



# VAN HORN AVIATION

## Delivers Tail Rotor Performance

By **Kim Rosenlof**, Marketing Coordinator, Van Horn Aviation, LLC



It's safe to say Lieutenant Michael Ingram of the Pasadena (CA) Police Department's Air Operations Section doesn't regret the chance he and his department took nearly three years ago when an unknown company from Arizona offered to loan them a set of composite STC/PMA tail rotor blades. The company touted the blade's more efficient design and claimed greater tail rotor authority with less pedal force, overall noise reduction and longer service life.

Despite already owning a stack of metal blades, the department decided to try the new Van Horn Aviation (VHA) composite blades. The stack of metal blades hasn't been touched since.

"We're extremely happy with the performance of the VHA blades. They're essentially bulletproof," Ingram said. "We're now flying them on both of our OH-58s and our 206B3 JetRanger. And we still have metal blades on the shelf. If there was no advantage, we'd be flying the cheap (metal) blades."

Founded in 2001 in Tempe, AZ, VHA specializes in the design, certification and manufacturing of aftermarket dynamic components for various rotorcraft. In addition to its 206B/L tail rotor blade, VHA produces an aftermarket carbon fiber tail rotor blade for various models of the UH-1 and is currently developing composite MD530F main rotor blades and Bell 212/412 tail rotor blades. All VHA blade designs feature more efficient airfoils and more rugged construction than the metal blades they replace.

The VHA 206B/L tail rotor blade features corrosion and damage-resistant carbon fiber skin, titanium root fitting (versus the OEM blade's aluminum root fitting), an electroformed nickel abrasion strip and stainless steel pitch bearings. Its NASA-

designed laminar flow RC(4)-10 airfoil and shaped tip reduce overall aircraft noise by up to 40 percent, according to FAA-mandated acoustics testing.

"The noise reduction is a huge thing for us," Ingram said. "The political side of the noise impact is a big deal in the [Los Angeles] basin, so we're doing anything we can proactively do to reduce the level of noise."

The rugged composite construction of both the 206B/L and UH-1 blades allowed FAA to grant VHA double the service life of their blades versus OEM metal blades. This results in a 5,000-hour service life for the 206B/L blades and 2,400 hours for the UH-1.

With more than 3,000 hours on its set of "loaner" 206B/L tail rotor blades, Pasadena is currently experiencing long-term benefits from the design upgrades. Besides already flying past the service life of the metal blades, Pasadena's VHA blades have not required a bearing change.

"The bearings have been phenomenal," Ingram said. "Looking at the lack of wear, our mechanic estimates they'll go the entire 5,000 hours without replacement, whereas the old factory bushings were replaced every 1,200 hours or so."

It doesn't take a pilot 3,000 hours to notice the difference VHA blades make. The more efficient airfoils on both the 206B/L and UH-1 blades provide more tail rotor authority with less pedal force, especially at altitude. For law enforcement, this translates into less pilot fatigue when doing extended hover or orbit work.

"We've put between 400 and 500 hours on the Van Horn tail rotor blades, and the pilots like them a lot," said Sergeant Nick Cory of the Tulsa (OK) Police Department Air Support Unit, which equipped one of its two 206L4s with VHA blades several months ago.

"They notice a huge difference in response. The Van Horn blades provide a lot more tail rotor authority. The other helicopter requires more input on the pedals. The pilots would prefer to fly the Van Horn blades if we gave them a choice, but we rotate aircraft to keep the maintenance in check."

VHA performs the majority of its engineering, design, testing, certification and manufacturing in-house at its new 23,000-square-foot facility, also located in Tempe. Purchased in April 2011, the facility received a complete overhaul before VHA personnel could relocate from the company's previously leased 6,500-square-



foot facility in November. The additional space allowed VHA to expand its prototyping and manufacturing capability with new computer-controlled machining centers, modern paint and prep booths, dedicated kitting and lay-up clean rooms and an expanded inspection center. The company nearly doubled its staff between April 2011 and April 2012 to meet production and prototyping demands.

The facility expansion was a critical component of the company's leap from producing 4-foot tail rotor blades to 11-foot main rotor blades for the MD 500

series. Currently in flight testing, the composite MD 500 series blades share many characteristics with their shorter VHA brethren, including the same airfoil as the 206B/L tail rotor blade.

"Our goals include increasing the helicopter's internal gross weight and nearly tripling the blade life limit, while also decreasing aircraft fuel burn rates, overall aircraft noise and direct operating costs," said James R. Van Horn, VHA president and founder. "We also aim to create an MD 500 series blade that is easier to track and balance." 

