

WHIRC Short Information List

WHIRC Information

Wavelength Coverage	900 – 2500 nm
Filters	J, H, Ks; 10 narrowband
Pixel Scale	0.098 arcsec
Field of View	200 × 200 arcsec
Detector	Raytheon Virgo HgCdTe, 2048 × 2048
Detector Gain	~ 4.0 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 (140000 e) @ 0.7 v bias

WHIRC Filter Characteristics

Filter	$\lambda(\mu\text{m})$	$\Delta\lambda (\mu\text{m})$	t_{avg}	Signal 10.0 mag	Background
J	1.250	0.162	0.913	183000	5 - 7
H	1.651	0.310	0.867	195000	25 - 40
Ks	2.168	0.343	0.877	109000	70 - 270
Low airglow	1.060	0.0132	0.638	15300	0.18-0.22
He I	1.082	0.0094	0.706	10000	0.25-0.33
Pa β	1.280	0.0158	0.872	15500	1.3 – 1.4
Pa β (4500 km/s)	1.303	0.0133	0.863	13500	0.8 – 1.0
[Fe II]	1.646	0.0164	0.791	10500	1.9 – 2.6
[Fe II] (4500 km/s)	1.668	0.0162	0.917	11300	2.5 – 4.1
H ₂ S(1)	2.117	0.0216	0.680	7150	2.4 – 8.3
Br γ	2.162	0.0215	0.849	7500	4 - 13
Br γ (4500 km/s)	2.188	0.0237	0.940	8400	5 - 18
CO	2.293	0.0228	0.797	5800	7 - 30

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 Lamp Intensities for WHIRC Flats (5 s)

FILTER	LAMP SETTING	SIGNAL
J	550	10000
H	400	12000
Ks	350	14000
Low airglow	1600	10000
He I	1600	8000
Pa β	1200	12000
Pa β (4500)	1200	10000
Fe II	1000	11000
Fe II (4500)	1000	12000
H ₂	1000	12000
Br γ	900	10500
Br γ (4500)	900	11000
CO	1000	11000

(use 16 s frame time and lamp setting ~ 2/3 of values above for Fowler-4 mode;
target signal level ~ 40000 ADU in Fowler-4 mode)

Short Summary of Normal WHIRC Start-Up Sequence

- 1) Observer: Single click MASSIVE CLEANUP 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**
 - c. **If errors, click clear 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. **Select Disable WTTM button is IAS guiding is to be used.** Verify “WTTM dithers disabled” message in MOP status window

- 5) Observer: single click start DS9 button
 - a. ds9 window opens
- 6) Observer: single click start PyRAF button
 - a. PyRAF window opens
- 7) OA: Click WHIRC Bias icon
 - a. Reconnect PAN
 - b. Update voltages
 - c. Power Detector
 - d. Bias Detector
 - e. **Observer: wait until OA says to proceed**
- 8) Observer: Single click start WHOMP button
 - 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. Ask the observing assistant to unbias the detector using the WHIRC Bias tool window:
 - 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. Take down the WHIRC Bias tool by quitting the window.
3. In the PAN window desktop, take down the PAN window by quitting the window (x on top right corner). This action will turn off the PAN processes. If the window had been minimized during observing, bring it up by clicking on the VNC button on the taskbar.
4. Exit the MOP by pulling down the File menu and selecting exit.
5. Keep the WHIRC Engineering GUI up for temperature control and monitoring purposes.