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Mauna Loa Solar Observatory Observer's Log  
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Wed Apr 9 16:38:43 GMT 2003

Year: 03 Doy: 099

Observer: yasukawa

WEATHER COMMENT: Wed Apr 9 16:38:41 GMT 2003

In thick cirrostratus and altostratus overcast, no shadows, light south breeze, cool.

A NEW TAPE HAS BEEN PUT INTO KAIEE DLT DRIVE, Wed Apr 9 16:58:54 GMT 2003

COMMENT: Wed Apr 9 17:09:44 GMT 2003

Stopped hoike to install new memory.

COMMENT: Wed Apr 9 17:23:24 GMT 2003

512Mb of memory installed into hoike. Boot dialog indicating 1024 MB detected.

COMMENT: Wed Apr 9 17:25:22 GMT 2003

Restarted hoike program, running "d4" instead of "display\_four -num\_imgs 80" which will display all images now that we have enhanced hoikke's memory capacity.

\*\*MKIV PROBLEM\*\* : Wed Apr 9 18:22:51 GMT 2003

OK, finished a bunch of housekeeping and administrative tasks. I will startup mk4 in thick clouds (dome closed, actually) to check for barrel problem recurrence.

Wed Apr 9 18:24:14 GMT 2003 MKIV Start Patrol

\*\*MKIV PROBLEM\*\* : Wed Apr 9 18:26:41 GMT 2003

Barrel appears to be running slow, barrel angle display on OCP incrementing very jerkily. KCC monitor steady at CCW-240.

Barrel got to around 220 degrees or so (was typing log entry and did not see where barrel stopped), akamai beeped, and following message appeared:

```
t_scan 1 records, last barrel 60066
```

```
done
```

```
t_drive barrel glitch
```

After that barrel ran CW and ran back to start point. It is now stalled at 181.7-182.0. After a while, got a beep, then a message that scrolled up before I could read it, akamai wrote a bunch of lines of "CW Limit".

Barrel then ran CW with no image data being written. Barrel is running slowly, CW.

\*\*MKIV PROBLEM\*\* : Wed Apr 9 18:36:54 GMT 2003

Barrel stepper motor is running in a very jerky manner, feels like a vibration. Appearances look smoothe, not doing the back and forth that I saw several days ago.

Modulator signals look OK.

Wed Apr 9 18:53:36 GMT 2003 MKIV Start Patrol

\*\*MKIV PROBLEM\*\* : Wed Apr 9 19:00:55 GMT 2003

Barrel pulses at J25-2, J25-3,(CW) and J25-5 & J25-6 (CCW) look uniform and strong.

Turning spar power off upstairs and then turning it back on.

\*\*MKIV PROBLEM\*\* : Wed Apr 9 19:07:36 GMT 2003

After cycling spar power upstairs, I restarted scan from KCC VCP by moving CW from 30 to Stop, then clicking CW 240. Barrel started running normally.

\*\*MKIV PROBLEM\*\* : Wed Apr 9 19:09:42 GMT 2003

Scan ran CW to limit, ran back to turnaround point, then ran CCW all the way to CCW turnaround, message at end of scan ) records, last barrel 7615.

BTW, I did not reset or cycle power to KCC when I cycled spar power.

Scan turned around and is now scanning CW.

Wed Apr 9 19:13:40 GMT 2003 MKIV End Patrol

\*\*MKIV PROBLEM\*\* : Wed Apr 9 19:13:47 GMT 2003

I had at one point selected Idle before messing with KCC buttons.

Scan stopped after CW scan, stopped at 198.58 instead of 175 degrees as normal. Message reads: t\_scan 0 records, last barrel 58199

Wed Apr 9 19:15:44 GMT 2003 MKIV Start Patrol

\*\*MKIV PROBLEM\*\* : Wed Apr 9 19:15:52 GMT 2003

Restarting Patrol.

\*\*MKIV PROBLEM\*\* : Wed Apr 9 19:31:18 GMT 2003

Scans are running to close to nominal end-of-scan point and then stopping, messages are printed out, beeps, and then continues to normal end-of-scan point with no data written to display, then turns around and begins scan in the opposite direction.

stop points and messages:

CCW: 174.97, 0 records, 7952

CW: 191.59, 0 records, 57888

CCW: 177.17, 0 records, 8052

CW: 191.40, 0 records, 57871

Nominal end of scan points are CCW=185, CW=175,

\*\*MKIV PROBLEM\*\* : Wed Apr 9 19:37:58 GMT 2003

Reset akamai (reset button), Restart Patrol.

Wed Apr 9 19:47:12 GMT 2003 MKIV Start Patrol

\*\*MKIV PROBLEM\*\* : Wed Apr 9 20:02:18 GMT 2003

Barrel still ran to some point before nominal stop point, stopped, messages printed out at the beep, after a brief wait, barrel continued to nominal stop point, turned around, then started next scan.

Here are the direction, stop, # of records, last barrel, and turnaround point:

CCW 182.00 1 8274 didn't go noticeably in CCW direction before turning

CW 187.97 0 57711 175.9

CCW 179.10 0 8142 184.0

CW 188.38 0 57734 175.9

Cycling akamai power (bottom power switch).

Wed Apr 9 20:13:12 GMT 2003 MKIV Start Patrol

\*\*MKIV PROBLEM\*\*:  
Wed Apr 9 20:29:19 GMT 2003

This time barrel behavior was a little different. On CCW scans, barrel ran to nominal end of scan point and turned around. On CW scans barrel ran to a point short of end of scan, beeped, printed out message, ran the rest of the way to end of scan, and then turned around. Here are the stop point, messages, turnaround point:

CCW	184.40	1198 records	8381	turnaround
CW	187.99	0 records	57713	175.9 turnaround
CCW	183.25	0 records	8329	turnaround
CW	188.38	0 records	57734	175.9 turnaround

I also checked on stepper motor and felt the jerky vibrations but they were more intermittent than the constant vibration I felt earlier.

Cycled power to KCC main power (upper switch).

Wed Apr 9 20:36:44 GMT 2003 MKIV Start Patrol

\*\*MKIV PROBLEM\*\*:  
Wed Apr 9 20:48:45 GMT 2003

Barrel is behaving now after the power cycle.

CCW scans are stopping at 184.5 and turning around and CW scans are stopping at 175.7 and turning around. Messages:

CCW:	982 records	8390
CW:	983 records	57160
CCW:	983 records	8391
CW:	983 records	57161

Barrel stepper was running very smoothly this time.

Wed Apr 9 21:18:16 GMT 2003 MKIV End Patrol

\*\*MKIV PROBLEM\*\*:  
Wed Apr 9 21:14:30 GMT 2003

Barrel is behaving.

There may be two problems -- the stepper motor drive system and one of the cards in akamai.

The stepper motor vibrations are suspicious. It occurs both CW and CCW directions so it is something common to both directions. Suspect are the 5V stepper motor logic power supply on the spar, one or both 24V motor driver power supplies that are tied together on the spar, the STM101 stepper motor driver card (although the card has been swapped recently in previous tests), the 75115 line receiver IC (chip A) on the tranceiver card, or the stepper motor.

The repeatability or near repeatability of where the stalls occur points to one of the VME cards. Behavior also appeared to vary between a reboot or a power cycle to entire VME card-cage.

Loss of records and funny stopping points could be due to chattering barrel causing confusing barrel angle data to programs in the KCC.

\*\*MKIV PROBLEM\*\*:  
Wed Apr 9 21:37:25 GMT 2003

Replaced the line receiver (A) on the tranceiver card (A1XA8) inside the

stepper motor driver box on the spar. This chip receives both the CW and CCW differential pulses (which look OK leaving the transformation board) and provide directional and speed data to the STM101 driver card.

Wed Apr 9 21:40:58 GMT 2003 MKIV Start Patrol

**\*\*MKIV PROBLEM\*\***: Wed Apr 9 21:42:27 GMT 2003

Barrel stepper motor is running very smoothly, no sign of vibration or chatter.

WEATHER COMMENT: Wed Apr 9 21:43:12 GMT 2003

Now in three layers of thick clouds. Orographic clouds / fog rolled in.

**\*\*MKIV PROBLEM\*\***: Wed Apr 9 22:02:30 GMT 2003

Barrel is behaving. Messages this series follows:

t\_scan 983 records, last barrel 8384  
done

t\_scan 983 records, last barrel 57152  
done

t\_scan 983 records, last barrel 8387  
done

t\_scan 983 records, last barrel 57153  
done

t\_scan 983 records, last barrel 8386  
done

t\_scan 983 records, last barrel 57154  
done

t\_scan 983 records, last barrel 8387  
done

Wed Apr 9 22:10:46 GMT 2003 MKIV End Patrol

Wed Apr 9 23:54:32 GMT 2003 MKIV Start Patrol

**\*\*MKIV PROBLEM\*\***: Thu Apr 10 00:03:26 GMT 2003

set up test leads to +24V/GND and +5V/GND from stepper motor driver box so that we can check on power supplies at next opportunity of flaky barrel rotation.

**\*\*MKIV PROBLEM\*\***: Thu Apr 10 00:28:53 GMT 2003

24V probe slipped off. 5V looked OK during last scans in which barrel misbehaved. I could feel constant vibration in stepper motor, akamai messages were the funnies. Needed to stop to reattach the 24V probes so I tried swappint one of the O1 guider steppers (A2) with the current barrel stepper (formerly F.O. rotation A3) in A1. Had to reset akamai (reset button) to resume and restart. Barrel stepper felt smooth as it rotated to start point.

Thu Apr 10 00:33:27 GMT 2003 MKIV Start Patrol

**\*\*MKIV PROBLEM\*\***: Thu Apr 10 00:36:40 GMT 2003

Barrel is behaving with the O1 stepper motor driver card swapped in.

Barrel STM101 has been swapped with the First Objective Rotator STM101 in the past so I am uncertain whether the card we swapped last time was

the original FO card or a possibly flaky Barrel card. It is quite possible  
\*\*MKIV PROBLEM\*\*:  
Thu Apr 10 01:39:13 GMT 2003

After running for a bit, stepper started to vibrate with A2 STM101 in place. We have swapped cards before so I'm not really sure who was originally who and if any cards were flaky at one time or another. In any case, it didn't appear to make a difference which STM101 was in place. I did get to check the 24V on the card and it was a steady 22.30V the whole time no matter what the barrel was doing. Swapped cards A1 and A2 back.

One thing I noticed when the barrel was doing its "finish data scan at 41-degrees or 118-degrees, stop taking data, printing akamai message, and rotating to turnaround point" thing during the last tests I was doing... the vibration I might be feeling is the discrete steps that are occurring when the barrel is turning at a slower speed. I observed that whenever the barrel stepper was vibrating, it'd take 3-min. 30-sec. to get from the start to where it stops at 41-degrees and then another 1-minute to rotate, rather smoothly, the rest of the way to the turnaround point. i.e. the barrel is running significantly slower when it is not working properly. Barrel takes 3:30 to go 221 degrees when it is taking data and 1:00 to go 139 degrees when it is just going to the turnaround without "vibrating". I think it normally takes around 3-minutes per scan when it is working properly???

\*\*MKIV PROBLEM\*\*:  
Thu Apr 10 01:55:13 GMT 2003

Well, I'll need to think about what I observed today. The last common item that would give problems in CW and CCW direction that is controlled by the Spar Power, I believe, is the stepper motor. We may need to replace it as a test. Stopping tests for the day. Need to tidy things up and put away tools and test equipment.

WEATHER COMMENT:  
Thu Apr 10 01:58:15 GMT 2003

Remained in thick cirrostratus and altocumulus overcast all day and in heavy orographic fog all day. No solar observations today.

Thu Apr 10 02:00:58 GMT 2003

MkIV

00_01.rawmk4	18_24.rawmk4	19_33.rawmk4	20_48.rawmk4	21_49.rawmk4
00_05.rawmk4	18_27.rawmk4	19_47.rawmk4	20_51.rawmk4	21_52.rawmk4
00_11.rawmk4	18_31.rawmk4	19_50.rawmk4	20_54.rawmk4	21_55.rawmk4
00_16.rawmk4	18_41.rawmk4	19_54.rawmk4	20_57.rawmk4	21_58.rawmk4
00_33.rawmk4	18_53.rawmk4	19_58.rawmk4	21_00.rawmk4	22_01.rawmk4
00_36.rawmk4	18_57.rawmk4	20_13.rawmk4	21_03.rawmk4	22_04.rawmk4
00_39.rawmk4	19_01.rawmk4	20_16.rawmk4	21_06.rawmk4	22_07.rawmk4
00_42.rawmk4	19_09.rawmk4	20_20.rawmk4	21_09.rawmk4	23_54.rawmk4
00_58.rawmk4	19_15.rawmk4	20_24.rawmk4	21_12.rawmk4	23_57.rawmk4
01_03.rawmk4	19_19.rawmk4	20_36.rawmk4	21_15.rawmk4	
01_13.rawmk4	19_23.rawmk4	20_39.rawmk4	21_40.rawmk4	
01_17.rawmk4	19_26.rawmk4	20_42.rawmk4	21_43.rawmk4	
01_23.rawmk4	19_30.rawmk4	20_45.rawmk4	21_46.rawmk4	