9000 COUNTDOWN PROCEDURES

9100 NASA ROLES AND RESPONSIBILITIES

The following definitions describe the roles and responsibilities of key NASA personnel:

Test Director (TD):   The WFF TD has authority over all operations conducted on the WFF Test Range. The TD is responsible for assuring that all range policy, criteria, and external agreements are satisfied during the operations. The TD is the only person with authority to resume the countdown after a "HOLD" has been declared.

Mission Manager (MM): The designated WFF MM is responsible for the planning, coordinating and directing of operational support for assigned projects conducted at the WFF Test Range. The MM is the author of the Operations and Safety Directive (OSD), which is designed to accomplish project objectives while complying with established policy, criteria, and procedures. The MM is responsible for coordinating and directing project activities as necessary during the countdown. The MM will apprise the TD and RSO of project status details and likewise keep the project personnel properly informed of range operational status. The MM also serves as Assistant TD.

Range Safety Officer (RSO): The WFF RSO is responsible for assuring the WFF safety policy, criteria, and procedures are not violated during operations, and to assure that risks are understood and are within acceptable limits. The RSO has authority to stop work, or hold a launch if necessary. The RSO will keep the TD and MM apprised of safety status, which could affect launch operations.

Launch Pad Supervisor (LPS): The WFF or NSROC LPS is responsible for implementing operational procedures in the launch area in accordance with the project OSD. The LPS or his designated representative must be present and shall monitor all procedures involving hazardous operations. No hazardous procedures will be initiated without the LPS's knowledge and consent.

Operations Safety Supervisor (OSS): The WFF OSS has authority over all hazardous operations performed during preparation and launch activities. The OSS or a designated OSS representative must be present and shall monitor all procedures involving hazardous operations. No hazardous procedures will be initiated without his knowledge and consent.

Payload Manager: The Payload Manager will keep the MM apprised of program status. The PM is responsible for assuring that programmatic objectives are achieved. The PM has authority, with the Test Director's concurrence, to conduct tests of program systems in accordance with procedures.

9200   ABBREVIATIONS USED IN COUNTDOWN UNDER "ACT BY"

COMP	Computer
FOTO	Photographer
LPS	Launch Pad Supervisor
MM	Mission Manager
PGMR	Programmer
PI	Principal Investigator
PLC	Payload Control
PM	Payload Manager
PTM	Payload Telemetry
RC	Radar Coordinator
RD	Recovery Director
ROA	Range Operations Assistant
RSO	Range Safety Officer
SURV	Surveillance
TD	Test Director
TM Readout	Telemetry Readout Room
TM Receiving	Telemetry Receiving Room

WW ……………………………………..Wind Weighting

9300   LAUNCH COUNTDOWN

All items are to be announced complete on Channel 1 of the WFF intercom unless
preceded by "N" for no response required. Each item will be performed only
after previous items have been checked complete unless directed otherwise by the
Test Director or his designee. Refer to page 9001 for the list of operator title
abbreviations.

All supporting elements of the operations are expected to keep the RCC advised
of their status throughout the countdown. However, after the "T-5 minute station
check" only personnel reporting countdown items or elements which affect the
"GO/NO GO" criteria will report. The elements are designated with an "asterisk"
in the T-5 minute station check. The countdown (program time) will be stopped
remotely by the Test Director (TD), Mission Manager (MM), the Range Safety
Officer (RSO), or the programmer on command by the TD if necessary.

This countdown officially begins at T-4:30 from the stated opening of the launch
window stated in Section 1110 of this OSD. At the opening of the countdown, it
is assumed the vehicle and payload are staged on the launcher and pad/blockhouse
voltage/amp (V/A) checks are complete.

Shaded portions of the program time column of this countdown indicate these
times are practice items conducted during the vertical payload checks.

"T" MINUS	ITEM	ACT BY	OPERATION

HH-MM-SS			
04-30-00	1	WW	Launch corner reflector balloon and track to maximum altitude.
03-30-00	2	ROA	All personnel be advised that the following launch will be conducted under NRW-3570, Orion 30.053 NO, OSD countdown procedure Rev. 0, dated May 2002. Please respond on Channel 1 on the intercom. LPS – Launch Pad Supervisor PGMR – Programmer RC – Radar Coordinator PI – Principal Investigator COMP – Computer PM – Payload Manager WW – Wind Weighting RSO – Range Safety Officer MM – Mission Manager TD – Test Director
	3	ROA	Establish RF avoidance for Pad 2.
	4	LPS	Arm vehicle and payload.
"T" MINUS HH-MM-SS	ITEM	ACT BY	OPERATION
	5	LPS	Verify that the following tasks are complete: 1. Vehicle and payload completely assembled on Pad 2 ARC launcher. 2. Umbilical rigged and connected. 3. Volt/Amp checks completed. 4. Batteries charged. 1. All safety restraints installed. 2. Set Pre-Launch Danger Area roadblocks. 3. Initial arming of Orion motor/payload.
03-00-00	6	TD,RSO,RSM	Conduct HOLD button checks.
	7	LPS	Remove shelter.
	8	FOTO	Take horizontal pictures of Orion.
	9	ROA	Release RF avoidance at Pad 2.
02-30-00	10	WW	Release and track corner reflector balloon to 50 k ft. altitude.

"T" MINUS HH-MM-SS	ITEM	ACT BY	OPERATION
	11	ROA	Reset clock to T-8 minutes for the horizontal payload checks.

00-08-00	12	PLC	1. Switch payload systems to EXT PWR ON in the following order:
			2. TM EXT PWR ON.
			3. Record TM 1 measurements.
			    Voltage _____ volts,　28 volts
			    Current _____ amps,　1.2 amps
			4. TRANSPONDER ON.
			5. Record TM Bus current.
			    Actual _____ amps,　1.5 amps
			6. Sub-SEM experiments ON.
			7. Record Experiment Bus measurements.
			    Voltage _____ volts,　12 volts
			    Current _____ amps,　0 amps

00-07-30	13	TM READOUT	8. Start chart recorders.

"T" MINUS HH-MM-SS	ITEM	ACT BY	OPERATION
	14	TM RCVING	9. Start magnetic tapes.

00-07-00	15	PLC	10. ARM payload CDI system, verify GSE data.
			11. Record the following battery voltages:
			
			                        Actual Nom.
			    TM Battery _____V 32V
			    Exp Battery _____ V 12V
			    CDI Battery #1 _____ V 32V
			    CDI Battery #2 _____ V 32V
			    Capow Pac _____ V 33V
			    Capow Pac _____ V 33V
			    Capow Pac _____ V 33V
			    Capow Pac _____ V 33V

00-06-30	16	RC	12. Interrogate Pad 2 transponder and verify good signal.
	17	PTM	13. Verify data in limits on GDP's.

"T" MINUS HH-MM-SS	ITEM	ACT BY	OPERATION
	18	PTM	14. Verify chart recorder channels are nominal.
	19	PTM	15. Screen print numeric displays from GDP.
00-06-00	20	TM RCVING	16. Record transmitter parameters. Actual Nominal TM Sig Str _____ dB >30 dB C/N Deviation _____ KHz $\pm$280 KHz
00-03-00	21	PLC	17. Switch TM, transponder and experiment to INTERNAL power and record battery voltages below: Actual Nominal TM battery _____ V 30 V Exp battery _____ V 12 V
00-02-30	22	TM RCVING	18. Verify no change in signal strength or deviation.
	23	RC	19. Verify radar transponder is still good.
00-02-00	24	PTM	20. Verify data in limits on GDP.
00-00-00	25	PLC	21. SAFE CDI system.
	26	PLC	22. Switch experiment, transponder and TM to EXTERNAL power.
	27	PLC	23. Switch experiment, transponder and TM OFF.
"T" MINUS HH-MM-SS	**ITEM**	**ACT BY**	**OPERATION**
	28	TM RCVING	24. Stop mag tapes.
	29	TM READOUT	25. Stop chart recorders.
	30	PM	Verify horizontal payload checks complete.
	31	ROA	Reset countdown clock to terminal count.
02-00-00	32	COMP	Conduct simulation using nominal trajectory
	33	TD	Initial contact with FAA, VACAPES, NORAD and recovery vessel.
	34	TD	Release surveillance aircraft for take-off.
01-30-00	35	WW	Relay wind weighted payload impact coordinates to RD.
	36	RD	Relay wind weighted payload impact coordinates to recovery aircraft and ship crew.
`	37	LPS	Elevate launcher to nominal settings: AZ = 140° EL = 82°

"T" MINUS HH-MM-SS	ITEM	ACT BY	OPERATION
01-15-00	38	WW	Commence 15 minute interval wind weighting chaff balloon release schedule. Track to an altitude of 6000 feet.
	39	ROA	Establish RF avoidance on Pad 2.
	40	ROA	Provide test rocket launcher setting.
	41	LPS	Request permission from TD to load test rockets.
	42	FOTO	Take vertical pictures and align Pad 2 cameras.
01-00-00	43	SURV	Surveillance aircraft on station with first ship report.
	44	LPS	Clear launch danger area and set roadblocks.
	45	LPS	Perform no voltage checks and connect firing circuits for test rockets.
	46	LPS	Verify test rocket launcher danger area clear.
	47	ROA	Release RF avoidance on Pad 2.
	48	ROA	Reset clock to T-10 minutes for the vertical payload checks.
	49	PM	Request permission to begin vertical checks.

"T" MINUS HH-MM-SS	ITEM	ACT BY	OPERATION

00-08-00	50	PLC	1. Switch payload systems to EXT PWR ON in the following order:
			2. TM EXT PWR ON.
			3. Record TM 1 measurements.
			    Voltage _____ volts, 28 volts
			    Current _____ amps, 1.2 amps
			4. TRANSPONDER ON.
			5. Record TM Bus current.
			    Actual _____ amps, 1.5 amps
			6. Sub-SEM experiments ON.
			7. Record Experiment Bus measurements.
			    Voltage _____ volts, 12 volts
			    Current _____ amps, 0 amps

00-07-30	51	TM	8. Start chart recorders.

"T" MINUS HH-MM-SS	ITEM	ACT BY	OPERATION
			READOUT
	52	TM RCVING	9. Start magnetic tapes.

00-07-00	53	PLC	10. ARM payload CDI system, verify GSE data.
			
			11. Record the following battery voltages:
			
			                                   Actual Nom.
			    TM Battery _____V 32V
			    Exp Battery _____ V 12V
			    CDI Battery #1 _____ V 32V
			    CDI Battery #2 _____ V 32V
			    Capow Pac _____ V 33V
			    Capow Pac _____ V 33V
			    Capow Pac _____ V 33V
			    Capow Pac _____ V 33V

00-06-30	54	RC	12. Interrogate Pad 2 transponder and verify good signal.
	55	PTM	13. Verify data in limits on GDP's.
	56	PTM	14. Verify chart recorder channels are nominal.
	57	PTM	15. Screen print numeric displays from GDP.

"T" MINUS HH-MM-SS	ITEM	ACT BY	OPERATION

00-06-00	58	TM RCVING	16. Record transmitter parameters.
			
			                        Actual Nominal
			    TM Sig Str _____ dB >30 dB C/N
			    Deviation _____ KHz ±280 KHz

00-03-00	59	PLC	17. Switch TM, transponder and experiment to INTERNAL power and record battery voltages below:
			
			                        Actual Nominal
			    TM battery _____ V 30 V
			    Exp battery _____ V 12 V

00-02-30	60	TM RCVING	18. Verify no change in signal strength or deviation.
	61	RC	19. Verify radar transponder is still good.
00-02-00	62	PTM	20. Verify data in limits on GDP.
00-00-00	63	PLC	21. SAFE CDI system.
	64	PLC	22. Switch experiment, transponder and TM to

"T" MINUS HH-MM-SS	ITEM	ACT BY	OPERATION
			EXTERNAL power.
	65	PLC	23. Switch experiment, transponder and TM OFF.
	66	TM RCVING	24. Stop mag tapes.
	67	TM READOUT	25. Stop chart recorders.
	68	PM	26. Verify vertical payload checks are complete.
	69	ROA	Reset countdown clock to terminal count.
00-30-00	70	TD	Inform Coast Guard of impending test rocket launches.
	71	ROA	Launch test rockets.
00-20-00	72	TD	Clear recovery aircraft for take-off.
00-15-00	73	WW	Provide wind weighted launcher setting coordinates (degrees-min-sec) to RD.
	74	ROA	Set launcher settings as specified by Range Safety Officer.
00-10-00	75	PGMR	Program HOLD is required.
	76	RD	Verify recovery ship is on station.

"T" MINUS HH-MM-SS	ITEM	ACT BY	OPERATION
00-09-00	77	ROA	Announce "This is NRW-3570 Sub-SEM Orion 30.053 NO launching from Pad 2, MRL launcher. Please stand by for station checks. All stations announce status as GO or NO GO on Channel 1. *LPS *PGMR *RC (minimum of 2 C-band radars) *TM (minimum of 2 antennas) *Computer (RTCS and RTBS) *RD (Recovery boat on station; sea state less than 4 feet) *PI *PM CAM5 CAM15

"T" MINUS HH-MM-SS	ITEM	ACT BY	OPERATION
			Sounding Rocket Program Office Representative *Mission Manager *RSO (Ceiling minimums at both launch and recovery sites; surface winds; launch hazard area clear; air/surface hazard area within limits) *TD (R-6604, VACAPES, NORAD clearances)
	78	TD	Test Director final briefing on "HOLD" procedures. Announce "All stations are responsible for reviewing the GO/NO GO criteria listed in the OSD. Only stations annotated with an asterisk are permitted to call a HOLD. All other sites should report RED."
00-08-00	79	PLC	1. Switch payload systems to EXT PWR ON in the following order: 2. TM EXT PWR ON. 3. Record TM 1 measurements. 　　Voltage _____ volts,　28 volts 　　Current _____ amps,　1.2 amps
"T" MINUS HH-MM-SS	**ITEM**	**ACT BY**	**OPERATION**
			4.　TRANSPONDER ON. 5.　Record TM Bus current. 　　Actual _____ amps,　1.5 amps 6.　Sub-SEM experiments ON. 7.　Record Experiment Bus measurements. 　　Voltage _____ volts,　12 volts 　　Current _____ amps,　0 amps
00-07-30	80	TM READOUT	8. Start chart recorders.
	81	TM RCVING	9. Start magnetic tapes.
00-07-00	82	PLC	10. ARM payload CDI system, verify GSE data. 11. Record the following battery voltages: 　　　　　　　　　　Actual　　Nom. 　TM Battery　　_____V　　32V 　Exp Battery　　_____V　　12V

"T" MINUS HH-MM-SS	ITEM	ACT BY	OPERATION
			CDI Battery #1 _____ V 32V CDI Battery #2 _____ V 32V Capow Pac _____ V 33V Capow Pac _____ V 33V Capow Pac _____ V 33V Capow Pac _____ V 33V
00-06-30	83	RC	12. Interrogate Pad 2 transponder and verify good signal.
	84	PTM	13. Verify data in limits on GDP's.
	85	PTM	14. Verify chart recorder channels are nominal.
	86	PTM	15. Screen print numeric displays from GDP.
00-06-00	87	TM RCVING	16. Record Transmitter parameters. Actual Nominal TM Sig Str _____ dB >30 dB C/N Deviation _____ KHz $\pm$280 KHz
00-05-00	88	PLC	17. Switch SOIDAR Experiment ON.
"T" MINUS HH-MM-SS	**ITEM**	**ACT BY**	**OPERATION**
	89	PLC	18. Record the following: SOIDAR Current _____ mA, 630 mA
00-03-00	90	PLC	19. Switch TM, transponder and experiment to INTERNAL power and record battery voltages below: Actual Nominal TM Battery _____ V 30 V Exp Battery _____ V 12 V
00-02-30	91	TM RCVING	20. Verify no change in signal strength or deviation.
	92	RC	21. Verify radar transponder.
00-02-00	93	PTM	22. Verify data in limits on GDP.
00-01-00	94	PLC	23. Switch Glennbrook Systems ON and CONFIRM.
00-00-10	95	PGMR	Time count at one second intervals to T-0 thru T+10 seconds then every 10 seconds to T+1 minute.
00-00-08	96	PLC	24. Switch SOLARE ON and CONFIRM.
00-00-00	97		Orion ignites (vehicle and payload umbilicals

			disengage).

"T" PLUS HH-MM-SS	ITEM	ACT BY	OPERATION
00-00-32.5	98		Orion burnout.
00-01-25	99		Payload separation.
00-02-00.5	100		Apogee.
00-03-05	101		Orion ballistic impact.
00-03-33	102		Parachute deployment.
00-10-32	103		Payload/parachute impact.
	104	TM RCVING	LOS. Stop mag tapes.
	105	TM READOUT	Stop chart recorders.
00-17-00	106	RD	Begin recovery operations. Relay actual payload impact to recovery aircraft and recovery boat.
			When operations in RCC are complete, release: Electric shop (ext. 1446) A/C shop (ext. 1511) Generator room (ext. 2225)