

WHIRC Short Information List

WHIRC Information

Wavelength Coverage	900 – 2500 nm
Filters	J, H, Ks; 10 narrowband
Pixel Scale	0.10030 × 0.0986 arcsec
Field of View	205 × 198 arcsec
Detector	Raytheon Virgo HgCdTe, 2048 × 2048
Detector Gain	~ 3.4 e/ADU (0.7v bias)
Readout Modes	Fowler-1; Fowler-4
Minimum Frame Time	3.8 s (Fowler-1)
Read Noise	~ 9 ADU Fowler-1; ~5 ADU Fowler-4
Full Well	~ 35000 ADU (119000 e) @ 0.7 v bias

WHIRC Filter Characteristics

(Signal, Background in ADU/s)

Filter	$\lambda(\mu\text{m})$	$\Delta\lambda(\mu\text{m})$	t_{avg}	Signal 10.0 mag	Background
J	1.250	0.162	0.913	175000	5 - 7
H	1.651	0.310	0.867	195000	25 - 40
Ks	2.168	0.343	0.877	107000	70 - 270
Low airglow	1.060	0.0132	0.638	15900	0.18-0.22
He I	1.082	0.0094	0.706	10000	0.25-0.33
CN	1.107	0.0168	0.742	15600	0.3 – 0.4
Pa β	1.280	0.0158	0.872	15900	1.3 – 1.4
[Fe II]	1.646	0.0164	0.791	11000	1.9 – 2.6
[Fe II] (4500 km/s)	1.668	0.0162	0.917	12300	2.5 – 4.1
H ₂ S(1)	2.117	0.0216	0.680	6750	2.4 – 8.3
Br γ	2.162	0.0215	0.849	7300	4 - 13
Br γ (4500 km/s)	2.188	0.0237	0.940	8000	5 - 18
CO-w	2.342	0.103	0.905	21700	13 - 220

The background, particularly in the K band, varies significantly with temperature. The limiting values in the table were taken at ambient temperatures of -4 and +23 C.

Recommended HIGH Lamp Intensities for WHIRC Flats (5 s in Fowler1; 16 s in Fowler4)

Thanks to K. Butler/D. Williams; note that 40000 is target signal level in Fowler4

FILTER	FOWLER 1		FOWLER 4	
	LAMP SETTING	SIGNAL	LAMP SETTING	SIGNAL
J	600	11000	470	44300
H	425	11000	340	41800
Ks	380	10000	215	44500
Low airglow	1650	11000	1120	44500
He I	1900	10600	1240	44600
CN	1450	11000	1000	44600
Pa β	1200	10500	820	44500
Fe II	1000	10000	680	44500
Fe II (4500)	1050	11000	660	44000
H ₂ S(1)	1050	11000	640	44500
Br γ	950	10500	600	44500
Br γ (4500)	900	11000	570	44500
CO-w	450	10000	300	44500

Short Summary of Normal WHIRC Start-Up Sequence

- 1) Observer: If wiy-2 screen is empty, double-click on WHIRC icon to bring up menu
 - a. Single click Stop PAN button to clear out any ongoing processes
- 2) Ask OA: to single click the WHIRC Engineering window and check:
 - a. Temperature Control window
 - b. Filters window
 - c. Temperature Status window
 - d. Wait until OA says to proceed**
- 3) Observer: Single click Start PAN button
 - a. Wait for all 4 windows to open**
 - b. Be sure there are no errors** ('first read' error in panSaver is OK)
 - c. If errors, click Stop PAN button, then Start PAN button again**
- 4) Observer: single click Start MOP button
 - a. MOP debug log window appears, **make sure there are no errors**
 - b. MOP status window appears
 - c. MOP control panel appears
 - d. Wait until Filter status windows are green**
 - e. WTTM client window appears; may be iconified if WTTM not used
 - f. Check that red button on Enable WTTM button is not lit if IAS guiding is used.**
 - g. WHIRC Detector Biasing window appears
 - h. ds9 display window automatically opens

- 5) Observer: single click PyRAF button
 - a. PyRAF window opens

- 6) Observer: Check in WHIRC Detector Biasing window:
 - a. Temperature button is green (detector temp = 78.5 K)
 - b. Voltages OK button is green
 - c. **Take an image (5s integration). If counts are all zero (0.0), it will be necessary to power cycle the DHE—the OA must do this. Otherwise, proceed.**
 - d. Power Detector—answer ‘yes’
 - e. **Wait for a minute or two while the OA monitors the detector temperature. If it maintains at the proper temperature, proceed.**
 - f. Bias Detector—answer ‘yes’
 - g. **At this point, Biasing window may be iconified (NOT CLOSED)**

- 7) Observer: Single click WHOMP button [optional]
 - a. WHOMP GUI opens

Shutting Down WHIRC

At the end of the night, the MOP, PAN and WHIRC Bias tool interfaces should be closed. The WHIRC Engineering GUI should be left running on the OA terminal to permit monitoring of the WHIRC temperatures. Follow the procedure below to safely shut down WHIRC.

1. Using the MOP, put the filter wheels into the OPAQUE filter position.

2. Unbias the detector using the WHIRC Detector Biasing window. If it has been iconified, it can be brought up from the PAN pull-down menu on the MOP:
 - a. Unbias the detector by clicking on the Bias Detector radio button. A window will pop up and ask you if you want to unbias the detector. Click OK to proceed with unbiasing.
 - b. Unpower the detector by clicking on the Power Detector radio button. A window will pop up and ask you if you want to unpower the detector. Click OK to proceed with unpowering the detector.
 - c. Close the WHIRC Detector Biasing window (x on top left corner).

3. Exit the MOP by pulling down the File menu and selecting *exit*. *NOTE: Closing the Detector Biasing window may also close the MOP automatically. Closing the MOP prior to the Detector Biasing window will close that window as well.*

4. Close the PAN session by clicking the Stop PAN button. This will close the window and terminate all of the PAN background processes, including logging. This will also clear the link. If the window had been minimized during observing, bring it up by clicking on the monsoon@whirc-pan icon on the wiy-2 taskbar.

5. Keep the WHIRC Engineering GUI up for temperature control and monitoring purposes.