|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Group | Fuel Weight (lbs) | Payload Weight (lbs) | Altitude (ft) | Flight Speed (EAS) |
| 07 | 2400 | 500 | 9000 | 190 |

Input names for roles below:

|  |  |  |
| --- | --- | --- |
|  |  | Take off  Phugoid  SPPO |
|  |  | Roll subsidence  Spiral (Left and Right) |
|  |  | Dutch roll  Extra time – missing data points |

# Trim procedure

1. Set the required amount of fuel and the offset for the aircraft’s zero-fuel centre of gravity position from the instructor’s console
2. Climb/descend to roughly the desired altitude. Try to maintain near your target level flight speed in the climb/descent, thus reducing the need for subsequent speed adjustments.
3. Apply a reasonable level of throttle and adjust the stick input, and therefore aircraft pitch, to maintain your altitude.
4. As the aircraft speed settles, further adjusting the throttle setting to accelerate/decelerate to the desired airspeed. As velocity changes, remember to adjusting the pitch attitude to remain level.
5. Continue the process until the desired constant airspeed and altitude are reached.
6. Once the aircraft is in the desired equilibrium state, we must adjust the trim wheel such as to achieve stick-free equilibrium, thus relieving the need any pitch control input. Work iteratively, making small adjustments of the trim wheel in the required direction, reducing the stick deflection required to maintain level and repeat until no pitch control input is required.

# Phugoid procedure

1. Record the velocity, altitude and fuel weight of your aircraft in the trimmed condition. Start the Simulink data recorder and note the start time.
2. Gently pull back on the stick until the aircraft’s pitch attitude has increased by about 5° and the aircraft enters a decelerating climb.
3. Maintain the back pressure until the aircraft’s indicated airspeed has decreased by about 10 kts.
4. Release the stick and allow the Phugoid mode to evolve.
5. Once sufficient data has been collected, stop the data recording and note the end time.
6. To get the aircraft back to its equilibrium condition, apply appropriate pitch control. No significant change in trim should be required if returning to the original altitude and airspeed if no significant change in fuel weight has occurred.

SPPO procedure

1. Record the velocity, altitude and fuel weight of your aircraft in the trimmed condition.

Start the Simulink data recorder and note the start time.

1. Apply a moderate nose down pitch input (about half stick deflection) followed by an

equal nose up input and then release the controls. Using the same magnitude and rate of actuation both nose up and down will ensure no net change in pitch and thus avoid also exciting the Phugoid mode.

1. Once sufficient data has been collected, stop the data recording and note the end time.

# Roll subsidence Procedure

1. Record the velocity, altitude and fuel weight of your aircraft in the trimmed condition. Start the Simulink data recorder and note the start time.
2. Apply a full right or full left stick input. Once the aircraft reaches a constant roll-rate,

release the stick.

1. Once sufficient data has been collected, stop the data recording and note the end time.
2. Apply aileron and elevator control as required to return the aircraft to its original trimmed state.

# Spiral procedure

1. Record the velocity, altitude and fuel weight of your aircraft in the trimmed condition. Start the Simulink data recorder and note the start time.
2. Apply a partial right rudder input such that the aircraft yaws and rolls to the right. Once the aircraft reaches a roll angle of about 10*◦* bank, release the rudder pedal.
3. Wait until the roll angle has approximately halved or doubled. Once sufficient data has been collected, stop the data recording and note the end time.
4. Apply aileron and elevator control as required to return the aircraft to its original trimmed state.
5. Repeat with a left rudder input to investigate the left turning spiral response.

# Dutch roll procedure

1. Record the velocity, altitude and fuel weight of your aircraft in the trimmed condition.

Start the Simulink data recorder and note the start time.

1. Apply a partial right rudder input such that the aircraft yaws and rolls to the right

followed by an equal and opposite left rudder input, bringing the aircraft’s wings back to

level. The two inputs should be in rapid succession of about 1-2 seconds each, such that a large enough roll and yaw rate develops.

1. Once sufficient data has been collected, stop the data recording and note the end time.