RealSimGear

SFx Home

Qualification and Approval Guide (QAG)

Basic Aviation Training Device

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Version Original
March 4, 2025

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37	Original	03/04/2025

FAA APPROVED QAG
Signature and Date

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for Daniel Kelman, Acting Manager
Training and Simulation Group

Compliance Statement

This Qualification and Approval Guide (QAG) provides a detailed description of all the required components, features, functions, and capabilities for the RealSimGear model Cirrus SFx Home aviation training device. This includes any optional airplane configurations with quality color pictures and diagrams. This QAG is provided by RealSimGear to clearly describe and verify the required functionality of this aviation training device platform confirming its suitability for airman training and experience. The information as described in advisory circular AC 61-136, *FAA Approval of Aviation Training Devices (ATD) and Their Use for Training and Experience* is provided within this document. This includes listing all of the required qualifying items, functions, and capabilities. A valid FAA Letter of Authorization (LOA) specifying the credit allowances must accompany the training device when utilized for satisfying airman training or experience requirements specified in 14 CFR §61 or 141. Additionally, FAA Order 8900.1 Volume 11 Chapter 10 Section 1 provides guidance to aviation safety inspectors facilitating ATD evaluations, approvals and oversight.

RealSimGear must provide a detailed operations manual with each aviation training device model produced. This will include how to properly start, operate, and shut down the trainer. This must include how to operate and maintain the trainer as originally designed and tested. RealSimGear will ensure that the operator of this training device is familiar and proficient with all the features and capabilities of this trainer, and how to correct any malfunctions that may occur.

The operator of this aviation training device is expected to become proficient in its operation before using it to satisfy any pilot experience requirements specified in the code of federal regulations. This includes maintaining its condition and functionally. This ATD must be maintained to its original performance and functionality, as demonstrated during the original FAA functional evaluation. This trainer cannot be used to log pilot time unless all the components of the trainer are in normal working order.

Only the airplane configurations approved for this model can be utilized when satisfying FAA experience or training requirements. Any additions, changes, or modifications to this model, or the associated configurations, must be evaluated and approved in writing by the General Aviation and Commercial Division. This does not prohibit software updates that do not otherwise change the appearance of the system's operation. Operators who use these trainers to satisfy FAA pilot training or experience requirements specified in part 61 or 141 are obligated to allow FAA inspection ensuring acceptable function and compliance. Any questions concerning this FAA approval or use of ATDs should be directed to the General Aviation and Commercial Division.

Aviation Training Device (ATD) Description and Pictures

The RealSimGear model SFx Home is based on the dimensions and layout of a production single engine land airplane. This trainer closely represents the overall functionality, performance, and instrumentation for the airplane. The platform consists of a flight deck, instrument panel, avionics panel, and associated flight and instrument controls. A combination of hardware and software components are assembled and functionally checked by RealSimGear. All hardware components are designed and installed so the flight deck has the appearance and feel of an actual airplane.

The SFx Home provides a realistic flight deck design, avionics interface, and reliable hardware/software performance. This platform provides an effective training environment for students and pilots in training. This includes the ability to accomplish scenario based flight training activities, instrument procedures and experience, pilot proficiency evaluations, simulated equipment failure, emergency procedures, and facilitates increased pilot competency.

The SFx Home represents a Cirrus SF50 airplane.

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Image 1. Interior showing the overall flight deck configuration.

SFx Home (triple screen variant shown)

Image 2. Detail view of flight instruments and avionics panel

SFx Home Main Console Detail

Image 3. General Switch panel

Image 4. Engine start panel

Image 5. View of autopilot system.

Image 6. Pilot side of instrument panel showing full screen PFD

Two options for split screen

Image 7. Co-Pilot side of instrument panel showing full screen MFD

Two options for split screen

Image 8. GTC Touchscreen Input devices

GTC configured as PFD control

GTC configured for MFD control

GTC configured as Radio Panel

GTC configured as backup gauge

Image 9. Control yoke/stick showing yoke mounted switches.

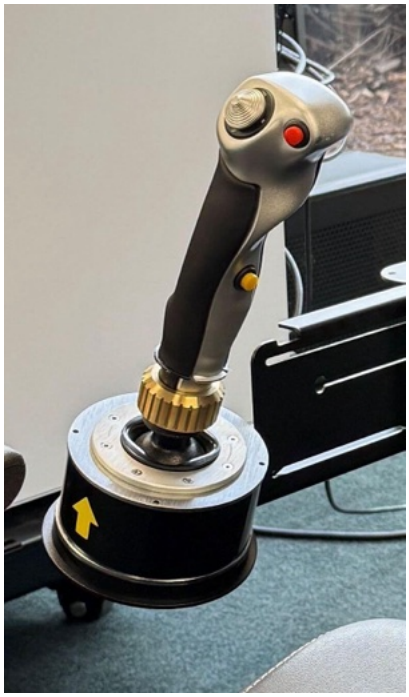


Image 10. Rudder pedals

Option 1 - Virtual Fly Ruddo+

Image 11. Engine control lever, flap selector - mixture,fuel pump and selectors

Image 12. Instructor station stand and monitor

Image 13. Instructor station showing moving map, victor airways and current airplane position.

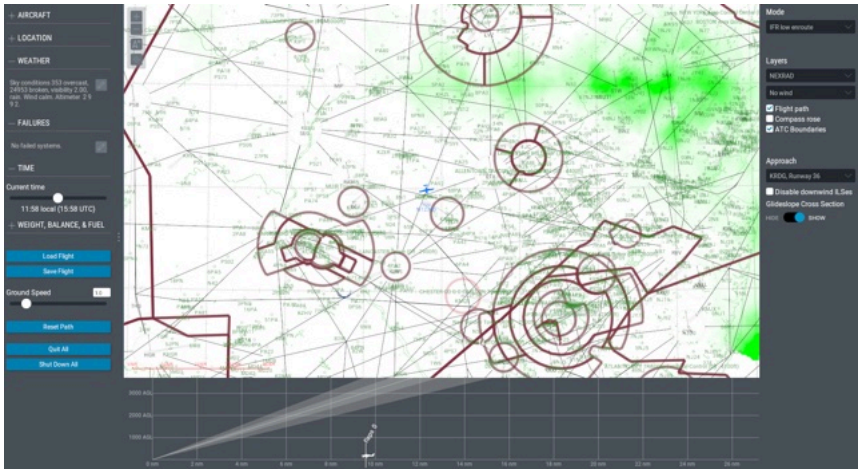
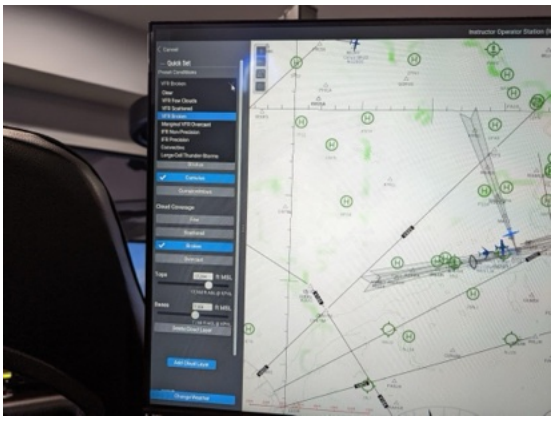


Image 14. Instructor station displaying weather controls and systems malfunction controls interface.



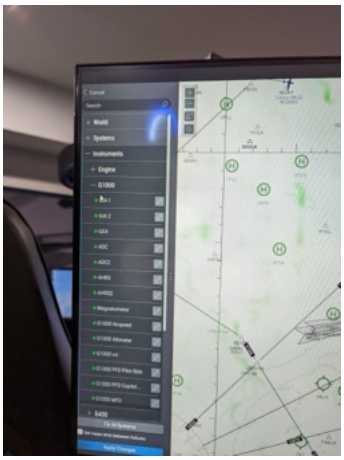


Image 15. iPad Instructor Station option showing moving maps, victor airways and current airplane position.

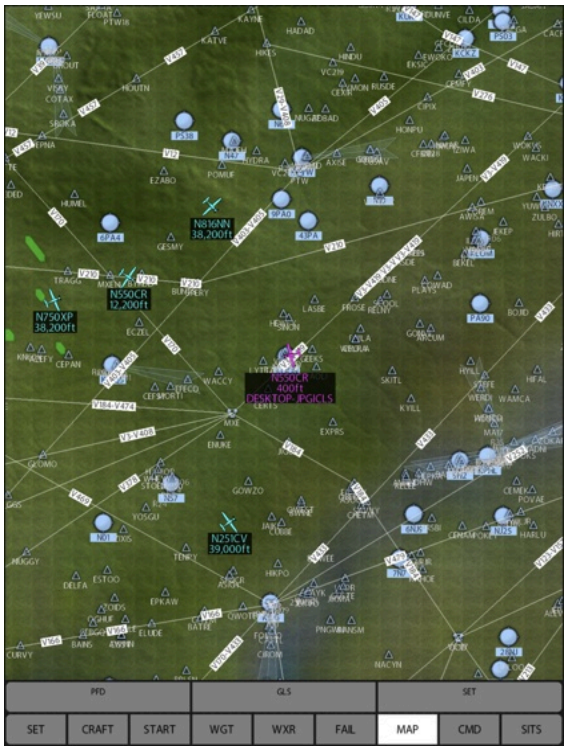


Image 16. iPad Instructor Station option displaying weather controls interface

Image 17. iPad Instructor Station option displaying the failures interface

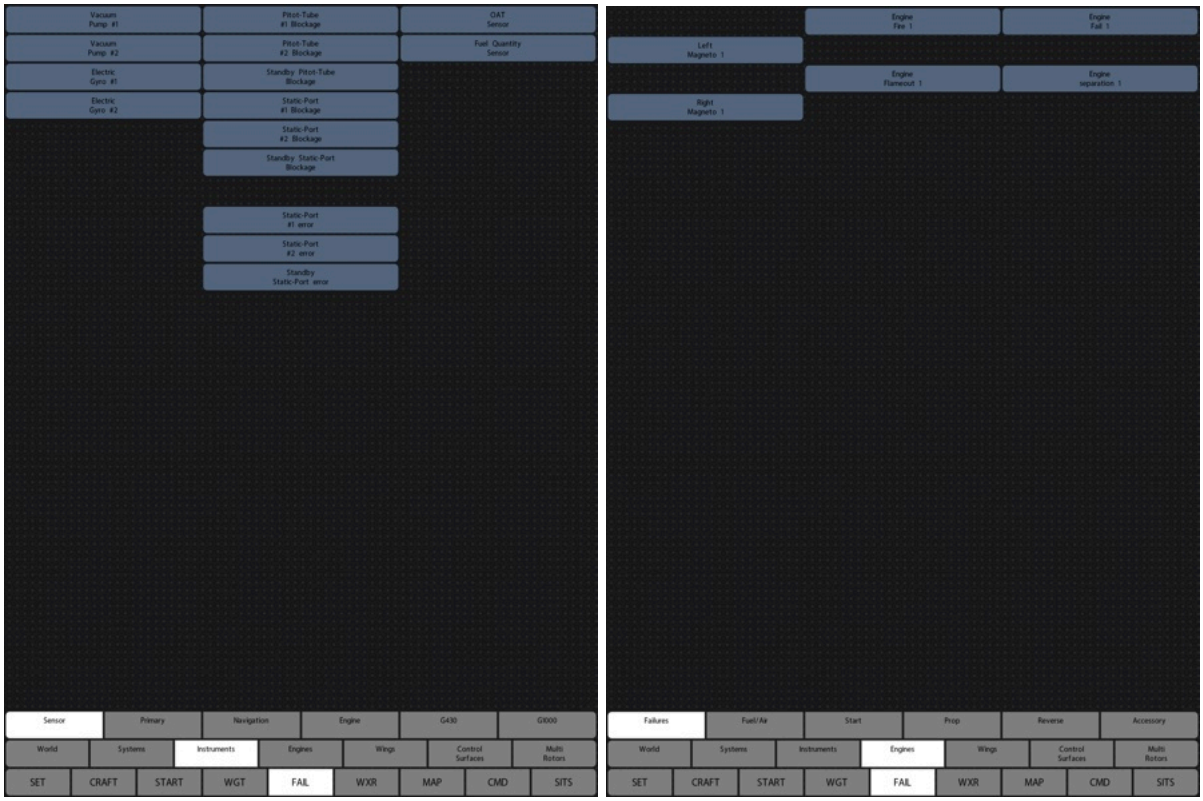


Image 18. Optional Elgato StreamDeck Simulator Control Unit

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Hardware and Software Components List - SFx Home - AATD

Detailed equipment list with description of hardware *and* software components installed or available.

Item	Component Name	Manufacturer	Model #	Quantity	Details
01	Enclosure Assembly	RealSimGear	SFx Console	1	This component houses all the avionics and controls and provides the basic physical structure of the system
02	Flight Controls (elevator and ailerons)	Thrustmaster	HOTAS	1	Control yoke for controlling pitch and roll. Thrustmaster HOTAS base with SFx style grip
03a	Rudder Pedals/Brakes	Virtual Fly	Ruddo+	1	Standard rudder pedals with yaw and toe brake action
04	Flap control and indicator	RealSimGear	SFx Flap	1	Flap selector and indicator
05	Engine start panel & switches	RealSimGear	SFx Start Switch	1	Starter switch panel
06	Engine controls Single	RealSimGear	SFx Throttle Console	1	Throttle console that contains throttle and trim controls. Auto-throttle and auto-trim supported.
07	Electrical switches	RealSimGear	SFx Switch Panel	1	Provides all electrical switching functions
08	Flight Instrumentation	RealSimGear	G3000	2	Two G3000 panels, designed mimic the functionality of the Cirrus Perspective Touch + avionics
09	FMS Interface	RealSimGear	GTC580	3	Three standard touch enabled input interfaces found in Cirrus SF50 aircraft.
10	Autopilot/Flight Director	RealSimGear	GFC500	1	Standard autopilot interface found in Cirrus SF50 aircraft.
11	Simulator Control	Elagato	StreamDeck	*1	Optional button box with definable functions to allow the pilot to control the sim without using a keyboard and mouse. For example, start the sim in a pre-defined situation, control parking brakes, set weight and balance.
12	Primary Flight Computer	RealSimGear	RSG-SFx-PC	1	Computer specifications to meet **or exceed** the following: * CPU - MD 9800X3D * GPU - nVidia RTX4070ti * Memory - 32DB DDR5 * Hard Disk - 2GB Nvme SSD
13a	Visual display monitors	Samsung or equivalent	LS49CG954SNXZA or equivalent	1	Standard visual setup using single 49” screen with 90 degrees of forward field of view
13b	Visual display monitors	LG or equivalent	65UQ9000PUD, 55UR9000PUA, 50UR9000PUA or equivalent	* 1	Optional visual setup includes a single 50”, 55”, or 65” 4K TV set to provide 90 degrees of forward field of view
13c	Visual display monitors	LG or equivalent	65UQ9000PUD or equivalent	*3	Optional visual setup using 3x 65” 4K TV’s to provide for 200+ degrees of field of view
14	Display Stand	RealSimGear	Single screen adjustable stand	1-3	Used for all visual configurations
15a	Audio system	RealSimGear	RSG-AUDIO-1	1	RealSimGear integrated audio system
15b	Audio system	LG or equivalent	65UQ9000PUD, 55UR9000PUA, 50UR9000PUA or equivalent	*1	Optionally audio is provided via the integrated speakers found in the above 4K TV’s

16	Operating system	Microsoft	Windows 11	1	This system will only support Windows operating systems. While Windows 11 is current, RealSimGear may also use whatever the next version may be such as Windows 12.
17	Simulation Software	Laminar Research	X-Plane 12 PRO	1	The underlying simulation software.
18	Instructor Station Monitor	ASUS	VT229H or equivalent	1	22” touchscreen monitor
19a	Instructor Operating System (IOS)	Laminar Research	Included Instructor Station	1	Provides for moving map that can be configured to show VFR or IFR conditions, shows traffic, weather, approaches and glide slope/path. Also allows instructors to select aircraft, location, set/change weather conditions, trigger and reset system failures.
19b	Instructor Operating Station	Laminar Research	Instructor Station	*1	Optional iPad app provided by Laminar Research which provides all instructor station functionality without the need for a physically separate screen and stand.
20a	Instrument Procedures and Navigational data Base used	Laminar Research	X-Plane 12 PRO	1	Base Jeppesen database included with X-Plane 12
20b	Instrument Procedures and Navigational data Base used	Navigraph	FMS Data	*1	Optional navigation database update subscription to allow monthly AIRAC updates as performed in a real aircraft.
20c	Instrument Procedures and Navigational database used	Jeppesen	Navigation Data/Charts	*1	Optional subscription provided monthly AIRAC database updates
20d	Instrument Procedures and Navigational database used	KeyVan	Navigation Data	*1	Optional subscription provided monthly AIRAC database updates
21	Simulated Aircraft Model	RealSimGear	SF50	1	Aircraft model used to simulate the actual flight characteristics of a Cirrus SF50 aircraft
22a	ATC Services	PilotEdge		*1	Optional plugin to allow live ATC communications via PilotEdge
22b	ATC Services	SayIntentions.AI		*1	Optional plugin to allow simulated ATC communications via AI generated ATC
23	Mounting Platform	RealSimGear	SFx Home Base	1	Mounting platform that has fixed adjustable seat panel mounting structure, fixed rudder pedal attachment point.

Design Criteria List

The following section provides a detailed “word for word” listing and design criteria of each of the required items, functions, and capabilities listed in AC 61-136, (See Appendix B for BATD and Appendix C for AATD items “if applicable”) and the operational performance (as applicable) for each of the functions described for the Cirrus SFx Home airplane ATD.

Basic ATD Requirements

All configurations for this model meet all AC 61-136, Appendix B requirements.

The RealSimGear SFx Home models meet the following Control Input requirements.

(1) The airplane's physical flight and associated control systems are recognizable as to their function and how they are manipulated solely from their appearance. These physical flight control systems do not use interfaces such as a keyboard, mouse, or gaming joystick to control the airplane in simulated flight.

(2) Virtual controls are those controls used to set up certain aspects of the simulation (such as selecting the airplane configuration, location, weather conditions, etc.) and otherwise program, effect, or pause the training device. These controls are part of the instructor station or independent computer interface.

(3) Except for the initial setup, a keyboard or mouse is not used to set or position any feature of the ATD flight controls for the maneuvers or training tasks to be accomplished. See the control requirements listed below as applicable to the airplane model represented. The pilot is able to operate the controls in the same manner as it would be in the actual airplane. This includes the landing gear, wing flaps, cowl flaps, carburetor heat, mixture, propeller, and throttle controls appropriate to the airplane model represented.

(4) The physical arrangement, appearance, and operation of controls, instruments, and switches closely models the airplane represented. This trainer recreates the appearance, arrangement, operation, and function of realistically placed physical switches and other required controls representative of an airplane instrument panel that includes the following:

- Master/battery;
- Magnetos for each engine (as applicable);
- Alternators or generators for each engine;
- Auxiliary power unit (APU) (if applicable);
- Fuel boost pumps/prime boost pumps for each engine;
- Avionics master;
- Pitot heat; and
- Rotating beacon/strobe, navigation, taxi, and landing lights.

(5) Only the software evaluated by the FAA is available for use on this computer system. Note: This does not prohibit software updates that do not otherwise change the appearance of the system's operation.

The RealSimGear SFx Home model meets the following additional airplane physical flight and airplane systems controls:

(1) A self-centering displacement yoke or control stick that allows continuous adjustment of pitch and bank.

(2) Self-centering rudder pedals that allow continuous adjustment of yaw and corresponding reaction in heading and roll.

(3) Throttle or power control(s) that allows continuous movement from idle to full-power settings and corresponding changes in pitch and yaw, as applicable.

(4) Mixture/condition, propeller, and throttle/power control(s) as applicable to the make and model of the airplane represented.

(5) Controls for the following items, as applicable to the category and class of airplane represented:

- Wing flaps,
- Pitch trim,
- Communication and navigation radios,
- Clock or timer,
- Gear handle (if applicable),
- Transponder,
- Altimeter,
- Carburetor heat (if applicable), and
- Cowl flaps (if applicable).

The RealSimGear SFx Home meets the following Control Input Functionality and Response Criteria:

(1) Time from control input to recognizable system response is without delay and does not appear to lag in any way. RealSimGear verifies that the SFx Home meets this performance requirement.

(2) The control inputs are tested by the computer software at each session startup, and displayed as a confirmation message of normal operation, or a warning message if the transport delay time or any design parameter is out of tolerance. It is not possible to continue the training session unless the problem is resolved and all components are functioning properly. This test considers all the items listed in the display and control requirements.

The RealSimGear SFx Home model meets the following Display Requirements:

(1) The following instruments and indicators are replicated and properly located in the instrument panel, as appropriate to the airplane represented:

- Flight instruments are in a standard configuration, represented as traditional “round dial” flight instruments, or as an electronic primary flight instrument display (PFD) and multi-function display (MFD) with reversionary and back-up flight instruments.
- A sensitive altimeter with incremental markings each 20 feet or less, operable throughout the normal operating range for the make and model of airplane represented.
- A magnetic direction indicator

• A heading indicator with incremental markings each 5 degrees or less, displayed on a 360 degree circle. Arc segments of less than 360 degrees are selectively displayed as applicable to the M/M of the airplane represented.

• An airspeed indicator with incremental markings as shown for the M/M airplane represented; airspeed markings of less than 20 knots need not be displayed.

• A vertical speed indicator (VSI) with incremental markings each 100 feet per minute (fpm) for both climb and descent, for the first 1,000 fpm of climb and descent, and at each 500 fpm climb and descent for the remainder of a minimum ±2,000 fpm total display, or as applicable to the M/M of airplane represented.

• A gyroscopic rate-of-turn indicator or equivalent with appropriate markings for a rate of 3 degrees per second turn for left and right turns. If a turn and bank indicator is used, the 3 degrees per second rate index must be inside of the maximum deflection of the indicator.

• A slip and skid indicator with coordination information displayed in the conventional inclinometer format where a coordinated flight condition is indicated with the ball in the center position. A split image triangle indication or as appropriate for a PFD configuration is used.

• An attitude indicator with incremental markings each 5 degrees of pitch or less, from 20 degree pitch up to 40 degree pitch down or as applicable to M/M of the airplane represented. Bank angles are identified at “wings level” and at 10, 20, 30, and 60 degrees of bank (with an optional additional identification at 45 degrees) in left and right banks.

• Engine instruments as applicable to the M/M of the airplane represented, providing markings for the normal ranges including the minimum and maximum limits.

• A suction gauge or instrument pressure gauge, if applicable, with a display appropriate to the airplane represented.

• A flap setting indicator that displays the current flap setting. Setting indications should be typical of that found in an actual airplane.

• A pitch trim indicator with a display that shows zero trim and appropriate indices of airplane nose down and nose up trim, as would be found in the actual airplane.

• Communication radio(s) with a full range of selectable frequencies displaying the radio frequency in use.

• Navigation radio(s) with a full range of selectable frequencies displaying the frequency in use and capable of replicating both precision and non-precision instruments, including approach procedures (each with an aural identification feature), and a marker beacon receiver. Examples include, an instrument landing system (ILS), non-directional radio beacon (NDB), Global Positioning System (GPS), Localizer (LOC) or very high frequency omni-directional range (VOR). Graduated markings as indicated below are present on each course deviation indicator (CDI) as applicable. The markings include:

- One-half dot or less for course/glideslope (GS) deviation (i.e., VOR, LOC, or ILS), and
- Five degrees or less for bearing deviation for automatic direction finder (ADF) and radio magnetic indicator (RMI), if installed.

- If equipped with a Primary Flight Display (PFD) and/or Multi Function Flight Display (MFD), the flight and navigation information and guidance replicates the avionics manufactures same scales and navigation information presentation.

- A clock with incremental markings for each minute and second, or a timer with a display of minutes and seconds.
- A transponder that displays the current transponder code.
- Fuel quantity indicator(s) that displays the fuel remaining, either in analog or digital format, as appropriate for the make and model of the airplane represented.

(2) All instrument displays listed above are visible during all flight operations. All of the displays provide an image of the instrument that is clear and:

(a) Does not appear to be out of focus or illegible

(b) Does not appear to "jump" or "step" during operation.

(c) Does not appear with distracting jagged lines or edges.

(d) Does not appear to lag relative to the action and use of the flight controls.

(3) Control inputs are properly reflected by the flight instruments in real time and without a perceived delay in action. Display updates or actions show all changes (within the total range of the replicated instrument) that are equal to or greater than the following values:

(a) Airspeed indicator: change of 5 knots.

(b) Attitude indicator: change of 2 degrees in pitch and bank.

(c) Altimeter: change of 10 feet.

(d) Turn and bank: change of ¼ standard rate turn.

(e) Heading indicator: change of 2 degrees.

(f) Vertical speed indicator (VSI): change of 100 fpm.

(g) Tachometer: change of 25 rpm or 2 percent of turbine speed.

(h) VOR/ILS: change of 1 degree for VOR or ¼ of 1 degree for ILS.

(i) ADF: change of 2 degrees.

(j) GPS: change as appropriate for the model of GPS based navigator represented.

(k) Clock or timer: change of 1 second.

Note: Airplane configurations with PFD and/or MFD displays are representative of those avionics systems and the associated instrument display information.

(4) Flight Displays reflect proper dynamic behavior of the airplane represented. Examples: a VSI reading of 500 fpm reflects a corresponding movement in altitude, and an increase in power reflects an increase in the rpm indication or power indicator.

The RealSimGear SFx Home model meets the following Flight Dynamics requirements:

(1) Flight dynamics are comparable to the way the airplane represented performs and handles.

(2) Airplane performance parameters (such as maximum speed, cruise speed, stall speed, and maximum climb rate) are comparable to the airplane represented. A performance table is provided for each airplane configuration for sea level and 5,000 feet, to verify the appropriate performance. (or 6,000 feet can be used. 25,000 feet should will be used for turboprop or turbojet altitude performance)

(3) Airplane vertical lift component changes as a function of bank comparable to the way the airplane represented performs and handles.

(4) Changes in flap setting, slat setting, or gear position are accompanied by the appropriate changes in flight dynamics comparable to the way the make and model of airplane represented performs and handles.

(5) The presence and intensity of wind and turbulence is reflected in the handling and performance qualities of the simulated airplane and is comparable to the way the airplane represented performs and handles.

The RealSimGear SFx Home model meets the following Instructional Management Requirements:

(1) The instructor is able to pause the system at any time during the training simulation for the purpose of administering instruction or procedural recommendations.

(2) If a training session begins with the “airplane in the air” and ready for the performance of a particular procedural task, the instructor can manipulate the following system parameters independently of the simulation:

- Airplane geographic location,
- Airplane heading,
- Airplane airspeed,
- Airplane altitude, and
- Wind direction, speed, and turbulence.

(3) The system is capable of recording both a horizontal and vertical track of airplane movement for the entire training session for later playback and review.

(4) The instructor can disable any of the instruments prior to or during a training session and is able to simulate failure of any of the instruments without stopping or freezing the simulation to affect the failure. This includes simulated engine failures and the following airplane systems failures: alternator or generator, vacuum or pressure pump, pitot static, electronic flight displays, or landing gear or flaps, as appropriate.

(5) This ATD has an available navigational database that is local (within 25NM) to the training facility location. All navigational data is based on procedures as published per 14 CFR part 97. This device uses Jeppesen database, with optional updates via Navigraph to support the instrument approach and navigation capabilities.

List of Airplane Configurations

Available airplane configuration “instrument panel” pictures and any optional instrument or avionics panels for each airplane are shown here. The components list identifies any optional displays, controls, or avionics equipment.

A) Cirrus SF50

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A/C PERFORMANCE TABLE (for the airplane configurations available)

Airplane Model	**Vso**	**Vs1**	**Vx**	**Vy**	**Best Glide Speed**	**Va**	**Vne**	**Vmc**	**KTAS at Cruise @ 75% power setting.**	**Rate of climb (fpm) at best rate (Vy), at full power or as recommended.**	**Single Engine Climb rate (at Vyse)**
(1)SF50	85	95	91	120	100	150	250	N/A	250	SL - 2500	SL N/A
	25,000 feet→								315	1400	N/A

NOTE: Standard atmosphere and gross weight is used for performance.

Airplane performance table for sea level *and* 6,000 feet
(12,000 feet for turbo-charged, 25,000 feet for turboprop/turbojet).

Visual System Description and Configurations

The standard visual system used by the RealSimGear SFx Home model includes a single 49” Ultrawide, 50”, 55”, or 65” TV monitor arranged as a forward facing view with 85-90 degree field of view.

Optional configuration utilizes 3 (three) 65” 4K TV monitors arranged with one forward facing, and one to each side of the pilot position at approximately 80 degrees from the forward monitor. This provides for greater than 200 degrees of visuals meaning the pilot can look over his shoulder and see the runway at the 45 degree point.

The **visual system** provides realistic cues in both day and night VFR and IFR meteorological conditions to enhance a pilot’s visual orientation in the vicinity of an airport, to include the ability to adjust the visibility and ceiling conditions permitting the simulation of various meteorological weather conditions.

Visual Display Setup (Single 49” Ultriawide) (standard configuration for SFx Home)

Visual Display Setup (1x 50”, 55”, or 65” 4K TV) (optional for SFx Home)

Visual Display Setup (Triple 65” 4K TV) (optional for SFx Home)

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Functions and Maneuvers Checklist

FIGURE 1. AIRPLANE ATD FUNCTION VERIFICATION CHECKLIST

Functions and Maneuvers	Yes, No, or N/A
a. Pre-Takeoff	
(1) Engine start	Yes
(2) Taxi and brake operation	Yes
b. Takeoff	
(1) Run-up and powerplant checks	Yes
(2) Acceleration characteristics	Yes
(3) Nose wheel and rudder steering	Yes
(4) Effect of crosswind	Yes
(5) Instrument	Yes
(6) Flap operation	Yes
(7) Landing gear operation (if retractable)	Yes
c. In-Flight Operations	
(1) **Climb**	
(i) Normal and max. performance	Yes
(ii) One engine inoperative procedures (Multiengine only)	N/A
(2) **Cruise**	
(i) Correct performance characteristics (speed vs. power)	Yes
(ii) Normal and steep turns	Yes
(iii) Approach to stalls, (i.e. stall warning), stalls. Execute from takeoff, cruise, and approach and landing configurations.	Yes
(vi) In flight engine shutdown (multi-engine only)	N/A

(v) In flight engine start (multi-engine only)	N/A
(vi) Fuel selector function	Yes
(3) **Approach**	
(i) Normal (with & without flaps) Check gear horn warning if applicable	Yes
(ii) Single engine approach and landing (multi-engine)	N/A
(iii) Best glide no power	Yes
(iv) Landings	Yes
d. Instrument Approaches	
(1) **Nonprecision**	
(i) GPS and LPV	Yes
(ii) GPS - WAAS (optional)	Yes
(iii) All engines operating	Yes
(iv) One engine inoperative (Multi-engine only)	N/A
(v) Approach procedures (VOR, VOR/DME, LOC procedures on an ILS, LDA, RNAV (RNP) or RNAV (GPS) to LNAV, LNAV/VNAV or LPV)	Yes
Functions and Maneuvers	**Yes, No, or N/A**
(2) **Precision**	
(i) ILS	Yes
(ii) GLS (optional)	N/A
(iii) Effects of Crosswind	Yes
(iv) One Engine Inoperative (Multi-engine only)	N/A
(v) Missed Approach	Yes
(A) Normal	Yes
(B) With One Engine inoperative (Multi-engine only)	N/A

e. Surface Operations (Post Landing)	
(1) Approach and landing roll	Yes
(2) Braking operation	Yes
(3) Reverse thrust operation, if applicable	N/A
f. Any Flight Phase	
(1) **Airplane and Power Plant Systems**	
(i) Electrical, mechanical, or hydraulic	Yes
(ii) Flaps	Yes
(iii) Fuel selector and oil temp/pressure	Yes
(iv) Landing gear (if applicable)	Yes
(2) **Flight Management and Guidance Systems**	
(i) Two axis auto pilot (if standard equipment)	Yes
(ii) Flight director (AATD only) and system displays (if installed)	Yes
(iii) Navigation systems and optional display configurations	Yes
(iv) Stall warning systems avoidance	Yes
(v) Multi-function displays (PFD/MFD) if applicable	Yes
(3) **Airborne Procedures**	
(i) Holding	Yes
(ii) Uncoordinated turns – slipping and skidding demo	Yes
(iii) Configuration and power changes and resulting pitch changes	Yes
(iv) Compass turns and appropriate errors (if installed)	Yes
(4) Simulated Turbulence in Flight (light, moderate, severe)	Yes

(**5**) **Parking and Engine Shutdown**	
(i) Systems operation	Yes
(ii) Parking brake operation (if installed)	Yes
g. Can simulate engine failure, including failures due to simulated loss of oil pressure or fuel starvation.	Yes
h. Can simulate the following equipment or system failures:	
(1) Alternator or generator failure.	Yes
(2) Vacuum pump/pressure failure and associated flight instrument failures.	N/A
(3) Gyroscopic flight instrument failures.	N/A
(4) Pitot/static system malfunction and associated flight instrument failures.	Yes
(5) Electronic flight deck display malfunctions.	Yes
(6) Landing gear (if retractable) or flap malfunctions	Yes
i. Independent Instructor Station Requirements (AATD only)	
(1) Displays published airways and holding patterns.	Yes
(2) Displays airplane position and track.	Yes
(3) Displays airplane altitude and speed.	Yes
(4) Displays NAVAIDs and airports.	Yes
(5) Can record and replay airplane ground track history for the entire training session.	Yes
(6) Can invoke instrument or equipment failures.	Yes

During the initial start of the trainer, the computer component “self-check” program verifies that all the features of the trainer are in working order. It is not possible to continue the training session unless the problem is resolved, and all the components are functioning properly.

During the initial start-up the ATD has the following **Screen Statement** is displayed on the instructor station or visual display before the trainer is used for training.

“*All the flight instruments required for visual and instrument flight rules listed in part 91.205 must be functional at the start of the simulated flight session. Temporary instrument or equipment failures are permitted when practicing emergency procedures. If this simulated flight session will be used for instrument experience or currency requirements, the visual component must be configured to Instrument Meteorological Conditions [IMC] during the simulated flight session, including execution of instrument approaches from the final approach fix until reaching Decision Height [DH], Decision Altitude [DA], or Minimum Descent Altitude [MDA] as appropriate*.”

Notice: Any changes or modifications to this training device that have not been reviewed, evaluated, and approved in writing by the General Aviation and Commercial Division will terminate FAA approval.