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Mauna Loa Solar Observatory Observer's Log  
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Fri Apr 18 16:41:13 GMT 2003

Year: 03 Doy: 108

Observer: yasukawa

WEATHER COMMENT: Fri Apr 18 16:41:31 GMT 2003

Cool, in broken cirrus and altocumulus, south wind.

Fri Apr 18 16:48:50 GMT 2003 CHIP Start Patrol

Fri Apr 18 16:49:01 GMT 2003 PICS Start Patrol

A NEW TAPE HAS BEEN PUT INTO KAIEE DLT DRIVE, Fri Apr 18 16:51:04 GMT 2003

PSPT COMMENT: Fri Apr 18 17:20:52 GMT 2003

Starting daily observations.

\*\*MKIV PROBLEM\*\*: Fri Apr 18 17:25:06 GMT 2003

In cirrus overcast, checking barrel rotation function.

Fri Apr 18 17:26:21 GMT 2003 MKIV Start Patrol

\*\*MKIV PROBLEM\*\*: Fri Apr 18 17:27:18 GMT 2003

Barrel is completely stalled at 169 to 171. Barrel gui shows CCW 240, normal pulses are seen at transformation board.

\*\*MKIV PROBLEM\*\*: Fri Apr 18 17:39:12 GMT 2003

Barrel oscillated back and forth, waveforms at stepper motor driver card output looked OK. After a while, barrel gui changed to CCW 30 and barrel rotated very slowly. Message from beginning of the scans follows:

t\_scan 1 records, barrel 56869 previous barrel 56869  
done

t\_drive barrel glitch

t\_drive barrel glitch

t\_drive barrel glitch

t\_drive barrel glitch

t\_drive barrel glitch

t\_drive barrel glitch

t\_drive barrel glitch

t\_drive barrel glitch

t\_drive barrel glitch

t\_drive barrel glitch

t\_scan 0 records, barrel 7675 previous barrel 7675

done

CW limit

CW limit

... repeats CW Limit

Fri Apr 18 18:00:47 GMT 2003 CHIP LSD

\*\*MKIV PROBLEM\*\*: Fri Apr 18 18:01:33 GMT 2003

Cycled main power.

Reset guiding.

Fri Apr 18 18:02:32 GMT 2003 CHIP End LSD

Fri Apr 18 18:02:44 GMT 2003 CHIP BiasLSD

Fri Apr 18 18:03:45 GMT 2003 PICS Flat

Fri Apr 18 18:03:49 GMT 2003 CHIP End BiasLSD

Fri Apr 18 18:03:59 GMT 2003 CHIP Bias  
Fri Apr 18 18:04:59 GMT 2003 MKIV Start Patrol  
Fri Apr 18 18:04:54 GMT 2003 CHIP End Bias  
Fri Apr 18 18:06:14 GMT 2003 PICS End Flat  
Fri Apr 18 18:17:17 GMT 2003 MKIV End Patrol

**\*\*MKIV PROBLEM\*\***: Fri Apr 18 18:17:12 GMT 2003

I believe that the output of the STM101 was good when the barrel was misbehaving (first look before the barrel went to 30 speed and I diddled with the scope setup) so I will turn my attention to determining what it will take to replace the stepper motor.

Fri Apr 18 19:40:21 GMT 2003 CHIP End Patrol

COMMENT: Fri Apr 18 19:40:35 GMT 2003

Stopping to reconfigure dome shutter.

Fri Apr 18 19:43:43 GMT 2003 PICS End Patrol

Fri Apr 18 19:49:45 GMT 2003 CHIP Start Patrol

Fri Apr 18 19:49:49 GMT 2003 PICS Start Patrol

WEATHER COMMENT: Fri Apr 18 20:06:37 GMT 2003

In orographic clouds.

Fri Apr 18 20:06:49 GMT 2003 CHIP End Patrol

Fri Apr 18 20:07:03 GMT 2003 PICS End Patrol

COMMENT: Fri Apr 18 20:07:34 GMT 2003

Stopping observations and closing domes while I work on barrel stepper motor swap so that I don't get caught in precipitation.

**\*\*MKIV PROBLEM\*\***: Fri Apr 18 20:38:19 GMT 2003

Barrel stepper motor swapped with a new one. Helical gear on the end of the shaft is somewhat worn and misshapen, smaller diameter where engagement occurs, but the teeth still have good height.

**\*\*\*** this note added later: No mis-shapen gear, gear is also drawn with the same profile in the mechanical drawing. The drawing is a bit more exaggerated than the actual helical gear. **\*\*\***

Replaced solid pin retaining

the gear with a roll pin, the solid pin did not fit all the way thru the new hole drilled thru the shaft due to some distortion from punching it out of the old motor.

Testing function.

Fri Apr 18 20:43:48 GMT 2003 MKIV Start Patrol

**\*\*MKIV PROBLEM\*\***: Fri Apr 18 20:50:54 GMT 2003

Well, barrel is running OK and I do not feel any vibration or stuttering at the motor and damper. STM101 waveforms look just fine.

I will try several power cycling exercises to determine if I can get the barrel to misbehave just in case replacing the stepper motor did not really fix things.

Fri Apr 18 20:55:54 GMT 2003 MKIV End Patrol

Fri Apr 18 21:00:54 GMT 2003 MKIV Start Patrol

**\*\*MKIV PROBLEM\*\***: Fri Apr 18 21:11:26 GMT 2003

On this series of rotations, I can feel the damper stuttering off and on,

like an occasional "click" maybe several seconds apart, When this happens, the amplitude of the waveforms (all 4 of them) changes from what I was seeing before to around 60%- 75% and then back at the next "click". Other than that, the barrel itself feels like it is running smooth, I cannot feel the stutter at the motor body itself--just at the damper. Akamai messages do not look wierd. Messages follow:

```
t_scan 993 records, barrel 8375 previous barrel 8358
done
t_scan 994 records, barrel 57161 previous barrel 57177
done
t_scan 993 records, barrel 8390 previous barrel 8372
done
t_scan 993 records, barrel 57161 previous barrel 57178
done
t_scan 994 records, barrel 8389 previous barrel 8372
done
```

**\*\*MKIV PROBLEM\*\***: Fri Apr 18 21:17:46 GMT 2003

Stopping scans and cycling power again.

```
Fri Apr 18 21:19:11 GMT 2003    MKIV    End Patrol
Fri Apr 18 21:27:07 GMT 2003    MKIV    Start Patrol
Fri Apr 18 21:40:12 GMT 2003    MKIV    End Patrol
```

**\*\*MKIV PROBLEM\*\***: Fri Apr 18 21:34:19 GMT 2003

This time I can see what looks like intermittent frequency drifts along with the changes in amplitude. I may be getting fooled by the sync process but I am also seeing a different records number on the messages.

```
t_drive barrel glitch
t_scan 1063 records, barrel 8376 previous barrel 8361
done
t_scan 1056 records, barrel 57152 previous barrel 57169
done
t_scan 1051 records, barrel 8375 previous barrel 8359
done
t_scan 1053 records, barrel 57145 previous barrel 57162
done
```

```
Fri Apr 18 21:54:00 GMT 2003    MKIV    Start Patrol
Fri Apr 18 22:06:11 GMT 2003    MKIV    End Patrol
```

**\*\*MKIV PROBLEM\*\***: Fri Apr 18 22:06:54 GMT 2003

This time, barrel stepper motor ran smoothly, and the frequencies and amplitudes of the STM101 outputs were consistent. Messages follows:

```
t_scan 982 records, barrel 8390 previous barrel 8372
done
t_scan 983 records, barrel 57159 previous barrel 57176
done
t_scan 983 records, barrel 8390 previous barrel 8373
done
t_scan 983 records, barrel 57160 previous barrel 57176
done
```

\*\*MKIV PROBLEM\*\*:

Cycling power again.

Fri Apr 18 22:13:33 GMT 2003 MKIV Start Patrol

Fri Apr 18 22:25:55 GMT 2003 MKIV End Patrol

\*\*MKIV PROBLEM\*\*:

Barrel was stuttering again, frequency looked a bit more stable than last time but I could still see some jitter, amplitude was varying.

messages:

t\_scan 996 records, barrel 8389 previous barrel 8371

done

t\_scan 1000 records, barrel 57145 previous barrel 57162

done

t\_scan 998 records, barrel 8390 previous barrel 8372

done

t\_scan 997 records, barrel 57154 previous barrel 57170

done

\*\*MKIV PROBLEM\*\*:

I noticed on schematic that the bottom 24V(PS2) supply is not connected to the stepper circuit, rather it goes to an unused connector, J12, along with 5V from the 5V supply. The top 24V supply(PS1) is connected to the STM101s.

I turned off spar power and swapped the plugs at the 18A1 connection panel to check out the 24V supply as the source of our troubles today.

Cycled main power after turning spar power back on.

Fri Apr 18 22:38:47 GMT 2003 MKIV Start Patrol

WEATHER COMMENT: Fri Apr 18 22:41:31 GMT 2003

In fog.

Fri Apr 18 22:50:59 GMT 2003 MKIV End Patrol

\*\*MKIV PROBLEM\*\*:

Barrel ran smoothly, waveforms stable. Messages:

t\_scan 982 records, barrel 8390 previous barrel 8372

done

t\_scan 983 records, barrel 57159 previous barrel 57176

done

t\_scan 983 records, barrel 8390 previous barrel 8373

done

t\_scan 983 records, barrel 57160 previous barrel 57176

done

\*\*MKIV PROBLEM\*\*:

Cycled main power.

Fri Apr 18 22:56:22 GMT 2003 MKIV Start Patrol

\*\*MKIV PROBLEM\*\*:

Barrel ran smoothly, waveforms stable. Messages:

t\_scan 982 records, barrel 8389 previous barrel 8371

done

t\_scan 983 records, barrel 57158 previous barrel 57175

done

t\_scan 983 records, barrel 8390 previous barrel 8373

done

t\_scan 983 records, barrel 57159 previous barrel 57176  
done

\*\*MKIV PROBLEM\*\* : Fri Apr 18 23:09:12 GMT 2003

Cycling power one more time.

Fri Apr 18 23:14:13 GMT 2003 MKIV Start Patrol

Fri Apr 18 23:26:27 GMT 2003 MKIV End Patrol

\*\*MKIV PROBLEM\*\* : Fri Apr 18 23:42:16 GMT 2003

Barrel again behaved, waveforms stable. I did some further checking and found that although there is a J12 connector that is empty on the connector panel, PS2 was powering the O1 stepper motor drivers and motors. (different drawing) When I disconnected power to PS1, the former Barrel, First Objective Rotation, & Tilt Plate stepper motor power supply, that buzzing noise we always hear in the dome went silent. Then of course, the O1 guider, which moved with the swap was disabled. Plugged power back into PS1 and when turned on, the O1 steppers began working. I did not notice whether they behaved badly because they behave badly anyway when they are working.

\*\*MKIV PROBLEM\*\* : Fri Apr 18 23:51:20 GMT 2003

Cycling power one more time.

Fri Apr 18 23:56:17 GMT 2003 MKIV Start Patrol

Sat Apr 19 00:08:26 GMT 2003 MKIV End Patrol

Sat Apr 19 00:34:47 GMT 2003 MKIV Start Patrol

\*\*MKIV PROBLEM\*\* : Sat Apr 19 00:35:13 GMT 2003

Cycled power, leaving it off for a longer period and restarted barrel.

Sat Apr 19 00:52:49 GMT 2003 MKIV End Patrol

Sat Apr 19 01:08:48 GMT 2003 MKIV Start Patrol

\*\*MKIV PROBLEM\*\* : Sat Apr 19 01:08:52 GMT 2003

Cycled power with long down-time.

Sat Apr 19 01:20:58 GMT 2003 MKIV End Patrol

\*\*MKIV PROBLEM\*\* : Sat Apr 19 01:20:49 GMT 2003

Barrel has been working fine since power supplies were swapped. Waveforms at output of STM101 have been stable, both in amplitude and frequency.

WEATHER COMMENT: Sat Apr 19 01:22:14 GMT 2003

In fog and rain. Shutting down for the day.

Sat Apr 19 01:23:29 GMT 2003

MkIV

00_02.rawmk4	01_17.rawmk4	21_00.rawmk4	21_57.rawmk4	22_56.rawmk4
00_05.rawmk4	17_26.rawmk4	21_04.rawmk4	22_00.rawmk4	22_59.rawmk4
00_34.rawmk4	17_30.rawmk4	21_06.rawmk4	22_02.rawmk4	23_02.rawmk4
00_37.rawmk4	18_05.rawmk4	21_09.rawmk4	22_13.rawmk4	23_05.rawmk4
00_40.rawmk4	18_08.rawmk4	21_12.rawmk4	22_16.rawmk4	23_14.rawmk4
00_43.rawmk4	18_11.rawmk4	21_15.rawmk4	22_19.rawmk4	23_17.rawmk4
00_46.rawmk4	18_14.rawmk4	21_27.rawmk4	22_22.rawmk4	23_20.rawmk4
00_49.rawmk4	20_43.rawmk4	21_30.rawmk4	22_38.rawmk4	23_23.rawmk4
01_08.rawmk4	20_46.rawmk4	21_33.rawmk4	22_41.rawmk4	23_56.rawmk4
01_11.rawmk4	20_49.rawmk4	21_36.rawmk4	22_44.rawmk4	23_59.rawmk4
01_14.rawmk4	20_52.rawmk4	21_54.rawmk4	22_47.rawmk4	