

Helio**ops**

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Although 2016 and 2017 proved to be tough years for Kazan Helicopters, with slumps in sales, deliveries, and revenues, 2018 proved to be the most problematic. Now the future looks a bit more optimistic with a significant growth expected in the civil deliveries in 2019 and further growth set for 2020 and 2021. Alexander Mladenov visited the company and provides an overview of its current business and near-future prospects.







ENgineered to Excel

BELL'S 505 ENTERS ENG SERVICE
WITH NEXT-GEN MISSION EQUIPMENT

STORY BY LEIGH NEIL
PHOTOS BY NED DAWSON

In a world first, Houston Television station ABC-13 KTRK and aircraft provider Helicopters Inc. recently instituted a Bell 505 into the ENG (electronic news gathering) role, replacing the station's previous Bell 206 L4 and matching the new generation aircraft with the very latest in aerial broadcast technology suites.



Tim Hinson is ABC-13's Vice President-Broadcast Technology, or Chief Engineer in television industry parlance, with an area of responsibility that essentially includes anything that carries a video signal, electric current, water or has a battery. "I'm responsible for making sure all those thousands of devices and components are installed and maintained correctly, and working properly 24/7," he explained. Hinson came to ABC just over three years ago from a well-qualified background of over fifteen years working at NASA, finishing there with eight years as video production manager and television operations supervisor. When it came time to replace the station's existing Bell LongRanger with a new aircraft, input into the selection of the new helicopter's onboard photography and broadcast equipment therefore fell under his purview. Hinson explained that ABC's choice of the Bell 505 was made at the suggestion of the aircraft lessor and operator. "The choice of the 505 was largely due to our relationship with Helicopters Inc. Our long-term lease was coming to an end and they suggested we consider the 505 along with a list of aircraft that they operate. They outlined the operational benefits of the newer type with particular emphasis on its improved performance and reduced fuel burn. We're not a helicopter company and so after hearing their opinion, we put our trust with their experience. Our station is incredibly forward thinking in terms of all technologies and we like to be early adopters of major technological systems that have to do with the core of our business, so going to a new helicopter type that's not yet in news-gathering use by anyone else anywhere in the world seemed a logical step for us."

The new helicopter's specialist onboard broadcast equipment includes the Churchill Navigation broadcast electronic augmented reality (BEAR) mapping system, which was developed specifically for the airborne news market from Churchill's well known and highly regarded law enforcement airborne augmented reality system. BEAR offers the ability to overlay detailed location information such as street, school and





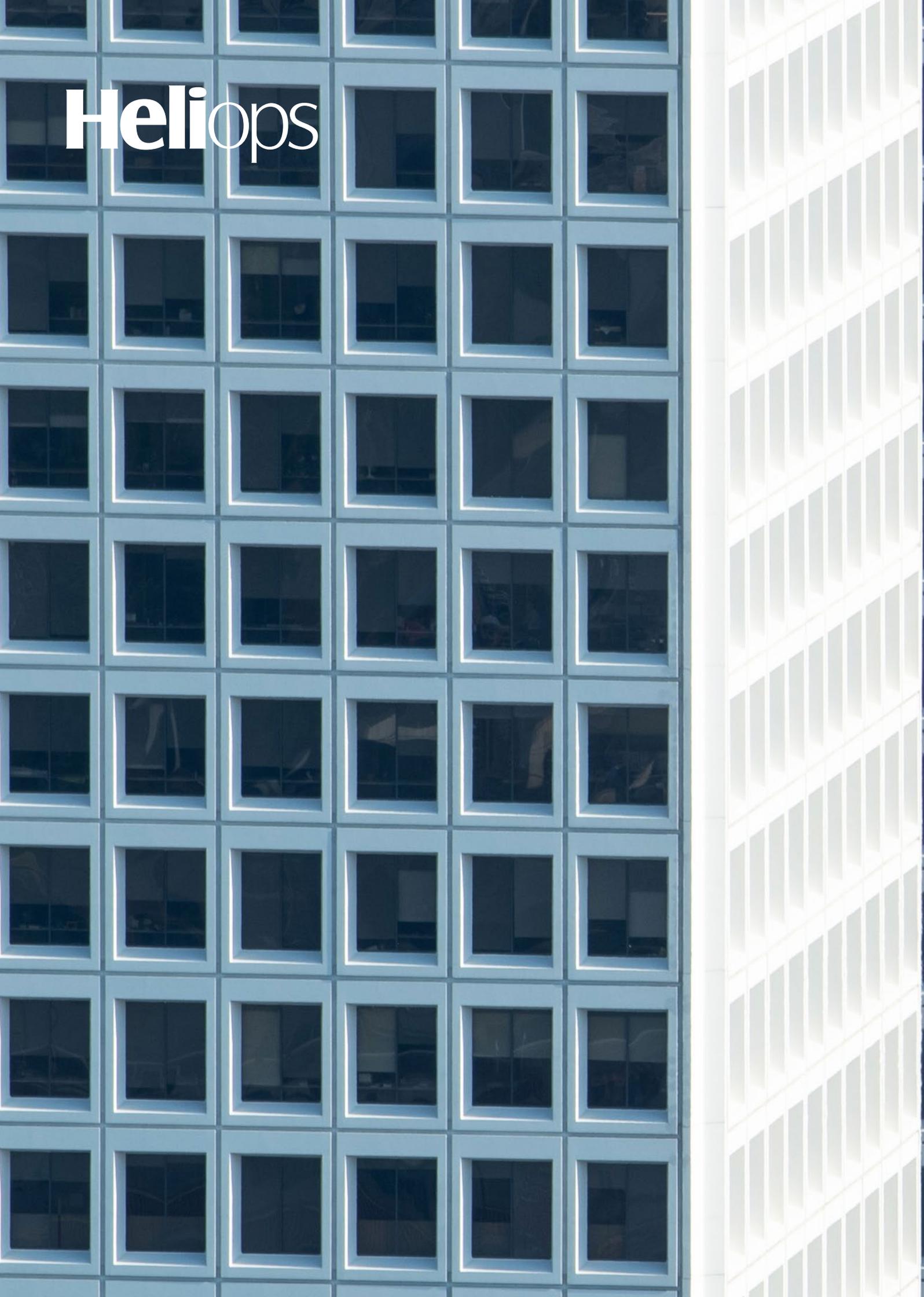
business names directly on the live video feed, display real-time speed tracking, highlight areas affected by natural disasters, fade between real-time video and high-resolution imagery and add 3D motion graphics and telestration. Air-ground encoding and transmission equipment is supplied by Troll Systems, while a Shotover M1 6-axis gyro-stabilized gimbal platform houses an Ikegami F3000 ultra low-light camera with a Fujinon lens. The selection of the Troll Systems equipment was made by Helicopters Inc. as the vast majority of major broadcast facilities already use Troll systems, but ABC – and particularly Hinson – were heavily involved in selecting the rest of the equipment. The decision had already been made that the Churchill system was a non-negotiable item, after the severe flooding caused by hurricane Harvey made it clear that its mapping overlay system would facilitate a vast improvement in both navigation and image presentation to viewers. Hinson elaborated, “There were occasions during the Harvey flooding – the worst in US history - when the assignment desk would give the helicopter a location or scene to attend, but the pilot and reporter would have to ask for a minute to determine where they actually were. That said, while the mapping overlay certainly provides a great tool for the reporter and pilot, the main reason we need it is for





the information it gives to our viewers because when streets and neighborhoods are flooded, everything looks the same from the air. It also has extra features such as the speedometer function, so viewers can see the speed of the target vehicle in a car chase.” The combination of the Ikegami camera and Fujinon lens had already been successfully used and well proven, with its exceptional low-light capability and long zoom making it the first choice for the new helicopter and leaving just the choice of gimbal to complete the equipment suite. The M1 gimbal from Shotover was a new design and had never been tested with Churchill Navigation’s system; in fact the only M1 in use was Shotover’s own test example, so in September 2018 Hinson took the opportunity to attend a trial in New York where the M1-Churchill interface was to be tested for the first time. “When it had become time for the contract to be finalized, I was in the position where I had to make a decision on limited information so we decided then to go with the Shotover M1, but subject to the proviso that if the September trial was not a success, we would fall back and make a change-request to go with the Cineflex gimbal. Within twenty-four hours of connecting the two systems though, they had it calibrated and operational, and we were able





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to do some test flights," he recalled. Prior to that test, Hinson had never operated a gimbal and he had never even been up in a helicopter but after a very brief crash course, Hinson was able to effectively and smoothly operate the M1/Churchill system. Before the end of the test flight he even managing to capture manually tracked footage of an escaped birthday balloon until it was well out of un-aided sight, an accomplishment which the helicopter pilot had told him would be impossible because of its size and distance from the aircraft.

Jule Boyer, the Director of Maintenance for Helicopters Inc, and his team of ENG techs designed the ENG system for the 505 along with Jose Montanez a consultant to the company. The system was designed for flexibility and ease of maintenance. The design included a removable center control that requires no tools to remove from the aircraft. The center monitor stand was designed to withstand vibration and provide multiply monitor mounts and selections. The rear cargo bay has a slide shelf for easy access and removal. All this makes for a very versatile design. One of the best advantages of the new ENG equipment is that the gimbal and many of the encoding and







transmission systems can be remotely monitored, diagnosed, trouble-shot and upgraded over an internet connection, enabling the equipment to be maintained remotely by the manufacturers while the aircraft is in the hangar for its own maintenance, reducing both cost and aircraft down-time. Less than a year after signing the contract, the new helicopter – painted in a new, contemporary scheme designed by ABC13’s in-house graphics team - arrived in Houston and about a month of equipment re-configuration and fine-tuning ensued, matching the equipment to ABC13’s specific video and audio systems. “Since those kinks were worked out, the helicopter has worked fantastically. The only area in which I could see potential improvement is perhaps a little more stability in the Troll microwave downlink, but I can say that I’m happy with the helicopter as it is right now,” Hinson summed up. “One of the key factors for us is that we are the only TV station in the Houston market with our own helicopter. We do seven hours of news every day and right from the start we knew how important it is to be able to call the shots with the helicopter because that gives us a competitive advantage. It’s not a pool helicopter and it’s got our logo on it so we also want to know that it’s the very best.”

ABC-13 is Houston’s most watched TV station and the one of the eight ABC-owned television stations, all of which are in





major US metropolitan areas and part of the massive Disney Corporation's holdings, so Hinson is therefore studiously conscientious in avoiding any commentary that could be taken as endorsing any external company or product. The facts contained in what he reported however, speak for themselves and it takes very little research to confirm that the Churchill augmented-reality mapping system is now the preferred choice for many law enforcement aviation operators who want the ultimate in real-time visual location information overlays. The build quality, design, finish and ease of use of the Shotover products are readily apparent when inspecting and operating them, and they are rapidly becoming the preferred gimbal platform for a large number of aerial movie and video production operators. In fact, an American company founded by some of the film and television industry's most highly regarded photographers and aerial photography pilots bought the New Zealand-based company after seeing a demonstration of Shotover's original K1 gimbal. In a recent HeliOps article on the Shotover M1, we printed the following quote from Brad Hurndell, Shotover's CEO and what it reveals about the ethos and corporate culture of Shotover is highly apropos to how Tim Hinson sees ABC13 as a forward-looking, early-adopting technology company. "Constant innovation is part of our brand and our key goal is for the whole industry to be of the opinion that if they want to shoot stabilized





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footage, they'll use one of our products. That's our vision. The catch phrase is: 'Look down, look forward but never look back.' Looking down is what our products do, looking forward is us always keeping an eye on the future and anticipating trends, and never looking back because there is nothing to be gained from getting bogged down in the obsolete systems, technologies and methods of the past."

Helicopter Inc's Allen Hopkins has been flying KTRK's ENG machine from its Hobby Airport base for two and a half years, and the primary pilot for the last year and a half. After leaving the Marine Corps, Hopkins turned his flying hobby into a career. With plenty of time on the KTRK LongRanger prior to the arrival of the 505, he is in a good position to offer qualified opinions on the relative merits of the two machines. The first he knew of the new machine was about a month before its arrival, when he was told he was heading off to attend 505 training at Bell. "When it arrived in mid-February after the install was done, there was a period of tuning out the bugs between the onboard systems and the receiving equipment, and then we just started flying it. Helicopter-wise, it's performed beyond my expectations and I've been much happier with the power available for what we use it for." Hopkins reported that on first acquaintance, the





new machine definitely did not feel like a typical Bell helicopter, due mainly to the partially composite construction and the accordingly lighter feel. "It feels lighter and I wasn't used to having slam-doors, rather than the heavier metal doors of the 206. The pedals felt a little 'fishy' to me at first; similar to the way the LongRanger felt when it went from the standard tail rotor to the Van Horn tail rotor. I'd also like the pedals to be a little wider as they're a little too close together for my liking." He explained that, unlike the 206 series, which offers fore and aft adjustment as well as limited width adjustment, the 505 pedals are fixed in place on pinned slides and adjustable only on the ground. "Power-wise, I have a lot more power than in the LongRanger and I'm able to hover out of ground effect. It's faster by about ten to fifteen knots and now I can compete with the 407, normally getting around 110 to 115 knots at my maximum, whereas the 206 was around 100 knots. I believe I have more tail rotor authority too." He admitted preferring the greater size and more solid feeling of the LongRanger, but Hopkins then referred to the lightness, speed and greater power of the 505, likening the comparison between the two to that of driving a Cadillac SUV vs. a Porsche Boxter. He finds the controls very light, with little feedback and commented that he flies the 505 with friction applied, in order to give him some control feedback.

While Hopkins is impressed with the performance of the







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new machine, there are a few minor issues that he is less happy with, opining, "I think the worst thing about it is the relatively poor air conditioning capability. We didn't have opening windows at first, but now we have slide windows on each side and that helps to keep it a bit cooler, but at eighty degrees and moderate humidity the air-con couldn't manage to keep the interior properly cooled. In summer it gets a lot hotter and more humid than that so heat is going to be an issue for us." The front seats are extremely comfortable in Hopkins' opinion but he advised that the rear seats are an entirely different matter, although new seats are already being worked on to improve comfort levels in the back; something for which the station's photographers will no doubt be immensely grateful. The aircraft is fitted with a Garmin 1000 avionics suite, incorporating a two-screen layout with MFD (multi-function display) and PFD (primary flight display), accompanied by a standby attitude and altitude module (SAAM). The main radio is accessed via the Garmin screens and a separate secondary radio is fitted for redundancy.

The technology in the new aircraft also required some adaptation, according to Hopkins. "Something that took me a while to get used to is that I don't actually have a throttle to





manipulate. You just have a switch and you're either in 'flight' or you're in 'idle'. They teach you in training how to deal with things such as a stuck pedal, how you manage it and how you land, but it's a different mindset and way of flying than we're used to." The computerized system does facilitate some simplifying of traditional pilot workload too, as he explained. "Every time you go out to fly, you turn it on and do a weight-and-balance before you start the aircraft. You enter the weight for each seat and





your fuel weight and the system calculates the C-of-G, you sync' and confirm it and then you can start the engine. Fuel is pretty much under the mast, effectively at zero datum and therefore the fuel burn-off during flight has only a very minimal effect on the C-of-G location and so you're golden for the entire flight; the weight in the front seats has by far the greatest effect."

Each day, the station wants the aircraft to be airborne and flying; one from 6am until 7am and concentrating largely on traffic unless called to a breaking news story, and an afternoon flight from 4:30 to 5:30. Between those times the aircraft is on call for any breaking news. "From the time we get a call, we have only five minutes to get airborne" he remarked. "The most fun things to do are car chases; we have plenty of those and they don't usually end quickly as Houston is really flat and there are lots of open spaces. We work in really well with the Houston police department and we always give them their space and follow in the background, but in chases and searches we'll always assist them if we can."

Hopkins considers that the 505 brings a definite boost to the stations ENG capabilities, noting the enhanced broadcast image quality of the new onboard equipment, but adding that his own monitoring screen is also a much higher resolution and aids him





in piloting the aircraft in a manner that gives the photographers more effective assistance in carrying out their tasks. The extra power allows him more flexibility in aircraft positioning, holding shots that otherwise would not be sustainable. At 2,670lb empty weight, the new aircraft's maximum limit of 3,680lb allows for plenty of fuel with the usual crew of pilot and photographer and carriage of a third person when required has little effect on the fuel load and no impact on mission effectiveness.

While it is clear from Hopkins' assessment that the Bell 505 is not without a few minor flaws or areas that would benefit from further development, he is happy with the aircraft as an ENG platform and confirms that it definitely offers notable improvements over the aircraft it replaces. From the station's point of view, the aircraft/equipment package is obviously able to immediately provide a greatly improved product to viewers and is able to offer an even higher level of transmission quality if future standards come into force permitting anything up to UHD broadcast quality, with Churchill, Shotover, Ikegami and Troll already positioned and engineered to meet the challenge. ABC13's combination of the Bell 505 and a leading-edge technology suite undeniably sets an extremely high benchmark for a first-of-type in the ENG role. ■





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