E2 AOB Dichroic Recovery Document

So, the E2 Dichroic / AOB got messed up during a change. You might see messages like those shown below and specifically the Dichroic status is listed as unknown. While these instructions are written with E2 in mind, these steps will work for any of the telescope's HUT systems provided you use that telescope in place of E2 at each step in this document.

		E2_HUT		×		
MAIN HUT	AOB AOB ENG	COOL				
E2_HUT:2021-09-20 10:58:29.001 ERROR: No response from AOB unit. RESET it? E2_HUT:2021-09-20 10:58:29.692 ERROR: failed to reset UNLOCK E2_HUT:2021-09-20 10:58:29.692 ERROR: Failed to unlock dichroic (-52). E2_HUT:2021-09-20 10:58:29.692 ERROR: Dichroic error -2						
	ELEV_M	OT inner limit re	eached			
Dichroic E UNKNOWN LO	lev BCart CKED UNLCKED	Fiber E OPEN	Beacon C-Cul OPEN OU	be 2 Hole T OUT		
VIS	BARE	IR	DISABLE	RESTART		
RESET	FLUSH	PING	REOPEN	QUIT		

For any problems or questions with this procedure, please contact Matt Anderson

Step 1. Recycle the AOB power.

On the RPC Gui, E2WFS column, turn off the AOB power. Pause a few seconds. Turn the AOB power back on. If you happen to be at the telescope, in the dome, you will hear some clicking when you do this power cycling.

<u>Step 2</u>. Reinitialize communications by restarting the PIC.

You will need a HUT GUI with engineering mode. If you don't have one, start it with "hutgtk - E E2 &". On the engineering tab, labelled "AOB ENG", click the button labelled "RESTART PIC".



E2WFS LOCK AOB ANDOR MERCURY COOLER EMPTY (5) EMPTY (6) NO ERROR CBrk: ON

<u>Step 3</u>. Make sure the dichroic is unlocked.

It most likely is, but to be safe, select ELEV_MOT from the pull-down menu and click the "UNLOCK" button.

E2_HUT ×									
MAIN HUT									
						M7			
+LIMIT	-LIMIT					UP			
SET	CAL]		LEF	т	100000	RIGHT		
ENABLE				-		DOWN	+		
	WFS					COL			
	UP					UP			
IFFT	5000	RIG	нт	LEF	т	100	RIGHT		
BEACON_	FOC	+		-		DOWN	+		
BFLAT_LIC			DICUI	DOC					
BFLAT_1	C C	FG	DICH	ros		LUCK	UNLOCK		
BFLAT_2	Т	PIC	R256	6 ON R2		256 OFF	M7 TO DFT		
ELEV_MO	Г		-	100					
ROT_MOT		DEC GOTO			GET				
DICHR_1		Cu	rrent D	ichroic I	R				
DICHR_2	E	BCart	Fib	er l	Beaco	n C-Cu	be 2 Hole		
WFS_PAR	OB_FOC	ILCKED	CLO	SED C	LOSE	D OU	T OUT		
CORNER	CUBE E		IF	2	D	ISABLE	RESTART		
WFS_X	ił.	+	PIN	IG	R	EOPEN	QUIT		

<u>Step 4</u>. Check where the software thinks the Dichroic is.

E2_HUT								
MAIN HUT	AOB AC	B ENG	cool	L				
		_				M7	,	
+LIMIT	-LIMIT					UF	,	
SET	CAL			LEF	т	100000		RIGHT
ENABLE				-		DOW	/N	+
	WFS	_				CO	L	
	UP	J				UF	•	
LEET	5000	RI	GHT	LEF	т	100		RIGHT
BEACON_F	=oc		+	-		DOW	/N	+
BFLAT_LID)	CFG	DICH	R POS		LOCK		UNLOCK
BFLAT 2		T PIC	R256	ON	R2	256 OFF		M7 TO DFT
ELEV_MOT	r i		*	100				
ROT_MOT		DEC		G	ото			GET
DICHR_1		C	urrent D	ichroic I	R			
DICHR_2		BCart	Fib	er l	Beaco	n C-	Cube	2 Hole
WFS_PARC	DB_FOC	NLCKED CLOSED CLOS		LUSE			RESTART	
CORNER_C	CUBE	-	11			DISABLE		OUT
WFS_X		Н	PIN	VG	R	EOPEN		QUII

On the Engineering tab in the HUT GUI, select "ROT_MOT" found on the pull-down menu.

<u>Step 5</u>. Locate the proper dichroic numbers.

Check the aob configuration file to see what the numbers should be for the dichroic you want.

In a terminal enter:

less /ctrscrut/chara/etc/E2_aob.cfg



For the ROT_MOT:

a value of 0 is the visible dichroic (VIS),

a value of 1x the "Dichroic Distance" or 114369 is the bare dichroic,

and a value of 2x "Dichroic Distance" or 228738 is the infrared dichroic (IR).

<u>Step 6</u>: Check the physical position of the Dichroic <u>at the telescope</u>.



At the telescope you will see one of the three dichroics lined up with the hard points (above the B dichroic in the image).

The dichroics are:

A: Visible Dichroic

B: Bare Glass

C: Infrared Dichroic

<u>Step 7</u>: Manually align the proper dichroic.

By-hand, gently rotate the carousel so that the desired dichroic is below the hard points. The small balls should line up with the v-shaped grooved pucks above the carousel. The carousel should rotate freely. If it doesn't double check that it is unlocked. (See Step 2)

The kinematic balls (purple) should align with the v-groove pucks so that the balls slot into the grooves when the ELEV_MOT is locked as seen in the image below.



<u>Step 8</u>: Update the HUT with the current dichroic position.

In the HUT GUI, select ROT_MOT from the pull-down menu. Enter the proper number into the field to the right of the pull-down menu (Proper numbers are listed in Step 5). Press the "ENABLE" button then press the "SET" button.

E2_HUT ×									
MAIN HUT	AOB AO	BENG COO	L						
				M7					
+LIMIT	-LIMIT			UP					
SET	CAL		LEFT	100000	RIGHT				
ENABLE			-	DOWN	+				
	WFS			COL					
	UP			UP					
LEFT	5000	RIGHT	LEFT	100	RIGHT				
-	DOWN	+ -		DOWN	+				
READ CFG	WRITE C	FG DICH	R POS	LOCK	UNLOCK				
WRT-EEPRM	RESTART	PIC R25	5 ON	R256 OFF	M7 TO DFT				
ELEV_MOT]	÷	100						
INC		DEC	G	ото	GET				
Current Dichroic IR									
Dichroic Elev BCart Fiber Beacon C-Cube 2 Hole IR LOCKED UNLCKED CLOSED CLOSED OUT OUT									
VIS	BARE	I	R	DISABLE	RESTART				
RESET	FLUSH	I PII	NG	REOPEN	QUIT				

<u>Step 9</u>: Relock the dichroic.

E2_HUT ×								
MAIN HUT	AOB AO	B ENG	cool	_				
						M	7	
+LIMIT	-LIMIT					U	Р	
SET	CAL			LEF	т	10000	D	RIGHT
ENABLE				-		DOV	٧N	+
	WFS					СО	L	
	UP					U	P	
LEFT	5000	RIGHT		LEFT		100		RIGHT
-	DOWN	-	F	-		DOV	٧N	+
READ CFG	WRITE C	RITE CFG		RPOS		LOCK		UNLOCK
WRT-EEPRM	RESTART	PIC	PIC R256 ON R2		256 OFF		M7 TO DFT	
ELEV_MOT			-	100				
INC		DEC		GOTO			GET	
	Current Dichroic IR							
Dichroic	Elev B	Cart	Fib	er E	Beaco	n C	-Cube	e 2 Hole
IR L	OCKED UN	LCKED	CLOS	SED C	LOSE	D	OUT	OUT
VIS	BARE		IR D			DISABLE		RESTART
RESET	FLUSH		PIN	١G	R	EOPEN		QUIT

In the HUT GUI, select the ELEV_MOT from the pull-down menu and press the "LOCK" button.

<u>Step 10</u>: Update the HUT for the newly aligned dichroic.

Push the dichroic button for the one you have in place. (ie. If you aligned and locked the visible dichroic, then press the "VIS" button.) Since the proper dichroic is in place, the HUT should only move the tip-tilt positions of the various optics and update the Dichroic displayed in the status field.

E2_HUT ×								
MAIN HUT	AOB AOI	BENG	COOL	-				
						M7		
+LIMIT	-LIMIT					UP		
SET	CAL			LEF	г	100000	RIGHT	
ENABLE				-		DOWN	+	
	WFS					COL		
	UP					UP		
LEFT	5000	RIGHT		LEFT		100	RIGHT	
-	DOWN	+		-		DOWN	+	
READ CFG	WRITE C	FG	DICHE	POS		LOCK	UNLOCK	
WRT-EEPRM	1 RESTART	PIC	R256	ON	R2	256 OFF	M7 TO DFT	
ELEV_MOT			*	100				
INC		DEC	DEC GOTO				GET	
Current Dichroic IR								
Dichroic Elev BCart Fiber Beacon C-Cube 2 Hole IR LOCKED UNLCKED CLOSED CLOSED OUT OUT								
VIS	BARE		IR DISABLE REST					
RESET	FLUSH	ł	PIN	IG	R	EOPEN	QUIT	

The AOB/HUT system should now be aligned and operational on the dichroic you wanted in the first place.