Australian Government
Civil Aviation Safety Authority

Approved Synthetic Trainer Standards Checklist

Form 0248

Guidance
This Checklist details the standards required for approved synthetic trainers. The standards are set out as a checklist which can be used as the "accreditation test guide". The list is in two parts: • Part 1 - Physical Characteristics and; • Part 2 - Operating Characteristics. Each part is further divided into sections under logical headings. The Checklist incorporates the requirements for all categories of synthetic trainer. The particular requirements for category B synthetic trainers are annotated with symbol (B). Category C synthetic trainers must meet all category B requirements, plus those annotated with the symbol (C). **Notes:** • Initial assessments to be conducted by CASA FOI • Category C synthetic trainers' assessments are to be evaluated by the CASA Flight Simulation Team. Inspectors and Evaluators should be aware that the standards for switches and controls, other than flight controls, set out in Part 1 - Physical Characteristics is deliberately non-prescriptive. The word 'conventional', when applied to these items, should be taken in its broadest sense. The switches or avionics controls do not need to be 'realistic'; they only need to be reasonably 'user friendly' and perform the functions required, thereby providing realistic cockpit management tasks. **Note:** A copy of this document, and those subsequently used in recurrent fidelity checks, must be retained permanently with the trainer.

Synthetic Trainer Details			
Operator		**ARN**	
Make		**Model**	
Software Name		**Serial Number**	
Version Number		**Hardware Specification**	

Synthetic Trainer Operations Manual (Review to be conducted by CASA FOI)		
STOM satisfactory in all respects	**Yes**	**No**
	☐	☐

Inspector/Evaluator Certification This synthetic trainer *satisfies/does not satisfy FSD 2 standards. **(*delete as required)**			
Inspector name		**Evaluator name**	
Signature		**Signature**	
		ARN	
Date		**Date**	

Part 1 - Physical characteristics

1.1 General			
Criteria	**Category**	**Yes**	**No**
Located in a dedicated area free from obtrusive light, noise or vibration		☐	☐
Size and shape of the enclosure compatible with the cockpit environment		☐	☐
Computer hardware capacity meets the minimum specification required to operate the software (where appropriate)		☐	☐
A pilot/s instructor intercom is provided		☐	☐
1.2 Pilot Station/s			
Criteria	**Category**	**Yes**	**No**
Checklists are readily available for normal, simulated emergency and REAL emergency procedures		☐	☐
Size, general appearance and layout resemble a conventional single or multi-engine aircraft, as appropriate		☐	☐
Panel, instrumentation, switches, controls and their layout resemble that of a conventional aircraft		☐	☐
Hardware and sound system standards applicable to flight simulators set out in subsections 11.1 and 11.4 of FSD 1	C	☐	☐
The representation and functioning of any electronic or cathode ray tube displays are realistic, stable, free from distortion or other distracting phenomena		☐	☐
All cockpit instruments, indicators, switches and controls can be viewed simultaneously		☐	☐
Instrument and cockpit lighting are adequate		☐	☐
Pilots' normal field of view excludes all but the cockpit environment and is free from distractions		☐	☐
A conventional pilot/s radio transmit facility is available for simulated radio communication	B	☐	☐
Aeroplane synthetic trainer controls and their indicators include: • control column or control wheel		☐	☐

1.2 Pilot Station/s			
Criteria	**Category**	**Yes**	**No**
• rudder pedals		☐	☐
• wing flap selector and position indicator (where appropriate)		☐	☐
• undercarriage selector and position indicating system (where appropriate)		☐	☐
• throttle/power lever/s		☐	☐
• propeller control/s (where appropriate)		☐	☐
• elevator trim and position indicator		☐	☐
• rudder trim and position indicator in multi-engine synthetic trainers		☐	☐
• a stall warning device	B	☐	☐
• mixture control (where applicable)	B	☐	☐
• carburettor heat control (where applicable)	B	☐	☐
• fuel tank selector (where applicable)		☐	☐
• fuel quantity indicator/s.		☐	☐
1.3 Instructor Station			
Criteria	**Category**	**Yes**	**No**
Checklists are readily available for normal and REAL emergency procedures		☐	☐
Instructor's console and controls are outside the pilots' field of view		☐	☐
The instructor's location is suitable to maintain surveillance of the pilot, the trainer's instruments and switches and the flight path display		☐	☐
The instructor can impose the effect of omni-directional wind on the trainer's flight path, with selectable increments of at least 30 in direction and 5 knots in speed up to at least 30 knots		☐	☐
A method of creating at least three levels of in-flight turbulence is provided		☐	☐
A flight path display is provided, in azimuth and elevation, relative to the navigation aid/s		☐	☐
The flight path display provides a record of the simulated flight path for student debrief		☐	☐
The flight path display plots in relation to a representative current Australian radio navigation chart	B	☐	☐
A system is provided for the instructor to distinguish between pilot/s intercom communication and simulated radio transmissions	B	☐	☐

1.4 Instrument systems				
Criteria		**Category**	**Yes**	**No**
Instrument presentation, markings and layout are 'conventional			☐	☐
Basic operational instruments available include:				
Instrument	**Minimum range**			
• ASI	• Appropriate, marked in knots		☐	☐
• Altimeter	• 0 - 9 999 feet, adjustable sub-scale in HPA		☐	☐
• Compass	• 360º		☐	☐
• Clock	• Hours, minutes and seconds		☐	☐
• VSI, for helicopters, IVSI	• ±1200 fpm		☐	☐
• AI	• Pitch +20º -10º Roll ±60º		☐	☐
• DG	• 360º adjustable heading bug	B	☐	☐
• T & S/Turn Coordinator • Slip only where extra AI is fitted. Slip only for helicopters	• ± Rate one		☐	☐
• VSI	• ± 2000 fpm		☐	☐
The following engine instruments with representative markings, including limitations, are fitted: • Tachometer/propeller/rotor speed			☐	☐
• Manifold pressure/torque(where applicable)			☐	☐
• Oil pressure			☐	☐

1.5 Radio Navigation Systems			
Criteria	**Category**	**Yes**	**No**
Instrument presentation, markings, layout, controls and frequency selection are 'conventional'		☐	☐
ADF or VOR is available for pilot navigation		☐	☐
Navigation aid frequency bands are conventional and tunable by the pilot/s	B	☐	☐
Station identification morse code audio is pilot selectable for each aid and simultaneously available to the pilot/s and instructor	B	☐	☐
Radio navigation stations available are representative of a current Australian radio navigation chart providing realistic instrument navigation exercises	B	☐	☐
Each aid can be 'failed' from the instructor station	B	☐	☐

1.5 Radio Navigation Systems					
Criteria			**Category**	**Yes**	**No**
Radio navigation aid capability to the following specifications is available			B	☐	☐
Navigation Aid	**Ground Stations (minimum)**	**Accuracy**			
ADF	Three	Track ± 8° Origin ± 2nm		☐	☐
VOR	Three	Track ± 6° Origin ± 2nm		☐	☐
DME or GPS, indicator/s must provide both distance and rate of change of distance	DME - Three	Distance & Speed ± 10% Origin ± 2nm		☐	☐
LLZ	One, plus an omni directional aid for orientation and to intercept final	Track ± 0.5° Origin ± 1nm		☐	☐
Glideslope	One, associated with LLZ	Slope ± 0.5% Origin ± 1nm		☐	☐
Marker Beacon	Outer and middle, associated with LLZ	Satisfactory		☐	☐

Part 2 - Operating characteristics

2.1 Effects of Controls - Aeroplanes			
Criteria	**Category**	**Yes**	**No**
Flight Controls			
Elevator: • operation and effect are conventional		☐	☐
• control forces acceptable.		☐	☐
Ailerons: • operation and primary effect are conventional		☐	☐
• secondary effect is conventional		☐	☐
• control forces acceptable.		☐	☐
Rudder: • operation and primary effect are conventional		☐	☐
• secondary effect is conventional		☐	☐
• control forces acceptable.		☐	☐
Wing Flap (where appropriate): • operation and indication are conventional		☐	☐
• effect on performance is conventional.		☐	☐
Undercarriage (where appropriate): • operation and indication are conventional		☐	☐
• effect on performance is conventional		☐	☐
• throttle/Power lever/s operation, indication and effects are conventional		☐	☐
• propeller control/s operation, indication and effects are conventional		☐	☐
• mixture control/s operation, indication and effects are conventional		☐	☐
• carburettor heat control/s operation, indication and effects are conventional.		☐	☐
Trim/s: • operation and indication are conventional		☐	☐
• effective in all configurations, speeds and power settings		☐	☐
• any other controls operation, indication and effects are conventional.		☐	☐

2.2 Effects of Controls - Helicopters			
Criteria	**Category**	**Yes**	**No**
Flight controls			
Cyclic: • operation and effect are conventional		☐	☐
• control forces minimal.		☐	☐
Collective/(throttle where appropriate): • operation and primary effect are conventional		☐	☐
• secondary effect (yaw) is conventional		☐	☐
• control forces acceptable.		☐	☐
Tail rotor pedals: • operation and primary effect are conventional		☐	☐
• secondary effect (roll) is conventional		☐	☐
• control forces minimal.		☐	☐
Undercarriage (where appropriate): • operation and indication are conventional		☐	☐
• effect on performance is conventional		☐	☐
• mixture control/speed select lever/s (as appropriate):		☐	☐
• operation, indication and effects are conventional		☐	☐
• cyclic trim operation and effect are conventional		☐	☐
• any other controls operation, indication and effects are conventional.		☐	☐
2.3 Instrument Systems			
The accuracy of the following instruments is adequate, they respond realistically to control inputs and, where appropriate, all changes in configuration, speed and power within the attitude limits of the trainer.			
ASI		☐	☐
Altimeter		☐	☐
Compass		☐	☐
Clock		☐	☐
VSI		☐	☐
AI		☐	☐
DG		☐	☐
T & S or Turn Coordinator		☐	☐

2.4 Handling - Aeroplanes			
Criteria	**Category**	**Yes**	**No**
Performance in climb, cruise and descent is conventionally related to power and attitude		☐	☐
Total drag is accurately represented with a realistic minimum drag speed (it may be necessary to plot speed/power relationship in level flight)		☐	☐
Longitudinal, directional, lateral and Dutch roll stability is adequate		☐	☐
Representative increase in elevator back pressure and corresponding decrease in speed during level turns		☐	☐
Slip/Skid and effect of rudder while turning is conventional		☐	☐
Turns at high speed, including spiral dive effects are conventional		☐	☐
Stalling, with or without power, and stall in a turn is conventional		☐	☐
Unusual attitude recovery realistic (within the attitude limits of the trainer)		☐	☐
Note: If software limitations limit normal indication of any flight instrument to a limited range of pitch and/or bank, those limits become the limits of the trainer unless the trainer limits are less. A normal indication is one which an observer would expect to see in an aircraft conducting the same manoeuvre.			
Indications, effects and procedures for simulated systems failures are conventional		☐	☐
Effectiveness of flight controls varies with IAS	B	☐	☐
Stalling is aerodynamically simulated and dependent on angle of attack, flap setting or configuration; stall warning is operative	B	☐	☐
Power available decreases conventionally (where appropriate) with increasing altitude	B	☐	☐
Cruise IAS decreases conventionally (where appropriate) with increasing altitude	B	☐	☐
Performance and flight characteristics which essentially simulate that of the specific aeroplane	C	☐	☐
2.5 Handling - Helicopters			
Performance in climb, cruise and descent is conventionally related to collective pitch, power and attitude		☐	☐
Total power requirement is accurately represented with a realistic minimum power speed		☐	☐
Helicopter stability characteristics are adequately represented: • representative back stick and corresponding speed reduction in level turns		☐	☐
• slip/skid and effect of yaw control while turning is conventional		☐	☐
• unusual attitude recovery realistic.		☐	☐

2.5 Handling - Helicopters			
Criteria	**Category**	**Yes**	**No**
• indications, effects and procedures for simulated systems failures are conventional.		☐	☐
2.6 Radio navigation systems			
Inter-relationship between indicated air speed, heading, ground speed and track made good is accurate		☐	☐
Effect of selected wind velocities is accurate		☐	☐
All aids meet accuracy requirements, see Part 1		☐	☐
ADF needle sensitivity, overhead, tracking and fail indication are conventional		☐	☐
VOR needle sensitivity, overhead, TO/FR, tracking and fail indication are conventional		☐	☐
Flight path recorder accurately reflects ground speed and track made good from aid/s		☐	☐
Indicated tracks and distances between ground stations corresponds to same route on radio navigation chart	B	☐	☐
DME or GPS sensitivity, time/distance equation, overhead and fail indication are conventional	B	☐	☐
LLZ needle sensitivity, tracking and fail indication are conventional	B	☐	☐
Glideslope needle sensitivity, tracking and fail indication are conventional	B	☐	☐
Glideslope relationship to altitude, DME or GPS and marker beacon/s are accurate	B	☐	☐
The flight path display is accurate to ±5 degrees for tracking and ±10% in distance flown	B	☐	☐
2.7 GPS (GNSS)			
Appropriate STOM references		☐	☐
Approach capable TSO C-129 receiver or equivalent		☐	☐
Current database includes waypoints represented of Australian radio navigation charts or alternate procedure		☐	☐
Instrument presentation ,markings, layout and function selection are “conventional”		☐	☐
CDI sensitivity Enroute , terminal approach		☐	☐
Procedure for flying holding patterns		☐	☐
Map page function		☐	☐
Raim Prediction/Warning		☐	☐
Flight Plan access, retention and retrieval		☐	☐