

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

FTD Operator Name			
FTD Qualification Level	<input type="checkbox"/> FTD Level 1	<input type="checkbox"/> FTD Level 2	
FTD Qualification Type	<input type="checkbox"/> Initial Qualification	<input type="checkbox"/> Qualification renewal	<input type="checkbox"/> Modifications <input type="checkbox"/> Re-location
FTD Manufacturer Name			
FTD Serial No			
FTD Qualification Number			
FTD Qualification Expiry Date			

A. FLIGHT TRAINING DEVICES (FTD) GENERAL TECHNICAL REQUIREMENTS

Qual. Level	General Technical Requirements	Result	
		YES	NO
FTD Level 1	Type specific with at least 1 system fully represented.	<input type="checkbox"/>	<input type="checkbox"/>
	Enclosed or open flight deck.	<input type="checkbox"/>	<input type="checkbox"/>
	Choice of systems simulated is the responsibility of the organization seeking approval or re-approval for the course.	<input type="checkbox"/>	<input type="checkbox"/>
	The airplane system simulated shall comply with the relevant subjective and objective tests relevant to that system.	<input type="checkbox"/>	<input type="checkbox"/>
FTD Level 2	Type specific device with all applicable systems fully represented.	<input type="checkbox"/>	<input type="checkbox"/>
	An enclosed flight deck with an onboard instructor station.	<input type="checkbox"/>	<input type="checkbox"/>
	Type specific or generic flight dynamics (but shall be representative of aircraft performance)	<input type="checkbox"/>	<input type="checkbox"/>
	Primary flight controls which control the flight path and be broadly representative of airplane control characteristics	<input type="checkbox"/>	<input type="checkbox"/>
	Significant sounds	<input type="checkbox"/>	<input type="checkbox"/>
	Control of atmospheric conditions	<input type="checkbox"/>	<input type="checkbox"/>
	Navigation Data Base sufficient to support simulated airplane systems	<input type="checkbox"/>	<input type="checkbox"/>

Remarks	

Inspector Name	Date	Signature
Qualified FTD (xxx) Assessor Name	Date	Signature

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

B. FLIGHT TRAINING DEVICES (FTD) QUALIFICATION REQUIREMENTS

This checklist describes the minimum Flight Training Devices (FTD) requirements for qualifying devices to the required Qualification Levels. Certain requirements included in this section shall be supported with a statement of compliance (SOC) and, in some designated cases, an objective test. The SOC will describe how the requirement was met. The test results shall show that the requirement has been attained. In the following tabular listing of FSTD standards, statements of compliance are indicated in the compliance column.

Requirements		FTD Level		Statement of Compliance	Result	
		1	2		YES	NO
1	General					
a	A cockpit/flight deck sufficiently enclosed to exclude distraction, which will replicate that of the airplane or class of airplane simulated		X		<input type="checkbox"/>	<input type="checkbox"/>
b	A full-size panel of replicated system(s) which will have actuation of controls and switches that replicate those of the airplane simulated	X	X	The use of electronically displayed images with physical overlay incorporating operable switches, knobs, buttons replicating airplane instruments panels may be acceptable	<input type="checkbox"/>	<input type="checkbox"/>
c	Crewmembers' seats shall be provided with sufficient adjustment to allow the occupant to achieve the design eye reference position appropriate to the airplane or class of airplane and for the visual system to be installed to align with that eye position.		X		<input type="checkbox"/>	<input type="checkbox"/>
d	Circuit breakers that affect procedures and/or result in observable cockpit indications properly located and functionally accurate	X	X		<input type="checkbox"/>	<input type="checkbox"/>
e	Flight dynamics model that accounts for various combinations of drag and thrust normally encountered in flight corresponding to actual flight conditions, including the effect of change in airplane attitude, sideslip, thrust, drag, altitude, temperature, gross weight, moments of inertia, center of gravity location, and configuration.	X	X	For FTD Levels 1 and 2 aerodynamic modeling sufficient to permit accurate systems operation and indication is acceptable.	<input type="checkbox"/>	<input type="checkbox"/>
f	All relevant instrument indications involved in the simulation of the applicable airplane shall automatically respond to control movement by a flight crewmember or induced disturbance to the simulated airplane; e.g., turbulence or wind shear	X	X		<input type="checkbox"/>	<input type="checkbox"/>
g	Lighting environment for panels and instruments shall be sufficient for the operation being conducted.	X	X	For FTD Level 2 lighting environment shall be as per airplane	<input type="checkbox"/>	<input type="checkbox"/>
h	Communications, navigation, and caution and warning equipment corresponding to that installed in the applicant's airplane with operation within the tolerances prescribed for the applicable airborne equipment	X	X	For FTD 1 applies where the appropriate systems are replicated	<input type="checkbox"/>	<input type="checkbox"/>
i	Navigational data with the corresponding approach facilities. Navigation aids should be usable within range without restriction.	X	X	For FTD 1 applies where navigation equipment is replicated. For all FFSs and FTDs 2 where used for area or airfield competence training or checking, navigation data should be updated within 28 days.	<input type="checkbox"/>	<input type="checkbox"/>
j	In addition to the flight crewmember duty stations, there are three suitable seats for the instructor, delegated examiner and GACA inspector. GACA will consider options to this standard based on	X	X	For FTDs and FNPT's suitable seating arrangements for the Instructor and Examiner or GACA Inspector should be provided.	<input type="checkbox"/>	<input type="checkbox"/>

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

	unique cockpit configurations. These seats provide adequate vision to the pilot's panel and forward windows. Observer seats need not represent those found in the airplane but in the case of FSTDs fitted with a motion system, the seats should be adequately secured to the floor of the FSTD, fitted with positive restraint devices and be of sufficient integrity to safely restrain the occupant during any known or predicted motion system excursion					
k	FSTD systems simulate applicable airplane system operation, both on the ground and in flight. Systems shall be operative to the extent that all normal, abnormal, and emergency operating procedures can be accomplished	X	X	For FTD Level 1, applies where system is simulated	<input type="checkbox"/>	<input type="checkbox"/>
l	Instructor controls shall enable the operator to control all required system variables and insert abnormal or emergency conditions into the airplane systems	X	X	Where applicable and as required for training the following shall be available as follows: - Position and flight freeze. - A facility to enable the dynamic plotting of the flight path on approaches, commencing at the final approach fix, including the vertical profile - Hard copy of map and approach plot	<input type="checkbox"/>	<input type="checkbox"/>
m	Control forces and control travel shall correspond to that of the replicated airplane. Control forces shall react in the same manner as in the airplane under the same flight conditions		X	For FTD Level 2 Control forces and control travel should correspond to that of the replicated airplane with CT&M. It is not intended that the device should be flown manually other than for short periods when the autopilot is temporarily disengaged	<input type="checkbox"/>	<input type="checkbox"/>
n	Instructor controls environmental effects including wind speed and direction shall be provided	X	X	For FTDs environment modeling sufficient to permit accurate systems operation and indication	<input type="checkbox"/>	<input type="checkbox"/>
o	Computer capacity, accuracy, resolution, and dynamic response shall be sufficient to fully support the overall fidelity, including its evaluation and testing	X	X	Statement of Compliance required.	<input type="checkbox"/>	<input type="checkbox"/>
p	One of the following two methods is acceptable as a means to prove compliance: (1) Transport Delay: A transport delay test may be used to demonstrate that the FSTD system response does not exceed 150 milliseconds. This test shall measure all the delay encountered by a step signal migrating from the pilot's control through the control loading electronics and interfacing through all the simulation software modules in the correct order, using a handshaking protocol, finally through the normal output interfaces to the motion system, to the visual system and instrument displays. (2) Latency: The visual system, flight deck instruments and initial motion system response shall respond to abrupt pitch, roll and yaw inputs from the pilot's position within 150 milliseconds of the time, but not before the time, when the airplane would respond under the same conditions	X	X	Tests required. For Level 'A' & 'B' FFSs, and applicable systems for FTDs, FNPTs and BITDs the maximum permissible delay is 300 milliseconds	<input type="checkbox"/>	<input type="checkbox"/>
q	Timely and permanent update of hardware and programming subsequent to airplane modification	X	X		<input type="checkbox"/>	<input type="checkbox"/>

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

C. FLIGHT TRAINING DEVICES (FTD) FUNCTIONS AND SUBJECTIVE TESTS					
No.	Table of Functions and Subjective Tests	FTD		Result	
		1	2	YES	NO
a	PREPARATION FOR FLIGHT				
	(1) Preflight. Accomplish functions check of all switches, indicators, systems, and equipment at all crewmembers' and instructors' stations and determine that;				
	(a) the flight deck design and functions are identical to that of the airplane or class of airplane simulated	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
b	SURFACE OPERATIONS (PRE-TAKE-OFF)				
	(1) Engine Start				
	(a) Normal start	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(b) Alternate start procedures	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(c) Abnormal starts and shutdowns (hot start, hung start, tail pipe fire, etc.)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
c	TAKE-OFF				
	(1) Normal				
	(a) Airplane/engine parameter relationships	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(b) Acceleration characteristics (not associated with motion)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(c) Nose wheel and rudder steering	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
d	CLIMB				
	(1) Normal	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(2) One or more engines inoperative	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(3) Other	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
e	CRUISE				
	(1) Performance characteristics (speed vs. power)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(2) High altitude handling	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(3) High Mach number handling (Mach tuck, Mach buffet) and recovery (trim change)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(4) High IAS handling	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
f	MANOEUVRES				
	(1) High angle of attack, approach to stalls, stall warning, buffet, and g-break (take-off, cruise, approach, and landing configuration)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(2) Flight envelope protection (high angle of attack, bank limit, over speed, etc.)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(3) Turns with/without speed brake/spoilers deployed	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(4) In flight engine shutdown and restart (assisted and windmill)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(5) Maneuvering with one or more engines inoperative, as appropriate	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(6) Specific flight characteristics (e.g. direct lift control)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(7) Flight control system failures, reconfiguration modes, manual reversion and associated handling	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(8) Other	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
g	DESCENT				
	(1) Normal	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(2) Maximum rate (clean and with speed brake, etc.)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(3) Flight control system failures, reconfiguration modes, manual reversion and associated handling	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(4) Other	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
h	INSTRUMENT APPROACHES AND LANDING				

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

Only those instrument approach and landing tests relevant to the simulated airplane type or class should be selected from the following list, where tests should be made with limiting wind Velocities, wind shear and with relevant system failures, including the use of Flight Director.				
(1) Precision				
(a) CAT I/GBAS (ILS/MLS) published approaches				
A. Manual approach with/without flight director including landing	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
B. Autopilot/auto throttle coupled approach and manual landing	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
C. Manual approach to DH and G/A all engines	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
D. Manual one engine out approach to DH and G/A	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
E. Autopilot/auto throttle coupled approach, one engine out to DH and G/A	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
F. Approach and landing with minimum/standby electrical power	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
(b) CAT II/GBAS (ILS/MLS) published approaches				
A. Autopilot/auto throttle coupled approach to DH and landing	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
B. Autopilot/auto throttle coupled approach to DH and G/A	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
C. Auto coupled approach to DH and manual G/A	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
(c) CAT III/GBAS (ILS/MLS) published approaches				
A. Autopilot/auto throttle coupled approach to land and rollout	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
B. Autopilot/auto throttle coupled approach to DH/Alert Height and G/A	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
C. Autopilot/auto throttle coupled approach to land and rollout with one engine out	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
D. Autopilot/auto throttle coupled approach to DH/Alert Height and G/A with one engine out	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
(2) Non-precision				
(a) NDB	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
(b) VOR, VOR/DME, VOR/TAC	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
(c) RNAV (GNSS)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
(d) ILS LLZ (LOC), LLZ(LOC)/BC	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
NOTE: If Standard Operating Procedures are to use autopilot for non-precision approaches, then these should be evaluated				
i VISUAL APPROACHES (SEGMENT) AND LANDINGS.	Not applicable			
j MISSED APPROACH				
(1) All engines	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
(2) One or more engine(s) out	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
(3) With flight control system failures, reconfiguration modes, manual reversion and flight simulator - associated handling	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
k SURFACE OPERATIONS (POST LANDING)				
(1) Landing roll and taxi				
(a) Spoiler operation	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
(b) Reverse thrust operation	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
(c) Directional control and ground handling, both with and without reverse thrust	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
(d) Brake operation, to include auto-braking system where applicable	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
(e) Other	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
l ANY FLIGHT PHASE				
(1) Airplane and power plant systems operation				
(a) Air conditioning and pressurization (ECS)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

	(b) De-icing/anti-icing	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(c) Auxiliary power plant/auxiliary power unit (APU)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(d) Communications	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(e) Electrical	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(f) Fire and smoke detection and suppression	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(g) Flight controls (primary and secondary)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(h) Fuel and oil, hydraulic and pneumatic	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(i) Landing gear	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(j) Oxygen	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(k) Power plant	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(l) Airborne radar	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(m) Autopilot and Flight Director	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(n) Collision avoidance systems. (e.g., GPWS, TCAS)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(o) Flight control computers including stability and control augmentation	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(p) Flight display systems	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(q) Flight management computers	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(r) Head-up guidance, head-up displays	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(2) Airborne procedures				
	(a) Holding	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(b) Air hazard avoidance. (Traffic, weather)	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(c) Wind shear	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(3) Engine shutdown and parking				
	(a) Engine and systems operation	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(b) Parking brake operation	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
	(4) Other as appropriate including effects of wind	✓	✓	<input type="checkbox"/>	<input type="checkbox"/>
m	VISUAL SYSTEM.	Not applicable			
n	MOTION EFFECTS.	Not applicable			
o	SOUND SYSTEM.	Not applicable			
p	SPECIAL EFFECTS.	Not applicable			

Remarks	

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

NOTE - It is accepted that tests will only apply to FTD Level 1 if that system and flight condition is simulated. It is intended that the tests listed below should be conducted in an automatic flight. Where automatic flight is not possible and pilot manual handling is required, the FTD shall be at least controllable to permit the conduct of the flight

Inspector Name	Signature	Date
Qualified FTD (xxx) Assessor Name	Signature	Date

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

D. FLIGHT TRAINING DEVICES (FTD) VALIDATION TEST								
No	Tests	Tolerance	Flight Conditions	FTD		COMMENTS	Result	
				1	2		YES	NO
1. PERFORMANCE								
a	TAXI					Not applicable		
						It is accepted that tests and associated tolerances will only apply to a Level 1 FTD if that system or flight condition is simulated.	<input type="checkbox"/>	<input type="checkbox"/>
b	TAKE-OFF							
						Note-All commonly used take-off flap settings should be demonstrated at least once either in minimum un-stick speed (1b3), normal take-off (1b4), and critical engine failure on take-off (1b5) or cross wind take-off (1b6).	<input type="checkbox"/>	<input type="checkbox"/>
	(1) Ground Acceleration Time and Distance.	± 5% or ±1.5 s time and ± 5% or ± 61 m (200 ft) distance	Take-off	CT & M	✓	Acceleration time and distance should be recorded for a minimum of 80% of the total time from brake release to VR. May be combined with normal takeoff (1b4) or rejected takeoff (1b7). Plotted data should be shown using appropriate scales for each portion of the maneuver. For FTD's test limited to time only	<input type="checkbox"/>	<input type="checkbox"/>
c	CLIMB							
	(1) Normal Climb All engines operating	± 3 kts airspeed ± 5% or ± 0.5 m/s (100 ft/min) R/C	Clean or specified climb configuration	✓	✓	Flight test data or airplane performance manual data may be used. Record at nominal climb speed and mid initial climb altitude. FSTD performance to be recorded over an interval of at least 300 m (1 000 ft). For FTD's may be a Snapshot test	<input type="checkbox"/>	<input type="checkbox"/>
	(2) One Engine Inoperative Second Segment Climb	± 3 kts airspeed ± 5% or ± 0.5 m/s (100 ft/min) R/C but not less than AFM values.	2nd Segment Climb for FNPTs and BITDs Gear up and Take-off Flaps	CT & M	✓	Flight test data or airplane performance manual data may be used. Record at nominal climb speed. Flight simulator performance to be recorded over an interval of at least 300m (1 000 ft). Test at WAT (Weight, Altitude, or Temperature) limiting condition. For FTD's may be a Snapshot test	<input type="checkbox"/>	<input type="checkbox"/>
	(3) One Engine Inoperative En route Climb.	± 10% time ± 10% distance ± 10% fuel used	Clean	CT & M	✓	Flight test data or airplane performance manual data may be used. Test for at least a 1 550 m (5 000 ft) segment.	<input type="checkbox"/>	<input type="checkbox"/>
d	CRUISE/DESCENT							

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

	(1) Level Flight Acceleration	± 5% time	Cruise	✓	✓	Minimum of 50 kts. Increase using maximum continuous thrust rating or equivalent. For very small airplanes, speed change may be reduced to 80% of operational speed range	<input type="checkbox"/>	<input type="checkbox"/>
	(2) Level Flight Deceleration	± 5% time	Cruise	✓	✓	Minimum of 50 kts. decrease using idle power. For very small airplanes, speed change may be reduced to 80% of operational speed range	<input type="checkbox"/>	<input type="checkbox"/>
	(3) Cruise Performance	± 0.05 EPR or ± 5% N1 or ± 5% torque ± 5% fuel flow	Cruise	✓	✓	May be a single snapshot showing instantaneous fuel flow or a minimum of two consecutive snapshots with a spread of at least 3 minutes in steady flight.	<input type="checkbox"/>	<input type="checkbox"/>
	(4) Idle Descent	± 3 kts airspeed ± 5% or ± 1.0 m/s (200 ft/min) R/D	Clean			Idle power stabilized descent at normal descent speed at mid altitude. Flight simulator performance to be recorded over an interval of at least 300 m (1 000 ft).	<input type="checkbox"/>	<input type="checkbox"/>
	(5) Emergency Descent	± 5 kts air speed ± 5% or ± 1.5 m/s (300 ft/min) R/D	As per AFM			Stabilized descent to be conducted with speed brakes extended if applicable, at mid altitude and near VMO or according to emergency descent procedure. Flight simulator performance to be recorded over an interval of at least 900 m (3 000 ft).	<input type="checkbox"/>	<input type="checkbox"/>
e	STOPPING					Not applicable		
f	ENGINES							
	(1) Acceleration	± 10% Ti or ± 0.25s ± 10% Tt	Approach or Landing	✓	✓	Ti = Total time from initial throttle movement until a 10% response of a critical engine parameter. Tt = Total time from initial throttle movement to 90% of go around power. Critical engine parameter should be a measure of power (N1, N2, EPR, etc.). Plot from flight idle to go around power for a rapid throttle movement. FTD, FNPT and BITD only: CT&M acceptable.	<input type="checkbox"/>	<input type="checkbox"/>
	(2) Deceleration	± 10% Ti or ± 0.25s ± 10% Tt	Ground	✓	✓	Ti = Total time from initial throttle movement until a 10% response of a critical engine parameter. Tt = Total time from initial throttle movement to 90% decay of maximum take-off power. Plot from maximum take-off power to idle for a rapid throttle movement. FTD, FNPT and BITD only: CT&M acceptable.	<input type="checkbox"/>	<input type="checkbox"/>
2. HANDLING QUALITIES								

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

a	STATIC CONTROL CHECKS							
						<p>NOTE: Pitch, roll and yaw controller position vs. force or time shall be measured at the control. An alternative method would be to instrument the FSTD in an equivalent manner to the flight test airplane. The force and position data from this instrumentation can be directly recorded and matched to the airplane data. Such a permanent installation could be used without any time for the installation of external devices.</p> <p>CCA: Testing of position versus force is not applicable if forces are generated solely by use of airplane hardware in the FSTD.</p>	<input type="checkbox"/>	<input type="checkbox"/>
	(1) Pitch Controller Position vs. Force and Surface Position Calibration.	± 0.9 daN (2 lbs) breakout. ± 2.2 daN (5 lbs) or ± 10% force. ± 2° elevator angle	Ground	CT & M	✓	Uninterrupted control sweep to stops. Should be validated (where possible) with in-flight data from tests such as longitudinal static stability, stalls, etc. Static and dynamic flight control tests should be accomplished at the same feel or impact pressures.	<input type="checkbox"/>	<input type="checkbox"/>
	(2) Roll Controller Position vs. Force and Surface Position Calibration.	± 0.9 daN (2 lbs) breakout ± 1.3 daN (3 lbs) or ± 10% force ± 2° aileron angle ± 3° spoiler angle	Ground	CT & M	✓	Uninterrupted control sweep to stops. It should be validated with in-flight data from tests such as engine out trims, steady state sideslips, etc. Static and dynamic flight control tests should be accomplished at the same feel or impact pressures.	<input type="checkbox"/>	<input type="checkbox"/>
	(3) Rudder Pedal Position vs. Force and Surface Position Calibration.	± 2.2 daN (5 lbs) breakout ± 2.2 daN (5 lbs) or ± 10% force ± 2° rudder angle	Ground	CT & M	✓	Uninterrupted control sweep to stops. It should be validated with in-flight data from tests such as engine out trims, steady state sideslips, etc. Static and dynamic flight control tests should be accomplished at the same feel or impact pressures	<input type="checkbox"/>	<input type="checkbox"/>
	(4) Pitch Trim Indicator vs. Surface Position Calibration	± 0.5° trim angle.	Ground			The purpose of the test is to compare flight simulator against design data or equivalent	<input type="checkbox"/>	<input type="checkbox"/>
		±1° of trim angle	Ground	✓	✓	BITD: Only applicable if appropriate trim settings are available, e.g. data from the AFM.	<input type="checkbox"/>	<input type="checkbox"/>
	(5) Pitch Trim Rate	± 10% or ± 0.5 deg/s trim rate (°/s)	Ground and approach	✓	✓	Trim rate to be checked at pilot primary induced trim rate (ground) and autopilot or pilot primary trim rate in flight at go around flight conditions.	<input type="checkbox"/>	<input type="checkbox"/>
	(6) Alignment of Cockpit Throttle Lever vs. Selected Engine Parameter.	± 5° of TLA or ± 3% N1 or ± 0.03 EPR or ± 3% torque For propeller-driven	Ground	✓	✓	Simultaneous recording for all engines. The tolerances apply against airplane data and between engines. For airplanes with throttle detents, all detents are to be presented.	<input type="checkbox"/>	<input type="checkbox"/>

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

		airplanes, where the propeller levers do not have angular travel, a tolerance of ± 2 cm (± 0.8 in) applies.				<p>In the case of propeller-driven airplanes, if an additional lever, usually referred to as the propeller lever, is present, it should also be checked.</p> <p>Where these levers do not have angular travel a tolerance of ± 2 cm (± 0.8 inches) applies.</p> <p>May be a series of Snapshot tests</p>		
b	DYNAMIC CONTROL CHECKS					Not applicable		
c	LONGITUDINAL					Power setting may be required for level flight unless otherwise specified.		
	(1) Power Change Dynamics.	± 3 kts airspeed ± 30 m (100 ft) altitudes. $\pm 1.5^\circ$ or $\pm 20\%$ pitch angle	Approach	CT & M	✓	<p>Power change from thrust for approach or level flight to maximum continuous or go-around power. Time history of uncontrolled free response for a time increment equal to at least 5 sec before initiation of the power change to completion of the power change + 15 sec.</p> <p>CCA: Test in Normal AND Non-normal Control state.</p>	<input type="checkbox"/>	<input type="checkbox"/>
	(2) Flap Change Dynamics.	± 3 kts airspeed ± 30 m (100 ft) altitudes. $\pm 1.5^\circ$ or $\pm 20\%$ pitch angle	Take-off Through initial flap retraction and approach to landing	CT & M	✓	<p>Time history of uncontrolled free response for a time increment equal to at least 5 sec before initiation of the reconfiguration change to completion of the reconfiguration change + 15 sec.</p> <p>CCA: Test in Normal and Non-normal Control state.</p>	<input type="checkbox"/>	<input type="checkbox"/>
	(3) Spoiler / Speed brake Change Dynamics.	± 3 kts airspeed ± 30 m (100 ft) altitude. $\pm 1.5^\circ$ or $\pm 20\%$ pitch angle	Cruise	CT & M	✓	<p>Time history of uncontrolled free response for a time increment equal to at least 5 sec before initiation of the reconfiguration change to Completion of the reconfiguration change + 15 sec.</p> <p>Results required for both extension and retraction.</p> <p>CCA: Test in Normal AND Non-normal Control state.</p>	<input type="checkbox"/>	<input type="checkbox"/>
	(4) Gear Change Dynamics.	± 3 kts airspeed ± 30 m (100 ft) altitude. $\pm 1.5^\circ$ or $\pm 20\%$ pitch angle For FNPTs and BITDs, $\pm 2^\circ$ or $\pm 20\%$ pitch angle	Takeoff (retraction) and Approach (extension)	CT & M	✓	<p>Time history of uncontrolled free response for a time increment equal to at least 5 sec before initiation of the configuration change to completion of the reconfiguration change + 15 sec.</p> <p>CCA: Test in Normal AND Non-normal Control state.</p>	<input type="checkbox"/>	<input type="checkbox"/>
	(5) Longitudinal Trim	$\pm 1^\circ$ elevator $\pm 0.5^\circ$ stabilizer $\pm 1^\circ$ pitch angle $\pm 5\%$ net thrust or equivalent	Cruise, Approach and Landing	CT & M	✓	<p>Steady-state wings level trim with thrust for level flight. May be a series of snapshot tests.</p> <p>CCA: Test in Normal OR Non-normal Control state.</p>	<input type="checkbox"/>	<input type="checkbox"/>

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

	(6) Stall Characteristics.	<p>± 3 kts air speed for initial buffet, stall warning, and stall speeds.</p> <p>For airplanes with reversible flight control systems (for FS only):</p> <p>± 10% or ± 2·2 daN (5 lb) column force (prior to g-break only)</p>	2nd Segment Climb and Approach or Landing	✓	✓	<p>Wings-level (1 g) stall entry with thrust at or near idle power. Time history data should be shown to include full stall and initiation of recovery. Stall warning signal should be recorded and should occur in the proper relation to stall. FSTDs for airplanes exhibiting a sudden pitch attitude change or 'g break' should demonstrate this characteristic.</p> <p>CCA: Test in Normal and Non-normal Control state.</p>	<input type="checkbox"/>	<input type="checkbox"/>
d	LATERAL DIRECTIONAL					Power setting may be required for level flight unless otherwise specified.		
	(1) Minimum Control Speed, Air (VMCA or VMCL), per Applicable Airworthiness Standard or Low Speed Engine Inoperative Handling Characteristics in the Air.	± 3 kts airspeed	Take-off or Landing (whichever is most critical in The airplane)	CT & M	✓	<p>Minimum speed may be defined by a performance or control limit which prevents demonstration of VMC or VMCL in the conventional manner. Take-off thrust should be set on the operating engine(s). Time history or snapshot data may be used</p> <p>CCA: Test in Normal OR Non-normal Control state.</p>	<input type="checkbox"/>	<input type="checkbox"/>
	(2) Roll Response (Rate).	<p>± 10% or ± 2°/sec roll rate</p> <p>FS only: For airplanes with reversible flight control systems: ± 10% or ± 1·3 daN (3 lb) roll controller force.</p>	Cruise and Approach or Landing	CT & M	✓	Test with normal roll control displacement (about 30% of maximum control wheel). May be combined with step input of flight deck roll controller test (2d3).	<input type="checkbox"/>	<input type="checkbox"/>
	(4) Spiral Stability.	<p>Correct trend and ± 2° or ± 10% bank angle in 20 seconds</p> <p>If alternate test is used: correct trend and ± 2° aileron.</p>	Cruise and Approach or Landing	CT & M	✓	<p>Airplane data averaged from multiple tests may be used. Test for both directions. As an alternative test, show lateral control required to maintain a steady turn with a bank angle of approximately 30°.</p> <p>CCA: Test in Non-normal Control state.</p>	<input type="checkbox"/>	<input type="checkbox"/>
	(5) Engine Inoperative Trim.	<p>± 1° rudder angle or</p> <p>± 1° tab angle or equivalent pedal.</p> <p>± 2° sideslip angle.</p>	2nd Segment Climb and Approach or Landing	CT & M	✓	Test should be performed in a manner similar to that for which a pilot is trained to trim an engine failure condition. 2nd segment climb test should be at take-off thrust. Approach or landing test should be at thrust for level flight. May be snapshot tests.	<input type="checkbox"/>	<input type="checkbox"/>
e	LANDINGS					Not applicable		
f	GROUND EFFECT					Not applicable		

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

g	WIND SHEAR					Not applicable		
h	Flight And Maneuver Envelope Protection Functions							
						This paragraph is only applicable to Computer-controlled airplanes. Time history results of response to control inputs during entry into each envelope protection function (i.e., with normal and degraded control states if function is different) are required. Set thrusts as required to reach the envelope protection function	<input type="checkbox"/>	<input type="checkbox"/>
	(1) Over speed	± 5 kts airspeed	Cruise	✓	✓		<input type="checkbox"/>	<input type="checkbox"/>
	(2) Load Factor	± 0.1 g	Take-off, Cruise	✓	✓		<input type="checkbox"/>	<input type="checkbox"/>
	(3) Pitch Angle	± 1.5° pitch angle	Cruise, Approach	✓	✓		<input type="checkbox"/>	<input type="checkbox"/>
	(4) Bank Angle	± 2° or ± 10% bank angle	Approach	✓	✓		<input type="checkbox"/>	<input type="checkbox"/>
	(5) Angle of Attack	± 1.5° AOA	Second Segment Climb and Approach or Landing	✓	✓		<input type="checkbox"/>	<input type="checkbox"/>
3. MOTION SYSTEM						Not applicable		
4. VISUAL SYSTEM								
a	SYSTEM RESPONSE TIME							
	(1) Transport Delay	150 milliseconds or less after controller movement. 300 milliseconds or less after controller movement.	Pitch, roll and yaw	✓	✓	One separate test is required in each axis. See Appendix 5 to AC FSTD A.030	<input type="checkbox"/>	<input type="checkbox"/>
	or							
	(2) Latency	150 milliseconds or less after controller movement. 300 milliseconds or less after controller movement	Take-off, Cruise, and Approach or Landing	✓	✓	One test is required in each axis (pitch, roll, yaw) for each of the 3 conditions compared with airplane data for a similar input. The visual scene or test pattern used during the response testing shall be representative of the required system capacities to meet the daylight, twilight (dusk/dawn) and night visual capability as applicable.	<input type="checkbox"/>	<input type="checkbox"/>
	(3) Light point Contrast Ratio	Not less than 10:1	Not Applicable	✓		Light point contrast ratio should be measured using a test pattern demonstrating a 1° area filled with light points (i.e. light point modulation just discernible) and should be compared to the adjacent background.	<input type="checkbox"/>	<input type="checkbox"/>

FLIGHT TRAINING DEVICES (FTD) QUALIFICATION TEST CHECKLIST

		Not less than 25:1				Note. During contrast ratio testing, simulator aft-cab and flight deck ambient light levels should be zero.		
5. SOUND SYSTEMS					Not applicable			

Remarks	

Inspector Name	Signature	Date
Qualified FTD (xxx) Assessor Name	Signature	Date