NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

February 21, 2015

Attachment 9 – Extra Training Syllabus

OPERATIONAL FACTORS

DCA15MA019

FLIGHT TEST DATA CARD
AST Compliance High G Training
SS2 Extra G training

DATE	N#	CALLSIGN	MSSN FREQ.	T/O	LAND
ASOS	GRND	CREW		TWR	JOSHUA
132.225	123.9			127.6	133.65

OBJECTIVE: To demonstrate competence with aircraft control while under the simulated stresses of space flight to include

- High accelerations/deceleration
- Microgravity
- Vibration

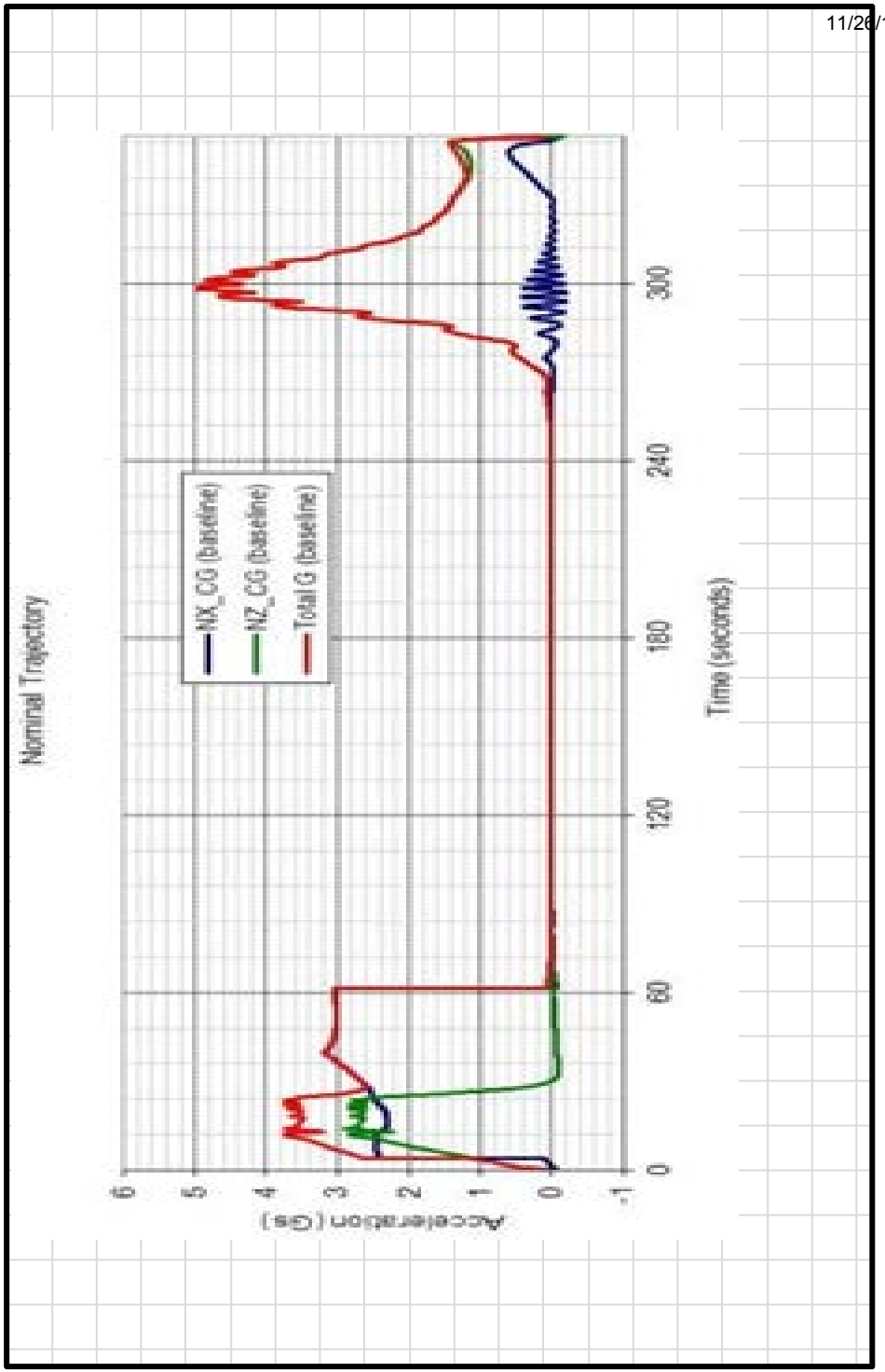
1. **G Exercise, 3G positive level turns (Left/Right)**
2. **FOD and belt check (0 to -0.5G pushover x 2)**

3. **Rapid G Onset (Gamma turn simulation) 9K'/150KIAS**
   a. 5G onset (steep ramp up)
   b. Hold for 15 seconds (Descend as required)

4. **Adverse Reentry G profile--9K'/140-160KIAS**
   a. -1.0g for 15 seconds (roll inverted and hold)
   b. Recover to upright and level, then immediate WUT)
   c. 2.5g for 5 seconds
   d. 3.5g for 5 seconds
   e. 4.5g for 5 seconds
   f. 5.5g for 5 seconds
   g. 4.5g for 5 seconds
   h. 3.5g for 5 seconds
   i. 2.5g for 5 seconds

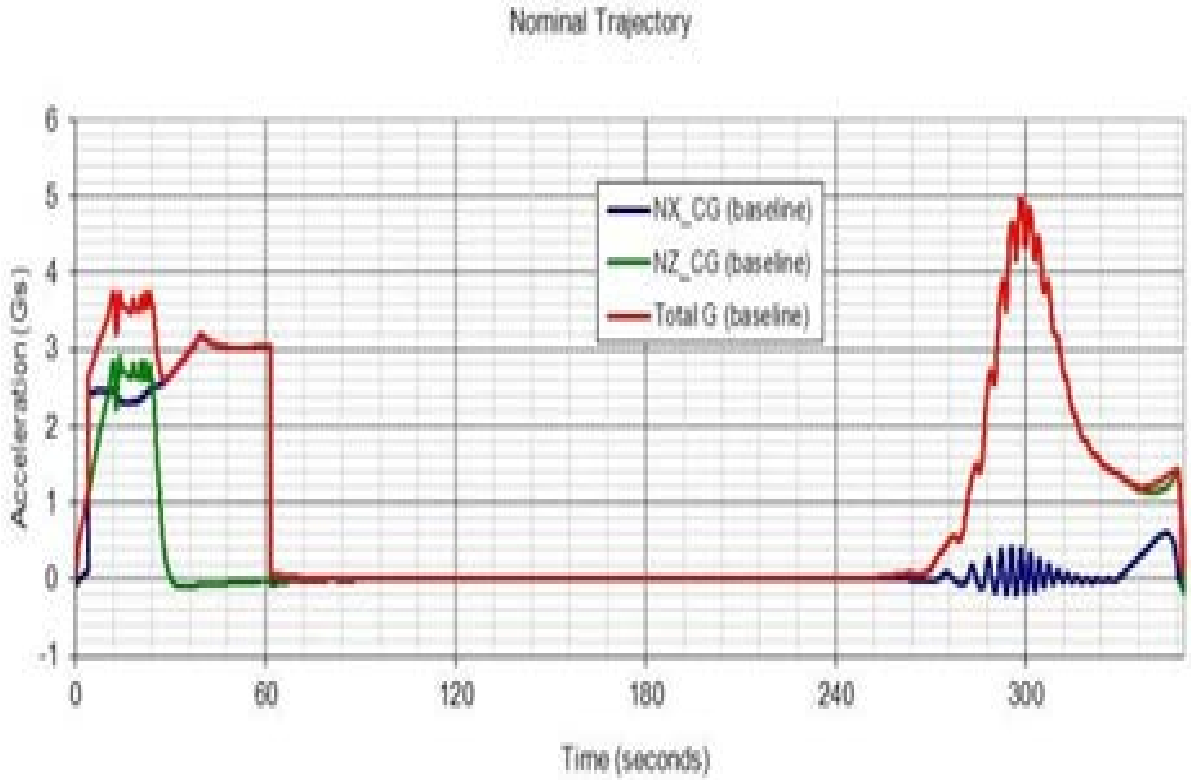
5. **Disorientation and recovery**
   i. Spins (Inverted and Upright)
   ii. Vertical rolls (Full Power)
   iii. Tumbles/Lumshevak

Spin entry >9K' MSL
ACRO Tank/Boost pump ON
Power idle is standard
Initiate recovery 7.5K'min
Bailout 5K' MSL if OOC



OBJECTIVE: To demonstrate competence with aircraft control while under the simulated stresses of space flight profile in the SS2 vehicle to include:

- High accelerations/deceleration
- Microgravity
- Vibration



Aircraft: Extra 300L with approximately 22-25 gals of fuel on board (1/4 wings plus full Acro tank). Parachutes required. To reduce the risk of FOD, minimize amount of extraneous items brought into the cockpit. Headsets with chin straps recommended.

Normal aircraft procedures thru climb out to above 9K' MSL overhead KMHV. Set Prop control at approx. 2500-2550 RPM. Maximize use of wing tank fuel when greater than 1.0 G maneuvering and not performing aerobatics.

1. **G Exercise, 3G positive level turns (Left/Right)**
   >9K, 140 KIAS, Full Power
   Practice nominal anti-g strain maneuvers. Stress proper strain while maintaining a breathing rhythm
2. **FOD and belt check (0 to -0.5G pushover x 2)**
   >9K, speed and power as required, ACRO Tank
   Check seat belts re-tightened before and after each pushover
   During pushover attempt to gather any FOD detected in the cockpit

3. Rapid G Onset (Gamma turn simulation) >9K'/150KIAS

a. Full Power, Wing Fuel Tank
b. 5G onset (steep ramp up, get to 5Gs within two seconds)
c. Hold for 15 seconds (Descend as required to avoid your own wake at the 360 deg point. A modified "sliceback" maneuver works nicely for this event.)
d. Recover from dive and start climb back to above 9K' MSL. Retighten seat belts in climb.

4. Adverse Reentry G profile--9K'/140-160KIAS, Full Power, ACRO Tank

a. -1.0g for 15 seconds (roll inverted and hold)
b. Recover to upright and level, then immediately into the WUT
c. 2.5g for 5 seconds
d. 3.5g for 5 seconds
e. 4.5g for 5 seconds
f. 5.5g for 5 seconds
g. 4.5g for 5 seconds
h. 3.5g for 5 seconds
i. 2.5g for 5 seconds

5. Disorientation and recovery

Spin entry >9K' MSL
ACRO Tank/Boost Pump ON
Power idle is standard
Initiate recovery 7.5K'min
Bailout 5K' MSL if OOC

a. Spins (Upright and Inverted)
Climb to above 9K' MSL, Idle
ACRO Tank and Boost pump on
Left rudder will produce a slightly higher rotation rate.
   - Upright performed from a slightly nose high attitude stall with application of full rudder and full aft stick at stall.
   - Inverted performed from an inverted slightly nose high stall with application of full rudder and full forward stick at stall. First indication may be an upright stall, but it will stabilize into an inverted stall after about a turn and a half.
   - To see a flatter spin either upright or inverted, you can smoothly add power while stabilized in the spin. Go to idle prior to recovery.
   - Upright to Inverted: On a stabilized Upright spin, applying full forward stick but keeping the rudder full in will cause a fairly dynamic transition from an upright to an inverted spin. Observe recovery altitude.

➢ **Standard recovery**: Full opposite rudder and elevator smoothly to neutral (slightly forward on the upright and slightly aft on the inverted may quicken the recovery). Pull out of dive smoothly once flying again.

b. Vertical rolls (Full Power, > 6K' MSL, >160 KIAS, ACRO Tank)
Smoothly pull nose up to vertical. Perform maximum rate aileron rolls in the vertical until out of airspeed. Smoothly recover from nose high altitude.

c. Tumbles/Lumshevak (Full Power, >6K' MSL, 140 KIAS, ACRO Tank, Boost Pump On)
Smoothly pull nose up to 45 degrees. Perform two maximum rate aileron rolls on that 45 degree line. At completion of second aileron roll abruptly and simultaneously apply full forward stick and full rudder. Recover smoothly after several tumbles.