TRU SIMULATION + TRAINING

EXPLORE THE POSSIBILITIES

FIXED-WING FULL FLIGHT SIMULATOR

AN EXPERT PARTNER
CHANGING HOW YOU THINK ABOUT SIMULATION

When you work with TRU Simulation + Training, you'll get a partner who listens to your needs for today and tomorrow. Together, we'll consider your training requirements and financial realities to help you select from our full lineup of devices—supporting ab-initio to type rating pilot training. We've integrated technology across our entire product lineup, so pilots can train on the same software used in full flight simulators. Keep exploring to learn how TRU excels in fixed-wing simulation and how we can bring that reality to you.

FULL FLIGHT SIMULATOR

Discover the highest-quality, most immersive training experience available. TRU Full Flight Simulators (FFS) are built from the ground up to deliver the full flight experience at the highest fidelity and realism. Full flight simulators are equipped to handle your complete training needs.

QUALIFICATION	FAA	EASA	CAAC	CASA
	LEVEL D	LEVEL D	LEVEL D	LEVEL D

EXPLORE THE DEVICE

The world of simulation and training can be a complicated and confusing one. We at TRU are here to help guide you in understanding your training requirements and suggest a solution that is best fit for you.

SIMULATOR COMPONENTS | SIMULATOR OPTIONS | SPACE REQUIREMENTS | TIMELINE

SIMULATOR COMPONENTS

The required components of a Level-D FFS are largely defined by aviation regulators. While these regulations vary from country to country, most are aligned with the FAA (14 CFR Part 60) or EASA (CS-FSTD) which are similar in their requirements. TRU simulators meet or exceed all regulatory requirements, but instead of a one-size-fits-all approach like many other simulator manufacturers, TRU prides itself on customizing the training device to meet the customer's specific needs.

MAJOR COMPONENTS OF A TRU FFS

MOTION

- TRU's REALCue™ motion system accurately replicates the simulated environment's motion characteristics utilizing a Six Degrees of Freedom (6DOF) electric motion system with 60-inch-stroke actuators
- This state-of-the-art system combines easy to replace Commercial Off The Shelf (COTS) computer hardware with TRU's proprietary motion cueing software creating a highly realistic flight experience
- Motion cues are correlated in position, velocity, and acceleration with respect to the visual system display, aural cues, and control forces to meet FFS Level D specifications: linear acceleration, synchronization, turnaround bump, step response, frequency response, damping, and smoothness
- TRU's eMOTION™ Control Panel with intuitive Graphical User Interface (GUI) makes testing, running diagnostics, and manual operations easy and efficient

VISUAL

- TRU's visual system consists of a COTS PC-based Image Generator (IG) on a collimated 200° x 40° field-of-view display
- Three high-definition 4K-resolution projectors present a bright and clear visual scene with an IG capable of displaying many different scenes and special effects including:
    - High definition airport models
    - Full atmospheric and environmental effects such as clouds, fog, and storms
    - Various lighting conditions including day, dawn, dusk, and night

FLIGHT CONTROLS

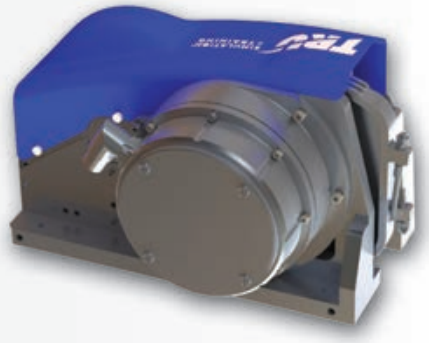
- Perhaps the most critical area that defines a high-quality simulator is if it flies like the actual aircraft it's simulating. TRU has a long history of producing the most advanced Control Loading System (CLS) in the industry
- Our latest generation digital electric CLS provides a high fidelity, realistic force-feel simulation exceeding all simulator regulatory requirements
- The compact yet powerful system design is easy to maintain and utilizes COTS hardware

INSTRUCTOR OPERATING STATION (IOS)

- The TRU IOS combines powerful components and features with an intuitive user interface to enhance the instructor's ability to effectively manage the simulator
- Two COTS touchscreen displays are used to control and navigate the IOS
- The IOS also supports maintenance functions such as QTG testing, operational readiness tests, and troubleshooting
- A wireless tablet, known as the Remote Instructor Control Unit (RICU), allows the instructor to control the IOS from anywhere in the simulator

TRU'S CONTROL LOADING SYSTEM

- Industry leading performance in force and dynamic response
- Incorporates the latest in brushless AC motor and position feedback technology
- Accomodates all fixed wing, rotorcraft, and land based training vehicles
- Linear loader fits all needs in one system



SIMULATOR OPTIONS

In addition to the core simulator components which make up a Level-D FFS, there are many options that can be considered to enhance the device capabilities, based on the customer's requirements. While TRU can incorporate almost any request a customer may have, there are standard options that are more typical for customers.

CUSTOM MODELED AIRPORTS

- Most major airports around the world are included in the modeled airport database which are selectable by the customer. However, if an airfield desired by the customer is not available, it can be added.

CUSTOM VISUAL SCENES

- Unique scenes can be created to address many desired scenarios. While the possibilities are nearly limitless, scenarios could include:
  - Off-airport landing on non-maintained surfaces, sloped terrain, or confined areas
  - Search and rescue operations
  - Smoke and fire scenes
  - Water models for amphibious aircraft

DEBRIEF STATION

- TRU's Debrief System makes simulator training session debriefing more effective by allowing reviews of the actual session.
- The system is capable of capturing video and audio using a mounted camera as well as information from the avionics.
- The system is controlled from the IOS and transfers video, audio, moving map, navigational charts, instrument displays, and more to the debrief station outside of the simulator for playback when the training session is complete.

LESSON PLAN BUILDER

- TRU's Lesson Plan System provides a way of managing the various scenarios during a training session in a consistent and targeted manner.
- Using the Lesson Plan Builder, users can easily create lesson plans for each training session that include predetermined sequence of events and activities which make managing the training sessions easier for the instructor.

SPACE REQUIREMENTS & TIMELINE

TRU full flight simulators have space and floor requirements to allow for safe operation of the device. A typical FFS project takes approximately 12 months to complete from planning to onsite acceptance. The space requirements and timeline can vary based on individual customer needs and requirements.

SIMULATOR ROOM

- The simulator room requires a minimum horizontal clear area of 41ft (12.5m) x 41ft (12.5m) and a clear height of 33 ft (10.1m). In addition, a minimum opening width of 20ft (6.1m) x height of 20ft (6.1m) is required to fit the device into the simulator room. If the computer equipment will be stored in a separate room, the minimum horizontal clear area is 14ft (4.3m) x 25ft (7.6m) and a clear height of 8ft (2.5m)

SIMULATOR PAD

- Due to the high motion system forces of the simulator, reinforced concrete pads are recommended for the three base pads. The anchoring bolts supplied with the motion system require a minimum pad depth of 12.38in (31.45cm) and concrete floor strength of 2,000psi

PROJECT TIMELINE

MONTHS

SIMULATOR PRICING

There are many factors that can influence the price of a full flight simulator, including avionics, control loading, visual systems, various regulatory requirements and customer preference. It's necessary to understand all of these factors that go into the device to be able to understand where the price range comes from.

PRICE RANGE

- The price range for a TRU Level-D Full Flight Simulator typically runs between $7 and $12 million dollars
- While simulator components such as the motion system, control loading, visual system, and instructor station make up much of the costs, it's the aircraft model and avionics that drive the biggest variations in the pricing
- Other factors that drive pricing are similar to those that drive aircraft prices such as optional avionics add-ons. In addition, optional simulation software and/or hardware can add to the cost of a simulator

PRICE RANGE OF OTHER TRU PRODUCTS

Depending on Aircraft, Avionics, & Visual Solution

- Airplane FFS - $7-12M
- Airplane (jet/turboprop) Flight Training Device (FTD) - $800K-5M
- Piston FTD - $300K-1.2M

TRU'S AIRPLANE PRODUCT LINEUP

	FLIGHT TRAINING DEVICES			FULL FLIGHT SIMULATOR
	FAA FTD 5 EASA FNPT II	FAA FTD 6 EASA FTD 2	FAA FTD 7 EASA FTD 2	FAA/EASA FFS Level D
Price	$	$$	$$$	$$$$
Field of View	Three 60" HD Televisions	220° x 40°	220° x 50°	200° x 40°
Motion	None	None	6 DOF Mini-Motion	6 DOF 60" actuators
Control Loading	Passive or Active	Active	Active	Active
Enclosed Cockpit	No	Yes	Yes	Yes
Simulator Room Size (L x W x H)	10ft x 12ft x 10ft (3.1m x 3.7m x 3.1m)	16ft x 20ft x 13ft (4.9m x 6.1m x 4.0m)	33ft x 27ft x 15ft (10.1m x 8.3m x 4.6m)	43ft x 42ft x 34ft (13.1m x 12.8m x 10.4m)
Typical Training Purpose	Procedural Training	Initial/Recurrent Training	Initial/Recurrent Training	Initial/Recurrent Training & Checking

LET'S WORK TOGETHER

TRU Simulation + Training collaborates with you to select the right training solution — or combination of solutions — to fit your organization.

220+

QUALIFIED, SUPPORTED DEVICES

120+

CUSTOMERS WORLDWIDE

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