

How Air Evac Lifeteam Trains With Frasca Simulators

Customer Feature



Air Evac's Growing Fleet Of Aircraft No Longer Matched Their Training Simulator

Since 2005, Air Evac has been using a Frasca 342 helicopter Level 4 FTD to train pilots, but the analogue cockpit couldn't match the upgraded fleet.

Frasca Delivered The Bell 206L4 Level 7 FTD And Another 7 AATD's

A Level 7 FTD provided a tremendous leap in training capability and replicates the aerodynamics, flight controls, systems and visual system technology found in Frasca's Level D Full Flight Simulators (FFS), but adapted for smaller facilities and tighter budgets.

In February 2017, Air Evac ordered seven Frasca Advanced Aviation Training Devices (AATDs) for its Bell 206L4 and Bell 407 helicopters



Largest Air Ambulance Service In The U.S.

Air Evac Lifeteam (Air Evac) of O'Fallon, Missouri, is the largest independently owned and operated membership supported helicopter air ambulance (HAA) service in the U.S.

Since 2015, Air Evac has embarked on major enhancements to its pilot training program with orders for eight Frasca International helicopter flight simulators, including one high fidelity Bell 206L4 LongRanger Level 7 Flight Training Device (FTD) and seven combination Bell 206L4/407 Advanced Aviation Training Devices (AATDs).

Air Evac is a subsidiary of Air Medical Group Holdings, Inc., (AMGH) based in Dallas, Texas, which is a leading provider of helicopter air ambulance programs throughout the United States. It transports more than 80,000 patients annually through its four helicopter EMS subsidiaries: Air Evac Lifeteam, Med-Trans Corp; REACH Air Medical Services and Air Medical Resources Group (AMRG) and its 11 air ambulance subsidiaries.

Mission Profile

Air Evac was founded with one Bell 206L1 LongRanger helicopter on August 1, 1985 in West Plains, Missouri.

"The founders wanted to put a helicopter where it was needed most – in a rural community," says Air Evac Lifeteam President Seth Myers. "At the time, nearly all of the medical helicopters were based at receiving medical centers in large cities.

"After 30 years, we are still a community-based air medical service, and it is a compliment that a majority of the industry has changed its model to be community-based, too," says Myers.

In 2015, Air Evac's helicopter fleet flew 66,627.6 flight hours and made 388,730 takeoff/landings.

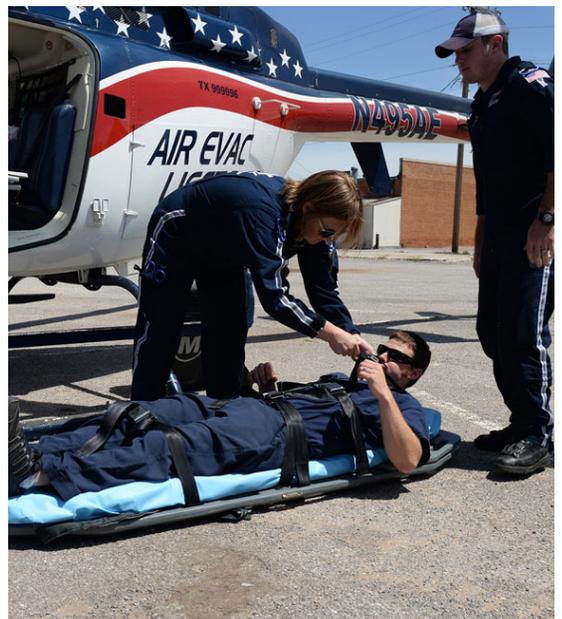
Today, Air Evac's nearly 600 pilots fly 130 Bell 206L4 LongRanger IVs helicopters (or equivalent 206L1+ and 206L3+), 10 Bell 407s, and 6 Airbus AS350s from 134 air ambulance bases across 15 states.

Upgrading The Helicopter Fleet

Helicopter Air Ambulance (HAA) operators in the United States are now subject to additional regulatory, operational and training requirements above those associated with other FAA FAR 135 On Demand Operations.

Air Evac operates under FAR Part 135 visual flight rules (VFR), but all its pilots are instrument rated (IFR) and Night Vision Goggle (NVG) qualified to meet company standards and the latest HAA regulatory requirements.

Starting in 2014, Air Evac began an ambitious program to upgrade the cockpits of its helicopter fleet to comply with the FAA's HAA mandate for cockpit safety improvements and introduce additional avionics including a glass cockpit, auto-pilot integrated with an Night Vision Goggles (NVG) system to enhance situational awareness, increase flight stability and reduce pilot workload.





New Integrated Training System

Between 2005 and 2017, Air Evac Lifeteam also made a parallel investment in pilot training systems to align with new FAA safety requirements and support its upgraded helicopter fleet.

Since 2005, Air Evac had been using a Frasca 342 helicopter Level 4 FTD to train pilots, but the analogue cockpit couldn't match the upgraded fleet.

In 2015, Air Evac placed an order with Frasca International to build a Bell 206L4 LongRanger Level 7 Flight Training Device (FTD) that duplicated all the avionics and systems on its upgraded fleet.

A Level 7 FTD provided a tremendous leap in training capability and replicates the aerodynamics, flight controls, systems and visual system technology found in Frasca's Level D Full Flight Simulators (FFS), but adapted for smaller facilities and tighter budgets.

Rather than produce a standard LongRanger IV cockpit, Frasca accurately replicated the new avionics suite including the FAA mandated Helicopter Terrain and Warning Systems (HTAWS), Automatic Dependent Surveillance- Broadcast (ADS-B) and Flight Data Monitoring Systems (FDMS).

Air Evac's LongRangers and the new FTD also feature additional safety technology not required by regulation such as a Garmin 650/500 glass cockpit, Genesys Aerosystems two-axis HeliSAS autopilot system and an ANVIS 9 Night Vision Goggles (NVS) system.

A major technical attraction for Air Evac was Frasca's Motion Cueing System (FMCS), a 6 degree of freedom (6DoF) Frasca Motion Cueing System integrated with a vibration system. One of the advantages of the short-stroke FMCS is its faster response compared to conventional simulator motion systems (i.e. with 60 inch long actuators) to provide a pilot with more realistic cues during complex flying tasks.

The Level 7 FTD incorporates a precise aerodynamic flight model, which was developed by Frasca using data collected during a LongRanger flight test program where the aircraft was equipped with dozens of sensors.

The device is also equipped with an eight-channel Frasca TruVision Global visual system with a 200° by 68° field of view spherical display screen that includes laser hybrid RGB projectors with an IR spectrum that provide realistic Night Vision Goggle (NVG) stimulation. The Frasca visual database is a training area about 100 square miles in size that includes open plains and mountains. This includes river valleys, highways and hospitals. Air Evac instructors have the ability to replicate hospital rooftop helipads and a car accident scene for training scenarios.





Level 7 Flight Training Device (FTD)

“Before a pilot can fly for Air Evac Lifeteam, a candidate must demonstrate instrument proficiency in our dedicated Frasca Level 7 Flight Training Device,” explains Stephen “Tink” Sullivan, an Air Evac simulator instructor and retired U.S. Air Force helicopter flight instructor.

New Air Evac pilots take an 18+ day ground school course that includes procedural training in a fixed-base FTD and advanced training in the Level 7 FTD.

“We received our Frasca Level 7 FTD in December 2015 and it took about four weeks for the FAA to approve it and our instructors to become familiar with capabilities before it was ‘ready for training’ on January 27, 2016,” says Sullivan.

“The Level 7 FTD is an entirely new technology that gives us the kind of training fidelity that you could previously only achieve with a full flight simulator. With Frasca’s new cueing system a pilot really senses motion with the vestibular apparatus (in the inner ear) and the proprioceptive sensors (the body).”

New hire simulator sessions include training on:

- Multiple starts with malfunction
- Prestart “Fatal Four” (rotor untied – swung 90 degrees, rotor brake up and locked, throttle full open full closed, fuel switch on)
- Unusual attitudes with Inadvertent Instrument Meteorological Condition (IIMC)
- HeliSAS autopilot on and off
- GPS approach
- Inflight diversions with Line Oriented Flight Training
- Analog gauge refresher
- “Buttonology” (procedure training and familiarity with device function).

“In the second training period in the simulator, students will spend about 35 minutes flying into clouds and practicing recoveries and then approaches and landing on unimproved rural terrain, such as pastures and fields,” says Sullivan.

Following ground school, each pilot will receive 12 to 15 hours of day and night flight orientation in one of Air Evac’s training helicopters based at Spirit Airport (KSUS) near St. Louis. The training fleet includes four Bell 206L LongRangers.

Air Evac flights occur 24-hours a day, but most of the training scenarios in the simulator are night flights.

“It’s important that our pilots understand what they need to do if they get into an IMC (loss of ground reference) situation and they know how to use NVG when you’re flying at night. We are a VFR-only operator, but we want our pilots to train for the absolutely worst-case scenario, which is IIMC,” adds Sullivan.

“You can’t practice IIMC in an actual aircraft,” explains Sullivan. “And it’s hard to evaluate whether you’re proficient or not in an actual aircraft. The simulator makes this possible.”





“Our NVG training is done with a new infrared imaging system that looks like night but when you put on night vision goggles you get the green glow from scene,” says Sullivan. “This is a huge safety advance.”

On average, each Air Evac pilot has flown more than 5,700 hours with many former military pilots having prior simulator experience.

Annual recurrent training last two days and includes about three or four hours of academics and 1.5 hours in the LongRanger IV FTD. Air Evac holds four or five classes for recurrent training each month with 12 pilots per class. The FTD sessions include a Garmin 650/500 H refresher; demonstration of unusual attitudes with IIMC, and HelisAS on and off scenarios.

“We have a situation-based training syllabus with three different instructors offering pilots different training scenarios,” adds Sullivan. The field scenarios include loss of tail-rotor effectiveness (LTE), brown out/white out conditions and GPS approaches.”

Frasca’s visual system can replicate 24 hours of the day and is based on an actual ephemeris model to providing correct sun, moon and star positions for any day, any time of the year.

An earlier Air Evac innovation saw the Frasca Level 4 FTD used in conjunction with Integrated Medical Crew scenario training.

Advanced Aviation Training Devices (AATD)

In February 2017, Air Evac ordered seven Frasca Advanced Aviation Training Devices (AATDs) for its Bell 206L4 and Bell 407 helicopters with system scheduled for delivery in the last half of 2017.

“Each of the AATDs will support about 20 bases and may be used instead of an actual aircraft for a portion of the training time,” says Sullivan. “The devices include a LongRanger cockpit, glass instrument panel and autopilot, but don’t have a motion system.”

The AATDs will support Air Evac’s goal of improving pilot decision-making, reducing aircraft accidents and improving safety through high quality training.

Beginning in mid-September, Air Evac’s 600 helicopter pilots will also start training in the first AATDs which

Frasca’s TruVision™ visual system and utilize the same visual database combined with a 70-inch monitor.





Every four months, Air Evac's 600 pilots will visit an AATD to practice flight in inadvertent instrument meteorological conditions (IIMC) and HAA operating procedures. The two training sessions will allow a pilot to experience a variety of scenarios.

"The AATDs will provide Air Evac with continuity of training to ensure that everything we teach at headquarters and in the field is consistent," says Sullivan. Two of the AATDs have can be re-configured in less than an hour to train pilots flying the Bell 407. The kit includes Bell 407 cockpit panels and software that replicates the performance of the four-blade helicopter.

Six AATDs installed in 18-foot long dual-axel trailers to be strategically located a Air Evac air ambulance bases in Ada, Okla., Danville, Ky., Manchester, Tenn., Forrest City, Ark., Cordele, Ga., and Killeen, Texas.

One fixed-base 206L4/407 AATD will be installed at Air Evac's O'Fallon training center adjacent to the Level 7 FTD and Killeen's simulator may be reconfigured to train Bell 407 pilots.



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