IBEX Command Approval Checklist Rev 16e removes the Moon in Lo FOV section.

Orbit	445	Special Ops				
14 R _E asc. Date/Time	4/25/2019 21	:37:55	15 R _E asc. Date/Time	=		
Apogee	4/30/2019 03:00:07	Maneuver Window Start	4/29/2019 17:03:17	Maneuver Window End	4/30/2019 13:03:19	
Apogee Target	targetX:0.7991000000000003 targetY:0.55557500000000004 targetZ:0.2297269999999999					
15 R _E desc. Date/Time	5/4/2019 06:	03:39	14 R _E desc. Date/Time	5/4/2019 08:28:24		
Perigee	5/4/2019 16:06:50	Maneuver Window Start	5/4/2019 09:01:44	Maneuver Window Stop	5/4/2019 23:49:16	
Perigee Target		89799999999995 7539999999999	targetY: 0.61053	3500000000005		
Eclipse	No	Eclipse Start		Eclipse End		
Sun Mnvr	No	Apogee/Perigee		Sun Angle at DESCENDING		
Approved Version	IBEX_2019_115	_o0445a_v001.s	scr			

Activity	Command Checks	Date Done	Done By
Supporting Materials	 IBEX_CrossingTimes_<date>_v00x.txt on SFTP at /Archive-Incoming/IBEXIncoming/FDG/PredictedEphemeris/Orbit Events/.</date> Orbit Events File on SFTP at /IBEXOutgoing/MOC/Moc-Soc/oef/. Command Constraint Violations Report on SFTP at /IBEXOutgoing/MOC/Moc-Soc/cvr/. Contacts this orbit Orbit_oXXX.txt included in the ATS approval email. Science Tasking File at /Archive-Incoming/IBEXIncoming/MOC/Soc-Moc/stf/. Merged ATS at http://ibex.unh.edu/cgi-bin/ats.cgi. 	04/17/19	NGA
Sun Maneuvers	• Additional contacts <i>should not</i> be planned to support IBEX Sun Precession Maneuvers due to star tracker outages. The standard apogee and perigee contacts should be used to verify that a maneuver has occurred. If it is not possible to plan one of the standard contacts after the star tracker outage is down to 50% and a valid quaternion reading can be made to verify the maneuver, the coarse Sun sensor angle and the thruster pulse count will be used to determine a) whether a maneuver took place, and b) whether the pointing after the maneuver is as expected +/- 2 degrees.	N/A	NGA
	 The nominal off-Sun pointing constraint is 7.25 degrees. Based on the missed maneuver in orbit 114, the payload team has determined that there is no hardware risk associated with off-Sun pointing up to angles of at least 13 degrees. There is a higher background noted in the data starting at around 9.5 degrees off Sun pointing. 		
File Input Check	 Current OEF inputs are Forecast STF, last orbit's OEF & latest predictive ephemeris. ATS inputs are this orbit's OEF & STF. (And ABS if present.) ATS filename is of the format IBEX_yyyy_doy_o0xxxa_v0zz.scr. where IBEX is capitalized, yyyy is the year, doy is the day of year, xxx is the 3-digit orbit number and zz is the 2-digit version number. Any special operations ATSs will have another designation between the orbit number and version number (i.e. *o0186a hgc v001 for the Hi gain curve). 	04/17/19	NGA

2. Verify long eclipse flag start & stop times reflect Ryan Tyler's recommendations based on his eclipse diagnostic tool. Suggestions made by Ryan after the use of this tool tump the general guidelines below. (Please note, specific liming may shift if the recommendations are relative to eclipse timing. For example, it may say set Lt flag to false X hours after the end of the eclipse with a given FALSE time suggested. If the eclipse timing changes as the ephemeris becomes more reflench, this command time may shift.) 3. Verify no contacts planned during an eclipse. Note: If in conflict, the eclipse diagnostic recommendations will trump the general guidelines below. a. Verify transmitter OFF from 30 minutes before eclipse start through the end of the eclipse commendations will trump the general guidelines below. a. Verify no maneuver of each bed readers on from 3 hours before eclipse start through 3 b. Verify no maneuver or cat bed heaters on from 3 hours before eclipse start through 3 b. Verify no maneuver or cat bed heaters on from 3 hours before eclipse start through 3 b. Verify the first command sets the long eclipse flag to TRUE, the second command sets the flag to FALSE. 5. Verify the first command sets the long eclipse flag to TRUE, the second command sets the flag to FALSE. b. Verify PrIL is in HYSTANDBY or HYENG. c. Verify no charging cycle within 2 hours of ASCENDING or DESCENDING macro execution. This applies to all eclipses, not just moderate or long eclipses. Contact Commands 4. Verify each contact contains the following 5 commands. 2. Settledy stx, on 2. Settledy stx, on 3. Verify all currently planned contacts in Orbit, xxxxt are in the ATS. 4. Verify each contact contains the following 5 commands. 5. Settledy stx, on 5. Settledy stx, on 6. Settledy stx, on 6. Settledy stx, on 6. Settledy stx, on 6. Settledy stx, on 7. Settledy stx, on 8. Settledy stx, o	Eclipses	1.	Check OEF for eclipses during the orbit.	N/A	NGA
guidelines below. [Please note, specific timing may shift if the recommendations are relative to eclipse timing. For example, it may say set Left flag to false X hours after the end of the eclipse with a given FALSE time suggested. If the eclipse timing changes as the ephemeris becomes more refined, this command time may shift.] 3. Verify no contacts planned during an eclipse. Note: If in conflict, the eclipse diagnostic recommendations will trump the general guidelines below. a. Verify transmitter OFF from 30 minutes before eclipse start through the end of the eclipse. b. For an eclipse where the long eclipse flag is set, schedule a SOH contact directly following the end of the eclipse (or per Ryan's assessment). c. Set the LE flag according to Ryan's assessments. 4. Verify no maneuver or cat beth deaters assessments. 4. Verify no maneuver or cat beth deaters are on while the long eclipse diagnostic recommendations will trump the general guidelines below. a. Verify no maneuver or cat beth elaters are on while the long eclipse flag is set. 5. Verify the following additional constraints (from battery balancing section). a. Verify no maneuver or cat beth elaters are on while the long eclipse flag is set. 5. Verify the first command sets the long eclipse flag of TRUE, the second command sets the flag to FALSE. b. Verify PALSE. c. Verify 10 charging cycle within 2 hours of ASCENDING or DESCENDING macro execution. This applies to all eclipses, not just moderate or long eclipses. 1. Verify STX orriff times, downlink rate against Orbi_DXXCtf flie. 2. Verify contacts in the previous ATS have not been duplicated. 3. Verify each contact contacts in Orbit_Xxxxxtd are in the ATS. 4. Verify each contact contacts in Choix Lixxxxtd are in the ATS. 4. Verify each contact contacts in Choix Lixxxxxtd are in the ATS. 5. SetBelevelOutputControlReg STXMODE_STOBe, ON 5. SetBelevelOutputControlReg COHERENT, ON 5. SetBelvelOutputControlReg COHERENT, ON 5. SetDownlink2X 5. SetDownlink2X 6. SetDownlink2X 6. SetD	20119000	2.		1471	110,1
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5. Verify the following additional constraints (from battery balancing section). a. Verify P/L is in HVSTANDBY or HVENG. c. Verify ocharging cycle within 2 hours of ASCENDING or DESCENDING macro execution. This applies to all eclipses, not just moderate or long eclipses. 1. Verify STX on/off times, downlink rate against Orbit_oXXX.txt file. 2. Verify contacts in the previous ATS have not been duplicated. 3. Verify all currently planned contacts in Orbit_xxx.txt are in the ATS. 4. Verify each contact contains the following 5 commands. • SetRelay stx,on • SetBellevelOutputControlReg STXMODE_Strobe,ON • SetBellevelOutputControlReg COHERENT,ON • SetBellevelOutputControlReg COHERENT,ON • SetBellevelOutputControlReg COHERENT,ON • SetBellevelOutputControlReg STXMODE_Strobe,ON • SetBellevelOutputControlReg COHERENT,ON • SetBellevelOutputControlReg STXMODE_Strobe,ON • SSR_SET_WRT_PTR 6500 • SSR_SET_WRT_PTR 6500			hours after eclipse end.		
a. Verify the first command sets the long eclipse flag to TRUE, the second command sets the flag to FALSE. b. Verify PIL is in HVSTANDBY or HVENG. c. Verify no charging cycle within 2 hours of ASCENDING or DESCENDING macro execution. This applies to all eclipses, not just moderate or long eclipses. Contact Commands 1. Verify STX on/off times, downlink rate against Orbit_OXXX.txt flie. 2. Verify contacts in the previous ATS have not been duplicated. 3. Verify all currently planned contacts in Orbit_xxx.txt are in the ATS. 4. Verify each contact contains the following 5 commands. • SetRelay stx,on • SetRelay stx,off 5. If contact is near an eclipse a. Verify transmitter OFF from 30 minutes before eclipse start through 30 minutes after eclipse end. b. If additional transmitter constraints exist, they will be captured in Ryan's recommendations. 6. If an APL contact is being used for an SSR Dump, the data rate should be at least 160 ksps & the SSR DUMP_NEW command should be included in the contact commands. Commands in Orange should only be sent if the SSR pointers need to be reset this perigee. These commands should be separated by 2s and occur 2s after the SSR_DUMP_NEW command. • SetRelay stx,on • SetBilevelOutputControlReg STXMODE_Strobe,ON • SetBilevelOutputControlReg STXMODE_Strobe,ON • SetBilevelOutputControlReg COHERENT,ON		_			
the flag to FALSE. b. Verify P/L is in HVSTANDBY or HVENG. c. Verify no charging cycle within 2 hours of ASCENDING or DESCENDING macro execution. This applies to all eclipses, not just moderate or long eclipses. Contact Commands 1. Verify STX on/off times, downlink rate against Orbit_oXXX.txt file. 2. Verify contacts in the previous ATS have not been duplicated. 3. Verify all currently planned contacts in Orbit_xxx.txt are in the ATS. 4. Verify each contact contains the following 5 commands. • SetRelay stx,on • SetBlevelOutputControlReg STXMODE_Strobe,ON • SetBlevelOutputControlReg STXMODE_Strobe,ON • SetBlevelOutputControlReg COHERENT,ON • SetRelay stx,off 5. If contact is near an eclipse a. Verify transmitter COFF from 30 minutes before eclipse start through 30 minutes after eclipse end. b. If additional transmitter constraints exist, they will be captured in Ryan's recommendations. 6. If an APL contact is being used for an SSR Dump, the data rate should be at least 160 ksps & the SSR DUMP NEW command should be included in the contact commands. Commands in Orange should only be sent if the SSR pointers need to be reset this perigee. These commands should be separated by 2s and occur 2s after the SSR_DUMP_NEW command. • SetBelay stx,on • SetBlevelOutputControlReg STXMODE_Strobe,ON • SetBlevelOutputControlReg COHERENT,ON • SSR_SET_RD_PTR 6500 • SSR_SET_RD_PTR 6500 • SSR_SET_RD_PTR 6500		Э.			
b. Verify P/L is in HVSTANDBY or HVENG. c. Verify no charging cycle within 2 hours of ASCENDING or DESCENDING macro execution. This applies to all eclipses, not just moderate or long eclipses. 2. Verify STX on/off times, downlink rate against Orbit_oXXX.txt file. 2. Verify contacts in the previous ATS have not been duplicated. 3. Verify all currently planned contacts in Orbit_xxx.txt are in the ATS. 4. Verify ach contact contains the following 5 commands. • SetRelay stx.on • SetBlevelOutputControlReg STMMODE_Strobe,ON • SetBlevelOutputControlReg STMMODE_Strobe,ON • SetBlevelOutputControlReg COHERENT,ON • SetBlevelOutputControlReg COHERENT,ON • SetBlevelOutputControlReg TOM or an investment of the contact commands in Crange an Verify transmitter Constraints exist, they will be captured in Ryan's recommendations. 6. If an APL contact is being used for an SSR Dump, the data rate should be at least 160 ksps & the SSR DUMP_NEW command should be included in the contact commands. Commands in Orange should only be sent if the SSR pointers need to be reset this perigee. These commands should be separated by 2s and occur 2s after the SSR_DUMP_NEW command. • SetBlevelOutputControlReg STXMODE_Strobe,ON • SetBlevelOutputControlReg STXMODE_Strobe,ON • SetBlevelOutputControlReg COHERENT,ON • SSR_SET_ND_PTR 6500 • SSR_SET_ND_PTR 6500 • SSR_SET_ND_PTR 6500					
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Contact Commands 1. Verify STX on/off times, downlink rate against Orbit_oXXX.txf file. 2. Verify contacts in the previous ATS have not been duplicated. 3. Verify all currently planned contacts in Orbit_xxx.txt are in the ATS. 4. Verify each contact contains the following 5 commands. • SetRelay stx.,on • SetBeilevelOutputControlReg STXMODE_Strobe,ON • SetBilevelOutputControlReg COHERENT,ON • SetRelay stx.,off 5. If contact is near an eclipse a. Verify transmitter OFF from 30 minutes before eclipse start through 30 minutes after eclipse end. b. If additional transmitter constraints exist, they will be captured in Ryan's recommendations. 6. If an APL contact is being used for an SSR Dump, the data rate should be at least 160 ksps & the SSR DUMP_NEW command should be included in the contact commands. Commands in Orange should only be sent if the SSR pointers need to be reset this perigee. These commands should be separated by 25 and occur 2s after the SSR_DUMP_NEW command. • SetRelay stx.,on • SetBelevelOutputControlReg STXMODE_Strobe,ON • SetBilevelOutputControlReg STXMODE_Strobe,ON • SetBilevelOutputControlReg COHERENT,ON • SetBilevelOutputControlReg COHERENT,ON • SSR_SET_RP_PTR 6500 • SSR_SET_NP_PTR 6500					
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• SSR_SET_RD_PTR 6500 • SSR_SET_WRT_PTR 6500					
SSR_SET_WRT_PTR 6500					

SC State	1.	Transition to Science state will be first command of each ATS (at 14 Re).	04/17/19	NGA
Science:		 SetScState science \$TIME=2019/04:25:21:38:09 		
arc a	2.	Lo science mode will be the next command (at 14 Re).		
		LO_SCIENCE_MODE NORMAL		
	3.	Verify no transition to Science again at the end of the ATS. The ATS commands go from 14 Re to 14 Re in each orbit.		
	4.	Verify the transition to Science commands for this orbit are not part of the previous ATS using		
		http://ibex.unh.edu/cgi-bin/ats.cgi.		
	5.	Verify that the beginning of this ATS does not overlap with the end of the previous orbit's ATS		
		using http://ibex.unh.edu/cgi-bin/ats.cgi.		
Payload	1.	Verify w/ Crossing Times report that it occurs about 15 Re ascending. The arc a ASCENDING	04/17/19	NGA
Mode		commands can start any time at or above 15 Re ascending.	04/17/19	NGA
HVSCI:	2.	Verify commanding takes ~ 24 minutes.		
arc a		 ASCENDING_PL1 \$TIME=2019/04:25:23:59:40 		
a. c a		ASCENDING_HI		
		SET_PARAMETER 1, TLM_RATE_SOH		
		SET_PARAMETER 4, HV_STEP_DWELL		
		SET_PARAMETER 3, HV_STEP_FRAC		
		HI_COL_NEG_LVL 1400		
		• CEU_HI_CEM_1_LVL 1780		
		• CEU_HI_CEM_2_LVL 1780		
		• CEU_HI_CEM_3_LVL 1780		
		• CEU_HI_CEM_4_LVL 1900		
		SET_PARAMETER 0, TLM_RATE_SOH		
		ASCENDING_PL2		
		ASCENDING_PL1		
		ASCENDING_LO		
		 ASCENDING PL2 \$TIME=2019/04:26:00:23:28 		
Davida a d	1.	Payload DESCENDING commands end 1.5h before thruster enable.	04/47/40	NOA
Payload Mode	2.	Verify commands take ~23 minutes to execute.	04/17/19	NGA
HVSTANDBY		 DESCENDING_PL1 \$TIME=2019/04:29:15:07:19 		
: arc a		DESCENDING_LO		
. aro a		ASCENDING_PL2		
		DESCENDING_PL1		
		• DESCENDING_HI		
		• DESCENDING_PL2 \$TIME=2019/04:29:15:30:09		
00.04-4-	1.	Spacecraft Housekeeping command occurs 1h before thruster enable.	04/47/40	NCA
SC State HK : arc a		SetScState housekeeping \$TIME=2019/04:29:16:03:19	04/17/19	NGA

				1
Inertial	1.	Use this command sequence if an apogee inertial maneuver is used, otherwise skip to the 'Sun	04/17/19	NGA
Maneuver:	2	Precession Maneuver: Apogee' sequence below.		
Apogee	2. 3.	Verify Thruster enable command occurs within STF maneuver window. Verify no eclipse occurs from cat bed heater on through set FC mode Mission.		
		Verify cat bed heaters come on 55 min before burn.		
	٦.	CATBED 5N HTR,ON \$TIME=2019/04:29:16:08:17		
	5.	Verify Kalman Filter input select is ground command & estimator update is disabled.		
	٥.	SetKFInputSelect GND_CMD, 0, 0, 0, 0		
		SetEstUpdateEnables ENABLE, DISABLE		
	6.	Verify in FC mode Burn.		
	0.	SetFcMode burn		
	7.	Compare SetInrDir in ATS with pointing as defined in the Forecast STF & verify the vectors		
	٠.	match.		
		• SetInrDir 0.7991,0.555575,0.229727		
		targetX:0.7991000000000003 targetY:0.5555750000000004		
		targetZ:0.2297269999999999		
	8.	Verify inertial maneuver chosen.		
	0.	SetLrTarget ACS_INERTIAL		
	9.	Verify thrust time set to 11 min.		
	٥.	SetThrustTime 660		
	10	Verify thruster enable command matches RepointingManeuverStart time in OEF.		
	10.	SetThrustEnable ENABLE \$TIME=2019/04:29:17:03:17		
		RepointingManeuverStart 2019-04-29T17:03:17		
	11	Verify 10 minutes after thrusters enabled: thrusters disabled, cat bed heaters off, thrust time set		
		to 0.		
		SetThrustEnable DISABLE \$TIME=2019/04:29:17:13:17		
		SetHTRCmd CATBED_5N_HTR,OFF		
		SetThrustTime 0		
	12.	Verify 25 min after thrusters enabled: Static Z rate set, outage %valid set, FC mode Mission.		
		SetStaticZrate ESTIMATOR, 0.418 \$TIME=2019/04:29:17:28:27		
		SetKFInputSelect STA_PCT_VALID, 43,28,33,48		
		SetFcMode Mission		
0	1.	Use this command sequence in the event of an apogee Sun maneuver.	21/2	NOA
Sun	2.	Verify Thruster enable command occurs within STF maneuver window.	N/A	NGA
Precession Maneuver	3.	Verify no eclipse occurs from cat bed heater on through set FC mode Mission.		
: Apogee		Verify cat bed heaters powered on 55 min before thruster enable.		
. Apogee		• CATBED_5N_HTR,ON		
	5.	Verify in FC mode Burn and Sun target.		
		SetFcMode burn		
		SetLrTarget ACS_SUN		
	6.	Verify thrust time set to 16 min.		
		SetThrustTime 960		
	7.	Verify thruster enable command matches SunMvrBegin time in OEF.		
		SetThrustEnable ENABLE		
		SunMvrBegin		
	8.	Verify 15 minutes after thrusters enabled: thrusters disabled, cat bed heaters off, thrust time set		
		to 0, FC mode Mission.	1	
		SetThrustEnable DISABLE		
		SetHTRCmd CATBED_5N_HTR,OFF		
		SetThrustTime 0		
		SetFcMode Mission		l
SC State	1.	Spacecraft Science commands occur ~1h after thruster Disable.	04/17/19	NGA
SC State Science :	1.		04/17/19	NGA

Payload	 Verify payload ASCENDING commands begin at least 1.5 hours after thruster DISABLE. Verify commands take ~24 minutes to execute. 	04/17/19	NGA
Mode	ASCENDING PL1 \$TIME=2019/04:29:18:48:23		
HVSCI:	• ASCENDING HI		
arc b	SET PARAMETER 1, TLM RATE SOH		
	• SET_PARAMETER 4, HV_STEP_DWELL		
	• SET PARAMETER 3, HV STEP FRAC		
	HI COL NEG LVL 1400		
	• CEU HI CEM 1 LVL 1780		
	• CEU_HI_CEM_1_LVL 1780 • CEU_HI_CEM_2_LVL 1780		
	• CEU_HI_CEM_3_LVL 1780		
	• CEU_HI_CEM_3_LVL 1780 • CEU_HI_CEM_4_LVL 1900		
	SET_PARAMETER 0, TLM_RATE_SOH ASCENDING RIG		
	ASCENDING_PL2 ASCENDING_PL3		
	ASCENDING_PL1 ASCENDING_LO		
	ASCENDING_LO ASCENDING_DIA CTIME 2010/04:20:10:42:41		
<u> </u>	• ASCENDING_PL2 \$TIME=2019/04:29:19:12:11		
Payload	1. Verify w/ Crossing Times report that it occurs about 15 Re descending. The arc b DESCENDING	04/17/19	NGA
Mode HVSTANDBY	commands can complete any time at or above 15 Re descending. 2. Verify commands take ~23 minutes to execute.		
: arc b	DESCENDING PL1 \$TIME=2019/05:04:05:37:37		
. are b	DESCENDING_FET_\$THME=2019/03.04.03.37.37 DESCENDING_LO		
	ASCENDING_EC ASCENDING_PL2		
	DESCENDING_PL1 DESCENDING_HI		
	DESCENDING_HI DESCENDING_DIA_CTIME_2010/05:04:06:00:27		
	• DESCENDING_PL2 \$TIME=2019/05:04:06:00:27		
SC State HK : arc b	 Verify with Crossing Times report that Transition to Housekeeping state occurs at 14 Re desc (or an hour before the maneuver if the maneuver occurs less than 1 hour after 14 Re desc). SetScState housekeeping \$TIME=2019/05:04:07:58:26 	04/17/19	NGA

Inertial	1.	Use this command sequence if a perigee inertial maneuver is used, otherwise skip to the 'Sun	04/17/19	NGA
Maneuver:		Precession Maneuver : Perigee' sequence below.		
Perigee	2.	Verify no eclipse occurs from cat bed heater on through set FC mode Mission.		
	3.	Verify cat bed heaters come on 55 min before burn.		
		• CATBED_5N_HTR,ON \$TIME=2019/05:04:08:06:44		
	4.	Verify in Housekeeping state.		
	5.	Verify Kalman Filter input select is ground command & estimator update is disabled.		
		SetKFInputSelect GND_CMD, 0, 0, 0, 0		
		SetEstUpdateEnables ENABLE, DISABLE		
	6.	Verify in FC mode Burn.		
	0.	SetEcMode burn		
	7.	Compare SetInrDir in ATS with target vector in the Forecast STF & verify the vectors match.		
	٧.			
		• SetInrDir 0.749898,0.610535,0.254754		
		targetX:0.74989799999999991targetY:0.6105350000000005		
		targetZ:0.254753999999999		
	8.	Verify inertial maneuver chosen.		
		SetLrTarget ACS_INERTIAL		
	9.	Verify thrust time set to 11 min.		
		SetThrustTime 660		
	10.	Verify thruster enable command matches RepointingManeuverStart time in OEF.		
		 SetThrustEnable ENABLE \$TIME=2019/05:04:09:01:44 		
		RepointingManeuverStart 2019-05-04T09:01:44		
	11.	Verify 10 minutes after thrusters enabled: thrusters disabled, cat bed heaters off, thrust time set		
		to 0.		
		SetThrustEnable DISABLE \$TIME=2019/05:04:09:11:44		
		• CATBED_5N_HTR,OFF		
		SetThrustTime 0		
	12.	Verify 25 min after thrusters enabled: Static Z rate set, outage %valid set, FC mode Mission.		
		• SetStaticZrate ESTIMATOR, 0.418 \$TIME=2019/05:04:09:26:54		
		SetKFInputSelect STA_PCT_VALID, 43,28,33,48		
		SetFcMode Mission		
_	1.	Use this command sequence in the event of a perigee Sun maneuver.		
Sun	2.	Verify Thruster enable command occurs within STF maneuver window.	N/A	NGA
Precession	3.	Verify no eclipse occurs from cat bed heater on through set FC Mode Mission.		
Maneuver :		Verify cat bed heaters come on 55 min before burn.		
Perigee		• CATBED 5N HTR,ON		
	5.	Verify in FC mode Burn and Sun target.		
		SetFcMode burn		
		SetLrTarget ACS_SUN		
	6.	Verify thrust time set to 16 min.		
		SetThrustTime 960		
	7.	Verify thruster enable command matches SunMvrBegin time in OEF.		
		SetThrustEnable ENABLE		
		SunMvrBegin		
	8.	Verify 15 minutes after thrusters enabled: thrusters disabled, cat bed heaters off, thrust time set	1	
		to 0, FC mode Mission.	1	
		SetThrustEnable DISABLE		
		SetHTRCmd CATBED_5N_HTR,OFF		
		SetThrustTime 0		
1				

IBEX Command Approval Checklist K. Fairchild

Rev 16e Last update 09/12/2018

Battery Cell Balancing	1. 2. 3. 4. 5. 6. 7.	There will be battery cell balancing every 2 out of 3 orbits. Battery cell balancing this orbit? Y Verify charging cycle (Long eclipse flag=TRUE) is 90 minutes long. Verify the first command sets the long eclipse flag to TRUE, the second command sets the flag to FALSE. Verify P/L is in HVSTANDBY or HVENG. Verify no charging cycle within 2 hours of ASCENDING or DESCENDING macro execution. Verify no charging cycle within 1 hour of maneuver. Verify no charging cycle during an eclipse.	04/17/19	NGA
Cmd Violation	1.	Review CCVR. If you have any questions Reply All to the ATS Approval email and ask the team.	04/17/19	NGA

Activity		Anomaly Response : Non-nominal burn	Date Completed	Completed By
	•	If the maneuver has not occurred or the spacecraft pointing as designated by either the star tracker or coarse Sun sensor is off by more than 2 degrees from the expected pointing, an anomaly has occurred.		
		If the spacecraft is in Contingency state all stored commands are flushed from the command queue. Follow standard anomaly process. **Title On the Command of the Comm		
		If the Sun maneuver did not occur and the spacecraft is in either Science or Housekeeping state follow the steps below. (1)		
		 If a partial Sun maneuver has occurred and the spacecraft is in either Science or Housekeeping state follow the steps below. 		
	•	Please note that there is no anticipated hardware damage associated with exceeding the 12.5 degree constraint; this constraint is in place because we should not exceed the largest pointing achieved thus far in the mission.		
	1.	If the payload is in HVSTANDBY, LVENG or OFF, and there are no commands loaded to bring it to HVSCI voltages, no operational pointing constraints will be violated. Follow standard anomaly process.		
	2.	If the payload is in HVSCI mode or there are uploaded commands to bring the payload to HVSCI mode,		
		 a. Determine current off Sun pointing. If the off Sun angle has already exceeded 12.5 degrees, the MOC should notify the MOM and immediately send the DESCENDING command suite in real-time, as described below. If this cannot be done in the contact where the pointing anomaly was discovered, another contact will be planned as soon as possible to execute these commands. @CEU_MACRO_EXEC_DESCENDING_PL1 (< 1 min) 		
		<pre>@CEU_MACRO_EXEC DESCENDING_LO (~ 10 min) @CEU_MACRO_EXEC DESCENDING_HI (~ 8 min) @CEU_MACRO_EXEC DESCENDING_PL2 (< 1 min) Please note: The only scenario where hitting 12.5 degrees is expected is when a</pre>		
		perigee Sun precession maneuver is completely missed after an inertial apogee maneuver which occurs late in the maneuver window (near apogee + 10 hours). b. If current Sun pointing is below 12.5 degrees, the ISOC should input ST Sun-		
		pointing angle into ibex_rotate to determine the Sun angle at the time of DESCENDING. Sun-Angle at payload DESCENDING		
		c. If 12.5 degrees is not exceeded by the time of DESCENDING, no payload-specific action is needed for this arc. Follow standard anomaly response process.		
		 If 12.5 degrees is exceeded by the time of DESCENDING, a new command set should be sent. 		
		 The ISOC will generate the new STF which has the DESCENDING commands executing early such that 12.5 degrees is not exceeded while the payload is in HVSCI. 		
		 ii. The MOC will create an associated ATS. iii. Approval is needed by the MOM, MOC & ISOC prior to upload. iv. The MOC will assess whether an additional pass is needed in order to upload the commands prior to exceeding the 12.5 degree constraint. The 		
		onboard DESCENDING commands do not need to be deleted.		