

-1,8

Jan 12 - day 7

pup. 1001 images of pupil  
pup. 1002 setup.

setting up at 12:45, pinhole, hi-med to check  
for noise from motors in data

- we don't see the pickup from the  
collimator motor when on the telescope.

setting up in camera mode  
image slit + mark  
slit is at 213, 155

going to B and to find boresight + focus

band. 1003

moved off the star + start taking skies with  
variable int times

sky. 1004	0.22 sec int, 4N frame
	not much signal
.1005	0.5 sec
.1006	1.0 sec
.1007	2 sec

Changing to scan of  $\odot \odot$  step to get plates also

sky. 1008	0.5 sec	2 scans of 16
.1009	1.0 sec	

- 3.1 started
- 2 ended

sky. 1010	2 sec int	
.1011	4 sec	
.1012	8 sec	nod wait is too short
.1013	16 sec	saturated flat

going to pupil mode to check collimation  
 Pup. 1014 Changed EtW ~~cal from~~ -3.1 to -2

change to ~~855~~  $\text{cm}^{-1}$  for sky  
 853

sky. 1015	0.5 sec	
.1016	1.0	didn't peak up the CVF

peaked up CVF repeat above

sky. 1017	0.5 sec	bad file chopper incorrect
.1018	0.5 sec	
.1019	1.0	
.1020	2.0	
.1021	4.0	block saturated

Change to med mode + do 5 scans

sky. 1022	0.22 sec	} Bias -4	
.1023	0.5 sec		saturated
.1024	0.11 sec		
.1025	0.11 sec	V-det = -3.4	
.1026	0.11 sec	= -3.6	
.1027	0.11 sec	= -4.0	
.1028	0.11 sec	= -4.4 saturated + noisy	

band, 1029 med mode ended after 9 pairs

.1030 hi-med

b.as, 1031 hi-med, -3.4 1 sec

.1032 -3.6 1 sec

.1033 -4.0 "

.1034 -4.4 "

---

going to dg tau 844.275

~~dg tau .1035~~

CUF  
not  
peaked

went to a tau to check focus & pointing  
changed focus to -0.88

a tau .1035 skip 1-2

going back to dg tau.

dg tau .1036 skip = 1 guiding started pair 8  
ended early to ~~check~~ recheck pointing

dg tau .1037 CUF not peaked

peaked up CUF - looks better now  
dg tau .1038 end early chopper in way

garbage  
dg tau .1039 guiding + peaked up  
moved 0.8 West after pair 8  
moved 0.7 West after pair 12 we see it

dgtau. 1040

dgtau. 1041 moved 0.7 West from 1040  
after pair 8 back to position of 1040

dgtau. 1042

.1043

.1044

.1045

Alpha Aur for division

Aaur. 1046 pair 5 is great  
16 nodes

.1047

8 nodes

A Aur at 778.28

Ne II for a galaxy  
focus = -1.0

aaur. 1048

He2-10 a galaxy

~~He2-10~~

he210.1049

good guide star  
looks like a little grating shift

.1050 moved -1.3 West of start

.1051 " 1.3 East of "

(1052) didn't happen.

Scanning + guided

he210.1053

nod wait may be too short

.1054 fixed nodewait, 16 scans

South moved source up in  
high med

he210 .1055

.1056

23 steps offset -5E ~~1~~ -1N  
grating shift in scan 2

.1057

.1058

Going to Mars

mars.1059

flat is bad started on Mars  
moved E after 1st scan  
ended after 2

now guiding

mars.1060

scan high-med  
(1060) didn't happen

mars.1062

scan medium mode  
2 scans started on mars

mars.1063

shifted E

shifted to  $885 \text{ cm}^{-1}$  & focused on  
S V in focus = -1.06

Using 4th order  
now back to mars

guiding

mars.1064

~~hi~~ hi. med  
ended after 2 - fine but need to  
increase int time to 2

.1065 2 sec int

Change to medium mode  
~~mars. 1066~~ doesn't exist

mars. 1067 black saturated at 0.5 secs  
ended early

.1068 0.1 sec

off to Saturn

starting  
on  
Saturn

Sat. 1069 guiding  
nod wait was too short

.1070

nod wait filed

.1071

changed offset to 17E ON

.1072

offset 15E ON

.1073

.1074

starting to see spiking

\*

.1075

lowered bias -3.6

.1076

.1077

offset 15E -3N

.1078

looks like some pickup noise

.1079

int time 0.22

.1080

.1081

offset 15E -6N

.1082

"

.1083

"

.1084

Saturn in hi-med

Sat. 1085      2 sec int      offset 15E 2N  
.1086                              "      15E 5N

.1087      6 pix slit      2 sec      same offset  
.1088      6 pix slit      1 sec      "

lost guiding  
.1089  
.1090

9 pix slit      1 sec      "  
~~12E~~ 5N

after 2nd scan moved about 2 west  
moved 2" west after scan 3

.1091      3 pix slit      2 sec int      7E 5N





# Consum

Jan 12, 8 TG, HR, EV

Setting up for  $529.8 \text{ cm}^{-1}$   $\text{SO}_2$  for IO

going to callisto to focus + get first calibration

Cal. 2001 used to check wavelength  
focus = -6.10

cal. 2002 good science

io. 2003 splash mark pair 2?  
garbage

.2004 good file

.2005

.2006

.2007

half good ammonia 1.034  
lost it last half

.2008

.2009

very very good file

.2010

.2011

.2012

## Callisto

Cal. 2013

## IO

io. 2014

io. 2015

2016

2017

2018

Pair 4 first der. bounce  
bounce seemed to go away  
after  $\sim$  pair 5

290

focus now autoadjusts for Temp changes

Co. 2019 skip = 13  
.2020  
.2021  
.2022

Callisto

Cal. 2023

Co  
Co. 2024  
.2025  
.2026  
.2027  
.2028  
.2029

Callisto

Cal. 2030

Co.

Co. 2031  
.2032  
.2033  
.2034

Callisto

Cal. 2035 ended early ignore

Cal. 2036 ending airmass 1.784

-0.2 -6.5

Set upon 949.67 S(IV)  
focus on A Aur  $P = -0.85$

aur. 2037 end early  
need to adjust nod.  
adjusted nod to 0.5E 13N

aur. 2038  
.2039

II ZW 40

getting a guide star

II ZW 40. 2040

.2041 moved -1.4E of start position  
.2042 moved +1.7E of start position  
.2043 zero position

got to Acma to check pointing  
were off EW by few " (3.5)  
reset crosshair

II ZW 40. 2044

Got it! strongest

.2045

-1.4"E of start weaker

.2046

-2.8"E " weaker

.2047

-4.2"E very weak

.2048

+1.4E of start

Scanning

II ZW 40. 2049

.2050

ended after 4

.2051

changed offset & # of steps

.2052

reduced steps

.2053

ended early after 9 scans

~~offset~~  
shifts were wrong

iizw40. 2054 4 scans changed offset - 6.5 E ON  
2055 ended early  
2056 ended early  
looked at ~~the~~ pointing off by -10.7 2.5  
repointed

Set up scan correctly again

2057 ~~no~~ 4 scans looks to me like off by  
2058 16 scans by 1 step at end.  
offset after done -1.4"  
looks like we lose 1 step after each file  
2059 off at end <sup>ind to offset</sup> by -1.4" E ~ 1N  
2060

~~switch~~

Switch to hi-med, nodding

iizw40. 2061

nodding off slit - good

2062

2063

2064

forgot to change int time  
ended early but good

2065 int time = 2 sec

Filter 100.860

## Mars

Mars. 2066

hi-med scan

ended after 1

on Mars at beginning

ignore

.2067

(Name incorrect in header)

## Med mode

Mars. 2068

Change wave to  $1213 \text{ cm}^{-1}$

focus = -0.90 t. = 00

2 cm. 2069

ended after 13 pairs

2 sec int

.2070

ended early dome got

4 sec int

not obvious are better  
than other

in way pair 12

Mars to scan for divisor

Mars. 2071

## Titan - Guidance

tit. 2072

not obvious - did some guiding

.2073

ended early, go check pointing

go look for  $\alpha$  Boo

was off by 2E

tit. 2074

saw it in sum?

.2075

half slit east from start

.2076

$\sim 4''$  E from start

5.2E

tit. 2077 used long wave filter  
281.25 to acquire tit.  
got IT !!

going to try guiding

tit. 2078 look good  
.2079 ended early - don't think we are on  
it - we drifted off  
.2080 new guide star in case old one  
was a moon. (it must have been)  
.2081 good  
.2082 ~~more~~ before start moved -0.5N  
.2083 after pair five moved 1.3E  
so might try skipping 1-5  
after pair 9 moved back to  
0.8E of start.  
.2084  
.2085 really good file  
.2086  
.2087  
.2088

of peak

Saturn

medium at  $1245 \text{ cm}^{-1}$

sat. 2089  
.2090

January 2012, 9th UT TG, HR, EV

Setting up at  $529.8 \text{ cm}^{-1}$   $\text{SO}_2$  on IO

Use Callisto for focus + divisor, start at -1.1  
focus = -1.11

### Callisto

- cal. 3001 store mode - garbage
- .3002 - quick file to check spec setup  
while at focus  
motors died
- cal. 3003 ←
- For real now
- Cal. 3004 ended early forgot to edge
- Cal. 3005

### IO

- io. 3006 good no guide star ;)
- .3007 half okay / big grating shift + huge east pump on sky? word
- ⊗ .3008 ended early didn't edge  
garbage
- .3009 bounce pair 13 only in pair
- .3010
- .3011
- .3012
- .3013
- .3014

nod = 1E 20N

Callisto

Cal. 3015

(object name is ~~not~~ still Fo)

i0

i0.3016

.3017

.3018

Skip = 12 odd frame

.3019

.3020

.3021

.3022

.3023

Callisto

Cal. 3024

i0

i0.3025

.3026

.3027

.3028

.3029

.3030

skip = 15 16

Callisto

Cal. 3031



Co

Co .3032

.3033

.3034

Callisto

Cal. 3035

A Aur

767.99

Ne II

medium mode

exam. 3036

focus = -0.9

go to L Cas to check pointing

N1614

guiding

N1614. 3037

can see it

.3038

.3039

.3040

Scanning

.3041

.3042

.3043

.3044

.3045

.3046

.3047

-0.3 -6

## Mars scans

mars. 3048 ended after 2  
, 3049 bigger offset ended after 2  
good enough

~~mas~~ Change wave to 778.35

mars. 3050  
going to muuma for pointing

muuma. 3051

Go to N3628

N3628.3052 not obvious we were in  
right place  
repointed guiding

N3628.3053 trying again  
call this nominal pos.  
got it  
a little shifted ~~to~~ N15 compared to  
muuma

.3054 moved 1.4" E of nominal  
nothing obvious

.3055 moved -1.4" E of nominal (see it)

.3056 " -2.8" E of nominal ✓

brightest

n3628.3057  
.3058  
.3059

moved 4.2" E of Nominal ✓  
-5.6" E of Nominal ✓  
-7.0" E "

Note  
a straight pointing  
good &  
dressed  
at per side

.3060  
.3061

-2.5" E of " (mean table 2.0)  
"

.3062

" increased nsum=8  
to get more efficient

.3063

same pos - back to  
original integration  
time.

.3064  
.3065  
.3066

-4.2" E of Nominal  
"

acmi change wave 1218 cm<sup>-1</sup>  
focus = 0.95

acmi.3067

More for division

more.3068  
.3069

ended after 2  
- same but ~~scanning in position~~

Filter  
100.5

3.5 - 3.2

1.8

Titan shift filter to 281.25  
worked like a charm

t.t. 3070

3071

moving after pair 7

> nada

hmm

bad guide object

changed & got new one

t.t. 3072

- taking data at filter position  
of  $\approx 850 \text{ cm}^{-1}$  to record  
tit pos on slit.

adjusted up in slit after pair 5

.3073

city again

✓  
✓

.3074

.3075

.3076

.3077

.3078

increased gain to 100.

ended early

Engineering

.3079

increased int time 4 secs

ended early need to decrease gain

.3080

.3081

Changed wavelength 1241.5

t.t. 3082

skip = 1-7

.3083

increased int time

.3084

guiding ended after pair 9

.3085

Mars. scanning

Mars. 3086

using Mars photo 4 flats  
moved west some after ~~photo~~  
Scan 2

10 Jan 2012 TKG, HR, TE, EV

Beta Peg

Focus = -0.80

~~beta Peg 4001~~

Venus

Ven. 4001

didn't set up Venus flats  
offset -11 0

Set flats  
Ven. 4002

6 black 6 sky  
offset -11 2

drifting ~~west~~ east need to move

changed E rate from 487-38.

Ven. 4003

off -11 4

shifted  $\approx 2''$  E after scan 1

changed E rate to 420

Ven. 4004

off -11 6

shifted  $\approx 2''$  east after scan 2

shifted  $\approx 1''$  N after scan 3

changed E rate to 480

Ven. 4005 off -11 0 / Motors died  
garbage

Ven. 4006 off -11 0 not using Venus flat

3rd scan was weird

in 3rd scan we ~~went~~ went from

~~set~~ seeing dome to not

1, 2, 4 are okay

Very windy

Ven. 4007

off -11 -2

getting a bit ~~of~~ of dome

Trying to shade primary

Ven. 4008

off -11 -4

dome issues, but we forced to deal with

hard data reduction

moved E 2" after scan 3

change Rate to E 470

Not seeing dome  
I don't think  
now

Ven. 4009

off -11 -4

moved about 2 E after scan 1

really good set

up rate E 490

Ven. 4010

off -11 ~~0~~ 0

moved E  $\approx$  1.5" after scan 1

moved E after scan 2

Ven. 4011

-11 +4

max plate = 6

moved 2" E after scan 1

increased E rate to 520 during scan 2

Ven. 4012

-11 +7

# Filling Spex

Callisto 529.8cm<sup>-1</sup> SO<sub>2</sub>  
focus = -1.0

Cal. 4013 short to check setting

.4014 didn't edge  
testing setting

~~4015~~ ~~testing spex~~ for real  
skip = 15-16 ~~for real~~

IO

IO. 4017

.4018

.4019

.4020

.4021

.4022

.4023

.4024

not as good as last night  
windy/poor seeing

good

Erate = -16

Callisto

Cal. 4025 skip = 12

IO

IO. 4026

.4027

.4028

.4029

.4030

Erate = -18

pair 6 garbage → skip 6

small bounce pair!

bounce = 0.1



io

io. 4031  
io. 4032  
io. 4033

E rate = -21  
= -24

Callisto

Cal. 4034

So windy may have to close...

io

io. 4035  
io. 4036  
io. 4037  
io. 4038  
io. 4039  
. 4040  
. 4041  
. 4042

pair on is odd but is tossed by pipe anyway  
E rate = -23, -22

Callisto

Cal. 4043

io

io. 4044  
. 4045  
. 4046  
. 4047  
. 4048  
. 4049

E rate = -20  
" = -16  
E = -12

4194

②

Co  
Co. 4050

Callisto  
Cal 4051

Setup for No II 779.1  
Medium mode

Alpha Aur

focus = -0.8

Sam. 4052

~~not~~

going to mu umu to check pointing  
had 0.6E15N

N2903

n2903. 4053

garbage  
go to nearby star to check pt.

n2903. 4054

with guider on (nom)

.4055

~~not~~ -1.4" from nom

.4056

1.4" from nom

.4057

2.8" from nom

.4058

4.2" from nom

.4059

-2.8" from nom

.4060

-4.2 from nom

n2903.4061

1.4 E of Nom

Try n2623

n2623.4062

wrong wave setting

set to 765.98

- .4063 nominal (maybe see it)
- .4064 moved -0.7 E from nom
- .4065 moved 0.7 E from nom
- .4066 moved -0.7 E from nom  
I think something there
- .4067 -1.4 E from nom
- .4068 -0.7 E from nom (best spot)
- .4069 "
- .4070 "
- .4071
- .4072
- .4073

Some beam obscuration in this one but don't think it hurts  
obs.

Try n4194

wave 774.08

n4194.4074

nominal position

.4075

"

N 4194  
going to move ~~300~~

n4194. 4076  
. 4077

moved 1.4" E of room  
1.4" W of 9

ended early

trip. 4078 moving from N4194.4077 to  
Zenith

Chopper got stuck rubbing on  
mounting plate & was cutting the  
previous files at edge of long slit

Beta Gem to set up for high

bgem. 4079 - to test ? setting  
focus set to - 0.75

More for divisor

Mars. 4080  
. 4081

scanning East  
scanning West  
ended after 3 - got noisy

lower the ~~focus~~ bias increased the gain



. 4082

I think there is a star  
at beginning of scan 101  
moon?

Probably  
Moon

good for PSF

mars. 4083 - didn't happen

mars. 4084 0.22 int 25 gain  
ended after 1 scan  
looks good

~~moving filter~~

moving filter to get rid of dark lane

mars. 4085 with fixed filter setting

\* Look at Flat  
black doesn't cover entire slit  
in long slit mode

looks good ended after 2

Going to Alpha Boo to check focus

aboo. 4086 ended after 1 scan

fixing pointing

aboo. 4087

aboo. 4088 same scan in reverse direction

don't seem to move E/W correctly  
at high airmass

probably a balance issue

moved 2" east after 2

moved more east after 3

Note - auto temp adjust focus was  
off all night until previous page  
alpha Boo

Now on

Mars one more time

Mars .4089 end after 1 ~~scan~~ scan

.4090 changed offset to get off Mars  
ended after 2 scans

Saturn

Sat. 4091

.4092

Wopper is slipping  
look at black in flat

.4093

ended after 1

~~need to adjust chop~~

moved along slit

.4094

moved  $\wedge$  2" E after scan 1  
" " E " " 2

.4095

.4096

moved 2" E after scan 1

.4097

scanning in hi med

.4098

ended after 1 ~~of~~ 9 look dead  
S should be fine though

.4099

offset -14E -10N

.4100

-14E 0N

.4101

-14E 4N

ended early

change to CH4 1245

used ~~Ed~~ Boo as focus + pl star

Focus -0.8

map for ~~the~~ division

mare. 4102

Saturn

Sat. 4103

.4104

.4105

.4106

.4107

offset ON

4N

6N

rates off here

Moved westabit after scan 1

offset 11E -4N

Jan 2012, 11  
focus = -0.7 Temp 4C  
wavelength 1366 cm<sup>-1</sup>  
used B Pegas focus

Venus 302

Ven. 5001  
. 5002

look at flat to make sure  
Venus isn't in it  
ended after 1 scan

Set trans flats = 6

. 5003 -11 +2

changed E rate 445

. 5004 -11 +4 changed E rate 380

recentered with guide camera  
after scan 2

change E rate 420

and shifted  $E \approx 2''$

after scan 3 shifted  $E \approx 2''$

. 5005 -11 +6

after scan 1 changed rate 440.  
changed rate to 450

. 5006 -11 -2

moved a bit east after scan 1  
moved a bit east after scan 3

. 5007

~~+11 -4~~ rate = 460

offset mistake ~~ended~~ ended early



normal flats

Ven. 5008 -11E -4N  
moved after scan 2

Ven. 5009 -11E -6N

Ven. 50~~010~~ -11E -6N      Erate = 470  
~~more~~

Ven. 5011 ~~-11E -4N~~ was set at -6 not -4  
moved 2" N after scan 2  
moved 2" E after scan 3

Ven. 5012 -11E ~~2N~~ N (new, should do  
shifted N (with  
paddle.)

Ven. 5013 shifted -2 with paddle to get back to norm  
-11E -2N

Ven. 5014 -11E 2N  
changed rate 490  
moved  $\approx 3''$  E after scan 1

Ven. 5015 -11E 4N  
moved 3" E after scan 3

Callisto  $N^{15}/N^{14}$   
885  $\text{cm}^{-1}$  med mode  
focus = 0.74

Cal. 5016

Jupiter scanning  
X Jup. 5017 doesn't exist

Jup. 5018 ended after 1

Jup. 5019 Ganymede is in picture

X Jup. 5020 doesn't exist

Jup. 5021

moved about 3" West after scan  
change E rate 10

moved  $\approx$  3" West after scan 3

.5022

moved West after scan 2  
changed E rate  $\odot$   
shifted 2" N after scan 2

.5023

must be on a moon at 1st  
position  
move 3 E after scan 2

rates 0 E 10 N

.5024

Callisto

Cal. 5025

looks like focus is soft

Change  $865 \text{ cm}^{-1}$   $\frac{18N}{14N}$   
focus = 0.6 Temp = 3.3 C

Cal. #026

Jupiter

Jup. #027

moved  $1.5''$  S after scan 1  
during scan 3 change E rate = 10

moved  $3''$  E after scan 3

Jup. #028

moved  $2''$  S after scan 1

Jup. #029

after scan 1 moved  $\approx 6.5''$  E  
moved wrong way

~~Jup. #030~~  
set E rate = 0

Jup. #030

after scan 1 moved  $3''$  W  
E rate = -10

Jup. #031

Callisto

Cal. #032

change to  $820 \text{ cm}^{-1}$   
focus = -0.75 Temp = 3 C

Cal. #033

ended after 8 glorious pairs

Jupiter at 820

Jup. 5034

E rate = -10

after scan 1 moved South 1.5"

.5035

Moved a couple " east after  
Scan 2

Callisto

Wave 745  $\text{cm}^{-1}$

focus = -0.83

cal. 5036

ended after 10 pairs

Jupiter

$\text{C}_2\text{H}_2$  RLS

Jup. 5037

~~ended after 1 scan~~

rate is off

~~now 2 needs to be 5~~

ended after 6 scans

~~Jup. 5038~~

Callisto

continuum at 1150  $\text{cm}^{-1}$

focus = -0.6

cal. 5038

Jupiter

Jup. 5039

moved 1.5 South after scan 1  
ended after 2 scans

lower shutter

.5040

Moved South after scan 3

zip, 5041

Alpha Aur. 949.67 cm<sup>-1</sup> S1V  
focus = ~~0~~ -0.72

alpha, 5042

II Zw 40

II Zw 40 . 5043 nominal position  
nodding off slit  
stopped after 11 pairs

. 5044 1.4E off of nominal  
. 5045 -1.4E off of "  
. 5046 ~~2.8E~~

trying to point to a coma  
were off by -1.8E and -1.4N

back to II Zw 40

II Zw 40 . 5047 new nominal  
" . 5048 medium mode  
" . 5049 to find this guy  
didn't see it  
moved -1.4E of nom  
+ 5050 moved -2.8E of ~~the~~ nom  
ended early

ii zw 40.5051

1.4E of nom.

.5052

2.8E of nom.

.5053

4.2E of nom.

went + pointed A Aur + pointed up

went to 2 ORE + checked pointing

Back to zw

ii zw 40.5054

Nominal

~~.5055~~

~~1.4E~~

Wrong Flipping Coordinates

ii zw 40.50595 ended early didn't edge

We're on it

.5056

Nominal pos!

.5057

1.4"E -

stronger

.5058

2.8"E

Change to hi-med

.5059

1.4"E of stronger  
longer int.

.5060

.5061

.5062

ended after 2 rods  
lower shutter

.5063

7.87

Mars

Mars - 5064

~~Scan~~ first step in scan 2 is bad  
because nod wait was too small

Went to  $\Delta$  delta Vir for focus at  $1270 \text{ cm}^{-1}$   
focus =  $-0.85$   
temp =  $2.6$

Going to Mars for Division

Mars - 5065  
.5066

waiting for Saturn  
I think we see shutter in 3rd scan  
or just sky

Titan

tit. 5067 nothing  
5068 "  
5069 "

going to new filter position

tit. 5070  
.5071

Signal 4" nod

.5072  
.5073  
.5074

3.5" N nod

titan

tit. 5075

.5076

.5077

skip 1-5

Mars

Mars. 5078

changed to

1260 cm<sup>-1</sup>

X Mars. 5079  
.5080

garbage  
"

Mars. 5081

- this one

flock died but scan should  
be good

Titan

tit. 5082

.5083

.5084

.5085

skip = 1-3

.5086

.5087

.5088

.5089

.5090

lost it midway through - it  
changed directions on me



1344-1351

-0.7

12 Jan 2012

Bowson Beta Peg  
focus = -0.6

Venus set up manifolds = 6

Ven. 6001 -11E 0N

.6002 -11E 2N

moved West  $\approx 2''$  after ~~scan~~ scan 2

lowered east rate 460

moved  $\approx 1''$  East after scan 3

.6003 -11E 4EN

changed E rate to 430 during  
scan 3

after scan 3 moved 2" west

.6004 -11E 55N ~~4N~~

.6005 -11 -2 N

moved 2" E after scan 1

.6006 -11 -4 N

.6007 -11 -4 N

moved E 2" after scan 2  
+ set E rate = 470

.6008 -11 -6 N

seeing is poor

.6009 -11 -4 N

changed rate to 480

.6010 -11 -2 N

Ven. 6011 -11E ON

.6012 -11E 2N

.6013 -11E 4N

ERate = 500 possible sun  
ended after 2 scans shutter

.6014 -11E 5N

Callisto at  $820 \text{ cm}^{-1}$

focus = -0.65 Temp = 1.8c  
Med Mode

Cal. 6015 - wrong integration time  
garbage

Cal. 6016

Jupiter scan at  $820 \text{ cm}^{-1}$

Jup ~~6017~~ .6017

Changed to  $1248 \text{ cm}^{-1}$   
used ~~B~~ Band to focus = -0.7

Jupiter

Jup. 6018

offset center pos  
changed ERate = 10

Jup. 6019

-4 N offset

5 lit 40  
240

Start =

Jup .6020	-8N
.6021	-12N
.6022	12N
.6023	8N
.6024	4N
.6025	0N

medium mode scan

.6026 ended after 1 scan.  
didn't change lit  
.6027 with long slit  
.6028 10" north

in 4th scan a small amount of  
time dome is in view  
just cut out

hi-med

.6029 0N - ended after 1 scan  
bad integration time

.6030 0N int time = 2 sec  
adjusting rates a lot  
moved east after first scan

.6031 0

.6031 -4

.6032 -8

.6033 -12

a bit of Southern  
aurora

.6034 4 almost end at start

.6035 8N moved east after scan!  
grating shift in scan 4

.544

98.820

try city med mode through filter at 191.25

imp. 6036

medium mode through road filter

moved North 2" after scan 1 & 3 E

moved E after scan 2

.6037 moved 2" North scan 2 & changed E rate to 30

Galaxies

Change to SIV setting  $951.8 \text{ cm}^{-1}$   
use Alpha Aur. to focus. = -0.60  
T = 1.3C

Aur. 6038

-3 -7.5

Go to N 1569

n 1569.6039

Very obvious

.6040

.6041

-0.7 E of Nom I think weak

.6042

-1.4 E of nom

.6043

-1.4 E " "

.6044

-2.1 E

.6045

-2.1 E

.6046

-2.8 E

.6047

-0.7 E

.6048

nom

.6049

nom

.6050

0.7 E

going to Alpha lya to check pointing in  
South came in super close.

N3125

N3125 .6051 -1.4  
.6052 ~~0.4~~ E from Nom  
.6053 -2.8 E "

off by -7.2 N wrong coord input

now did an edge ~~so~~ source should show  
up where the star was

.6054 Nom  
.6055 "  
.6056 "  
.6057 "

Move 3" East to other source

.6058 3" E Nom I see it in a file  
.6059 " "  
.6060 " "  
.6061 " "

.6062 1.5" E Nom  
.6063  
.6064  
.6065

~~Got to~~ Go to 8 vii for focus at 1253  
focus = -0.9

Mars for division

mas. 6066	2N
.6067	0N
.6068	-2N
	San 3 odd 44
.6069	-2N

Titan

tit. 6070	skip 1-6
.6071	pretty crappy
.6072	pretty good
.6073	really good
.6074	lost it at end ii
.6075	really good
.6076	
.6077	really good
.6078	

1147 cm-1

.6079	good
.6080	-lost it nothing
.6081	so so
.6082	was too high in slit
.6083	
.6084	good one

tit. 6085

.6086

.6087

.6088

.6089

.6090

.6091

.6092

.6093

.6094

where did who go?

skip 8-10

good finally

good though

Mars for a divisor!

Mars. 6097

moved north after scan 1





13 Jan 2012  
TG, HR, TE, SB, BG  
cloudy at 3:30 pm

Cloudy  
opened at 21:15 HST

Alpha Aur.

aam. 7001

focus = -0.9 Temp cold

! got glow issues try again

try again

aam. 7002

garbage

over more time

aam. 7003

this is okay use to help decide  
positioning along slit

Multiple areas seeing

N2798

- n2798.2004 16 nod
- .2005 32 nod
- .2006 moved -1.4 E
- .2007 moved 1.4 E

nothing  
going to mu umma to check focus  
& pointing focus = -1.0

1 user local time / scripts

1241.6  
1236.3

Apr 299

arp299.7008 wrong 7

move 772.98  
arp299.700~~8~~9

give up

goto acma for focus at  
focus = -1

Mars  $H_2O_2 + H_2O$

Mars - 7009

no mars flats

ending after 1 float died

.7010

no mars flats

center

.7011

mars flats

center

.7012

move 2 N

.7013

"

.7014

~~to~~ -2 from nom

.7015

-2 " "

.7016

nom pos.

.7017

is focus test

Going to med mode at 1248 cm<sup>-1</sup>

Mars. 7018

medium mode

on 7" slit, but 0.5" steps

.7019

Saturn - medium mode imaging

hard sat. 7020

Move E after Scan 1

" " " 2

E rate = 7

.7021

E rate = -5

.7022

bad H<sub>2</sub>O

.7023

Change to 1150

Focus on 2 Boo then off to mars  
focus = -0.95 temp -2.21-3.7  
Air/dome

mars. 7024

hard

Sat. 7025

moved E after after scan 3

.7026

.2027

Change to 961.5

focus = -1.05

int time 1 sec

-4.0V was noisy

Vdet = -3.6

mars. 7028

ended early after 1 scan  
were on it at beginning

moved about 5" E

Mars. 7029

odd line is ~~that~~  
sky?

Sat. 7030 \* moved 4" E after scan 1  
.7031  
.7032  
.7033

---

set up at  $905 \text{ cm}^{-1}$  w/f  
focus = -1.05

Mon. 7034 only 1 on it at beginning  
Mon. 7035

Sat. 7036

Moved 3" S after scan 1  
Moved 3" E after scan 3

Sat. 7037  
.7038  
.7039

really good

---

set up at  $870 \text{ cm}^{-1}$  focus = -0.9

Mon. 7040

Sat. 7041

---

$745 \text{ cm}^{-1}$  focus = -0.6

Mon. 7042

Sat. 7043

Sat. 7044 8 nodes

587 cm<sup>-1</sup>

focus = -1.10

max. 2045

sat.

sat. 7046

7047



15 Jan 2018 TKG, SB, ABC

Cloudy

Go to Beta And for focus + pointing  
setting up at  $1248\text{cm}^{-1}$

Cloudy at Beta And

went to 2 Tau

air 0m

focused = -0.80 Temp -2.0, -1.7

not bad for  
weather  
8pm

Jupiter

medium mode scan at 1248

Jup. 8001

southern aurora  
change E rate to 20

Jup. 8002

telescope jumped towards  
end of scan 4

hi-med mode

Jup. 8003

center

~~scan at beginning of scan~~

Jup. 8004 increase gain to 50

4N

. 8005 8N

E rate = 23

clouds in scan 2

ended early shift back to med mode

clouds

8:54

medium mode

Jup. 8006

crappy clouds

. 8007

. 8008

E rate = 28

. 8009

E rate = 32

Terrible clouds

Aug. 8010 This is getting pretty  
rediculous

.8011 this one is going to be tough to  
pull out  
where did who go?

went to 2 Tau for focus focus = -1.05  
Ne II at  $780.4 \text{ cm}^{-1}$

now on to  
AFGL 5142

at gl 5142 .8012 scan all clear is  
cloud! guides working  
.8013 mod clouds

Note it is still cloudy

Trying again at 3:15 am HST  
mu umma to focus at  $969 \text{ cm}^{-1}$  N/N<sup>14</sup>

going to Mars for division

Mars

Mars.8014

moved west at step 32 instead  
of 35 in scan

.8015

fucky clouds  
mars just disappeared  
really bad clouds



cloudy garbage

Saturn

Sat: 8016

pscan cloudy  
by cloud moving by  
I didn't see anything

Sat: 8017

can't see sky lines in row!

:8018

I don't think even John Lacy's  
reduction skills could find Saturn in  
this  
we are definitely background limited!  
nodda

:8019

not clear yet but background  
has fallen by a factor of 3

going to recenter + try again

:8020

I may have seen signal in scan 1  
I see saturn in 2nd scan  
I can see it now sort of

:8021

pretty decent in scan 3

:8022

~~scan 3~~  
scan 3 cloudlock  
scan 4 get hammered

:8023

give it another shot  
clouds in scan 1  
✓ getting signal in scan 2  
bad clouds in scan 3  
~~bad~~ clouds in scan 4

Sat. 8024 try again but doubtful  
clouds in scan  
clouds clouds  
everywhere

I Give UP!!

Spiles

move + remove

16 Jan 2012, TRG, SB, EU

start at 7:05

Go to Beta And for focus + a quick flux cal.

Beta And  
band. 9001

ended after 7 pairs plenty of 3 signal

did a mid + marked boresight in center of slit

Went to I0 - useless bad offsets

Jup. 9002

started moving West opt pair 13 peaking  
up a bit moved  $\approx 2''$  west

Inert PA  
to move  
in 9002 - 9005 - it  
was 150

9003

1.5" N and  $\approx 1''$  west of start of file 9002

set E rate = 22

9004

same as 9003

9005

E rate = 24

9006

saved but in continuous  
 $\hookrightarrow$  tracking was perfect may not have flat?

1188  $\text{cm}^{-1}$

Jup. 9007

a weak cloud  $\approx$  pair 13 or 14

just sat in initial pos.

9008

try moving a bit increase  
a line pops up  
no better a few arcs see E or W  
at 0 in pair 9

Questionable if  
on it.

Jup. 9009  
.9010

put in mirror - looks like we were  
off the planet

off to J. Tan to get focus at  $1248 \text{ cm}^{-1}$   
focus =  $-0.76$

Scanning Jupiter at  $1248 \text{ cm}^{-1}$  in med mode

Jup. 9011 moved  $52''$  after scan  
E rate = 31

hi-med mode

Jup. 9012

E rate = 33  
small cloud seen  
clouds in scan

back to med

Jup. 9013 doesn't exist ~~that~~

.9014

clouds so bright can't see  
Jupiter  
offset  $4''$  E after scan 1

upped E rate = 38

.9015

Cloudy  
Cloudy

.9016

ended early  
need more lower shutter  
E rate 45

Jan. 9017

moved 8" E after scan 1  
clouds quieted down pretty good file

774.22 for Ne II in galaxy

focused on  $\lambda$  Tau

354 line flux

NGC 1222

N 1222.9018

using coordinates  
slightly off the optical

clouds were bad at first

.9019 repeat

.9020 -1.4" E from Nom  
terrible clouds

.9021 1.4" E nom

clouds are terrible

.9022 1.4" E nom

.9023 -1.4" E of Nom

cloudy after pair 10

moved crosshair onto bright core of galaxy

N 1222.9024

nom

clouds pretty terrible

.9025

AFG15142

move to rest beam  
Nest

afgl5142.9026

not yet

started at 12:45 HST all stars are gone

looks pretty clear

pretty clean 1-

try a scan

afgl5142.9027

not obvious

going to Arp 299

at 1pm HST

first check pointing on Mu Uma

772.8

focus looks good

arp299.9028

nodding

this was at our offset  
position

Pointing to bright core offset -34.8E -5.3N  
from .9028 pos.

call this pos 1

arp299.9029

we see emission here

Scan basically a 45' x 45' area  
.9030 we are guiding

.9031 ended early after 2 scans

want to extend map

arp299. 9032  
.9033  
9034

got bright at very end  
on last scans  
steps increased to 76  
clouds  
big clouds  
4 scans  
5 My is behaving again

Saturn 13 51 27 -8:45 39.3  
moon 13 40

Go to mu Uma to focus and change  
wavelength to 964 15N/14N  
focus = -0.80

Mars for division

Mars. 9035

Saturn  
Sat. 9037

15N/14N 964  
moved -4N

-2E after scan 1

Zeroed the east rate

moved -8E after scan 2

moved wrong way

East rate = 15

moved E 12" after scan 3

E rate = 25

moved 4" E after scan 4

.9038

.9039

during scan 4 set E rate  
= 20

10 nights at  
3.3 hours at  
35 hours on sat

E rate = 20

Sat. 9040

we getting pick up from  
something  
check out black in next plot  
then decide what to do

.9041

ended after scan 1  
going to try to unplug  
parabolic mirror &  
turn off motors to everything  
but chopper

Left all motors on, but unplugged  
Calibrator

\* Sat 9042 - garbage just starts

Sat. 9043

scanning  
pick up noise is gone  
moved 4E - 8S after scan 1  
moved +E after scan 2

change E rate to 15

28

.9044

.9045 mod = 8

.9046 " "

change E rate = 12

.9047

changed E rate = 6

.9048

moved 4" south after  
scan 7

.9049

29

.9050

scan 7 may have seen a  
small amount of dome  
scan 8 garbage

30

.9051



Sat. 9052 reconnected paraboloid in scan 3  
so can move to new setting

so the pick up in scan 7

Went to 2 Boo - focused + changed to  
750.8 cm<sup>-1</sup> focus = -0.1

Mars for division

Mars. 9053 clouds I think - can't  
seem to see Mars?

Titan  
Tit. 9054  
.9055  
.9056  
.9057  
.9058

Frigid clouds!  
water mark in pair 15

Last pair bad - skip = 16  
clipped by minor I think

Mars one more time

Mars. 9059 ended after 3  
Can't see it in scan

nodded Mars observation

Mars. 9060 ended after 3 nodes  
Mars wasn't even on the screen  
no idea what happened

Mars. 9061 ~~at~~ there he is.  
~~ended~~ ended after 3 scans

17 Jan 2012, TK6, SB, EV

Callisto - focus + set  $\lambda = \del{529.8}$   
 $529.8 \text{ cm}^{-1} \text{ SO}_2$   
 focus = -1.05

Cal. 1501

I<sub>0</sub>

i0.1502

.1503

.1504

.1505

.1506

.1507

.1508

.1509

Callisto

Cal. 1510

.1511

skip 1-2

Eric not in room

ended after 6 Eric is back

I<sub>0</sub>

i0.1512

.1513

.1514

.1515

.1516

.1517

.1518

.1519

Cal. 1520

change  
to a bit

cal. 1521

Shift over the parabola

change  
returns!

Io

- io. 1522
- .1523
- .1524
- .1525
- .1526
- .1527
- .1528
- .1529



object called callisto in header

io is now object in header  
Isn't it time to go home yet?

Callisto

Cal. 1530 skip 1-2

Io

io. 1531

had it on decume  
figured it out on pair 5

io. 1532

Moved to J Cet to focus at 774.2  
focus = -0.85

off to 11222

# guiding

N1222.1533	nominal position
.1534	" " nothing do,
.1535	-1.4" E of nominal
.1536	" "
.1537	1.4" E of <del>nominal</del> nom
.1538	maybe something 1.4" E
.1539	2.8" E nom
.1540	2.8" E nom
.1541	2.8" E nom

Mu Uma

778.35 set up for  
NGC 3628

NGC 3628

N3628.1542	will start -2.8" E of pointed position
.1543	-4.2" E of pointed pos
.1544	-5.6" E " "

Nothing obvious - going to check  
pt again at mu Uma - went to early  
to N3628 ~22am

try again

N3628.1545	-2.8" E of pointed position
1546	-2.8" E " wear on it
1547	-4.2" E " "
1548	" up a sum to 8
1549	-1.4" E of pointed position
1550	0 E " "

-2.8" = 0

-19E -4N

n 3628, <del>1550</del>	1551	1.4" E of pointed pos.
	1552	2.8" E "
	1553	4.2" E "
	1554	4.2" E "
	1555	5.6" E "
	1556	5.96" E "

Arp 299 set 772.8

arp 299.1557 nod ~~at~~ centered on bright core

Tom thinks wrong direction

1558 scan map offset -10E ON pos 1  
0.7E ON  
24 steps

n 3690.1559 nodded obj

1560 scan just like above but about this source ended after 10 scans wrong offset

n 3690.1561

Go to S via to set up for Titan  
Allene setting 845, 25  
focus = -1.0

Mars. for divison

Mars. 1562

clouds ended after 5  
clouds seem to be gone but  
don't see Mars?

0 ~~0~~

Mars. 1563 <sup>retry</sup> with better scan setup  
good fill  
clouds blowover

Titan

tit. 1564      crushing it  
1565  
1566  
1567  
1568

changed to 861.5

tit. 1569  
1570  
1571  
1572  
1573

Mars  
Mars. 1574

set up at 853.6

Mars. 1575

Titan

tit. 1576      skip = 1-2  
1577  
1578  
1579  
1580

Switch to  $836.6 \text{ cm}^{-1}$

tit. 1581  
1582  
1583  
1584  
1585

Mars

Mars. 1586 moved West + S after scan 1

Mars at  $\approx 821$

Mars. 1587

Titan for on east stand

tit. 1588 skip 1-~~7~~5  
1589  
1590

adjusted E rate to 1.9



looks cloudy

23 13

18 Jan 2012 TKG, SB, EV  
Eric overslept -  
opened dome at  $\approx 6:45$

Beta And for focus = -0.60

Jupiter CHy

med mode - scan  
Jup. 2501 moved N 2" after scan 1  
wrong way  
moved 4" S after scan 2  
set E rate = 23

Changed to Larry's program  
1230  $\text{cm}^{-1}$

garbage Jup. 2502

weather too gray for nodding  
but not scanning

all setup now  
offset from I<sub>0</sub> and now taking data

Jup. 2503

moved south a bit after pair 1  
moved  
nailed it at pair ~~1~~ 6

.2504

moved south a bit  
a bit of cloud  
cloud pair 5 - 96  
cloud pair 9

- really good scan of pair 14  
went to I<sub>0</sub> & dropped crosshair on it

.2505

nodding again on Jupiter  
clouds

adjusted E rate = 15

Jup. 2506

ended early + gave up  
too cloudy for this

---

med modest 1250

Jup. 2507

cloudy - but better than

SCAN 4

turbidity fingers  
can see jupiter in scan 2007

.2508

need to move a bit ~~South~~ <sup>South</sup> after scan 1

can sort of see it in scan 2

scan 3 starts off good okay - some cloud

.2509

.2510

Jup appears faint in  
visible (not good)

after scan 2 moved 3" S

maybe too close to slit edge

.2511

.2512 ended after 3 drifted West  
put in mirror to center

E rate = 25

.2513

.2514

Went to zenith this  
ishopless

-0.2

Went to 2 am focus = ~~2078~~ -0.85

Going to NGC 1614 767.99

We have guiding

N1614.2515 nominal  
cleared off a bit -  
move South by 5" to get neg beam  
better on slit

N1614.2516

same pos E/W just shifted S

.2517

moved 1 slit width E (1.4")

.2518

moved 1" " W (-1.4E) nom

.2519

" nice file

.2520

2 slits west of nom (-2.8E)

.2521

"

.2522

"

.2523

1.5 slits west of nom (-2.1E)

.2524

"

.2525

1 slit west of nom (-1.4E)

.2526

"

clouds

clouds - terrible file

.2527

still 1 slit W

.2528

"

.2529

0.7E of nominal

.2530

"

some cloud variation

really good

.2531

-0.7E of nominal

.2532



19 Jan 2012

afternoon testing

	voltage	on card	measured
1	V <sub>ssa</sub>	-1.5	-1.5
2	V <sub>gg1</sub>	-3.0 -4.0 warned	-4.0
3	V <sub>duc</sub>	-4.0	-4.0
4	V <sub>gg2</sub>	-1.5	-1.75
5	V <sub>det</sub>	-4.2 -4.0 spiking	-4.0
6	V <sub>rst</sub>	-3.2	-3.12
7	V <sub>vard</sub>	-3.2	-3.13
8	V <sub>out</sub>	-0.0	<del>507.770</del>
9	V <sub>ldout</sub>	-1.7	-2.0
10	V <sub>dcl</sub>	-1.75	-2.0
11-12	V <sub>ss cans</sub>	-1.0	-1.0

darks

~~at 1250~~ setup at 1250 - note put in pinhole then moved in between two filters - took about 1 min for image of pinhole to disappear.

1250 <sup>cm<sup>-1</sup></sup> for e helix

~~darks~~

dark .3501 v<sub>det</sub> = -3.4 int = 0.2

looked noisy - so unplugged collimator motor

.3502 -3.4 0.2 gain 25

much cleaner

.3503 -3.4 0.5

darko .3504 Vdet -3.4 1 sec  
 .3505 " 2 sec  
 .3506 " 4 sec  
 .3507 " 8 sec  
 .3508 " 16 sec

---

dark .3509 Vdet = -3.6 0.2 sec  
 .3510 " 0.5  
 .3511 " 1.0  
 .3512 " 2.0  
 .3513 " 4.0  
 .3514 " 8.0  
 .3515 " 16.00

---

dark 3516 Vdet -4.0 0.2 sec  
 .3517 " 0.5  
 .3518 " 1.0  
 .3519 " 2.0  
 .3520 " 4.0  
 .3521 " 8.0  
 .3522 " 16.0

---

dark .3523 Vdet -4.4 0.2 sec  
 .3524 " 0.5  
 .3525 " 1.0  
 .3526 " 2.0  
 .3527 " 4 sec  
 .3528 " 8 sec  
 .3529 " 16 sec

Night time

lets see it 's my time so there must be clouds ;)

Beta And to focus = -0.65

Jupiter scanning at 1248 cm<sup>-1</sup>

garbage Jup. 3530 ended early - all done  
 3531 try again  
~~3532~~ Erate = 27  
 3532 Erate = 23  
 3533  
 3534 Erate = 25

T. 28 HST Go to high-med since cl in loved light clouds  
 Jup .3535 ended after 1 glock died  
 .3536 pretty good first scan ON  
 Erate = 27  
 .3537 ON  
 .3538 4N Erate = 25  
 .3539 8N  
 .3540 4N Erate = 30  
~~3541~~ Erate = 35  
 .3541 ON  
 .3542 ON

used offset 45 for med mode scans

Scan 3 cl think had a ~~gap~~ jump in it.

Yep scan 4 started on Jupiter

33413

yuk  
→

jup. 3543

Swap to med mode for a scan  
med-scan - centered on jup  
with guide camera

integration time is wrong  
Saturated

.3544 ended

Callisto to check focus.

Focus currently = -0.56  
changed it to -0.65

Jupiter

.3545

~~nsam = 3~~ ~~ended after 1~~  
~~never mind it fixed itself~~  
image looks sharper!

~~ended after 3~~ 25 Erate wrong  
Erate 35 Nrate = 10

hi med

jup .3546

8N

.3547

4N

.3548

4N

ended after 3 for shutter  
orders shifted in scan!  
ended after 1 scan

.3549

4N

8 look dead

running blind

.3550

4N

ended after 2 going  
to Sara's project



change to  $\approx 1112.5$  Ar III  
set up on Callisto + get a quick divisor

X ~~Callisto~~  
cal. 3551 garbage

cal. 3552 for divisor just in case

now off to 2 Aur to check pointing

NGC 1569 Ar III

N 1569 . 3553  
          . 3554

nom pointed position

. 3555  
. 3556

-1.4 ~~W~~E of nom  
" "

didn't see anything

now going to pt to brightest knot of visible light  
looks like middle of galaxy

N 1569 . 3557  
          . 3558  
          . 3559

Nominal #2

Some calls it  
pos 1

N 1569 . 3560  
          3561  
          3562

pos #2  
" "  
" "

N 1569 . 3563  
          3564

pos 3

Change to 1115  
at 1115

1115  
1115

1115

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Jan 2012

set up at  $800 \text{ cm}^{-1}$  with  $\text{C}_2\text{H}_2$  in gas cell  
probably not well pumped (not res test)

overlap of orders

on edge between longslit and longest short slit

Cell. 0002	2 sec int, gain 25 num = 1, v det = 4.0
. 0003	4 sec int, may be saturated online
. 0004	1 sec
. 0005	0.5 sec, 2 n frame

moved off blaze same spectral setting

cell. 0006	0.5 sec, 2 n frame
. 0007	1 sec, 1 n frame
. 0008	2 sec, 1 n frame
. 0009	4 sec,

room. 0010	overlap orders, blackbody 0.5 int, 2 n frame
. 0011	1 sec int
. 0012	2 sec int

. 0013 - taken on continuous by mistake

room <del>cell</del> . 0014	empty gas cell <del>4 sec</del> 0.5 sec, 2 n frame
. 0015	1 sec
. 0016	2 sec
. 0017	4 sec
. 0018	8 sec

really is gas cell

changed  $\bar{\nu} \sim 845 \text{ cm}^{-1}$

Pumped gas cell

Cell .0019	empty cell	0.5 sec int
.0020	1 sec	
.0021	2 sec	
.0022	4 sec	

moved to ~~the~~ centered on longest short slit.

cell. 0023	0.5 sec int
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Changed to  $1245 \text{ cm}^{-1}$

have overlapping orders  
and are shifted to on side of blaze

room. 0024	0.5 sec int	
room. 0025	1 sec int	
.0026	2 sec	
.0027	4 sec	
.0028	8 sec	some places saturated

placed mirror cover over window

meov. 0029	8 sec
.0030	4 sec
.0031	2 sec
.0032	1 sec
.0033	0.5 sec

2.034 kmires

Testing for a Bias Curve  
at  $1245 \text{ cm}^{-1}$  looking through small pinhole  
at the room

$V_{\text{det}} = -2.49$

Gain = 50

bias .0034

$V_{\text{det}} = -2.49$

300 counts

bias .0035

$V_{\text{det}} = -3.00$

1000 counts

.0036

$= -3.5$

1500

.0037

$= -4.0$

1900

.0038

$= -4.5$

2050

.0039

$= -5.0$

2450

.0040

$= -5.5$

3100

normal  $1245$  setup with 1.8" wide slit

bias .0041

$V_{\text{det}} = -2.5$

1100 counts

.0042

$V_{\text{det}} = -3.0$

7900

.0043

$V_{\text{det}} = -3.5$

13600

.0044

$= -4.0$

17500

.0045

$V_{\text{det}} = -4.5$

21000

Went to med mode at same wavelength Gain = 25

bias .0046

$V_{\text{det}} = -2.5$

1400 counts

.0047

$= -3.0$

12000

.0048

$= -3.5$

24500

.0049

$= -4.0$

39000

.0050

$= -4.5$

? sat

~~Switched~~  
Switched to  $780\text{cm}^{-1}$  in med mode

bias .0051	$V_{\text{det}} = -2.5$	counts 8500
.0052	$= -3.0$	64500
.0053	$= -3.5$	152000
.0054	$= -4.0$	311000
.0055	$= -4.25$	409000
.0056	$= -4.5$	Saturated

hi - med at same settings

bias .0057	$V_{\text{det}} = -2.5$	counts 1200
.0058	$= -3.0$	8900
all at 1.4" slit .0059	$= -3.5$	18000
.0060	$= -4.0$	27000
.0061	$= -4.25$	32000 noisy
1.0" slit .0062	$= -4.25$	21000
1.0" slit bias .0063 minor	$= -4.25$	2000
bias .0064	$= -4.5$	2400