1. Summary of LittleDog controlled devices

This table summarizes the devices controlled by the littledog computer.

Short name	Controller	Axis/Serial	A/D ch	Notes
CalMir	PC58/Stepper	v	n/a	
Dit	PC58/Stepper	x	0	
OSF	PC58/Stepper	y	1	
Rot	Anamatics SM	/dev/ttyC0	6	
Slit	PC58/Stepper	z	2	
Grat	Anamatics SM	/dev/ttyC1	7	
GFlt	PC58/Stepper	t	3	
Afoc	PC58/Stepper	u	4	
TC Spex	LS tc330 Cntlr	/dev/ttyC2	n/a	
TC Guider	LS tc330 Cntlr	/dev/ttyC3	n/a	
TC208	LS tc228 Cntlr	/dev/ttyC4	n/a	

The SPeX mechanisms can be grouped into 4 types: detented wheels, continuous rotary, continuous linear, and 2-position linear.

The detented mechanisms are the Dichroic Turret, Order Sorter Filter, Slit Wheel and Guider Filter Wheel. Each of these mechanisms is effectively a wheel with discrete positions provided by a detent notch machined on the wheel. The wheel is locked into place when positioned in the detent. An HESensor indicates when the wheel is positioned in the detent by sensing the presence of a magnet located at each detent. The HESensor can also sense a single Home magnet positioned between 2 of the wheel's detents. The PC58 Controller/Stepper motor drives these mechanisms. A PC58 input bit is tripped ON when the sensor is in a detent. The PC58 axis home bit is tripped ON when the sensor is near the Home magnet. The output of the HESensor is also connected to an AD16 A/D channel.

The continuous rotary wheels are the Rotator and Grating Turret. These wheels have a single magnet and HESensor. The output of the sensor is connected to the AD16 A/D channel. These are high resolution anti-backlash mechanisms. They use a complex home algorithm to precisely calculate their home positions.

A continuous linear mechanism is used for the Array Focus Stage. This stage has a duel magnet / HESensor setup which can encode the position of the stage. The sensor is connected to an AD16 A/D input. The center position of the stage is located at 0 volts. As the stage moves in the negative direction, the voltage becomes more negative. As the stage moves in the positive direction, the voltage becomes more positive.

The 2-position linear mechanism is used for the calibration mirror. Details to be determine.

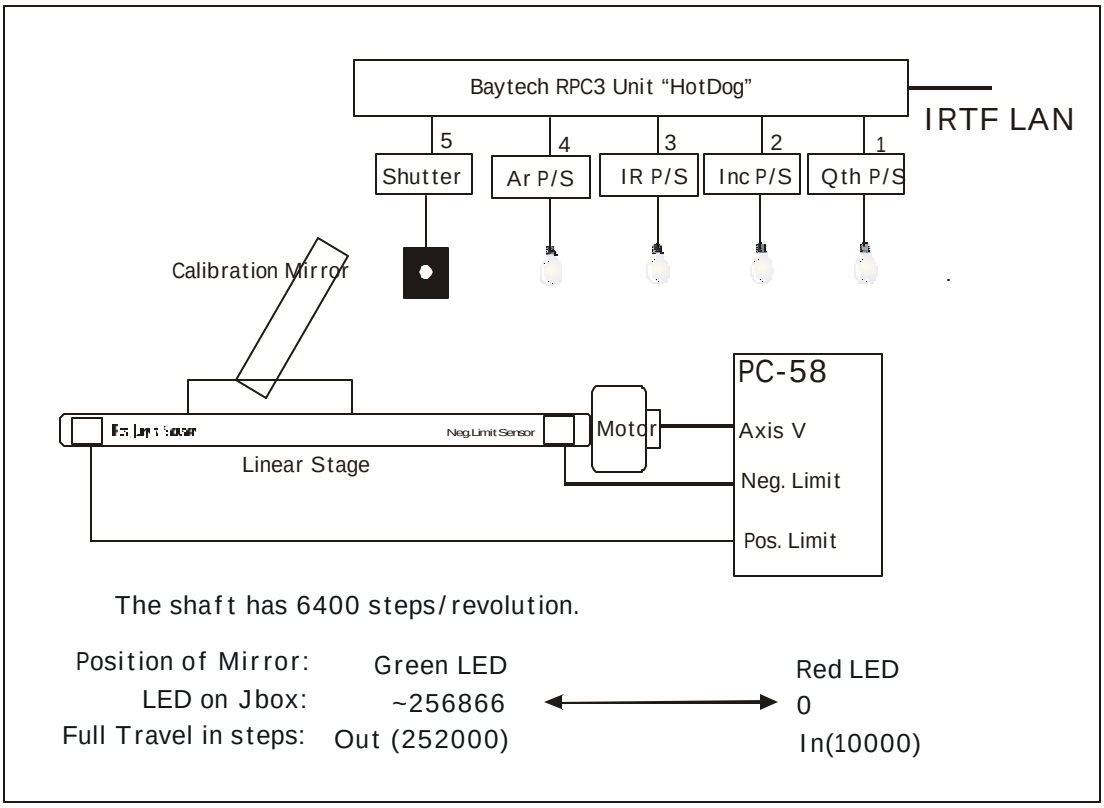
There are calibration lamps that are controlled by turning off or on their power supplies.

Two temperature controllers are connected to littledog though its serial port. You can communicate directly with these controllers using the SPeX software or the tc330_tool application.

2. Calibration Mirror & Lamps

2.1 Summary of Cal_Mirror & Lamps

A stepper motor drives a linear stage to position the calibration mirror In or Out of the beam. A Baytech RPC3 (Remote Power Control) switch controls the A/C power to 4 power supplies to turn the 4 SpeX calibration lamps, and shutter On and OFF. The following diagram illustrates the interface to the PC-58 motor controller, the RPC3, and provides some motor position information.



See section 10 for description of RPC-3 unit use to control the calibration lamp power.

2.3 CalMir Commands

2.3.1 calmir_init – Calibration Mirror initialization command

SYNOPSIS: dit_init [-cdh]

DESCRIPTION: This command initializes the Calibration Mirror & Lamp power. The mirror is positioned in the OUT position and all power to the lamps are turned off. During execution, the shared memory status is updated. The following command line options are available:

-c Caller Option (to disregard state). Normally the init command can only run if the current state is at READY or ERROR. During the BUSY or INITIALIZE states another process should be driving the mechanism. However, due to software error, the state can be left in an incorrect setting. The Caller Option disables this restriction, allowing initialization of the mechanism regardless of its state.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

2.3.2 calmir_pos – Calibration Mirror & Lamp position command

SYNOPSIS: calmir_pos [-cdh –l #lamp_id] step_number

DESCRIPTION: This command will position the calibration mirror to the indicated step number and turns on/off the RPC outlet to the lamp's power supply. The following command line options are available:

-c Caller Option (to disregard state). Normally this command runs only if the device is in a READY state. This option tells dit_pos to ignore the current state. This allows the RPC program to set the state to BUSY and then execute the command.

-l Lamp. Identifies the lamp to be turned on. All other lamps are turned off.
0 = Turn all lamps off.
1 = Qth
2 = Inc
3 = IR
4 = Arg
5 = Qth & IR

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

2.3.3 calmir_sim – calmir (and lamp) simulation command

SYNOPSIS: calmir_sim [-dh] { off | on }

DESCRIPTION: This command turns the simulation flag OFF or ON. When ON, the motor movements are simulated in software. The following command line options are available:

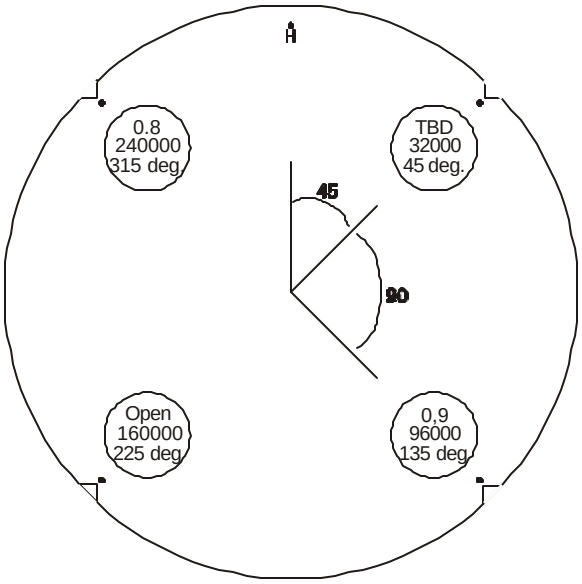
-d Debug. Various debug-type messages are printed to standard output during execution.

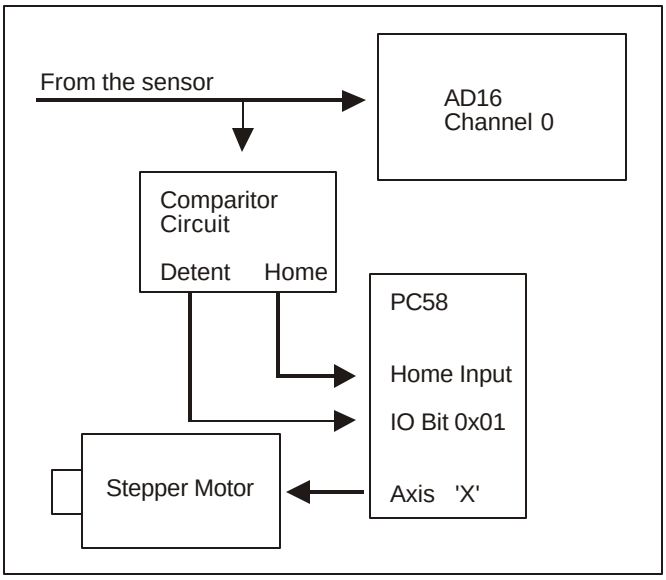
-h Help. Displays a short summary of the command's arguments and options.

3. The Dichroic Wheel

3.1 Summary of Dichroic wheel

The dichroic wheel is a 4-position detent mechanism. The following figures illustrate the wheel's physical makeup and interfaces to the littledog computer.





This table summarizes each position's name and location on the wheel.

Steps/rev = 256000

Menu Inx	Short Name	Long Name	Angle	Step Pos
0	TBD	ToBeDetermine/Open	45	32000
1	0.9	0.9 (Rf:0.47-0.92,Tx:0.92-6)	135	96000
2	Open	Open	225	160000
3	0.8	0.8, Rf:0.42-0.8 Tx:0.80-6.0	315	224000

3.2 Dichroic commands

The dichroic wheel is normally controlled from the SPeX's Graphical User Interface. The GUI uses an RPC request to execute dichroic commands located on the littledog computer. However, it is possible to logon to littledog and executes these commands manually. Each command is described below.

3.2.1 dit_init – dichroic initialization command

SYNOPSIS: dit_init [-cdh]

DESCRIPTION: This command initializes the dichroic wheel using the detent wheel homing algorithm. The wheel is then positioned in a discrete position. During execution, the shared memory status is updated. The following command line options are available:

-c Caller Option (to disregard state). Normally the init command can only run if the current state is at READY or ERROR. During the BUSY or INITIALIZE states another process should be driving the mechanism. However, due to software error, the state can be left in an incorrect setting. The Caller Option disables this restriction, allowing initialization of the mechanism regardless of its state.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

3.2.2 dit_pos – dichroic position command

SYNOPSIS: dit_pos [-cadh] step_number

DESCRIPTION: This command will position the dichroic wheel to the indicated step number. The following command line options are available:

-c Caller Option (to disregard state). Normally this command runs only if the device is in a READY state. This option tells dit_pos to ignore the current state. This allows the RPC program to set the state to BUSY and then execute the command.

-a Absolute Move. Normally the move is done using the move-to-detent algorithm. This option will position the wheel to step_number using a simple absolute move command.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

3.2.3 dit_sim – dichroic simulation command

SYNOPSIS: dit_sim [-dh] { off | on }

DESCRIPTION: This command turns the simulation flag OFF or ON. When ON, the motor movements are simulated in software. The following command line options are available:

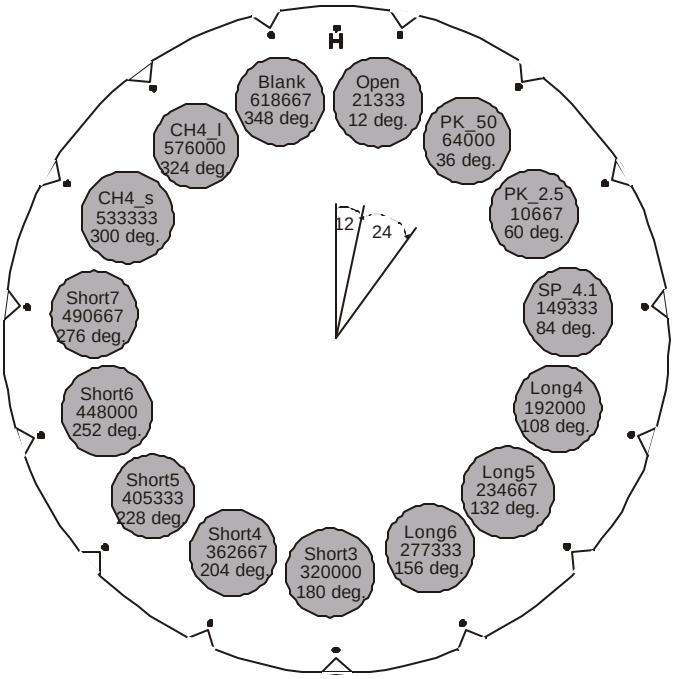
-d Debug. Various debug-type messages are printed to standard output during execution.

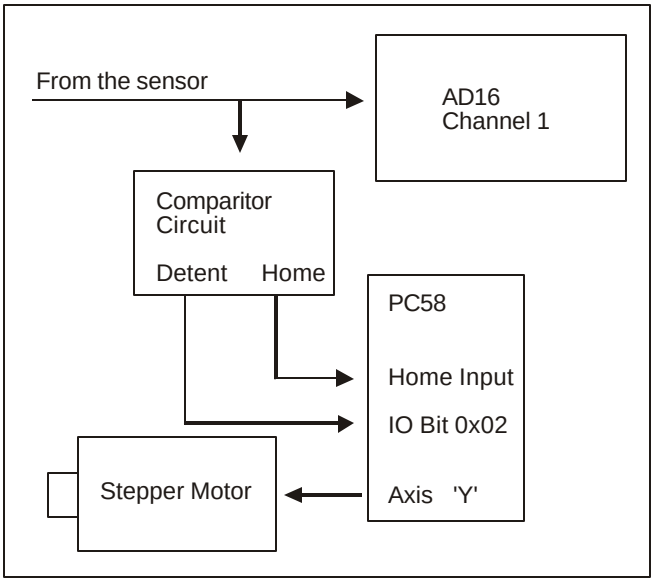
-h Help. Displays a short summary of the command's arguments and options.

4. The Order Sorter Filter (OSF)

4.1 Summary of OSF wheel

The OSF wheel is a 15-position detent mechanism. The following figures illustrate the wheel's physical makeup and interfaces to the littledog computer.





This table summarizes each position's name and location on the wheel.

Steps/Rev = 640000

Menu Inx	Short Name	Long Name	Angle	Step Pos
0	Open	Open	12	21333
1	PK_50	PK_50 - Pass < 2.5 um	36	64000
2	SP_2.5	SP_2.5 - Pass < 2.5 um	60	106667
3	SP_4.1	SP_4.1 - Pass < 4.1	84	149333
4	Long4	Long4 4.40 - 6.00 um	108	192000
5	Long5	Long5 3.59 - 4.14	132	234667
6	Long6	Long6 3.13 - 3.53 um	156	277333
7	Short3	Short3 1.92 - 2.52 um	180	320000
8	Short4	Short4 1.47 - 1.80 um	204	362667
9	Short5	Short5 1.17 - 1.37um	228	405333
10	Short6	Short6 1.03 - 1.17um	252	448000
11	Short7	Short7 0.91 - 1.00um	276	490667
12	CH4_s	CH4_s 1.58um 6%	300	533333
13	CH4_l	CH4_l 1.69um 6%	324	576000
14	Blank	Blank - Closed	348	618667

4.2 OSF commands

The OSF wheel is normally controlled from the SPeX's Graphical User Interface. The GUI uses an RPC request to execute OSF commands located on the littledog computer. However, it is possible to logon to littledog and executes these commands manually. Each command is described below.

4.2.1 osf_init – order sorter filter initialization command

SYNOPSIS: osf_init [-cdh]

DESCRIPTION: This command initializes the osf wheel using the detent wheel homing algorithm. The wheel is then positioned in a discrete position. During execution, the shared memory status is updated. The following command lines options are available:

-c Caller Option (to disregard state). Normally the init command can only run if the current state is at READY or ERROR. During the BUSY or INITIALIZE states another process should be driving the mechanism. However, due to software error, the state can be left in an incorrect setting. The Caller Option disables this restriction, allowing initialization of the mechanism regardless of its state.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

4.2.2 osf_pos– order sorter filter position command

SYNOPSIS: osf_pos [-cadh] step_number

DESCRIPTION: This command will position the OSF wheel to the indicated step number. The following command line options are available:

-c Caller Option (to disregard state). Normally this command runs only if the device is in a READY state. This option tells osf_pos to ignore the current state. This allows the RPC program to set the state to BUSY and then execute the command.

-a Absolute Move. Normally the move is done using the move-to-detent algorithm. This option will position the wheel to step_number using a simple absolute move command.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

4.2.3 osf_sim – order sorter filter simulation command

SYNOPSIS: osf_sim [-dh] { off | on }

DESCRIPTION: This command turns the simulation flag OFF or ON. When ON, the motor movements are simulated in software. The following command line options are available:

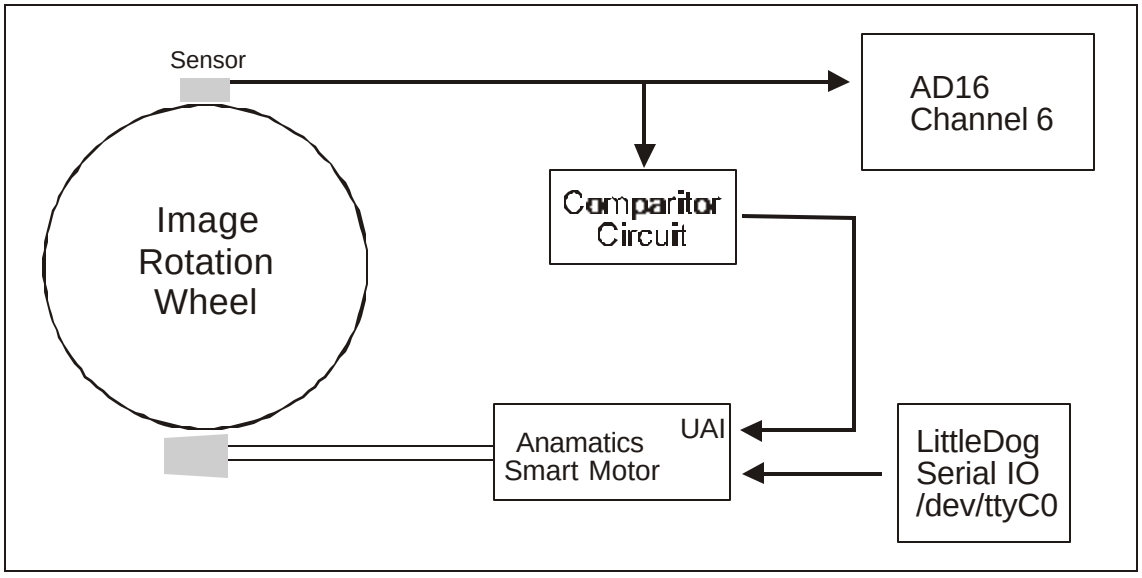
-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

5. The Rotator

5.1 Summary of Rotator wheel

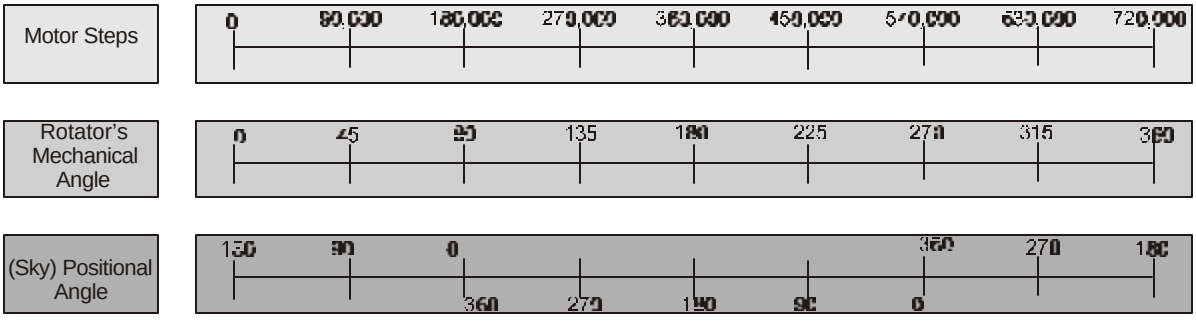
The rotator is a continuous wheel mechanism. The following figure illustrates the wheel's physical makeup and interfaces to the littledog computer.



Methods for describing the Rotator's Position:

Motor Steps – The rotator is controlled using a stepper motor. The mechanism has a step range of 0 to 720,000.
Rotator Angle – The rotator angle is simple mapping of degrees (0 to 360) to the motor steps (0 to 720,000).
Position Angle – The position angle describes the orientation of the slit to the sky image. 0 degrees, the slit is vertical (North on Top). Positive angles rotator the slit clockwise. Negative angles rotate the slit counter-clockwise.

This diagram illustrates the relationship between the position Angle, rotator angle, and Motor Steps.



5.2 Rotator commands

The Rotator wheel is normally controlled from the SPeX's Graphical User Interface. The GUI uses an RPC request to execute rotator commands located on the littledog computer. However, it is possible to logon to littledog and executes these commands manually. Each command is described below.

5.2.1 rot_init – rotator initialization command

SYNOPSIS: rot_init [-cdh]

DESCRIPTION: This command initializes the rotator wheel using the continuous wheel homing algorithm. The wheel is then positioned in a default position. During execution, the shared memory status is updated. The following command lines options are available:

-c Caller Option (to disregard state). Normally the init command can only run if the current state is at READY or ERROR. During the BUSY or INITIALIZE states another process should be driving the mechanism. However, due to software error, the state can be left in an incorrect setting. The Caller Option disables this restriction, allowing initialization of the mechanism regardless of its state.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

5.2.2 rot_pos – rotator position command.

SYNOPSIS: rot_pos [-cdh] step_number

DESCRIPTION: This command will position the rotator wheel to the indicated step number. The following command line options are available:

-c Caller Option (to disregard state). Normally this command runs only if the device is in a READY state. This option tells rot_pos to ignore the current state. This allows the RPC program to set the state to BUSY and then execute the command.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

5.2.3 rot_sim- rotator simulation command

SYNOPSIS: rot_sim [-dh] { off | on }

DESCRIPTION: This command turns the simulation flag OFF or ON. When ON, the motor movements are simulated in software. The following command line options are available:

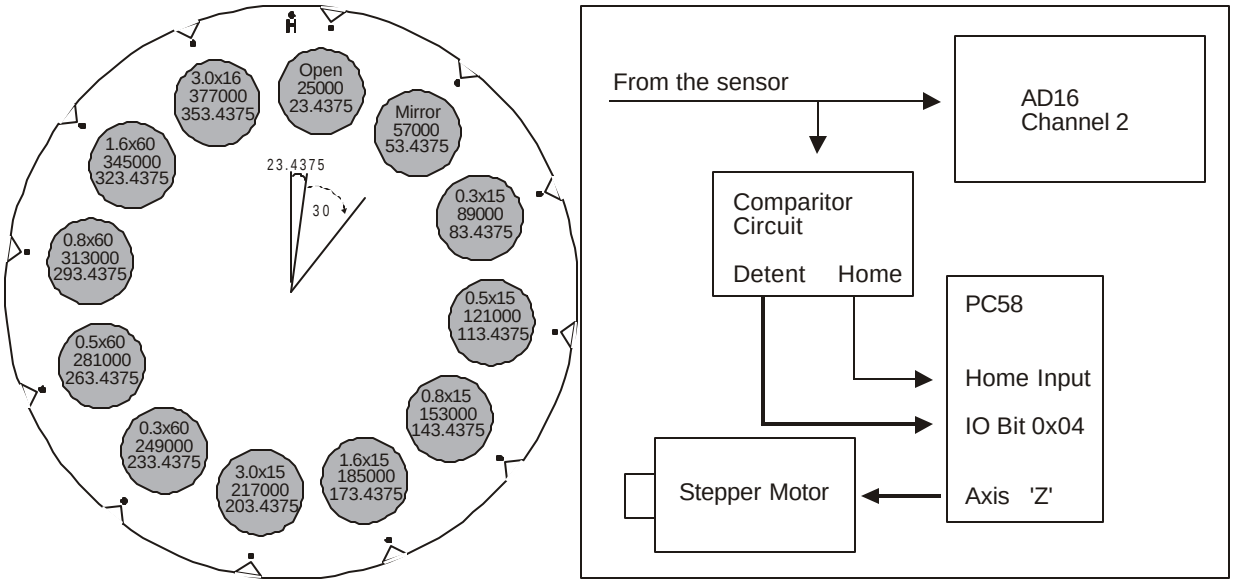
-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

6. The Slit Wheel

6.1 Summary of Slit wheel

The slit wheel is a 12-position detent mechanism. The following figures illustrate the wheel's physical makeup and interfaces to the littledog computer.



This table summarizes each position's name and location on the wheel.

Steps/Rev = 384000

Short Name	Long Name	Angle	Step Pos
Open	Open	23.4375	25000
Mirror	Mirror/Blank	53.4375	57000
0.3x15	0.3x15 arcsec	83.4375	89000
0.5x15	0.5x15 arcsec	113.4375	121000
0.8x15	0.8x15 arcsec	143.4375	153000
1.6x15	1.6x15 arcsec	173.4375	185000
3.0x15	3.0x15 arcsec	203.4375	217000
0.3x60	0.3x60 arcsec	233.4375	249000
0.5x60	0.5x60 arcsec	263.4375	281000
0.8x60	0.8x60 arcsec	293.4375	313000
1.6x60	1.6x60 arcsec	323.4375	345000
3.0x60	3.0x60 arcsec	353.4375	377000

This table summaries the setting of the AutoGuideBox Commands based on the slit position:

	Box A					
	Upper-Left				Center X,Y	
Name	x	y	wid	hgt	X	Y
open	219	211	30	30	234	226
mirror	219	211	30	30	234	226
0.3x15	220	211	30	30	235	226
0.5x15	216	212	30	30	231	227
0.8x15	217	215	30	30	232	230
1.6x15	217	211	30	30	232	226
3.0x15	216	211	30	30	231	226
0.3x60	219	211	30	30	234	226
0.5x60	215	212	30	30	230	227
0.8x60	215	215	30	30	230	230
1.6x60	219	211	30	30	234	226
3.0x60	219	211	30	30	234	226

Box B					
Upper-Left				Center X,Y	
x	y	wid	hgt	X	Y
219	275	30	30	234	290
219	275	30	30	234	290
220	275	30	30	235	290
216	275	30	30	231	290
217	278	30	30	232	293
217	275	30	30	232	290
216	275	30	30	231	290
219	275	30	30	234	290
216	275	30	30	231	290
216	278	30	30	231	293
219	275	30	30	234	290
219	275	30	30	234	290

6.2 Slit commands

The slit wheel is normally controlled from the SPeX's Graphical User Interface. The GUI uses an RPC request to execute slit commands located on the littledog computer. However, it is possible to logon to littledog and executes these commands manually. Each command is described below.

6.2.1 slit_init – slit initialization command

SYNOPSIS: slit_init [-cdh]

DESCRIPTION: This command initializes the slit wheel using the detent wheel homing algorithm. The wheel is then positioned in a discrete position. During execution, the shared memory status is updated. The following command lines options are available:

-c Caller Option (to disregard state). Normally the init command can only run if the current state is at READY or ERROR. During the BUSY or INITIALIZE states another process should be driving the mechanism. However, due to software error, the state can be left in an incorrect setting. The Caller Option disables this restriction, allowing initialization of the mechanism regardless of its state.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

6.2.2 slit_pos – slit position command

SYNOPSIS: slit_pos [-cadh] step_number

DESCRIPTION: This command will position the slit wheel to the indicated step number. The following command line options are available:

-c Caller Option (to disregard state). Normally this command runs only if the device is in a READY state. This option tells slit_pos to ignore the current state. This allows the RPC program to set the state to BUSY and then execute the command.

-a Absolute Move. Normally the move is done using the move-to-detent algorithm. This option will position the wheel to step_number using a simple absolute move command.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

6.2.3 slit_sim – slit simulation command.

SYNOPSIS: slit_sim [-dh] { off | on }

DESCRIPTION: This command turns the simulation flag OFF or ON. When ON, the motor movements are simulated in software. The following command line options are available:

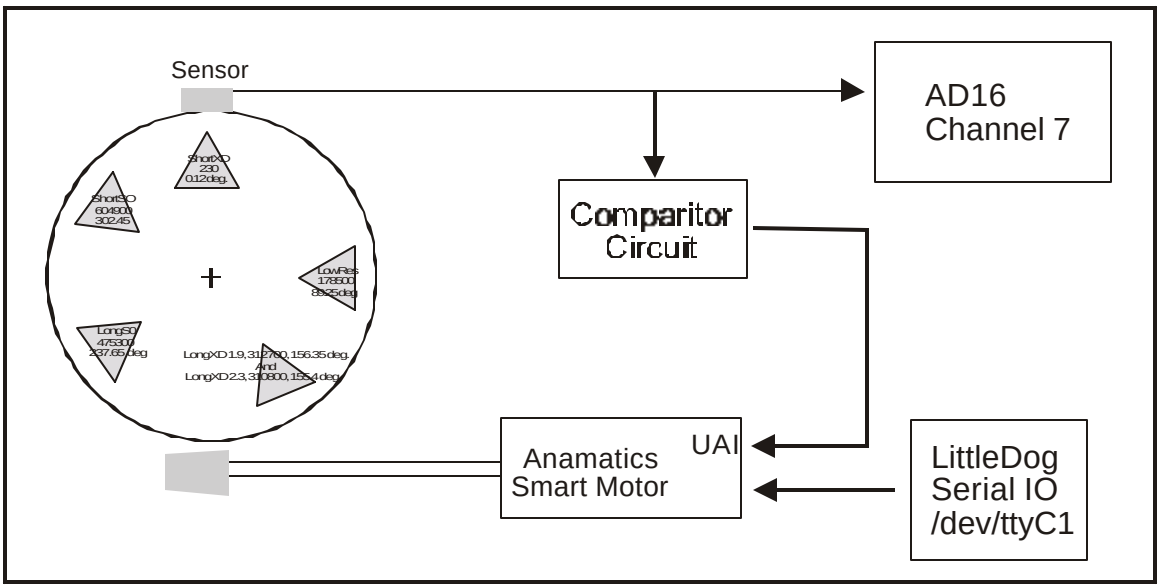
-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

7. The Grating Turret

7.1 Summary of Grating Turret

The grating is a continuous wheel mechanism. The following figure illustrates the wheel's physical makeup and interfaces to the littledog computer.



Step/Rev = 720000

Short Name	Long Name	Angle	Step Position	Desired Focus Pos
ShortXD	ShortXD 0.8 - 2.46 um	359.80	719600	100000
LongXD1.9	LongXD 1.9 - 4.20 um	156.25	312500	125000
LongXD2.3	LongXD 2.3 - 5.50 um	155.30	310600	125000
LowRes60	LowRes 0.8 - 2.50 um	89.08	178150	50000
LowRes15	LowRes 0.8 - 2.50 um	89.68	179350	50000
ShortOS	Short Single Order 0.9 - 2.50 um	302.35	604700	0
LongOS	Short Signal Order 3.1 - 5.50 um	237.55	475100	0

7.2 Grating commands

The grating turret wheel is normally controlled from the SPeX's Graphical User Interface. The GUI uses an RPC request to execute grating commands located on the littledog computer. However, it is possible to logon to littledog and executes these commands manually. Each command is described below.

7.2.1 grat_init – grating initialization command

SYNOPSIS: grat_init [-cdh]

DESCRIPTION: This command initializes the grating turret using the continuous wheel homing algorithm. The wheel is then positioned in a default position. During execution, the shared memory status is updated. The following command lines options are available:

-c Caller Option (to disregard state). Normally the init command can only run if the current state is at READY or ERROR. During the BUSY or INITIALIZE states another process should be driving the mechanism. However, due to software error, the state can be left in an incorrect setting. The Caller Option disables this restriction, allowing initialization of the mechanism regardless of its state.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

7.2.2 grat_pos – grating position command.

SYNOPSIS: grat_pos [-cdh] step_number

DESCRIPTION: This command will position the grating wheel to the indicated step number. The following command line options are available:

-c Caller Option (to disregard state). Normally this command runs only if the device is in a READY state. This option tells grat_pos to ignore the current state. This allows the RPC program to set the state to BUSY and then execute the command.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

7.2.3 grat_sim- grating simulation command

SYNOPSIS: grat_sim [-dh] { off | on }

DESCRIPTION: This command turns the simulation flag OFF or ON. When ON, the motor movements are simulated in software. The following command line options are available:

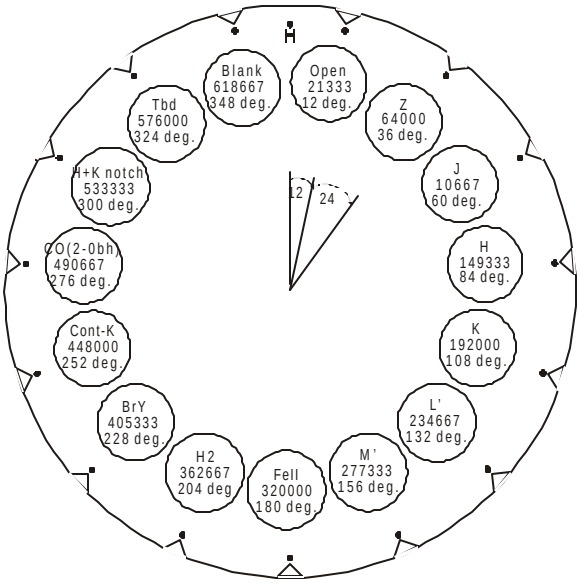
-d Debug. Various debug-type messages are printed to standard output during execution.

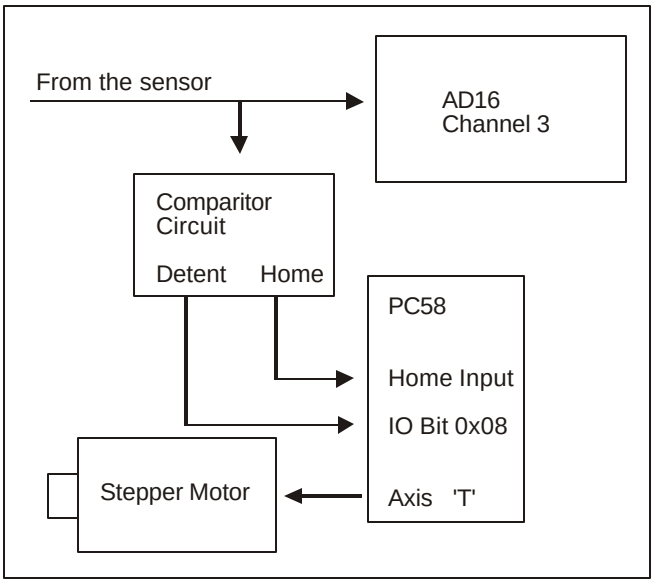
-h Help. Displays a short summary of the command's arguments and options.

8. The Guider Filter (GFlt)

8.1 Summary of GFlt wheel

The GFlt wheel is a 15-position detent mechanism. The following figures illustrate the wheel's physical makeup and interfaces to the littledog computer.





This table summarizes each position's name and location on the wheel.

Steps/Rev = 640000

Menu Inx	Short Name	Long Name	Angle	Step Pos
0	Open	Open	12	21333
1	Z	Z 0.95 - 1.11 um	36	64000
2	J	J 1.164-1.326 um	60	106667
3	H	H 1.487-1.783 um	84	149333
4	K	K 2.027-2.363 um	108	192000
5	L'	L' 3.424-4.124 um	132	234667
6	M'	M' 4.562-4.803um	156	277333
7	FeII	FeII 1.644 1.5%	180	320000
8	H2	H2 v=1-0 s(1) 2.122 1.5%	204	362667
9	BrY	BrY 2.166um 1.5%	228	405333
10	contK	cont-K 2.26 um 1.5%	252	448000
11	CO	CO(2-0bh) 2.294um 1.5%	276	490667
12	H+K	H+K notch	300	533333
13	3.454	3.454um 0.5%	324	576000
14	Blank	Blank	348	618667

8.2 Guider Filter commands

The GFlt wheel is normally controlled from the SPeX's Graphical User Interface. The GUI uses an RPC request to execute GFlt commands located on the littledog computer. However, it is possible to logon to littledog and execute these commands manually. Each command is described below.

8.2.1 gflt_init – guider filter initialization command

SYNOPSIS: gflt_init [-cdh]

DESCRIPTION: This command initializes the gflt wheel using the detent wheel homing algorithm. The wheel is then positioned in a discrete position. During execution, the shared memory status is updated. The following command lines options are available:

-c Caller Option (to disregard state). Normally the init command can only run if the current state is at READY or ERROR. During the BUSY or INITIALIZE states another process should be driving the mechanism. However, due to software error, the state can be left in an incorrect setting. The Caller Option disables this restriction, allowing initialization of the mechanism regardless of its state.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

8.2.2 gflt_pos– guider filter position command

SYNOPSIS: gflt_pos [-cadh] step_number

DESCRIPTION: This command will position the gflt wheel to the indicated step number. The following command line options are available:

-c Caller Option (to disregard state). Normally this command runs only if the device is in a READY state. This option tells gflt_pos to ignore the current state. This allows the RPC program to set the state to BUSY and then execute the command.

-a Absolute Move. Normally the move is done using the move-to-detent algorithm. This option will position the wheel to step_number using a simple absolute move command.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

8.2.3 gflt_sim – guider filter simulation command

SYNOPSIS: gflt_sim [-dh] { off | on }

DESCRIPTION: This command turns the simulation flag OFF or ON. When ON, the motor movements are simulated in software. The following command line options are available:

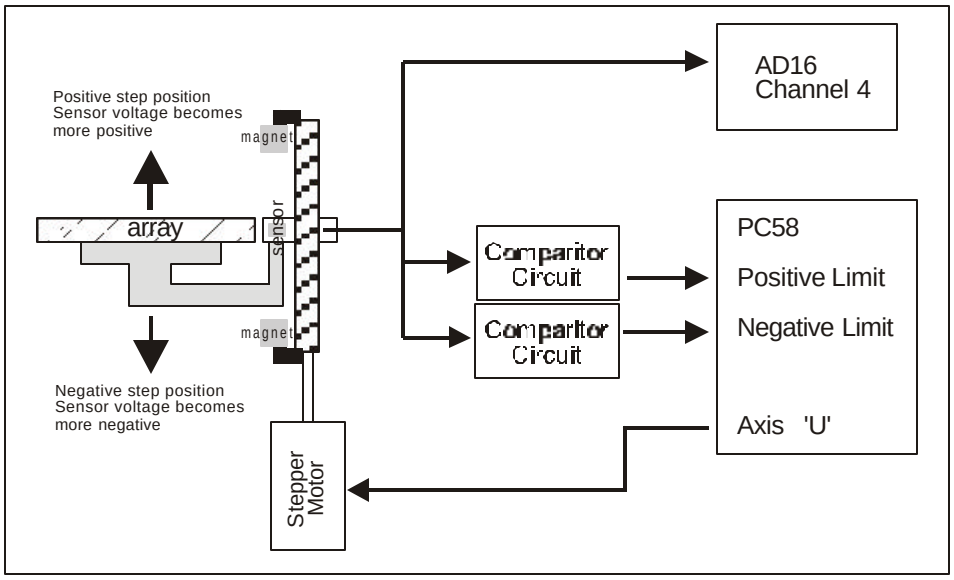
-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

9. The (Spectrograph) Array Focus

9.1 Summary of Afoc mechanism

The AFoc mechanism is a continuous linear slide. The following figure illustrates the wheel's physical makeup and interfaces to the littledog computer.



There are 6500 steps per motor revolution.
1 revolution of the axis = 50 microns of linear travel.

Several Nth degree polynomial equations are used to convert between HE Sensors voltage output and the motor position counts. The y = f(x) represents a Nth degree polynomial fit. The equations would look like:

$$y = a + xb + x^2c + x^3d + x^4e + ...$$

```
Here are the coefficients for volts = f(step) for steps > 0.

     a = 0.001485338738
     b = 4.790665341E-6
     c = -9.288558697E-12
     d = 1.493343871E-16
     e = -5.069249881E-22
     f = 1.076768382E-27

Here coefficients for volt = f(step) for step < 0.

     a = 0.007388485132
     b = 4.6880558E-6
     c = 8.425187609E-12
     d = 1.215113197E-16
     e = 4.133287597E-22
     f = 9.032058324E-28

Here are the coefficients for steps = f(volts) for step > 0.

     a = -2068.814187
     b = 245944.684
     c = -91923.26161
     d = 17884.99208
```

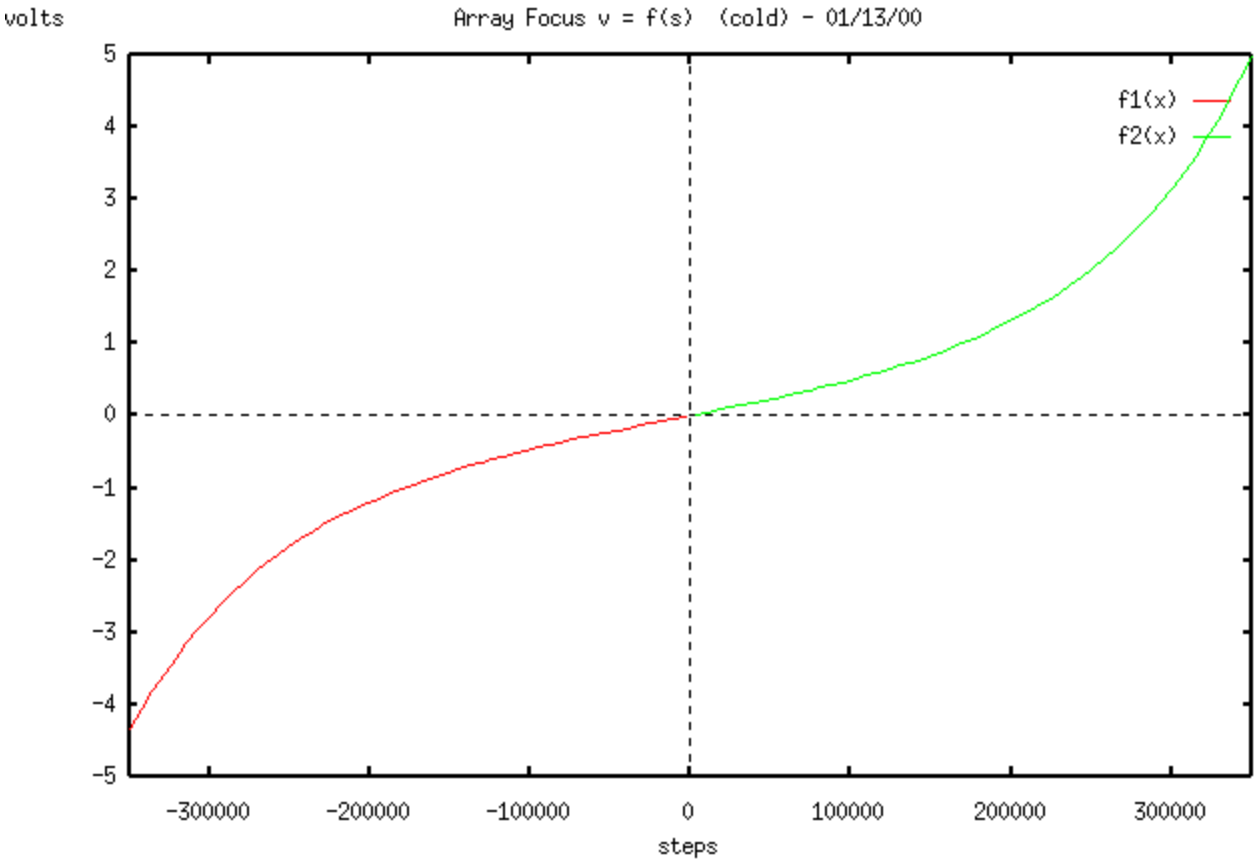
```
     e = -769.6607777
     f = -139.3147189

Here are the coefficients for steps = f(volts) for step < 0.

     a = -66.84140123
     b = 247791.9112
     c = 76057.25043
     d = 4628.385596
     e = -3089.756591
     f = -499.5566671
```

Current hardware limits at: -296,261 to 313,106
Software limits set to: -295,000 to 310,000

A graph would look something like:



9.2 Array Focus Commands

The AFoc wheel is normally controlled from the SPeX's Graphical User Interface. The GUI uses an RPC request to execute AFoc commands located on the littledog computer. However, it is possible to logon to littledog and execute these commands manually. Each command is described below.

9.2.1 afoc_init – array focus initialization command

SYNOPSIS: afoc_init [-cdh]

DESCRIPTION: This command initializes the afoc device by positioning the stage at 0 volts and setting its step counter to 0. The following command lines options are available:

-c Caller Option (to disregard state). Normally the init command can only run if the current state is at READY or ERROR. During the BUSY or INITIALIZE states another process should be driving the mechanism. However, due to software error, the state can be left in an incorrect setting. The Caller Option disables this restriction, allowing initialization of the mechanism regardless of its state.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

9.2.2 afoc_pos– array focus position command

SYNOPSIS: afoc_pos [-cdh] step_number

DESCRIPTION: This command will position the array focus to the indicated step number. The following command line options are available:

-c Caller Option (to disregard state). Normally this command runs only if the device is in a READY state. This option tells afoc_pos to ignore the current state. This allows the RPC program to set the state to BUSY and then execute the command.

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

9.2.3 afoc_sim – array focus simulation command

SYNOPSIS: afoc_sim [-dh] { off | on }

DESCRIPTION: This command turns the simulation flag OFF or ON. When ON, the motor movements are simulated in software. The following command line options are available:

-d Debug. Various debug-type messages are printed to standard output during execution.

-h Help. Displays a short summary of the command's arguments and options.

10. Baytech RPC-3 (Remote Power Control) - Spex uses two RPC-3 units:

10.1 The Hotdog RPC-3 unit is used to control spex's calibration lamps and shutter mechanism. Normally the IC/XUI controls this RPC-3 unit. You should not telnet into this unit (unless the IC/XUI are not functioning). The outlets are assigned as follows:

Outlet	Item	Off	On
1	Qth Lamp Power Supply	off	on
2	Incandesce Lamp Power Supply	off	on
3	IR Source Power Supply	off	on
4	Argon Lamp Power Supply	off	on
5	Shutter Mechanism	closed	open

1**0.2 The Power4 RPC-3** is a general-purpose unit to power spex's MIM hardware. Use telnet to access these items. The outlet are assigned as follows:

Outlet	Item
1	LittleDog Computer
2	Lakeshore 330 Temp Cntl (Guidedog)
3	Lakeshore 330 Temp Cntl (Bigdog)
4	Lakeshore 208 Temp Cntl
5	HP Power Supply (Array Electronics Power)

10.3 Hostname and IP Numbers:

The Hotdog RPC-3 is known as:
Manoa Hostname/IP is: Hotdogm 128.171.79.153
Summit Hostname/IP is: Hotdog 128.171.165.73
The Power4 RPC-3 is known as:
Summit Hostname/IP is: Power4 128.171.165.44

10.4 RPC login & Passwords – The following logins & password are defined for both RPC-3.

Username	Password	Allowed outlets	Comment
Spex	Rpcopen	1 to 4	This account is used by littledog's applications to control the lamp power. No individual should use this account.
Irtf	Rpcopen	All 8	If you wish to telnet to the rpc unit. Use this account. It is the general-purpose account for the IRTF technical staff.
Admin	Standard RPC3 password – see administrator.	All 8	Standard RPC administration account.

11. Vendor Contact

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The End.