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Sim-Avionics

Professional Flightdeck Avionics Solutions

Custom Design Integration and Support

Instructor Operating Station





Overview

The Instructor Operating Station from Sim-Avionics puts full control of your simulator at your finger tips



features to compliment your avionics suite

Including...

- Fuel and Weight Loading
- Moving Map
- Repositioning
- Weather and Environment Control
- Approach Plotting

- TCAS Training
- ACARS
- Malfunctions
- Blackbox Recording
- Multi Screen Map Operation



Interface Layout

The IOS is designed around a clean and easy to read tabbed and pushbutton layout, fully compatible with Mouse/Keyboard or Touchscreen operation.

Live Flight Parameters, Queued and Active Malfunctions and the most common menu Controls are always visible, making the layout intuitive and simple to navigate.

Menu Bar

Buttons and Information



Live Flight Parameters Strip



Aircraft Setup

Aircraft Dispatch Functions

Everything you need to dispatch the aircraft, including :

- · GPU and Air units
- Quick start Engines and APU
- Set HYD, Oil and Oxygen quantities
- Quick IRS/ADIRU alignment
- Fire Bottle / Elec Drive resets
- Pushback control



- Zero Fuel Weight •
- Gross Weight .
- CG

Control over individual Payload compartments



Fuel Loading



Weight and Balance



Repositioning

Simple repositioning to multiple points from any runway in the database, or to a point anywhere on the moving map.



Given a Reference Airport and Runway, it's easy to select one of the repositioning presets



Quick Custom Repositioning is easy... Click the new desired location on the MAP and enter the Altitude, Heading and Speed

HOLD / TAXI LOCATIONS USER: GATE M26 USER: GATE 401 USER: TAXI A USER: HOLD RWY 27R A1 USER: HOLD S4 A 176 Gate Small

Create Custom Airport Specific Preset Positions

Default Gate Positions are available from the Database



Fully Automatic, Semi Automatic and Manual Pushback Modes



Moving Map

The perfect tool for monitoring your flight progress or for assessing a pilots flight tracking accuracy.

Display : Airports, Runways, ILS, Navaids, Waypoints, Airways and Holds near your aircraft or around your selected reference airport.





	Fail S	tations		
	Select Nearby ILS	Select Nearby Stations		
	or Enter S	pecific Idents		
Reset	IWW	Select Station ID to Fail	Fail Glideslope Only	
Reset	NONE	Select Station ID to Fail	Fail Glideslope Only	
Reset	NONE	Select Station ID to Fail	Fail Glideslope Only	EOK
Reset	NONE	Select Station ID to Fail	Fail Glideslope Only	
Reset	NONE	Select Station ID to Fail	Fail Glideslope Only	
Reset	NONE	Gelect Station ID to Fail	Fail Glideslope Only	
	c	lose		FAIL

Options to fail an individual Station, Localizer or Glideslope



Showing : ILS, Waypoints, Upper Airways and Current Wind

- Display your FMC routing and current flight track.
- At the end of the flight, save or print your progress for further analysis.
- Fail Individual Stations, Localizer and/or Glideslopes.
- Reposition to any location by clicking on the moving map.
- Inject Storm Cells onto the Weather Radar.
- Display your flight profile in Google Earth.



Flight Plots

TAKEOFF PLOT

Monitor aircraft runway centre line deviation and pilot control inputs.



APPROACH PLOT

Monitor the ILS approach for accuracy. Check Flight Control, Speed, Throttle, Flap and Gear inputs along with final touchdown Vertical Speed.



LANDING PLOT

Monitor aircraft Runway Centre Line deviation and Pilot Control Inputs. Displays Touchdown points and Rollout Distance

0 nm		1 nm	
RUNWAY DEVIATION	T/D Point 3039 ft	Landing Roll 4639 ft	
<u></u>			
Rudder			



Take full control of the surrounding environment

The option to control variables including :

- Time of Day Time Lapse
 - Cloud Layers Winds

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- Rain / Snow Turbulence
- Pressure / Temp Visibility

Weather	CLOUDS AND VISIBILITY			
Presets Winds And Environment	<u>Ground Ref Altitude</u> 80 ft	САVОК		
Cloud Adjustment	CIRCLING	NON PRECISION		
	CAT I	CAT II		
	CAT IIIA	CAT IIIB		



Showing : Precipitation options

14 Standard Weather Presets are available suitable for all types of training.

- 10 Custom Weather Presets can be setup.
- 10 Quick Access Visibility Presets



Showing various : Wind, Turbulence, Pressure and Time options



TCAS Training Add TCAS Targets to aid training and crew response

	Preset Tra	iffic Scenarios
10 O'Clock 10 NM + 200 FT	12 O'Clock 10 NM 0 FT	2 O'Clock 10 NM - 300 FT
10 O'Clock 10 NM + 200 FT	12 O'Clock 10 NM 0 FT	2 O'Clock 10 NM - 300 FT
	Custom Traffic Scenarios	
10 O'Clock	12 O'Clock	2 O'Clock
9 O'Clock		3 O'Cleck
8 O'Clock		4 O'Clock

Multiple TCAS targets can be inserted at any Altitude, Distance and with any Vertical Speed. Targets are displayed on the Navigation Display and Moving Map. (not currently visible in P3D)

System Information **Realtime Aircraft System Information**

Electrical Hydraulic Fuel	Air Anti Ice II	RS MCP Flight Ctrls		
	Switch Position	System Status		
GND PWR	1	0		
PU	0	0		
PU RPM/EGT	0	0		
APU Fault/ Oil Press	0	0		
Standby Power Switch	2	0		
Battery Switch	0		System	Status
APU Gen L	0	Temperature PACK L/R	34.3	32
APU Gen R	0	Temperature FLIGHTDECK	21	20.9
Eng Gen L	0	Temperature CABIN	21	20.9
Eng Gen R	0	Temperature FWD CARGO	21	20.9
Eng Gen Drive L	1	Temperature AFT CARGO	5	5
Eng Gen Drive R	1	Cabin Altitude	201	
100		Cabin Delta Pressure	0	
		Cabin Cabin Rate	0	
		BLEED Outflow Valve Position	148	
		BLEED FLT Altitude	10000	
Assistant the souther and sustains status of many		BLEED LND Altitude	50	

Monitor the switch and system status of many aircraft systems.

BLEED Duct Pressure L / R 27.589 25.536

Scenario Snapshots

Save and Load your own Custom Scenarios for easy recall





ACARS Messaging Send and receive Telex, CPDLC and Pre Departure Clearances

TELE	Send X Message	CPD	Send DLC Message		Send Preset MSG		
	Message Log						
🍄 CPDLC Message E	Builder				- 0	×	
Climb	Descend	Route	CLIMB TO [LEVER CLIMB TO REACH	L] H [LEVEL] BY [T H [LEVEL] BY [P	IME]	Î	
Comms	Misc	Speed	CLIMB TO AND MAINTAIN [LEVEL] CLIMB TO AND MAINTAIN BLOCK [LEVEL] TO [LEVEL] MAINTAIN BLOCK [LEVEL] TO [LEVEL] MAINTAIN [LEVEL] AT [TIME] CLIMB TO AND MAINTAIN [LEVEL]			Ш	
SSR	Crossing	Emergency				Ш	
Enquiry	Report	Custom	AT [POSITION] CLIMB TO [LEVEL] REPORT REACHING [LEVEL] REPORT REACHING BLOCK [LEVEL] TO [LEVEL]				
WU: Wilco / Ui	nable		EXPECT CLIMB A	T [TIME]		v	
Element 1	Element 1 Clear CLIMB TO FL260						

On the 737MAX and 787 this displays on the AUX panel next to the PFD.

ATC UPLINK	
RKSS DEP ATIS B 0130Z EXP ILS RWY 32R APP	
DEP FREQ WILL BE 125.150 WIND 050 AT 10 KTS	
TP 15 DEGREES CELCIUS DP 10. ONH 1019 HPA	
ADZ YOU HAVE INFO A	
	CANCEL



On the 737NG and 777 this info can be displayed via the CDU.



Integrated Hardware Check

Individual Hardware components can be continually monitored before and during a training session to ensure the simulator is fully operational.

Hardware	Status		
Flight Controls-Elevator	Connected		
Flight Controls-Aileron	Connected		
Flight Controls-Rudder	Connected		
Throttle Quadrant	Disconnected		
Main Overhead	Disconnected		
MCP / EFIS	Disconnected		
Main Instrument Panel	Disconnected		
Pedestal	Disconnected		
CPT CDU	Disconnected		
FO CDU	Disconnected		
Radio-CPT MCOMM	Connected		
Radio-CPT NAV	Connected		
Radio-XPNDR	Connected		
Radio-ADF1	Connected		
Radio-FO MCOMM	Connected		
Radio-FO NAV	Connected		
Compass Gauge	Disconnected		
Cabin Rate Gauge	Disconnected		
Duct Press Gauge	Disconnected		
Fuel Temp Gauge	Disconnected		
Cabin Temp Gauge	Disconnected		
Crew Oxygen Gauge	Disconnected		



Approved for Flight Training == NOTICE == 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 Decent Altitude [MDA] as appropriate DECLINE AGREE

All Flight Controls Detected



Malfunctions

A comprehensive Malfunction set has been added to simulate various system failures and fires.



Malfunction Categories include :

- Flight Controls
- Electrical
- Fuel
- APU
- Navigation / Comms
- Gear and Flaps
- Air

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- Engine
- Fire
- Anti Ice
- Doors
- Hydraulic
- Engine Starting
- Instruments / Displays
- Reverse Thrust



Malfunctions can be 'Pre-Armed' and assigned different triggers, including : Speed, Altitude, Gear or Flap changes.



Secondary Map Screen

Connect a second monitor to your computer and you can display a moving map on the additional screen.

This allows you to control the training session whilst always keeping a clear view of the current flight track.



Showing various modes on the secondary Map







Detailed Specification

General

Touch screen compatible Windows Application Resizable Screen Easy to Navigate Layout Menu Strip Flight Strip Failure Information Window Customizable Lesson Plans

Main Categories

AIRCRAFT SET

Weight and Balance Fuel Loading Flight Quantities / Pressures / Temps Quick Presets

POSITION SET

Favourite Airports List Preset Position Alignments Takeoff / Approach Air work / Gate positioning Manual Slew Direct Positioning Pushback

ACTIVE ENVIRONMENT

Season Time of Day Sim Rate Cloud Layers Visibility Winds Precipitation Turbulence Weather Presets

Мар

Moving Map showing aircraft position Display : Country Borders / Airports / Rwys / ILS / Navaids / Airways / Holds / Terrain Record / Display / Save / Load : Aircraft Lateral Tracks Fail Individual Navaids / LOC / Glideslope Secondary Map Display Print Map Display



Takeoff Plotting

Log Aircraft Runway Centre Line Deviations Log Flight Controls, Throttle, N1, IAS Changes Log Minimum Tail Clearance on Rotation Save / Load Takeoff Plots

Approach Plotting

Log Aircraft Localizer and Glideslope Deviations Log Flight Controls, Throttle, N1, Flap, Gear and Trim Changes Log deviation from the selected VREF Speed Save / Load Approach Plots

Landing Plotting

Log Aircraft Runway Centre Line Deviations Log Flight Controls and Brake Changes Log Touchdown, Touchdown Vertical Speed and Rollout Information Save / Load Landing Plots

TCAS Training

Add TCAS Targets at custom Distance and Altitude

Add TCAS Targets using Quick Presets

ATC Comms

Build computer generated ATC responses to send to the flight deck

ACARS Training

Send and Receive Message Types :

Telex

CPDLC

Pre Departure Clearances

Logon Requests

Hardware and Flight Control Checks

Verify Joystick Connection Status before each session

Continually check individual Sim Hardware Status



The current Failure System contains 218 possible failures

Mechanical

Flight Controls

CPT / FO Stab Trim Fail Aileron Trim Fail Rudder Trim Fail STABILIZER Fail STABILIZER L2 STABILIZER R2

Flap Primary Drive Fail Flap Drive Fail Slat Primary Drive Fail Auto Slat Fail TE Disagree TE Asymmetry

Auto Speedbrake Fail Thrust Asym Compensation Fail

Landing Gear / Brakes

Anti Skid Fail Autobrake Fail Brake Fail Dragging Brake OVHT Gear L / N / R : Jammed Down - Temp Jammed Down - ALTN OP Jammed Down - ALTN INOP Gear Door L / N / R : Fail Open

Doors

Cargo Door FWD / AFT Open Passenger Door Entry : Door L1 / R1 Open Door L4 / R4 Open

Systems

Electrical

IDG L1 / L2 / R1 / R2 Drive Disconnect Drive Oil Leak Generator Fail AC Bus Fail Standby Power Fail

Air Systems

Rapid Decompression Slow Decompression Cabin Pres Sensor Auto : Fail Outflow Valve FWD / AFT : Fail Liquid Cooling L / R Fail Pack L / R : Fail Pack L / R : Overheat Trim Air L / R : PRSOV Fail Closed EQUIP Cooling OVRD

Hydraulic

HYD Pri L / R : Pump OVHT HYD Pri Eng L / R : Pump Fail HYD Demand 1 / 2 / 3 / 4 : Pump Fail HYD QTY L / C / R : Low HYD L / C / R : System Leak HYD L / C / R : Low Pressure HYD RAT : Pump Fail

Fuel

 $\begin{array}{l} Pump \ L \ / \ R : FWD \ Pump \ Fail \\ Pump \ L \ / \ R : \ AFT \ Pump \ Fail \\ Pump \ L \ / \ R : \ CTR \ Pump \ Fail \\ Crossfeed \ Fail \ in \ Position \\ Fuel \ L \ / \ R : \ Imbalance \\ Tank \ L \ / \ C \ / \ R : \ Leak \end{array}$

Anti Ice

Pitot Heat L / R / Aux : Fail AOA Vane L / R : Fail TAT Probe Fail Window Heat L / R : SIDE Fail Window Heat L / R : FWD Fail Window Overheat ENG Anti-Ice L / R : Fail Closed Wing Anti-Ice Fail Closed ENG L / R : Duct Leak ENG L / R : Duct Loss

Engines

Failures

ENG L / R : Flame Out Compressor Stall / Surge Fail and Seizure EGT Overlimit Fan Damage / Vibrations Oil Leak / Pump Fail EEC L / R : ALTN

Starts

ENG L / R : Hot Start Hung Start No N1 Rise No N2 Rise No Oil Pressure Rise

Reverse Thrust

ENG L / R : Reverse Thrust Fail Reverser Stuck Open

APU

AUTO Shutdown Low Oil Pressure / Qty Starter Fail

Avionics

Automatic Flight

Primary Flight Computer Fail Autopilot Fail Flight Directors Fail FCC Downgrade / LAND 2 No Autoland Autothrottle Motor L / R : Fail

Displays

CPT / FO Outboard Fail Lower Fail Attitude Fail Attitude Unreliable Altimeter Fail Altimeter Unreliable Airspeed Fail Airspeed Unreliable Radio Altimeter Fail Radio Altimeter Unreliable AOA Fail AOA Unreliable EFIS Control Panel Fail **Overspeed Warning Fail** Stall Warning Fail

Nav / Communications

IRS L / R : Fail FMC L / R : Fail COM 1 / 2 : Fail VOR 1 / 2: Fail ADF 1/2 : Fail DME 1/2: Fail ILS LOC Antenna SW : Fail ILS G/S Antenna SW : Fail Individual Station : Fail Individual LOC or GS : Fail Marker Receiver Fail Weather Radar Fail Altitude Callouts Fail TCAS Fail GND PROX SYS Fail GPWS Pull Up Warning Fail

Fire

APU Extinguishable APU Non-Extinguishable Cargo FWD / AFT Wheel Well / Detector Fail ENG L / R : 1 Bottle 2 Bottle Non-Extinguishable Overheat (Idle Required) Overheat (Shutdown Required) Detector Fail Cargo FWD / AFT : Detector Fail



737NG / 737MAX Malfunction List

The current Failure System contains 237 possible failures

Mechanical

Flight Controls

CPT / FO Stab Trim Fail Aileron Trim Fail Rudder Trim Fail Horizontal Stabilzer Fail Runaway Stabilizer UP / Down MCAS Fault (Orig Logic Only)

Flap Primary Drive Fail Flap Drive Fail Slat Primary Drive Fail Auto Slat Fail TE Disagree TE Asymmetry

Auto Speedbrake Fail

Landing Gear / Brakes

Anti Skid Fail Autobrake Fail Brake Fail Dragging Brake OVHT Gear L / N / R : Jammed Down - Temp Jammed Down - ALTN OP Jammed Down - ALTN INOP Main Gear Down lock Disagree

Doors

Cargo Door FWD / AFT Open Passenger Door Entry : Door L1 / R1 Open Door L4 / R4 Open

Systems

Electrical

Main AC Bus Short Main Battery Rely Fails Open DC Standby Bus Fail ELEC Fail IDG 1 / 2 Drive Disconnect Drive Oil Leak Generator Fail TRU 1 / 2 / 3 Fail Maintenence

Air Systems

Rapid Decompression Slow Decompression Cabin Pres Sensor Auto : Fail Cabin Pres Sensor Dual : Fail Outflow Valve : Fail Pack L / R : Fail Pack L / R : Overheat Trim Air PRSOV Fail Closed EQUIP Cooling Supply OVRD EQUIP Cooling Exhaust OVRD Bleed Air L / R : Trip OFF Bleed ISLN : Fail Closed Wing Body L / R : Overheat

Hydraulic

HYD ELEC 1 / 2 : Pump OVHT HYD ELEC 1 / 2 : Pump Fail HYD Pri Eng 1 / 2 : Pump Fail HYD QTY A / B : Low HYD A / B : System Leak HYD A / B : Low Pressure

Fuel

Pump L / R : FWD Pump Fail Pump L / R : AFT Pump Fail Pump L / R : CTR Pump Fail Crossfeed Fail in Position Tank L / C / R : Leak

Anti Ice

Pitot Heat L / R / Aux : Fail AOA Vane L / R : Fail TAT Probe Fail Window Heat L / R : SIDE Fail Window Heat L / R : FWD Fail Window Overheat ENG Anti-Ice L / R : Fail Closed Wing Anti-Ice Fail Closed ENG L / R : Duct Leak ENG L / R : Duct Loss

Engines

Failures

ENG L / R : Flame Out Compressor Stall / Surge Fail and Seizure EGT Overlimit Fan Damage / Vibrations Oil Leak / Pump Fail EEC L / R : ALTN

Starts

ENG L / R : Hot Start Hung Start No N1 Rise No N2 Rise No Oil Pressure Rise ENG L / R Start Valve Fail Open ENG L / R Start Valve Fail Closed ENG L / R Ignition 1 / 2 Fail

Reverse Thrust

ENG L / R : Reverse Thrust Fail Reverser Stuck Open

APU

AUTO Shutdown Low Oil Pressure / Qty APU Overspeed Starter Fail

Avionics

Automatic Flight

Autopilot Fail Flight Directors Fail FCC Downgrade / LAND 2 No Autoland Autothrottle Motor L / R : Fail

Displays

CPT / FO Outboard / Inboard Fail Upper / Lower Fail Attitude Fail Attitude Unreliable Altimeter Fail Altimeter Unreliable Airspeed Fail Airspeed Unreliable Radio Altimeter Fail Radio Altimeter Unreliable AOA Fail AOA Unreliable EFIS Control Panel : Fail **Display Select Panel : Fail** Overspeed Warning : Fail Stall Warning CH 1 / 2 : Fail

Nav / Communications

IRS L / R : Fail IRS L/R: On DC IRS : DC Fail FMC L / R : Fail CDU L / R : Fail COM 1 / 2 : Fail VOR 1 / 2: Fail ADF 1 / 2 : Fail DME 1 / 2 : Fail ILS LOC Antenna SW : Fail ILS G/S Antenna SW : Fail Individual Station : Fail Individual LOC or GS : Fail Marker Receiver Fail Weather Radar Fail Altitude Callouts Fail TCAS Fail GND PROX SYS Fail GPWS Pull Up Warning Fail

Fire

APU Extinguishable APU Non-Extinguishable Cargo FWD / AFT Wheel Well / Detector Fail ENG L / R : 1 Bottle 2 Bottle Non-Extinguishable Overheat (Idle Required) Overheat (Shutdown Required) Detector Fail Cargo FWD / AFT : Detector Fail



QUALITY DESIGN INTEGRATION AND SUPPORT

Sim-Avionics is a comprehensive commercial software package used in projects such as :

- Flight Experience Centers
- Fear of Flying Sessions
- TV and Movies
- Research Laboratories
- Product Demonstrators
- Flight Training

We specialize in custom projects and our aircraft avionics portfolio is expanding, so don't hesitate to contact us to discuss any custom requirement your project requires.

WEBSITE : www.sim-avionics.com

EMAIL : support@sim-avionics.com

LICENSING

Please contact FlightDeckSolutions.com for sales or any form of professional usage or application

All pictures in this document are generated from screenshots of the software.



CUSTOM SOLUTIONS

Sim-Avionics has partnered with many leading aerospace companies, to develop customized avionics solutions for various demonstration, research and training projects on time and on budget.



REMOTE SETUP AND TRAINING SOLUTIONS

Using remote access we are able to offer quick setup and maintenance assistance via an internet connection.

This provides you with piece of mind that there will always be someone available to help you. No matter where you are



SUPPORT SOLUTIONS

After choosing Sim-Avionics you are not alone. Many questions are answered by visiting our support forum with friendly feedback provided by our support team and our growing user community.

email us at : support@sim-avionics.com