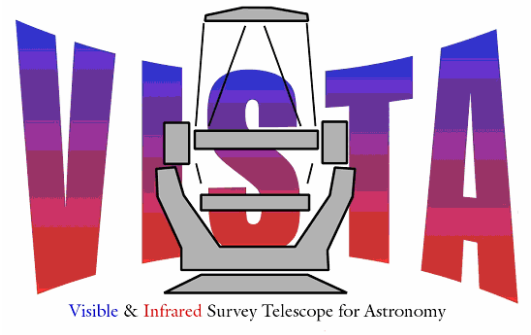

IR CAMERA

Document Title: **Thermal configuration control lists**

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Change Record

Issue	Date	Section(s) Affected	Description of Change/Change Request Reference/Remarks
Draft 0.1	18/08/03	All	New document

Notification List

The following people should be notified by email that a new version of this document has been issued and is available on the IR Camera Sharepoint database:

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TABLE OF CONTENTS

1 SCOPE

This document contains item lists summarising the camera thermal configuration.
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2 ACRONYMS & ABBREVIATIONS

ADxx	Applicable Document No xx
VISTA	Visible and Infrared Survey Telescope for Astronomy
VPO	VISTA Project Office

3 APPLICABLE DOCUMENTS

AD01	VISTA IR Camera Tech Spec	VIS-SPC-ATC-60000-00004 Issue: 1.0
AD02		
AD03		
AD04		

4 Thermal properties list

Item	Sub-item	Thermal/optic spec.	Properties/ref.
Window cell	Window	Silica	Thermal emissivity = 0.97, VIS-TRE-RAL-06064-001
	Mount	Silgard ?	Use RTV to bond window thermally to its mount. Used thermal conductivity, k = 0.25W/m/K. Could use CV2496 with k = 4W/m/K
	Cell outer	Black paint, Nextel	Thermal emissivity = 0.97
	Cell inner	Black paint, Nextel	Thermal emissivity = 0.97
Baffle tube	Vanes outward face	Black crystal	Thermal emissivity = 0.09
	Vanes inner	Black paint, Nextel	Thermal emissivity = 0.97
	Tube inner	Black paint, Nextel	Thermal emissivity = 0.97
	Tube outer	Alocrom	Thermal emissivity = 0.1
Lens barrel	Lenses	silica	Thermal emissivity = 0.97, VIS-TRE-RAL-06064-001
	Lens mounts	Polymer rings	?
	Barrel inner surfaces	Black paint, Nextel	Thermal emissivity = 0.97
	Outer	Black paint, Nextel	Thermal emissivity = 0.97
	Mount to LN2	Conductive Al flange, bolted	Interface conductivity of 1000W/m2/K VIS-ANA-RAL-06072-0001 Analysis doc p.28
LOCS/AG unit	Box outer	Black paint, Nextel	This unit needs to be added to the thermal model. Thermal engineering needs to be involved with UoD as develop the design.
	Mount	3-point Al shim	
	Conductive braid	TBD	
Filter wheel	Filter tray	Mixed property, as per ANA, table 5.5	VIS-ANA-RAL-06072-0001 Analysis doc p.28
	Filter wheel	Black paint, Nextel	Thermal emissivity = 0.97
	Filter hub & items	Black paint, Nextel	Thermal emissivity = 0.97
	Mount to LN2	Flange, bolted	Interface conductivity of 1000W/m2/K VIS-ANA-RAL-06072-0001 Analysis doc p.28
FPA	Detectors	As per ANA table 5.5	VIS-ANA-RAL-06072-0001 Analysis doc p.28
	Mounting plate	Mo black painted	Black paint, Thermal emissivity = 0.9
	Sub-frame	Black paint	Black paint, Thermal emissivity = 0.9
	Mount to LN2	3-point pads in series with bolted flange.	Interface conductivity of 1000W/m2/K

	Cold box	Black inner, alochrom outer	Not yet in model. Black/alocrom as suggestec look sgood
	Harness link to cryo wall		Needs to be added to thermal model
Cryostat	LN2 vessel	Alochrom outside, black paint inside	
	Thermal shields	Stainless, polished	Electropolished, Thermal emissivity = 0.1
	G10 trusses		Thermal conductivity, k = 0.158W/m/K
	Cryostat inner	alochrom	Thermal emissivity = 0.1
	Cryostat outer	Black paint, heater + control	Thermal emissivity = 0.9

5 Temperature sensors list

TC = Thermo-couple

Workpackage	Subsystem	Number of diodes	Diode spares	Number of TC's (for AIT only)	Notes
Cryostat	Window glass	0			Window T distribution can be checked by thermal camera
Cryostat	Window cell (outside)	1		1	
Cryostat	Ambient (outside tube)	1	1		Air temperature.
Cryostat	Tube (on outside)	1	1		In FPA-Cryost T control LS332
Cryostat	Baffle	1		6	One on each of 7 baffles. Diode on 2nd baffle
Cryostat	Lens barrel	1		2	Diode is at L3, TC's near L1, L2.
Cryostat	LN2 tank	1	1	4	TC's: 3 around perimeter. 1 on other side of G10's.
Cryostat	Radiation shield	0		6	Distributed around the vessel
Cryostat	Cold heads 1st stage and 2nd stage, x3	6			- I.e. 2 TS's per cold head
Cryostat	Thermal straps 1st stage			3	" connected to LN vessel
Cryostat	Thermal straps 2nd stage			3	" connected to DTP
Cryostat	Cryopump	2			Read by FPA-Cryost T controller Sensors of spare CP are 'pigtailed'.
Cryostat	WFS plate	1		2	Read by FPA-

					Cryost T control LS332. TC's near each WFS unit, TS near mid-point
Cryostat	WFS CCDs	(2 – 4)			Read by SDSU, so not part of the total
"	Mid-section			5	CC location, bulge upper face, cass rot mount x 3
	Lower section			3	Centre lower face, centre at side, bulge lower face
Filter wheel	Filter wheel shield	1		4	TC's: 2 on upper, 2 on lower. TS at 'extreme' radius.
Filter wheel	Filter wheel near hub	1			
Filter wheel	Filter wheel	0		6	Included in AIT, only AIT-2 when filter non-moving. Lower side, including different radii.
Focal plane	FPA frame	0		2	Operational T's are instead derived from LN tank, FW, VIRGO, thermal plate sensors. TC's on + and – X sides?
Focal plane	FPA subframe	0		2	Near top & bottom (shield) of assembly?To check conductivity of mounting
Focal plane	Thermal plate	1	1		In FPA-Cryost T control LS332
Focal plane	VIRGO detectors	8			Pigtailed, re-configurable to read the other 8, or just 4.
	TOTAL	**26**	**4**	**49**	

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