



Transports Canada Transport Canada
Sécurité et sûreté Safety and Security
Aviation civile Civil Aviation

TP 13799E

QUALIFICATION TEST GUIDE

CAR PART IV FLIGHT TRAINING DEVICES

LEVEL 2 OR 5 AEROPLANE

Second Edition
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Qualification Test Guide

CAR Part IV **Flight Training Device** **Level 2 or 5** **Aeroplane**

This reference sets out the minimum data required for the initial and recurrent Flight Training device (FTD) certification. It is intended for the use of the FTD operator to complete the initial and recurrent certification validation tests.

The initial qualification has a dual purpose, firstly to ensure that the handling characteristics and performance of the FTD are comparable to the aircraft type presented and secondly, to establish some baseline values for the annual validation tests. The subsequent annual validation tests should that the FTD performance remains within the tolerances to maintain certification.

Operators requesting FTD certifications shall contact the Superintendent – Flight Training at the Transport Canada Regional office to coordinate the data collection process for the FTD initial and recurrent certification validation tests.

Detailed descriptions and explanations of the validation tests can be found in Chapter 4 of the Aeroplane and Rotorcraft Simulator Manual (TP 9685) published by Transport Canada and available at:

<http://www.tc.gc.ca/aviation/commerce/manuals/>

Once completed, this Qualification Test Guide (QTG) is to be retained on file by the FTD operator for future reference during recurrent validation tests. A Transport Canada - Civil Aviation Inspector shall monitor the conduct of the initial validation test and may monitor recurrent validation tests.

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Drawings for the attachment of the spring scale to the control wheel and rudder pedals should be attached here, when required.

SECTION 1

Part IV Flight Training Devices

Part IV flight training devices are those devices used by Flight Training Units (FTU) operating in accordance with a FTU Operating Certificate issued pursuant to Subpart 406 of the *Canadian Aviation Regulations (CAR)*.

Flight training devices must meet the requirements of section 606.03 – *Synthetic Flight Training Equipment*, which states in part “No person shall use synthetic flight training equipment for pilot training or a pilot proficiency check required pursuant to Part IV, this Part or Part VII unless there is in force in respect of that equipment a flight simulator certificate or a flight training device certificate issued pursuant to subsection (2)...”.

Subsection 606.03(2) states “The Minister shall, where it is determined that the synthetic flight training equipment meets the standards set out for that equipment in the *Aeroplane and Rotorcraft Simulator Manual*, issue to the operator of that equipment a flight simulator certificate or a flight training device certificate.”

Subsection 606.03(5) states in part “A certificate issued pursuant to subsection (2) remains in force where the synthetic flight training equipment in respect of which the certificate has been issued is re-evaluated

(b) in the case of a flight training device, at least every twelve (12) months.”

Subsection 606.03 (6) states in part “Subject to subsection (7), the certificate referred to in subsection (5) remains in force:

(b) in the case of a flight training device, until the first day of the thirteenth month following the month in which the flight training device was evaluated.”

Subsection 606.03(7) states “The Minister may extend the period in respect of which a flight simulator certificate or a flight training device certificate is in force by up to 60 days where the Minister is of the opinion that aviation safety is not likely to be affected.

In summary, for simulated flight training credits to be recognized for licences or ratings, FTU operators must meet the initial certification requirements for Level 2 or Level 5 FTDs and must annually verify that the FTD continues to meet the standards established at the initial certification.

Levels of Part IV FTDs

Level 1:

Level 1 flight training devices are those listed at the following website:

http://www.tc.gc.ca/aviation/commerce/simulator.ftd_list_e.htm

The Level 1 FTDs listed are no longer approved or recognized for training credits. FTDs of this level must meet the requirements of this guide. FTD operators who, for one reason or another could not meet the qualification standards for Level 2 or Level 5 as described in this guide, but who had been previously approved for training credits, are eligible for an evaluation and qualification for Part IV Level 2 or Level 5 FTDs.

Level 2:

Level 2 FTDs are generic and do not represent a specific aircraft cockpit and need not refer to a specific aeroplane type.

Level 5:

Level 5 FTDs represent a specific cockpit for the aircraft represented.

Certification of Part IV FTDs

Flight training devices are required to maintain the levels of performance, functions of controls and other characteristics found during the initial qualification test. The recurrent validations of these FTDs will be completed in accordance to the validation procedures described in this guide for the initial and recurrent qualification tests.

On demand, the Minister shall verify the initial certification and issue a *Flight Training Device Certificate*. The Minister may verify recurrent validations.

An operator wanting to qualify a FTD must submit a completed *Qualification Test Guide (TP 13799)*(QTG) and a request for validation to the Regional Superintendent – Flight Training. In turn, a Transport Canada Inspector will schedule a validation using the submitted QTG. The ability to meet the requirements of section 5 of this guide must be satisfied prior to granting approval for qualification. When the qualification tests are satisfactorily completed and all discrepancies corrected, the Minister shall issue an FTD Identification Number and a *Flight Training Device Certificate*.

A QTG must be completed for each aircraft type to be represented during the planned training operations. Level 2 and Level 5 FTDs do not require a specific aerodynamic model, however, their performance must be compared to a reference set of validation data for initial qualification and for repeated recurrent evaluations. In the absence of a specific model, these devices may use a generic model typical of the aeroplane class represented.

Evaluation Policy

The FTD must be assessed in the areas critical to the accomplishment of pilot training and checking events. This includes aerodynamic responses, control checks and performance in take-off, climb, cruise, descent, approach and landing. Crewmember stations and instructor station function checks and certain additional requirements must be assessed. The visual systems, if installed, will be evaluated to ensure their proper operation. It is intended that FTDs be evaluated as objectively as possible. During the Transport Canada validation, time will be spent evaluating certain tests from this guide. The aim of the Transport Canada evaluation is to validate the testing completed by the operator.

The following guidelines are provided for the initial and recurrent qualification tests:

1. This sample QTG was originally prepared for a Level 2 FTD. The validation tests contained herein are the tests required for a Level 2 FTD. Data stated in the QTG are based on a generic C-172 aircraft (the same tests are required for a Level 5 FTD).
2. A copy of this validation QTG is to be provided to the operator at least 2 weeks prior to the scheduled validation visit of a Transport Canada Inspector. This sample QTG is meant to demonstrate the contents required by the simulator manual (TP9685E) and is one example only.
3. Validation Tests: Ensure you review the initial conditions in this sample and change them to reflect the way you wish to fly your device for the represented aircraft, ie. Weight, airspeeds, power and flap settings etc.
4. The operator shall provide the assistance of two qualified persons to conduct the validation test.(One at the instructor console and one to fly the FTD)
5. The operator is to ensure that a required suitable scale, attachment accessories and digital stopwatch are available to carry out the qualifying test.
6. The operator is responsible to ensure that the FTD is fully operational at the time of the scheduled validation visit.
7. The copy of this QTG validation test is to be retained in the FTD file by the operator for annual re-validation by the FTD operator.
8. It is strongly recommended that a complete briefing of all personnel involved in the QTG validation take place before the test is initiated.

ANNEX 1 shall be completed to record the recurrent test prior to the submission of the annual letter of compliance to Transport Canada.

The QTG will be approved after completion of the initial or upgrade evaluation and all discrepancies in the QTG have been corrected. This document, after inclusion of the TC-witnessed test results, will become the Master Qualification Test Guide (MQTG). The MQTG will then remain in the custody of the operator for use in future recurrent qualifications.

Recurrent Evaluations

For a FTD to retain its qualification, it will be evaluated on a recurrent basis using the MQTG. Each recurrent evaluation will consist of function tests and at least a portion of the validation tests in the MQTG to confirm the functions of controls and the flight parameters are within tolerances of the results in the MQTG. The tolerances expressed are the maximum allowed by transport Canada and the data obtained during the initial qualification tests serve as a reference base for recurrent and special evaluations.

The recurrent evaluations will be planned for every six months with approximately one-half of the validation tests in the MQTG accomplished each time. This will allow all MQTG tests to be accomplished annually.

When the annual recurrent verifications have been completed and the results have been recorded in Annex 1, the operator shall submit a letter of compliance to the Regional Superintendent – Flight Training.

Changes to the FTD

If the FTD is transferred to another operator, is upgraded or moved to a new location, the following procedures should be followed:

1. Notify the Regional Office of Transport Canada prior to the change;
2. Prior to returning the FTD to service, the operator should compete a validation test and functions check. The results will be retained and presented for validation by Transport Canada.

Transport Canada may schedule a validation visit prior to issuing a new certificate.

Special Evaluations

Between recurring evaluations, if deficiencies are discovered or it becomes apparent that the FTD is not being maintained to initial qualification standards, a special evaluation may be conducted by the Minister to verify its status.

The FTD will lose its qualification when the Minister can no longer ascertain maintenance of the original validation criteria based on a recurrent or special evaluation. Additionally, the Minister shall advise the operator if a deficiency is jeopardizing training requirements and arrangements shall be made to resolve the deficiency in the most effective manner, including the withdrawal of approval by the Minister.

SECTION 2

**QUALIFICATION TEST GUIDE
APPROVAL PAGE**

Company Name: _____

FTD Type/Name: _____

Type of Aircraft Represented: _____ i.e. C172

The abovementioned Flight Training Device has met the requirements applicable to Flight Training Devices in accordance with section 606.03 – *Synthetic Flight Training Equipment* of the *Canadian Aviation Regulations*.

The operator is responsible for the validation of the Flight Training Device in order to maintain a valid status on the list of approved Flight Training Devices and allow the recognition of credits for the training completed on the device.

Date of Approval: _____

Company

Transport Canada

SECTION 2

FTD IDENTIFICATION

- 2.1.1. The Qualification Test Guide herein is applicable to **FTD ID #**_____, for qualification to Level ___ FTD in accordance with Transport Canada Aeroplane and Rotorcraft Simulator Manual, TP 9685 Revision 2.
- 2.1.2. FTD Model _____ was manufactured by _____.
- 2.1.3. For the purpose of this test guide, **APPR Flap** is considered to be _____ degrees of flap.
- 2.1.4. For the purpose of this test guide, **WEIGHT** is considered to be _____ KG or _____ LB
- 2.1.5. Approval was based on using a _____ computer type.
- 2.1.6. Equipment required to conduct the certification is a _____ **spring scale and a digital stop watch.**
- 2.1.7. Method of attachment _____
- 2.1.8. All validation tests are conducted under **ISA** conditions, therefore temperatures are not part of the initial conditions for each test.
- 2.1.9. Acceptable location, (the FTD shall be in a closed room suitable to conduct training)?
Yes, _____ No _____
- 2.1.10. Pilot's seat arrangement - Fixed pilot's seat/s shall be adjustable fore and aft. The seat height shall be equivalent to aircraft seating, (distance from cushion to yoke).
Yes, _____ No, _____
- .11. Instructor console: The instructor console shall be positioned and designed to enable the instructor to readily introduce faults, configuration changes and to freeze the FTD without distracting the trainees.
Yes, _____ No, _____
- 2.1.12. Aircraft type Log book available?
Yes _____ No _____

(Note: Any other descriptions or items considered to be appropriate may be added on this page.)

SECTION 3

GLOSSARY OF TERMS

The following abbreviations are used throughout the test guide.

APPR	Approach	MAX	Maximum
A/S	Airspeed	MB	Megabyte
		MHz	Megahertz
CARB HT	Carburettor Heat	MP	Manifold Pressure
		ms	Milliseconds
		OAT	Outside Air Temperature
deg	Degrees	PRES ALT	Pressure Altitude
DWN	Down	PROP	Propeller
FPM	Feet per Minute	PFLF	Power for level flight
FT	Feet	RPM	Revolutions per Minute
FWD	Forward		
in	inch	sec	Second
KG	Kilograms	T/O	Takeoff
KIAS	Knots Indicated Airspeed	VSI	Vertical Speed Indicator
lb.	Pounds	Vso	Stall Speed
LDG	Landing	WT	Weight

SECTION 4

VALIDATION TESTS

PERFORMANCE

1. NORMAL CLIMB

TEST OBJECTIVE Demonstration of normal climb performance.

INITIAL FLIGHT CONDITIONS

POWER - **FULL THROTTLE** or _____ **RPM** _____ **MP**

Flaps - **UP**

Trimmed for **72** or _____ **KIAS** climb.

TEST METHOD Maintain Climb A/S **72** or _____ **KIAS**

FTD DATA VSI reads: _____ **FPM**

TOLERANCE +/- **3 KIAS** and +/- **100 FPM**

2. STALL WARNING (actuation of stall warning device)

TEST OBJECTIVE To determine that the FTD stall warning capabilities are adequate.

TEST METHOD **Case 1**

Flaps - **UP**

POWER - **PFLF @ 85** or _____ **KIAS** and trimmed for level flight.

Reduce power to idle.

Raise nose to decrease airspeed at a rate of approximately one knot/sec decelerating towards V_s .

FTD DATA Stall warning: _____ **KIAS**

TOLERANCE +/- **3KIAS**

Case 2

Flaps - **LDG (Full)**

POWER - **PFLF @ 60** or _____ **KIAS** and trimmed for level flight

Raise nose to decrease airspeed at a rate of approximately one knot/sec decelerating towards V_{so} .

FTD DATA Stall warning: _____ **KIAS**

TOLERANCE +/- **3KIAS**

3. **ENGINE ACCELERATION**

TEST OBJECTIVE Demonstrate engine acceleration response time.

INITIAL FLIGHT CONDITIONS

PRES ALT - **On ground**

POWER - **Idle**

Parking brake **ON**

TEST METHOD Slam power to MAX.

FTD DATA Time required to indicate full power: _____ **sec**

TOLERANCE **+/- 10% of time or 1 sec**

4. **ENGINE DECELERATION**

TEST OBJECTIVE Demonstrate engine deceleration response time.

INITIAL FLIGHT CONDITIONS

PRES ALT - **On Ground**

Power - **MAX T/O**

Brakes - **ON**

TEST METHOD

Rapidly retard throttle to IDLE STOP.

Time engine response from MAX T/O power down through 1000 RPM (*or as appropriate for your FTD*).

FTD DATA

Time required to slow through 1000 RPM: _____ **sec**

TOLERANCE **+/- 10% of time or 1 sec**

HANDLING QUALITIES

STATIC CONTROL CHECKS:

5. COLUMN POSITION VERSUS FORCE

TEST OBJECTIVE: Demonstrate column position versus control force.

INITIAL CONDITIONS

On the ground, engine at IDLE, Parking Brake ON, trim centered, control column resting at neutral.

TOLERANCE **Breakout force +/- 2 lb.**
Force to hold +/- 5 lb.

TEST METHOD

Case 1

Use the spring scale to measure the breakout force required to initiate aft column movement from neutral (*use some appropriate method to attach the spring scale, suggest you may describe this in section 2, para 2.1.6 or in Annex 2*).

Deflect column from neutral to full aft and measure the force with a spring scale (*use some appropriate method to attach the spring scale, suggest you may describe this in section 2, para 2.1.6 or in Annex 2*).

NOTE: For full column deflection, back off from stop (1/4 in. or less) to acquire free-floating reading.

FTD DATA Breakout force: _____ **lb.**
Force to hold full aft: _____ **lb.**

Case 2

Measure the forward column break out and full deflection forces as above.

FTD DATA Breakout force: _____ **lb.**
Force to hold full forward: _____ **lb.**

6. CONTROL WHEEL POSITION VERSUS FORCE

TEST OBJECTIVE Demonstrate control wheel deflection versus control force.

INITIAL CONDITIONS

On the ground, engine at IDLE, Parking Brake ON, trim centered, control wheel resting at neutral.

TOLERANCE **Breakout force +/- 2 lb.**
Force to hold +/- 3 lb.

TEST METHOD Case 1

Use the spring scale to measure the breakout force required to initiate left control wheel movement from neutral (*use some appropriate method to attach the spring scale, suggest you may describe this in section 2, para 2.1.6 or in Annex 2*).

Deflect the control wheel from neutral to full left and measure force with the spring scale (*use some appropriate method to attach the spring scale, suggest you may describe this in section 2, para 2.1.6 or in Annex 2*).

NOTE: For full deflection, back off from stop (1/4 in. or less) to acquire a free-floating reading.

FTD DATA Breakout force: _____ **lb.**
Force to hold full left aileron: _____ **lb.**

Case 2

Measure the right control wheel breakout and full deflection forces as above.

FTD DATA Breakout force: _____ **lb.**
Force to hold full right aileron: _____ **lb.**

7. **RUDDER PEDAL POSITION VERSUS FORCE**

TEST OBJECTIVE Demonstrate rudder pedal deflection versus control force

INITIAL CONDITIONS

On the ground, engine at IDLE, Parking Brake ON, trim centered, rudder pedals neutral.

TOLERANCE Breakout force +/- 5 lb.
Force to hold full rudder deflection +/- 5 lb.

TEST METHOD **Case 1**

Use the spring scale to measure the breakout force required to initiate left rudder (left pedal forward) movement from neutral (*use some appropriate method to attach the spring scale, suggest you may describe this in section 2, para 2.1.6 or Annex 2*).

Use the spring scale to measure the force to hold the left rudder left pedal deflected fully forward (*use some appropriate method to attach the spring scale, suggest you may describe this in section 2, para 2.1.6 or in Annex 2*).

NOTE: For full rudder pedal deflection, back off from stop (1/4 in. or less) to acquire a free floating reading.

FTD DATA Breakout force: _____ lb.
Force to hold full left rudder pedal: _____ lb.

Case 2

Measure the right rudder pedal breakout and full deflection forces as above.

FTD DATA Breakout force: _____ lb.
Force to hold full right rudder: _____ lb.

8. LONGITUDINAL POWER CHANGE FORCE

TEST OBJECTIVE Demonstrate longitudinal power change force.

INITIAL FLIGHT CONDITIONS

POWER - **2300** or _____ **RPM**, and _____ **MP.**@ **100** or _____ **KIAS**
Flaps - **UP**
Trimmed for level flight.

TEST METHOD

Reduce power to idle.
Maintain backpressure on control column to maintain 100 KIAS and measure force with the spring scale.

TOLERANCE : **+/- 5 lb.. or 20% of the force whichever is the lesser**

FTD DATA

Back pressure on control column to maintain desired A/S: _____ **lb.**

9. LONGITUDINAL FLAP CHANGE FORCE

TEST OBJECTIVE Demonstrate longitudinal flap change force.

INITIAL FLIGHT CONDITIONS

Flaps - **UP**

TOLERANCE: **+/- 5 lb.. or +/- 20% of the force**

TEST METHOD

Case 1

POWER - **PFLF @ 100** or _____ **KIAS**, trimmed for level flight
Select **APPR** flap; maintain level flight. Once the airspeed stabilizes, measure control column force.

FTD DATA

Pressure on control column to maintain level flight: _____ **lb. FWD/AFT**

Case 2

POWER - **PFLF @ 60** or _____ **KIAS**, trimmed for level flight
Select **LDG** flap; maintain level flight. Once the airspeed stabilizes, measure control column pressure as above.

FTD DATA

Pressure on control column to maintain level flight: ____ **lb. FWD/AFT**

10. FLAP OPERATING TIME

TEST OBJECTIVE Demonstrate flap operating times.

TOLERANCE +/- 3 sec or 10% of time

TEST METHOD

Case 1

POWER - PFLF @ 95 or _____ KIAS

Flap - Up, trimmed for level flight

Select APPR Flap and record the time for the flaps to cycle from UP to APPR.

FTD DATA Length of time for flap to cycle to APPR: ____ sec

Case 2

POWER - reduce to PFLF @ 60 or _____ KIAS with flap at APPR.

Maintain level flight.

Select LDG Flap and record the time for the flaps to cycle from APPR to LDG.

FTD DATA Length of time for flap to cycle to LDG: ____ sec

Case 3

Select APPR Flap and record the time for the flaps to cycle from LDG to APPR.

FTD DATA Length of time for flap to cycle up to APPR: ____ sec

Case 4

Select UP Flap and record the time for the flaps to cycle from APPR to UP.

FTD DATA Length of time for flap to cycle to UP: ____ sec

NOTE: With the exception of the power and airspeed reduction when lowering flap, the test is meant to run from one step to the other. Airspeed is not critical other than in preventing a stall or an overspeed condition.

11. LONGITUDINAL TRIM

TEST OBJECTIVE

Measure pitch attitude and trim indicator position required to maintain level flight.

TOLERANCE +/- 1 deg Pitch angle, +/- ½ unit of trim

TEST METHOD

Case 1

POWER - **PFLF @ 100 or _____ KIAS**

Flap - **UP**, trimmed for level flight

FTD DATA The attitude indicator reads: _____ **deg pitch**

The trim indicator reads: _____ **units**

Case 2

Flap - Select **APPR**

POWER - **PFLF @ 90 or _____ KIAS**

Trim to maintain level flight.

FTD DATA The attitude indicator reads: _____ **deg pitch down**

The trim indicator reads: _____ **unit nose down trim**

Case 3

Flap - Select **LDG**

POWER - **PFLF @ 65 or _____ KIAS**

Trim to maintain level flight.

FTD DATA The attitude indicator reads: _____ **deg pitch down**

The trim indicator reads: _____ **units**

12. LONGITUDINAL STATIC STABILITY

TEST OBJECTIVE

Determine the tendency of the aircraft to return to a trimmed condition.

INITIAL CONDITIONS

POWER - **PFLF @ 90 or _____ KIAS**

Flap - **UP, trimmed for level flight**

TOLERANCE **+/- 5 lb. or 10% of control column force**

TEST METHOD

NOTE: DO NOT RETRIM or CHANGE THE POWER SETTING.

Case 1

Apply backpressure on yoke to raise nose and stabilize the A/S at **70 or _____ KIAS** and measure the force with the spring scale.

FTD DATA Control column pressure: _____ **lb. aft**

Case 2

NOTE: DO NOT RETRIM or CHANGE THE POWER SETTING.

Apply forward pressure on yoke to lower nose and stabilize A/S at **100 or _____ KIAS** and measure the force as above.

FTD DATA Control column pressure: _____ **lb. fwd**

13. **LONGITUDINAL DYNAMIC STABILITY (PHUGOID DYNAMICS)**

TEST OBJECTIVE Test longitudinal dynamic stability.

INITIAL FLIGHT CONDITIONS

POWER - **PFLF @ 100 or _____ KIAS**

Flap - **UP**, trimmed for level flight

TEST METHOD

Pitch nose UP to 10 degrees.

Wait for VSI to stabilize.

Start timing and release controls.

Allow the nose to pitch DOWN and then UP.

Record the time for the first two times the VSI stabilizes upwards.

Allow pitching to continue and record the total number of pitches until stabilized in level flight (or VSI change is less than + or - 50 FPM).

FTD DATA Time for pitch cycles: (1) _____ sec, and (2) _____ sec

Pitching totally dampened: _____th Oscillation

TOLERANCE 10% of period with representative damping

14. **ROLL RESPONSE (RATE)**

TEST OBJECTIVE. Demonstrate lateral roll response at various airspeeds.

TOLERANCE +/- 10% or +/- 2deg/sec roll rate

TEST METHOD

Case 1

POWER - **PFLF @ 100 or _____ KIAS**

Flap - **UP**, trimmed for level flight

Establish 30 deg left bank. Roll to 30 deg right bank with full aileron deflection.

Record the time from initiation of control wheel movement to 30 deg right bank.

NOTE: 1 DO NOT ATTEMPT TO STOP ROLL AT 30 deg RIGHT BANK

NOTE 2 Roll rate = $60 \div$ time to roll from 30 deg on one side to 30 deg on the opposite side.

FTD DATA Roll rate: _____ deg/sec (rate per Case 1).Left to right.

FTD DATA Roll rate: _____ deg/sec (rate per Case 1).Right to left.

Case 2

POWER - **PFLF @ 65 or _____ KIAS**

Flap - **LDG**, trimmed for level flight

COMPLETE AS PER CASE 1

FTD DATA Roll rate: _____ **deg/sec** (rate per Case 1).Left to right.

FTD DATA Roll rate: _____ **deg/sec** (rate per Case 1).Right to left.

15. SPIRAL STABILITY

TEST OBJECTIVE Demonstrate correct spiral stability representative of the type.

INITIAL FLIGHT CONDITIONS

POWER - **PFLF @ 100 or** _____ **KIAS**

Flap - **UP**, trimmed for level flight

TEST METHOD

Roll to 45 deg of bank to the left.

Pitch the nose **DOWN** to 10 deg.

Release the controls.

FTD DATA

Maximum Airspeed: _____

Maximum Angle of Bank: _____

TOLERANCE **Correct trend**

16. RUDDER RESPONSE

TEST OBJECTIVE To demonstrate roll response to a rudder input.

INITIAL FLIGHT CONDITIONS

POWER - **PFLF @ 100 or** _____ **KIAS**

Flap - **UP**, trimmed for level flight

TEST METHOD

Wings level.

Apply full left rudder.

Record the time to 10 deg of bank.

FTD DATA Time to 10 deg of bank: _____ **sec**

TOLERANCE **Roll rate - +/- 2 deg/sec**
Bank angle - +/- 3 deg

17. STEADY STATE SIDESLIP OR CONSTANT HEADING CROSS-CONTROLLED BANK ANGLE

TEST OBJECTIVE To determine rudder/aileron effectiveness.

INITIAL FLIGHT CONDITIONS

POWER - **PFLF @ 80 or _____ KIAS**

Flap - **APPR**, trimmed for level flight

TEST METHOD

While maintaining a constant A/S;

- (1) Apply full left rudder, and
- (2) Apply sufficient right bank to stop the turn.

FTD DATA Bank: _____ **deg**

TOLERANCE +/- **2 deg of bank**

18. TRANSPORT DELAY

Time from control input to recognizable system response (transport delay) must be 300 milliseconds or less. The standard must be certified by the manufacturer in the qualification guide submitted for qualification. Users will not be required to verify this standard when requesting approval of a FTD. Normally, Transport Canada inspectors will not be expected to measure or verify this maximum delay time as a part of the FTD approval process.

TEST OBJECTIVE

Demonstrate Transport Delay between control input and processor reaction.

TEST METHOD

The response time from control input to the instrument response shall be quick enough to simulate normal aircraft responses.

TOLERANCE **300 milliseconds or less**

SECTION 5

AVIONICS

TEST OBJECTIVE

To determine the ability of the aircraft avionics to simulate actual flight conditions.

INITIAL CONDITIONS

The FTD shall be flown for one holding pattern, one VOR or LOC/BC, one ILS and one NDB or GPS approach.

TEST METHOD

The display at the pilot station(s) and instructor's station must be accurate and realistic

FTD DATA

1. Communication radio(s) with display(s) of the radio frequency in use.
Navigation radio(s), including: an ADF, a GPS and a VOR with ILS indicator (each with an aural identification feature), and a marker beacon receiver.
2. All instrument displays must be visible during all flight operations. The update rate of all displays must provide an image of the instrument that does not appear:
 - a. to be out of focus;
 - b. to "jump" or "step" to a distracting degree during operation;
 - c. with distracting jagged lines or edges.
3. Displays must reflect dynamic behavior of an actual aircraft display; e.g., a VSI reading of 500 fpm must reflect a corresponding movement in altimeter, and an increase in power must reflect an increase in the rpm indication or power indicator.

Flight Dynamics Requirements

Flight dynamics of the FTD must be comparable to the way the training aircraft represented performs and handles. The presence and intensity of wind and turbulence must be reflected in the handling and performance qualities of the simulated aircraft and must be comparable to the way the aircraft or family of aircraft replicated under these conditions.

