1. INTRODUCTION

This competition is designed to test the skills of each participating team in their understanding of and ability to troubleshoot an aircraft Pitot-Static system. Barfield recommends participants fully understand a basic aircraft Pitot-Static system (shown below)and potential issues that could be found. The faults found during this procedure will test this knowledge.

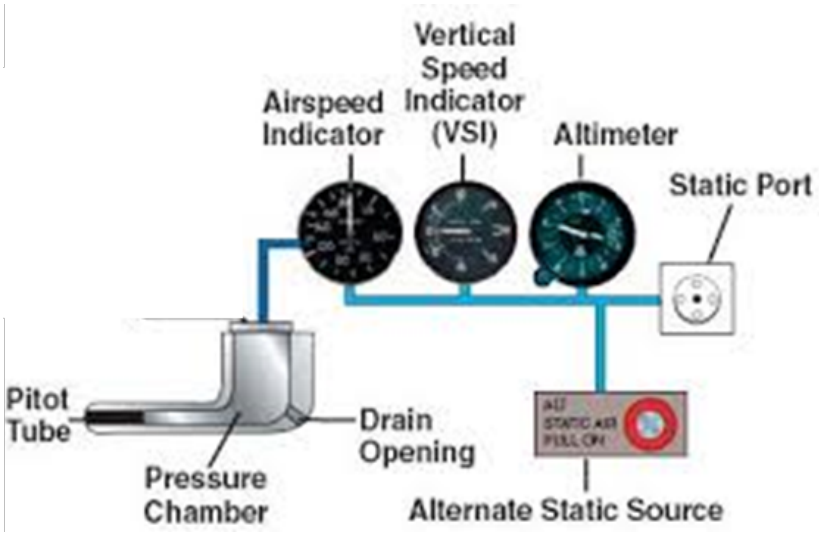


Figure 1 BASIC AIRCRAFT PITOT-STATIC SYSTEM

To ensure Teams which have yet to compete in this competition do not gain an unfair advantage by observing the earlier competitors, Barfield may have unidentified members of our team monitoring spectators in the testing area. Any team members or associates to a team identified to be loitering in the Pitot-Static area may result in a 3 min penalty being assessed when the team actually completes the competition. This penalty may be applied without a warning to the offending party found in the testing area and is at Barfield's, AMC and/or the judge's discretion.

2. INSTRUMENT CONFIGURATION – SINGLE SYSTEM (PILOT & COPILOT)

A. Airspeed 420 knot, Rate of Climb 6000 feet/min, Altimeter 50,000 feet

3. GOAL OF THE EXERCISE

A. Leak test both Pitot and Static system and record results that are within tolerance level.

B. Isolate, ID and Document trouble if found

4. ITEMS KNOWN GOOD

A. Test Equipment and test equipment hoses

B. Both Manifolds for Pilot's side and interconnecting hoses to Pitot-Static probe

C. Both Manifolds for Copilot's side and interconnecting hoses to Pitot-Static probe

D. All plumbing on the rear of the bench

5. TOOLS

A. Copy of Written Procedures

B. Form 611-00052 Test Data Sheet for annotating the test results.

C. DPS500NG Automated Air Data Tester.

D. Remote for control of DPS500NG

E. Set of Four known-good replacement hoses, PT1 (Red), PS1, PS2, PS3 (Blue)

F. The Airspeed, VSI, Altimeter or Pitot-Static Adapter may include potential failures. If an instrument or adapter is determined to be unserviceable during testing the participants will inform the judge which component is damaged.

G. 9/16' Wrench for replacing hoses.

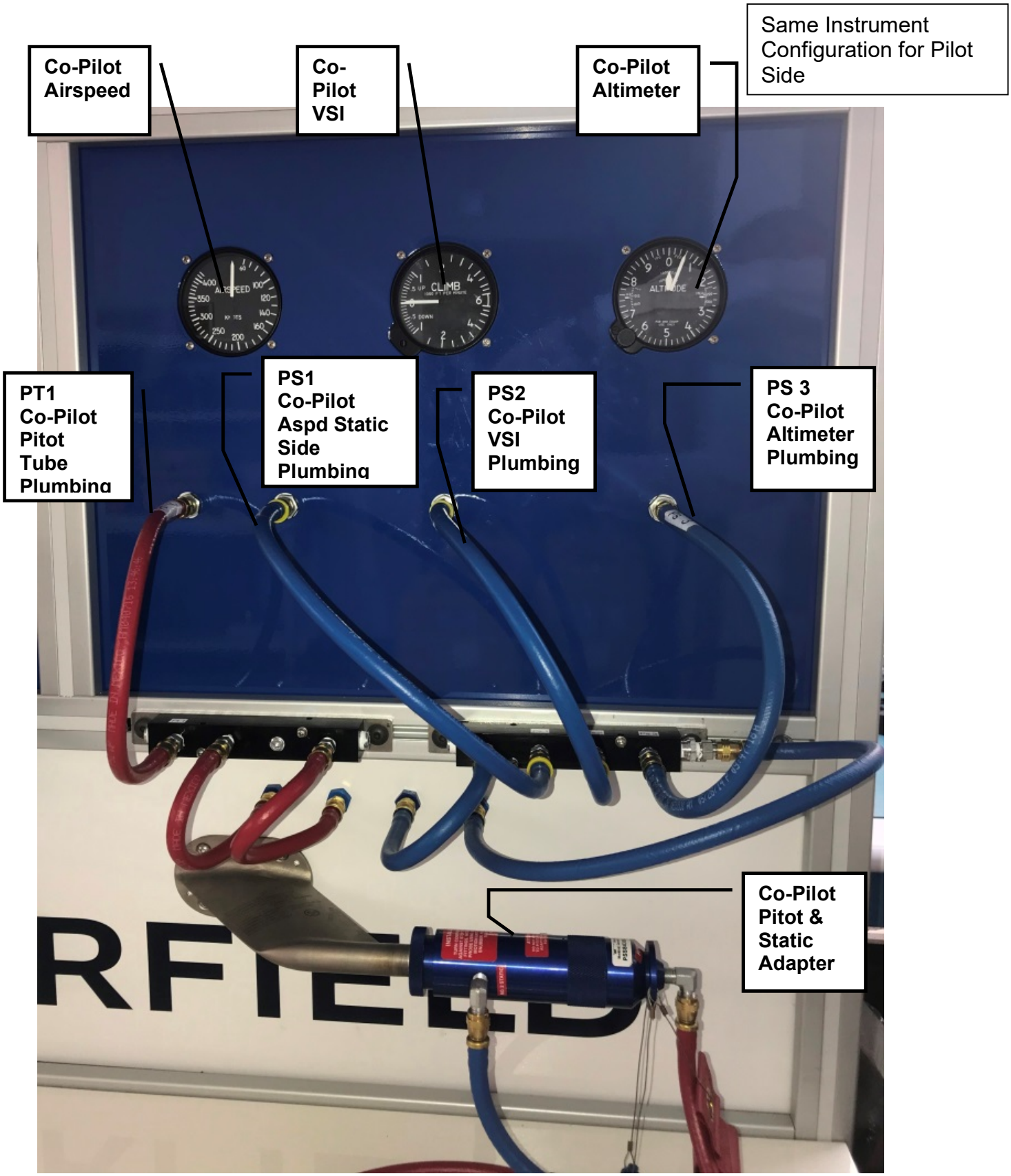


Figure 2 Instrument and Plumbing

6. TIMER:

A. Starting: The Judge will start the timer to begin the event. The timer is started once the ALT-Ps or A/S-Pt button on the DPS500NG is selected and the unit transitions into the control mode at the beginning of the Pitot Leak test procedure.

B. Stopping: The Participants will press the timer button to stop the clock once the Static Leak Test has been successfully completed. Taking the system back down to ground is not necessary. A successful completion is defined as a leak test within the specified tolerances and the Value and Pass/Fail boxes on the 611-00052 have been filled in with data. Once the data has been filled stop the clock.

7. PITOT SYSTEM LEAK TEST

A. Aircraft Preparation

a) Insure the aircraft (bench) is safe at ground level with no trapped pressures or vacuums.

B. Test Set Preparation

a) Unit will be powered up and initialization is complete.

b) Test Set is already safe at ground and in Leak Measure Mode.

c) Hoses are already connected between Test Set and correct Nav-Aids adapters.

C. Repairs:

a) A problem may be experienced at any time during this procedure. If a problem is detected, then attempt to determine the likely failure using best troubleshooting practices or suggestions shown below.
- Attempt repairs by removing suspect hose(s) and replace with new hose(s) having same designators (PT1, PS1, PS2, PS3). Any quantity or combination of hoses may be replaced during a single troubleshooting effort.
- The Airspeed, VSI, Altimeter and/or Pitot/Static Adapter may include potential failures. If the team suspects a component is the failed item, inform the judge which component is damaged.

b) Never make or break any connections on the bench or to the test equipment unless the system is safe at ground.

c) Be especially careful when unfastening hoses as there are always possible situations where trapped pressure could be present.

d) The team will be assessed a time penalty for Not taking the system to ground before removing a hose and/or for each good hose that is replaced unnecessarily.

D. Connecting Test Set

a) Nav-Aid's Adapter already mounted on the Pitot probe under test.

b) No other Connections are required.

Note: The test begins when the ALT CMD or A/S CMD button on the DPS500NG is selected and the unit transitions into the control mode and ends when the final leak testing result for the Static Channel is completed.

E. Test

a) Fill in Team Name in the top box of TEST DATA SHEET P/N 611-00052.

b) Press the "A/S-CMD" button to begin testing.

Note: DPS500NG automatically enters Control Mode upon selection of the ALT-Ps or A/S-Pt button.

c) Continuously monitor gauges to verify correct indications.

d) Enter the following data:

- Altitude Target: **N/A feet**
- Airspeed Target: **300 knots**
- Altitude Rate: **N/A feet/min***
- Airspeed Rate: **450 knots/min**

NOTE: Do not Enter an Altitude at this time.

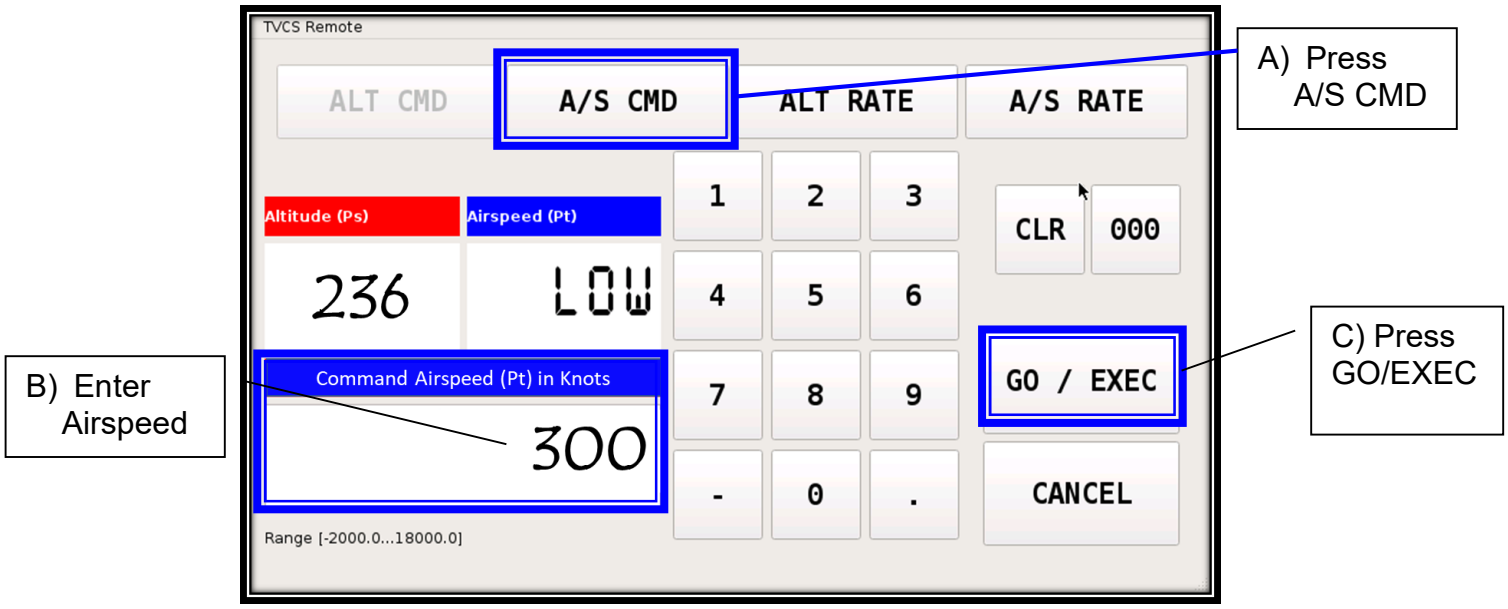


Figure 3: DPS500NG Define Setpoint Window (Airspeed)

e) Continuously monitor gauges to verify correct indications.

f) Once 300 knots have been achieved press “LEAK TEST” button twice.

g) The test set leak test will start immediately

h) The Airspeed must not decrease by more than 2 knots in 1 minute.

i) Record the test data on the Test Data Sheet form 611-00052

j) If the leak test passed, then proceed to Section 8 without returning airspeed to ground.

k) If the leak test failed, then take the Test Set safely to 0 knot. DPS500NG operators can use the “AMB. VENT” feature.

l) Attempt to determine the likely failure using best troubleshooting practices or suggestions shown below.
   - Attempt repairs by removing suspect hose(s) and replace with new hose(s) having same designators (PT1, PS1, PS2, PS3).
   - If the team suspects an instrument is the failed component, inform the judge which indicator is damaged.

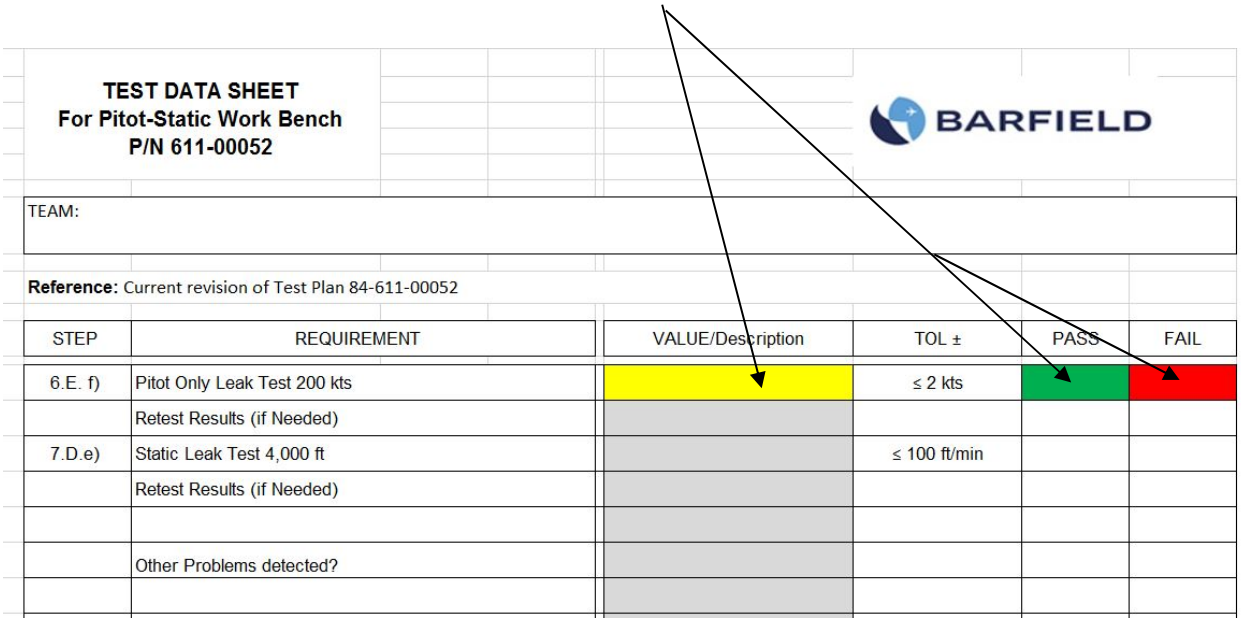
CAUTION: Never make or break any connections on the bench or to the test equipment unless the system is safe at ground. Be especially careful when unfastening hoses as there are always possible situations where trapped pressure could be present.

NOTE: A problem could exist at the hose fittings or anywhere along the body of the hose.

NOTE: The team will be assessed a time penalty for each good hose that is replaced unnecessarily or incorrectly identifying a broken indicator.

F. Repeat Section 7. E. c) through f). PITOT SYSTEM LEAK TEST as needed

G. Complete the Pass/Fail boxes on the Pitot Leak Test 200 Kt. procedure on form 611-00052.



TEST DATA SHEET
For Pitot-Static Work Bench
P/N 611-00052

BARFIELD

TEAM:

Reference: Current revision of Test Plan 84-611-00052

STEP	REQUIREMENT	VALUE/Description	TOL ±	PASS	FAIL
6.E. f)	Pitot Only Leak Test 200 kts		≤ 2 kts		
	Retest Results (if Needed)				
7.D.e)	Static Leak Test 4,000 ft		≤ 100 ft/min		
	Retest Results (if Needed)				
	Other Problems detected?				

8. STATIC SYSTEM LEAK TEST

A. Aircraft Preparation

a) Set Altitude Baro for **29.92 inHg**.

B. Test Set Preparation

a) N/A

C. Repairs:

a) A problem may be experienced at any time during this procedure. If a problem is detected, then attempt to determine the likely failure using best troubleshooting practices or suggestions shown below.

- Attempt repairs by removing suspect hose(s) and replace with new hose(s) having same designators (PT1, PS1, PS2, PS3). Any quantity or combination of hoses may be replaced during a single troubleshooting effort.
- The Airspeed, VSI, Altimeter and/or Pitot/Static Adapter may include potential failures. If the team suspects a component is the failed item, inform the judge which component is damaged.

b) Never make or break any connections on the bench or to the test equipment unless the system is safe at ground.

c) Be especially careful when unfastening hoses as there are always possible situations where trapped pressure could be present.

d) The team will be assessed a time penalty for Not taking the system to ground before removing a hose and/or for each good hose that is replaced unnecessarily.

D. Connecting Test Set

a) N/A

E. Test

a) Press the “ALT-Ps” button to begin testing.

Note: DPS500NG automatically enters Control Mode upon selection of the ALT-CMD or A/S-CMD button.

b) Continuously monitor gauges to verify correct indications.

c) Enter the following data:

- Altitude Target: **5,000 Feet**
- Airspeed Target: **Any knots**
- Altitude Rate: **5,000 feet/min**
- Airspeed Rate: **Any knots/min**

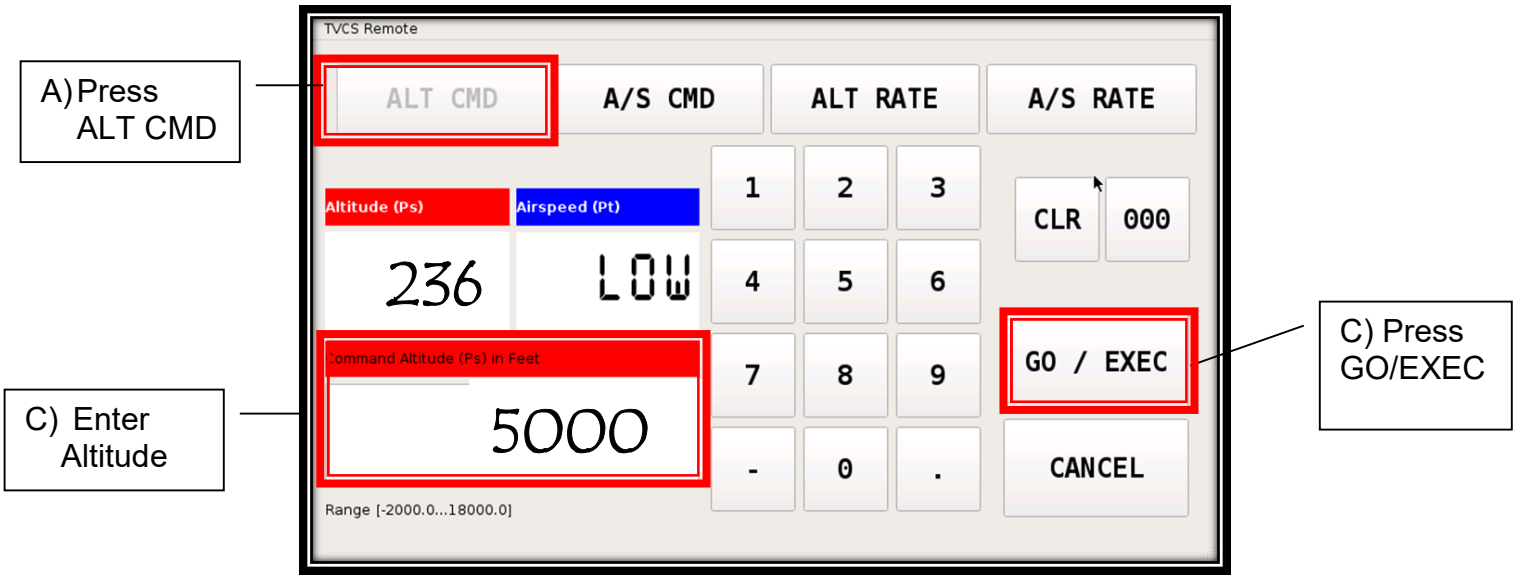


Figure 4: DPS500NG Define Setpoint Window (Altitude)

d) Press GO/EXEC button to go to test point.

e) Continuously monitor gauges to verify correct indications.

f) Once 5,000 Feet have been achieved press “LEAK TEST” button twice.

g) The test set leak test will start immediately

h) The Altitude must not decrease by more than 100 feet in 1 minute.

CAUTION: Observe instruments and be ready to resume control if necessary.

i) Record the test data on the worksheet 64-611-00052.

j) If the leak test passes then proceed to Section 9.

k) If the leak test failed, then take the system safely to ambient pressure.

l) Attempt to determine the likely failure using best troubleshooting practices or suggestions shown below.

- Attempt repairs by removing suspect hose(s) and replacing with new hose(s) having same designators (PT1, PS1, PS2, PS3).
- If the team suspects an instrument is the failed component, inform the judge which indicator is damaged.

CAUTION: Never make or break any connections on the bench or to the test equipment unless the system is safe at ground. Be especially careful when unfastening hoses as there are always possible situations where trapped pressure could be present.

CAUTION: Never use Snoop on instruments, fittings, lines or hoses which are at vacuum.

NOTE: The team will be assessed a time penalty for each good hose that is replaced unnecessarily or incorrectly identifying a broken indicator.

m) Repeat Section 8. E. a) through d) STATIC SYSTEM LEAK TEST as needed

9. COMPLETE THE PASS/FAIL BOXES ON THE STATIC LEAK TEST 5,000 FT. PROCEDURE ON FORM 611-00052

TEST DATA SHEET
For Pitot-Static Work Bench
P/N 611-00052

BARFIELD

TEAM:

Reference: Current revision of Test Plan 84-611-00052

STEP	REQUIREMENT	VALUE/Description	TOL ±	PASS	FAIL
6.E. f)	Pitot Only Leak Test 200 kts		≤ 2 kts		
	Retest Results (if Needed)				
7.D.e)	Static Leak Test 4,000 ft		≤ 100 ft/min		
	Retest Results (if Needed)				
	Other Problems detected?				

10. PRESS THE TIMER BUTTON TO STOP THE CLOCK UPON COMPLETING THE LEAK TEST

11. TIME ADJUSTMENTS/PENALTIES

STEP	REQUIREMENT	VALUE
	Total Time Elapsed	
A	Damage to indicators	Disqualification
B	Not following test procedure 84-611-00052-150412-5 or following any of the Cautions outlined in the procedure.	+ 2 Min Addition
C	Hose replacements do not show correct designator (PT1, PS1, PS2, PS3). Parts on an aircraft must always be replaced with the correct part numbers	+ 1 Min Addition/Discrepancy
D	Other discrepancies as determined by Barfield Inspector.	+2 Min per
E	Team members or associates identified to be loitering in the Pitot-Static area can be assessed a 3 min penalty by judges. **If organization has more than one team, all teams are assessed this penalty**	+ 3 Min Addition