEX Special Processing at NASA Goddard Space Flight Center's Wallops Flight Facility (WFF).

1.2 Scope

This document is Volume 6 in a series of publications generated by the TOPEX Software Development Team (SWDT) at WFF. Volume 1 is an overview of the project and its processes. Volume 2 documents pre-launch Radar Altimeter System Evaluator (RASE) processing. Volume 3 documents the Altimeter Instrument File (AIF) processing. Volume 4 documents Sensor Data Record (SDR) processing and Volume 5 documents Geophysical Data Record (GDR) processing. The series is an attempt to document SWDT software and procedures used in support of TOPEX at WFF.

1.3 Organization of Document

Each section documents a special case of processing that is required in the processing of TOPEX data.

1.3.1 Document Change History

Document Name: WFF TOPEX Software Documentation Volume 14 - Special Processing		
Version Number	**Date**	**Nature of Change**
WFF-TPX-006-0	April 1999	Initial Document
WFF-TPX-006-1 Revision A	September 2000	Updated Information
NASA/TM-2003-212236 Vol. 14/Revision 2	July 2003	Updated Information

Section 2

Related Documentation

2.1 Publications

- *TOPEX Project Plan*, July 1989, Jet Propulsion Laboratory (JPL), JPL D-3635, 633-100.
- *TOPEX/POSEIDON Joint Verification Plan*, June 15, 1992, JPL92-9
- *TOPEX Mission Radar Altimeter Engineering Support Plan*, May 1992, NASA GSFC WFF.
- *TOPEX Project Radar Altimeter Development Requirements and Specifications*, August 1988, NASA GSFC WFF 672-85-004.
- *TOPEX Ground System Algorithm Specification Document*, September 1990, JPL D-7075 (Rev. A), TOPEX 633-708.
- *TOPEX Ground System Software Interface Specification (SIS-2) Instrument File*, October 8, 1991, JPL D-7925 (Rev. A), TOPEX 633-731-23-007, Rev. A.
- *TOPEX Ground System Software Interface Specification (SIS-2) Altimeter Sensor Data Record (SDR) - Alt SDR Data*, March, 1993, JPL D-8591 (Rev. C), TOPEX 633-751-23-001, Rev. C.
- *TOPEX Ground System Software Interface Specification, Vol. 2: Design (SIS), Geophysical Data Record (GDR) - GDR Data, Interim Geophysical Data Record (IGDR) - GDR Data*, March, 1993, JPL D-8590 (Rev. C), TOPEX 633-751-23-004, Rev. C.
- *Interface Control Document between the TOPEX Ground System and the Goddard Space Flight Center/Wallops Flight Facility Oceans Laboratory*, (Rev. 2.0), July 1990, TOPEX 633-712J.
- *Wallops Flight Facility TOPEX Project Software Products Specification for Engineering Assessment Software*, January 1991.
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Section 3

Single Event Upset (SEU)

3.1 Definition

Anytime the TOPEX radar altimeter's onboard processor experiences a reset, it is necessary to record the SEU for tracking the number of occurrences and the geographic location of each occurrence.

3.2 Notification

Whenever a SEU has occurred, the TOPEX ACE at JPL will notify Wallops via fax, with a SEU Recovery Checklist (Figure 3-1) as soon as the system has recovered from the SEU alarm, The reset will also appear on the "TOPEX Daily AIF Summary Information" header printout (Figure 3-2) and on the daily aif_event log (Figure 3-3).

3.3 Processing

All processing is done in the directory gen/topex/data/seu.

- **seuevent** (Figure 3-4) is a Fortran program that provides the location of the SEU by the manual input of the time (Year, Julian Day, Hour, Minute, Second) of the reset. This will provide a printout **event2.out** (Figure 3-5) which contains the latitude and longitude of the SEU.
- **DataFile.SEU** is edited with the new entry of SEU information as the next occurrence. Table 3-1 provides the format of DataFile.SEU.
- **DataFile.SEU.List** (Figure 3-6) is a printout using UNIX script and numbering each occurrence (cat -n DataFile.SEU > DataFile.SEU.List)
- **topexseu** is an IDL program that plots the location of the SEU on a world map (Figure 3-7). The locations of the six most recent SEUs are shown in bold.

3.4 Special Check for Height Sweep

- cd /gen/topex/wrk/hgtlimit
- ln -f /gen/topex/data/aif/tcc*(utc of data)*

JET PROPULSION LABORATORY
TOPEX/POSEIDON POCC
818-393-1237
FAX: 818-393-5166

TO: ____ Dave Hancock FAX: 1-757-824-1036
____ Craig Purdy FAX: 1-757-824-1052
____ John Hultberg FAX: 1-818-393-1173

Fax sent to all three parties/numbers: ___ YES ___ NO (see comments)

NASA Altimeter - SEU recovery checklist

On-duty Flight Controller: GENE REYNOLDS

Date: 3/12/99

Alarm Mnemonic: ✓ AENG010A ___ Other (_____)

Alarm occurrence (e.g. DOY 001/0001Z) 071/10:48:43 ___ at start of pass ✓ during pass

(Please note: if alarm existed when pass started, write down pass start time; otherwise; write down time of occurrence.)

Status of critical altimeter mnemonics: YES / NO
(Note: All parameters can be found on display FCTMONITOR)

ALTSCI (ALT science word) CHANGING: ..... ✓ ___
AENG021A (S/C time) CHANGING ..... ✓ ___
AENG009A (ALT-A status word):= FINE TRACK ..... ✓ ___
AENG101A (Ku MTU XMIT PWR) = 20.xxx-21.xxx ..... ✓ ___
ANEG108A (C MTU XMIT PWR) = 22.xxx ..... ✓ ___

*IF ALL ABOVE PARAMETERS ARE **YES**, ALTIMETER HAS SELF RECOVERED, I.E., SEND OUT FAXES, UPDATE ALTIMETER ALARM LIMIT FILES AND IT IS NOT NECESSARY TO NOTIFY SENSOR REPRESENTATIVE IMMEDIATELY.*

Altimeter has self-recovered from SEU: ✓ YES ___ NO (refer to comments)

If any of the above parameters are no, or if situation is questionable, notify sensor representative ASAP.

Comments: SA28B01 & SA28B02 SENT AT 10:49

updated - 6/19/98

** TOTAL PAGE.01 **

Figure 3-1 SEU Recovery Checklist

TOPEX Daily AIF Summary Information

Header ID:	0
Day Number:	1995083
Alt:	A
KuOn:	ON
COn:	C32
Date Processed:	03/25/95
WFF Program:	doTelem
WFF Version:	4.0,02/10/95
TelemConst Version:	13,05/11/93
EALimits Version:	10.0,02/10/95
ROMMap Version:	2.0,02/10/95
Bad Eng Records:	3
Bad Sci Records:	3
Hours in TRACK:	22.27
Sci Data Lost (sec):	5679.6
Eng Data Lost (sec):	24.6
Last RST, # RSTs:	4CF1AE01A2D2,1
STBYWF Alarms(Hi,Lo):	1,2
CAL2WF Alarms(Hi,Lo):	2,4

Figure 3-2 TOPEX Daily AIF Summary Information

```
Mar 25 06:34        /gen/topex2/aif/aif_event_1995083t000000.std                24
1995083 -150643980.91 1995-083T22:26:59 ENG  dTime         Eng_Time_EDF          0.00
--------------------------------------------------------------------------------
1995083 -150643972.72 1995-083T22:27:07 ENG  dTime         Eng_Time_EDF          0.00
--------------------------------------------------------------------------------
1995083 -150643964.53 1995-083T22:27:15 ENG  dTime         Eng_Time_EDF          0.00
--------------------------------------------------------------------------------
1995083 -150643956.33 1995-083T22:27:24 ENG  dTime         Eng_Time_EDF          0.00
--------------------------------------------------------------------------------
1995083 -150643939.95 1995-083T22:27:40 ENG Status           BadEngRecs             1
1995083 -150643939.95 1995-083T22:27:40 ENG  dTime         Eng_Time_EDF       5677.24
1995083 -150643939.95 1995-083T22:27:40 ENG  dTime         Eng_Time_UTC         16.38
1995083 -150643939.95 1995-083T22:27:40 ENG  dTime      Time_Last_Reset   82618056.81
1995083 -150643939.95 1995-083T22:27:40 ENG  dTime  Time_Last_Reset_Hex 4CF1AE01A2D2
1995083 -150643939.95 1995-083T22:27:40 ENG    CMD      Last_Command(1) ICA  $ 800F7F OK
--------------------------------------------------------------------------------
1995083 -150643833.45 1995-083T22:29:27 ENG    CMD      Last_Command(8) ICA  AFULLON  OK
--------------------------------------------------------------------------------
1995083 -150638400.49 1995-084T00:00:00 SCI  TOTAL           BadSciRecs             3
--------------------------------------------------------------------------------
1995083 -150638402.16 1995-083T23:59:58 ENG  TOTAL           BadEngRecs             3
```

Figure 3-3 aif_event Listing

```
osb3.seu# seuevent
 TOPEX/POSEIDON  "EVENT2" program (4/28/93)

   This program computes latitude (geodetic) and longitude of the
 T/P subsatellite point at a specified event time, Te.
 The  user must input Te in UTC.
 The program is valid only for T/P "operational orbit"
 (See T/P Mission Plan, Appendix E.)
 To exit program at any time, type control and c keys at the same time.
 If problems, call
                  H. Ling    (818-354-4904)  or
                  E. Cutting (818-354-4988)


 Wantdoyyydayin calendar day-of-year or month & day ?

doy
 Want to change the default parameter ?  n/y

n
 Hit Enter to continue

 REFERENCE NODE parameters :
 Tr = 1992-267T04:06:22.238 Cycle =   1 Pass =   1 Rev =   554

 ORBIT PARAMETERS :
 INC =  66.0418 Pn = .0780759050 Node dot =  -2.079100  N = 127  We =  360.985

 Enter event time in yyyy,doy,hh,mm,ss.sss

1999,71,10,07,08.0
 EVENT TIME TE = 1999-071T10:07:08.000
    EVENT TIME      CYCLE PASS    REV    LONG    LATD
1999-071T10:07:08.0  239    35  30797   339.4     4.0

 Another event time ? y/n --->
y
 Enter event time in yyyy,doy,hh,mm,ss.sss

1999,71,20,27,45.0
 EVENT TIME TE = 1999-071T20:27:45.000
    EVENT TIME      CYCLE PASS    REV    LONG    LATD
1999-071T20:27:45.0  239    46  30802     6.0   -10.6

 Another event time ? y/n --->
n
 For tabulated results enter: type event2.out
```

Figure 3-4 Display of seuevent

```
Mar 15 03:19                    event2.out                    1

 REFERENCE NODE parameters :
 Tr = 1992-267T04:06:22.238 Cycle =   1 Pass =   1 Rev =   554

 ORBIT PARAMETERS :
 INC =  66.0418 Pn = .0780759050 Node dot =  -2.079100  N = 127  We =  360.9856

 EVENT TIME TE = 1999-071T10:07:08.000
    EVENT TIME       CYCLE PASS    REV    LONG    LATD
1999-071T10:07:08.0  239    35  30797   339.4     4.0

 EVENT TIME TE = 1999-071T20:27:45.000
    EVENT TIME       CYCLE PASS    REV    LONG    LATD
1999-071T20:27:45.0  239    46  30802     6.0   -10.6
```

Figure 3-5 event2.out Printout

Table 3-1 DataFile.SEU Format

Field	Fmt	Units	Description
ATBD	A17	n/a	Full UTC ASCII Time of SEU
Latitude	F6.2	degrees	Latitude of SEU
Longitude	F6.2	degrees	Longitude of SEU
TypeRST	A1	n/a	Type of Reset (A=Automatic, M=Manual)
ATB-MAN	A17	n/a	Time of Manual Reset
HoursLost	F6.2	Hours	Number of Track Hours Lost due to Reset
Mode	A4	n/a	Altimeter Mode Prior to Reset
Description	n/a	n/a	Description of Reset

Mar 15 03:26 DataFile.SEU.List 1

1	1992-238t21:42:00	-90.00	1.00	M	1992-238t21:42:00	UnkHr	STBY	SciTlm Interface
2	1992-245t16:58:00	-08.00	329.00	A				
3	1992-247t17:04:30	-57.00	188.00	A	1992-248t03:56:45	11.00	ACQ	Pulse Count
4	1992-260t16:30:13	-13.50	288.00	A				
5	1992-263t05:38:36	-32.00	284.00	A				
6	1992-277t11:24:32	-07.00	318.00	A				
7	1992-284t08:18:58	-08.00	341.00	A				
8	1992-284t15:08:34	-40.00	083.00	A				
9	1992-292t11:01:26	-38.00	262.00	A				
10	1992-304t04:12:19	-17.00	338.00	A				
11	1992-306t21:08:18	-34.00	282.00	A				
12	1992-308t03:47:16	-15.00	333.00	A				
13	1992-320t16:43:56	-23.00	297.00	A				
14	1992-321t00:57:06	-17.00	335.00	A				
15	1992-327t05:02:16	-08.00	260.00	A				
16	1992-327t17:23:23	-22.00	266.00	A				
17	1992-349t22:09:39	-36.00	279.00	A				
18	1992-350t10:45:55	-40.00	307.00	A				
19	1992-354t01:35:00	-15.00	225.00	M	1992-354t18:22:25	16.75	TRACK	SciTlm Interface
20	1992-364t08:07:38	-08.00	286.00	A				
21	1992-365t20:28:54	-25.00	262.00	A				
22	1992-366t05:03:13	-01.00	323.00	A				
23	1993-004t20:24:38	-25.00	247.00	A				
24	1993-012t01:43:00	26.80	323.20	A	1993-012t02:07:34	00.50	FTRK	DFB Interface,Ocea
25	1993-022t05:38:42	-32.00	263.00	A				
26	1993-026t03:18:08	-25.00	281.00	A				
27	1993-046t05:33:22	-21.00	344.00	A				
28	1993-047t23:59:59	-31.00	268.00	A				
29	1993-052t23:47:06	-07.00	243.00	A				
30	1993-054t18:54:57	-12.00	313.00	A				
31	1993-105t07:14:19	-04.00	330.00	A				
32	1993-119t06:39:28	-13.00	299.00	A				
33	1993-126t10:00:17	-14.00	036.00	A				
34	1993-142t22:31:21	-21.00	354.00	A				
35	1993-150t09:23:17	07.60	340.80	A				
36	1993-152t20:27:50	-16.40	351.20	A				
37	1993-174t13:16:54	02.00	024.10	A				
38	1993-181t05:25:18	-14.60	295.80	A				
39	1993-181t19:36:43	-09.40	272.00	A				
40	1993-186t01:36:40	-12.40	339.20	A				
41	1993-190t09:40:37	00.30	30.40	A				
42	1993-190t19:12:50	-29.00	260.40	A				
43	1993-225t21:14:40	-15.20	281.40	A				
44	1993-230t21:12:39	-07.80	270.00	A	1993-230t22:29:00	01.25	FTRK	DFB Interface,Ocea
45	1993-240t17:50:32	65.90	31.80	A				
46	1993-250t15:09:44	-29.70	289.20	A				
47	1993-264t02:44:29	-30.50	283.90	M	1993-264t17:10:07	14.50	ACQ	DFB Interface
48	1993-266t09:47:35	-09.00	332.00	M	1993-266t17:13:42	7.43	FTRK	DFB Interface,Ocean
49	1993-268t02:15:05	-21.10	273.70	A				
50	1993-275t19:37:21	03.00	338.40	A				
51	1993-292t14:35:22	-13.80	010.00	A				
52	1993-297t06:01:16	03.10	229.40	A				
53	1993-307t18:23:38	-90.00	2.00	M	1993-307t19:37:21	UnkHr	STBY	SciTlm Interface
54	1993-323t05:30:18	-66.00	130.20	A				
55	1993-330t09:29:57	-10.20	329.00	M	1993-330t17:41:58	8.25	TRACK	SciTlm Interface
56	1993-355t03:25:56	01.80	338.80	A				
57	1994-001t09:14:58	04.10	216.10	M	1994-001t12:56:12	3.75	TRACK	SciTlm Interface
58	1994-020t11:17:53	-21.80	298.50	A				
59	1994-031t09:47:42	06.60	300.70	A				
60	1994-044t04:58:44	-15.00	324.00	A				
61	1994-052t18:21:09	-18.40	292.50	A				
62	1994-054t15:15:13	-06.10	327.40	A				
63	1994-063t02:21:22	-30.20	297.40	A				
64	1994-070t01:04:54	-37.60	290.20	A				

Figure 3-6 DataFile.SEU.List Printout

.

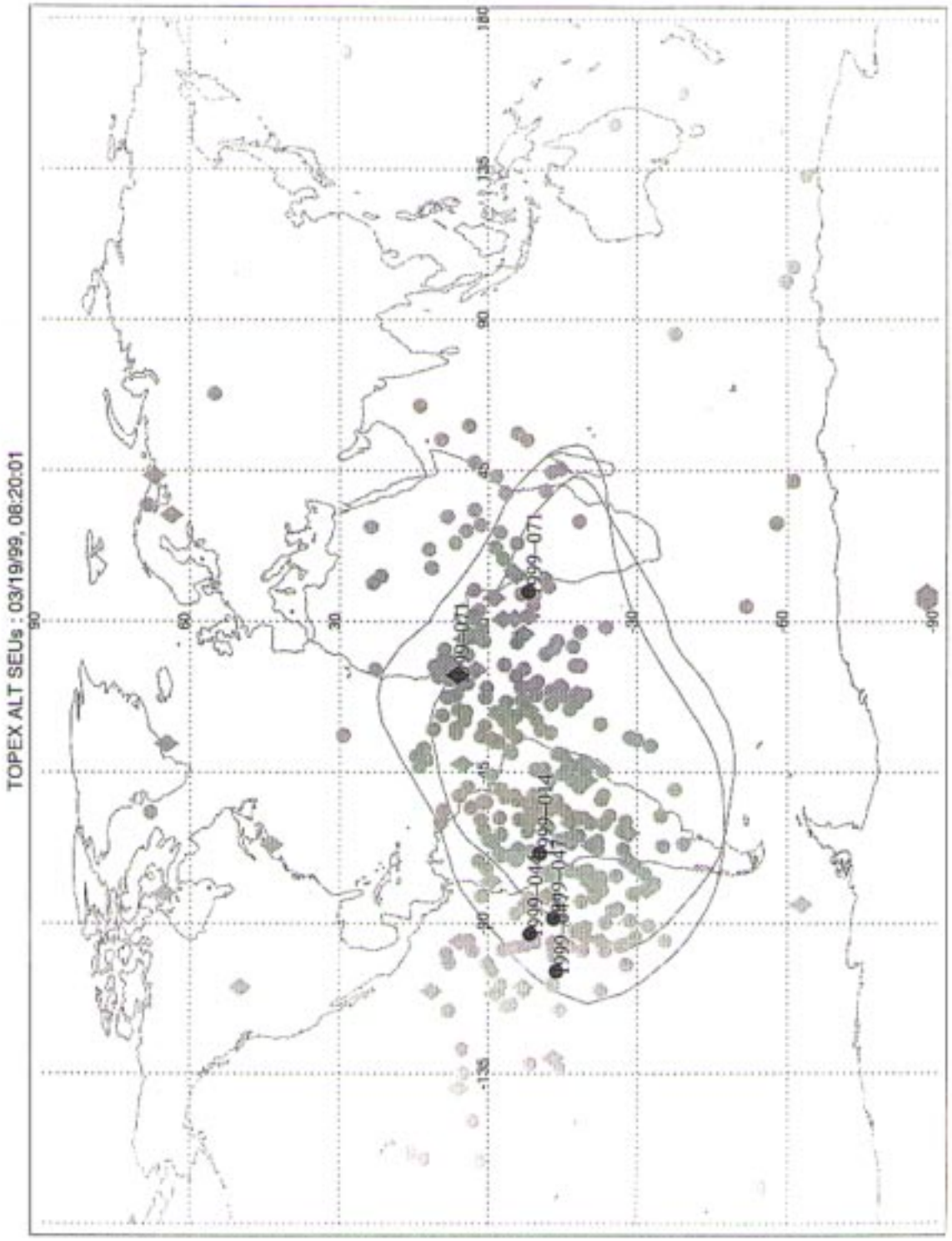

Figure 3-7 World Plot of SEUs

Section 4

Altimeter Boresight Calibration (ABCAL)

4.1 Definition

An ABCAL is an off-nadir maneuver of the TOPEX/Poseidon satellite for the calibration of the spacecraft's attitude system.

4.2 Notification

When an ABCAL is scheduled, a memo (Figure 4-1) from M. Nachman at JPL is sent to all concerned, regarding the information on the scheduled events.

4.3 Processing

- All processing is done in the directory **gen/topex/data/aif.**
- **dotelem** is a Fortran program that, by a select process, creates a five (5) second average of waveforms for the time interval from the start of the maneuver to the completion of the maneuver. The ABCAL maneuver typically has a duration of fifteen minutes. To ensure that all the ABCAL waveforms are averaged, the time intervals for the waveform averaging are entered such that the start time is five minutes earlier than the scheduled maneuver start time and the stop time is five minutes later than the scheduled ending of the maneuver.
- Run fittpx3 or fittpx3B, based on the Altimeter Side A or Side B data that is being processed.
- Save all input and output products into the directory **gen/topex/wrk/abcal**. A sample of the input control file for Side A is Figure 4-2 and for Side B is Figure 4-3. Figure 4-4 is an example of the output to the console or file, Figure 4-5 is an example of the parameter output file, and Figure 4-6 is an example of the printout of the processing.

4.3.1 Altimeter Side A

- **fittpx3** is a Fortran program that uses the averaged waveforms created from **dotelem**. See Attachment A and B (immediately following Figure 4-6) for information on the TOPEX Waveform Fitting Program.

4.3.2 Altimeter Side B

- **fittpx3B** is a Fortran program that uses the averaged waveforms created from **dotelem**. This **fittpx3B** has one more line in its console dialog, so the control file for the job has one more line.

JET PROPULSION LABORATORY
INTEROFFICE MEMO
313-L99-007-MN
11 February 1999

To: SPAT, NAV, M Fujishin, T Adamski, R Ouellet, A Badea, S Hyman, P Callahan, R Richardson, Welch Eng, B Lee, D Hancock

From: M Nachman

Subject: Parameters for ABCAL #46 (5 March 99)

Following are the defining parameters for ABCAL #46, which has been scheduled for Friday, 5 March, 1999 when β'= -32°. It will be the 3rd ABCAL via ALT-B, but the first while the Satellite is in yaw Steering. In accordance with the established procedure, Ho Sen will generate the required command file (as governed by SAB MN05) which will be provided to Laurie Francis via SR ... to be inserted as a stored command sequence in SEQ 909.

Table of General Information

ITEM	INFO
ABCAL #	46
Date (PST)	Friday, 5 March 99
DoY (UTC)	064
β'	-32°
Rev #	30712
Cycle #	238
Pass #	121 (Ascending)
Ocean Area	South Pacific
Sun Cone Angle (Start)	118°
Sun Cone Angle (End)	147°
Altimeter On	ALT-B

Table of Key Events & Times

Event	UTC Time	Latitude (Deg)
Previous Land/Sea Crossing	064/20:15	-66.2
Maneuver Start	064/20:28	-40.0
Orbit Noon	064/20:45	+9.9
Maneuver Completion	064/20:42	0.0
Next Sea/Land Crossing	064/21:01	+53.2

NOTE : The time from the last Land/Sea crossing to the start of the maneuver is 13 min.
The time from the end of the maneuver to the next Sea/Land crossing is 19 min.

Figure 4-1 Notification Schedule of ABCAL

k1998352a_A.job

```
k1998352a.prt
kfp13f5.d
1             1st line = outprintfile; 2nd = setupfile; YES, wts
filename:
inwtxx.d
0             NO, accept default Version 13 gains & additions
1             Output parameters to following filename:
k1998352a.prm
aif_wave_1998352t000000a.hiavg
0, 0         selected records for above input filename
0             select all indgt values


File k1998352a.job, a control script for Ku job in
/gen/topex/bin/fittpx3.

    This file is for 5-second averages with new additive
    waveform factors from v13.0 final (delivered 05/12/93)

revised 09/09/98
```

Figure 4-2 Input Control File Sample, Side A

k2000199a_B.job

```
k2000199a_B.prt
kfp13f5.d
1             1st line = outprintfile; 2nd = setupfile; YES, wts
filename:
inwtxx.d
0             NO, accept default Version 13 gains & additions
1             Output parameters to following filename:
k2000199a_B.prm
0             NO, don't want output file of gain adjustments from
this job
aif_wave_2000199t000000a.hiavg
0, 0         selected records for above input filename
0             select all indgt values


File k2000199a_B.job, a control script for Ku job in
/gen/topex/bin/fittpx3B,
     which is the waveform fitting routine for Side B.

    This file is for 5-second averages and uses the same
    waveform gains as Side A but uses zero additive leakages.

revised 00/07/18, 1100 hrs
```

Figure 4-3 Input Control File Sample, Side B

```
Dec 21 08:25                    k1998352a.out                    1

            f  i  t  t  p  x  3
     ver.1.00        rev.09/29/93

 Default Version 13 constants


  OPEN PRINT & SUMMARY FILE
ENTER OUTPUT FILENAME ( < 36 CHAR.) :   GET INPUT, FIT PARAMETER SET UP FILE
ENTER INPUT FILENAME ( <36 CHAR.) :
 Is there a file of weighting factors? 1=yes,0=no :  Open the input weighting factors file
ENTER INPUT FILENAME ( <36 CHAR.) :   There were   6 values read in

Are there changes to V13 waveform factors?
        0 = no,
        1 = yes, there are gain changes
        1 = yes, there are additive changes,
        3 = yes, BOTH gain and additive changes


Want a plot file of results?  0=no,
 1=parameters only, 2=waveforms only, 3=both  :  Open the parameter results plot file
ENTER OUTPUT FILENAME ( < 36 CHAR.) :
 Open next input data file
ENTER INPUT FILENAME ( <36 CHAR.) :  Specify lower, upper record # to analyze (0,0 for all)
   1,  1,  8,  117.13,  10648.3,   -17.11,  1.8500,   172.3,  0.100, 0.2472,   -32710017.62,
   2,  1,  8,  109.46,   9026.2,   -20.34,  2.0638,   148.7,  0.100, 0.1959,   -32710012.24,
   3,  1,  8,   96.37,   8920.2,    -6.26,  1.9495,   172.8,  0.100, 0.1330,   -32710006.87,
   4, -4,  1,  157.35,   8431.8,     0.03,  1.8862,    70.8,  0.100,-0.0040,   -32710001.48,
   5,  1,  8,  103.98,   8775.3,   -16.07,  1.9794,   161.3,  0.100, 0.1455,   -32709996.10,
   6,  1,  8,  141.60,  11336.8,   -15.03,  1.9819,   178.7,  0.100, 0.2664,   -32709990.72,
   7,  1,  8,  159.46,   9916.9,  -205.20,  3.7045,   196.1,  0.100, 0.2172,   -32709985.35,
   8,  1,  8,   97.70,   8608.9,     1.88,  2.0109,   156.5,  0.100, 0.1217,   -32709979.97,
   9,  1,  8,   95.28,   8665.9,    -7.49,  1.9891,   164.4,  0.100, 0.1099,   -32709974.60,
  10,  1,  8,   95.59,   8291.0,    -0.26,  2.0034,   161.7,  0.100, 0.0473,   -32709969.22,
  11,  1,  8,   93.28,   8385.2,    -1.59,  2.1364,   163.2,  0.100, 0.0470,   -32709963.84,
  12,  1,  8,   99.50,   9174.0,   -12.50,  2.0072,   162.0,  0.100, 0.1284,   -32709958.47,
  13,  1,  8,   97.22,   8268.8,     1.20,  1.9517,   155.4,  0.100, 0.0931,   -32709953.09,
  14,  1,  7,   99.63,   8080.8,   -11.15,  2.0443,   161.1,  0.100,-0.0141,   -32709947.72,
  15,  1, 12,  116.67,   8441.9,  -129.98,  2.9511,   175.6,  0.100,-0.0678,   -32709942.34,
  16,  1,  9,  102.24,   7853.5,    22.82,  1.9790,   160.9,  0.100,-0.0278,   -32709936.96,
  17,  1,  8,  101.42,   9300.6,    -7.52,  1.9791,   176.4,  0.100, 0.1400,   -32709931.59,
  18,  1,  8,  109.61,   8678.3,     4.67,  2.2801,   147.9,  0.100, 0.1288,   -32709926.21,
  19,  1,  8,  110.08,   8222.2,  -202.98,  3.0880,   162.0,  0.100, 0.0530,   -32709920.84,
  20,  1,  8,   94.78,   8389.5,   -36.84,  2.2760,   165.9,  0.100, 0.0738,   -32709915.47,
  21,  1,  8,   96.14,   8392.3,    -4.22,  2.1603,   164.4,  0.100, 0.0862,   -32709910.10,
  22,  1,  8,   92.85,   8407.4,     2.99,  2.0485,   169.1,  0.100, 0.0582,   -32709904.72,
  23,  1,  8,   95.70,   8395.2,    -3.71,  2.0986,   167.9,  0.100, 0.0583,   -32709899.35,
  24,  1,  8,   91.23,   8787.7,    -5.58,  2.0145,   170.9,  0.100, 0.1108,   -32709893.97,
  25,  1,  8,   97.16,   8473.9,   -14.13,  2.1011,   163.3,  0.100, 0.0781,   -32709888.61,
  26,  1,  8,  102.01,   8749.0,    -2.13,  2.1860,   165.0,  0.100, 0.1069,   -32709883.23,
  27,  1,  7,  100.53,   8189.6,     0.01,  2.1418,   158.2,  0.100,-0.0133,   -32709877.85,
  28,  1,  8,   97.91,   8679.6,    -1.97,  2.1651,   162.7,  0.100, 0.1104,   -32709872.48,
  29,  1,  8,   97.32,   8404.7,     0.09,  2.1959,   160.1,  0.100, 0.0543,   -32709867.11,
  30,  1,  8,   93.86,   8119.3,    -2.36,  2.2386,   161.1,  0.100,-0.0181,   -32709861.74,
  31,  1,  8,   96.00,   8282.7,    -8.37,  2.1056,   164.2,  0.100, 0.0622,   -32709856.36,
  32,  1,  8,   84.48,   8572.2,   -10.40,  2.1815,   173.2,  0.100, 0.0750,   -32709851.00,
  33,  1,  8,   97.08,   8258.6,     0.53,  2.2117,   163.9,  0.100, 0.0616,   -32709845.62,
  34,  1,  8,   99.01,   8467.6,    -5.17,  2.2013,   167.3,  0.100, 0.0985,   -32709840.25,
  35,  1,  8,   87.42,   8756.2,   -12.24,  2.2902,   176.2,  0.100, 0.1097,   -32709834.88,
  36,  1,  8,   91.35,   8370.5,     1.13,  2.2846,   169.7,  0.100, 0.0526,   -32709829.52,
  37,  1,  8,   87.50,   8258.6,    -2.79,  2.3412,   164.5,  0.100, 0.0487,   -32709824.15,
  38,  1,  8,  103.12,   8510.0,    -4.60,  2.2904,   173.3,  0.100, 0.0882,   -32709818.77,
  39,  1,  8,   90.55,   8376.1,    -4.78,  2.3393,   170.2,  0.100, 0.0642,   -32709813.41,
  40,  1,  8,   88.69,   8560.3,     6.73,  2.3604,   171.9,  0.100, 0.0855,   -32709808.03,
```

Figure 4-4 Example of Output File to Console or File

Dec 21 08:25 k1998352a.prm 1

Reference time (in J2000) for trel is -32710017.62

Nrec	Ier	Iter	Ku rms	Ku ampl	Ku Dht mm	Ku SWH	Ku Bsln	KuSkw	Ku Att	T(J2000)
1.	1.	8.	117.13.	10648.3.	-17.11.	1.8500.	172.3.	0.100.	0.2472.	-32710017.62.
2.	1.	8.	109.46.	9026.2.	-20.34.	2.0638.	148.7.	0.100.	0.1959.	-32710012.24.
3.	1.	8.	96.37.	8920.2.	-6.26.	1.9495.	172.8.	0.100.	0.1330.	-32710006.87.
4.	-4.	1.	157.35.	8431.8.	0.03.	1.8862.	70.8.	0.100.	-0.0040.	-32710001.48.
5.	1.	8.	103.98.	8775.3.	-16.07.	1.9794.	161.3.	0.100.	0.1455.	-32709996.10.
6.	1.	8.	141.60.	11336.8.	-15.03.	1.9819.	178.7.	0.100.	0.2664.	-32709990.72.
7.	1.	8.	159.46.	9916.9.	-205.20.	3.7045.	196.1.	0.100.	0.2172.	-32709985.35.
8.	1.	8.	97.70.	8608.9.	1.88.	2.0109.	156.5.	0.100.	0.1217.	-32709979.97.
9.	1.	8.	95.28.	8665.9.	-7.49.	1.9891.	164.4.	0.100.	0.1099.	-32709974.60.
10.	1.	8.	95.59.	8291.0.	-0.26.	2.0034.	161.7.	0.100.	0.0473.	-32709969.22.
11.	1.	8.	93.28.	8385.2.	-1.59.	2.1364.	163.2.	0.100.	0.0470.	-32709963.84.
12.	1.	8.	99.50.	9174.0.	-12.50.	2.0072.	162.0.	0.100.	0.1284.	-32709958.47.
13.	1.	8.	97.22.	8268.8.	1.20.	1.9517.	155.4.	0.100.	0.0931.	-32709953.09.
14.	1.	7.	99.63.	8080.8.	-11.15.	2.0443.	161.1.	0.100.	-0.0141.	-32709947.72.
15.	1.	12.	116.67.	8441.9.	-129.98.	2.9511.	175.6.	0.100.	-0.0678.	-32709942.34.
16.	1.	9.	102.24.	7853.5.	22.82.	1.9790.	160.9.	0.100.	-0.0278.	-32709936.96.
17.	1.	8.	101.42.	9300.6.	-7.52.	1.9791.	176.4.	0.100.	0.1400.	-32709931.59.
18.	1.	8.	109.61.	8678.3.	4.67.	2.2801.	147.9.	0.100.	0.1288.	-32709926.21.
19.	1.	8.	110.08.	8222.2.	-202.98.	3.0880.	162.0.	0.100.	0.0530.	-32709920.84.
20.	1.	8.	94.78.	8389.5.	-36.84.	2.2760.	165.9.	0.100.	0.0738.	-32709915.47.
21.	1.	8.	96.14.	8392.3.	-4.22.	2.1603.	164.4.	0.100.	0.0862.	-32709910.10.
22.	1.	8.	92.85.	8407.4.	2.99.	2.0485.	169.1.	0.100.	0.0582.	-32709904.72.
23.	1.	8.	95.70.	8395.2.	-3.71.	2.0986.	167.9.	0.100.	0.0583.	-32709899.35.
24.	1.	8.	91.23.	8787.7.	-5.58.	2.0145.	170.9.	0.100.	0.1108.	-32709893.97.
25.	1.	8.	97.16.	8473.9.	-14.13.	2.1011.	163.3.	0.100.	0.0781.	-32709888.61.
26.	1.	8.	102.01.	8749.0.	-2.13.	2.1860.	165.0.	0.100.	0.1069.	-32709883.23.
27.	1.	7.	100.53.	8189.6.	0.01.	2.1418.	158.2.	0.100.	-0.0133.	-32709877.85.
28.	1.	8.	97.91.	8679.6.	-1.97.	2.1651.	162.7.	0.100.	0.1104.	-32709872.48.
29.	1.	8.	97.32.	8404.7.	0.09.	2.1959.	160.1.	0.100.	0.0543.	-32709867.11.
30.	1.	8.	93.86.	8119.3.	-2.36.	2.2386.	161.1.	0.100.	-0.0181.	-32709861.74.
31.	1.	8.	96.00.	8282.7.	-8.37.	2.1056.	164.2.	0.100.	0.0622.	-32709856.36.
32.	1.	8.	84.48.	8572.2.	-10.40.	2.1815.	173.2.	0.100.	0.0750.	-32709851.00.
33.	1.	8.	97.08.	8258.6.	0.53.	2.2117.	163.9.	0.100.	0.0616.	-32709845.62.
34.	1.	8.	99.01.	8467.6.	-5.17.	2.2013.	167.3.	0.100.	0.0985.	-32709840.25.
35.	1.	8.	87.42.	8756.2.	-12.24.	2.2902.	176.2.	0.100.	0.1097.	-32709834.88.
36.	1.	8.	91.35.	8370.5.	1.13.	2.2846.	169.7.	0.100.	0.0526.	-32709829.52.
37.	1.	8.	87.50.	8258.6.	-2.79.	2.3412.	164.5.	0.100.	0.0487.	-32709824.15.
38.	1.	8.	103.12.	8510.0.	-4.60.	2.2904.	173.3.	0.100.	0.0882.	-32709818.77.
39.	1.	8.	90.55.	8376.1.	-4.78.	2.3393.	170.2.	0.100.	0.0642.	-32709813.41.
40.	1.	8.	88.69.	8560.3.	6.73.	2.3604.	171.9.	0.100.	0.0855.	-32709808.03.
41.	1.	8.	100.81.	8367.1.	3.30.	2.4150.	168.7.	0.100.	0.0654.	-32709802.67.
42.	1.	8.	95.27.	8572.2.	-8.15.	2.2403.	176.6.	0.100.	0.0937.	-32709797.29.
43.	1.	8.	94.52.	8372.8.	1.59.	2.4680.	167.8.	0.100.	0.0589.	-32709791.93.
44.	1.	8.	98.70.	8509.6.	-0.93.	2.4497.	170.9.	0.100.	0.0863.	-32709786.55.
45.	1.	8.	92.79.	8291.7.	-3.78.	2.5132.	171.1.	0.100.	0.0431.	-32709781.19.
46.	1.	8.	92.08.	8378.5.	-1.08.	2.4436.	172.6.	0.100.	0.0639.	-32709775.83.
47.	1.	8.	102.80.	8498.5.	2.73.	2.5100.	171.3.	0.100.	0.0788.	-32709770.45.
48.	1.	8.	96.11.	8355.8.	-18.35.	2.4177.	172.7.	0.100.	0.0685.	-32709765.09.
49.	1.	8.	93.66.	8463.9.	0.83.	2.4958.	173.6.	0.100.	0.0768.	-32709759.71.
50.	1.	8.	91.83.	8508.4.	1.64.	2.5152.	173.0.	0.100.	0.0827.	-32709754.35.
51.	1.	8.	93.83.	8473.8.	-5.57.	2.4684.	175.0.	0.100.	0.0775.	-32709748.97.
52.	1.	8.	98.14.	8435.1.	-0.81.	2.6806.	167.7.	0.100.	0.0713.	-32709743.61.
53.	1.	8.	91.60.	8507.8.	1.46.	2.6444.	172.9.	0.100.	0.0816.	-32709738.24.
54.	1.	8.	100.41.	8464.1.	-5.02.	2.5669.	177.2.	0.100.	0.0836.	-32709732.88.
55.	1.	8.	99.10.	8536.1.	-11.32.	2.6993.	174.8.	0.100.	0.0900.	-32709727.51.
56.	1.	8.	97.93.	8393.0.	-4.58.	2.6880.	171.9.	0.100.	0.0588.	-32709722.14.
57.	5.	9.	97.46.	8212.8.	-9.86.	2.6876.	169.2.	0.100.	0.0261.	-32709716.78.
58.	5.	11.	93.25.	8559.7.	8.55.	2.8681.	175.0.	0.100.	0.0902.	-32709711.40.
59.	1.	8.	94.19.	8369.3.	-6.23.	2.7390.	174.0.	0.100.	0.0591.	-32709706.04.
60.	1.	8.	88.85.	8623.1.	-9.17.	2.6554.	182.2.	0.100.	0.1036.	-32709700.68.
61.	1.	8.	87.25.	8411.2.	-7.38.	2.7809.	177.5.	0.100.	0.0648.	-32709695.31.
62.	1.	8.	96.04.	8486.7.	-3.12.	2.7558.	177.2.	0.100.	0.0824.	-32709689.95.

Figure 4-5 Example of Output Parameter File

Dec 21 08:25 k1998352a.prt 1

```
*************************************************************
*                                                           *
*                                                           *
* NASA/GSFC/WFF Observational Sciences Branch Code 972      *
*                                                           *
*                                                           *
*    Program Name:  fittpx3                                 *
*                                                           *
*    Program Version:  1.00                                 *
*                                                           *
*    Program Date:  09/29/93                                *
*                                                           *
*    Program Number:  ---.----                              *
*                                                           *
*                                                           *
*                                                           *
*    Execution Date:  Mon Dec 21 1998     TIME:  08:18:51   *
*                                                           *
*    Username:  lockwood                                    *
*                                                           *
*    Pathname:  /gen/topex/wrk/abcal                        *
*                                                           *
*                                                           *
*************************************************************

 The following set up values were from file kfp13f5.d

 The Ku fit was for input from Topex TLM samplers   5 through  60
with antenna beamwidth of  1.080 degrees,  1334.0 km altitude, and track-point at sample  3

For this  5-parameter fit, jordr(.) =   1  2  3  4  6
                        Constraint values are:   200.000    0.050    0.500   20.000    0.10
                          1st-guess(.) values:  9200.000    0.000    3.000   95.000    0.10
The finite steps for derivative evaluation are:   0.0000   0.1000   0.2000   0.0000   0.0500

For Vatt calculation, ELY lo,hi:  5, 6    AGC lo,hi: 12,37    Att lo,hi: 57,60

 6 input data weighting factors were read from file inwtxx.d

 The set of weighting factors applied was:
    1, 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1
   11, 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1
   21, 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1
   31, 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1
   41, 1.0000    , 1.0000    , 1.0000    , 1.0000    ,     0.    ,     0.    ,     0.    ,
   51, 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1.0000    , 1
   61, 1.0000    , 1.0000    , 1.0000    , 1.0000


The gains were default Version 13 values

The set of gain multipliers applied was:
    1, 3.3548    , 2.3270    , 1.6384    , 1.1780    , 1.1200    , 1.0828    , 1.0652    , 1
   11, 1.0411    , 1.0254    , 1.0361    , 1.0123    , 1.0292    , 1.0091    , 1.0371    ,0.
   21, 1.0056    ,0.99237    , 1.0053    ,0.98700    , 1.0275    ,0.98712    ,0.99744    ,0.
   31,0.99698    ,0.96939    , 1.0069    ,0.95797    ,0.98107    ,0.95643    ,0.97567    ,0.
   41,0.96636    ,0.95533    ,0.95496    ,0.94746    ,0.94541    ,0.94116    ,0.91270    ,0.
   51,0.93391    ,0.93223    ,0.93749    ,0.93168    ,0.94547    ,0.94835    ,0.95446    ,0.
   61,0.98258    , 1.0128    , 1.1584    , 2.2731
```

Figure 4-6 Processing Printout Example

```
Dec 21 08:25                    k1998352a.prt                    2


The additive factors were default Version 13 values

The set of additive factors applied was:
    1.      0.     ,     0.     ,     0.     ,     0.     ,-1.3900     ,-2.7800     ,-2.7800     ,-9
   11.-6.6700     ,-17.780     ,-17.780     ,-17.780     ,-17.780     ,-11.110     ,-11.110     ,-1
   21.      0.     ,-11.110     ,-11.110     ,-11.110     ,-11.110     ,-11.110     ,-11.110     ,-1
   31,      0.     ,     0.     ,     0.     ,     0.     ,     0.     ,     0.     ,     0.     ,
   41,      0.     ,     0.     ,     0.     ,     0.     ,     0.     ,-15.560     ,-57.780     ,-5
   51,      0.     ,     0.     ,     0.     ,     0.     ,-2.7800     ,-11.110     ,-11.110     ,-1
   61,      0.     ,     0.     ,     0.     ,     0.


 Wrote parameter results out to plot file k1998352a.prm


 Specified records     1 to  32767  from file aif_wave_1998352t000000a.hiavg



 Selected all possible INDGT values


1st T = 1998-352T21:53:02
cycle (or yyyy) = 1998, pass (or ddd) = 352, and istep =    0


Reference time (in J2000) for trel is    -32710017.62


Nrec ,Ier,Iter ,Ku rms ,Ku ampl  ,Ku Dht mm,Ku SWH  ,Ku Bsln ,KuSkw ,Ku Att   ,T(J2000)
   1,  1,  8,  117.13,  10648.3,   -17.11,  1.8500,   172.3,  0.100, 0.2472,   -32710017.62,
   2,  1,  8,  109.46,   9026.2,   -20.34,  2.0638,   148.7,  0.100, 0.1959,   -32710012.24,
   3,  1,  8,   96.37,   8920.2,    -6.26,  1.9495,   172.8,  0.100, 0.1330,   -32710006.87,
   4, -4,  1,  157.35,   8431.8,     0.03,  1.8862,    70.8,  0.100,-0.0040,   -32710001.48,

 Within fitprm3:
 Iter  (Na =  5,)       I =:          1           2           3           4           5
 #  0, ssq = 0.13677E+07; Aprm(.) :   8506.1          0.       1.8899      60.610     0.10000
 #  1, ssq = 0.13865E+07; Aprm(.) :   8431.8     0.29138E-04  1.8862      70.784     0.10000



Nrec ,Ier,Iter ,Ku rms ,Ku ampl  ,Ku Dht mm,Ku SWH  ,Ku Bsln ,KuSkw ,Ku Att   ,T(J2000)
   5,  1,  8,  103.98,   8775.3,   -16.07,  1.9794,   161.3,  0.100, 0.1455,   -32709996.10,
   6,  1,  8,  141.60,  11336.8,   -15.03,  1.9819,   178.7,  0.100, 0.2664,   -32709990.72,
   7,  1,  8,  159.46,   9916.9,  -205.20,  3.7045,   196.1,  0.100, 0.2172,   -32709985.35,
   8,  1,  8,   97.70,   8608.9,     1.88,  2.0109,   156.5,  0.100, 0.1217,   -32709979.97,
   9,  1,  8,   95.28,   8665.9,    -7.49,  1.9891,   164.4,  0.100, 0.1099,   -32709974.60,
  10,  1,  8,   95.59,   8291.0,    -0.26,  2.0034,   161.7,  0.100, 0.0473,   -32709969.22,
  11,  1,  8,   93.28,   8385.2,    -1.59,  2.1364,   163.2,  0.100, 0.0470,   -32709963.84,
  12,  1,  8,   99.50,   9174.0,   -12.50,  2.0072,   162.0,  0.100, 0.1284,   -32709958.47,
  13,  1,  8,   97.22,   8268.8,     1.20,  1.9517,   155.4,  0.100, 0.0931,   -32709953.09,
  14,  1,  7,   99.63,   8080.8,   -11.15,  2.0443,   161.1,  0.100,-0.0141,   -32709947.72,
  15,  1, 12,  116.67,   8441.9,  -129.98,  2.9511,   175.6,  0.100,-0.0678,   -32709942.34,
  16,  1,  9,  102.24,   7853.5,    22.82,  1.9790,   160.9,  0.100,-0.0278,   -32709936.96,
  17,  1,  8,  101.42,   9300.6,    -7.52,  1.9791,   176.4,  0.100, 0.1400,   -32709931.59,
  18,  1,  8,  109.61,   8678.3,     4.67,  2.2801,   147.9,  0.100, 0.1288,   -32709926.21,
```

Figure 4-6 Processing Printout Example (Continued)

Dec 21 08:25 k1998352a.prt 7

277.	1.	8.	100.69.	10014.0.	-22.42.	2.4825.	208.1.	0.100.	0.2080.	-32708542.35.
278.	1.	8.	95.08.	10246.6.	-20.99.	2.5105.	207.3.	0.100.	0.2196.	-32708536.96.
279.	1.	8.	102.43.	9980.4.	-21.23.	2.5631.	205.0.	0.100.	0.2077.	-32708531.56.
280.	5.	11.	99.50.	9661.2.	-20.22.	2.6147.	201.4.	0.100.	0.1887.	-32708526.16.
281.	5.	10.	95.28.	9940.2.	-8.22.	2.6670.	202.0.	0.100.	0.2011.	-32708520.77.
282.	5.	10.	94.72.	9811.0.	-10.01.	2.6732.	200.8.	0.100.	0.1934.	-32708515.37.
283.	5.	10.	112.61.	9754.7.	-7.71.	2.8505.	195.7.	0.100.	0.1909.	-32708509.96.
284.	5.	11.	105.30.	10018.2.	-15.13.	2.6085.	196.4.	0.100.	0.2034.	-32708504.58.
285.	1.	8.	94.88.	9599.8.	-20.69.	2.6532.	190.6.	0.100.	0.1807.	-32708499.17.
286.	5.	10.	98.70.	9321.8.	-10.74.	2.7744.	185.0.	0.100.	0.1691.	-32708493.76.
287.	5.	10.	97.88.	9270.1.	-6.82.	2.7101.	185.1.	0.100.	0.1513.	-32708488.38.
288.	1.	8.	102.02.	9131.4.	-26.34.	2.6346.	180.3.	0.100.	0.1553.	-32708482.96.
289.	5.	13.	108.86.	9719.0.	-2.82.	2.7625.	182.6.	0.100.	0.1919.	-32708477.57.
290.	5.	14.	104.10.	8989.0.	-13.99.	2.5452.	185.9.	0.100.	0.1400.	-32708472.17.
291.	5.	12.	114.54.	8761.7.	-20.69.	2.7390.	180.4.	0.100.	0.1130.	-32708466.76.
292.	1.	8.	93.71.	9001.7.	-11.95.	2.7175.	180.8.	0.100.	0.1386.	-32708461.37.
293.	1.	8.	108.09.	8848.2.	-22.38.	2.6747.	184.0.	0.100.	0.1196.	-32708455.95.
294.	1.	8.	96.91.	8392.5.	-18.15.	2.7990.	175.9.	0.100.	0.0718.	-32708450.56.
295.	5.	10.	99.20.	8823.0.	-1.46.	2.9092.	177.3.	0.100.	0.1275.	-32708445.15.
296.	1.	8.	102.14.	8825.0.	-3.41.	2.9484.	180.5.	0.100.	0.1189.	-32708439.75.
297.	1.	8.	108.02.	8701.8.	7.33.	3.0946.	178.3.	0.100.	0.1066.	-32708434.35.
298.	1.	8.	94.72.	8879.5.	-5.07.	2.9910.	183.3.	0.100.	0.1258.	-32708428.93.
299.	1.	8.	89.79.	8556.4.	1.17.	3.4198.	173.4.	0.100.	0.0919.	-32708423.54.
300.	1.	8.	107.52.	8711.0.	-2.68.	3.1621.	176.7.	0.100.	0.1128.	-32708418.12.
301.	1.	8.	91.14.	8518.8.	11.27.	2.9140.	181.9.	0.100.	0.0721.	-32708412.74.
302.	1.	8.	99.48.	8538.5.	-0.49.	3.1167.	177.3.	0.100.	0.0898.	-32708407.31.
303.	1.	8.	100.70.	8589.8.	-0.41.	3.2722.	177.1.	0.100.	0.0939.	-32708401.92.
304.	1.	8.	101.15.	8647.9.	-1.82.	3.1539.	175.6.	0.100.	0.1024.	-32708396.51.
305.	1.	8.	111.61.	8526.2.	-2.61.	3.2214.	176.1.	0.100.	0.0852.	-32708391.11.
306.	1.	8.	93.96.	8476.9.	0.98.	3.2495.	178.9.	0.100.	0.0773.	-32708385.69.
307.	1.	8.	105.22.	8509.7.	8.76.	3.2580.	179.3.	0.100.	0.0835.	-32708380.29.
308.	1.	8.	91.08.	8721.7.	-2.70.	3.2665.	182.4.	0.100.	0.1106.	-32708374.89.
309.	1.	8.	88.49.	8710.5.	4.15.	3.4090.	182.2.	0.100.	0.1063.	-32708369.48.
310.	1.	8.	96.65.	8553.5.	-2.47.	3.4780.	181.5.	0.100.	0.0887.	-32708364.07.
311.	1.	8.	93.53.	8677.1.	-0.66.	3.4059.	184.9.	0.100.	0.1012.	-32708358.66.
312.	1.	8.	102.37.	8536.2.	3.21.	3.5782.	178.8.	0.100.	0.0833.	-32708353.26.
313.	1.	8.	98.75.	8644.0.	-4.52.	3.5611.	180.4.	0.100.	0.1001.	-32708347.84.
314.	1.	8.	100.05.	8604.3.	-6.50.	3.6785.	179.2.	0.100.	0.0943.	-32708342.44.
315.	1.	8.	103.93.	8741.3.	3.12.	3.7215.	181.1.	0.100.	0.1081.	-32708337.03.
316.	1.	8.	98.09.	8547.3.	-4.90.	3.7685.	184.1.	0.100.	0.0847.	-32708331.61.
317.	1.	8.	94.59.	8707.6.	1.87.	3.8084.	181.4.	0.100.	0.1070.	-32708326.21.
318.	1.	8.	97.66.	8631.9.	-2.92.	3.9482.	182.2.	0.100.	0.0974.	-32708320.80.
319.	1.	8.	96.70.	8649.1.	-7.54.	3.9977.	181.0.	0.100.	0.0981.	-32708315.40.
320.	1.	8.	92.18.	8497.6.	-0.84.	4.0192.	181.6.	0.100.	0.0792.	-32708309.97.
321.	1.	8.	95.85.	8581.3.	-3.54.	4.2102.	176.4.	0.100.	0.0848.	-32708304.58.
322.	1.	8.	83.42.	8509.9.	-10.98.	4.1332.	182.2.	0.100.	0.0792.	-32708299.14.
323.	1.	8.	97.92.	8490.2.	-11.46.	4.1312.	180.3.	0.100.	0.0795.	-32708293.76.
324.	1.	8.	98.14.	8503.9.	2.42.	4.1840.	178.6.	0.100.	0.0788.	-32708288.32.
325.	1.	8.	92.00.	8424.4.	-16.90.	4.2562.	186.6.	0.100.	0.0631.	-32708282.92.

```
END OF FILE ENCOUNTERED ON INPUT DATA

No results were acceptableand within the limits RMSlim =     75.0000,
 and BSlim =     200.000,so no adjustments were computed

END OF JOB:   f i t t o p e x   PROGRAM
   completion date:  Mon Dec 21 1998     completion time:  08:25:26
```

Figure 4-6 Processing Printout Example (Continued)

Attachment A
Memo June 21, 1993

WFF TOPEX INFORMAL MEMORANDUM

Date: June 21, 1993

From: George Hayne

To: Dennis Lockwood
cc: Ron Brooks, Ron Forsythe, Hayden Gordon, David Hancock

Subject: TOPEX Waveform Fitting Program fittpx3

This memo is a brief description of the current TOPEX waveform fitting program which is called fittpx3. Among the several significant changes and improvements in fittpx3 compared to earlier versions are:

- all three possible altimeters (Ku, C-320, and C-100) are now handled within the single program.
- the waveform data to be fitted are from the output of the current version of Jeff Lee's TOPEX program dosdr
- the waveform fit control file now includes the antenna beamwidth (which was hard-coded in the older fit program versions)
- a substantially improved first guess is now provided for the parameter values which are to be fitted.

You have somewhere an older version of a TOPEX waveform fitting program and I would suggest that you replace it with the fittpx3 described here.

You will find in directory /osbnet/hayne/public/fitstuff all of the necessary files to compile, load, and execute fittpx3 on the osb1 computer. Here is a list of the files I have provided:

```
   Various files in directory fitstuff, 06/21/93
-----------------------------------------------------------
-rw-rw-rw-  1 hayne        7445 Jun 21 10:14 aguess3.f
-rw-rw-rw-  1 hayne         562 Jun 21 10:14 c027045a.job
-rw-rw-rw-  1 hayne        1356 Jun 21 10:14 c027045a.out
-rw-rw-rw-  1 hayne         566 Jun 21 10:14 c027045a.prm
-rw-rw-rw-  1 hayne        8358 Jun 21 10:14 c027045a.prt
-rw-rw-rw-  1 hayne         995 Jun 21 10:14 cfp13f10.d
-rw-rw-rw-  1 hayne        5886 Jun 21 10:14 drvxxtpx.f
-rw-rw-rw-  1 hayne        2313 Jun 21 10:14 dsyinv.f
-rw-rw-rw-  1 hayne       12255 Jun 21 10:14 fitprm3.f
-rwxrwxrwx  1 hayne      307725 Jun 21 10:14 fittpx3
-rw-rw-rw-  1 hayne       25797 Jun 21 10:14 fittpx3.f
-rw-rw-rw-  1 hayne        1276 Jun 21 10:14 fittpx3.makefile
-rw-rw-rw-  1 hayne        8710 Jun 21 10:14 genwavxx.f
-rw-rw-rw-  1 hayne        8780 Jun 21 10:14 gfsrt.f
-rw-rw-rw-  1 hayne        3534 Jun 21 10:14 gseat.f
-rw-rw-rw-  1 hayne        3862 Jun 21 10:14 gsysxx.f
-rw-rw-rw-  1 hayne        3234 Jun 21 10:14 gtdata2.f
-rw-rw-rw-  1 hayne         210 Jun 21 10:14 inwtxx.d
-rw-rw-rw-  1 hayne         558 Jun 21 10:14 k027045a.job
-rw-rw-rw-  1 hayne        1356 Jun 21 10:14 k027045a.out
```

fittpx3 ... - pg 2

```
-rw-rw-rw-  1 hayne        566 Jun 21 10:14 k027045a.prm
-rw-rw-rw-  1 hayne       8358 Jun 21 10:14 k027045a.prt
-rw-rw-rw-  1 hayne       1133 Jun 21 10:14 kfp13f10.d
-rw-rw-rw-  1 hayne       3182 Jun 21 10:14 pickt4.f
-rw-rw-rw-  1 hayne        824 Jun 21 10:14 rlout2.f
-rw-rw-rw-  1 hayne       4725 Jun 21 10:14 sdr_wave_027_045a.hiavg
-rw-rw-rw-  1 hayne       4725 Jun 21 10:14 sdr_wave_027_045a.loavg
-rw-rw-rw-  1 hayne       9233 Jun 21 10:14 topwavxx.f
-rw-rw-rw-  1 hayne       2744 Jun 21 10:14 txat5134.f
-rw-rw-rw-  1 hayne       1349 Jun 21 10:14 txsw1051.f
-rw-rw-rw-  1 hayne       2981 Jun 21 10:14 wavtrp4.f
-rw-rw-rw-  1 hayne       5543 Jun 21 10:14 wv100tpx.f
-rw-rw-rw-  1 hayne       5909 Jun 21 10:14 wv320tpx.f
```

You can compile and load the program by executing the Unix system command "make -f fittpx3.makefile", and the executable module fittpx3 will be produced in whatever directory you choose to move this stuff to. I have also provided two short sample waveform data files for checking program operation, sdr_wave_027_045a.hiavg and sdr_wave_027_045a.loavg, for the TOPEX Ku and the C-320 altimeters respectively. Each of these sample files contains three 10-second waveform averages of over-ocean fine-track data.

Program fittpx3 has a variety of console dialog for job specification. It is generally easier to operate with job scripts, the set of user responses to the input details asked by fittpx3. I have provided job scripts k027045a.job and c027045a.job for running fittpx3 with the sample data files, and the output files from these sample jobs are k027045a.prt, k027045a.prm, c027045a.prt, and c027045a.prm. These sample jobs were run in background on osb1 by

fittpx3 <k027045a.job >k027045a.out &

fittpx3 <c027045a.job >c027045a.out &

and the output files k027045a.out and c027045a.out are also provided. (Normally I discard any *.out files after the background job is completed.) These examples have been for 10-second waveform averages. Here is one of the *.job files, the one for the Ku altimeter:

```
k027045a.prt
kfp13f10.d
1       ;;1st lin =outprintfile; 2nd=setupfile; YES, wts filename:
inwtxx.d
0       ;;NO, accept default Version 13 gains & additions
1       ;;Output parameters to following filename:
k027045a.prm
sdr_wave_027_045a.hiavg
0, 0    ;;selected all records for above input filename
0       ;;select all indgt values

 File k027045a.job, a script control file for Ku job in fittopex.

   This file is for 10-second averages with new additive
   waveform factors from v13.0 final (delivered 05/12/93)
```

fittpx3 ... - pg 3

```
17    revised 06/21/93
```

The bold italic line numbers are not in the *.job file itself, but I have inserted the numbers for this discussion.

Except for those jobfile lines providing file names, the lines supply one or two numbers for a free-format read operation by the fittpx3 program. The numbers-only lines can have comments anytime after the last number to be specified, and in the example above the comments are preceded by ";;". Line ***1*** above specifies the output file for eventual off-line printout if desired. Line ***2*** specifies waveform fit control file, to be discussed later. Line ***3*** specifies whether another input file is to be consulted for data-weighting, and the following line specifies that filename (the answer in this example was 1 = yes, that the data-weighting file to be used was named inwtxx.d). Line ***5*** allows specifying different waveform gains and additions than the default set, but in the example the default set was used.

Line ***6*** specifies additional output files: 0 = no other output files; 1 = output a file of fitted parameters to the filename on the next line; 2 = output a file of input and fitted waveform values to the filename on the next line; and 3 = output both fitted parameter and waveform files to the filenames on the next two lines.. In the example above, just the fitted parameter output file was requested. Line ***8*** specifies the input waveform data filename. Then line ***9*** indicates range of data to be fitted (by record number). For line ***9***, either actual numbers can be specified (1,4 to process records 1 through 4), or 0,0 can be entered to denote all available waveform data. Finally, line ***10*** allows restricting the gate index values to be fitted. The 0 signals that all gate index values are to be fitted; otherwise line ***10*** would indicate the number of separate gate index values to be fitted and a following line would indicate those gate index values (for example, 2 on line ***10*** followed and 1 and 3 on line ***11*** would allow only data with gate index values of 1 or 3 to be fitted). After the gate index values or range are specified, there is no more reading of the job script file, so the remainder of that file can be filled with file-identification comments. The source file fittpx3.f contains the code specifying what form the terminal (or redirected job script file) responses should have.

The waveform fit control file used in the Ku sample fit is given below:

```
5                          ;; # parameters to be fitted
5  60                      ;;low, high limit on fitted TLM samples
1  2  3  4  6              ;;Jordr(.) for the parameters to be fitted
200   0.05   0.5  20  0.1  0.025 .1      ;;the fit constraints
0     .10    .20   0  .05   .025   0.    ;;finite-step sizes for derivatives
9200. 0.00   3.0  95.  0.1  0.05  0.0    ;;first guess at parameter values
10                          ;;min NumRec required (10-sec avg's)
5,6      12.37      57,60          ;;lo,hi indices for Early, AGC, ATT gates
1        32.5               ;;nnnalt( =1 for Ku) & track-point
```

fittpx3 ... - pg 4

```
1334.     1.08          ;;altitude (km) & beamwidth (degrees)
75.       200.          ;;RMSlim & BSlim, for weight calc...

file kfp13f10.d                revised 05/13/93
   This is a file of settings for the Topex fitting routine
   fittpx3 doing 10-second averages.  The early gate for Att
   has been changed to match the simulation for Ku, about
   03/15/93.  The fit is for 5-parameters, at 0.1 skewness.
THE BEAMWIDTH IS 1.08 degrees (about 2.85% above nominal 1.05 degrees)
```

The seventh line of this file gives the minimum NumRec required. For the 10-second fit, this requires that 10 frames (TOPEX nominal 1 second/frame) were used in forming the waveform average. If 5-second waveform averages are to be fitted, this minimum value should be changed to 5. For full-rate data or 1-second averages, the value would be 1.

This memo obviously doesn't provide a complete fittpx3 description, but it should at least allow you to set up an operating version in your own work area. Please don't hesitate to come to me with questions or comments.

George Hayne

Attachment B
Memo September 29, 1993

WFF TOPEX INFORMAL MEMORANDUM

Date: September 29, 1993

From: G. Hayne

To: Dennis Lockwood
cc: R. Brooks, R. Forsythe, H. Gordon, D. Hancock, J. Lee

Subject: Needed Corrections to TOPEX Waveform Fitting Program fittpx3

In an earlier memo "TOPEX Waveform Fitting Program fittpx3", G.S. Hayne, June 21, 1993, I described briefly the program, its subroutines, where to find them, and how to load and run the program. I had developed and used it exclusively on osb1, but Dennis Lockwood installed and ran it on osb4. Later, in analyzing data from ABCAL #21 on 09/14/93, we found that the results from osb1 and osb4 differed significantly in the fitted value of the range correction.

I have found the error which was in the subroutine wv320tpx. It is a simple parameter-setting statement which was badly written, with the original error being made years ago. The osb1 compiler interpreted the ambiguous statement in the way that had been intended, but osb4 treated it differently. The subroutine has been fixed, as has subroutine wv100tpx which had the same error. (Subroutine wv100tpx is called only if the C-100 waveform is being fitted, and we have never looked at any C-100 waveforms to date.)

I have also made minor cosmetic changes in the main program and in the subroutines topwavxx and drvxxtpx. Copies of the five revised files (fittpx3.f, drvxxtpx.f, wv100tpx.f, wv320tpx.f and topwavxx.f) have been put into the area /osbnet/lockwood/public. Please use these files to replace the earlier versions which were the subject of the June 1993 memo, and then recompile and reload the fittpx3 program into the same place where the current malfunctioning version resides. After this, there should be no further problems with the waveform-fitting program.

There are some very slight numerical differences for ABCAL #21 results from the osb1 and the (corrected) osb4 versions, but these are not a problem. The maximum range correction difference was 0.5 mm, the maximum SWH difference was 0.002 meters, the maximum amplitude difference was 9 (out of about 9000), and the maximum baseline difference was 0.6 (out of about 100). I consider these acceptable for the complicated fitting procedure, run on real data. For general information, I have attached a copy of a diagram showing the relationship of the various subroutines in program fittpx3; see me if you want a larger copy of this eye test figure.

For fittpx3, the Topex waveform-fitting-to-data program, the files are listed below:

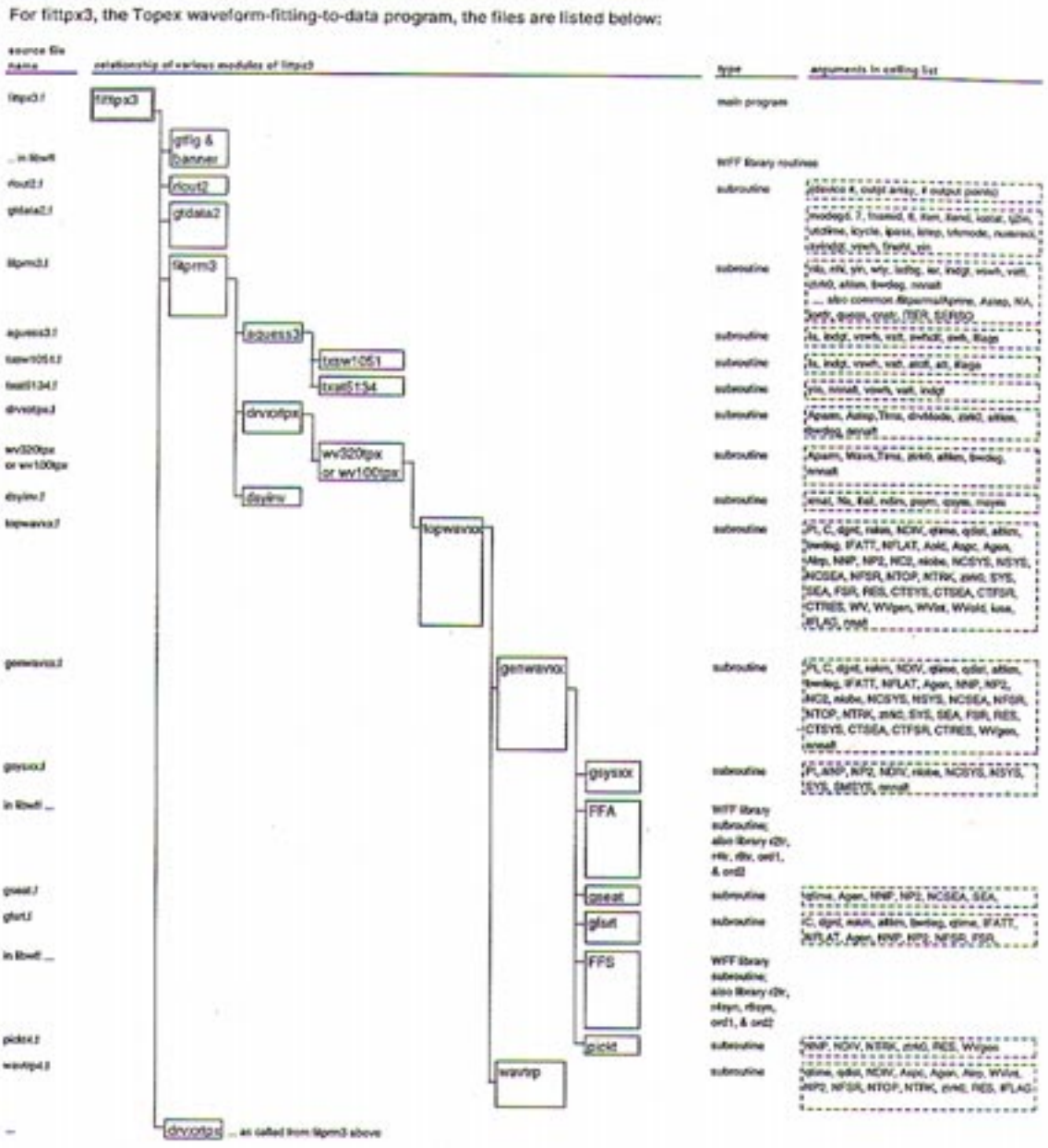

Table 4-1 AIF Waveform Averages Format

Field	Fmt	Units	Description
utcsec	F16.2	seconds	Average UTCSeconds
ATB	A17	n/a	Full UTC ASCII Time
year	A3	n/a	Last 3 Digits of Year
day	A3	n/a	Julian Day of Year
step	I4	n/a	CAL Mode Step (Valid only if Mode=CAL1)
mode	A4	n/a	Mode
numrec	I4	records	Number of Records Used to Compute Averages
gateindex	I4	n/a	Computer Gate Index Average
vswh	F14.2	counts	Computed VSWH Average
finehgt	F14.2	mm	Computed Fine Height Average
gate01	F14.2	counts	Computed WF Gate #1 Average
gate02	F14.2	counts	Computed WF Gate #2 Average
gate03	F14.2	counts	Computed WF Gate #3 Average
gate04	F14.2	counts	Computed WF Gate #4 Average
. . .	. . .	. . .	. . .
gate61	F14.2	counts	Computed WF Gate #61 Average
gate62	F14.2	counts	Computed WF Gate #62 Average
gate63	F14.2	counts	Computed WF Gate #63 Average
gate64	F14.2	counts	Computed WF Gate #64 Average

Section 5

Track-Mode Waveform Monitoring

5.1 Definition

Waveform monitoring provides Track-Mode waveforms for trend analysis.

5.2 Notification

Notification is by receipt of the SDR Product Release Form and the SDR Dat tape from JPL PODAAC.

5.3 Processing

- When an SDR tape is received, use the "**tar xvt**" command, to extract passes 157 to 182, normally file 7, for processing. The work is processed in the directory **gen/topex/data/sdr**.
- **doallwfmon** - a UNIX script that will run the Fortran program **tpx_sdr_wfmon** on all data.
- After all the data is processed, the data is to be saved for later archiving. The SDR pass files, sdp_altsdr_???_???.dat, are to be saved in the directory gen/**topex/data/sdr/sdrmondata/sdrs**. The waveform average files, sdr_wfmon_???_???.hi and sdr_wfmon_???_???.lo, are to be saved in the directory **gen/topex/data/sdr/sdrmondata/sdrwfmon**.
- **tpx_sdr_wfmon** is a Fortran program that creates an output file of 10 second averaged Track-Mode waveforms. See Table 5-1 "Track-Mode Waveform Averages Format" for the output format.
- **sdr_wfmon_hist** provides histogram plots of selected parameters, based on the criteria for selected Gate Indexes. The histograms depict the distribution of VSWH and VAttWF, with the criteria of Gate Indexes between: 1.0 to 1.5; 1.5 to 2.5; 2.5 to 3.5; and 3.5 to 4.5. A sample plot is shown in Figure 5-1.
- **sdr_wfmon_trend** provides time-history plots of selected gates, using the criteria of selected parameters and the parameters' values. The output waveform plots are time series of gate values for Track TLM Gates 8 to 15, and are based on the multiple criteria of: Gate Index being between 1.0 and 1.3; VSWH being between 145 and 155; and VAttWF being between 1.1 and 1.2. A sample plot is shown in Figure 5-2.

A database has been created with data starting at Cycle 10 (1992-362T11:35:48) to present, using only Passes 157-182 of each cycle.

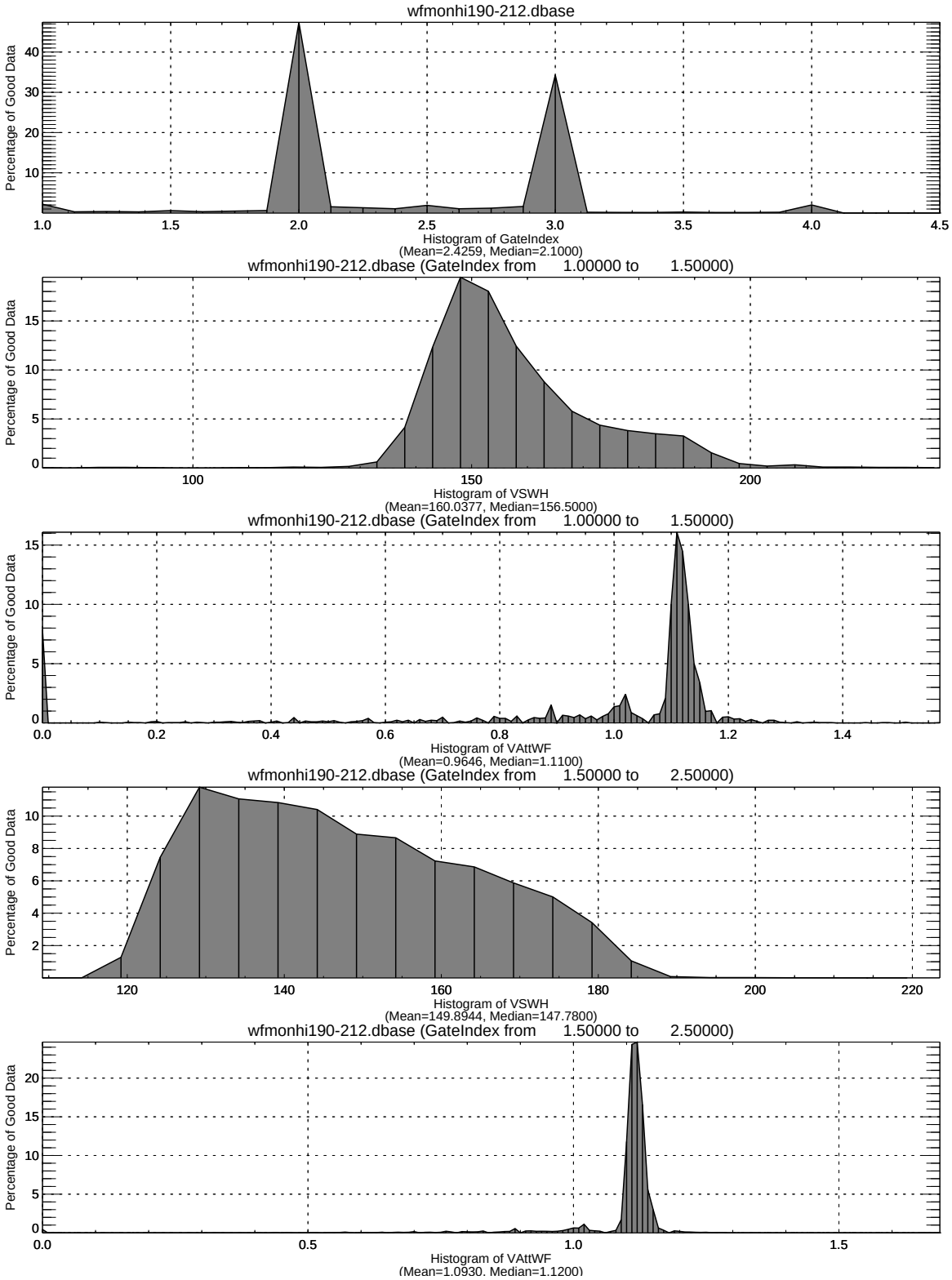

Figure 5-1 Example of sdr_wfmon_hist Plot

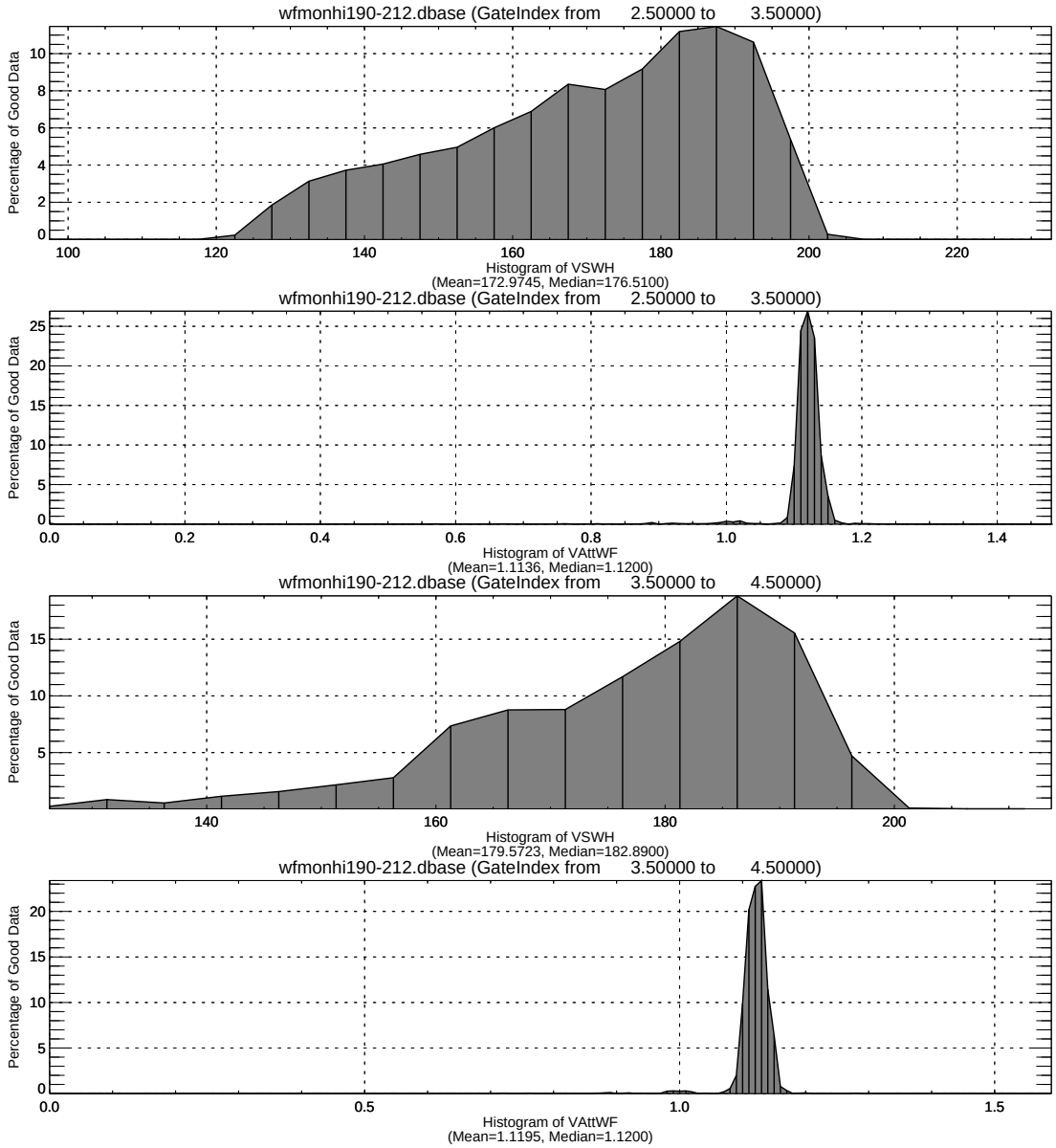

Figure 5-1 Example of sdr_wfmon_hist Plot (Continued)

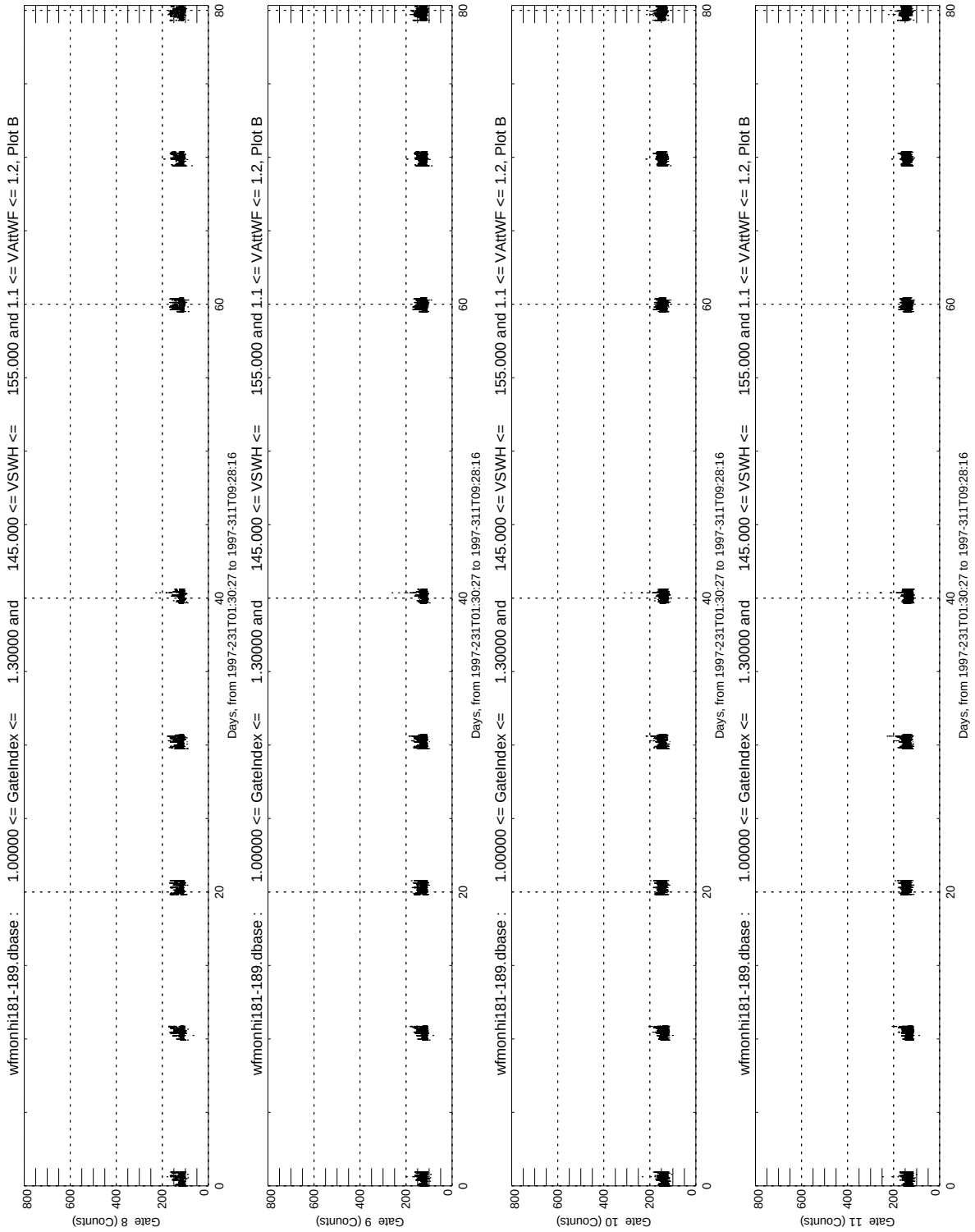

Figure 5-2 Example of sdr_wfmon_trend Plot

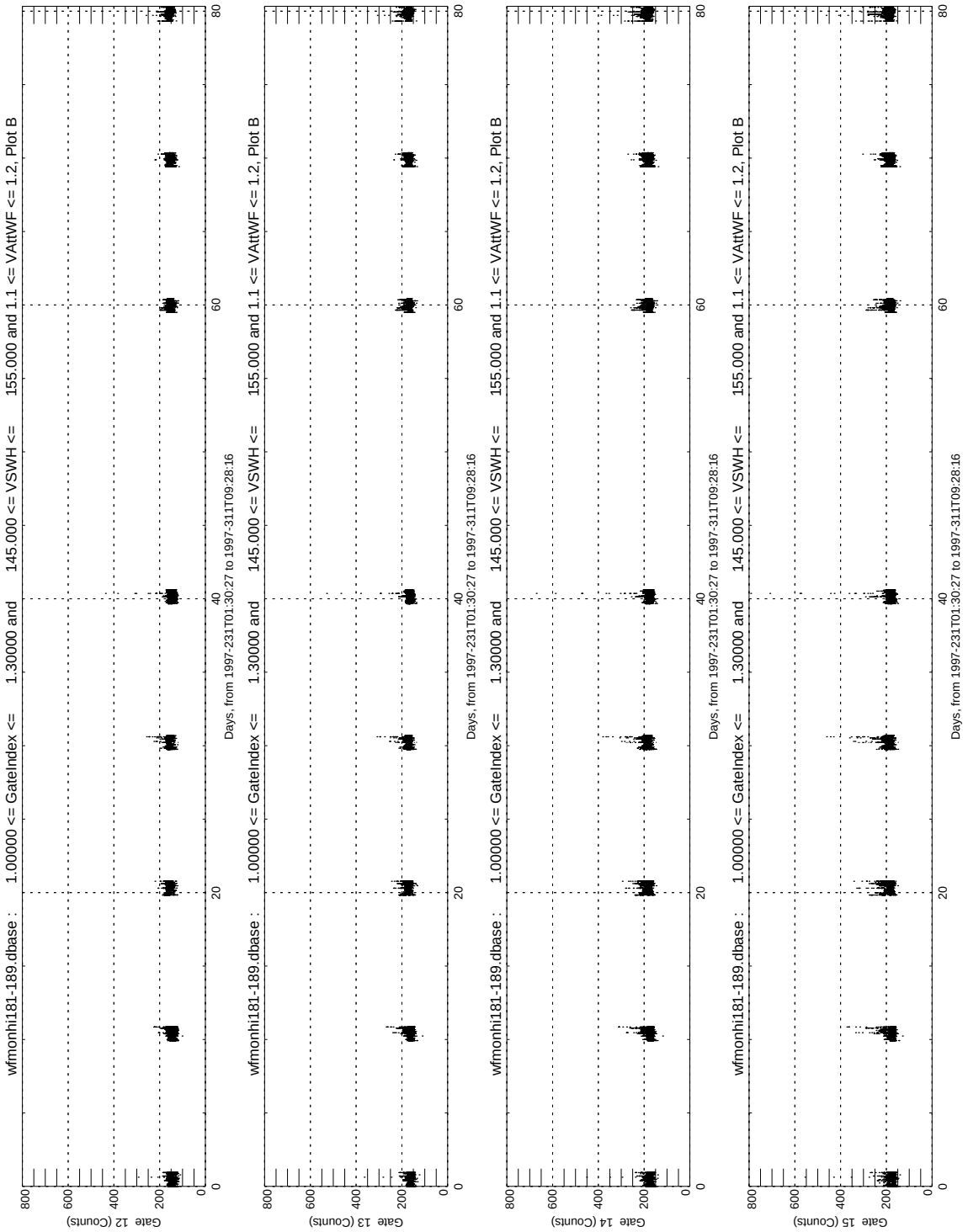

Figure 5-2 Example of sdr_wfmon_trend Plot (Continued)

Table 5-1 Track-Mode Waveform Averages Format

Field	Fmt	Units	Description
utcsec	F16.2	seconds	Average UTC Seconds
ATB	A17	n/a	Full UTC ASCII Time
cycle	I3	n/a	Cycle
pass	I3	n/a	Pass
mode	A4	n/a	Mode
numrec	I4	records	Number of Records Used to Compute Averages
latitude	F14.2	degrees	Computed Latitude Averages
longitude	F14.2	degrees	Computed Longitude Averages
gate index	I4	n/a	Computed Gate Index Average
vswh	F14.2	counts	Computed VSWH Average
finehgt	F14.2	mm	Computed Fine Height Average
vatt	F14.2	ratio	Computed Vatt Average
hgtrate	F14.2	m/sec	Computed AltHgtRate Average
AGC	F14.2	dB	Computed AGC (TempCor) Average
gate01	F14.2	counts	Computed WF Gate #1 Average
gate02	F14.2	counts	Computed WF Gate #2 Average
gate03	F14.2	counts	Computed WF Gate #3 Average
gate04	F14.2	counts	Computed WF Gate #4 Average
. . . .	. . . .	. . . .	. . . .
gate 61	F14.2	counts	Computed WF Gate #61 Average
gate62	F14.2	counts	Computed WF Gate #62 Average
gate 63	F14.2	counts	Computed WF Gate #63 Average
gate64	F14.2	counts	Computed WF Gate #64 Average

Section 6

Cal 1 Waveform Monitoring

6.1 Definition

The purpose of CAL1 waveform monitoring is to provide CAL 1 waveforms for trend analysis.

6.2 Notification

This waveform monitoring is processed daily as part of the daily AIF processing.

6.3 Processing

- **calwfmon** is a Fortran subroutine in **dotelem**. It is a CAL 1 mode waveform averaging routine that creates CAL 1 waveform average files.
- Refer to the “WFF TOPEX Software Documentation, Volume 3 - AIF Processing” for additional information. Section 7 “Components of AIF Processing”, Section 7.1.18 defines the addition of Cal waveform extraction to the standard processing of **dotelem**.
- After the data is processed, the data is to be saved for later archiving. The AIF files, tcc_alteng_1999???t000000.bin and tcc_altsci_1999???t000000.bin, are to be saved in the directory **gen/topex/data/aif/aifmondata/aifs**. The waveform average files, aif_wfmon_1999???t000000.mhi and aif_wfmon_1999???t000000.mlo, are to be saved in the directory **gen/topex/data/aif/aifmondata/aifwfmon**.
- **aif_wfmon_steptrend** is an IDL program that provides a trend plot of selected steps and gates. The waveform plots (Figure 6-1) are a time series of: gate values for CAL 1 Step 5, TLM Gate #40 to 56, the AGC, and Temperature.

A database has been created with data from 1992243 to the present, every tenth day. The intent of retaining the CAL1 waveforms will be every tenth day, such as 1998243, 1998253, etc. See Table 6-1 for database format.

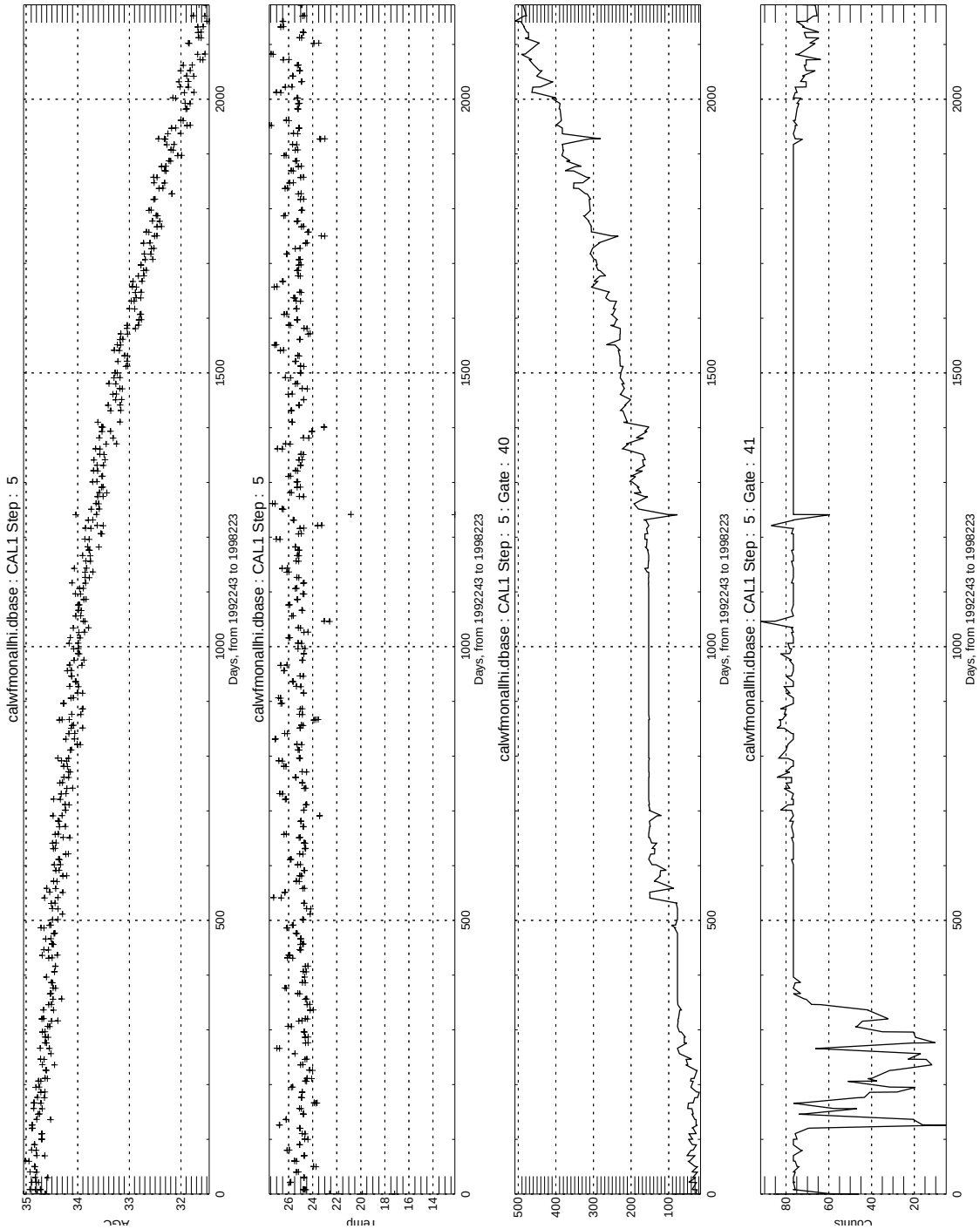

Figure 6-1 CAL 1 Step Waveform Trend Plot

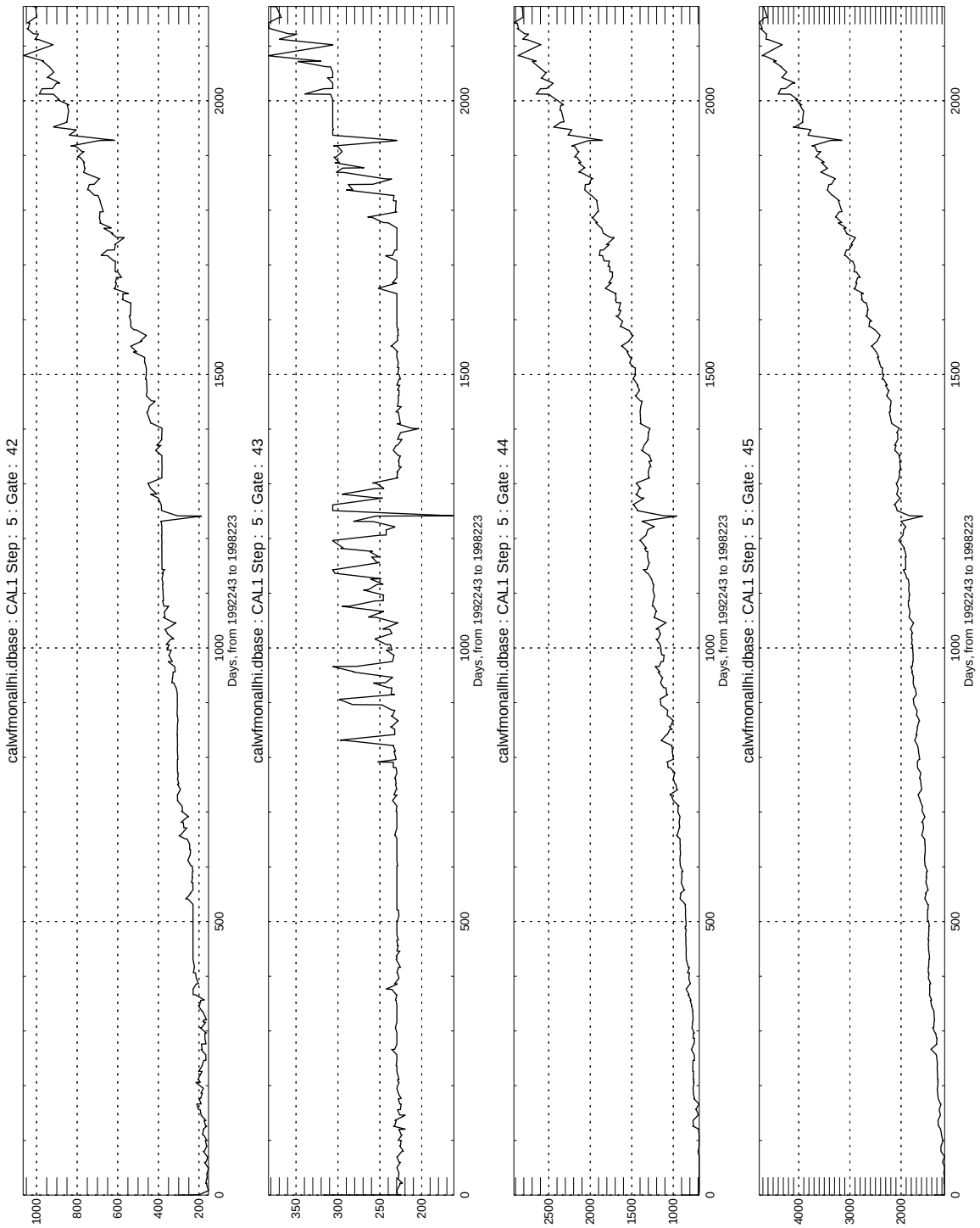

Figure 6-1 CAL 1 Step Waveform Trend Plot (Continued)

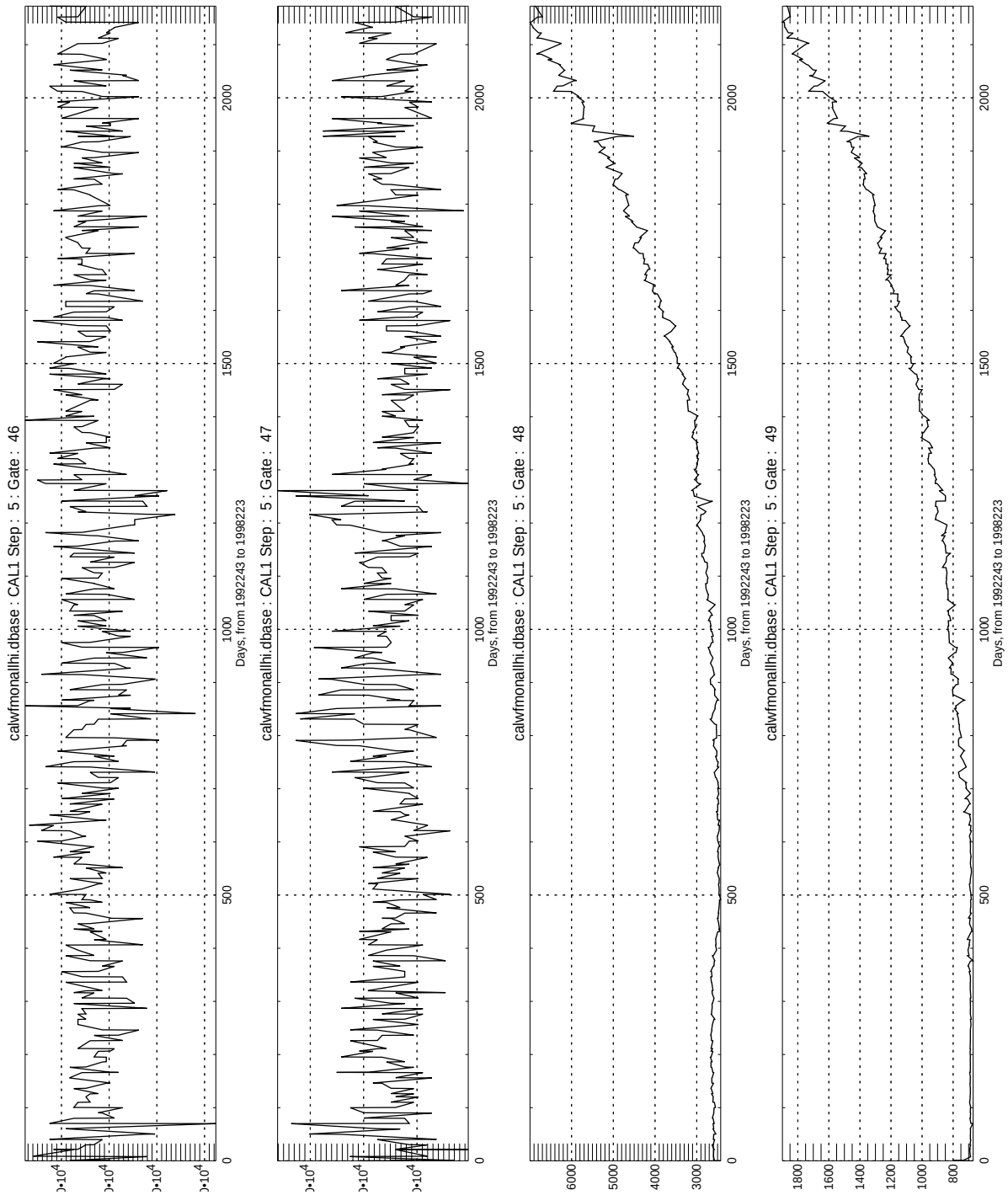

Figure 6-1 CAL 1 Step Waveform Trend Plot (Continued)

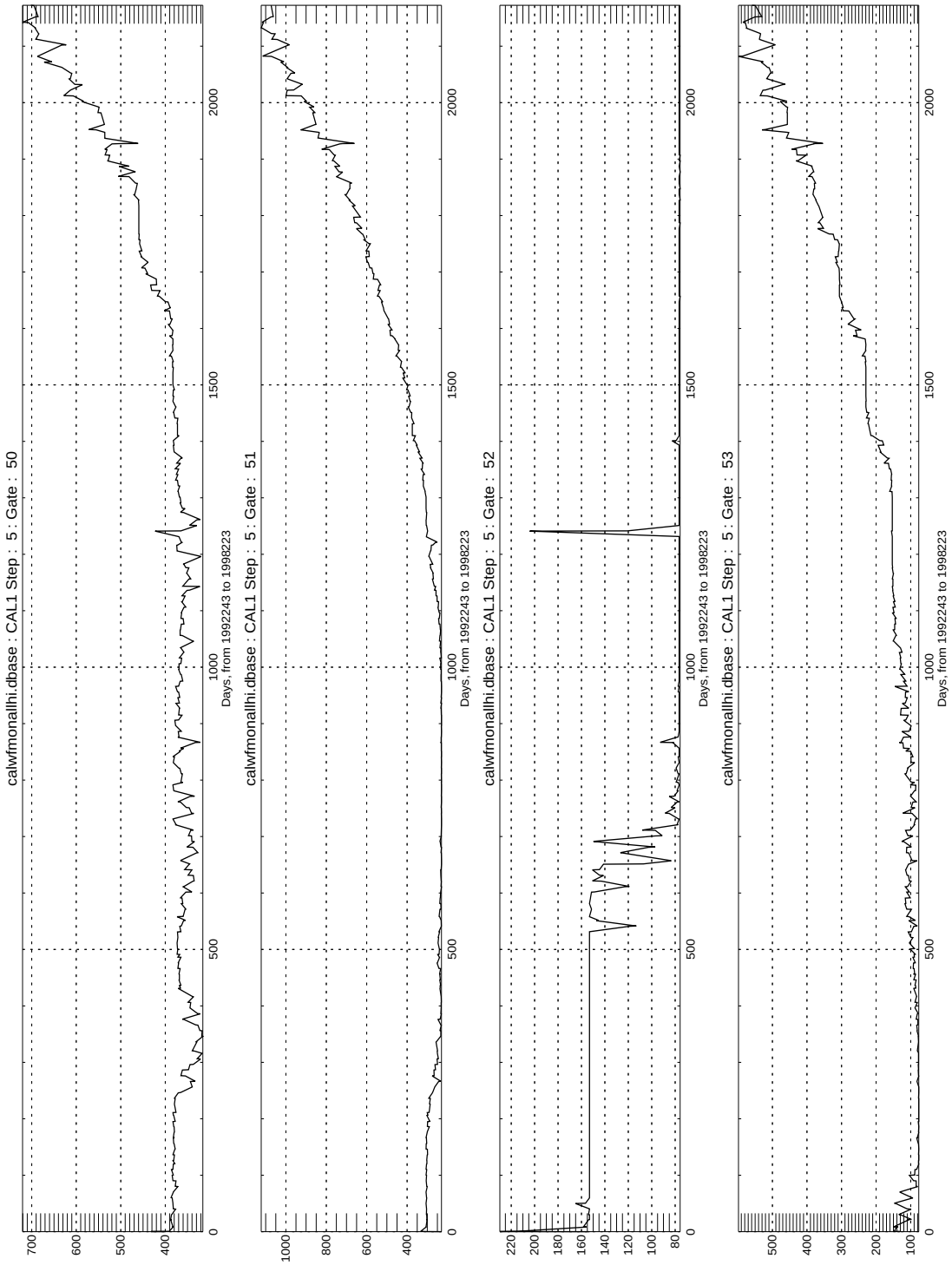

Figure 6-1 CAL 1 Step Waveform Trend Plot (Continued)

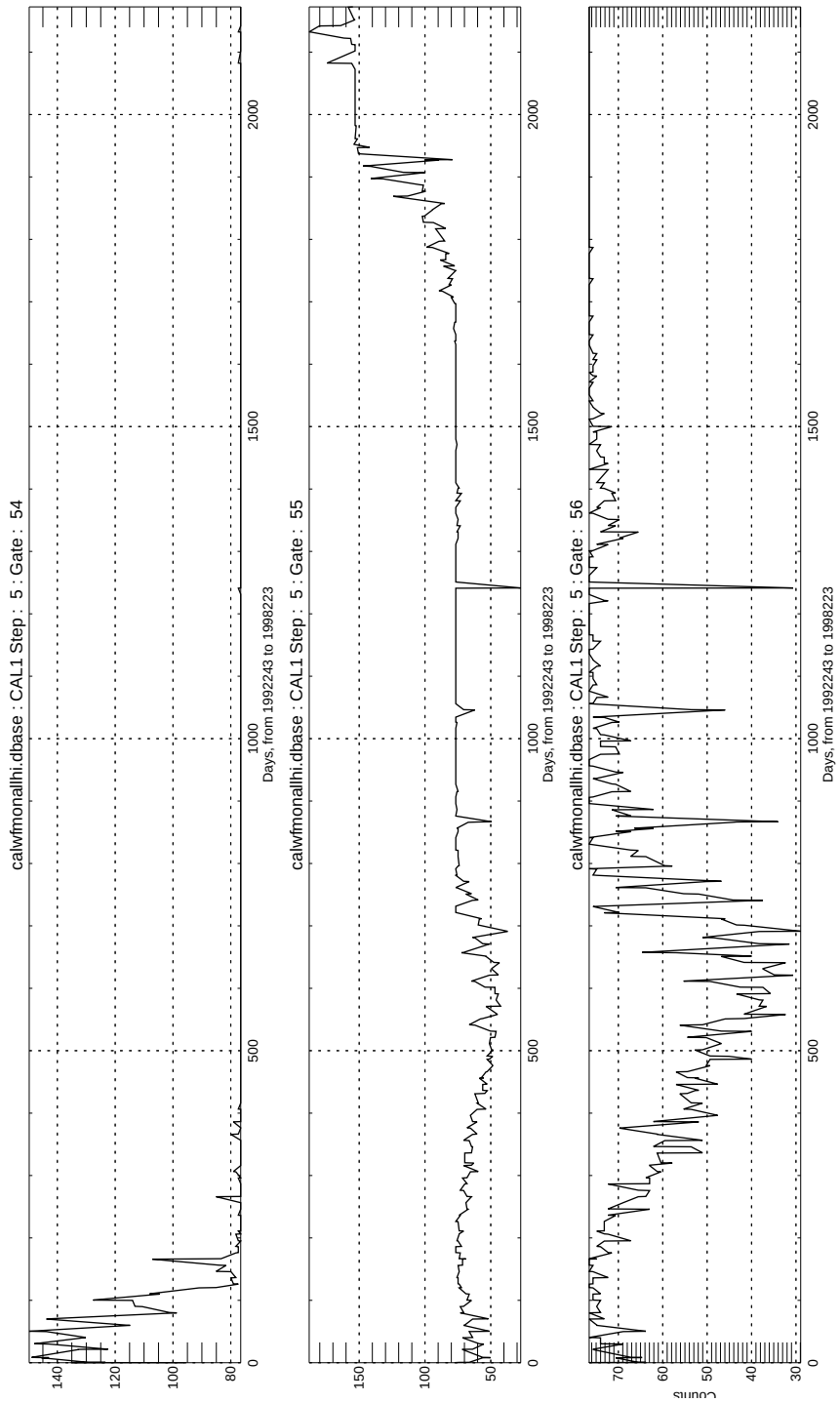

Figure 6-1 CAL 1 Step Waveform Trend Plot (Continued)

Table 6-1 AIF Cal Waveform Monitor Database

Field	Fmt	Units	Description
utcsec	F13.2	seconds	Average UTC Seconds
fileid	A7	YYYYDDD	Year and Julian Day
wffid	I2	n/a	
hdrid	I2	n/a	
step	I2	n/a	CAL1 Step (16)
mode	A4	n/a	Mode CAL1 only
reccount	F4.0	records	Number of Records Used to Compute Averages
Height	F16.4	mm	Altimeter Height
AGC	F8.4	db	Average of AGC
Temp	F8.4	degC	Mean of AGC Receiver Section Temperature
gate01	F14.3	Scaled	WF Gate #1 Step Average
gate02	F14.3	Scaled	WF Gate #2 Step Average
gate03	F14.3	Scaled	WF Gate #3 Step Average
gate04	F14.3	Scaled	WF Gate #4 Step Average
. . .	. . .	. . .	. . .
gate61	F14.3	Scaled	WF Gate #61 Step Average
gate62	F14.3	Scaled	WF Gate #62 Step Average
gate63	F14.3	Scaled	WF Gate #63 Step Average
gate64	F14.3	Scaled	WF Gate #64 Step Average

Section 7

Calibration Sweep (CalSwp)

7.1 Definition

Calibration Sweep is a Cal 1 Freeze of a designated step.

7.2 Notification

Upon Work Request.

7.3 Processing

- Processing is done in the directory **gen/topex/data/aif**. Then the waveform average files are moved to the directory **gen/topex/wrk/calsweep** for further processing.
- **dotelem** creates a 1 second average of waveforms on Cal 1 sweep data. The start and stop time of the CalSwp can be determined by the command HBIA-SON and HBIASOFF. By using the UNIX script (grep HBIAS) on the aif_event logs (Figure 7-2), the start and stop times can be determined.
- **topexfhgtlog** is an IDL program run on the one second average of hi/low waveforms. See Figure 7-1 for an example of an output product.

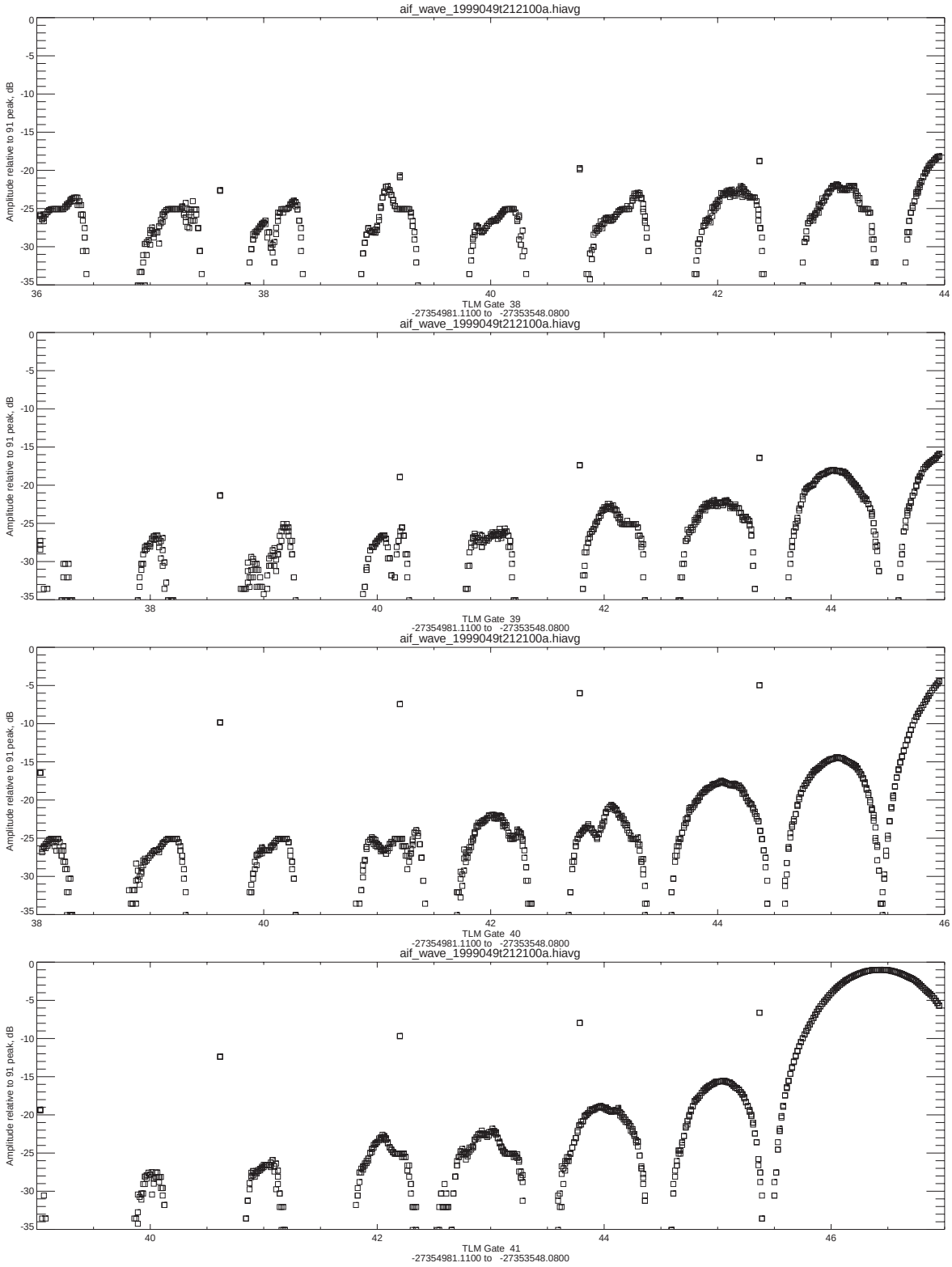

Figure 7-1 Output Product Example

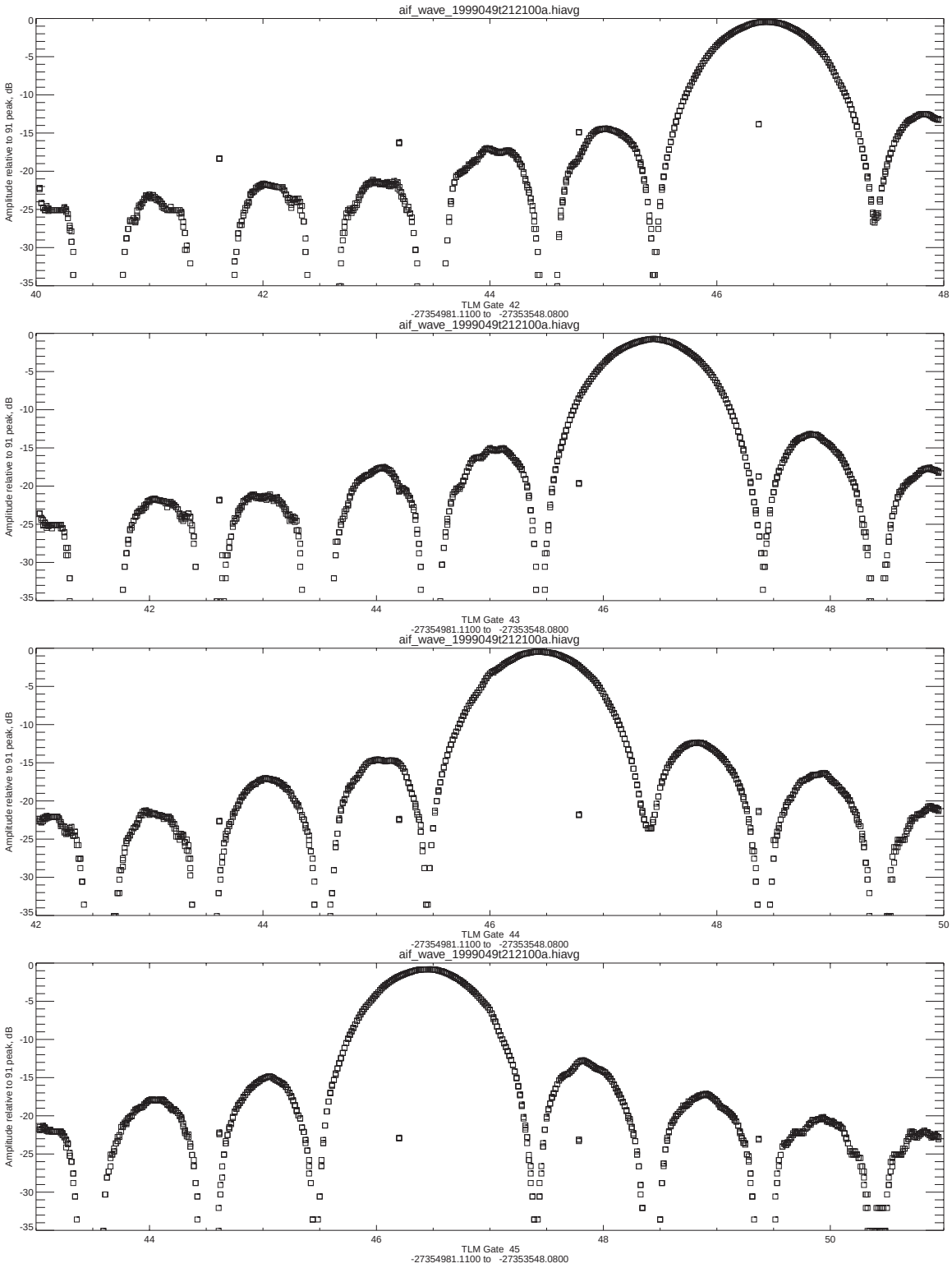

Figure 7-1 Output Product Example (Continued)

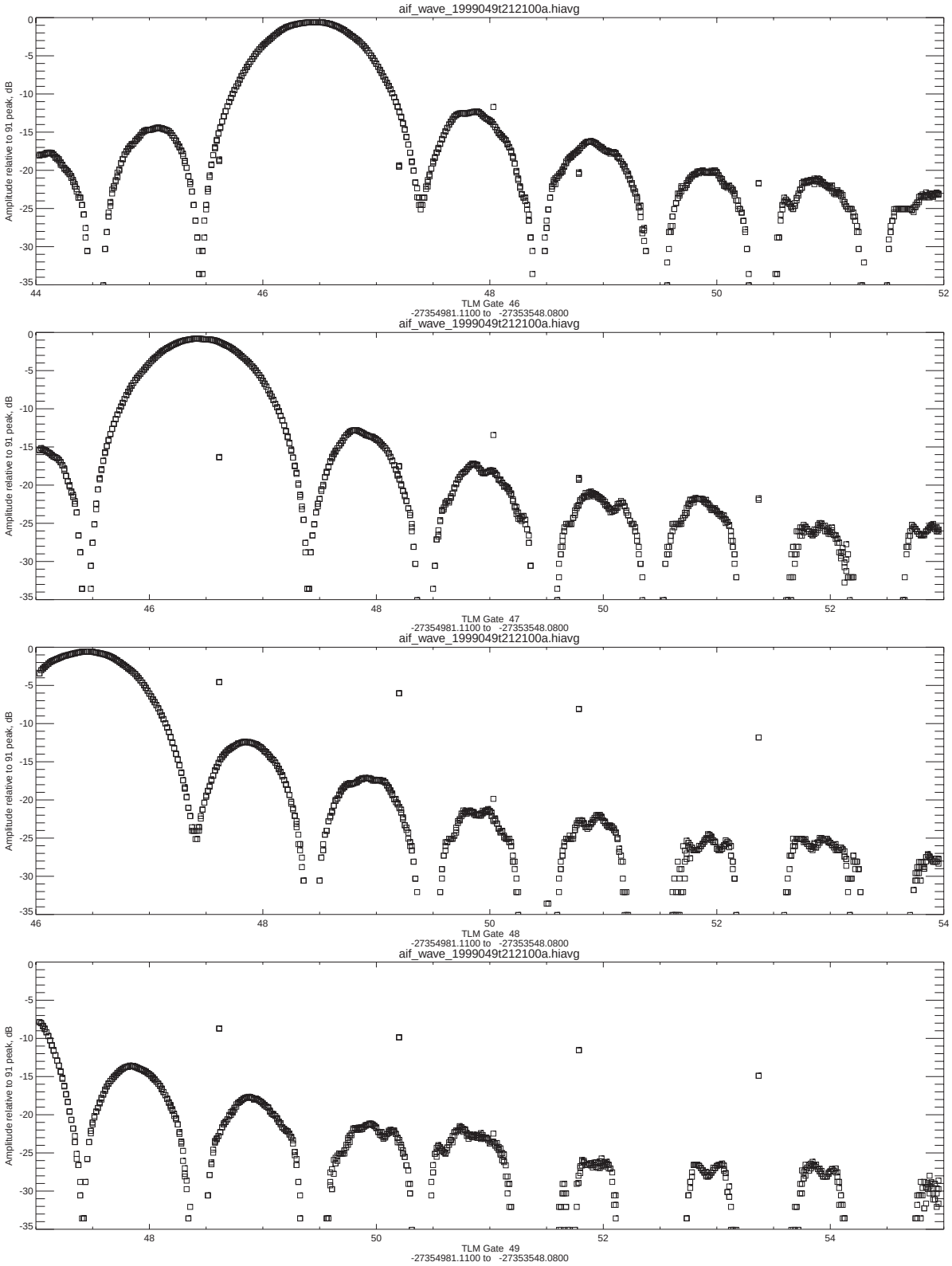

Figure 7-1 Output Product Example (Continued)

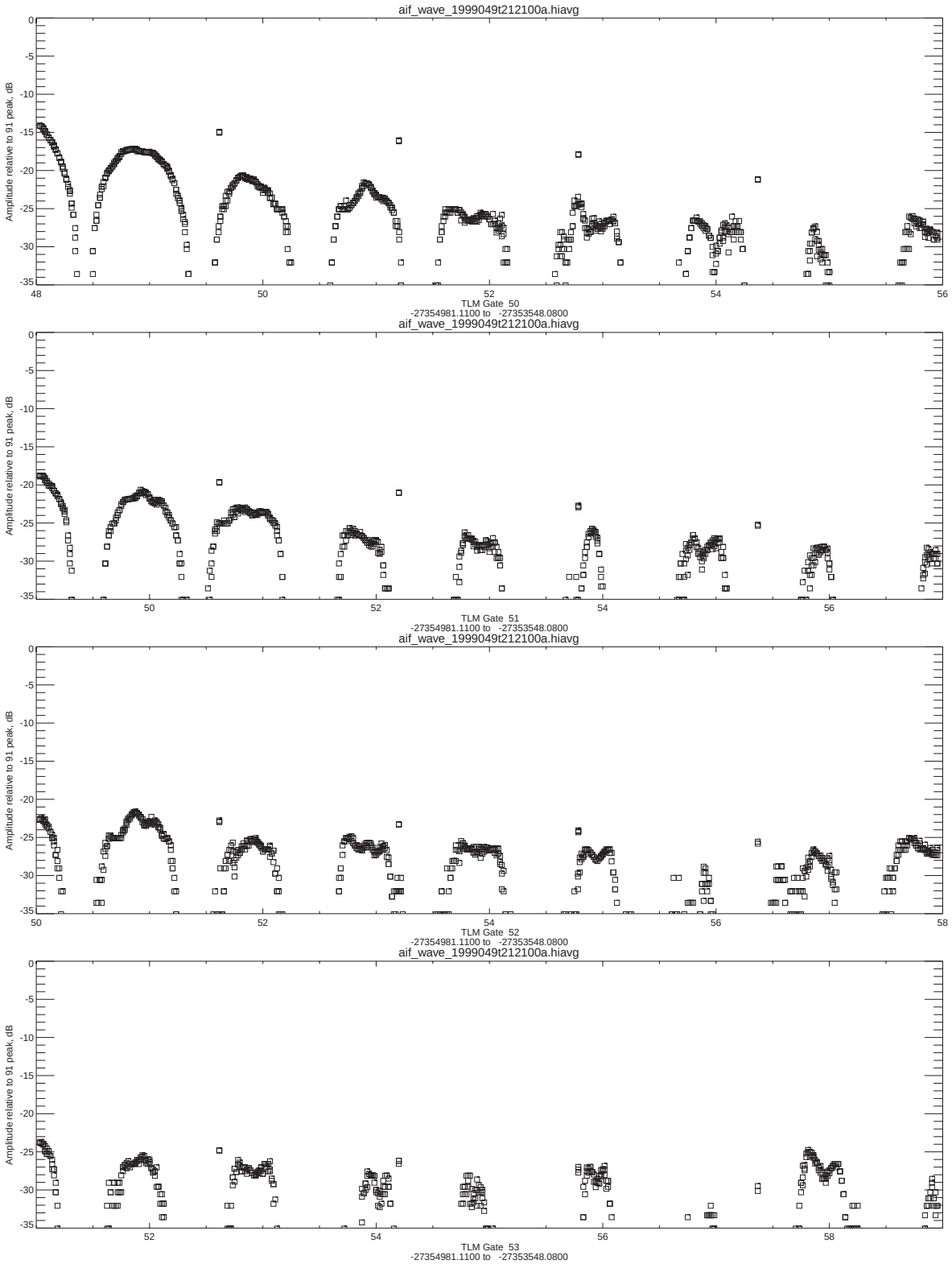

Figure 7-1 Output Product Example (Continued)

```
Feb 18 17:07        /gen/topex/data/aif/aif_event_1999049t212100.std        3

1999049  -27355043.06 1999-049T21:22:37 WF  STBYLO Gate  87 Lower -42.0   -43.02
--------------------------------------------------------------------------------
 999049  -27355042.04 1999-049T21:22:38 WF  STBYHI Gate  35 Lower -36.8   -39.70
 999049  -27355042.04 1999-049T21:22:38 WF  STBYHI Gate  39 Lower -35.1   -36.34
1999049  -27355042.04 1999-049T21:22:38 WF  STBYLO Gate  44 Lower -51.1   -51.75
1999049  -27355042.04 1999-049T21:22:38 WF  STBYLO Gate  83 Lower -55.5   -61.29
--------------------------------------------------------------------------------
1999049  -27355041.01 1999-049T21:22:39 WF  STBYHI Gate  39 Lower -35.1   -36.34
1999049  -27355041.01 1999-049T21:22:39 WF  STBYLO Gate  59 Lower -44.3   -45.91
1999049  -27355041.01 1999-049T21:22:39 WF  STBYLO Gate  85 Lower -59.3   -63.58
1999049  -27355041.01 1999-049T21:22:39 WF  STBYLO Gate  87 Lower -42.0   -43.02
1999049  -27355041.01 1999-049T21:22:39 WF  STBYHI Gate  96 Lower -32.2   -35.62
--------------------------------------------------------------------------------
1999049  -27355039.99 1999-049T21:22:40 WF  STBYHI Gate  35 Lower -36.8   -39.70
1999049  -27355039.99 1999-049T21:22:40 WF  STBYHI Gate  39 Lower -35.1   -36.34
1999049  -27355039.99 1999-049T21:22:40 WF  STBYLO Gate  75 Lower -43.2   -46.21
1999049  -27355039.99 1999-049T21:22:40 WF  STBYLO Gate  85 Lower -59.3   -63.58
1999049  -27355039.99 1999-049T21:22:40 WF  STBYLO Gate  87 Lower -42.0   -43.02
1999049  -27355039.99 1999-049T21:22:40 WF  STBYLO Gate  95 Lower -81.8  -100.00
--------------------------------------------------------------------------------
1999049  -27355038.96 1999-049T21:22:41 SCI   Mode            Mode(1,2) CAL1,CAL1
--------------------------------------------------------------------------------
1999049  -27355039.92 1999-049T21:22:40 ENG    CMD      Last_Command(2) ATAs CAL      OK
1999049  -27355039.92 1999-049T21:22:40 ENG    CMD      Last_Command(4) ICA  BFULLON  OK
1999049  -27355039.92 1999-049T21:22:40 ENG Memory  ENG_Memory_CheckSum D3C0
1999049  -27355039.92 1999-049T21:22:40 ENG Danger  Unexpected_CheckSum D3C0
--------------------------------------------------------------------------------
1999049  -27354990.77 1999-049T21:23:29 ENG    CMD      Last_Command(7) ICA  BWENBLK1 OK
'999049  -27354990.77 1999-049T21:23:29 ENG Memory  ENG_Memory_CheckSum F3F9
--------------------------------------------------------------------------------
.999049  -27354982.58 1999-049T21:23:37 ENG    CMD      Last_Command(2) ATAs HBIASON  OK
1999049  -27354982.58 1999-049T21:23:37 ENG    CMD      Last_Command(4) ICA  BFULLON  OK
1999049  -27354982.58 1999-049T21:23:37 ENG Memory  ENG_Memory_CheckSum D3C1
1999049  -27354982.58 1999-049T21:23:37 ENG Danger  Unexpected_CheckSum D3C1
--------------------------------------------------------------------------------
1999049  -27353548.98 1999-049T21:47:31 ENG    CMD      Last_Command(2) ICA  BWENBLK1 OK
1999049  -27353548.98 1999-049T21:47:31 ENG    CMD      Last_Command(5) ATAs BHIASOFF OK
1999049  -27353548.98 1999-049T21:47:31 ENG    CMD      Last_Command(8) ATAs STANDBY  OK
1999049  -27353548.98 1999-049T21:47:31 ENG Memory  ENG_Memory_CheckSum F3F9
--------------------------------------------------------------------------------
1999049  -27353541.88 1999-049T21:47:38 SCI   Mode            Mode(1,2) STBY,STBY
--------------------------------------------------------------------------------
1999049  -27353541.88 1999-049T21:47:38 WF  STBYLO Gate  53 Lower -41.6   -50.97
1999049  -27353541.88 1999-049T21:47:38 WF  STBYHI Gate  91 Lower -45.6   -46.88
1999049  -27353541.88 1999-049T21:47:38 WF  STBYLO Gate  96 Lower -44.1   -54.48
--------------------------------------------------------------------------------
1999049  -27353540.85 1999-049T21:47:39 WF  STBYLO Gate  35 Lower -56.6   -73.38
1999049  -27353540.85 1999-049T21:47:39 WF  STBYLO Gate  89 Upper 158.6   218.21
1999049  -27353540.85 1999-049T21:47:39 WF  STBYHI Gate  91 Lower -45.6   -53.47
--------------------------------------------------------------------------------
1999049  -27353540.79 1999-049T21:47:39 ENG    CMD      Last_Command(2) ICA  BFULLON  OK
1999049  -27353540.79 1999-049T21:47:39 ENG Memory  ENG_Memory_CheckSum D3BA
1999049  -27353540.79 1999-049T21:47:39 ENG Danger  Unexpected_CheckSum D3BA
--------------------------------------------------------------------------------
1999049  -27353539.83 1999-049T21:47:40 WF  STBYHI Gate  35 Lower -36.8   -59.45
1999049  -27353539.83 1999-049T21:47:40 WF  STBYLO Gate  35 Lower -56.6   -73.38
1999049  -27353539.83 1999-049T21:47:40 WF  STBYLO Gate  73 Lower -93.7  -100.00
1999049  -27353539.83 1999-049T21:47:40 WF  STBYLO Gate  82 Lower -52.2   -59.22
--------------------------------------------------------------------------------
 999049  -27353538.80 1999-049T21:47:41 WF  STBYLO Gate  81 Lower -52.4   -56.72
--------------------------------------------------------------------------------
1999049  -27353536.69 1999-049T21:47:43 WF  STBYHI Gate  39 Lower -35.1   -41.95
1999049  -27353536.69 1999-049T21:47:43 WF  STBYLO Gate  79 Lower -52.4   -56.72
--------------------------------------------------------------------------------
```

Figure 7-2 Example of the aif_event log

Section 8

Command File Processing

8.1 Definition

Attachments A and B (immediately following Figure 8-6) provide a definition of this process.

8.2 Notification

The process is initiated by receipt of a CmdLoad Form (Figure 8-1) to create either a Parameter Load File or Memory Load File and / or a CmdEdit Form (Figure 8-2) to modify a parameter file.

8.3 Processing

- All processing is done in the directory **gen/topex/data/SatActivity Blks.**
- **CmdLoad** is a Fortran program to be run on any of the command files to properly transform files into JPL POCC commands. Figure 8-3 is an example of an output file from CmdLoad.
- **CmdEdit** is a Fortran program to be run on received data, if any parameters are to be modified and to create a new parameter file.
- **CmdParamConv** is a Fortran program to be run on an input parameter file (Figure 8-4) to provide an easy to read printout (Figure 8-5).
- An additional printout which is more descriptive (Figure 8-6) may also be derived from the Parameter Block Table.

Program to run: **CmdLoad**

Name of Parameter File used for input: _____

Name of PARAMETER LOAD File for output: _____
(not to exceed 8 characters)

_____
Comments not to exceed 50 characters

Name of Memory File used for input: _____

Name of MEMORY LOAD File for output: _____
(not to exceed 8 characters)

_____
Comments not to exceed 50 characters

Name of MEMORY ADDRESS File for output: _____
(not to exceed 8 characters)

Start address of MEMORY ADDRESS File: _____
(4 byte hexidecimal number)

Name of MEMORY DUMP ADDRESS File for output: _____
(not to exceed 8 characters)

Start address of MEMORY DUMP ADDRESS File: _____
(4 byte hexidecimal number)

Stop address of MEMORY DUMP ADDRESS File: _____
(4 byte hexidecimal number)
(must be at least start address + 1)

Figure 8-1 Sample of CmdLoad Form

Parameter Description of Bytes and Values to be changed are listed in Table 5.0 of the TOPEX NASA ALTIMETER OPERATIONS HANDBOOK.

The **Parameter Byte** is the byte numbered 0 thru 273 that is to be changed.

The **Integer Value** is the value between 0 and 255 which the specific Parameter Byte is going to be changed to.

Program to run: **CmdEdit**

Name of Parameter File used for input: _____

Name of modified File used as output: _____

_____ Parameter Byte #	_____ Integer #	_____ Parameter Byte #	_____ Integer #
_____ Parameter Byte #	_____ Integer #	_____ Parameter Byte #	_____ Integer #
_____ Parameter Byte #	_____ Integer #	_____ Parameter Byte #	_____ Integer #
_____ Parameter Byte #	_____ Integer #	_____ Parameter Byte #	_____ Integer #
_____ Parameter Byte #	_____ Integer #	_____ Parameter Byte #	_____ Integer #
_____ Parameter Byte #	_____ Integer #	_____ Parameter Byte #	_____ Integer #
_____ Parameter Byte #	_____ Integer #	_____ Parameter Byte #	_____ Integer #
_____ Parameter Byte #	_____ Integer #	_____ Parameter Byte #	_____ Integer #
_____ Parameter Byte #	_____ Integer #	_____ Parameter Byte #	_____ Integer #
_____ Parameter Byte #	_____ Integer #	_____ Parameter Byte #	_____ Integer #
_____ Parameter Byte #	_____ Integer #	_____ Parameter Byte #	_____ Integer #
_____ Parameter Byte #	_____ Integer #	_____ Parameter Byte #	_____ Integer #

Figure 8-2 Sample of CmdEdit Form

```
Dec 22 11:06                    PARMC320                          1

* TITLE=NASA ALTIMETER PARAMETER LOAD FILE
* FILENAME=PARMC320
* DTG=1992-114T 9:15:27
* TEAM=WFF
* OPER=D.LOCKWOOD,D.HANCOCK,E.RODBERG
* PROJ=TOPEX
* PROG=CmdLoad/VER1.2
* SIS ID=633-741-23-006
* TWINDOW=1992-999T00:00:00,1992-999T00:00:00
* WFF_CMD_PARMC320.TXT
*    This is an ALT parameter load file
*     for nominal ALT operations
*
2D,SC42_ATAWD,'0000'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0000'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'00A6'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0000'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0000'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'00B6'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0000'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0000'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0100'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'4D4E'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0004'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0004'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0040'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0202'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'1818'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'2300'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0010'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
```

Figure 8-3 Example of Output File from CmdLoad

```
Dec 22 11:06                    PARMC320                    2
,SC42_ATAWD,'0600'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0000'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0048'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'8B00'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0120'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0400'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0014'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1E04'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'A600'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'00FB'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2008'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'B600'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0000'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'006C'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0000'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0000'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1100'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0000'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'3400'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0000'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'9C08'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0000'H
```

Figure 8-3 Example of Output File from CmdLoad (Continued)

```
Dec 22 11:06                    PARMC320                    3

,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0000'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0100'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0407'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0004'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0407'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1F10'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2F04'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0719'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0201'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'B282'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'B282'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'E782'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'C782'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1D82'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0080'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'4D00'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'6900'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0601'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'B802'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'5A07'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0407'H
,DC02_RIUNOOP
```

Figure 8-3 Example of Output File from CmdLoad (Continued)

```
Dec 22 11:06                    PARMC320                    4

,DC02_RIUNOOP
,SC42_ATAWD,'1F10'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2F04'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0719'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0201'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0080'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0080'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2980'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'4780'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'3D80'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0080'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'3801'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'B801'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1004'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'E00A'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'C81B'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'7F18'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'00A0'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0010'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0028'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0000'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'041F'H
,DC02_RIUNOOP
,DC02_RIUNOOP
```

Figure 8-3 Example of Output File from CmdLoad (Continued)

```
Dec 22 11:06                    PARMC320                    5
,SC42_ATAWD,'1F1E'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1F1D'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1E1A'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1D14'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1B08'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'171F'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'201F'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'201E'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'211C'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2318'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2718'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2720'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2020'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2121'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2222'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2524'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2B28'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'371F'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1F1E'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1F1D'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1E1A'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1D14'H
```

Figure 8-3 Example of Output File from CmdLoad (Continued)

```
Dec 22 11:06                    PARMC320                    6
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1B08'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'171F'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'201F'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'201E'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'211C'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2318'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2718'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2720'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2020'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2121'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2222'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2524'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'2B28'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'3708'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0052'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'4E46'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'3F08'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'080C'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'1020'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0306'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'0204'H
,DC02_RIUNOOP
```

Figure 8-3 Example of Output File from CmdLoad (Continued)

```
Dec 22 11:06                PARMC320                    7
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'000A'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0028'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0001'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'191A'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'1A0D'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0000'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0000'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0028'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'A800'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0000'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0000'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'00F0'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATAWD,'0019'H
  ,DC02_RIUNOOP
  ,DC02_RIUNOOP
  ,SC42_ATACHKSM,'F42E'H
*ENDCMD
```

Figure 8-3 Example of Output File from CmdLoad (Continued)

```
Dec 22 11:06                    parmc320.pa                    1
0000000000A60000000000B60000000001004D4E000400040040020218182300
0010060000000488B000120040000141E04A60000FB2008B6000000006C0000
000011000000340000009C080000000001000407000404071F102F0407190201
B282B282E782C7821D8200804D0069000601B8025A0704071F102F0407190201
00800080298047803D8000803801B8011004E00AC81B7F1800A0001000280000
041F1F1E1F1D1E1A1D141B08171F201F201E211C231827182720202021212222
25242B28371F1F1E1F1D1E1A1D141B08171F201F201E211C2318271827202020
2121222225242B28370800524E463F08080C102003060204000A00280001191A
1A0D000000000028A8000000000000F00019
```

Figure 8-4 Input Parameter File

Dec 22 11:12 PARMC320List 1

0	Iscan_Min_Hgt	00	0	8.4992
1		00	0	
2		00	0	
3		00	0	
4		00	0	
5		A6	166	
6	Iscan_Max_Hgt	00	0	9.3184
7		00	0	
8		00	0	
9		00	0	
10		00	0	
11		B6	182	
12	Iscan_Hgt_Inc	00	0	200.0000
13		00	0	
14		00	0	
15		00	0	
16		01	1	
17		00	0	
18	Cal-I Index 1	4D	77	77.0000
19	Cal-I Index 2	4E	78	78.0000
20	Cal-I Ku Min AGC Gate	00	0	1024.0000
21		04	4	
22	Cal-I C Min AGC Gate	00	0	1024.0000
23		04	4	
24	CI_AGC_Threshold	00	0	16384.0000
25		40	64	
26	CI-AGC_Alpha	02	2	2.0000
27	CI_Track_Alpha	02	2	2.0000
28	CI_Ku_Hgt_Error_Scale	18	24	24.0000
29	CI_C_Hgt_Error_Scale	18	24	24.0000
30	CI_AGC_Error_Scale	23	35	35.0000
31		00	0	
32	AGC_Threshold	00	0	4096.0000
33		10	16	
34	Low_Vres	06	6	6.0000
35	Hgt_Adjustment	00	0	0.0000
36	AGC_Adjustment	00	0	18.0000
37		00	0	
38		00	0	
39		48	72	
40	AGC_Error_Scale	8B	139	139.0000
41		00	0	
42	Ku_AGC_Gate_Scale	01	1	1.0000
43	C-100_AGC_Gate_Scale	20	32	32.0000
44	C_320_AGC_Gate-Scale	04	4	4.0000
45	LRA_Min_Height	00	0	1274.1215
46		00	0	
47		14	20	
48		1E	30	
49		04	4	
50		A6	166	
51	LRA_Max_Height	00	0	1397.0367
52		00	0	
53		FB	251	
54		20	32	
55		08	8	
56		B6	182	
57	LRA_Height_Inc	00	0	3.2378
58		00	0	
59		00	0	
60		00	0	
61		6C	108	
62		00	0	
63	LRA_AGC_Dec	00	0	4.2500

Figure 8-5 Parameter C320 Listing

Dec 22 11:12 PARMC320List 2

64		00	0	
65		00	0	
66		11	17	
67	AGC_Minimum	00	0	13.0000
68		00	0	
69		00	0	
70		34	52	
71	Delta_AGC	00	0	39.0000
72		00	0	
73		00	0	
74		9C	156	
75	HRA_Scan_Window	08	8	800.0000
76	HRA_Scan_Hgt_Inc	00	0	200.0000
77		00	0	
78		00	0	
79		00	0	
80		01	1	
81		00	0	
82	HRA_AGC_NoiseI1	04	4	4.0000
83	HRA_AGC_NoiseI2	07	7	7.0000
84	HRA_Min_Sig_Thr	00	0	1024.0000
85		04	4	
86	LR_Ku_NoiseI1	04	4	4.0000
87	LR_Ku_NoiseI2	07	7	7.0000
88	LR_Ku_Thr_Hgt_Scale	1F	31	31.0000
89	HR_Ku_AGC_I1	10	16	16.0000
90	HR_Ku_AGC_I2	2F	47	47.0000
91	HR_Ku_NoiseI1	04	4	4.0000
92	HR_Ku_NoiseI2	07	7	7.0000
93	Ku_HR_Thr_Hgt	19	25	25.0000
94	Fine_Trk_Ku_Alpha	02	2	2.0000
95	Coarse_Trk_Ku_Alpha	01	1	1.0000
96	Ku_AGC_Scale1	B2	178	33458.0000
97		82	130	
98	Ku_AGC_Scale2	B2	178	33458.0000
99		82	130	
100	Ku_AGC_Scale3	E7	231	33511.0000
101		82	130	
102	Ku-AGC_Scale4	C7	199	33479.0000
103		82	130	
104	Ku_AGC_Scale5	1D	29	33309.0000
105		82	130	
106	Ku_AGC_Scale6	00	0	32768.0000
107		80	128	
108	Ku_EML_Hgt_Scale1	4D	77	77.0000
109		00	0	
110	Ku_EML_Hgt_Scale2	69	105	105.0000
111		00	0	
112	Ku_EML_Hgt_Scale3	06	6	262.0000
113		01	1	
114	Ku_EML_Hgt_Scale4	B8	184	696.0000
115		02	2	
116	Ku_EML_Hgt_Scale5	5A	90	1882.0000
117		07	7	
118	LR_C_NoiseI1	04	4	4.0000
119	LR_C_NoiseI2	07	7	7.0000
120	LR_C_Thr_Hgt_Scale	1F	31	31.0000
121	HR_C_AGCI1	10	16	16.0000
122	HR_C_AGC_I2	2F	47	47.0000
123	HR_C_NoiseI1	04	4	4.0000
124	HR_C_NoiseI2	07	7	7.0000
125	C_HR_Thr_Hgt	19	25	25.0000
126	Fine_Trk_C_Alpha	02	2	2.0000
127	Coarse_Trk_C_Alpha	01	1	1.0000

Figure 8-5 Parameter C320 Listing (Continued)

Dec 22 11:12 PARMC320List 3

128	C_AGC_Scale1	00	0	32768.0000
129		80	128	
130	C_AGC_Scale2	00	0	32768.0000
131		80	128	
132	C_AGC_Scale3	29	41	32809.0000
133		80	128	
134	C-AGC_Scale4	47	71	32839.0000
135		80	128	
136	C_AGC_Scale5	3D	61	32829.0000
137		80	128	
138	C_AGC_Scale6	00	0	32768.0000
139		80	128	
140	C_EML_Hgt_Scale1	38	56	312.0000
141		01	1	
142	C_EML_Hgt_Scale2	B8	184	440.0000
143		01	1	
144	C_EML_Hgt_Scale3	10	16	1040.0000
145		04	4	
146	C_EML_Hgt_Scale4	E0	224	2784.0000
147		0A	10	
148	C_EML_Hgt_Scale5	C8	200	7112.0000
149		1B	27	
150	LR_Track_Point	7F	127	63.5000
151	T1	18	24	24.0000
152		00	0	
153	T2	A0	160	160.0000
154		00	0	
155	T3	10	16	16.0000
156		00	0	
157	T4	28	40	40.0000
158		00	0	
159	T8	00	0	1024.0000
160		04	4	
161	Ku_Early_Index1_1	1F	31	31.0000
162	Ku_Early_Index2_1	1F	31	31.0000
163	Ku_Early_Index1_2	1E	30	30.0000
164	Ku_Early_Index2_2	1F	31	31.0000
165	Ku_Early_Index1_3	1D	29	29.0000
166	Ku_Early_Index2_3	1E	30	30.0000
167	Ku_Early_Index1_4	1A	26	26.0000
168	Ku_Early_Index2_4	1D	29	29.0000
169	Ku_Early_Index1_5	14	20	20.0000
170	Ku_Early_Index2_5	1B	27	27.0000
171	Ku_Early_Index1_6	08	8	8.0000
172	Ku_Early_Index2_6	17	23	23.0000
173	Ku_Middle_Index1_1	1F	31	31.0000
174	Ku_Middle_Index2_1	20	32	32.0000
175	Ku_Middle_Index1_2	1F	31	31.0000
176	Ku_Middle_Index2_2	20	32	32.0000
177	Ku_Middle_Index1_3	1E	30	30.0000
178	Ku_Middle_Index2_3	21	33	33.0000
179	Ku_Middle_Index1_4	1C	28	28.0000
180	Ku_Middle_Index2_4	23	35	35.0000
181	Ku_Middle_Index1_5	18	24	24.0000
182	Ku_Middle_Index2_5	27	39	39.0000
183	Ku_Middle_Index1_6	18	24	24.0000
184	Ku_Middle_Index2_6	27	39	39.0000
185	Ku_Late_Index1_1	20	32	32.0000
186	Ku_Late_Index2_1	20	32	32.0000
187	Ku_Late_Index1_2	20	32	32.0000
188	Ku_Late_Index2_2	21	33	33.0000
189	Ku_Late_Index1_3	21	33	33.0000
190	Ku_Late_Index2_3	22	34	34.0000
191	Ku_Late_Index1_4	22	34	34.0000

Figure 8-5 Parameter C320 Listing (Continued)

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192	Ku_Late_Index2_4	25	37	37.0000
193	Ku_Late_Index1_5	24	36	36.0000
194	Ku_Late_Index2_5	2B	43	43.0000
195	Ku_Late_Index1_6	28	40	40.0000
196	Ku_Late_Index2_6	37	55	55.0000
197	C_Early_Index1_1	1F	31	31.0000
198	C_Early_Index2_1	1F	31	31.0000
199	C_Early_Index1_2	1E	30	30.0000
200	C_Early_Index2_2	1F	31	31.0000
201	C_Early_Index1_3	1D	29	29.0000
202	C_Early_Index2_3	1E	30	30.0000
203	C_Early_Index1_4	1A	26	26.0000
204	C_Early_Index2_4	1D	29	29.0000
205	C_Early_Index1_5	14	20	20.0000
206	C_Early_Index2_5	1B	27	27.0000
207	C_Early_Index1_6	08	8	8.0000
208	C_Early_Index2_6	17	23	23.0000
209	C_Middle_Index1_1	1F	31	31.0000
210	C_Middle_Index2_1	20	32	32.0000
211	C_Middle_Index1_2	1F	31	31.0000
212	C_Middle_Index2_2	20	32	32.0000
213	C_Middle_Index1_3	1E	30	30.0000
214	C_Middle_Index2_3	21	33	33.0000
215	C_Middle_Index1_4	1C	28	28.0000
216	C_Middle_Index2_4	23	35	35.0000
217	C_Middle_Index1_5	18	24	24.0000
218	C_Middle_Index2_5	27	39	39.0000
219	C_Middle_Index1_6	18	24	24.0000
220	C_Middle_Index2_6	27	39	39.0000
221	C_Late_Index1_1	20	32	32.0000
222	C_Late_Index2_1	20	32	32.0000
223	C_Late_Index1_2	20	32	32.0000
224	C_Late_Index2_2	21	33	33.0000
225	C_Late_Index1_3	21	33	33.0000
226	C_Late_Index2_3	22	34	34.0000
227	C_Late_Index1_4	22	34	34.0000
228	C_Late_Index2_4	25	37	37.0000
229	C_Late_Index1_5	24	36	36.0000
230	C_Late_Index2_5	2B	43	43.0000
231	C_Late_Index1_6	28	40	40.0000
232	C_Late_Index2_6	37	55	55.0000
233	RAVE Time Constant	08	8	8.0000
234		00	0	
235	Ku_GI_Scale	52	82	82.0000
236	C_320_GI_Scale	4E	78	78.0000
237	C_100_GI_Scale	46	70	70.0000
238	HR_Track_Point	3F	63	63.0000
239	Thr_Hgt_Err_Win1	08	8	8.0000
240	Thr_Hgt_Err_Win2	08	8	8.0000
241	Thr_Hgt_Err_Win3	0C	12	12.0000
242	Thr_Hgt_Err_Win4	10	16	16.0000
243	Thr_Hgt_Err_Win5	20	32	32.0000
244	Fine_Trk_AGC_Alpha	03	3	3.0000
245	Fine_Track_Beta	06	6	6.0000
246	Coarse_Trk_AGC_Alpha	02	2	2.0000
247	Coarse_Track_Beta	04	4	4.0000
248	T5	00	0	2560.0000
249		0A	10	
250	T6	00	0	10240.0000
251		28	40	
252	T7	00	0	256.0000
253		01	1	
254	Ku_Pulse_Count	19	25	25.0000
255	C_Pulse_Count	1A	26	26.0000

Figure 8-5 Parameter C320 Listing (Continued)

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256	Acq_Pulse_Count	1A	26	26.0000
257	AGC_Rate	0D	13	13.0000
258		00	0	
259	Xmit_Test_Height	00	0	8.6096
260		00	0	
261		00	0	
262		00	0	
263		28	40	
264		A8	168	
265	Xmit_Test_Hgt_Rate	00	0	0.0000
266		00	0	
267		00	0	
268		00	0	
269		00	0	
270		00	0	
271	Xmit_Test_AGC	F0	240	60.0000
272	BC_Init	00	0	0.0000
273	WD_Init	19	25	25.0000

Figure 8-5 Parameter C320 Listing (Continued)

Byte	Parameter	Hex	Dec	EA Value	Units	Description
0	Iscan_Min_Hgt	00	0	8.4992	mSec	Minimum Interference Scan height, 48 bits, MSB = 6.5536 msec
1		00	0			MSByte of LSWord
2		00	0			LSByte of Middle Word
3		00	0			MSByte of Middle Word
4		00	0			LSByte of Upper Word
5		A6	166			MSByte of Upper Word
6	Iscan_Max_Hgt	00	0	9.3184	mSec	Max Scan height, 48 bits, MSBit = 6.5536 msec
7		00	0			MSByte of LSWord
8		00	0			LSByte of Middle Word
9		00	0			MSByte of Middle Word
10		00	0			LSByte of Upper Word
11		B6	182			MSByte of Upper Word
12	Iscan_Hgt_Inc	00	0	200.0000	nSec	Iscan Height Increment 48 bits, MSBit = 6.5536 msec
13		00	0			MSByte of LSWord
14		00	0			LSByte of Middle Word
15		00	0			MSByte of Middle Word
16		01	1			LSByte of Upper Word
17		00	0			MSByte of Upper Word
18	Cal-I Index 1	4D	77	77.0000	n/a	Cal-I Tracking waveform sample index 1, 8 bits (samples indexed 0..127)
19	Cal-I Index 2	4E	78	78.0000	n/a	Cal-I Tracking waveform sample index 2, 8 bits
20	Cal-I Ku Min AGC Gate	00	0	1024.0000	n/a	Cal-I Ku Minimum AGC Gate, 16 bits, LSByte
21		04	4			Cal-I Ku Minimum AGC Gate, MSByte
22	Cal-I C Min AGC Gate	00	0	1024.0000	n/a	Cal-I C Minimum AGC Gate, 16 bits, LSByte
23		04	4			Cal-I C Minimum AGC Gate, MSByte
24	CI_AGC_Threshold	00	0	16384.0000	n/a	Cal-I AGC Threshold, 16 bits, LSByte
25		40	64			Cal-I AGC Threshold, MSByte
26	CI-AGC_Alpha	02	2	2.0000	n/a	Cal-I AGC Alpha, 8 bits, # of right shifts of AGC Error (power of 2)
27	CI_Track_Alpha	02	2	2.0000	n/a	Cal-I Track Alpha, 8 bits, # of right shifts
28	CI_Ku_Hgt_Error_Scale	18	24	24.0000	n/a	Cal-I Ku Height Error Scale, 8 bits, # of left shifts
29	CI_C_Hgt_Error_Scale	18	24	24.0000	n/a	Cal-I C Height Error Scale, 8 bits, # of left shifts
30	CI_AGC_Error_Scale	23	35	35.0000	n/a	Cal-I AGC Error Scale, 16 bits, LSByte
31		00	0			Cal-I AGC Error Scale, MSByte
32	AGC_Threshold	00	0	4096.0000	n/a	AGC Threshold, 16 bits, Track modes and Cal-II, LSByte
33		10	16			AGC Threshold, MSByte
34	Low_Vres	06	6	6.0000	n/a	Vres value used in Low Resolution Modes
35	Hgt_Adjustment	00	0	0.0000	n/a	subtracted from tracker height when changing from Low to High res track, 8 bits, LSBit = 3.125 ns
36	AGC_Adjustment	00	0	18.0000	dB	subtracted from Primary and Secondary AGC's when changing from Low to High res track, 32 bits, MSBit = 32dB, LSByte of LSWord

Figure 8-6 Parameter Block PARMC320

Byte	Parameter	Hex	Dec	EA Value	Units	Description
37		00	0			MSByte of LSWord
38		00	0			LSByte of MSWord
39		48	72			MSByte of MSWord
40	AGC_Error_Scale	8B	139	139.0000	n/a	LSByte, 8 bits
41		00	0			MSByte
42	Ku_AGC_Gate_Scale	01	1	1.0000	n/a	8 bits
43	C-100_AGC_Gate_Scale	20	32	32.0000	n/a	8 bits
44	C_320_AGC_Gate-Scale	04	4	4.0000	n/a	8 bits
45	LRA_Min_Height	00	0	1274.1215	Km	Low res acquisition min height. 48-bits, MSBit = 6.55 msec, LSByte of LSWord
46		00	0			MSByte of LSWord
47		14	20			LSByte of Middle Word
48		1E	30			MSByte of Middle Word
49		04	4			LSByte of MSWord
50		A6	166			MSByte of MSWord
51	LRA_Max_Height	00	0	1397.0367	Km	Low res acquisition max height, 48-bits, MSBit = 6.55 msec, LSByte of LSWord
52		00	0			MSByte of LSWord
53		FB	251			LSByte of Middle Word
54		20	32			MSByte of Middle Word
55		08	8			LSByte of MSWord
56		B6	182			MSByte of MSWord
57	LRA_Height_Inc	00	0	3.2378	Km	Low res acquisition height increment, (scan step size), 48-bits, MSBit = 6.55 msec, LSByte of LSWord
58		00	0			MSByte of LSWord
59		00	0			LSByte of Middle Word
60		00	0			MSByte of Middle Word
61		6C	108			LSByte of MSWord
62		00	0			MSByte of MSWord
63	LRA_AGC_Dec	00	0	4.2500	dB	Low res acquisition AGC decrement, 32-bits, MSBit = 32 dB, LSByte of LSWord
64		00	0			MSByte of LSWord
65		00	0			LSByte of MSWord
66		11	17			MSByte of MSWord
67	AGC_Minimum	00	0	13.0000	dB	Minimum AGC Value, 32-bits, MSBit = 32 dB, LSByte of LSWord
68		00	0			MSByte of LSWord
69		00	0			LSByte of MSWord
70		34	52			MSByte of MSWord
71	Delta_AGC	00	0	39.0000	dB	AGC adjustment for entering Low res acquisition, 32-bits, MSBit = 32 dB, LSByte of LSWord
72		00	0			MSByte of LSWord
73		00	0			LSByte of MSWord

Figure 8-6 Parameter Block PARMC320 (Continued)

Byte	Parameter	Hex	Dec	EA Value	Units	Description
74		9C	156			MSByte of MSWord
75	HRA_Scan_Window	08	8	800.0000	nSec	High res acquisition scan window size, 8-bits, LSBit = 100 ns
76	HRA_Scan_Hgt_Inc	00	0	200.0000	nSec	High res acquisition scan height increment, 48-bits, MSBit = 6.55 milliseconds, LSByte of LSWord
77		00	0			MSByte of LSWord
78		00	0			LSByte of Middle Word
79		00	0			MSByte of Middle Word
80		01	1			LSByte of MSWord
81		00	0			MSByte of MSWord
82	HRA_AGC_NoiseI1	04	4	4.0000	n/a	High res acquisition AGC noise index 1, 8-bits, (bins start at 0)
83	HRA_AGC_NoiseI2	07	7	7.0000	n/a	High res acquisition AGC noise index 2, 8-bits
84	HRA_Min_Sig_Thr	00	0	1024.0000	n/a	High res acquisition min signal threshold, 16-bits, bit significance same as waveform samples, LSByte
85		04	4			MSByte
86	LR_Ku_NoiseI1	04	4	4.0000	n/a	Low res Ku noise index 1 (waveform sample index) 8-bits
87	LR_Ku_NoiseI2	07	7	7.0000	n/a	Low res Ku noise index 2, 8-bits
88	LR_Ku_Thr_Hgt_Scale	1F	31	31.0000	n/a	Low res Ku threshold height scale, 8=bits, # of left shifts of height error
89	HR_Ku_AGC_I1	10	16	16.0000	n/a	High res Ku AGC index 1, 8-bits, (waveform sample index)
90	HR_Ku_AGC_I2	2F	47	47.0000	n/a	High res Ku AGC index 2, 8-bits, (waveform sample index)
91	HR_Ku_NoiseI1	04	4	4.0000	n/a	High res Ku noise index 1, 8-bits, (waveform sample index)
92	HR_Ku_NoiseI2	07	7	7.0000	n/a	High res Ku noise index 2, 8-bits, (waveform sample index)
93	Ku_HR_Thr_Hgt	19	25	25.0000	n/a	Ku high res threshold height scale, 8-bits, # of left shifts
94	Fine_Trk_Ku_Alpha	02	2	2.0000	n/a	Fine track Ku alpha, 8-bits, # of right shifts of height error
95	Coarse_Trk_Ku_Alpha	01	1	1.0000	n/a	Coarse track Ku alpha, 8-bits, # of right shifts of height error
96	Ku_AGC_Scale1	B2	178	33458.0000	n/a	AGC Multiplier for gate index 1, 16-bits, LSByte
97		82	130			MSByte
98	Ku_AGC_Scale2	B2	178	33458.0000	n/a	AGC Multiplier for gate index 2, 16-bits, LSByte
99		82	130			MSByte
100	Ku_AGC_Scale3	E7	231	33511.0000	n/a	AGC Multiplier for gate index 3, 16-bits, LSByte
101		82	130			MSByte
102	Ku-AGC_Scale4	C7	199	33479.0000	n/a	AGC Multiplier for gate index 4, 16-bits, LSByte
103		82	130			MSByte
104	Ku_AGC_Scale5	1D	29	33309.0000	n/a	AGC Multiplier for gate index 5, 16-bits, LSByte
105		82	130			MSByte
106	Ku_AGC_Scale6	00	0	32768.0000	n/a	AGC Multiplier for gate index 6, 16-bits, LSByte
107		80	128			MSByte
108	Ku_EML_Hgt_Scale1	4D	77	77.0000	n/a	Ku EML Height error scale factor, gate index 1, 16-bits
109		00	0			
110	Ku_EML_Hgt_Scale2	69	105	105.0000	n/a	Ku EML Height error scale factor, gate index 2, 16-bits

Figure 8-6 Parameter Block PARMC320 (Continued)

Byte	Parameter	Hex	Dec	EA Value	Units	Description
111		00	0			
112	Ku_EML_Hgt_Scale3	06	6	262.0000	n/a	Ku EML Height error scale factor, gate index 3, 16-bits
113		01	1			
114	Ku_EML_Hgt_Scale4	B8	184	696.0000	n/a	Ku EML Height error scale factor, gate index 4, 16-bits
115		02	2			
116	Ku_EML_Hgt_Scale5	5A	90	1882.0000	n/a	Ku EML Height error scale factor, gate index 5, 16-bits
117		07	7			
118	LR_C_Noisel1	04	4	4.0000	n/a	Low res C noise index 1 (waveform sample index) 8-bits
119	LR_C_Noisel2	07	7	7.0000	n/a	Low res C noise index 2, 8-bits
120	LR_C_Thr_Hgt_Scale	1F	31	31.0000	n/a	Low res C threshold height scale, 8=bits, # of left shifts of height error
121	HR_C_AGC11	10	16	16.0000	n/a	High res C AGC index 1, 8-bits, (waveform sample index)
122	HR_C_AGC_12	2F	47	47.0000	n/a	High res C AGC index 2, 8-bits, (waveform sample index)
123	HR_C_Noisel1	04	4	4.0000	n/a	High res C noise index 1, 8-bits, (waveform sample index)
124	HR_C_Noisel2	07	7	7.0000	n/a	High res C noise index 2, 8-bits, (waveform sample index)
125	C_HR_Thr_Hgt	19	25	25.0000	n/a	C high res threshold height scale, 8-bits, # of left shifts
126	Fine_Trk_C_Alpha	02	2	2.0000	n/a	Fine track C alpha, 8-bits, # of right shifts of height error
127	Coarse_Trk_C_Alpha	01	1	1.0000	n/a	Coarse track C alpha, 8-bits, # of right shifts of height error
128	C_AGC_Scale1	00	0	32768.0000	n/a	AGC Multiplier for gate index 1, 16-bits, LSByte
129		80	128			MSByte
130	C_AGC_Scale2	00	0	32768.0000	n/a	AGC Multiplier for gate index 2, 16-bits, LSByte
131		80	128			MSByte
132	C_AGC_Scale3	29	41	32809.0000	n/a	AGC Multiplier for gate index 3, 16-bits, LSByte
133		80	128			MSByte
134	C-AGC_Scale4	47	71	32839.0000	n/a	AGC Multiplier for gate index 4, 16-bits, LSByte
135		80	128			MSByte
136	C_AGC_Scale5	3D	61	32829.0000	n/a	AGC Multiplier for gate index 5, 16-bits, LSByte
137		80	128			MSByte
138	C_AGC_Scale6	00	0	32768.0000	n/a	AGC Multiplier for gate index 6, 16-bits, LSByte
139		80	128			MSByte
140	C_EML_Hgt_Scale1	38	56	312.0000	n/a	C EML Height error scale factor, gate index 1, 16-bits
141		01	1			
142	C_EML_Hgt_Scale2	B8	184	440.0000	n/a	C EML Height error scale factor, gate index 2, 16-bits
143		01	1			
144	C_EML_Hgt_Scale3	10	16	1040.0000	n/a	C EML Height error scale factor, gate index 3, 16-bits
145		04	4			
146	C_EML_Hgt_Scale4	E0	224	2784.0000	n/a	C EML Height error scale factor, gate index 4, 16-bits
147		0A	10			
148	C_EML_Hgt_Scale5	C8	200	7112.0000	n/a	C EML Height error scale factor, gate index 5, 16-bits
149		1B	27			

Figure 8-6 Parameter Block PARMC320 (Continued)

Byte	Parameter	Hex	Dec	EA Value	Units	Description
150	LR_Track_Point	7F	127	63.5000	n/a	Low res track point, 8-bits, LSBit = 1/2 a waveform sample bin
151 152	T1	18 00	24 0	24.0000	n/a	"adequate signal width," 16-bits, LSB = 1/2 waveform sample bin, LSByte MSByte
153	T2	A0	160	160.0000	n/a	"adequate signal variability," 16-bits, in 1/2 bins squared, summed for 10 track intervals, LSByte
154		00	0			MSByte
155	T3	10	16	16.0000	n/a	"Good signal width," 16-bits, LSBit = 1/2 a waveform sample bin, LSByte
156		00	0			MSByte
157	T4	28	40	40.0000	n/a	"Good signal variability," 16-bits, in 1/2 bins squared, summed for 10 track intervals, LSByte
158		00	0			MSByte
159	T8	00	0	1024.0000	n/a	"Absolute Threshold," same scaling as waveform samples, LSByte
160		04	4			MSByte
161	Ku_Early_Index1_1	1F	31	31.0000	n/a	Ku Early index1, gate index 1, waveform bin index, 8-bits
162	Ku_Early_Index2_1	1F	31	31.0000	n/a	Ku Early index2, gate index 1, waveform bin index, 8-bits
163	Ku_Early_Index1_2	1E	30	30.0000	n/a	Ku Early index1, gate index 2, waveform bin index, 8-bits
164	Ku_Early_Index2_2	1F	31	31.0000	n/a	Ku Early index2, gate index 2, waveform bin index, 8-bits
165	Ku_Early_Index1_3	1D	29	29.0000	n/a	Ku Early index1, gate index 3, waveform bin index, 8-bits
166	Ku_Early_Index2_3	1E	30	30.0000	n/a	Ku Early index2, gate index 3, waveform bin index, 8-bits
167	Ku_Early_Index1_4	1A	26	26.0000	n/a	Ku Early index1, gate index 4, waveform bin index, 8-bits
168	Ku_Early_Index2_4	1D	29	29.0000	n/a	Ku Early index2, gate index 4, waveform bin index, 8-bits
169	Ku_Early_Index1_5	14	20	20.0000	n/a	Ku Early index1, gate index 5, waveform bin index, 8-bits
170	Ku_Early_Index2_5	1B	27	27.0000	n/a	Ku Early index2, gate index 5, waveform bin index, 8-bits
171	Ku_Early_Index1_6	08	8	8.0000	n/a	Ku Early index1, gate index 6, waveform bin index, 8-bits
172	Ku_Early_Index2_6	17	23	23.0000	n/a	Ku Early index2, gate index 6, waveform bin index, 8-bits
173	Ku_Middle_Index1_1	1F	31	31.0000	n/a	Ku Middle index1, gate index 1, waveform bin index, 8-bits
174	Ku_Middle_Index2_1	20	32	32.0000	n/a	Ku Middle index2, gate index 1, waveform bin index, 8-bits
175	Ku_Middle_Index1_2	1F	31	31.0000	n/a	Ku Middle index1, gate index 2, waveform bin index, 8-bits
176	Ku_Middle_Index2_2	20	32	32.0000	n/a	Ku Middle index2, gate index 2, waveform bin index, 8-bits
177	Ku_Middle_Index1_3	1E	30	30.0000	n/a	Ku Middle index1, gate index 3, waveform bin index, 8-bits
178	Ku_Middle_Index2_3	21	33	33.0000	n/a	Ku Middle index2, gate index 3, waveform bin index, 8-bits
179	Ku_Middle_Index1_4	1C	28	28.0000	n/a	Ku Middle index1, gate index 4, waveform bin index, 8-bits
180	Ku_Middle_Index2_4	23	35	35.0000	n/a	Ku Middle index2, gate index 4, waveform bin index, 8-bits
181	Ku_Middle_Index1_5	18	24	24.0000	n/a	Ku Middle index1, gate index 5, waveform bin index, 8-bits
182	Ku_Middle_Index2_5	27	39	39.0000	n/a	Ku Middle index2, gate index 5, waveform bin index, 8-bits
183	Ku_Middle_Index1_6	18	24	24.0000	n/a	Ku Middle index1, gate index 6, waveform bin index, 8-bits
184	Ku_Middle_Index2_6	27	39	39.0000	n/a	Ku Middle index2, gate index 6, waveform bin index, 8-bits
185	Ku_Late_Index1_1	20	32	32.0000	n/a	Ku Late index1, gate index 1, waveform bin index, 8-bits
186	Ku_Late_Index2_1	20	32	32.0000	n/a	Ku Late index2, gate index 1, waveform bin index, 8-bits

Figure 8-6 Parameter Block PARMC320 (Continued)

Byte	Parameter	Hex	Dec	EA Value	Units	Description
187	Ku_Late_Index1_2	20	32	32.0000	n/a	Ku Late index1, gate index 2, waveform bin index, 8-bits
188	Ku_Late_Index2_2	21	33	33.0000	n/a	Ku Late index2, gate index 2, waveform bin index, 8-bits
189	Ku_Late_Index1_3	21	33	33.0000	n/a	Ku Late index1, gate index 3, waveform bin index, 8-bits
190	Ku_Late_Index2_3	22	34	34.0000	n/a	Ku Late index2, gate index 3, waveform bin index, 8-bits
191	Ku_Late_Index1_4	22	34	34.0000	n/a	Ku Late index1, gate index 4, waveform bin index, 8-bits
192	Ku_Late_Index2_4	25	37	37.0000	n/a	Ku Late index2, gate index 4, waveform bin index, 8-bits
193	Ku_Late_Index1_5	24	36	36.0000	n/a	Ku Late index1, gate index 5, waveform bin index, 8-bits
194	Ku_Late_Index2_5	2B	43	43.0000	n/a	Ku Late index2, gate index 5, waveform bin index, 8-bits
195	Ku_Late_Index1_6	28	40	40.0000	n/a	Ku Late index1, gate index 6, waveform bin index, 8-bits
196	Ku_Late_Index2_6	37	55	55.0000	n/a	Ku Late index2, gate index 6, waveform bin index, 8-bits
197	C_Early_Index1_1	1F	31	31.0000	n/a	C Early index1, gate index 1, waveform bin index, 8-bits
198	C_Early_Index2_1	1F	31	31.0000	n/a	C Early index2, gate index 1, waveform bin index, 8-bits
199	C_Early_Index1_2	1E	30	30.0000	n/a	C Early index1, gate index 2, waveform bin index, 8-bits
200	C_Early_Index2_2	1F	31	31.0000	n/a	C Early index2, gate index 2, waveform bin index, 8-bits
201	C_Early_Index1_3	1D	29	29.0000	n/a	C Early index1, gate index 3, waveform bin index, 8-bits
202	C_Early_Index2_3	1E	30	30.0000	n/a	C Early index2, gate index 3, waveform bin index, 8-bits
203	C_Early_Index1_4	1A	26	26.0000	n/a	C Early index1, gate index 4, waveform bin index, 8-bits
204	C_Early_Index2_4	1D	29	29.0000	n/a	C Early index2, gate index 4, waveform bin index, 8-bits
205	C_Early_Index1_5	14	20	20.0000	n/a	C Early index1, gate index 5, waveform bin index, 8-bits
206	C_Early_Index2_5	1B	27	27.0000	n/a	C Early index2, gate index 5, waveform bin index, 8-bits
207	C_Early_Index1_6	08	8	8.0000	n/a	C Early index1, gate index 6, waveform bin index, 8-bits
208	C_Early_Index2_6	17	23	23.0000	n/a	C Early index2, gate index 6, waveform bin index, 8-bits
209	C_Middle_Index1_1	1F	31	31.0000	n/a	C Middle Index1, gate index 1, waveform bin index, 8-bits
210	C_Middle_Index2_1	20	32	32.0000	n/a	C Middle Index2, gate index 1, waveform bin index, 8-bits
211	C_Middle_Index1_2	1F	31	31.0000	n/a	C Middle Index1, gate index 2, waveform bin index, 8-bits
212	C_Middle_Index2_2	20	32	32.0000	n/a	C Middle Index2, gate index 2, waveform bin index, 8-bits
213	C_Middle_Index1_3	1E	30	30.0000	n/a	C Middle Index1, gate index 3, waveform bin index, 8-bits
214	C_Middle_Index2_3	21	33	33.0000	n/a	C Middle Index2, gate index 3, waveform bin index, 8-bits
215	C_Middle_Index1_4	1C	28	28.0000	n/a	C Middle Index1, gate index 4, waveform bin index, 8-bits
216	C_Middle_Index2_4	23	35	35.0000	n/a	C Middle Index2, gate index 4, waveform bin index, 8-bits
217	C_Middle_Index1_5	18	24	24.0000	n/a	C Middle Index1, gate index 5, waveform bin index, 8-bits
218	C_Middle_Index2_5	27	39	39.0000	n/a	C Middle Index2, gate index 5, waveform bin index, 8-bits
219	C_Middle_Index1_6	18	24	24.0000	n/a	C Middle Index1, gate index 6, waveform bin index, 8-bits
220	C_Middle_Index2_6	27	39	39.0000	n/a	C Middle Index2, gate index 6, waveform bin index, 8-bits
221	C_Late_Index1_1	20	32	32.0000	n/a	C Late Index1, gate index 1, waveform bin index, 8-bits
222	C_Late_Index2_1	20	32	32.0000	n/a	C Late Index2, gate index 1, waveform bin index, 8-bits
223	C_Late_Index1_2	20	32	32.0000	n/a	C Late Index1, gate index 2, waveform bin index, 8-bits
224	C_Late_Index2_2	21	33	33.0000	n/a	C Late Index2, gate index 2, waveform bin index, 8-bits
225	C_Late_Index1_3	21	33	33.0000	n/a	C Late Index1, gate index 3, waveform bin index, 8-bits

Figure 8-6 Parameter Block PARMC320 (Continued)

Byte	Parameter	Hex	Dec	EA Value	Units	Description
226	C_Late_Index2_3	22	34	34.0000	n/a	C Late Index2, gate index 3, waveform bin index, 8-bits
227	C_Late_Index1_4	22	34	34.0000	n/a	C Late Index1, gate index 4, waveform bin index, 8-bits
228	C_Late_Index2_4	25	37	37.0000	n/a	C Late Index2, gate index 4, waveform bin index, 8-bits
229	C_Late_Index1_5	24	36	36.0000	n/a	C Late Index1, gate index 5, waveform bin index, 8-bits
230	C_Late_Index2_5	2B	43	43.0000	n/a	C Late Index2, gate index 5, waveform bin index, 8-bits
231	C_Late_Index1_6	28	40	40.0000	n/a	C Late Index1, gate index 6, waveform bin index, 8-bits
232	C_Late_Index2_6	37	55	55.0000	n/a	C Late Index2, gate index 6, waveform bin index, 8-bits
233	RAVE Time Constant	08	8	8.0000	n/a	Late-Early running average time constant, 16-bits, LSbit = 1/128, LSByte
234		00	0			MSByte
235	Ku_GI_Scale	52	82	82.0000	n/a	Ku Gate Index Scale factor, 8-bits, program multiplieas this value by 2**7
236	C_320_GI_Scale	4E	78	78.0000	n/a	C 320 Gate Index Scale factor, 8-bits, program multiplies this value by 2**7
237	C_100_GI_Scale	46	70	70.0000	n/a	C 100 Gate Index Scale factor, 8-bits, program multiplies this value by 2**7
238	HR_Track_Point	3F	63	63.0000	n/a	High res Track Point, 8-bits, LSBit = 1/2 waveform sample bin
239	Thr_Hgt_Err_Win1	08	8	8.0000	n/a	Threshold Height Error Window, gate index 1, 8-bits
240	Thr_Hgt_Err_Win2	08	8	8.0000	n/a	Threshold Height Error Window, gate index 2, 8-bits
241	Thr_Hgt_Err_Win3	0C	12	12.0000	n/a	Threshold Height Error Window, gate index 3, 8-bits
242	Thr_Hgt_Err_Win4	10	16	16.0000	n/a	Threshold Height Error Window, gate index 4, 8-bits
243	Thr_Hgt_Err_Win5	20	32	32.0000	n/a	Threshold Height Error Window, gate index 5, 8-bits
244	Fine_Trk_AGC_Alpha	03	3	3.0000	n/a	Fine Track AGC Alpha, 8-bits, # of right shifts of AGC error
245	Fine_Track_Beta	06	6	6.0000	n/a	Fine Track Beta, 8-bits, # of right shifts of Height rate
246	Coarse_Trk_AGC_Alpha	02	2	2.0000	n/a	Coarse Track AGC Alpha, 8-bits, # of right shifts of AGC error
247	Coarse_Track_Beta	04	4	4.0000	n/a	Coarse Track Beta, 8-bits, # of right shifts of height rate
248	T5	00	0	2560.0000	n/a	variability threshold, 16-bits, units are 1/2 bins squared * 10, thus 8-bins RMS => 2560 = T5, LSByte
249		0A	10			MSByte
250	T6	00	0	10240.0000	n/a	"poor variability," 16-bits, units are 1/2 bins squared * 10, LSByte
251		28	40			MSByte
252	T7	00	0	256.0000	n/a	"absolute threshold," 16-bits, units of waveform samples, LSByte
253		01	1			MSByte
254	Ku_Pulse_Count	19	25	25.0000	n/a	Ku Pulse Count, 8-bits
255	C_Pulse_Count	1A	26	26.0000	n/a	C Pulse Count, 8-bits
256	Acq_Pulse_Count	1A	26	26.0000	n/a	Acquisition pulse count, 8-bits, (Low res acquisition)
257	AGC_Rate	0D	13	13.0000	n/a	AGC Rate, 16-bits, LSByte
258		00	0			MSByte
259	Xmit_Test_Height	00	0	8.6096	mSec	Transmit Test Height, 48-bits, MSBit = 6.55 msec. LSByte of LSWord
260		00	0			MSByte of LSWord
261		00	0			LSByte of Middle Word
262		00	0			MSByte of Middle Word
263		28	40			LSByte of Upper Word

Figure 8-6 Parameter Block PARMC320 (Continued)

Byte	Parameter	Hex	Dec	EA Value	Units	Description
264		A8	168			MSByte of Upper Word
265	Xmit_Test_Hgt_Rate	00	0	0.0000	m/s	Transmit Test Height Rate, 48-bits, LSBit = 130.897e-9 meters/seconds
266		00	0			MSByte of LSWord
267		00	0			LSByte of Middle Word
268		00	0			MSByte of Middle Word
269		00	0			LSByte of Upper Word
270		00	0			MSByte of Upper Word
271	Xmit_Test_AGC	F0	240	60.0000	dB	Transmit Test AGC, 8-bits, MSBit = 32 dB
272	BC_Init	00	0	0.0000	n/a	Initial Burst_Count Value (for changing number of bursts per track interval)
273	WD_Init	19	25	25.0000	n/a	Initial Watchdog timer count (same as above)

Figure 8-6 Parameter Block PARMC320 (Continued)

Attachment A: Memo February 24, 1992

S3S-1-xxxx
February 24, 1992

TO: Distribution

FROM: Elliot H. Rodberg

SUBJECT: Post Launch Parameter and Memory Load File Transfers to NASA-WFF

REFERENCE: 1) Process for Transferring TOPEX Altimeter Flight Processor Upload Files to Fairchild for Spacecraft Integration Testing, Elliot H. Rodberg, S3S-1-1270, June 19, 1990.

Introduction

Following launch of the TOPEX spacecraft, NASA-Wallops Flight Facility is responsible for delivering Altimeter Parameter and Memory upload files to the Payload Operations Control Center at JPL. It is likely that some of these files will initially be generated at APL. This memo defines the format of the files that will be used to transfer the desired upload data from APL to NASA-WFF.

Discussion

There are two types of Altimeter upload files: Parameter loads and Memory loads. For each Parameter upload and Memory upload, the files shown below will be delivered to NASA-WFF. After each file type, the default naming convention is displayed.

Parameter Upload

1. ASCII HEX file - name.PA
2. Binary Data file - name.PB
3. ASCII Image of the Binary file - name.PT

Memory Upload

1. ASCII HEX file - name.MA
2. Binary Data file - name.MB
3. ASCII Image of the Binary file - name.MT

ASCII HEX file - ASCII file of upload data. Parameter load file will NOT contain multi-word command checksum (only Parameter data)

Binary Data file - Upload data in binary format. No parameter checksum in this file, either.

ASCII Image of Binary File - Text file showing binary data with byte addresses in first column.

The three files are derived from an Intel ASCII Hex file format. This means that the data is word oriented (16-bits per word), with the least significant byte first and the most significant byte second. The flight processor in the Altimeter expects the data in this order.

When a new upload is generated at APL, the data will be stored on the Data General Computer. An archive tape will be made identical to those used for transferring data to Fairchild during S/C level testing. The archive tape will be labeled and stored at APL.

The three files will then be transferred to the Analysis PC. An ASCII file will be generated that lists all of the files to be transferred to NASA-WFF. In addition to file names, this file will list the multi-work command checksum that should be appended to the corresponding Parameter load. The file list and the appropriate data files will then be transferred to a NASA-WFF Observational Sciences Branch computer using File Transfer Protocols over the PC network.

Procedure For Processing Upload Files

1. If file(s) generated on PC, then use BLAST to transfer ASCII Hex files from Analysis PC to Data General computer.

   Place in directory - :TPXSYS:UPLOADS

2. Process File(s) using PARM_GEN or MEM_GEN batch files to create Binary files.

3. Create archive tape by running MISC_MKTP.
   (Record Parameter Load Checksum)

4. Create text file of binary upload using DG DISPLAY command.

5. Create file listing names of files to be transferred.

6. Transfer files from DG to Analysis PC using BLAST.

7. Transfer files from Analysis PC to WFF-OSB computer using FTP.

Summary

During the TOPEX mission, Altimeter Parameter and Memory loads may need to be generated at APL. This memo describes the files that will be used to transfer the appropriated data from APL to NASA-WFF. The procedure for processing these files is also outlined.

Elliot H. Rodberg
TOPEX RASE System Engineer

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EH Rodberg
C Roelle
WB Shoemaker (NASA-WFF)
CE Spaur
S3S Files
Archives

Attachment B: Memo July 27, 1992

To: Distribution
From: Ron Brooks
Date: July 27, 1992
Subject: Modification of Altimeter Command File Build Specifications

There has been a recent modification to the specifications for building command files. The modification is: Change the delay associated with issuing the first command of each file from one second (1D) to two seconds (2D). This additional second will permit echoing of the prior command if the command file immediately follows another file.

This modification has been incorporated into the attached specifications document, and has been implemented in the file-generating software.

Attachment: Altimeter Command File Build Specifications (July 27, 1992)

Distribution:

Ron Forsythe
Hayden Gordon
David Hancock
George Hayne
Jeff Lee
Dennis Lockwood
Carol Purdy

ALTIMETER COMMAND FILE BUILD SPECIFICATIONS

During pre-launch readiness testing and on-orbit operations of the TOPEX altimeter, there are recurring requirements for the following command files:

Memory Address File
Memory Load File
Parameter Load File
Memory Dump Address File

Wallops has the responsibility to produce these files and to electronically transmit them to JPL for implementation.

The intent of this memorandum is to define the Wallops guidelines for producing these files. The guidelines are based on the TOPEX Project command file specifications as described in the Command File SIS-2 (633-741-23-006, Rev. A) dated May 17, 1991.

The Command Files are to be written as ASCII text files, readable by a text editor. Each file is preceded by headers, and the last record of the file will be "*ENDCMD".

The input characters for the WFF-generated files will often come from APL files transferred to Wallops. A generic description of these APL files is contained in a February 24, 1992, memorandum (attached) from Elliot Rodberg of APL. The files transferred from APL are in three formats as described in the Rodberg memorandum; WFF will use the ASCII Hex File format (.PA or .MA) for input to our command file generation system.

FILE HEADERS

For each of the four types of command files there are ten regular header lines, followed by N (as many as needed) comment lines to further describe the file. All the header lines and the comment lines are preceded by an "*" in column 1 and a blank in column 2, as depicted in Figure 1.

Header line 1 provides a descriptive title for the command file.
Header line 2 will be the same as shown in Figure 1 except the file name (FADDBETA in the example) will change to reflect the appropriate file name.

The year, day-of-year, and hours:minutes:seconds (HH:MM:SS) in header line 3 will change to the date and time this command file was created.

Header line 4 will be the same as that shown in Figure 1 for all files created by Wallops.

The operator's name in line 5 should reflect the lineage of individuals responsible for creating the file. A typical lineage would be "R. Brooks, D.Hancock, E.Rodberg".

Header line 6 will be the same as that shown in Figure 1 for all files created by Wallops.

Line 7 will change to incorporate the program name and version used to create the command file.

Line 8 provides the SIS document number. This number is not expected to change.

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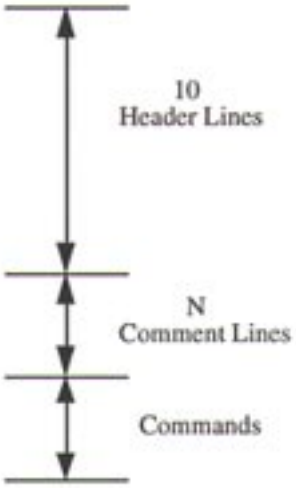
FIGURE 1. MEMORY ADDRESS FILE

```
* TITLE=NASA ALTIMETER MEMORY ADDRESS FILE
* FILENAME=FADDBETA
* DTG=1992-101T15:01:00
* TEAM=WFF
* OPER=R.BROOKS,D.HANCOCK,E.RODBERG
* PROJ=TOPEX
* PROG=COMPILE/VER02
* SIS ID=633-741-23-006
* TWINDOW=1992-TBDT00:00:00,1992-TBDT00:00:03
* WFF_CMD_FADDBETA.TXT
* This is an ALT memory load
* address file for
* FMEMBETA
* Memory Load
2D,SC42_ATASTART,'xxxx'H
 ,DC02_RIUNOOP
 ,DC02_RIUNOOP
 ,SC42_ATACHKSM,'nnnn'H
*ENDCMD
```



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Line 9 will change to reflect the year and time the file is to be commanded. The initial time in HH:MM:SS will usually be 00:00:00; this is followed by the lapsed time in HH:MM:SS required for loading and echoing the commands, and is calculated by multiplying the number of commands with hex parameters in the file by 1.024 seconds.

Line 10 will be the same as shown in Figure 1, except that the filename (FADDBETA in the example) will change to be the same as that in header line 2.

The N comment lines which immediately follow the ten header lines are intended to provide information to the user regarding the purpose and use of the file.

COMMAND FILE DESCRIPTIONS

The four types of Command Files are described in the following.

Memory Address File

The Memory Address File provides the memory buffer starting address for the memory patch. It is preceded by a file header and is followed by a checksum.

An example of this file is depicted in Figure 1. In this file there always are four command lines. They will be the same as the example in Figure 1 except that the hex values for the SC42_ATASTART command and for the SC42_ATACHKSM command will change as required. The hex value for the SC42_ATASTART command is the starting buffer address; the hex value for the SC42_ATACHKSM command is the checksum. The starting address usually will be provided by the requestor who will access it from an APL memory location file. The two commands are always separated by two DC02_RIUNOOP command lines which serve only as command transmission time buffers.

The checksum is calculated by adding the hex value in the first command line to the hex value for Command Buffer Address which is 6180. For the example in Figure 1, the hex value for the SC_ATASTART is 0010; adding 6180 to it yields 6190.

The first command line (containing SC42_ATASTART) begins with a "2D," in columns 1,2 and 3, indicating a 2-second delay for the command transmission. The other three commands have a blank in column 1 followed by a comma in column 2, indicating no transmission delay. The last line of each file is "*ENDCMD", beginning in column one.

Memory Load File

The Memory Load Address File provides the coding for the memory patch. It is preceded by a file header; it does not contain a checksum.

An example of this file is depicted in Figure 2. The HH:MM:SS end time in line 9 of the header is calculated by multiplying the number of SC42_ATAWD commands in the file by 1.024 seconds. This will have to be an iterative process since these files are, by their nature, variable in length.

The memory file format will always be the same as shown in Figure 2. The hex values for the SC42_ATAWD commands will be made available in an identified file; successive byte-

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FIGURE 2. MEMORY LOAD FILE

```
* TITLE=NASA ALTIMETER MEMORY LOAD FILE TO MODIFY BETA
* FILENAME=FMEMBETA
* DTG=1992-101T14:50:00
* TEAM=WFF
* OPER=R.BROOKS,D.HANCOCK,E.RODBERG
* PROJ=TOPEX
* PROG=COMFILE/VER02
* SIS ID=633-741-23-006
* TWINDOW=1992-999T00:00:00,1992-999T00:20:00
* WFF_CMD_FMEMBETA.TXT
*   This is an ALT memory load file
*   to modify BETA.
*   This is a memory update file
*   regularly used for ALT
*   ground-testing.
2D,SC42_ATAWD,'xxxx'H
 ,DC02_RIUNOOP
 ,DC02_RIUNOOP
 ,SC42_ATAWD,'xxxx'H
 ,DC02_RIUNOOP
 ,DC02_RIUNOOP
 ,SC42_ATAWD,'xxxx'H
 ,DC02_RIUNOOP
 ,DC02_RIUNOOP
 ,SC42_ATAWD,'xxxx'H
 ,DC02_RIUNOOP
 ,DC02_RIUNOOP
 ,SC42_ATAWD,'xxxx'H
        .
        .
        .
        .
        .
 ,SC42_ATAWD,'xxxx'H
 ,DC02_RIUNOOP
 ,DC02_RIUNOOP
 ,SC42_ATAWD,'xxxx'H
 ,DC02_RIUNOOP
 ,DC02_RIUNOOP
 ,SC42_ATAWD,'xxxx'H
17:45D, DC02_RIUNOOP
 *ENDCMD
```

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pairs will be extracted from the input file and must be byte swapped. Each SC42_ATAWD command will be separated by two DC02_RIUNOOP commands as shown in Figure 2.

The first command line (containing SC42_ATAWD) begins with a "2D," in columns 1,2 and 3, indicating a 2-second delay for the command transmission. The other commands, except for the final one, have a blank in column 1 followed by a comma in column 2, indicating no transmission delay.

The final command will be a DC02_RIUNOOP with an "hh:mm:ssD," in front, where hh, mm and ss are the hours, minutes and seconds required for echoing the command file in the telemetry. The time is calculated by multiplying the number of SC42_ATAWD commands in the file by 1.024 seconds, and then converting the time to hours, minutes and seconds. If the number of total seconds is less than sixty, the "hh:mm:" portion of the time will be deleted, and the time delay will be "ssD,". If the number of total minutes is greater than zero and less than sixty, the "hh:" portion of the time will be deleted, and the time delay will be "mm:ssD,".

The last line of each file is "*ENDCMD", beginning in column one.

Parameter Load File

The Parameter Load File uploads a replacement parameter file. An example of this file is depicted in Figure 3. In this file there are always 137 SC42_ATAWD command lines, followed by one SC42_ATACHKSM command. These 138 commands are each separated by two DC02_RIUNOOP commands as shown in Figure 3. The hex values associated with each SC42_ATAWD command will be extracted in successive byte-pairs from an identified input file and must be byte swapped.

The hex value for the SC42_ATACHKSM is the checksum; it may be calculated by: 1) summing hex bytes for all the 137 SC42_ATAWD commands; 2) then adding the hex value for Parameter Set Upload, 6300; and 3) ignoring the overflow, keeping only the two least significant bytes.

The first command line (containing SC42_ATAWD) begins with a "2D," in columns 1,2 and 3, indicating a 2-second delay for the command transmission. The other commands have a blank in column 1 followed by a comma in column 2, indicating no transmission delay.The last line of each file is "*ENDCMD", beginning in column one.

Memory Dump Address File

The Memory Dump Address File provides the starting and ending addresses for the memory patch. It is preceded by a file header and is followed by a checksum.

An example of this file is depicted in Figure 4. In this file there always are seven command lines. They will be the same as the example in Figure 4 except that the hex values for SC42_ATASTART and for SC42_ATASTOP will change as required.

The first hex value, for the SC42_ATASTART command, is the start address for the memory dump. The second hex value, for the SC42_ATASTOP command, is the stop address for the memory dump. The hex value for the SC42_ATACHKSM command is the checksum. The start address usually will be provided by the requestor who will access it from an APL memory location file. The stop address will normally be the sum of the start address plus 20

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FIGURE 3. PARAMETER LOAD FILE

```
* TITLE=NASA ALTIMETER PARAMETER LOAD FILE FOR C320 OPERATIONS
* FILENAME=FC320
* DTG=1992-101T14:50:00
* TEAM=WFF
* OPER=R.BROOKS,D.HANCOCK,E.RODBERG
* PROJ=TOPEX
* PROG=COMFILE/VER02
* SIS ID=633-741-23-006
* TWINDOW=1992-999T00:00:00,1992-999T00:02:22
* WFF_CMD_FC320.TXT
*   This is an ALT parameter load file
*   to enable C320 operations.
*   This parameter file has been
*   regularly used for
*   ALT ground-testing.
2D,SC42_ATAWD,'xxxx'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'xxxx'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'xxxx'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'xxxx'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'xxxx'H
        .
        .
        .
        .
        .
,SC42_ATAWD,'xxxx'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATAWD,'xxxx'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATACHKSM,'nnnn'H
*ENDCMD
```

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FIGURE 4. MEMORY DUMP ADDRESS FILE

```
* TITLE=NASA ALTIMETER MEMORY DUMP ADDRESS FILE
* FILENAME=PARMDPAD
* DTG=1992-101T15:01:00
* TEAM=WFF
* OPER=R.BROOKS,D.HANCOCK,E.RODBERG
* PROJ=TOPEX
* PROG=COMPILE/VER02
* SIS ID=633-741-23-006
* TWINDOW=1992-TBDT00:00:00,1992-TBDT00:00:04
* WFF_CMD_FADDBETA.TXT
*       This is an ALT memory dump
*       address file
2D,SC42_ATASTART,'xxxx'H
 ,DC02_RIUNOOP
 ,DC02_RIUNOOP
,SC42_ATASTOP, 'xxxx'H
,DC02_RIUNOOP
,DC02_RIUNOOP
,SC42_ATACHKSM,'nnnn'H
*ENDCMD
```

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(hex) bytes. The three commands are always separated by two DC02_RIUNOOP command lines which serve only as command transmission time buffers.

The checksum value is calculated by: 1) summing the hex bytes in the SC42_ATASTART and SC42_ATASTOP command lines; and then 2) adding the hex value for Memory Dump Limits which is 6030. For the example in Figure 4, the hex value for SC42_ATASTART is 1820 and the hex value for SC42_ATASTOP is 1840. Summing these two hex values, and adding 6030 (hex) equals 9090 (hex) for the checksum.

The first command line (containing SC42_ATASTART) begins with a "2D," in columns 1, 2 and 3, indicating a 2-second delay for the command transmission. The other three commands have a blank in column 1 followed by a comma in column 2, indicating no transmission delay.

The last line of each file is "*ENDCMD", beginning in column one.

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Section 9

Universal Time Conversion

9.1 Definition

Universal Time Conversion provides the conversion of time either as UTC time in seconds past J2000 or in ASCII format.

9.2 Notification

Upon request.

9.3 Processing

- Processing can be run in any directory, at any time.
- **utcconvert** is a Fortran program that will convert a UTC time based on the manual input of a specified time. Figure 9-1 shows an example of the conversion process.

```
osb3/seu# utcconvert
================================================================================
                              W F F   T O P E X
                S O F T W A R E   D E V E L O P M E N T   T E A M
================================================================================
           Program Number  : UTCConvert
           Program Title   : TOPEX Engineering Assessment Processing
           Program Version : Code : 1.1, Last Mod : 04/01/96
           T&Const File    :
           T&Const Version :

           Date of Run     : 03/29/99
--------------------------------------------------------------------------------
                           Select UTC Time to Enter
                               RETURN = Seconds
--------------------------------------------------------------------------------
                            1. Convert UTC Seconds.
                            2. Convert UTC ASCII.
                            X. Exit.
2
--------------------------------------------------------------------------------
                                   Enter UTC
--------------------------------------------------------------------------------
 Enter UTC in the format YYYYDDDtHHMMSS
 Where YYYYDDDtMMSS is year,day,t,hour,minute, and seconds.
 Enter the UTC (or X to exit)
1999088t123045

   UTC Time (Seconds)  :    -24017355.000000

   UTC Time (ASCII)    : 1999-088T12:30:45.000000

   UTC Time (Calendar) : 29-MAR-1999 12:30:45.0000

                           Press RETURN to Continue

--------------------------------------------------------------------------------
                           Select UTC Time to Enter
                               RETURN = Seconds
--------------------------------------------------------------------------------
                            1. Convert UTC Seconds.
                            2. Convert UTC ASCII.
                            X. Exit.
1
--------------------------------------------------------------------------------
                               Enter UTC Seconds
--------------------------------------------------------------------------------
 Enter UTC Seconds
-24017355

   UTC Time (Seconds)  :    -24017355.000000

   UTC Time (ASCII)    : 1999-088T12:30:45.000000

   UTC Time (Calendar) : 29-MAR-1999 12:30:45.0000

                           Press RETURN to Continue

--------------------------------------------------------------------------------
                           Select UTC Time to Enter
                               RETURN = Seconds
--------------------------------------------------------------------------------
                            1. Convert UTC Seconds.
                            2. Convert UTC ASCII.
                            X. Exit.
x
 Done.
osb3/seu#
```

Figure 9-1 Example of Conversion Process

Section 10

TOPEX Ground System Display Screens

10.1 Definition

The TGS at JPL is the commanding center for the TOPEX satellite. The operating systems that are in use are on VAXes and Alphas. The login for the VAX machines may be on the TGSA, TGSB, and TGSC cluster and for the Alpha may be TGSD, TGSE, and TGSF. As of March 1999, the VAX machines are being decommissioned.

10.2 Notification

Upon request. This is usually in support of any special commanding for the TOPEX satellite.

10.3 Processing

- Processing is done on TGSD. **telnet tgsd.jpl.nasa.gov.**
  See Attachment A, 'JPL SPAT Display Instructions' for a proper operating session. Figure 10-1 contains examples of several display screens.

```
tgsd
TLM2_1-DUAL- TLM CHANNEL DATA-SPAT-ALTAP          MODE REAL  UTC: 1999-038T20:06:58
ALARMS:      FMT ID: FLEX      STA: WSC                        ERT:       038T20:06:59
MNEMONIC    DESCRIPTION     EU/DN/VALUE   MNEMONIC    DESCRIPTION     EU/DN/VALUE

IMAUN28V IMIU-A UNREG +28V      31.3636 AENG107A TWTA BUS CURRENT        2.39055
IMBUN28V IMIU-B UNREG +28V      31.2121 AENG102A TWTA CATHODE VLTS       4179.07
INSPOWER INSTRUMENT POWER         358.8 AENG105A TWTA CATHODE AMPS      .0375514
                                        AENG106A TWTA HELIX AMPS      .000885103
AENG113A LVPS BUS CURRENT       4.29906 AENG101A Ku MTU XMIT PWR         21.1594
AENG086A LVPS +12VDC            13.0906
AENG089A LVPS +28VDC            30.4095
AENG090A LVPS +15VDC            15.7637 AENG110A CSSA BUS CURRENT        .743308
AENG091A LVPS -15VDC           -15.4411 AENG108A C MTU XMIT PWR          22.1925
AENG092A LVPS +5VDC 5%          4.92063 AENG109A CSSA RF POWER         .00475574
AENG093A LVPS +5VDC 1%          5.11111
AENG094A LVPS -5.2VDC          -5.56453 AENG009A ALT-A STATUS WORD      FINE_TRK
AENG097A LVPS -6VDC            -6.15785

PF1 KP4 = GOTO List of Displays (TLM3)   PF2 = Help        PF1 KP0 = Exit
PF1 KP5 = GOTO TLM Database (TLM7)       KP1 = Toggle Mode (Real/Replay)

1)Press KP. 2)Type in the Display Name 3)Press PF3 - to view TLM data
```

```
tgsd
TLM2_1-DUAL- TLM CHANNEL DATA-SPAT-ALTBP          MODE REAL  UTC: 1999-038T20:08:04
ALARMS:      FMT ID: FLEX      STA: WSC                        ERT:       038T20:08:05
MNEMONIC    DESCRIPTION     EU/DN/VALUE   MNEMONIC    DESCRIPTION     EU/DN/VALUE

IMAUN28V IMIU-A UNREG +28V      31.3636 AENG107B TWTA BUS CURRENT        NO DATA
IMBUN28V IMIU-B UNREG +28V      31.2121 AENG102B TWTA CATHODE VLTS       NO DATA
INSPOWER INSTRUMENT POWER        360.64 AENG105B TWTA CATHODE AMPS       NO DATA
                                        AENG106B TWTA HELIX AMPS         NO DATA
AENG113B LVPS BUS CURRENT       NO DATA AENG101B KU MTU XMIT PWR         NO DATA
AENG086B LVPS +12VDC            NO DATA
AENG089B LVPS +28VDC            NO DATA
AENG090B LVPS +15VDC            NO DATA AENG110B CSSA BUS CURRENT        NO DATA
AENG091B LVPS -15VDC            NO DATA AENG108B C MTU XMIT PWR          NO DATA
AENG092B LVPS +5VDC 5%          NO DATA AENG109B CSSA RF POWER           NO DATA
AENG093B LVPS +5VDC 1%          NO DATA
AENG094B LVPS -5.2VDC           NO DATA AENG009B ALT-B STATUS WORD       NO DATA
AENG097B LVPS -6VDC             NO DATA

PF1 KP4 = GOTO List of Displays (TLM3)   PF2 = Help        PF1 KP0 = Exit
PF1 KP5 = GOTO TLM Database (TLM7)       KP1 = Toggle Mode (Real/Replay)

1)Press KP. 2)Type in the Display Name 3)Press PF3 - to view TLM data
```

Figure 10-1 Examples of Display Screen

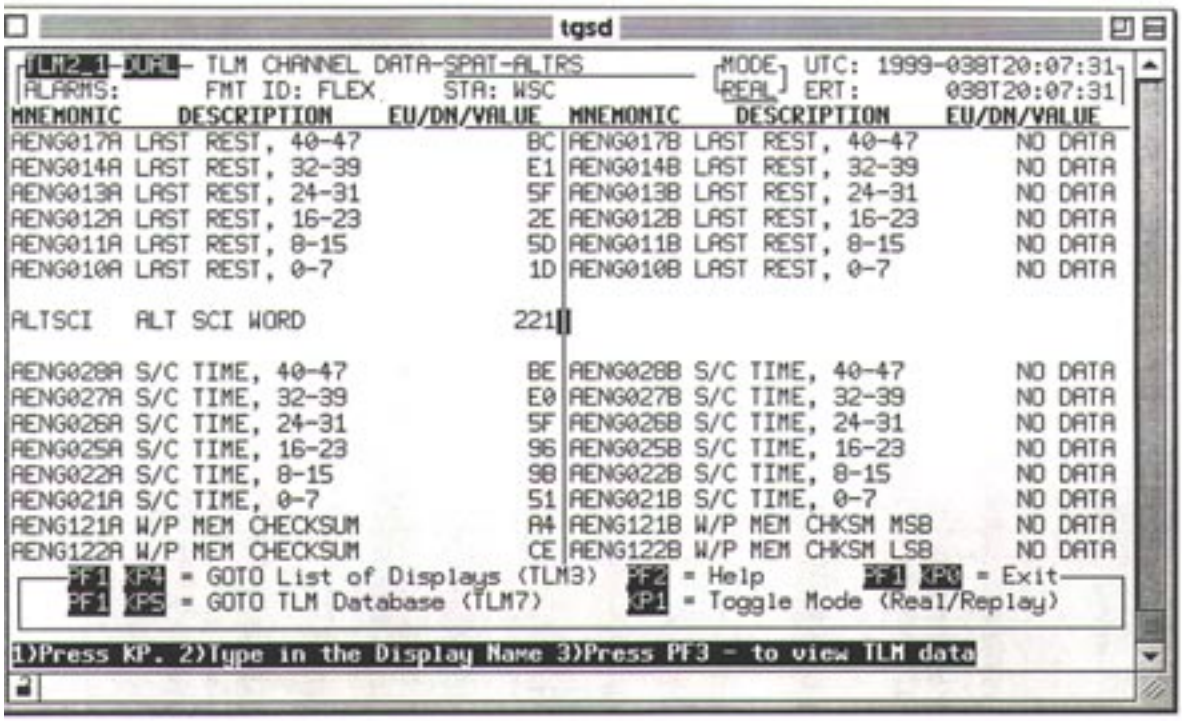
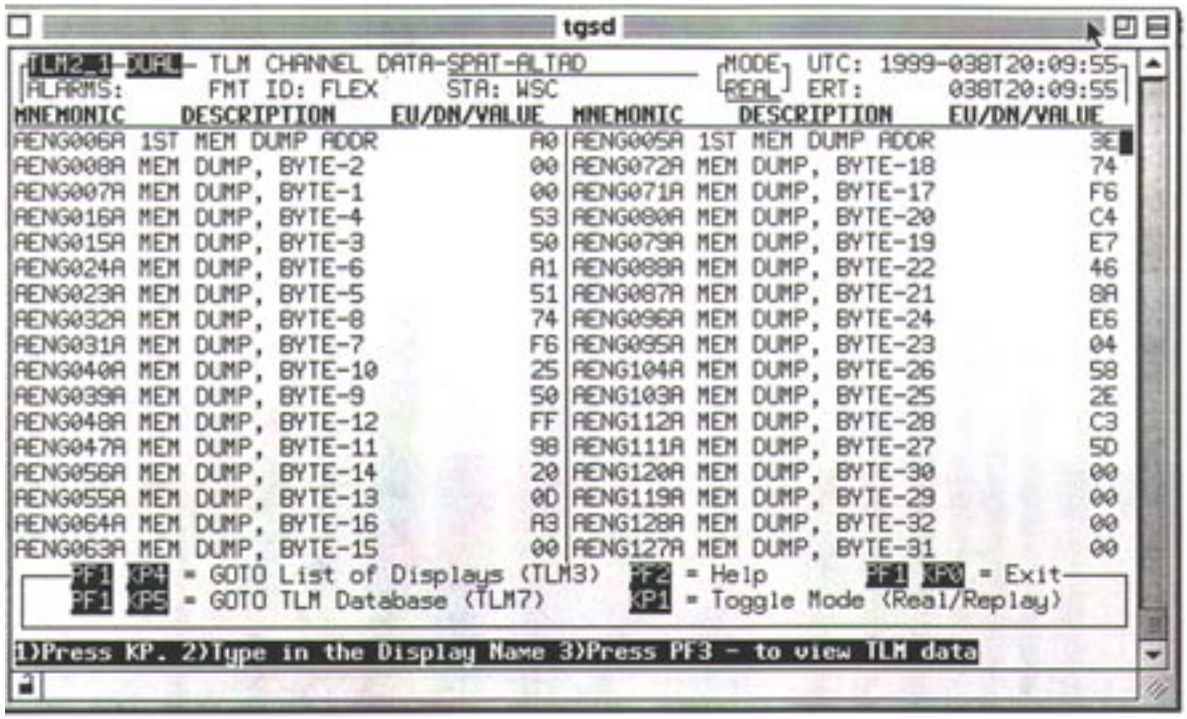


Figure 10-1 Examples of Display Screen (Continued)



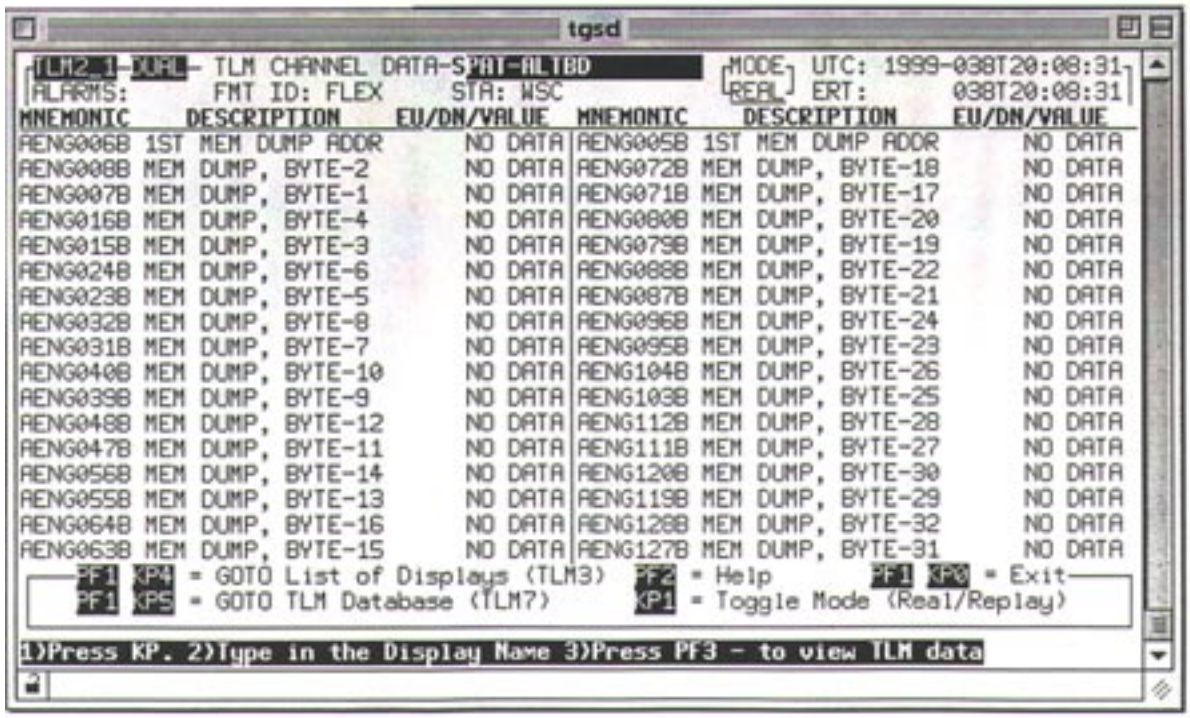
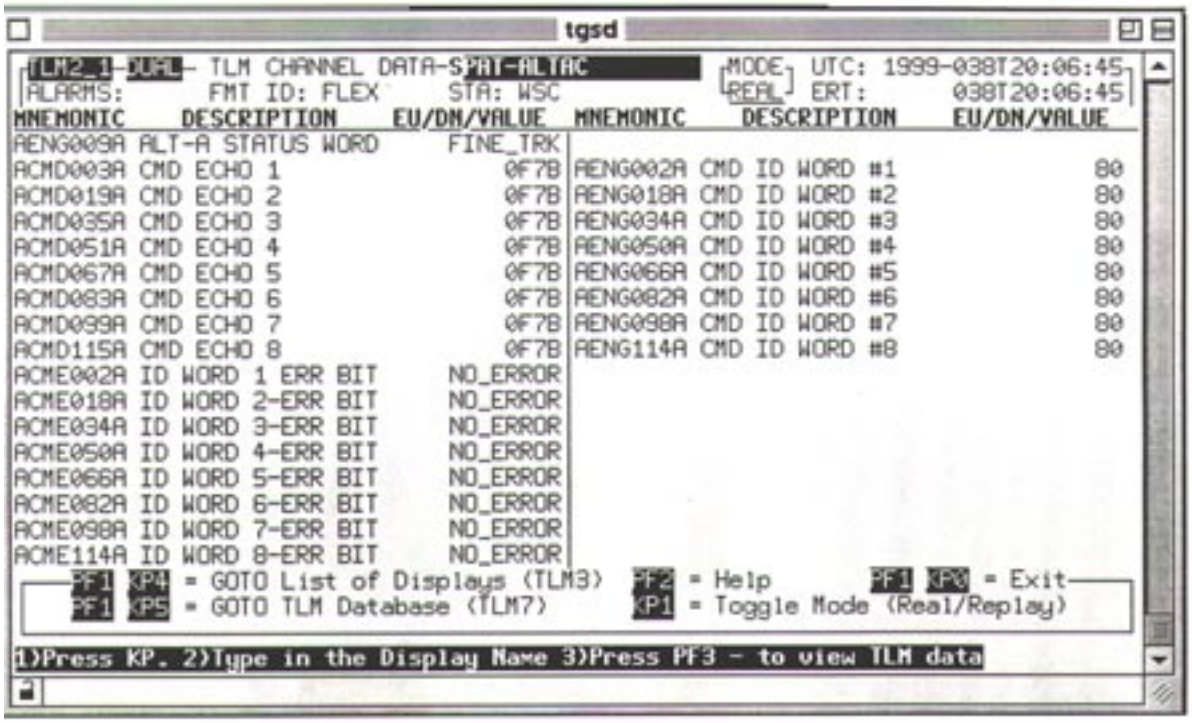


Figure 10-1 Examples of Display Screen (Continued)



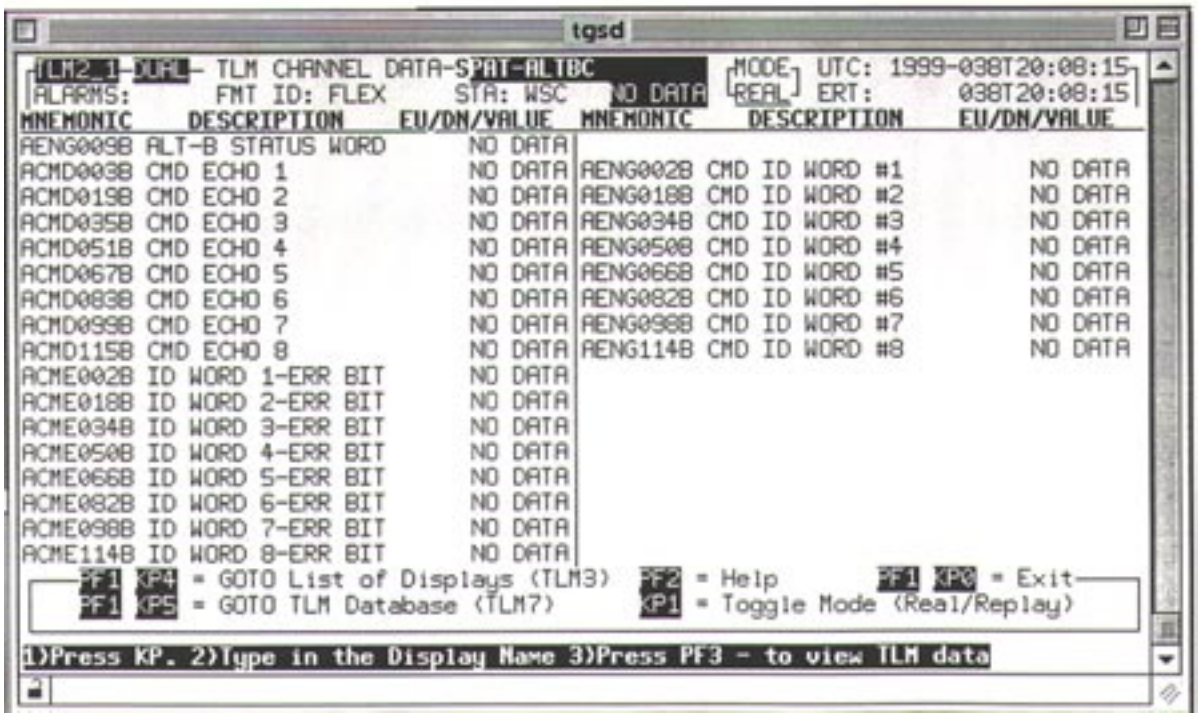


Figure 10-1 Examples of Display Screen (Continued)

Attachment A
JPL SPAT Display Instructions

Note: Requests for ALT Science and Engineering instrument files should be directed to the TOPEX Data Analyst Office at 818/393-0701.

1. Telnet with a vt102 session to **tgsd.jpl.nasa.gov** (128.149.96.24).
2. Press the [return] key once to get TGSD's attention. Enter the Username (**opssys**) and Password at the appropriate prompts. (*Password cannot be published but must be obtained from a cognizant TOPEX team member.)

   Note: If there are errors made in entering username/password attempts, the TGS will lock out the attemptee for a period of time. After an undetermined amount of time, the system will accept another attempt.

VT102 Emulation Keys	
VT102 Key	**Local Keyboard**
enter	[enter] on numeric keypad
PF1	[clear] on numeric keypad
PF2	[=] on numeric keypad
PF3	[/] on numeric keypad
PF4	[*] on numeric keypad
KP0	[0] on numeric keypad
KP1	[1] on numeric keypad
KP2	[2] on numeric keypad
KP3	[3] on numeric keypad
KP4	[4] on numeric keypad
KP5	[5] on numeric keypad
KP6	[6] on numeric keypad
KP7	[7] on numeric keypad
KP8	[8] on numeric keypad
KP9	[9] on numeric keypad
KP.	[.] on numeric keypad
Up	[↑] on cursor keypad
Down	[↓] on cursor keypad
Left	[←] on cursor Keypad
Right	[→] on cursor Keypad

3. Follow on-screen instructions until you get to the **TCCS MAIN MENU**.
4. Press the [**enter**] key on the **numeric keypad** to access the **TELEMETRY** menu.
5. Follow Step 6 to choose from a list of displays, or Step 7 to view a “standard” display.
6. Press the [**Down**] key three times to highlight **TLM3 VIEW CHANNEL DATA (LIST OF DISPLAYS).**

   Press the [**enter**] key on the numeric keyboard to select this choice.

   Press the [**KP.**] key.

   Type **SPAT*** in response to **Where DISPLAY_NAME is**.

   Press the [**PF3**] key to execute the query.

   Use the [**Up**] and [**Dow**n] keys to highlight the desired screen. Note: using the [Up] key to scroll backwards may produce strange results.

   Press the [**PF1**] then [**KP4**] keys to select your choice. The selected display should now be viewable on screen.
7. Press the [**Down**] key two times to highlight **TML2_1 VIEW CHANNEL DATA - DUAL COLUMN.**

   Press the [**enter**] key to select this choice.

   Press the [**KP.**] key. Type one of the following choices in response to **DISPLAY_NAME is**. For example, **SPAT-ALTAC**.

“Standard” Displays	
Name	**Description**
SPAT-ALAT1	ALT-A NADIR PANEL TEMPERATURES
SPAT-ALAT2	ALT-A+Y PANEL TEMPERATURES
SPAT-ALBT1	ALT-B NADIR PANEL TEMPERATURES
SPAT-ALBT2	ALT-B+Y PANEL TEMPERATURES
SPAT-ALTAC	ALT-A CMD WDS AND ID
SPAT-ALTAD	ALT-A MEMORY DUMP
SPAT-ALTAP	ALT-A POWER
SPAT-ALTBC	ALT-B CMD WDS AND ID
SPAT-ALTBD	ALT-B MEMORY DUMP
SPAT-ALTBI	ALT A/B BILEVEL WORDS
SPAT-ALTBP	ALT-B POWER

“Standard” Displays	
Name	**Description**
SPAT-ALTBP	ALT-B POWER
SPAT-ALTRL	ALT A/B RELAYS
SPAT-ALTRS	ALT A/B S/C & RESET TIMES
SPAT-ALTST	ALT-A GENERAL STATUS

Press the **PF1** and **KP4** keys to confirm your choice. The selected display should now be viewable on-screen.

8) You may move the display screen windows around by clicking on the title bar and dragging the mouse. The title bar is the area at the top of the window that contains “128.149.96.13” surrounded by faint lines.

9) To exit, for each window, “back-out” of TGS system by pressing subsequent [**PF1**] then [**KP0**] keys.

Note: at screen bottom : At HOME level, now exiting. Are you sure (y/n):___[return].

Section 11

Memory Map Patcher

11.1 Definition

Memory Map Patches creates a new Memory Map. Figure 11-1 shows the layout of memory locations.

11.2 Notification

Upon Work Request.

11.3 Processing

- Processing is usually done in the directory **/gen/topex/wrk/new_patchmap.**
- **DataFile.ROMMap** is the input datafile. Figure 11-2 is a sample input.
- **patchmmap** is a Fortran program that creates a new memory map reference when the altimeter is patched. Figure 11-3 shows an example of an input memory patch. Figure 11-4 is an example of the new **DataFile.ROMMap** that is created from the memory load patch. Attachment A describes the new features of **patchmmap** and how it is used.

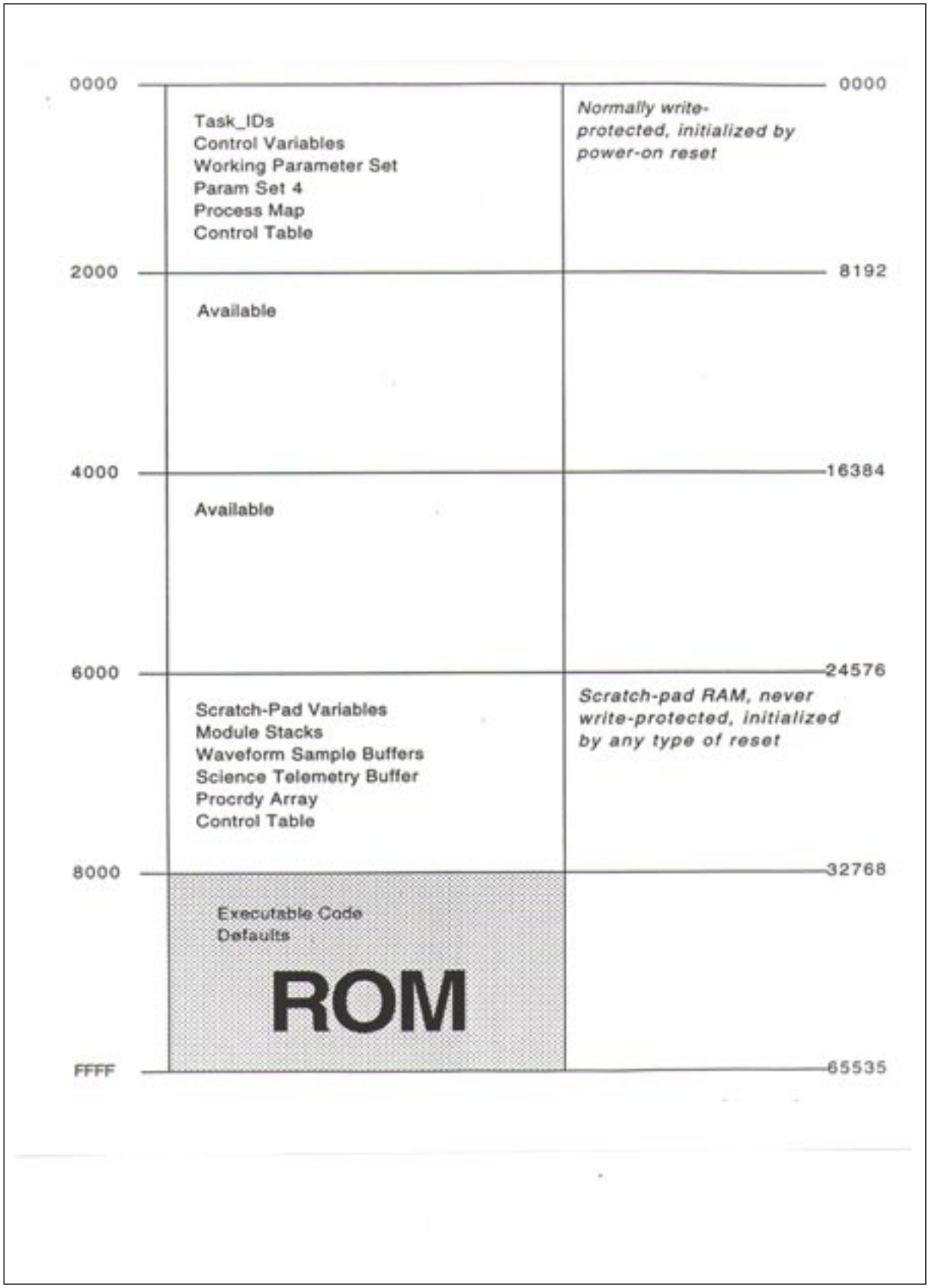


Figure 11-1 Layout of Memory Locations

```
Mar 29 15:31                    DataFile.ROMMap                                   1

"TOPEX Memory Map Datafile"
"Version 04.1,09/11/1998,    CheckSum=A4CE"
    0 E8 83 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
   32 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF E2 80 00 00 FF FF FF FF FF FF FF FF FF FF FF FF
   64 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
   96 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  128 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  160 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  192 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  224 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  256 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  288 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  320 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  352 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  384 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  416 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  448 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  480 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  512 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  544 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  576 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  608 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  640 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  672 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  704 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  736 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  768 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  800 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  832 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  864 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  896 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  928 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  960 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  992 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 1024 00 FF 00 00 00 40 00 20 00 10 00 04 00 01 00 05 00 02 00 08 00 75 00 0A 00 01 00 7F 00 00 00 00
 1056 00 00 00 00 00 00 00 05 00 00 00 00 00 7F 00 00 00 FF AC 86 AC 88 5B 88 5B 88 00 00 00 00 00 00
 1088 00 80 00 00 00 00 00 36 08 40 67 00 00 00 01 A0 D2 50 67 00 00 00 02 F0 8E 70 67 00 00 00 03 E0
 1120 E9 90 67 00 00 00 04 30 F2 B0 67 00 00 00 05 60 B3 D0 67 00 00 00 06 40 BF F0 67 00 00 00 07 D6
 1152 A9 10 68 00 00 00 08 1C C9 30 68 00 00 00 09 BA B5 50 68 00 00 00 0A 98 A8 60 68 00 00 00 0B 5A
 1184 CC 80 68 00 00 00 0C B0 A8 D0 68 00 00 00 0D A0 E3 70 69 00 00 00 0E A2 96 F0 68 00 00 00 0F A6
```

Figure 11-2 Example of Input Data File - DataFile.ROMMap

```
Dec 22 11:06                    PCTPATCH                    1
 * TITLE=NASA ALTIMETER MEMORY LOAD FILE
 * FILENAME=PCTPATCH
 * DTG=1992-301T11:22:41
 * TEAM=WFF
 * OPER=R.BROOKS,D.HANCOCK,E.ROOBERG
 * PROJ=TOPEX
 * PROG=CmdLoad/VER1.6  07/22/92
 * SIS ID=633-741-23-006
 * TWINDOW=1992-999T00:00:00,1992-999T00:00:00
 * WFF_CMD_PCTPATCH.TXT
 *    This is an ALT memory load file
 *    set the primary pulse ct. 4A
 *
 2D,SC42_ATAWD,'07A0'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'A808'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'74FF'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'A00B'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'06D6'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'A8A2'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'EA78'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'9AB0'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'0000'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'D7A0'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'A206'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'78A8'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'B0EA'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'009A'H
   ,DC02_RIUNOOP
   ,DC02_RIUNOOP
   ,SC42_ATAWD,'0000'H
 15D,DC02_RIUNOOP
 *ENDCMD
```

Figure 11-3 Example of Input Memory Patch

```
Mar 29 15:33                    DataFile.ROMMap.PCTPATCH                    1

"TOPEX Memory Map Datafile"
"Version **VERSION INFO **, CheckSum=50CE"
   0 E8 83 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  32 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF E2 80 00 00 FF FF FF FF FF FF FF FF FF FF FF
  64 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  96 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 128 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 160 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 192 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 224 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 256 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 288 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 320 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 352 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 384 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 416 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 448 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 480 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 512 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 544 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 576 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 608 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 640 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 672 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 704 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 736 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 768 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 800 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 832 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 864 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 896 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 928 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 960 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 992 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
1024 00 FF 00 00 00 40 00 20 00 10 00 04 00 01 00 05 00 02 00 08 00 75 00 0A 00 01 00 7F 00 00 00 00
1056 00 00 00 00 00 00 00 05 00 00 00 00 00 7F 00 00 00 FF AC 86 AC 88 5B 88 5B 88 00 00 00 00 00 00
1088 00 80 00 00 00 00 00 36 08 40 67 00 00 00 01 A0 D2 50 67 00 00 00 02 F0 8E 70 67 00 00 00 03 E0
1120 E9 90 67 00 00 00 04 30 F2 B0 67 00 00 00 05 60 B3 D0 67 00 00 00 06 40 BF F0 67 00 00 00 07 D6
1152 A9 10 68 00 00 00 08 1C C9 30 68 00 00 00 09 BA B5 50 68 00 00 00 0A 98 A8 60 68 00 00 00 0B 5A
1184 CC 80 68 00 00 00 0C B0 A8 D0 68 00 00 00 0D A0 E3 70 69 00 00 00 0E A2 96 F0 68 00 00 00 0F A6
```

Figure 11-4 Example of New Input Data File - DataFile.ROMMap

Attachment A: Memo October 7, 1999

TOPEX Software Development Team
Observational Science Branch
Laboratory for Hydrospheric Processes
NASA GSFC/WFF
Wallops Island, VA 23337

Memorandum

To: WFF TOPEX Team
From: Jeff Lee / Raytheon, Dennis Lockwood / Raytheon
Date: 07 October 1999
Subject: Release Notes for ECR-1999-005

This release is for the enhancement of PatchMMap. The first added feature now calculates the check-sums for the four modes of IDLE, STBY, TRACK, and CAL, for both the input and resulting output Memory Map file. The second is the option of accepting the Memory Load as either an ASCII or HEX file.

This process can also be automated by creating a script of input responses.

The following is an example of the script file creating a new Memory Map with an ASCII load file.

```
DataFile.ROMMap          ; Input Memory MAP Filename

1                        ; Specify Output Type

DataFile.NOPAGC          ; Output Memory Map Filename

NOPAGC1L                 ; Input Memory PATCH Filename

1                        ; Input Memory PATCH Type

44475                    ; Patch Starting Location

NOPAGC2L                 ; Input Memory PATCH Filename

1                        ; Input Memory PATCH Type

44891                    ; Patch Starting Location

x                        ; Input Memory PATCH Filename (THE END)
```

The following example is creating a new Memory Map with an ASCII load file without a script file.

Attachment A: Memo October 7, 1999 (cont.)

```
==============================================================
                  W F F   T O P E X
          S O F T W A R E  D E V E L O P M E N T  T E A M
==============================================================
        Program Number  : PatchMMap
        Program Title   : Creates Patched Memory Map
        Program Version : Version 1.1, 02 / 07 / 99
        T&Const File    : n / a
        T&Const Version : n / a
        Date of Run     : 10 / 07 / 99
 Initializations...
-------------------------------------------------------------------------------
                  Input Memory MAP Filename
-------------------------------------------------------------------------------
 Enter Filename (Default=DataFile.ROMMap, x to exit)
 Using DataFile.ROMMap
 #
 #  Successfully read   : DataFile.ROMMap
 #  Revision            : Version 04.1,09 / 11 / 1998,
 #  Memory Checksums    : IDLE: 8FCE STBY: 92CE TRACK: A4CE CAL: 98CE
-------------------------------------------------------------------------------
                   Specify Output Type
-------------------------------------------------------------------------------
 1. Create Single Output File
 2. Create Multiple Output Files
 x. Exit
1
```

Page 2

Attachment A: Memo October 7, 1999 (cont.)

```
-------------------------------------------------------------------------------
                Specify Output Memory Map Filename
-------------------------------------------------------------------------------
 Enter Filename (or x to exit)
DataFile.NOPAGC
-------------------------------------------------------------------------------
                Input Memory PATCH Filename

-------------------------------------------------------------------------------
 Enter Filename (or x to exit)
NOPAGC1L
-------------------------------------------------------------------------------
                Input Memory PATCH Type
-------------------------------------------------------------------------------
 1. Memory Load (ASCII) File
 2. Memory (HEX) File
 x. Exit
1
-------------------------------------------------------------------------------
                Patch Starting Location
-------------------------------------------------------------------------------
 Enter the Patch Start Address (decimal)
44475
 #
 #-------------------------------------
 #
 #  Patching DataFile.ROMMap
```

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Attachment A: Memo October 7, 1999 (cont.)

```
# Using NOPAGC1L
# Starting at Address 44475
# Output File is DataFile.NOPAGC

  Patching 9090 into   44475  44476
  Patching 9090 into   44477  44478
  Patching 9090 into   44479  44480
  Patching 9090 into   44481  44482
#
# Memory Checksums : IDLE: 8902 STBY: 8C02 TRACK: 9E02 CAL: 9202
-------------------------------------------------------------------------------
                    Input Memory PATCH Filename
-------------------------------------------------------------------------------
Enter Filename (or x to exit)
NOPAGC2L
-------------------------------------------------------------------------------
                    Input Memory PATCH Type
-------------------------------------------------------------------------------
1. Memory Load (ASCII) File
2. Memory (HEX) File
x. Exit
1
-------------------------------------------------------------------------------
                    Patch Starting Location
-------------------------------------------------------------------------------
Enter the Patch Start Address (decimal)
44891
```

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Attachment A: Memo October 7, 1999 (cont.)

```
 #
#-------------------------------------
 #
 #  Patching DataFile.ROMMap
 #  Using NOPAGC2L
 #  Starting at Address  44891
 #  Output File is DataFile.NOPAGC
   Patching 9090 into   44891  44892
   Patching 9090 into   44893  44894
   Patching 9090 into   44895  44896
   Patching 9090 into   44897  44898
 #
 #  Memory Checksums  : IDLE: 7A36 STBY: 7D36 TRACK: 8F36 CAL: 8336
-------------------------------------------------------------------------------
                    Input Memory PATCH Filename
-------------------------------------------------------------------------------
 Enter Filename (or x to exit)
x
 Cancelled.
-------------------------------------------------------------------------------
                      Performance Summary
-------------------------------------------------------------------------------
 Beginning of Processing :  10:49:17
 End of Processing :        10:49:28
 Number of Frames Processed   599
 Elapsed time (in sec) :      0
 Frames per second :          739.506
```

Page 5

Attachment A: Memo October 7, 1999 (cont.)

```
-----------------------------------------------------------------------------
                    Performance Summary
-----------------------------------------------------------------------------
Beginning of Processing :  10:49:17
End of Processing :        10:49:28
Number of Frames Processed   59
Elapsed time (in sec) :      0
Frames per second :          739.506
-----------------------------------------------------------------------------
                    Closing All Open Files
Closing File : DataFile.ROMMap
Closing File : NOPAGC2L
Closing File : DataFile.NOPAGC
Processing Complete.
Program Ends.
```

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Section 12

GDR Database Processing

12.1 Definition

The ORACLE Relational Database Management System (RDBMS) is used for the TOPEX GDR Database management system.

12.2 Notification

Upon Request.

12.3 Loading Data into Database Tables

The I/GDR database tables are loaded using the Oracle utilities, **sqlldr**, **sqlplus**, and **PL/SQL**. The **sqlldr** utility loads data into the database tables using a control file, which maps the format of the input datafile to the database table. The **sqlplus** utility and **PL/SQL** procedures are used to perform miscellaneous checks and updates to database tables after loading.

12.3.1 Load Process

The processed and stored I/GDR data for loading into the GDR Database can be found on the OSB3 operating system in the**/gen/topex/data/dbase** directory. When it is determined that the files are to be loaded into the database, it is necessary to prepare the directory for easy retrieval and concatenating all igdr_hdr_???_???.db. igdr_sci_???_???.db into the files igdr???.hdr and igdr???.sci respectively. A copy of the igdr???.hdr and igdr???.sci files should be saved in the **/gen/topex/data/dbase/PrevDBase** directory, as a backup and a copy of the files moved to the /gen/topex/dhaps/in directory for processing to the GDR Database. The Data Handling and Processing System (DHAPS) was designed to automate the handling of data with minimal user intervention. The TOPEX DHAPS is being used for the handling and processing of the TOPEX I/GDR data.

12.4 Extracting Data from the Database Tables

The Oracle utilities, **sqlplus** and **PL/SQL** are also used for extracting data from the database tables. These utilities are used to filter data and create output files to be used in further processing.

Attachment A
GDR Database Loading Instructions

Operations on the SUN

The processed and stored I/GDR data for loading into the GDR Database can be found on the OSB3 operating system in the **/gen/topex/data/dbase** directory. When it is determined that the files are to be loaded into the database, it is necessary to prepare the directory for easy retrieval. First, remove the saved files, igdr_hdr_???_???.db, and igdr_sci_???_???.db. This will leave only the files, igdrhdr.dbase, and igdrsci.dbase. A copy of the igdr???.dbase files should be saved in the **/gen/topex/data/dbase/PrevDBase** directory, as a backup.

NOTE: The normal operating procedure for loading of the GDR or AIF Databases is to load both of them at the same time. Therefore, when preparing the directory on OSB3, it will be necessary to remove the saved files for the AIF Database, aif_hdr_1999???t000000.db, aif_eng_1999???t000000.db, aif_cal_1999???t000000.db, aif_wfcheck_1999???t000000.hi, and aif_wfcheck_1999???t000000.lo. This will leave the files: hdr.dbase, eng.dbase, cal.dbase, wfh.dbase, and wfl.dbase.

Once it has been requested that the database be loaded, it is necessary to know which IGDR files are going to be loaded and if any GDR files are going to be loaded. The reason for knowing if there are any GDR files is that it usually means that the IGDR files that are already in the database must be deleted from the GDR Database.

The TOPEXGDR Database management system is in FoxBase/Mac. It is located on Lockwood's Macintosh Power PC.

Operations on the MAC

*****Check space availability*******

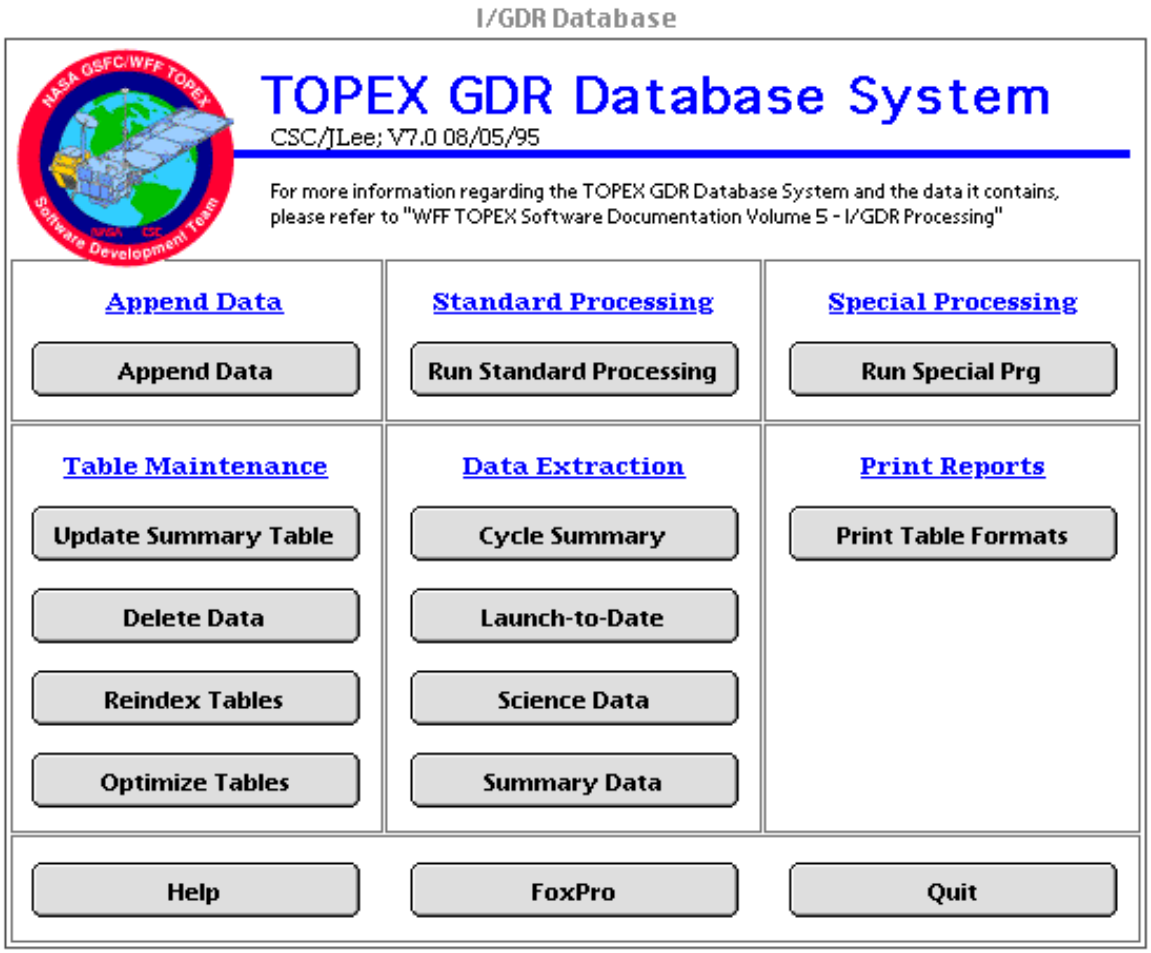
- Open (double click) on Macintosh HD. Check to see how much space (Gigabytes) is available.
- Open Databases Folder.
- Open TOPEX IGDR Database Folder.
- Open DBFS Folder. Compute the total size of the files. What you are checking on is to determine whether enough space is available for processing. Two times the files size is needed for space available to sort files during the deleting process.
- Close DBFS Folder.
- Close TOPEX IGDR Database Folder.
- Close Databases Folder.
- Close Macintosh HD Folder.

- Under the **Launcher** menu, click on the “Net” button, then click on the “Fetch” button. Log on OSB3 and using “Desktop”, change to directory **topex/data/dbase**.
- Select the files igdrhdr.dbase and igdrsci.dbase. Since at this time you are loading the GDR database, it is a good idea to go ahead and select the AIF database files: cal.dbase, eng.dbase, hdr.dbase, wfh.dbase, and wfl.dbase, for later loading into the AIF Database.
- Copy (drag) to the MAC all the ???.dbase files.

*****Open GDR Database*******

- Under the **Launcher** menu, click on the “DBase” button, then click on the “TOPEXGDR” button.

The I/GDR Database menu for the TOPEX GDR Database SYSTEM appears on the console as shown below.



- If there are IGDRs to be deleted because GDRs have been received, then click on “DELETE DATA” button. Then select by entering the start cycle number of

the to-be-deleted cycle(s) and the stop cycle number of the to-be-deleted cycle(s).

- Click on the “Select” button. A message will appear on the console referring to the Deleting Data. Click on the “YES” or “NO” button for the deleting process to continue. It will also indicate what data is going to be removed; therefore, do not reply until one is sure that the to-be-deleted cycles are correct. Once the “Yes” button has been clicked, it will take a while.
- Click on the “Append Data” button. It is necessary at this time to find the data, igdrhdr.dbase and igdrsci.dbase, copied from OSB3. Click on “Desktop”. Then select either the igdrhdr.dbase or igdrsci.dbase, and the software will select the other file automatically.
- Upon completion of the Append, click on the “Update Summary Table” button. A message will indicate what the last cycle is in the Summary Database. If there are IGDRs deleted, then start the “Update Summary Table” with the GDR cycles that are to be appended. If there are no IGDRs deleted, then start the Update Summary Table with that same last cycle that the Summary Table had indicated. This is to make sure that some passes of that last cycle get loaded from the current Append Data.
- Upon completion of the Update Summary, click on the “Cycle Summary” button. Select the GDRs that were loaded. (This is not always done, only when we have GDRs, and the IGDRs were deleted and GDRs were loaded). Name the file to be saved as **CycleSummary.gdr**, then select and save under Desktop. Ensure that the files match those on OSB3 (case sensitive). Copy (drag) the file to OSB3 **/topex/data/trend**.
- Upon completion of the Cycle Summary, click on the “Launch-to-Date” button. Selection is from Cycle 1 to the last Cycle available. Name the file to be saved as **aiftrend.current.gdr**, then select and save under Desktop.
- Unless additional files are to be created, click on “Quit”.
- Click on the “Fetch” button (it should still be available since it was not closed from copying the files from OSB3). Copy to **/topex/data/trend** on OSB3. Ensure that the files match those on OSB3 (case sensitive).

After the files have been copied to OSB3, then the correct UNIX script will be run on each file.

Operations on the SUN

- **igdrdb CycleSummary.gdr** - A UNIX script that runs the IDL program **igdrdb.pro** to plot the GDR Cycle Summary (Figure 12-1).
- **gdrtrend aiftrend.current.gdr** - A UNIX script that runs the IDL program **igdrsum.pro** to plot the GDR Launch to Date trend (Figure 12-2).
- After the plots have been checked and one is sure that the data were loaded correctly, then it is time to clear the *.dbase files such as igdrhdr.dbase and igdrsci.dbase. This is in preparation for the next set of IGDR data that will be

received. IDL script **igdrdb.clean** will do this. Remember, it would be a good idea to copy the ???.dbase files to the **PrevDBase** directory.

.

I/GDR Cycle Summary : Cycle 233

1-Minute Averages from IGDR Database (CAL-Corrected and Edited for NumSecs > 45 and ONA < 0.12 and Sigma0Ku < 16)

Processing Summary

Level 0 : All Data		
Records Processed :	385670	
Level 1 : Deep Water, TFlag=0		
Records Processed :	384245	
Records Deleted :	1425	(0.376%)
Level 2 : Level 1, AltBadx=0		
Records Processed :	379038	
Records Deleted :	5207	(1.374%)

Good Data = Remainder After Removing Level-2 Flagged Data

Flagging Summary

TFlags : Deep Water	1425	(0.376%)
Level 1 : Deep Water,TFlag=0		
AltBad1 Flags :	2935	(0.774%)
KuRangCorr Flags :	1536	(0.405%)
CRangCorr Flags :	1440	(0.380%)
GeoBad Flags :	1431	(0.378%)
SSHBad Flags (10/rec) :	1974	(0.521%)
EMBias Flags (2/rec) :	0	(0.000%)

Dates of Cycle: 1999-010T13:56:26 to 1999-020T10:52:02

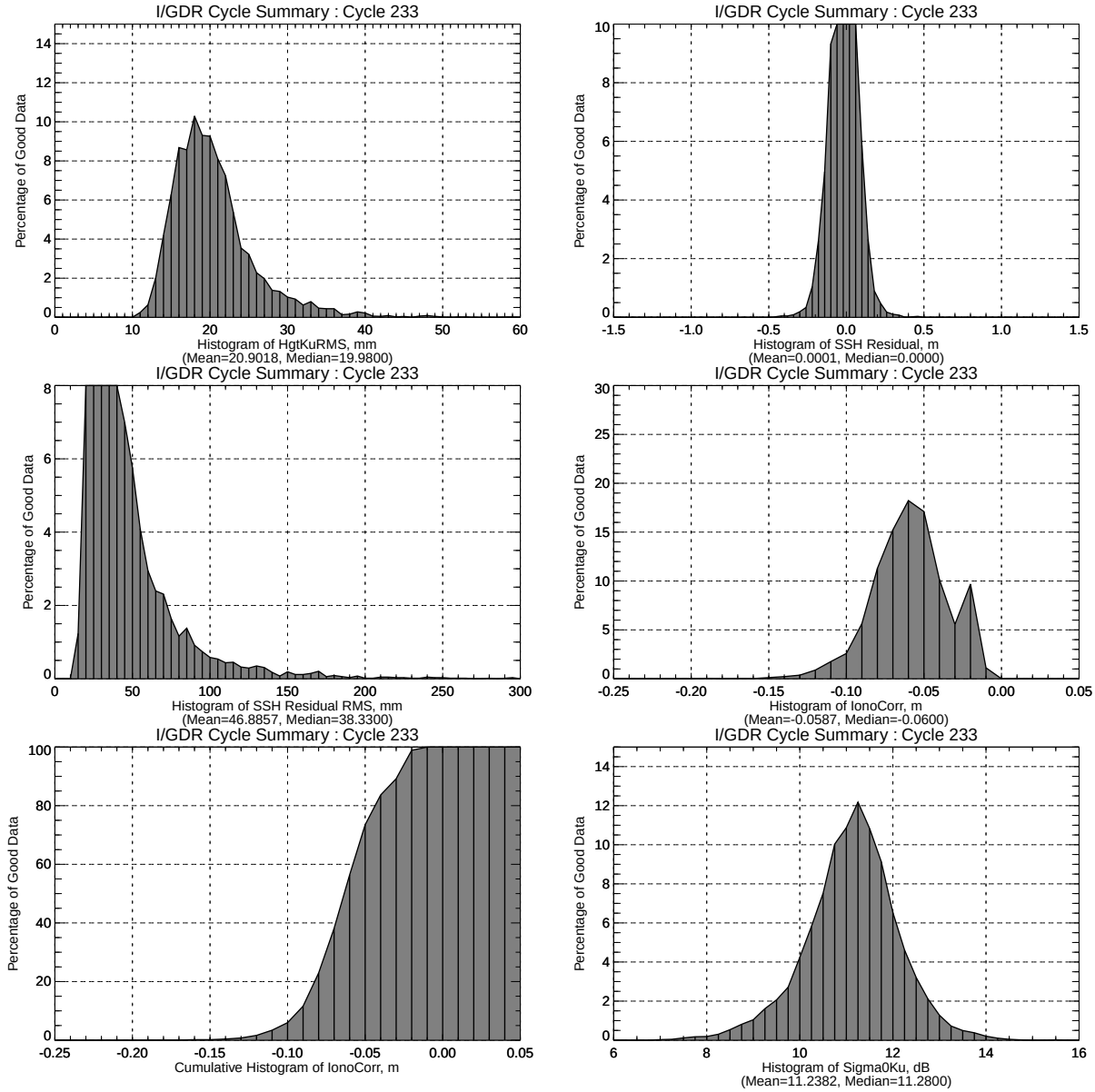


Figure 12-1 Sample of GDR Cycle Summary

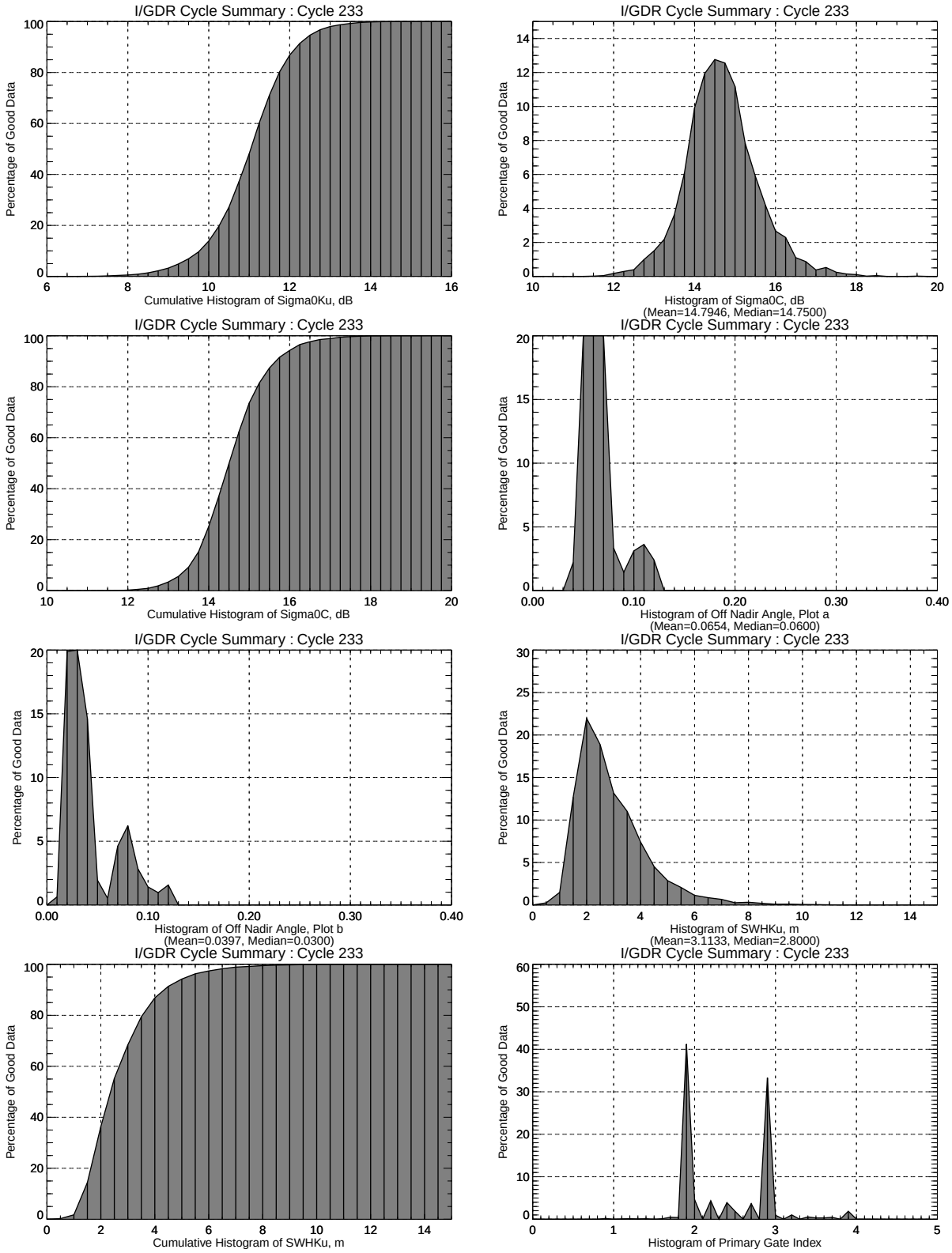


Figure 12-1 Sample of GDR Cycle Summary (Continued)

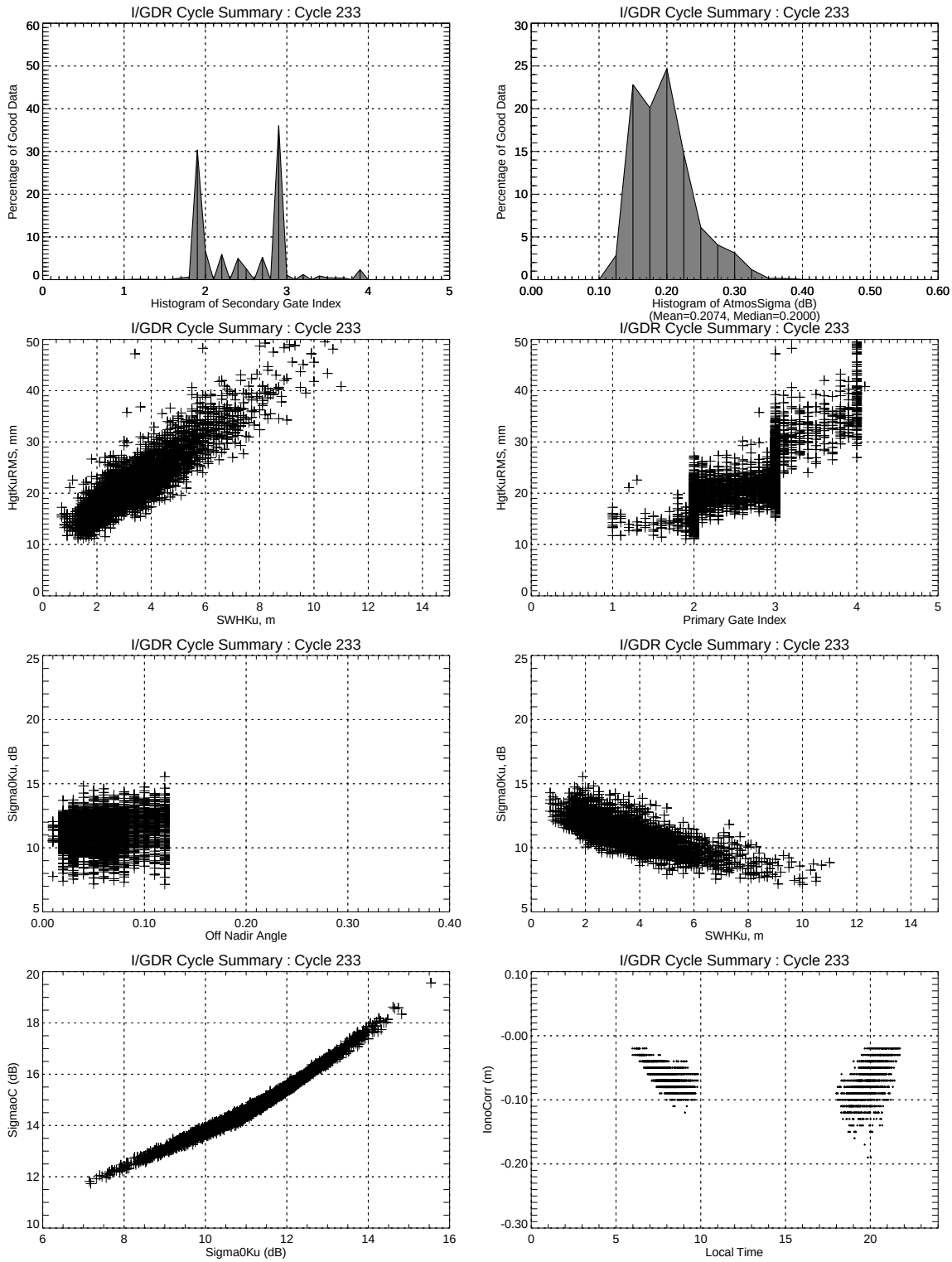


Figure 12-1 Sample of GDR Cycle Summary (Continued)

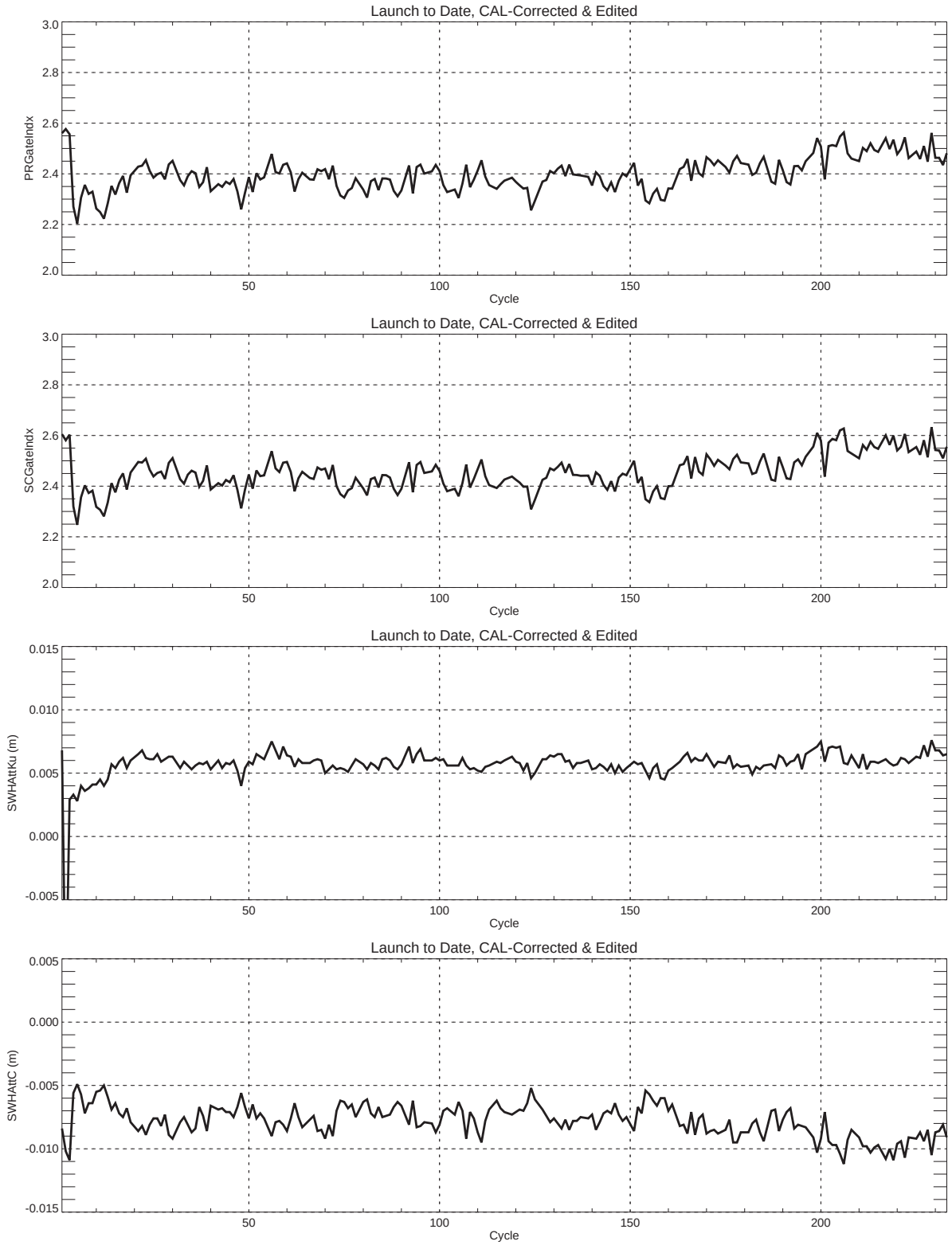


Figure 12-2 Sample of GDR Launch to Date Trend

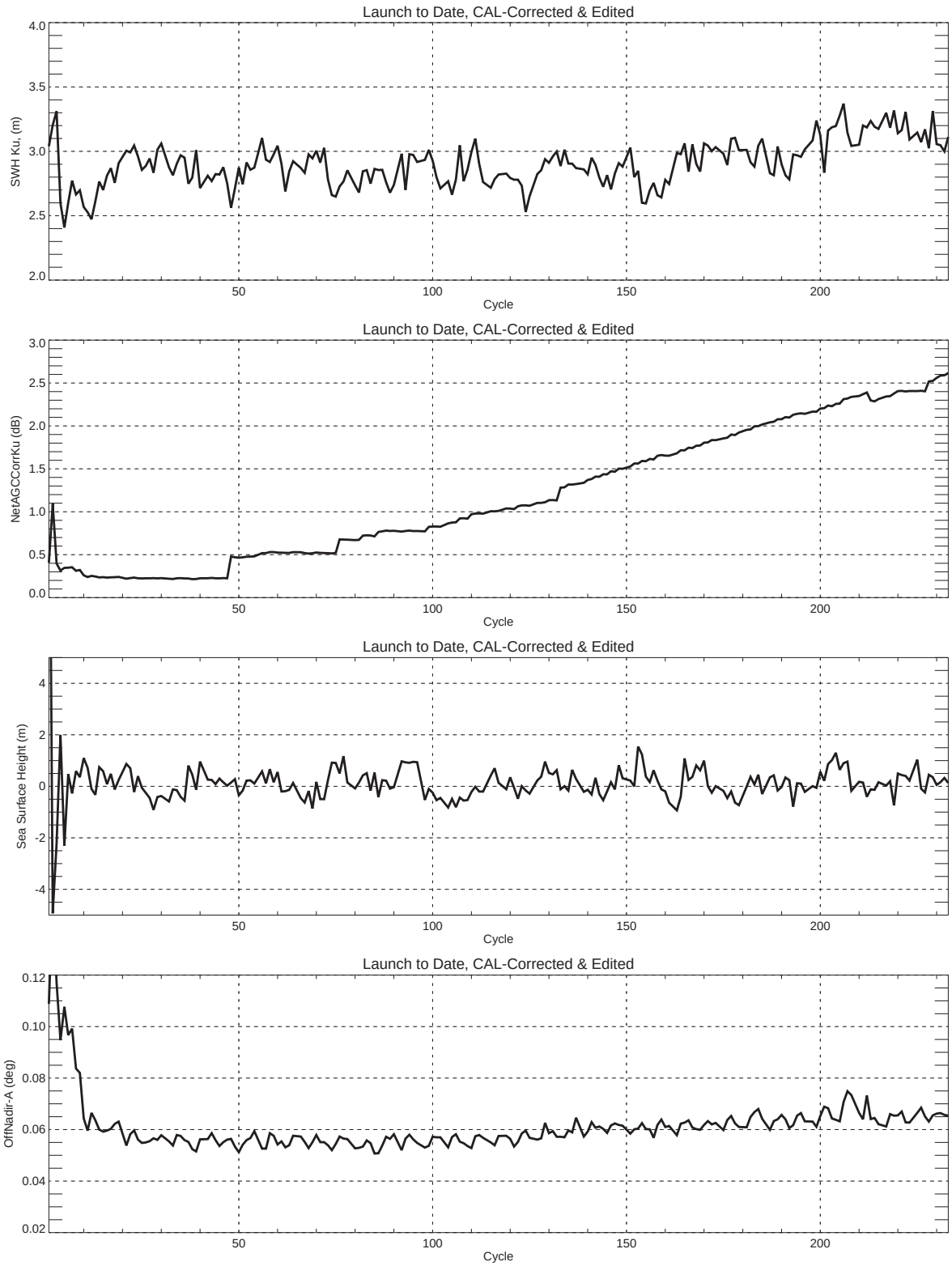


Figure 12-2 Sample of GDR Launch to Date Trend (Continued)

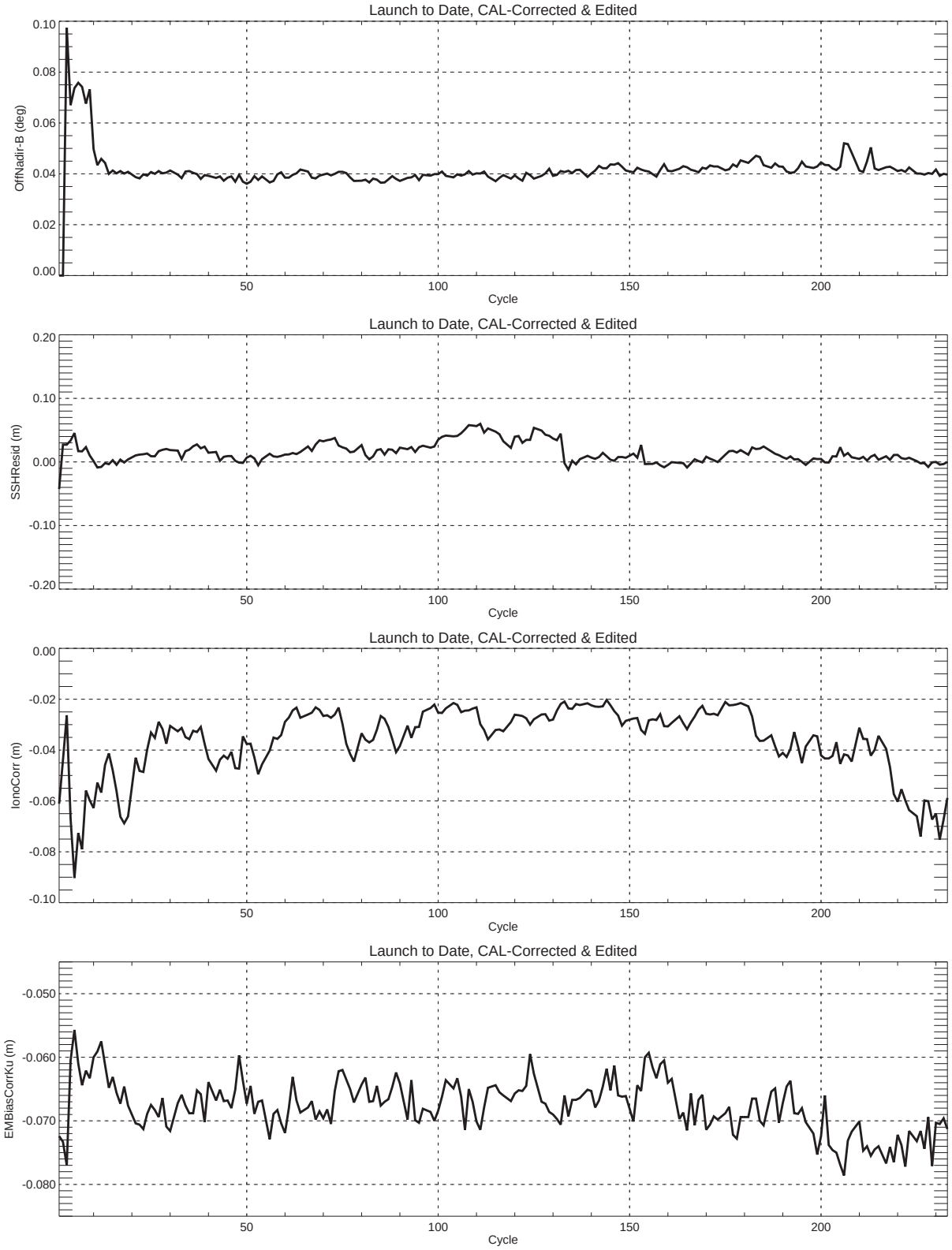


Figure 12-2 Sample of GDR Launch to Date Trend (Continued)

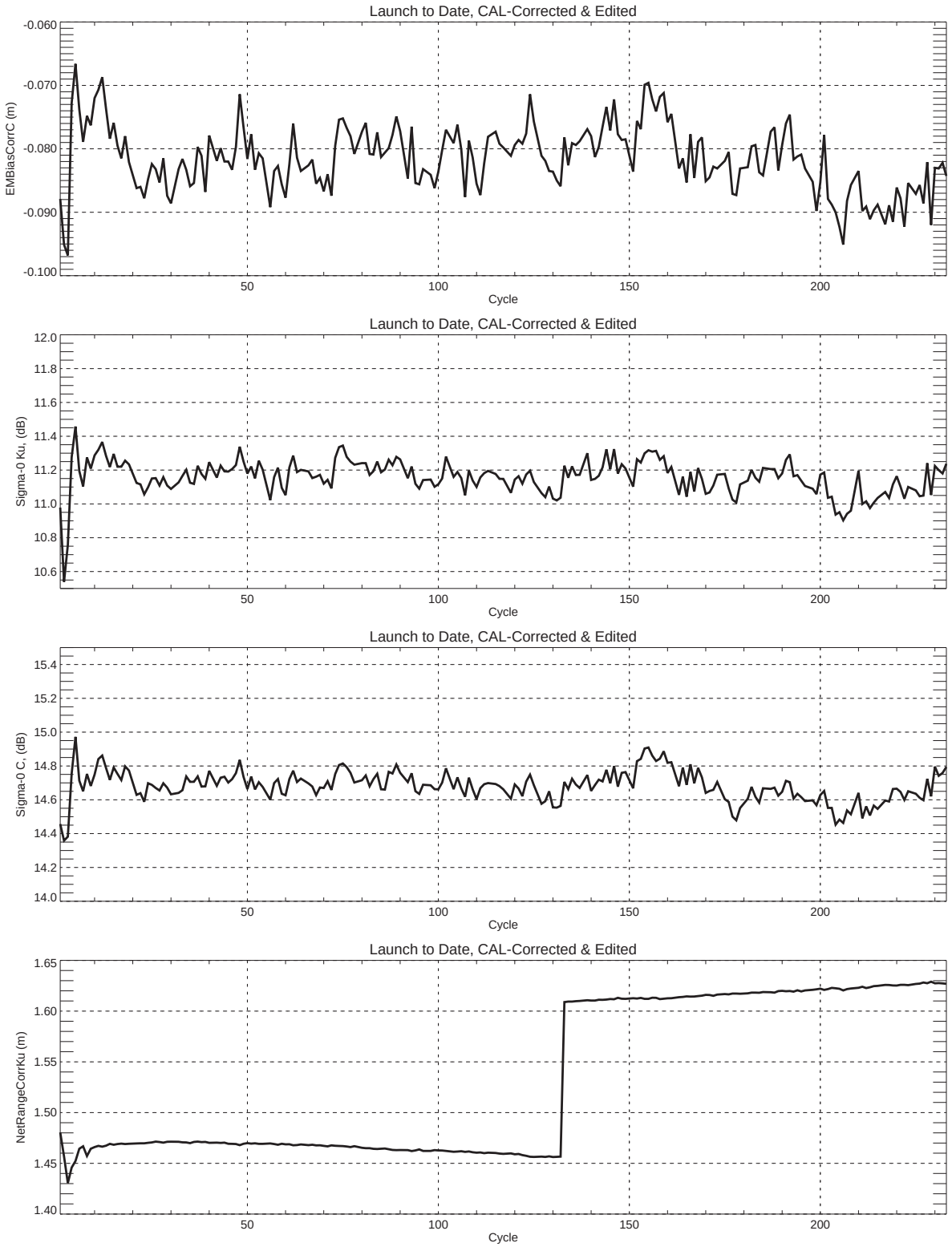


Figure 12-2 Sample of GDR Launch to Date Trend (Continued)

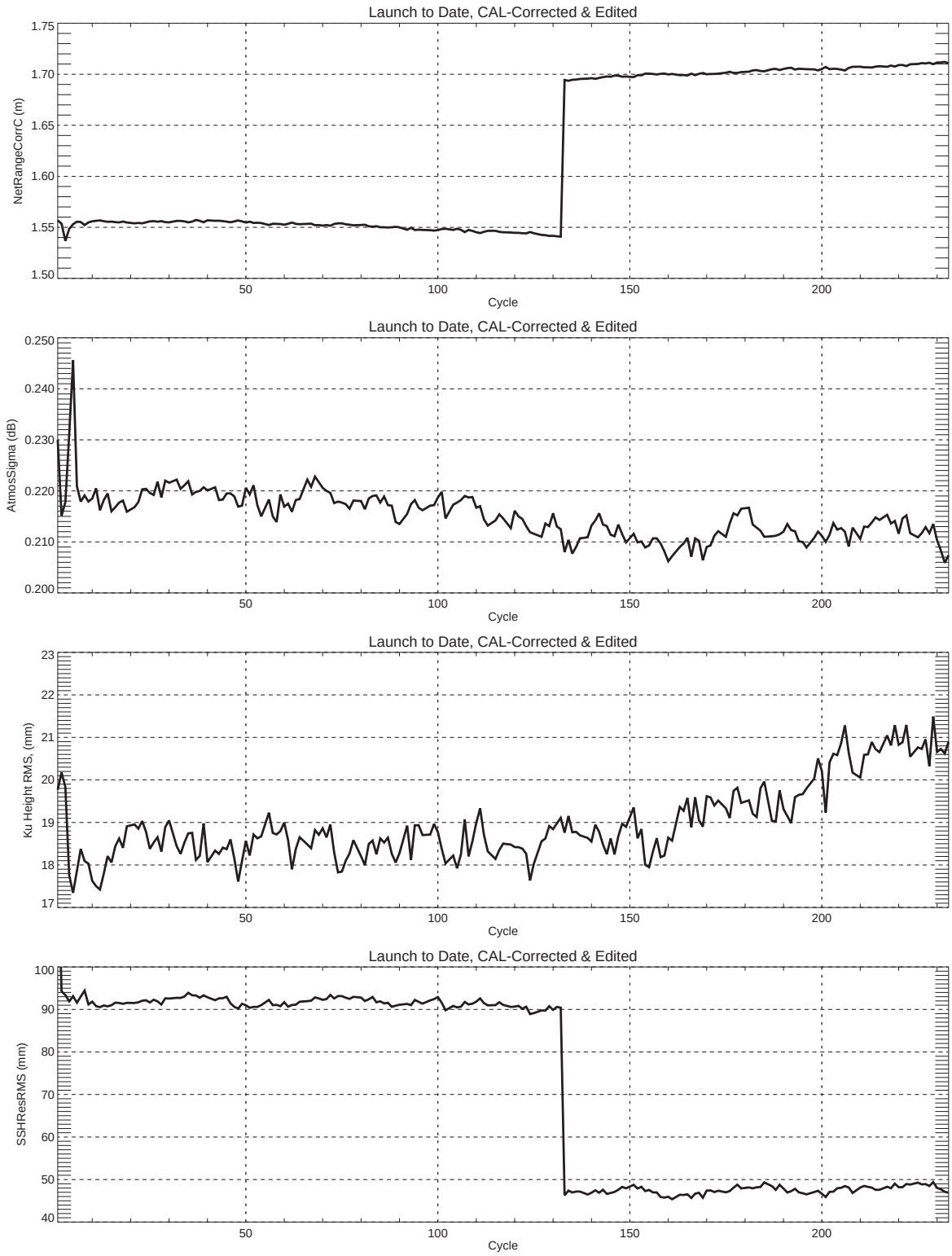


Figure 12-2 Sample of GDR Launch to Date Trend (Continued)

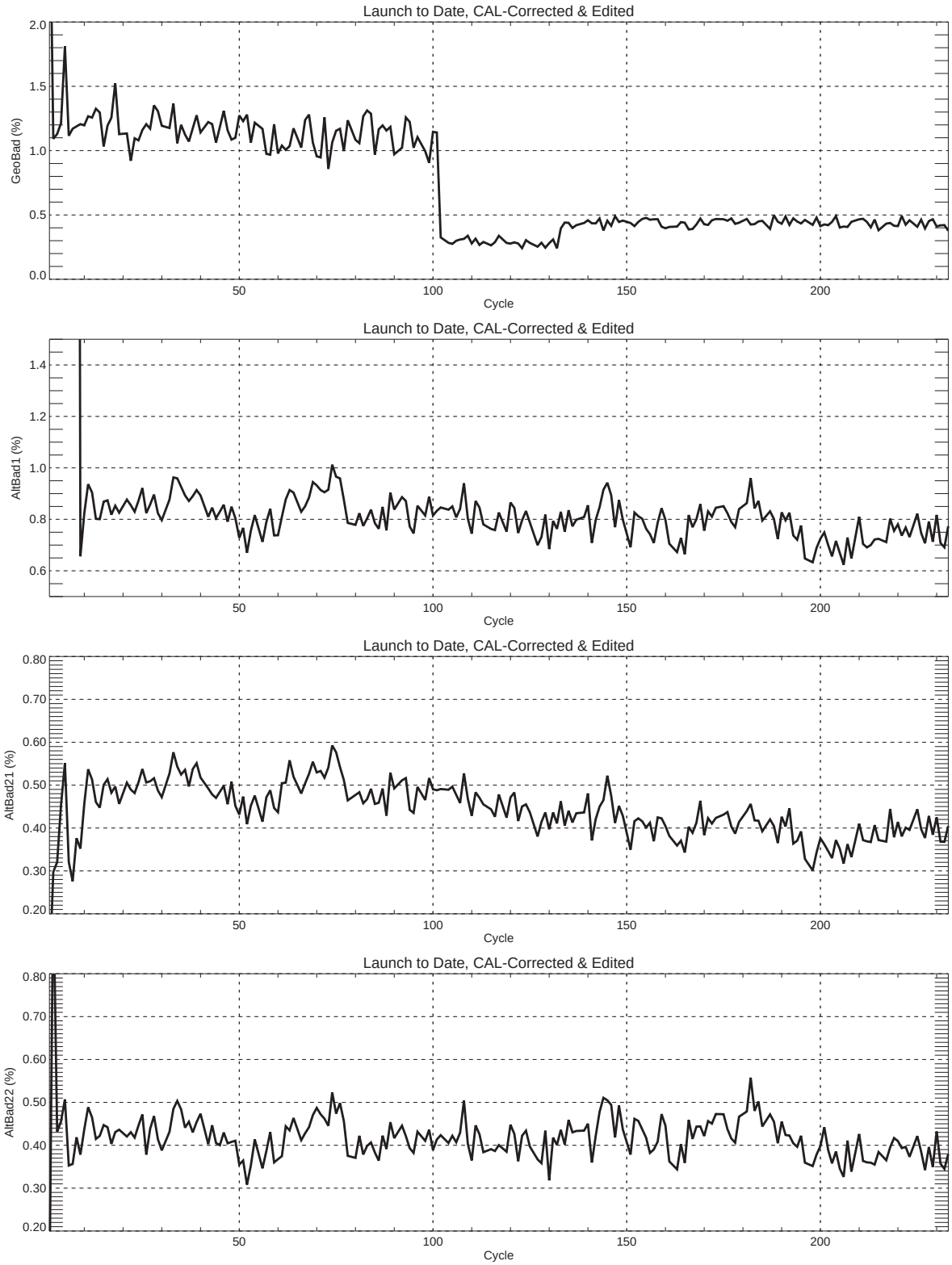


Figure 12-2 Sample of GDR Launch to Date Trend (Continued)

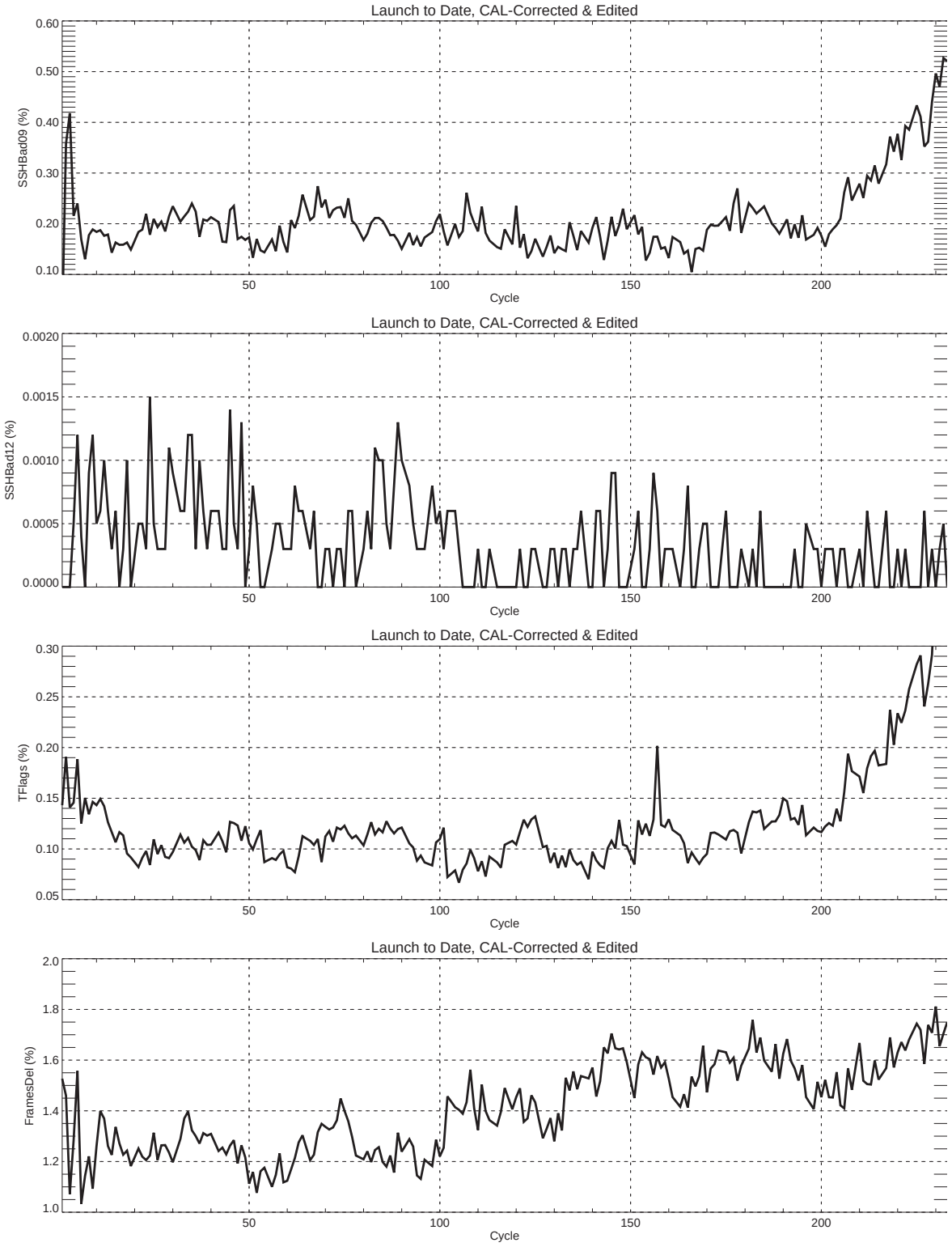


Figure 12-2 Sample of GDR Launch to Date Trend (Continued)

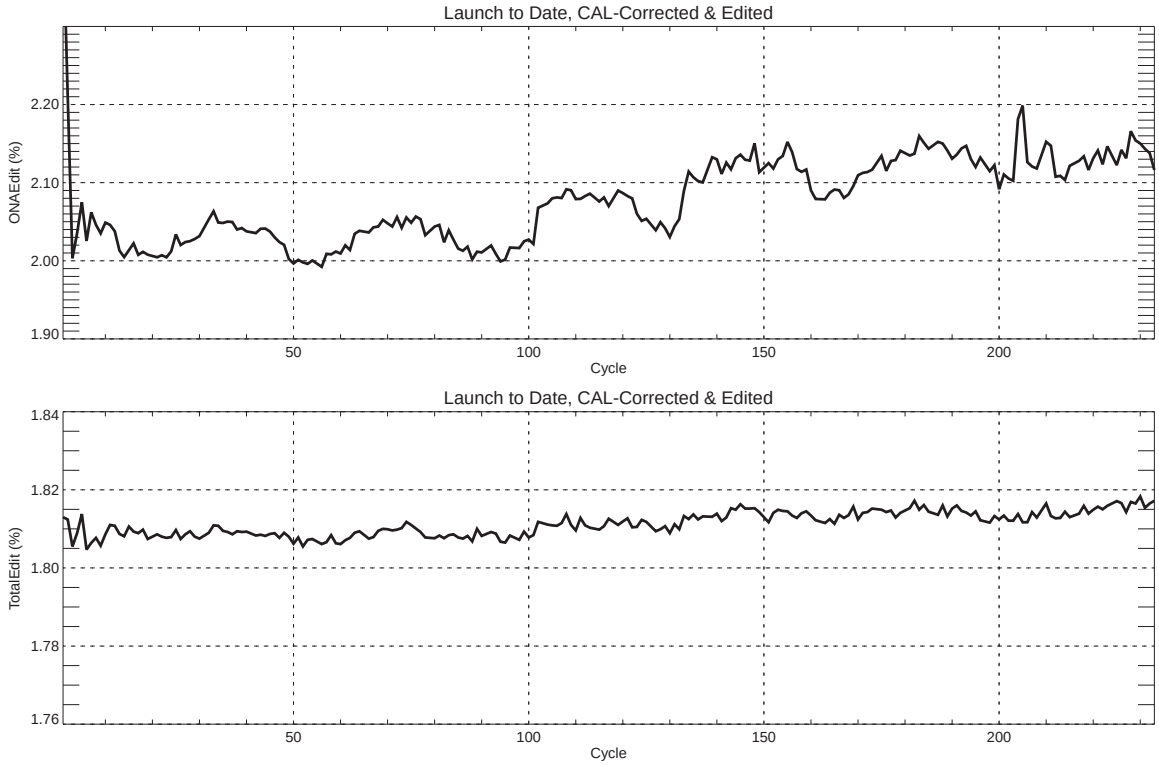


Figure 12-2 Sample of GDR Launch to Date Trend (Continued)

Section 13

AIF Database Processing

13.1 Definition

The ORACLE Relational Database Management System (RDBMS) is used for the TOPEX AIF Database management system.

13.2 Notification

Upon request.

13.3 Loading Data into Database Tables

The AIF database tables are loaded using the Oracle utilities, **sqlldr**, **sqlplus**, and **PL/SQL**. The **sqlldr** utility loads data into the database tables using a control file, which maps the format of the input datafile to the database table. The **sqlplus** utility and **PL/SQL** procedures are used to perform miscellaneous checks and updates to database tables for loading.

13.3.1 Load Process

The Data Handling and Processing System (DHAPS) was designed to automate the handling of data with minimal user intervention. The TOPEX DHAPS is being used for the handling and processing of the TOPEX I/GDR data.

13.4 Extracting Data from the Database Tables

The Oracle utilities, **sqlplus** and **PL/SQL** are also used for extracting data from the database tables. These utilities are used to filter data and create output files to be used in further processing.

Attachment A

AIF Database Loading Instructions

Operations on the SUN

The processed and stored AIF data for loading into the AIF Database can be found on the OSB3 operating system in the **/gen/topex/data/dbase** directory. When it is determined that the files are to be loaded into the database, it is necessary to prepare the directory for easy retrieval. First remove the saved files, aif_hdr_1999???t000000.db, aif_eng_1999???t000000.db, aif_cal_1999???t000000.db, aif_wfcheck_1999???t000000.hi, and aif_wfcheck_1999???t000000.lo. This will leave only the files, hdr.dbase, eng.dbase, cal.dbase, wfh.dbase, and wfl.dbase. A copy of the ??.dbase files should be saved in the **/gen/topex/data/dbase/PrevDBase** directory, as a backup.

NOTE: The normal operating procedure for loading of the GDR or AIF Databases is to load both of them at the same time. Therefore, when preparing the directory on OSB3, it will be necessary to remove the saved files for the I/GDR Database, igdr_hdr_???_???.db and igdr_sci_???_???.db. This will leave the files, igdrhdr.dbase, igdrsci.dbase.

The TOPEX AIF Database management system is in FoxBase/Mac. It is located on Lockwood's Macintosh Power PC.

Operations on the MAC

Under the **Launcher** menu, click on the "Net" button, then click on the "Fetch" button. Log on OSB3, and use "Desktop" to change to directory **topex/data/dbase**.

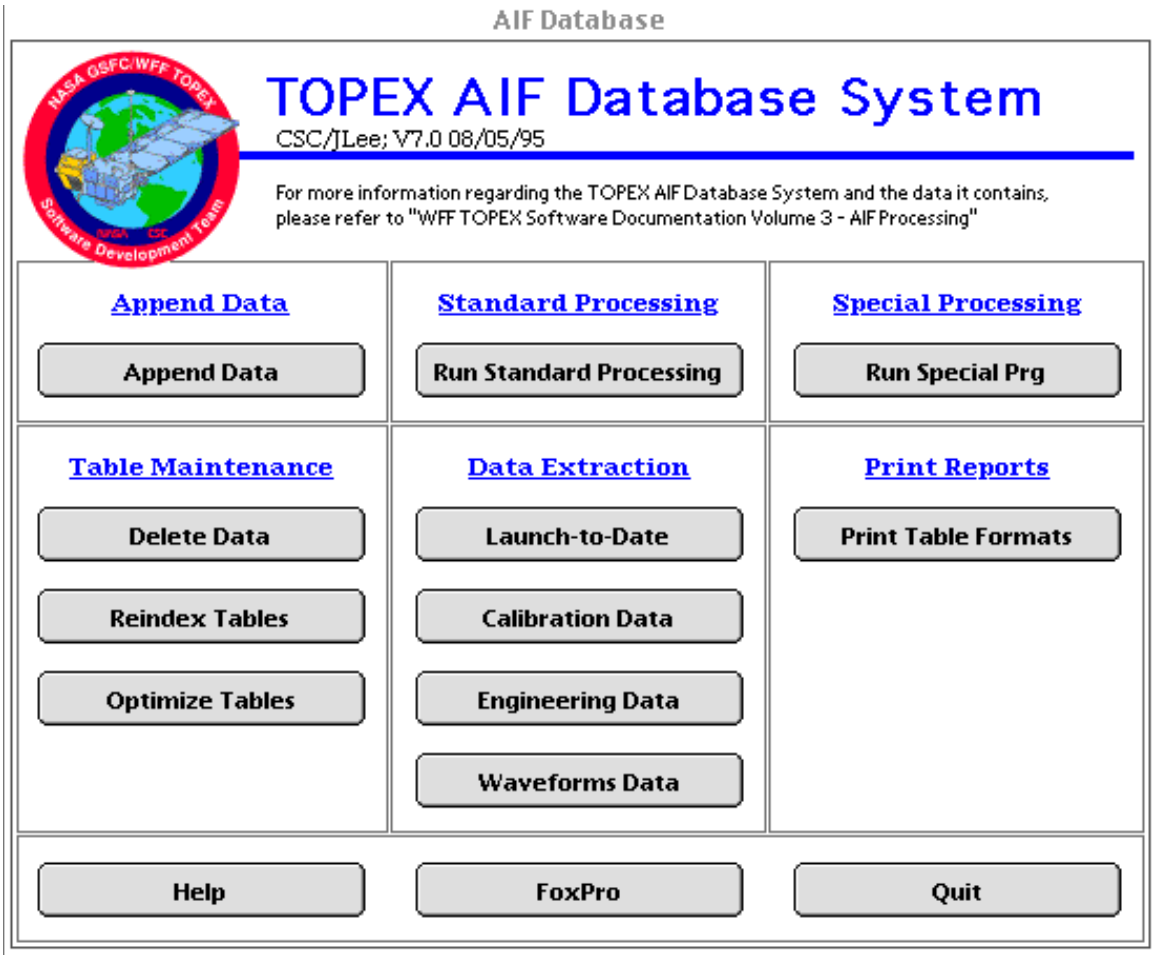
Select the files hdr.dbase, eng.dbase. cal.dbase. wfh.dbase and wfl.dbase. Since at this time you are only loading the AIF database, it is a good idea to go ahead and select the GDR database files, igdrhdr.dbase, and igdrsci.dbase, for later loading the I/GDR Database.

Copy (drag) to the MAC all the ???.dbase files.

*****Open AIF Database*******

Under the **Launcher** menu, click on the "DBase" button, then click on the "aifdb" button.

The AIF Database menu for the TOPEX AIF Database SYSTEM appears on the console as in the following.



Click on the “Append Data” button. It is necessary at this time to find the data: hdr.dbase, eng.dbase. cal.dbase. wfh.dbase and wfl.dbase, copied from OSB3. Click on “Desktop”, then select either the hdr.dbase or cal.dbase, and the software will select the other files automatically.

Upon completion of the Append, click on the “Launch-to-Date” button. Selection of the time range for one year, is to start by selecting the stop date and go back one year, and select the start date. The files to be saved will automatically be named as **aiftrend.current.**???, with ??? having the suffix of cal, eng, hdr, wfh, and wfl. Then select and save under “Desktop”. Ensure that the file names match those on OSB3 (case sensitive).

Unless additional files for different time ranges are to be created, click on the “Quit” button.

Click on the “Fetch” button. It should still be available since it was not closed from copying the files from OSB3. Copy (drag) the newly created files to **topex/data/trend**.

After the files have been copied to OSB3, then the correct UNIX script will be run on each file.

Operations on the SUN

aifcurrenttrend - A UNIX script that runs three scripts; **caltrend**, **wftrend**, and **engtrend**. UNIX script **caltrend** runs an IDL program, **aifcal.pro**, that plots the data from the file, **aiftrend.current.cal**, as shown in Figure 13-1.UNIX script **wftrend**, this script must be run twice for two separate files, runs an IDL program, **wfdiff.pro**, that plots the data from the files, **aiftrend.current.hi** and **aiftrend.current.lo**, as shown in Figure 13-2 UNIX script **engtrend** runs an IDL program, **aifeng.pro**, that plots the data from the file, **aiftrend.current.eng**, as shown in Figure 13-3. When the script file, **aifcurrenttrend**, is used, the process automatically uses file names with the naming convention of **aiftrend.current**.??? When the individual script files are used, then the file name must be entered. Example: **engtrend aiftrend.current.eng**.

After the plots have been checked and one is sure that the data were loaded correctly then it is time to clear the *.dbase files such as hdr.dbase, cal.dbase, eng.dbase, wfh.dbase, and wfl.dbase. This is in preparation for the next set of AIF data that will be received. IDL script **db.clean** will do this. Remember, it would be a good idea to copy the ???.dbase files to the **PrevDBase** directory.

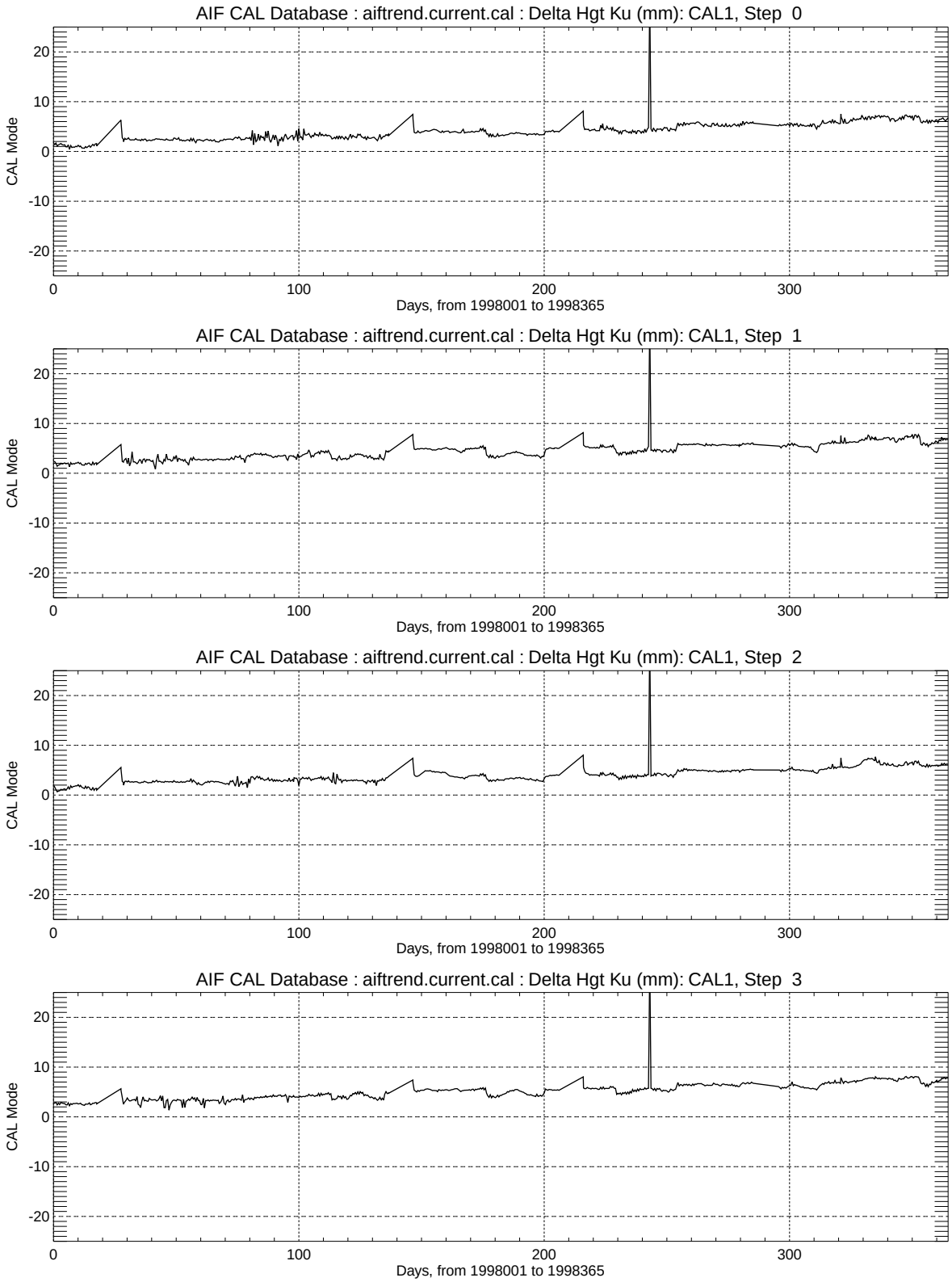


Figure 13-1 Cal Trend Plot

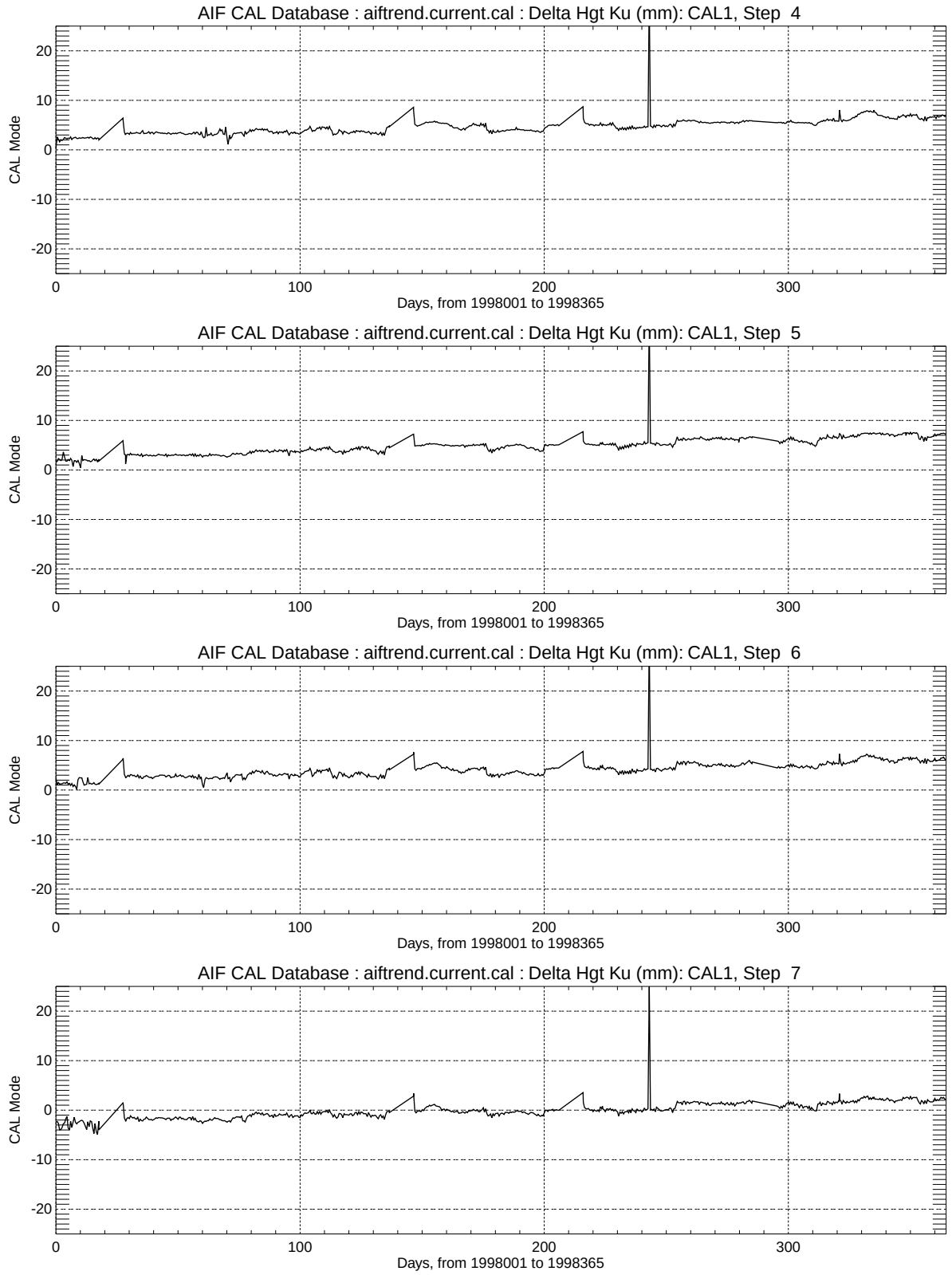


Figure 13-1 Cal Trend Plot

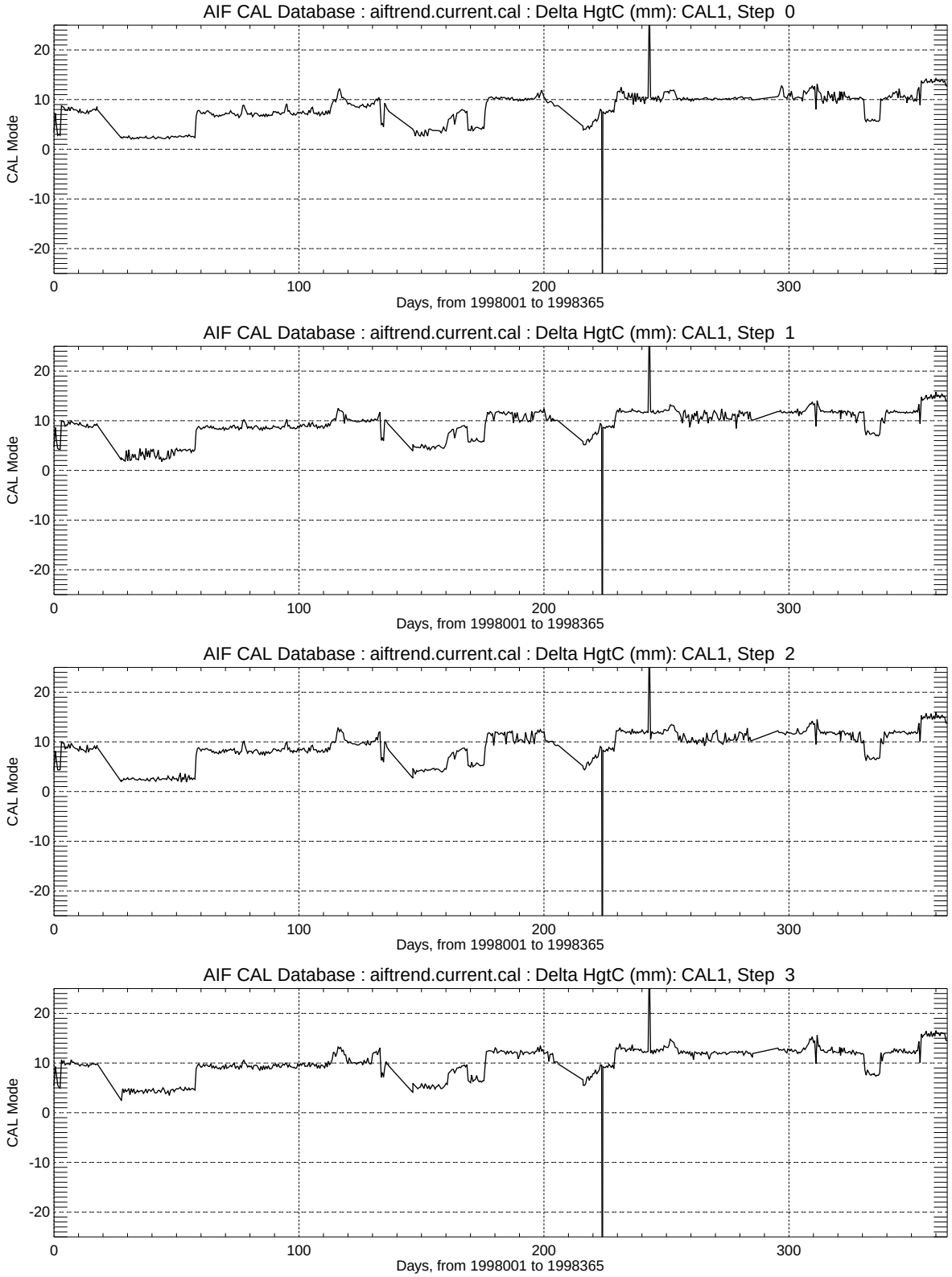


Figure 13-1 Cal Trend Plot

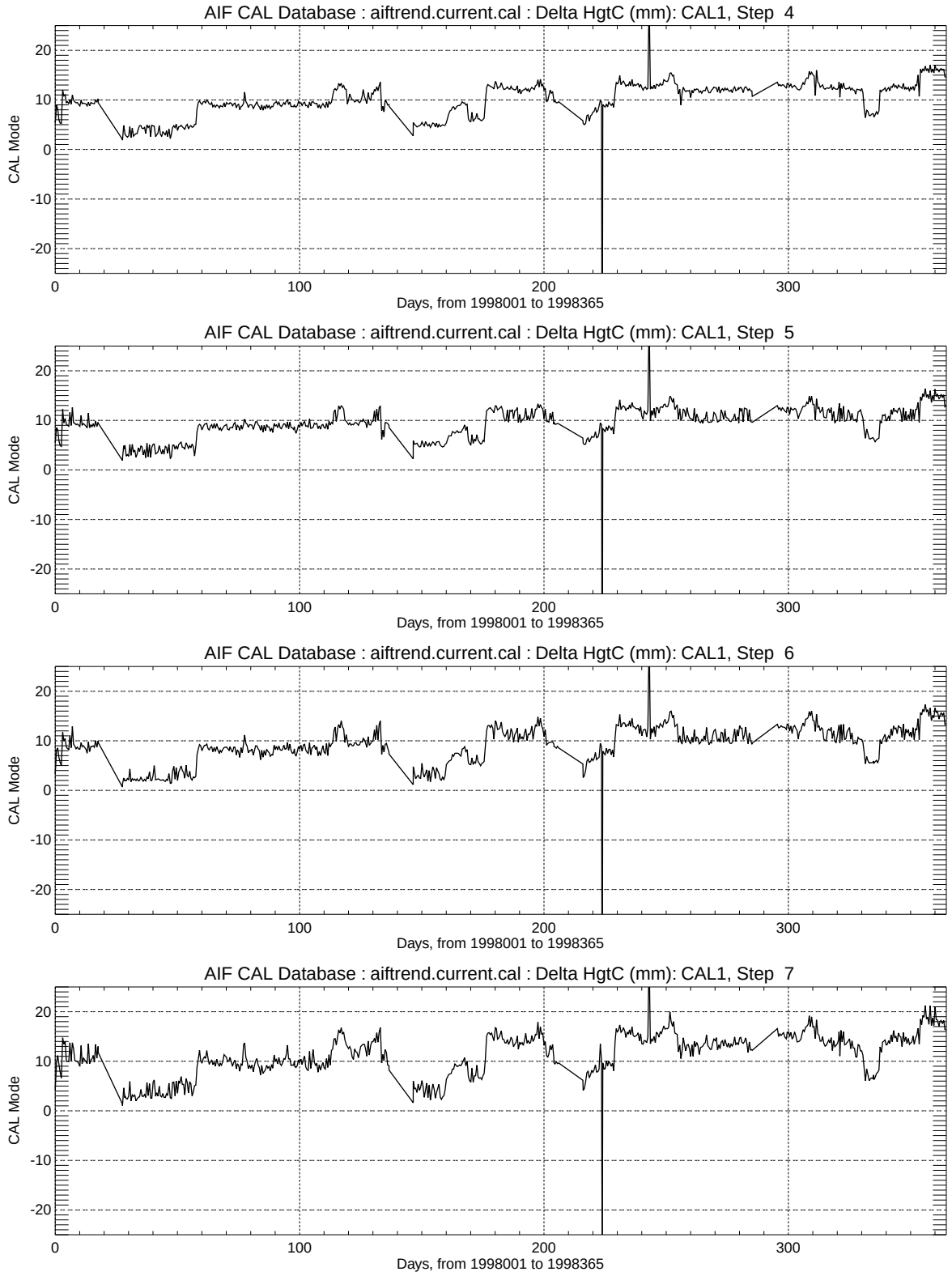


Figure 13-1 Cal Trend Plot

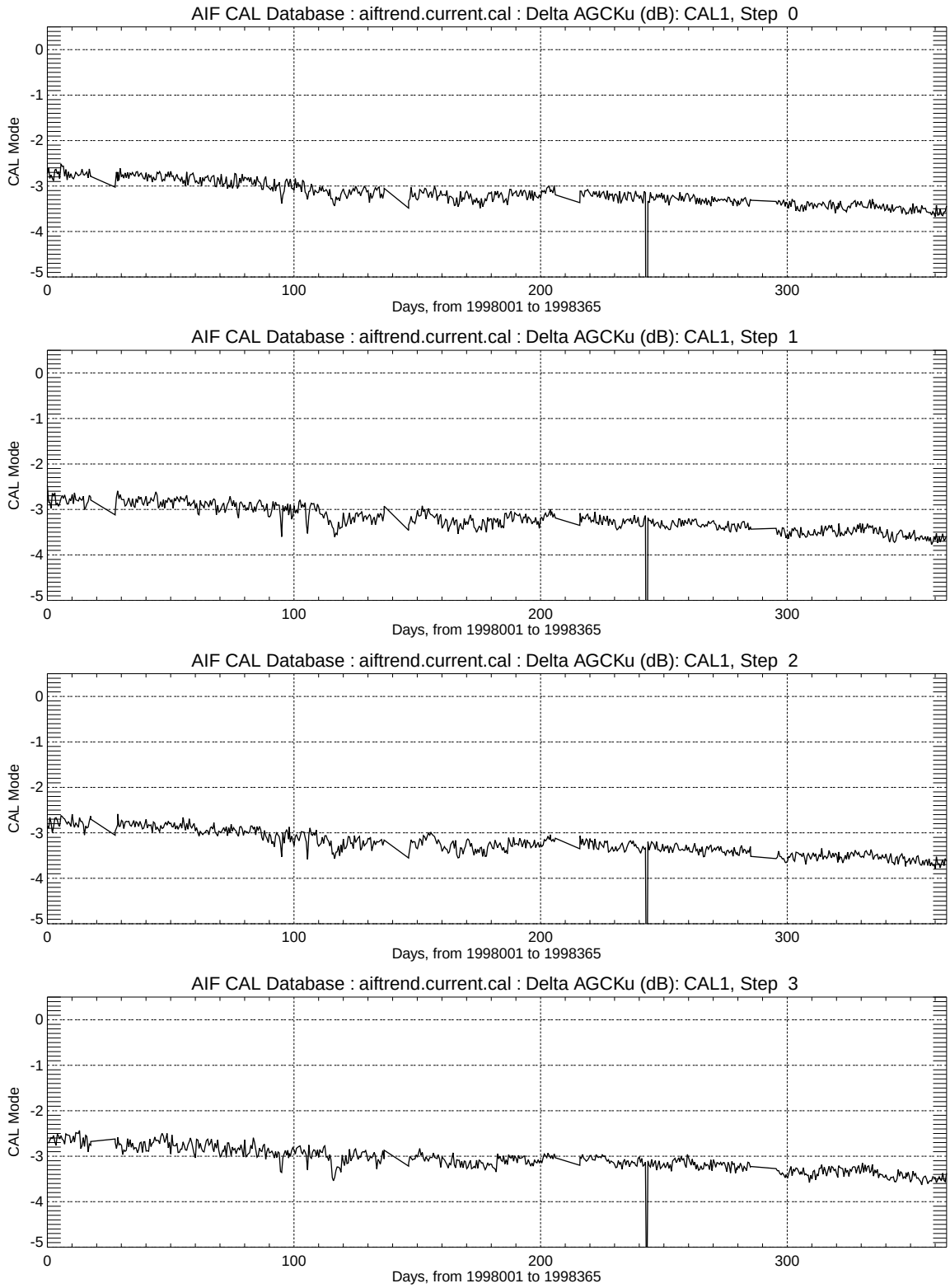


Figure 13-1 Cal Trend Plot

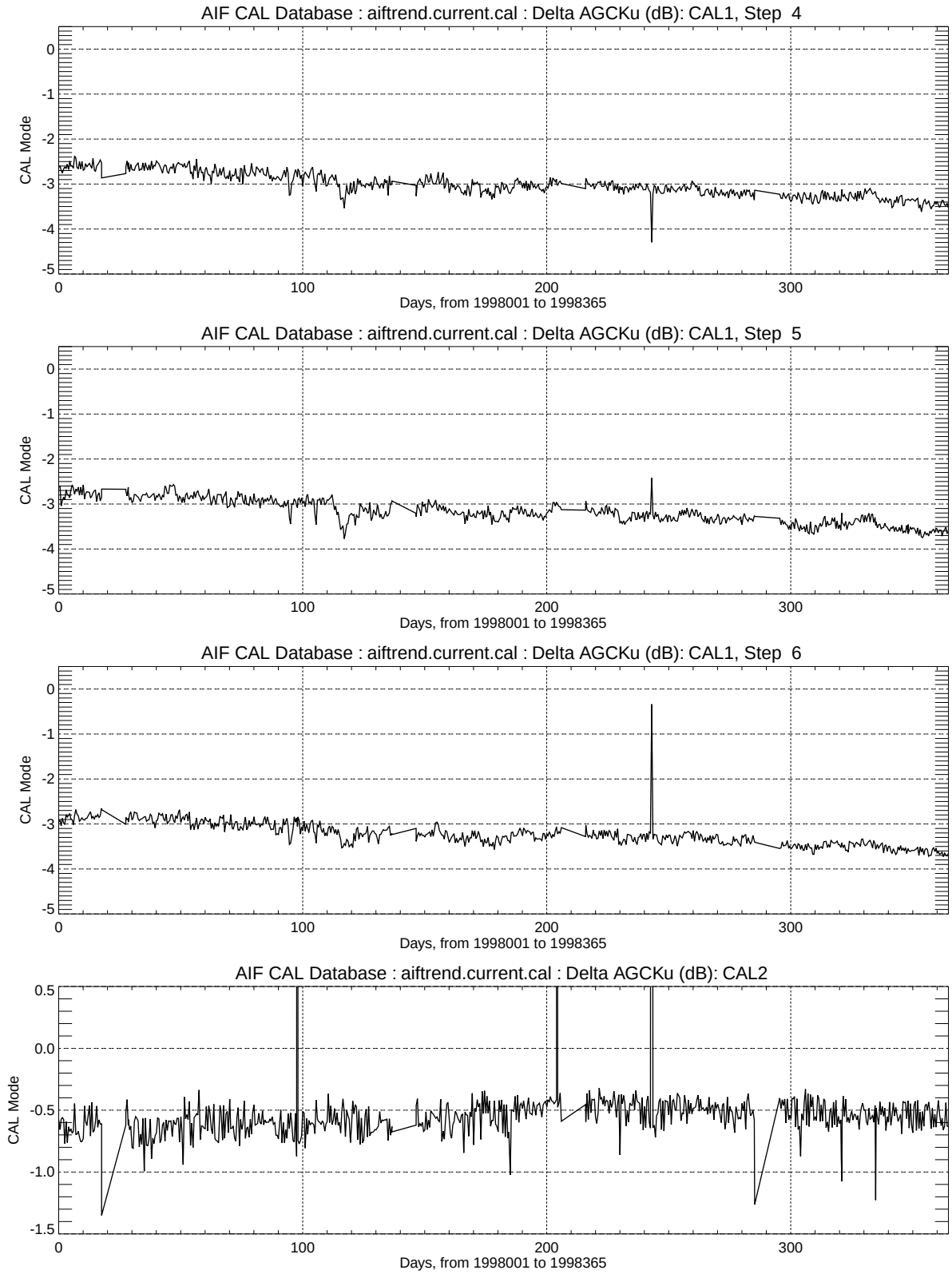


Figure 13-1 Cal Trend Plot

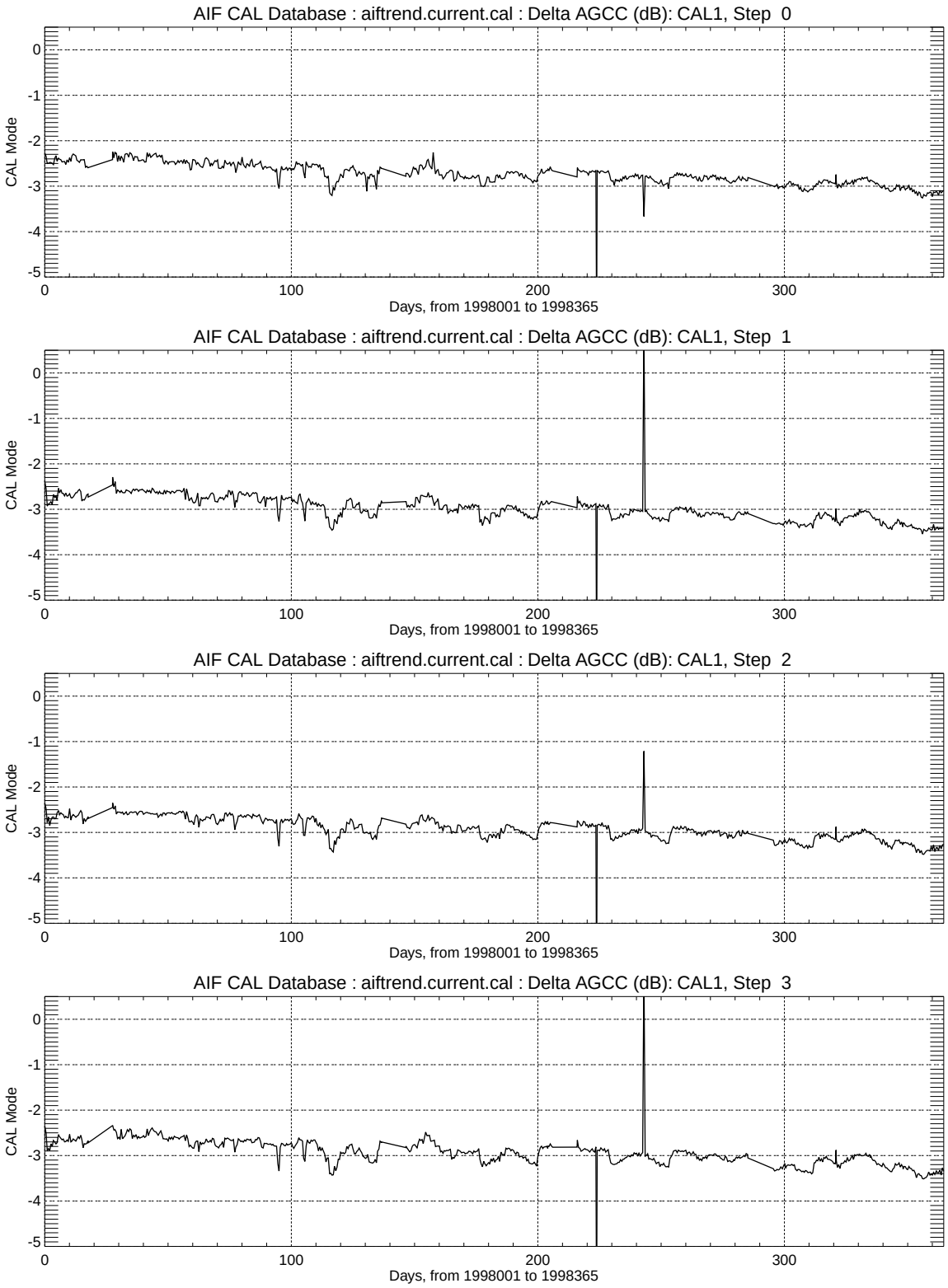


Figure 13-1 Cal Trend Plot

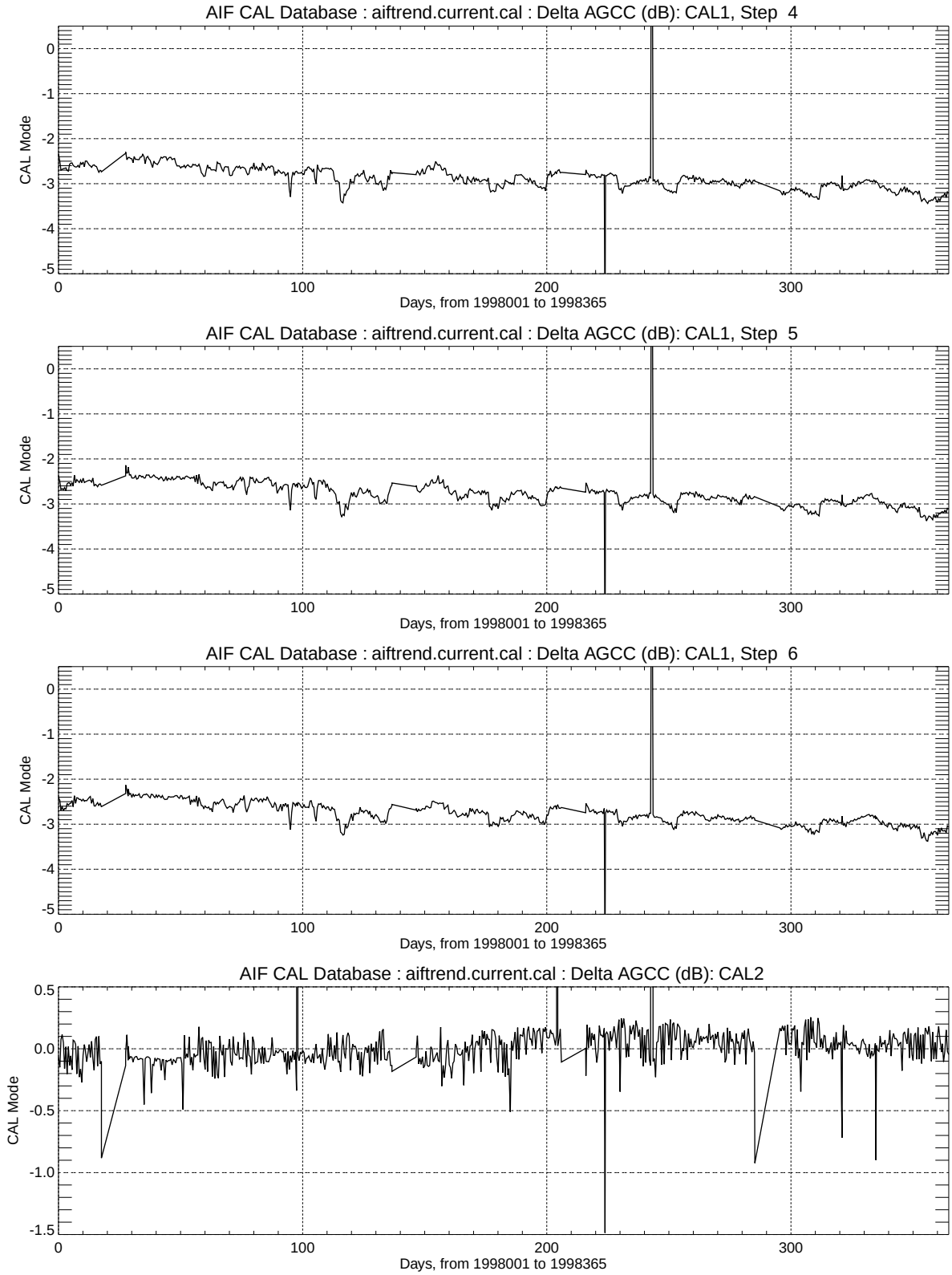


Figure 13-1 Cal Trend Plot

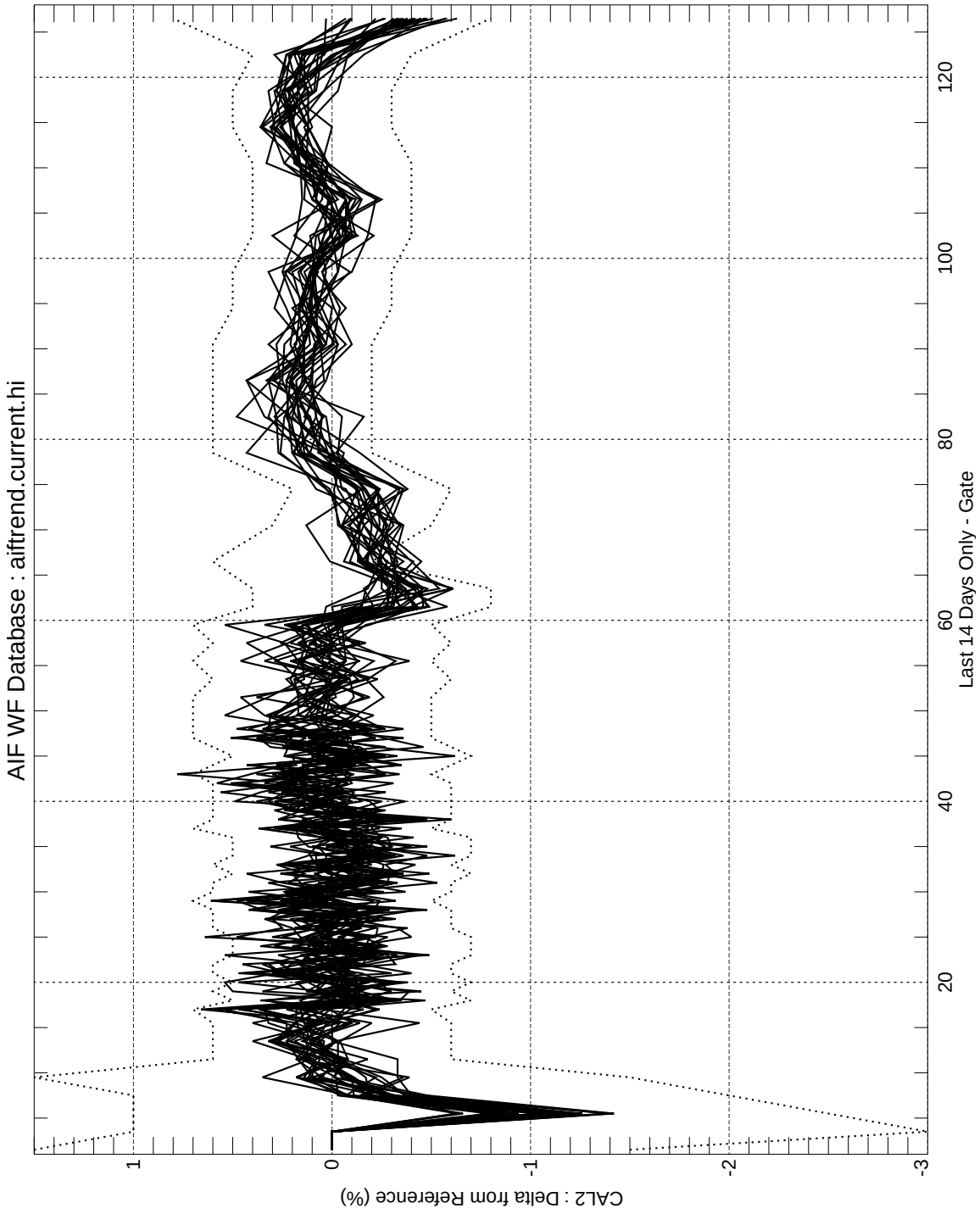


Figure 13-2 Waveform Trend Plot

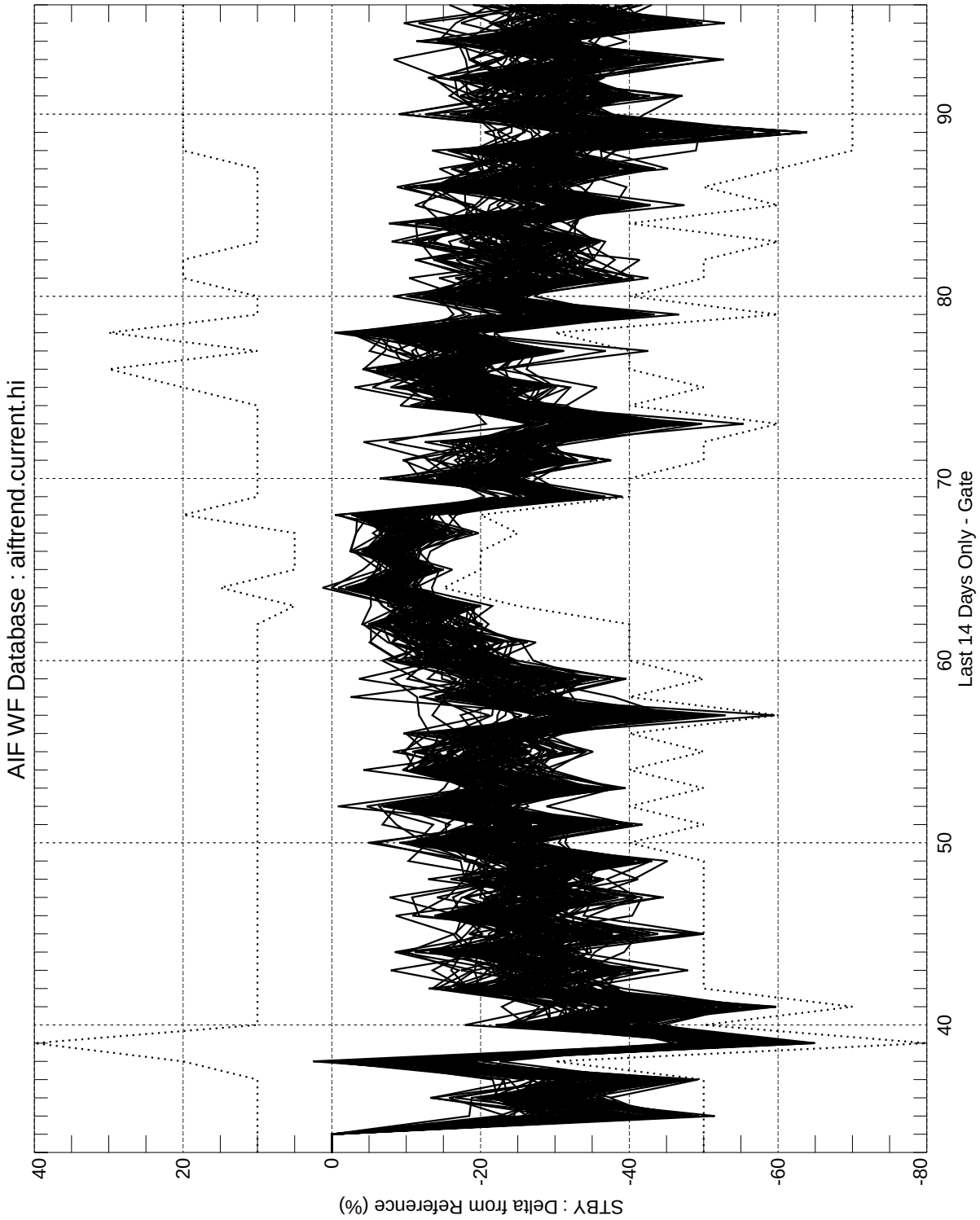


Figure 13-2 Waveform Trend Plot

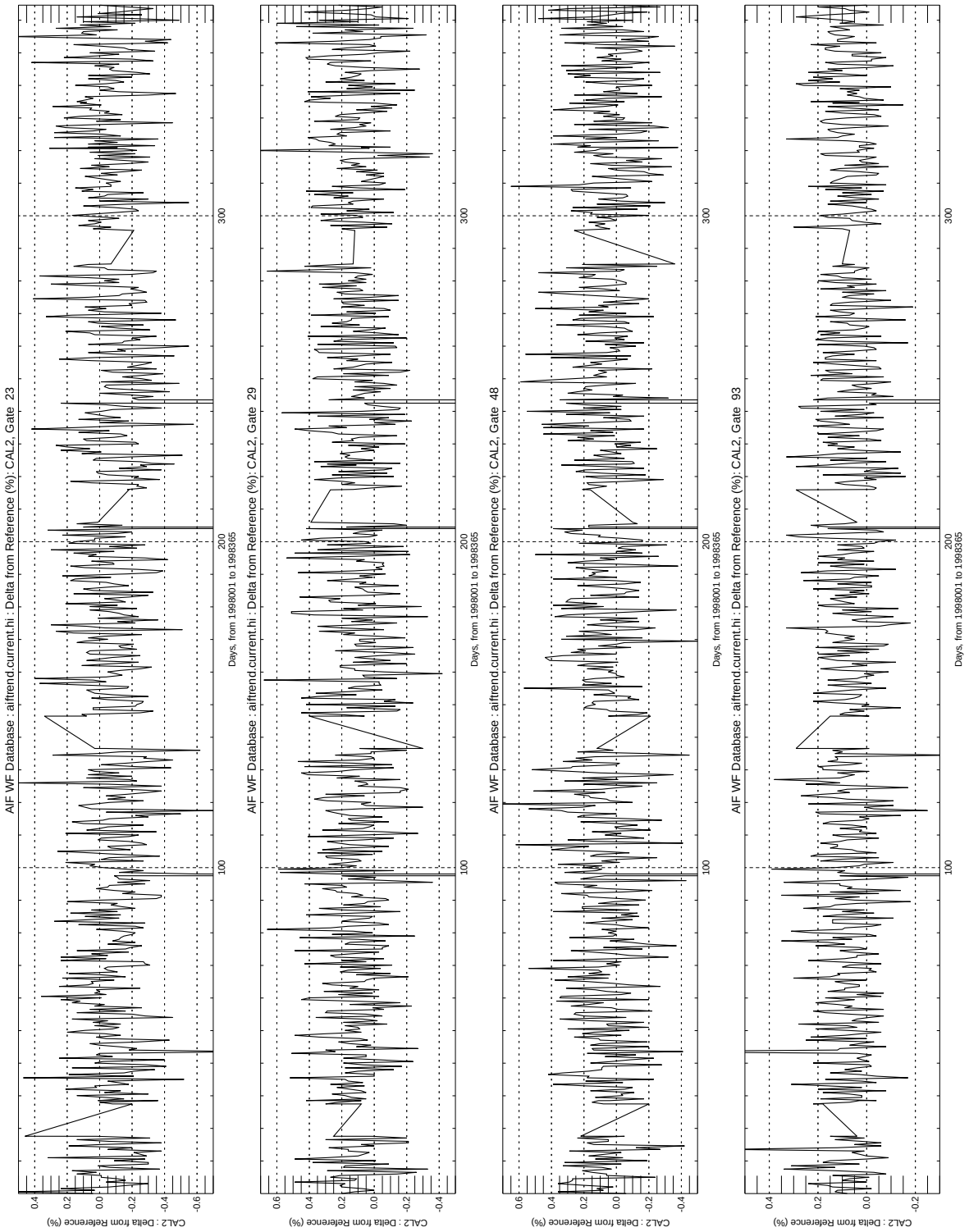


Figure 13-2 Waveform Trend Plot

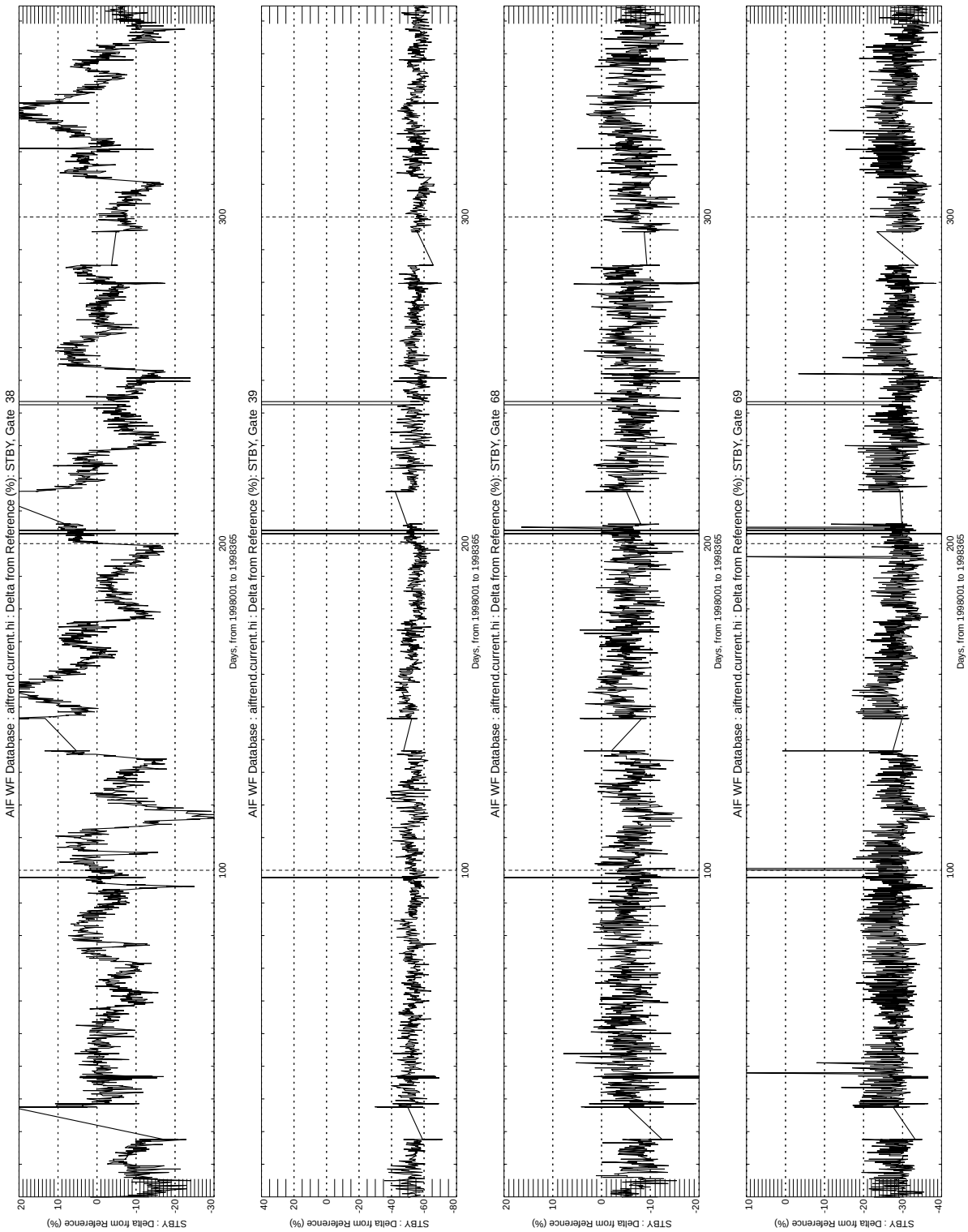


Figure 13-2 Waveform Trend Plot

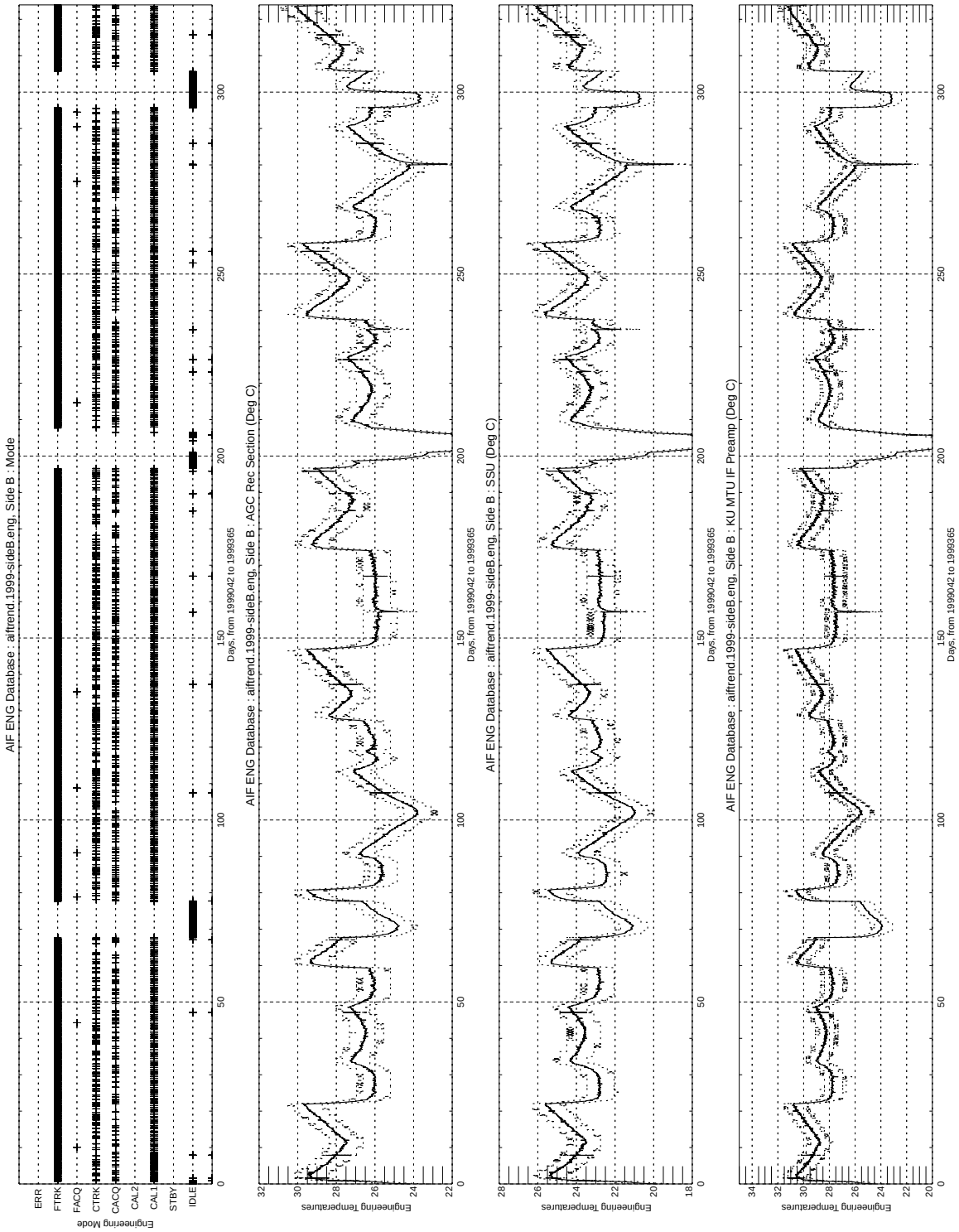


Figure 13-3 Eng Trend Plot

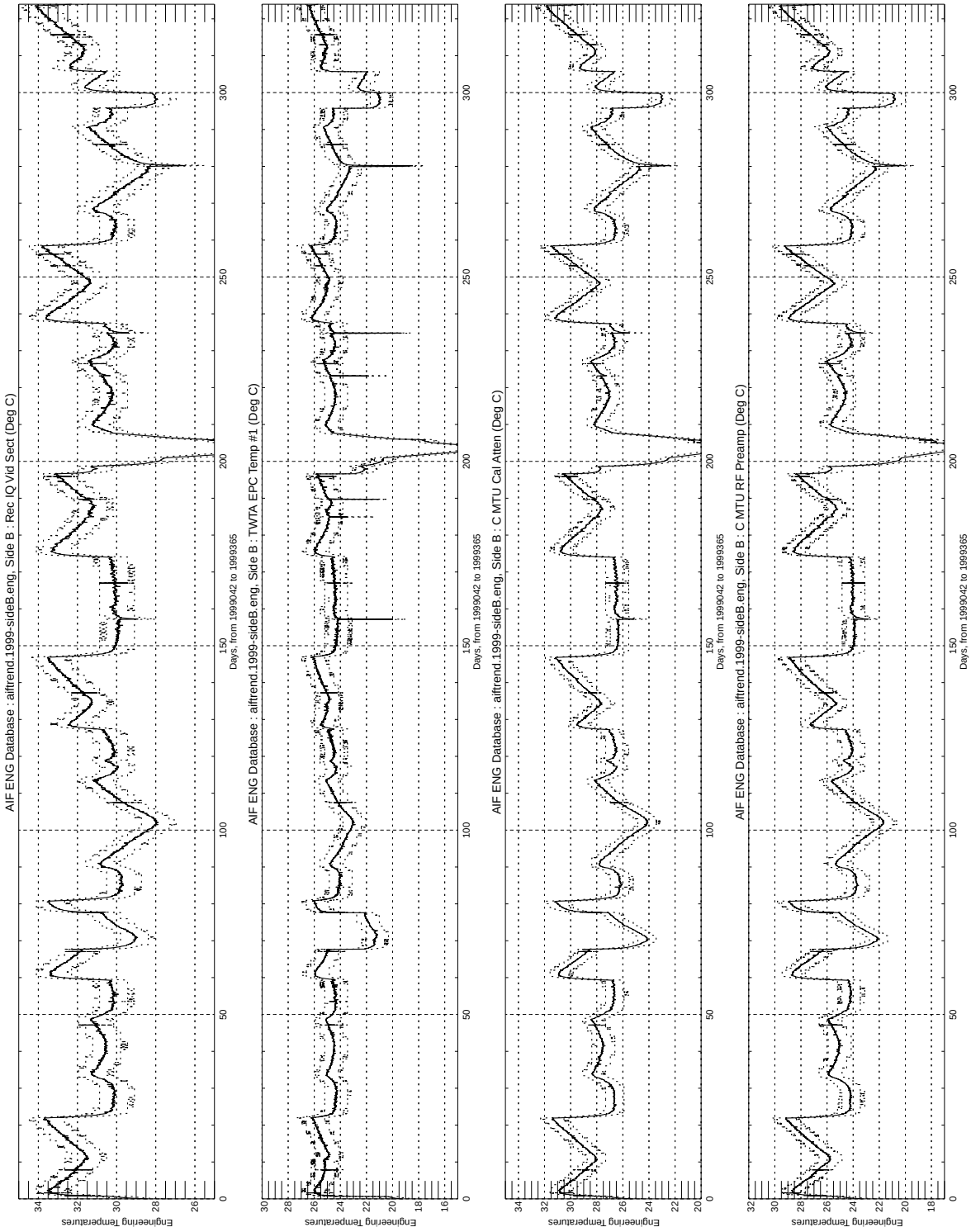


Figure 13-3 Eng Trend Plot

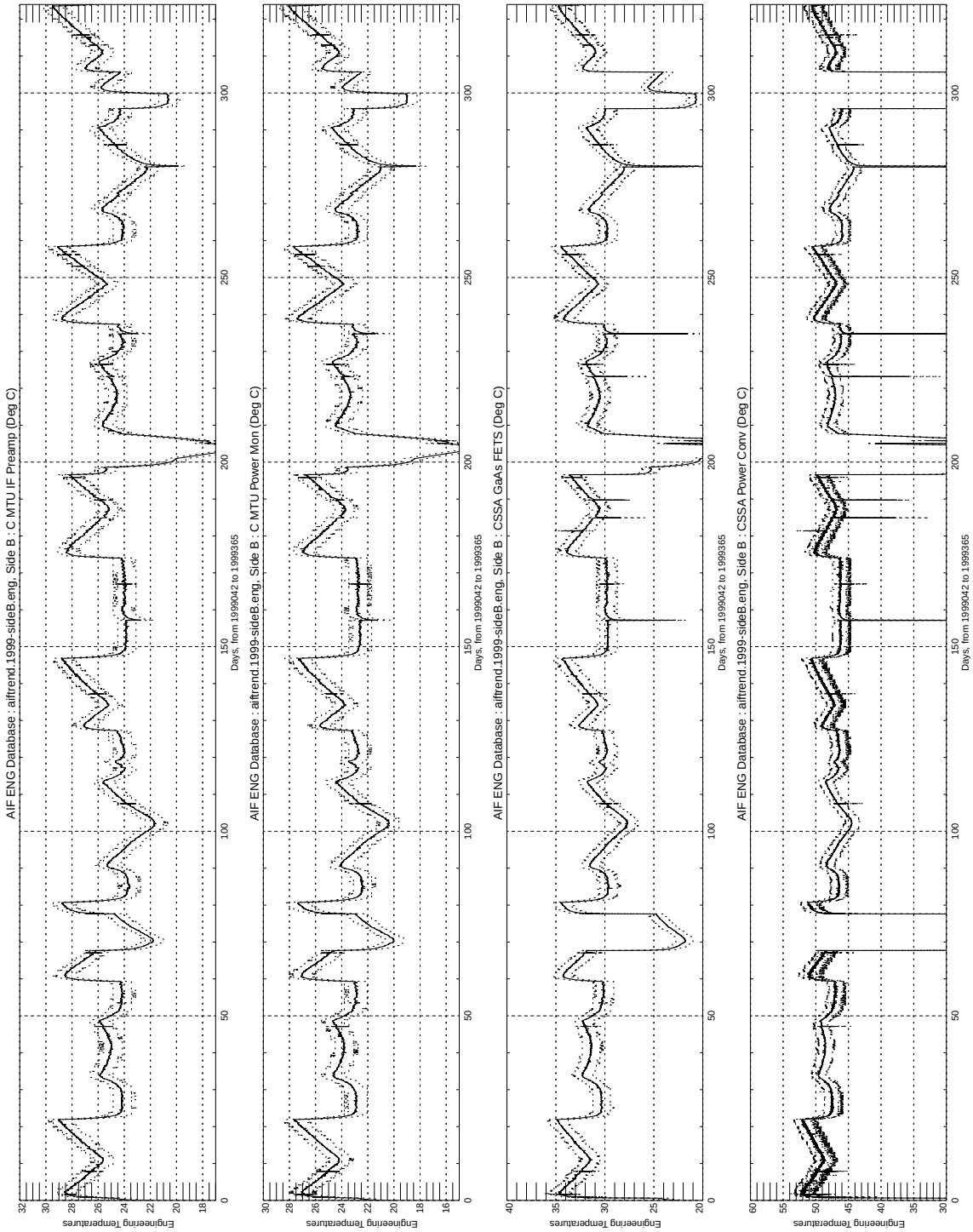


Figure 13-3 Eng Trend Plot

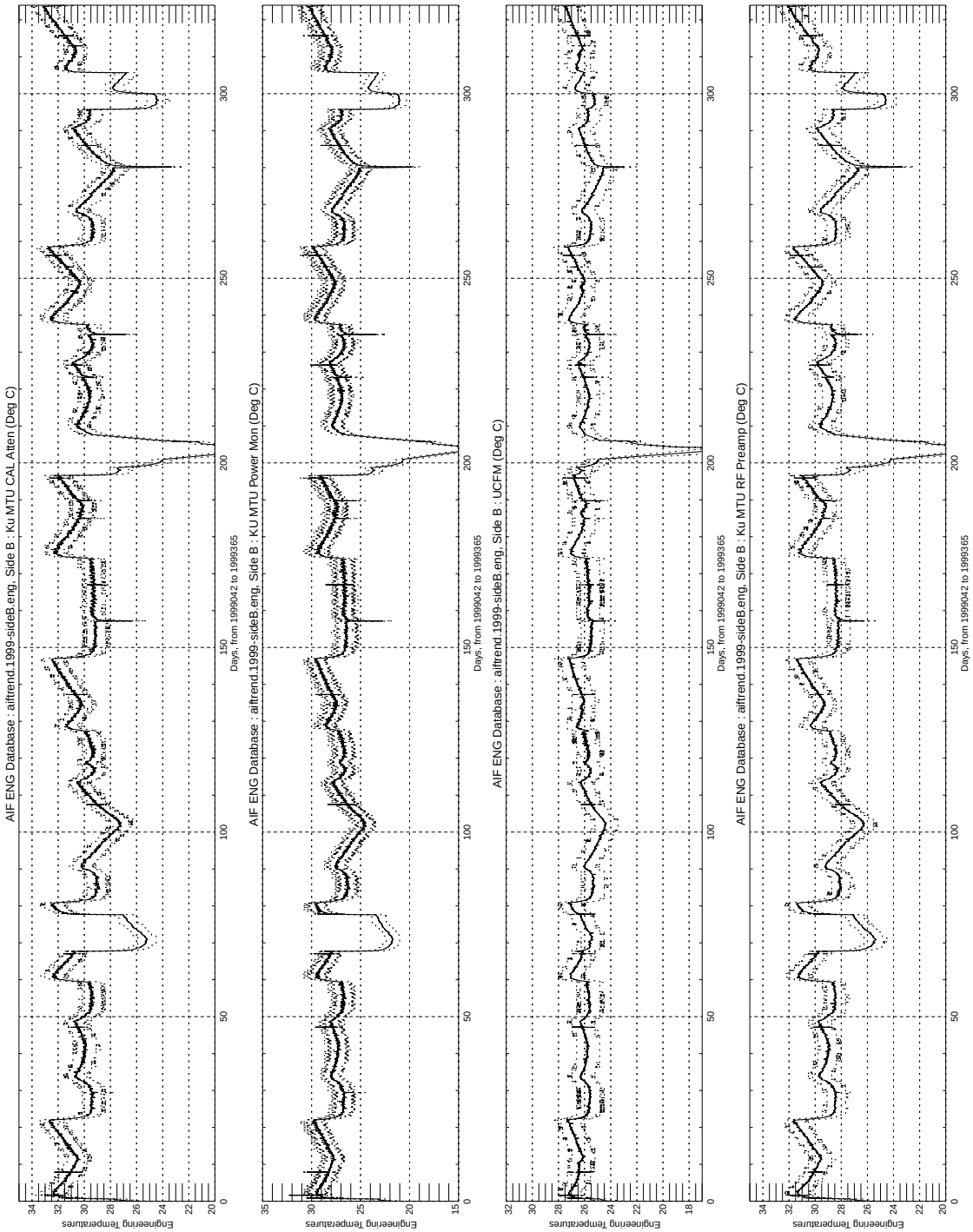
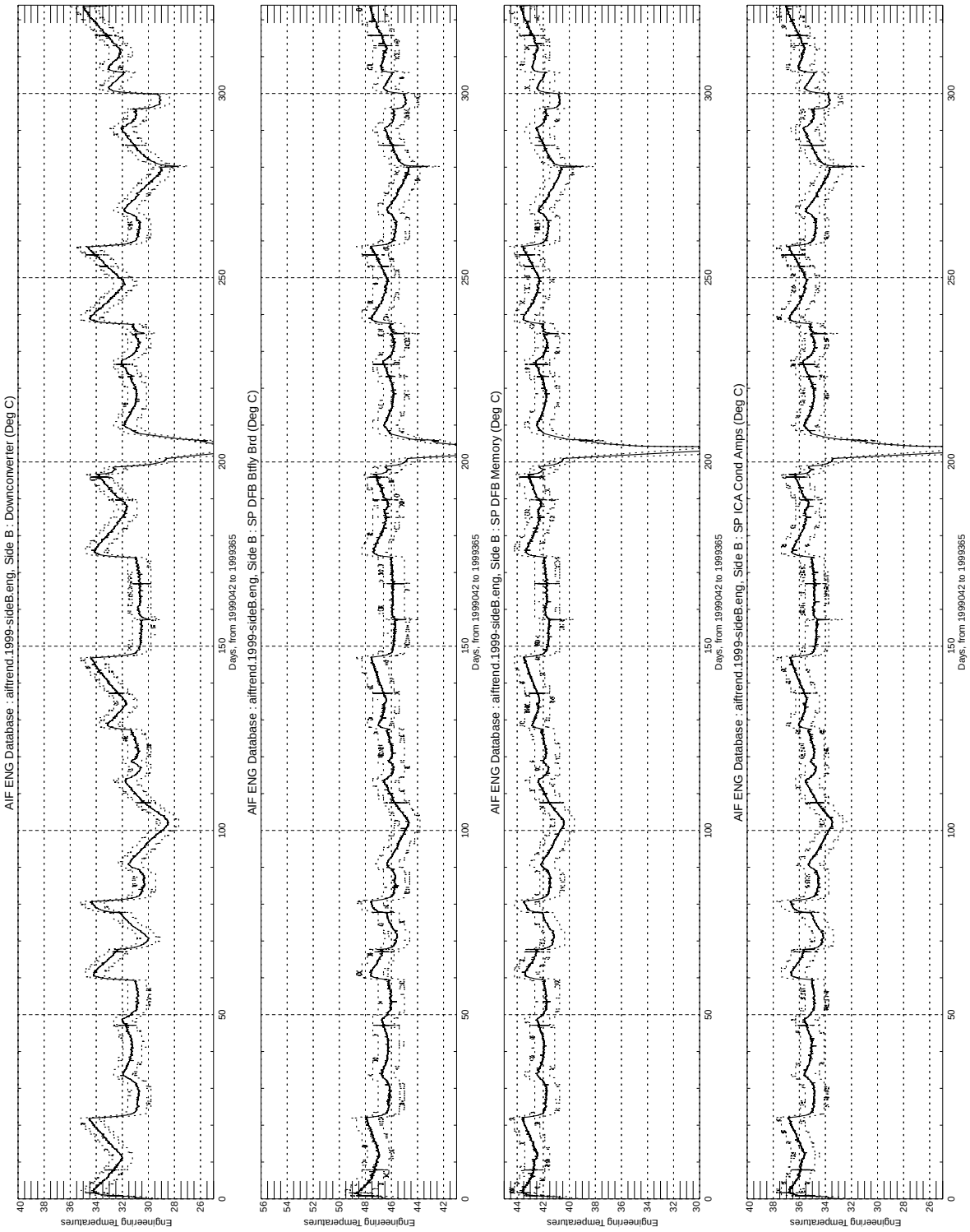


Figure 13-3 Eng Trend Plot



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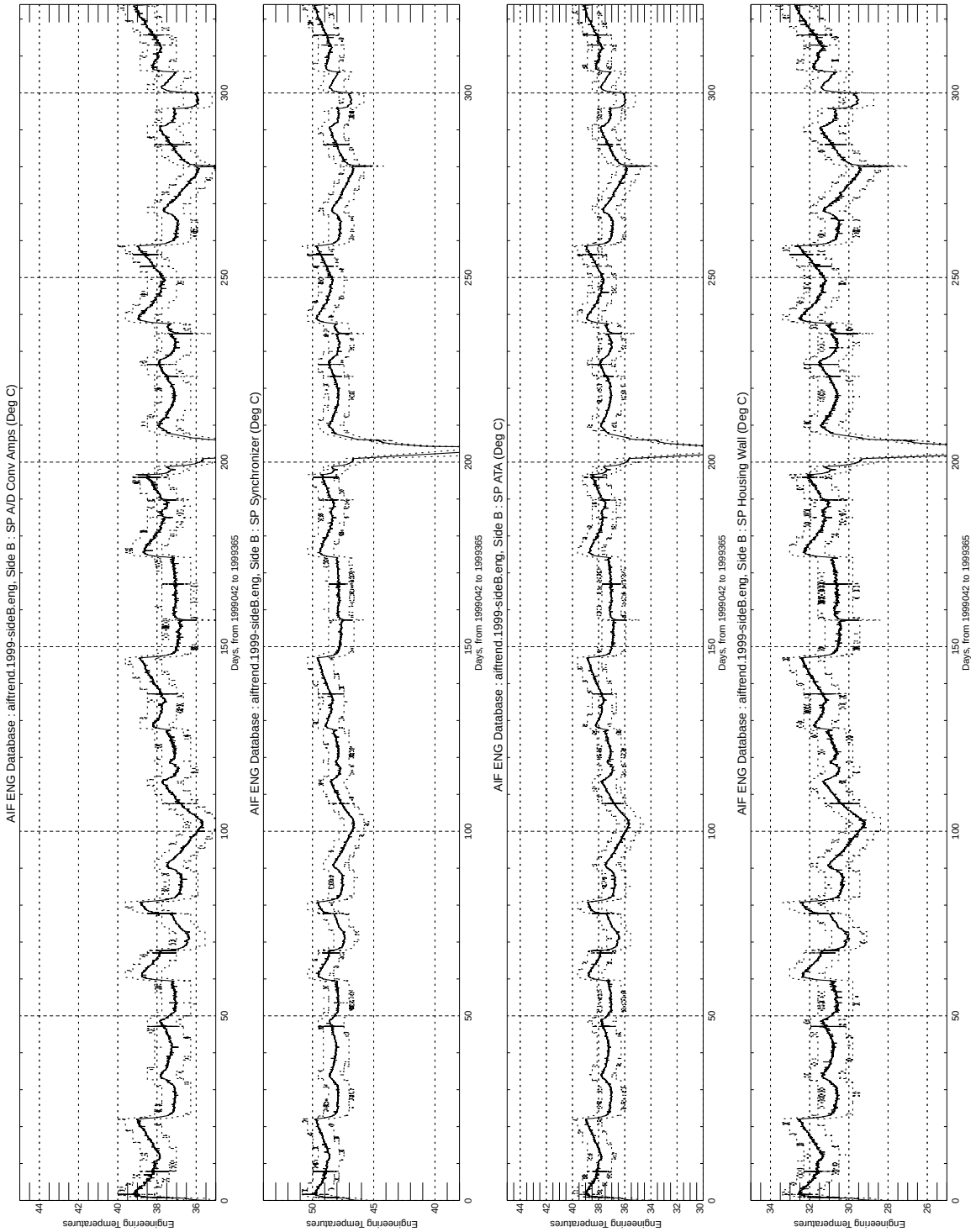

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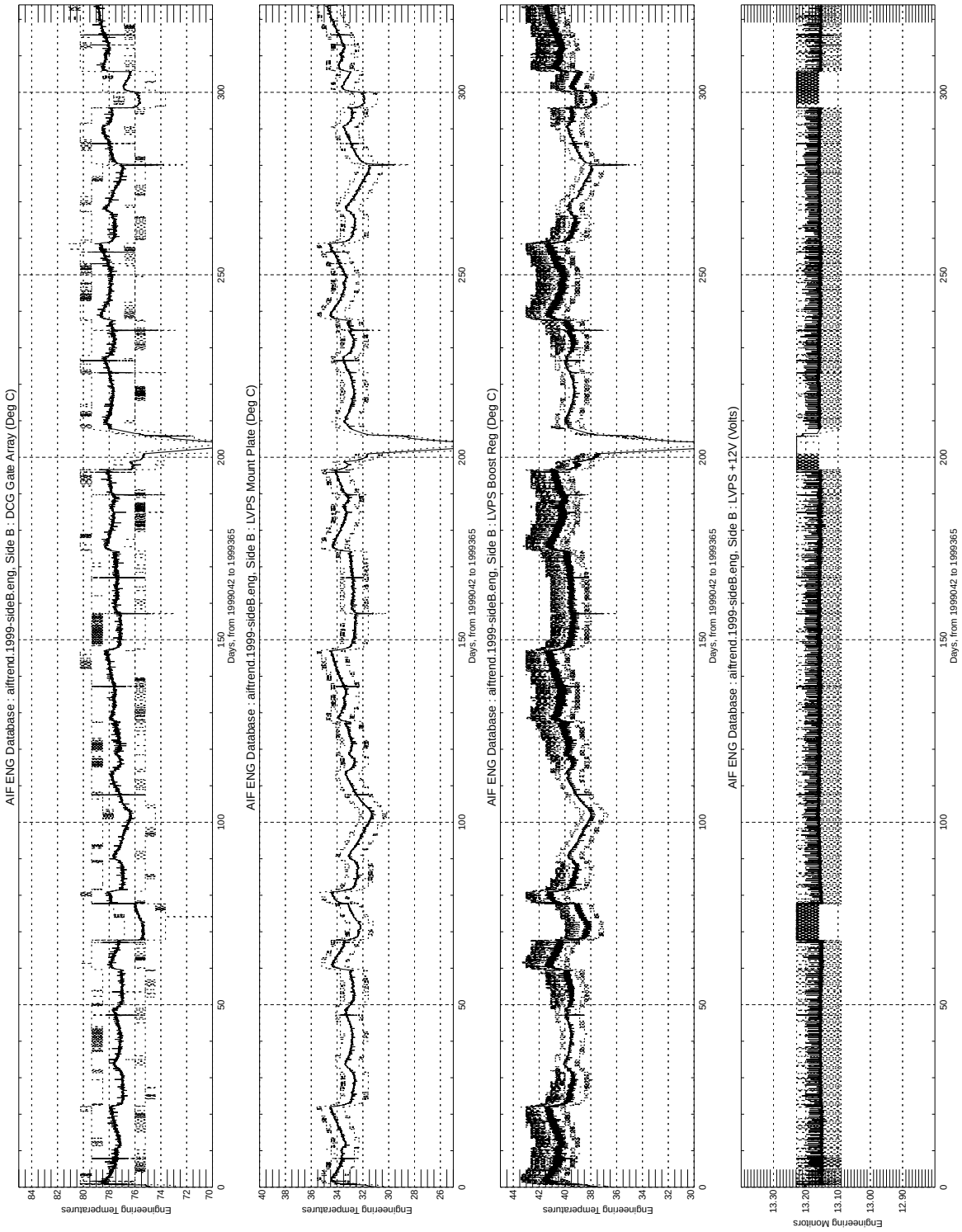

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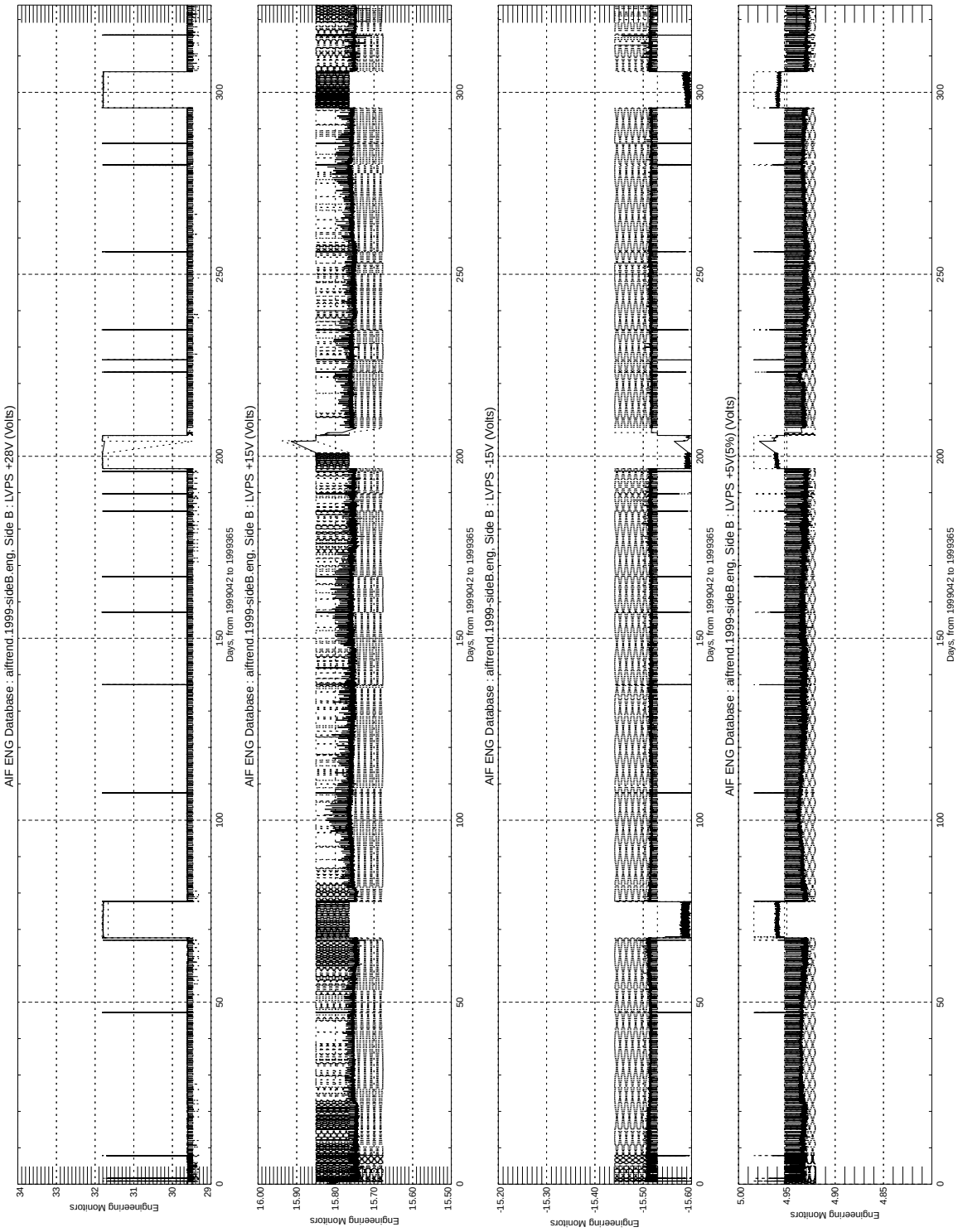

Figure 13-3 Eng Trend Plot

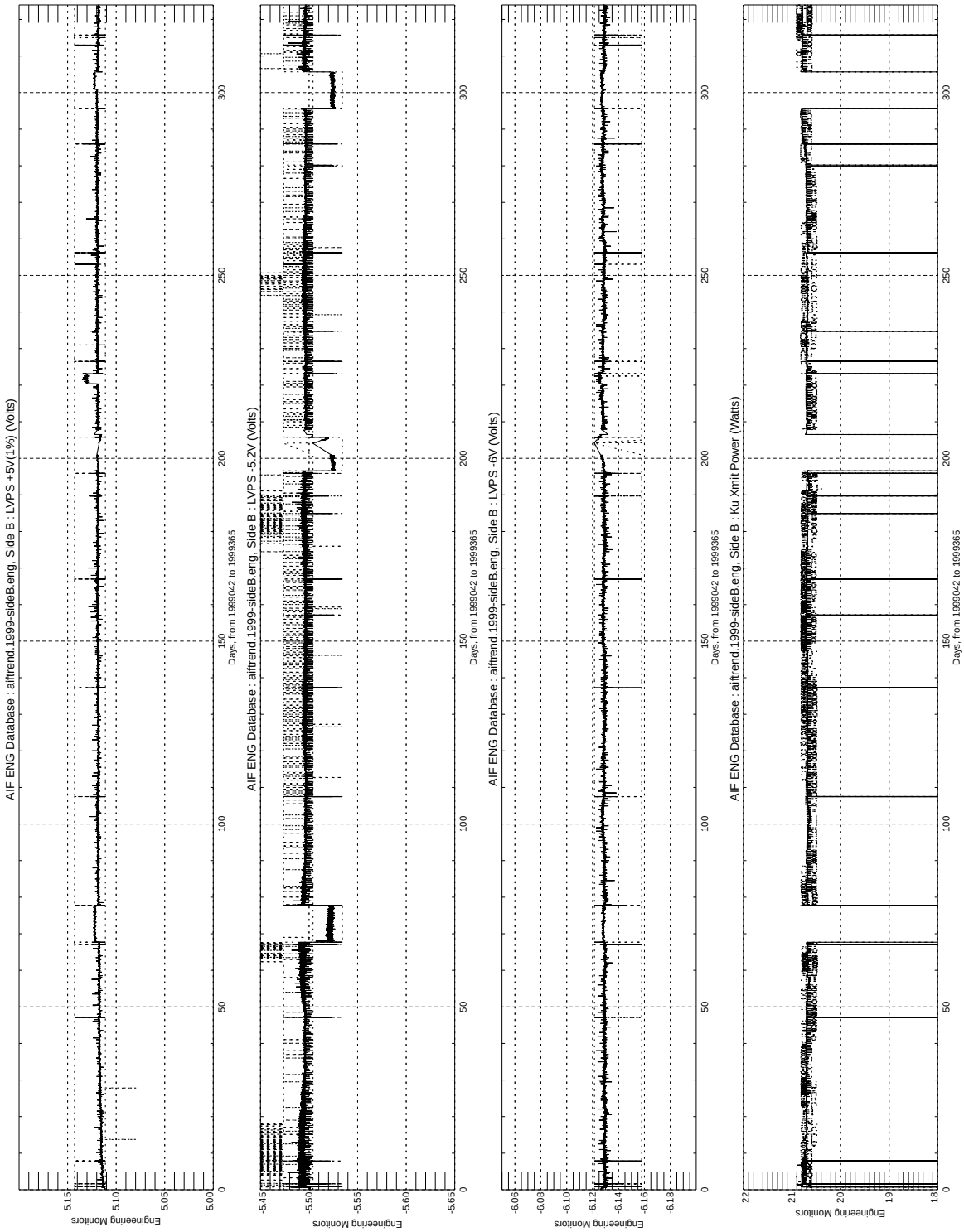

Figure 13-3 Eng Trend Plot

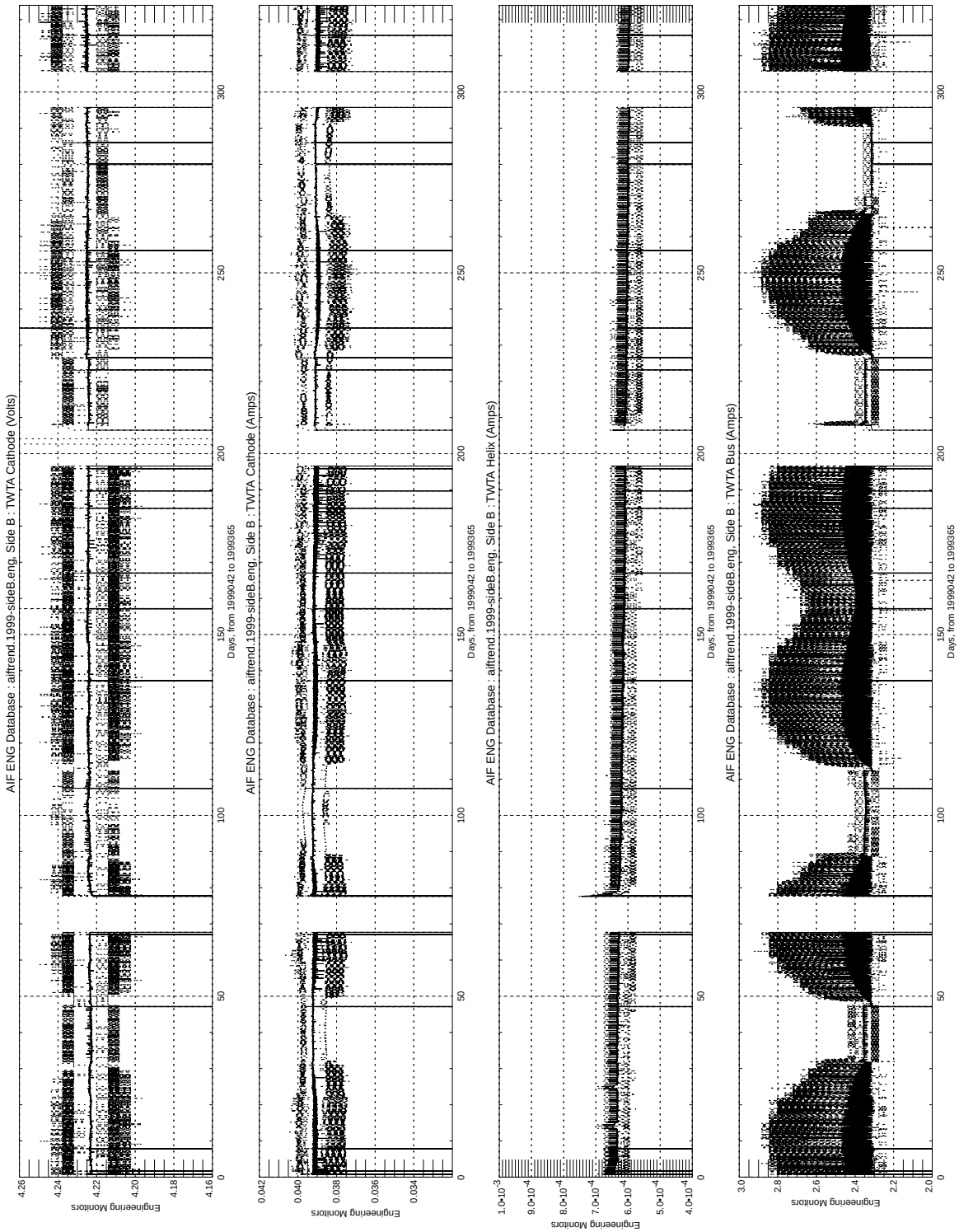

Figure 13-3 Eng Trend Plot

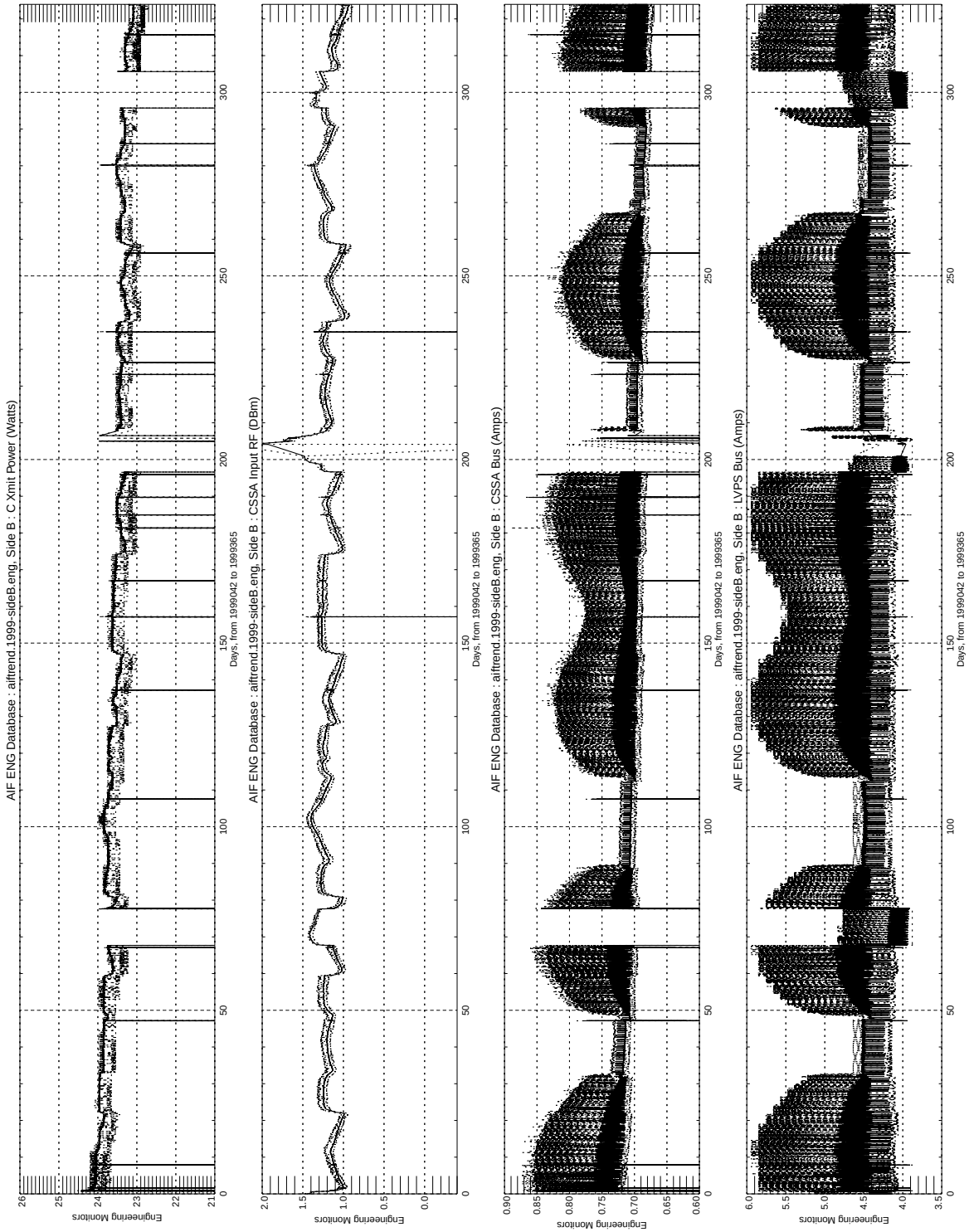

Figure 13-3 Eng Trend Plot

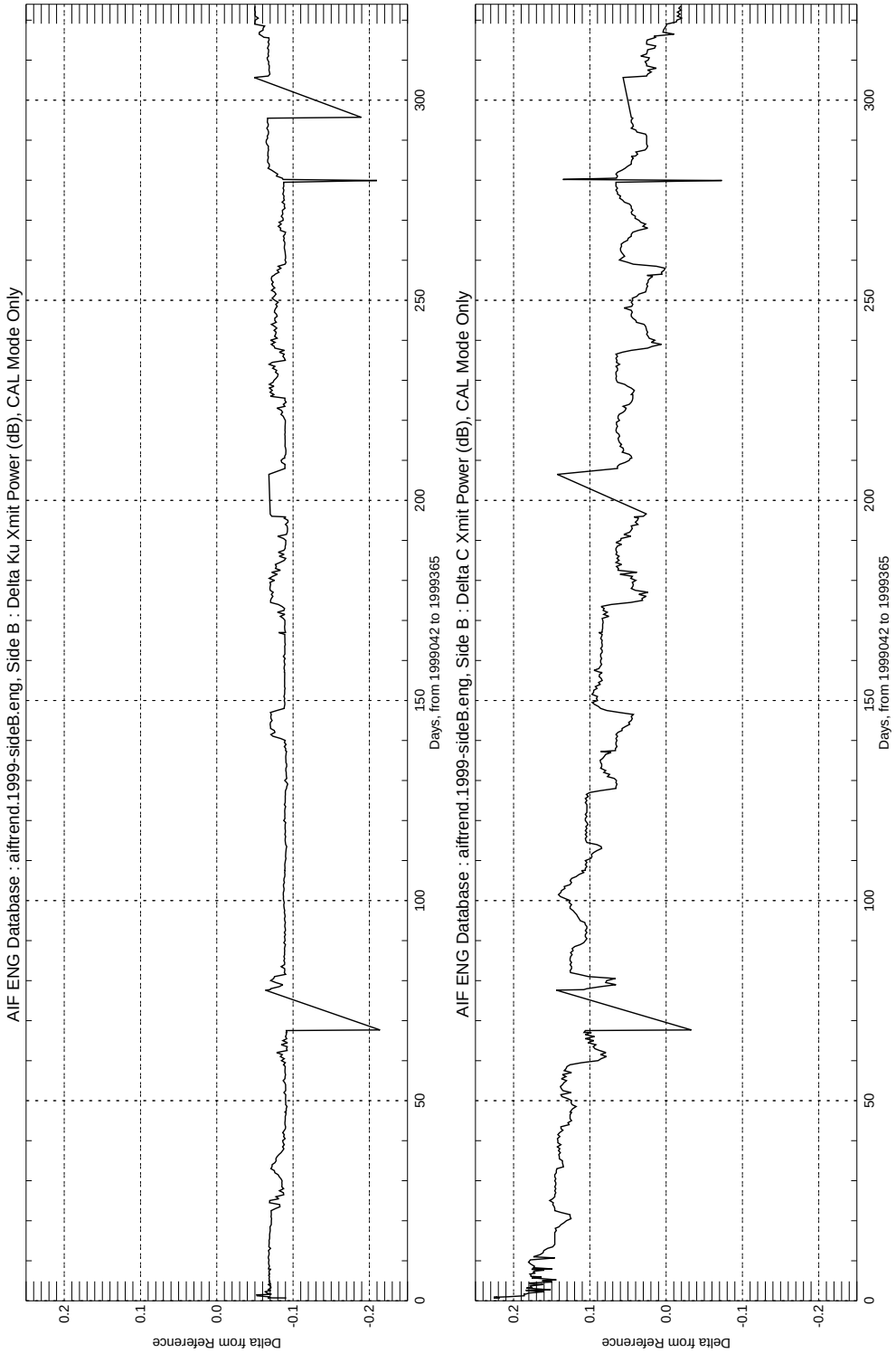

Figure 13-3 Eng Trend Plot

Section 14

Data Archiving

14.1 Definition

TOPEX data that is received at WFF is archived onto a 1/2” cartridge tape, DLT tape IV, for storage. This data consists of either Altimeter Instrument Files (AIF), Geophysical Data Record Files (GDR), or Sensor Data Record Files (SDR).

14.2 Notification for Storage

14.2.1 AIF Storage

Altimeter Instrument Files (AIF) are retrieved daily from the Topex-Server at the Jet Propulsion Laboratory (JPL). Normally, a week of AIFs is kept in the aif data directory (/gen/topex/data/aif) and, at the end of the week, are archived for storage.

14.2.2 GDR Storage

Interim Geophysical Data Record (IGDR) pass files are retrieved daily from the topex-server at JPL. The GDR cycles are received on an Exabyte tape which is stored. Normally, a cycle of IGDRs is kept in the igdr data directory (gen/topex/data/igdr). When a complete cycle of IGDRs (254 pass files) is received, the cycle is archived for storage.

14.2.3 SDR Storage

Sensor Data Record (SDR) pass files can be retrieved from the Topex-Server at JPL. Normally, SDR passes are retrieved only upon special request. SDR cycles are received on an Exabyte tape which is stored.

14.3 Processing

Processes are as follows:

- To space forward to the next file for storage,
  mt -f /dev/rmt/2ubn fsf # (number of files to forward)
- To check to insure one is at the correct file number,
  mt -f /dev/rmt/2ubn status
- To archive a file,
  tar -cvf /dev/rmt/2ubn filename (name of file to archive)

14.4 Record Keeping

The TOPEX record book has a log of each day’s AIF data, with the tape number and with the file number denoting where the data is archived. Also the cycle of each GDR

is logged with its tape number and file number, along with the Exabyte tape numbers.

Section 15

Access to JPL

15.1 Definition

Access to TOPEX data at JPL is described in Attachment A.

15.2 Notification

TOPEX data are retrieved daily from JPL, for normal processing and upon special requests.

15.3 Processing

Script files for accessing the data from JPL are described in Attachment A.

Attachment A: Memo October 4, 1999

TOPEX Software Development Team
Observational Science Branch
Laboratory for Hydrospheric Processes
NASA GSFC/WFF
Wallops Island, VA 23337

Memorandum

To: WFF TOPEX Team
From: Raytheon/Dennis Lockwood
Date: 4 October 1999
Subject: Access JPL on TOPEX-Server or TOPEX Ground System

In April 1999 access to JPL was changed from the TOPEX Ground System (TGS) to the TOPEX-Server (TS). Any access for data was to be done through the TS only, but we are still having to access TGS for any data that is necessary for immediate processing. Since two different methods are needed because of the two types of system access, script files have been set up for both the TGS and TS.

The following are TOPEX script files for access to JPL through the TOPEX File Server.

autoaif – Automatic retrieval of the Altimeter Instrument Files, Standard Processing of the files, and copy files to database storage.

autogdr – Automatic retrieval of the Interim Geophysical Data Files, Standard Processing of the files, Process pass plots, and copy files to database storage.

autoorf – Automatic retrieval of the Orbital Files.

autospat – Automatic retrieval of 'spa' Satellite Information Files from the 'topex/spat/state' directory.

dirjplaif – An ftp command 'dir' for file size of the TCC_ALT Files.

ftpjplbin – FTP command to 'get' binary files.

ftpjpltxt – FTP command to 'get' text files.

lsjplaif – Directory 'topex/wff/wff_data' listing of tcc_alt files.

lsjplall – Directory 'topex/wff/wff_data' listing of all files.

lsjplgdr – Directory 'topex/wff/wff_data' listing of gdr files.

lsjpligdr – Directory 'topex/sds/igdrdata' listing of igdr files.

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Attachment A: Memo October 4, 1999 (cont.)

lsjplnav – Directory ‘topex/nav/orf’ listing of orf files.

lsjplnew – Directory ‘topex/wff/wff_data’ listing of new???.out files.

lsjplsdr – Directory ‘topex/wff/wff_data’ listing of sdr files.

lsjplspat – Directory ‘topex/spat/state’ listing of spa files.

stdaif – Automatic retrieval of the Altimeter Instrument Files and standard processing of the files only.

The following are TOPEX script files for access to JPL through the TOPEX Ground System (TGS).

TGSautoaif – Automatic retrieval of the Altimeter Instrument Files, Standard Processing of the files, and copy files to database storage.

TGSautogdr – Automatic retrieval of the Interim Geophysical Data Files, Standard Processing of the files, Process pass plots, and copy files to database storage.

TGSautoorf – Automatic retrieval of the Orbital Files.

TGSftpjplbin – FTP command to ‘get’ binary files.

Example: TGSftpjplbin ‘sdtops1:[ops.sds.sds_igdrdata]sdp_igdr_CCC_PPP.dat’ (this will retrieve an igdr file).

TGSftpjpltxt – FTP command to ‘get’ text files.

TGSlsjplaif – Directory ‘wffdev:[wffuser.wff_data]’ listing of tcc_alt files.

Example: TGSlsjplaif (this will list the tcc_alt files at JPL on the TGS).

TGSstdaif – Automatic retrieval of the Altimeter Instrument Files and standard processing of the files only.

Example: TGSstdaif YYYYDDDtHHMMSS (this will retrieve the files that were found by doing TGSlsjplaif).

When it is necessary to obtain data from JPL in a Quick-turn-around situation, it will be necessary to access the TOPEX Ground System (TGS). This is normally for the Altimeter Science and Engineering data. The way to do this is: first do a TGSlsjplaif, which will list the tcc_alt files at JPL so that one can request the correct file name; second is to do a TGSstdaif file-name (file-name is the date and time of file, e.g., 1999276t155100).

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Abbreviations & Acronyms

AIF	Altimeter Instrument File
ADP	Algorithm Development Plan
ADT	Algorithm Development Team
AGC	Automatic Gain Control
APL	Applied Physics Laboratory
CAL	Calibration Mode or Calibration Mode data
CSC	Computer Sciences Corporation
CNES	Centre National d'Etudes Spatiales
COTS	Commercial Off-The-Shelf
EM	Electromagnetic
ENG	Engineering Data
EU	Engineering Unit
FTP	File Transfer Protocol
GDR	Geophysical Data Record
GSFC	Goddard Space Flight Center
HDR	Header data
IGDR	Intermediate Geophysical Data Record
IDL	Interactive Data Language
JPL	Jet Propulsion Laboratory
NASA	National Aeronautics and Space Administration
NSI	NASA Science Internet
RASE	Radar Altimeter System Evaluator
SCI	Science Data
SDR	Sensor Data Record
SDS	Science Data System
SIS	Software Interface Specification
SDT	Science Definition Team
SEU	Single Event Upset
STR	Selected Telemetry Record

SWDT Software Development Team

SWH Significant Wave Height

TGS TOPEX Ground System

TMR TOPEX Microwave Radiometer

TOPEX Ocean Topography Experiment

UTC Universal Time Coordinated

WFF Wallops Flight Facility